

## Idaho 4-H Animal Science Lesson Program Checklist

Member's Name: \_\_\_\_\_ 4-H Club: \_\_\_\_\_

Indicate the years (i.e. 2019, 2020, 2021) enrolled in the project below:

\_\_\_\_\_

This program incorporates a series of age-appropriate, skill-based objectives to guide and encourage 4-H members in gaining a diverse working knowledge related to the animal industry. These skills are in addition to the basic Idaho 4-H project requirements listed below:

- Choose your project animal(s)
- Individually identify each animal (ear tag, etc.)
- Complete project record & involvement report
- Exhibit project animal(s) in quality/showmanship
- Complete Permanent Individual Animal Record – one/animal (breeding only)
- Provide positive proof of ownership based of required days
- Weigh & give primary care during county feed period (market only)
- Give oral presentation related to this project
- Complete any other County-based requirements

All individuals (regardless of age) should begin with Level 1. Youth must complete at least 5 skills/year; at least one of these must be a Quality Assurance [QA] noted activity. The lesson title from where the skill will be learned is in **Bold letters**. A minimum of 15 different skills should be completed before advancing to the next level. Older youth just entering the (species) project are encouraged to move through Levels 1 and 2 at an accelerated rate to enhance their overall 4-H career learning experience. **{Note: Submit this updated checklist annually with your animal project record book.}**

LEVEL 1 SKILLS		Completed (mm/dd/yy)	Leader's Initials
	Describe the reason to provide livestock bedding for your animal <b>Environment: Caring for My Animal</b>		
	Describe the basic facilities (housing, pen space & equipment) needed to safely raise your project animal(s) <b>Housing My Animal</b>		
	Demonstrate how knowing the flight zone of an animal can help you be safe when working with an animal <b>Safe Animal Handling</b>		
	Describe how temperature and air flow can affect the performance and health of an animal <b>Temperature &amp; Ventilation in the Barn</b>		
	Develop a basic (species) project plan (including income, expenses and facilities) <b>What's Your Plan</b>		
	Identify at least 5 breeds within your project species <b>Common Livestock Breeds and Characteristics</b>		
	Identify at least 20 parts of the animal within your project species <b>Evaluation</b>		
	Estimate what the market weight or frame size of your animal should be by the county fair <b>Frame Size and Market-Ready weights</b>		
	Describe the importance of raising a structurally correct animal <b>Structural Conformation</b>		
	Describe the following animal selection traits: muscling, trimness, growth & frame, structure & balance and why they are important - <b>Common Breeds and Characteristics or Evaluation</b>		
	Define why reproduction is important in raising livestock <b>Introduction to Reproduction</b>		
	List 5 basic classifications of nutrients <b>Five Basic Nutrients</b>		
	Describe Average Daily Gain <b>Average Daily Gain</b>		
	Explain why it is important to have a fresh, clean source of water <b>Basic Nutritional Requirements - Ruminant</b>		
	Explain the difference between a roughage, concentrate and supplement <b>Basic Nutritional Requirements - Ruminant</b>		
	Explain the purpose of a feed label <b>Feed Labels</b>		
	Define a monogastric animal <b>Monogastric Nutrition</b>		

	<b>LEVEL 1 SKILLS (continued)</b>	<b>Completed (mm/dd/yy)</b>	<b>Leader's Initials</b>
	List the two types of digestive systems found in most domestic farm animals <b>Basic Nutritional Requirements – Ruminant and Monogastric Nutrition</b>		
	Describe at least 5 symptoms/behaviors of a healthy animal <b>What Does a Healthy Animal Look Like?</b>		
	Describe where injections should be given on your animal <b>Injection Sites and Techniques</b>		
	List three things you can learn from a medication label <b>Reading Medication Labels</b>		
	List 3 things you can do to prevent your animal from getting diseases <b>Preventable Practices</b>		
	Tell why recordkeeping is important in disease prevention <b>Animal Record Keeping for Disease Prevention</b>		
	Explain how a veterinarian can help you keep your animal healthy <b>Veterinary Client Relationships</b>		
	Prepare a list of livestock equipment & supplies needed at a Fair <b>Equipment</b>		
	Describe what you will need to do to be ready to show your animal <b>Getting Ready for the Show</b>		
	Make a list of products that can be used to groom your animal <b>Grooming Beef</b>		
	List some of the steps to halter break or gentle your animal <b>Halter Breaking and Gentling</b>		
	Watch a Showmanship video and demonstrate proper showmanship techniques <b>Showmanship</b>		
	Make a list of animal science related careers <b>Career Exploration</b>		
	Describe how to properly care for your animal at the fair <b>Connecting with the Public through a Positive Image</b>		
	Explain the importance of knowing where food comes from <b>Where Our Food Comes From</b>		
	Prepare a thank you card to be used to thank a sponsor <b>Thank You Letters</b>		
	Discuss why you need to know how much it costs to raises an animal in 4-H <b>Making a Plan – Costs to Raise Market Animals</b>		
(QA)	Describe an animal by-product <b>Animal By-Products</b>		
(QA)	Describe 2 things you can do to properly handle your animal <b>Animal Welfare – Handling</b>		
(QA)	Describe Biosecurity <b>Biosecurity</b>		
(QA)	Conduct a safety evaluation of your livestock facilities; report any changes needed/made to promote animal well-being - <b>Biosecurity</b>		
[QA]	Explain good character and ethics <b>Ethics: Pillars of Character</b>		
(QA)	Define sportsmanship have to do with raising and showing livestock <b>Ethics: Sportsmanship</b>		
(QA)	Tell the difference between wholesale and retail cuts of meat <b>Recognizing Wholesale and Retail Cuts</b>		
(QA)	Describe what Quality Assurance means to you <b>What is Quality Assurance?</b>		



LEVEL 2 SKILLS		Completed (mm/dd/yy)	Leader's Initials
	Explain impact of temperature extremes (hot & cold), wind and humidity on livestock performance <b>Environment: Caring for My Animal</b>		
	Identify at least 3 problems created by insufficient air circulation within livestock facilities. <b>Temperature and Ventilation (Air Flow) in the Barn</b>		
	Explain the impact frame size can have on the final weight of your animal <b>Frame Size and Market Ready Weights</b>		
	List 5 things to consider when selecting a project animal <b>Project Animal Selection</b>		
	Tell the importance of skeletal structure in animal selection <b>Skeletal Structure</b>		
	Evaluate, rank and give reasons on a class of four animals <b>Livestock Judging, Note Taking and Oral Reasons</b>		
	Participate in a Livestock Judging activity or contest <b>Livestock Judging, Note Taking and Oral Reasons</b>		
	List 3 major parts of the male reproductive system <b>Parts of Reproductive Systems</b>		
	Describe the difference between a dominant and recessive gene <b>Genetics</b>		
	Define the following terms: purebred, crossbred, heredity <b>Purebred vs. Crossbred</b>		
	Explain what a crossbreeding program is and why would it be used <b>Purebred vs. Crossbred</b>		
	Identify heat detection methods used for your species of animal <b>Heat Detection</b>		
	Describe when the breeding season should be for the species of animal you are raising <b>When will My Livestock Project Animal Be Born?</b>		
	Describe the different nutritional needs of a monogastric and a ruminant animal <b>Basic Nutritional Requirements – Ruminant and Monogastric Nutrition</b>		
	List at least 7 pieces of information found on a feed tag <b>Feed Labels</b>		
	Describe the difference between a "caution" and "warning" on a feed tag <b>Feed Labels</b>		
	Demonstrate how to calculate average daily gain <b>Average Daily Gain</b>		
	Describe why a ruminant animal can breakdown and utilize more complex feeds <b>Digestive Systems</b>		
	Describe a valid Veterinary-Client-Patient relationship <b>Veterinary Client Relationships</b>		
	List 6 things you can that would help to keep your animal healthy <b>Preventable Practices</b>		
	Explain the difference between a vaccination and a medication <b>Injection Sites and Techniques</b>		
	List at least 3 external parasites common to your animal and describe how to treat for them <b>External Parasites</b>		
	Describe castration, dehorning and docking <b>Castration, Dehorning and Docking</b>		
	Describe the reproductive difference in a castrated male <b>Castration, Dehorning and Docking</b>		
	Define medication withdrawal time and describe why it is important to follow medication withdrawal times – <b>Reading Medication Labels</b>		
	Demonstrate proper grooming and showmanship techniques for younger members in your group <b>From Showing Level 1 Lessons</b>		
	Describe where our food comes from to a friend or an adult <b>Where Our Food Comes From</b>		
	Describe or give a demonstration on an agriculture career you are interested in <b>Career Exploration</b>		



	<b>LEVEL 2 SKILLS (continued)</b>	<b>Completed (mm/dd/yy)</b>	<b>Leader's Initials</b>
	Demonstrate how to invite buyers to the market animal sale <b>Inviting Buyers to the Market Animal Sale</b>		
	Describe the animal identification options for your species <b>Animal Identification</b>		
	Describe the difference between a bill of sale, receipt and brand inspection <b>Livestock Ownership Records</b>		
(QA)	Describe the term "flight zone" and how you can determine your animal's point of balance <b>Animal Welfare - Moving</b>		
(QA)	List the applicable USDA Quality Grades or USDA Grades for your species <b>Ideal Market Animal</b>		
(QA)	Describe the industry standards for your species of animal <b>Ideal Market Animal</b>		
(QA)	List 10 examples of by-products derived from your species of animal <b>Animal By-products</b>		
(QA)	Describe 5 carcass terms that relate to your animal project <b>Carcass Terminology</b>		
(QA)	Create a Biosecurity plan for your livestock project <b>Biosecurity</b>		
(QA)	Name the six pillars of characters <b>Pillars of Character</b>		
[QA]	Describe unethical behavior and why it's not acceptable in 4-H <b>Consequences of Unethical Behavior</b>		

	<b>LEVEL 3 SKILLS</b>	<b>Completed (mm/dd/yy)</b>	<b>Leader's Initials</b>
	Explain why structural soundness is critical in both breeding and market animals; list 5 common structural defects within your species – <b>Structural Conformation</b>		
	Explain the roles of estrogen, FSH, LH and progesterone in male & female reproductive physiology <b>Hormones</b>		
	Define heritability and how it is used in breeding management decisions <b>Expected Progeny Differences (EPD's)</b>		
	Identify the parts of the female reproductive tract for the species you are raising <b>Parts of the Reproductive System</b>		
	Describe the impact using artificial insemination could have in a livestock operation <b>Artificial Insemination</b>		
	Describe why a producer would want to use embryo transfer in their herd or flock <b>Embryo Transfer (this lesson not yet available)</b>		
	Describe difference between fat-soluble and water-soluble vitamins; list the 4 fat-soluble vitamins <b>5 Basic Nutrients</b>		
	Name in order the four compartments within the ruminant stomach; explain how roughages are broken down within that system – <b>Digestive Systems</b>		
	Describe the role body condition scores play in animal production <b>Body Condition Scores</b>		
	Determine how much it will cost to feed your project animal <b>Nutrition Budgets</b>		
	Name at least 8 items that should be listed on an animal treatment record <b>Animal Recordkeeping for Disease Prevention</b>		
	Describe the impacts that parasites can have on animal production <b>Internal Parasites</b>		
	Track weekly market prices for US No 1 hogs, choice lambs or choice/yield grade 3 steers. Plot this information on a graph.		
	Create a YouTube video to promote your animal project for sale <b>Inviting Buyers to the Market Animal Sale</b>		
	Give a marketing/sales presentation (including buyer recruitment, appropriate thank you notes, etc.) at a club/project meeting		





	LEVEL 3 SKILLS (continued)	Completed (mm/dd/yy)	Leader's Initials
	Prepare/give a 7-10 minute presentation on nutrition at your club or group meeting		
	Prepare/give a 7-10 minute presentation on health care at your club or group meeting		
	Prepare/give a 7-10 minute presentation on genetics at your club or group meeting		
	Prepare/give a 7-10 minute presentation on related career opportunities at your club or group meeting		
	Prepare/give a 7-10 minute presentation on reproduction at your club or group meeting		
(QA)	Describe the steps you would take to safely haul your animal project <b>Animal Welfare - Hauling</b>		
(QA)	Determine ribeye area or loin eye area and fat thickness using a picture of the meat or the actual meat cut. Share the results with your club – <b>Carcass Measurements</b>		
(QA)	Explain how the USDA Quality and/or Yield Grades for your species are determined. <b>Quality and Yield Grade</b>		
(QA)	Identify 4 examples of unethical behavior; explain why each is wrong and what you think the consequences should be for someone doing that – <b>Consequences of Unethical Behavior</b>		
(QA)	Prepare/give a 7-10 minutes presentation on wholesale cuts of meat for your project animal species		
[QA]	Prepare/give a 7-10 minute presentation on meat quality at your club or group meeting		
[QA]	Prepare/give a 7-10 minute presentation on quality assurance practices at your club or group meeting		
(QA)	Prepare/give a 7-10 minute presentation on ethics education at your club or group meeting		

# Career Exploration

Alaena Ruth, Extension Educator

## Goal (learning objective)

Youth will learn about animal agricultural careers and how they connect to each other to make the industry function.

## Supplies

- Handout 1- “Animal Agriculture Career Description Cards” (one copy for instructor and make enough copies so each child gets one career card once they have been cut up)
- Handout 2- “Career Bank” (one for each member)
- Handout 3 - “Description of Agricultural Areas (one copy)
- Handout 4 - “Animal Agriculture Careers” (one copy for instructor)
- Four bowls (buckets or bins)
- Pencils (or pens) enough for group
- Flip chart paper and marker or chalkboard and chalk

## Pre-lesson preparation

- Make copies of Handouts:
- Cut out Animal Agriculture Areas from Handout 3, tape one to each bowl (bucket or bin)
- Cut out Career Description Cards from Handout 1
- Read/review lesson and resource materials

## Lesson directions and outline

Share the following information with the youth:

There are a wide variety of animal agricultural careers that many people do not know or think about when searching for a field to enter in to. If you are involved in 4-H animal science project, it shows interest in the animal science field. There are many potential careers

in animal agriculture and learning about all the options may help you decide what field to enter in to.

These careers can be separated into four major areas:

- **Production-management:** This area is for individuals who enjoy the opportunity to work directly with animals. These careers allow you to be involved with the production of animals for human use or consumption. Some careers may involve most of your time being outdoors. Other options in production-management pertain to the health treatment and care of animals.
- **Agribusiness:** Careers in this area can be for individuals who enjoy being around animals but not the direct production or treatment of them. Many people are employed to produce goods and services that are necessary to produce livestock.
- **Government Agencies:** Opportunities in government agency careers are varied. Government agencies careers are best fit for individuals who want to assist and service producers and consumers. This area does not provide direct connections to animals but allows an individual to help people in all disciplines of animal science.
- **Research and Teaching:** Research and teaching careers are for individuals who enjoy speaking and helping others learn about animal agriculture. These careers offer opportunity to advance agriculture through technology, information, and even the potential to help others discover their passion for animal agriculture.

## Conducting the activity (DO)

### Activity 1

1. Ask for a volunteer to handout to each member one Career Description Card (from Handout 1) and a Career Bank (Handout 2).
2. Make sure every member has a pen/pencil. Ask the youth write any additional things that they believe a person in that career does.
3. Have youth come up one by one and share just the facts about their career without revealing what the career is. Have the rest of the group guess what the career is based on the Career Bank provided (Handout 2).
4. Once the group has guessed their career, have the youth who has the card determine what area of agriculture (Production Management, Agribusiness, Government Agencies, or Research & Teaching) their career belongs in and drop it into the respective receptacle (help the youth as needed).
5. Go through as many different careers as possible.

### Activity 2

1. Once the youth have placed their career cards into the correct place, the next step is to place the careers into a logical order of how they are all connected.
2. You may split the youth into groups (make as many groups as you are comfortable with).
3. Provide groups with scissors, have one youth cut out each of the careers from their word bank for their group.
4. Once the group has identified the order ask members how each career is connected to the career behind and in front of it.

## What did we learn? (REFLECT)

- Ask: What are careers in agriculture that you learned about that you didn't know before?
- Ask: How are careers in animal agriculture influenced by other careers?

## Why is that important? (APPLY)

- Ask: How can you contribute to animal agriculture with your career choice?
- Ask: What are other areas of agriculture besides animal based, that you may be able to start a career in?
- Ask: How can you begin preparing for a career in agriculture?

## Resources

Agriculture Council of America. (2017). National Ag Day. *Careers in Agriculture*. Retrieved from: <https://www.agday.org/careers-in-agriculture>

Ohio State University Extension. (2011). Careers in Animal Science. *Beef resource handbook* (page 15-1 through 15-5).

Ohio State University Extension. (2008). Careers in Animal Science. *Goat resource handbook* (pages 173-174).

Ohio State University Extension. (2011). Careers in Animal Science. *Sheep resource handbook for market and breeding projects* (pages 131-133).

Ohio State University Extension. (2000). Careers in Animal Science. *Swine resource handbook for market and breeding projects* (pages 25-1 through 25-4).

## ADVOCACY: CAREER EXPLORATION – HANDOUT 1

### Animal Agriculture Career Description Cards:

#### **Livestock Producer**

A person that raises animals to sell to others interested in raising livestock. A person is considered a producer whether they have one or many animals.

#### **Agricultural Broadcaster**

they use radio or television to report on stories that will be found relevant by agricultural viewers, but that also may be used by regional and national outlets reaching non-ag viewers.

#### **Artificial Insemination (AI) Technician**

Someone trained to use semen collected from the male animal and used to breed a female animal. This person usually uses semen that has been frozen. The technician thaws the semen and uses the proper tools to inseminate or breed the female,

#### **Veterinarian**

A person that has received a college degree to be able to provide animal care. A vet is similar to a medical doctor for people except they only work to keep animals healthy.

#### **Animal Geneticist**

Analyzes the genetic makeup of animals to discover which genes cause them to behave certain ways. Geneticists may also study animal health to determine what causes animals be immune to specific diseases or fail to thrive in certain environments.

#### **Nutritionist**

A person with a college degree that determines the types of feed ingredients and feed formulations that will help animals grow the most efficiently.

#### **Feed Salesperson**

A person that works for a feed company to sell feed to feed stores, large ranches and feedlots. This person usually travels to places that sell feed to let them know about the product he has available.

#### **Herd Manager**

This person is usually hired by a farm or ranch owner to see that the animals are provided the proper daily care. This would include proper feed, proper health care and make sure there are good facilities to house the animals.

#### **Extension Educator or Specialist**

A person with a college degree that works for the state university to provided educational, researched based information to the local community. They may have a knowledge in agriculture or home and family issues.

**Breed Association Representative** A person that works for animal breed associations to help breeders with knowledge about those animals and to promote the breed to other people that may be interested.

#### **Ag Magazine Editor**

A person that puts together an agriculture information magazine to share latest products, successful practices, etc. This person may assign writers to research and write stories based on current industry topics.

#### **Ag Loan Officer**

This person has experience in the banking industry. They work with farmers and ranchers or others involved in agriculture to provide funding. They help producers determine the best ways to repay loaned monies.

#### **Waste Disposal Specialist**

This person works with owners of livestock facilities to help them determine how to manage the animal waste (manure and feed) from the farm, ranch or feedlot.

#### **Livestock Transporter**

This person has a truck and trailer to haul animals for other people. They provide the opportunity for people to buy animals and then have them hauled to the new location.

#### **Livestock Buyer**

A person that buys livestock for his own operation, buys livestock for others to feed, buys livestock for other producers. The buyer usually has on order of what livestock is needed and an acceptable price range to pay.

#### **Processing Plant Manager**

This person works to make sure that the agriculture product or commodity processed by the plant is done efficiently. They may manage employees and oversee all aspects of getting the product ready to be used or marketed.

**USDA Meat Inspector** A Meat Inspector ensures that meat is safe from contamination and that the process it goes through follows quality assurance regulations. They inspect all meat products including, poultry, seafood, beef, pork, etc. before the initial packaging.

#### **Meat Cutter**

A person that works in a meat packing plant or grocery store. This person knows how to break down animal carcasses into wholesale and retail cuts. They may also prepare and package the meat to be sold.

**Food Technologist**

Food technologists oversee all aspects of product development, reviewing and approving nutritional data, writing product specifications and enforcing USDA labeling regulations on new and modified food products.

**Quality Assurance Auditor**

Monitors companies' production process to ensure they are in compliance with governmental regulations.

**Restaurant Manager**

Oversee the day to management of a restaurant for the owner. They make sure the commodities needed to make food are available and the employees are trained to take care of customers.

**Feedlot Manager**

oversee daily operations of feed yards. They provide knowledge and support for heard nutrition, marketing, and environmental conditions for livestock in feedlots.

**Social Media Strategist**

Develop, manage and track internet content on their employer's social media pages. Because of the popularity of social media, social media strategists play a crucial role in defining agriculture's brand to the masses.

**Marketing Specialists** Are responsible for getting the appropriate communication message and medium delivered to the public. By doing so, they ensure that the company meets their sales goals. Marketing Specialists also watch over companies'/clients promotions for their products and services through their marketing skill sets.

**Veterinary Technician**

Responsible for the well-being of animals. They work hand-in-hand with veterinarians providing the essential medical procedures to ensure that animals are healthy.

**Embryologist**

An embryologist provides reproductive services and research in the areas of embryo creation, IVF (in vitro fertilization), cloning, and transgenic animal production.

**Food Safety Specialist**

Food Safety Specialists are responsible for meeting food safety standards. They oversee that foods are processed, packaged, and prepared according to those specific standards. he standards can be implemented by their company or regulatory organizations.

**Agricultural Science Teacher** Responsible for the education of agriculture, food science, and natural resources for students. Using these topics, agricultural science teachers can give students vital skills that are important in the ag industry. These skills include: math, science, leadership, technology, communications, and management. They can also go the extra step in providing strong agricultural education by advising their school's FFA Chapter.

**Brand Inspector** Brand Inspectors must check brands on livestock. They check any documents that show ownership such as bills of sale and shipping manifest. They issue brand inspection papers when cattle are sold or are going to be transported they are a law enforcement official.

**Game Warden**

Game wardens work at the state or federal level, enforcing laws related to hunting and fishing. Work to arrest offenders as well as assist with wildlife conservation efforts.

**Agricultural Lobbyist** Agriculture lobbyists work to make sure government officials hear the voice and position of companies, organizations, industries or even communities. It is their goal to influence policy development and look out for the interests of the individuals they represent.

**ADVOCACY: CAREER EXPLORATION – HANDOUT 2**

**Career Bank**

**Livestock Producer**

**Agricultural Broadcaster**

**Restaurant Manager**

**Livestock Buyer**

**Food Safety Specialist**

**Food Technologist**

**Feedlot Manager**

**Agriculture Science Teacher**

**Feed Salesperson**

**Embryologist**

**Quality Assurance Auditor**

**Marketing Specialist**

**Artificial Insemination Technician**

**Ag Loan Officer**

**Agricultural Lobbyist**

**Brand Inspector**

**Game Warden**

**Veterinary Technician**

**Waste Disposal Specialist**

**Livestock Transporter**

**Meat Cutter**

**Livestock Producer**

**Nutritionist**

**Herd Manager**

**Veterinarian**

**Social Media Strategist**

**Ag Magazine Editor**

**Animal Geneticist**

**USDA Meat Inspector**

**Breed Association Representative**

**Extension Educator or Specialist**

**Processing Plant Manager**

Descriptions of Agricultural Career Areas

# Production Management

This area is for individuals who enjoy the opportunity to work directly with animals. These careers allow you to be involved with the production of animals for human use or consumption. Some careers may involve most of your time being outdoors. Other options in production-management pertain to the health treatment and care of animals.

# Agribusiness

Careers in this area can be for individuals who enjoy being around animals but not the direct production or treatment of them. Many people are employed to produced goods and services that are necessary to produce livestock.

# Government Agencies

Opportunities in government agency careers are varied. Government agencies careers are best fit for individuals who want to assist and service producers and consumers. This area does not provide direct connections to animals but allows an individual to help people in all disciplines of animal science.

# Research & Teaching

Research and teaching careers are for individuals who enjoy speaking and helping others learn about animal agriculture. These careers offer opportunity to advance agriculture through technology, information, and even the potential to help others discover their passion for animal agriculture.



## ADVOCACY: CAREER EXPLORATION – HANDOUT 4

### Animal Agriculture Careers



(Figure 15.01)

# Connecting with the Public through a Positive Image

Brandy Kay, Extension Educator

## Goal (learning objective)

Youth will:

- Learn to understand agriculture from other points of view
- Learn how to create a positive public image
- Learn how to connect with the general public

## Supplies

- Items to demonstrate an extremely well-cared-for dog or cat. Keep it simple, but enough so the youth understand.
  - Soft, comfortable bed
  - Canned pet food
  - Pet clothes—sweater, rain coat, etc. (One item will work.)
  - “Nice” pet carrier
  - Personalized, very nice food/water dish, maybe with name decorations on it
  - Fancy collar with bling and tags
  - Fun pet toys
- Items to demonstrate adequately cared for pet (nice but not as fancy or over-the-top as those previously listed)
  - Shelter
  - Food and water
  - Collar with tags
  - Nice, clean regular pet carrier
  - Appropriate dishes/feeders for food and water
  - Chew toy or bone
- Blank paper
- Markers, color crayons, or colored pencils
- Large pad paper/chart for you to write on

- Items for alternative option (these will depend on the species the members are showing).
  - Feeder and feed
  - Water bucket and water
  - Halter/lead rope
  - Show stick or driving device
  - Blankets (sheep)
  - Bedding
  - Appropriate way to decorate the stall/pen area so livestock cannot eat fair decorations/signs
  - Rakes, brooms, shovels

## Pre-lesson preparation

- Read “Animal Well-being” in the *Swine resource handbook for market and breeding projects*, chapter 24, page 24-2.
- Read “Caring for Animals” in the *Beef resource handbook*, chapter 12, pages 12-2 and 12-16.
- Read “Caring for Animals” in the *Goat resource handbook*, pages 159-160 and 162-163.
- Read “Showing and Selling, and Caring for Animals” in the *Sheep resource handbook for market and breeding projects*, pages 100 and 136-138.
- Be able to recognize the different views members of the public may have toward fairs, youth raising livestock, and the livestock industries (beef, sheep, swine, goat).
- Become familiar with how the livestock industries promote a positive public image.

## Lesson directions and outline

Ask youth to list the type of care they think they should provide for their animal projects. Have them list the type of facilities they recommend for housing their animal. Write down the answers.

### Introduction

Many people are now three or four generations removed from the farm. They do not have a concept of normal conditions for raising livestock. When it comes to raising animals, they know only what they have experienced, and for many of them, their experience is with pet cats and dogs. Pet stores provide a huge range of products providing “quality care” for pets.

### Conducting the activity (DO)

1. Show an example of a very pampered dog or cat and an example of a pet that is cared for (food, water, shelter, clean living area, etc.) but not pampered.
2. Ask youth to identify the differences and discuss what is important for a healthy pet.
3. Ask youth to draw or describe pampered livestock. Discuss why this is not necessary, but why the general public may feel that it is. Write the responses or display the drawings on a board or pad so the group can see them.
4. Ask youth to draw or describe the requirements for having healthy livestock. Include animal handling. Have them give examples of what they can do at fair to provide a positive image to the public, showing that the animals are well cared for just like their pets. Write the responses or display the drawings on a board or pad so the group can see them.

### Alternate activity

As an alternative to having the youth draw, you could bring in a wide variety of supplies used to care for livestock and have them pull together the items that are needed to keep their livestock healthy.

### What did we learn? (REFLECT)

- Ask: Why it is not necessary or always healthy to pamper livestock? How and why may the general public feel differently?
- Ask: How do you keep your animals healthy at home?
- Ask: How can you keep your animals healthy and comfortable at fair? What can you do to make sure your care provides a positive image to the public?
- Ask: How can you educate the public about caring for livestock?

### Why is that important? (APPLY)

- Ask: Why is it important to provide the public with a positive image of animal health and handling?
- Ask: What organizations or industries may you be representing to the public when at fair?
- Ask: What are examples of a positive image that is not related to livestock or the fair?
- Ask: Why is having a personal positive image important?

## Resources

- American Farm Bureau Federation. The Voice of Agriculture. <http://www.fb.org>
- Ohio State University Extension. (2011). Caring for Animals. *Beef resource handbook* (pages 12-2 and 12-16).
- Ohio State University Extension. (2008). Caring for Animals. *Goat resource handbook* (pages 159-160, 162-163).
- Ohio State University Extension. (2011). Showing and Selling, and Caring for Animals. *Sheep resource handbook for market and breeding projects* (pages 100 and 136-138).
- Ohio State University Extension. (2000). Caring for Animals. *Swine resource handbook for market and breeding projects* (pages 24-1-24-2)
- Payn-Knoper, M. (2013). *No more food fights!* Indianapolis: Dog Ear Publishing.

# Where Our Food Comes From

Nikola Dalton, Extension Educator

## Goal (learning objective)

Youth will learn where their food comes from.

## Supplies

- Room that has enough space for your members to move around in small groups
- Paper and pencils (enough for group)
- Crayons, markers or colored pencils (enough for group)
- Copies of the following handouts
  - Handout 1 - "US Map" (make enough copies for group)
  - Handout 2 - "Food Production Chain (make enough copies for group)
  - Handouts 3 -7 - "Animal Inventories" make 1 copy for your reference/leader packet

## Pre-lesson preparation

- Obtain a copy of the Ohio resource handbook for the species you lead (see resources below)
- Read/review handouts
- Read/review tips with dealing with the general public and the media
  - Beef Resource Handbook page 14-1
  - Swine Resource Handbook page 23-1
  - Sheep Resource Handbook page 100
  - Goat Resource Handbook page 153-154
- Make copies of the handouts

## Lesson directions and outline

Share the following information with the youth:

Whether you raise livestock or not, understanding where our food comes from is important to understanding the industry and how it is crucial to feeding the world. Most of the products we use every day come from agriculture. A big part of this is the livestock industry.

Where our food comes from is also based on areas where the climate is ideal, there is necessary space, and necessary resources for those animals. Census maps for each production species show where they are more highly concentrated.

Understanding where our food comes from how it is raised can help us become better advocates for the agricultural industry. Tip sheets in the resources section are available on ways to practice public relations.

## Conducting the activity (DO)

### Activity 1

1. Distribute and review Handout 2 with the group.
2. Have members pick a food item, work your way back through the Food Production Chain to determine how it came to be on your table.
3. Review with group tips on dealing with the general public and media. Review basic messages to communicate with everyone about your animals and the agricultural industry.
4. Have members divide into 3 small groups. Have them practice talking about how their animals are raised and how they move through the food production chain to feed the population. After each member has presented have each person in the group ask a question as if they were interested, concerned citizen, activist, or protester.



## Activity 2

1. List or use different colors for each species to color in the blank US map where the top 10 states for production of each species are located. (Refer to Handouts 3-7).
2. Further activity make arrangements to do a tour of a farm with a local producer.

### What did we learn? (REFLECT)

- Ask: How did you feel when someone questioned how you raised your animals or the industry you're in?
- Ask: What are some effective tips that you can use when being questioned?

### Why is that important? (APPLY)

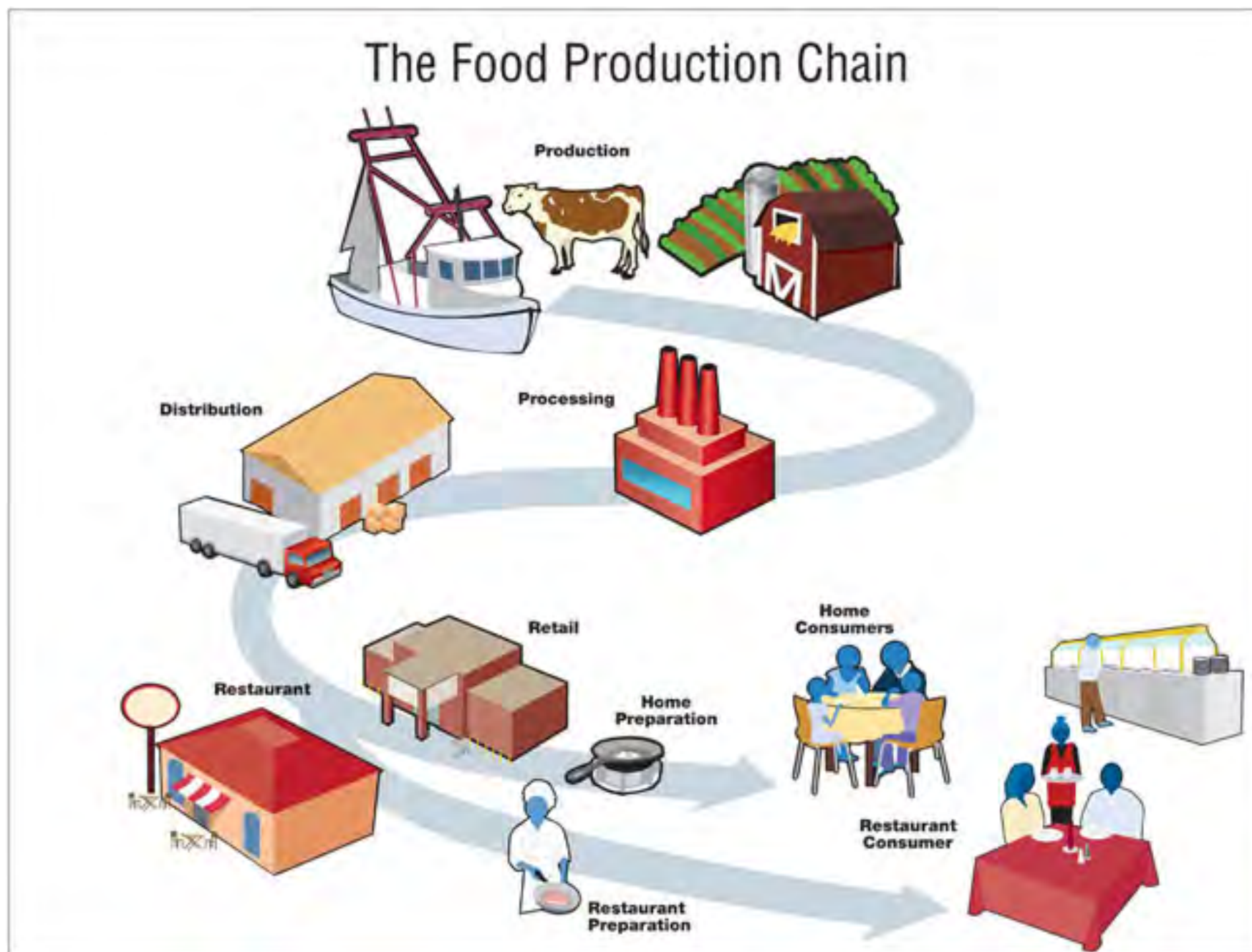
- Ask: Why is it important to know where our food comes from and how it gets to our plate?
- Ask: Why is it important to understand how our food choices can provide us with a healthy life-style?

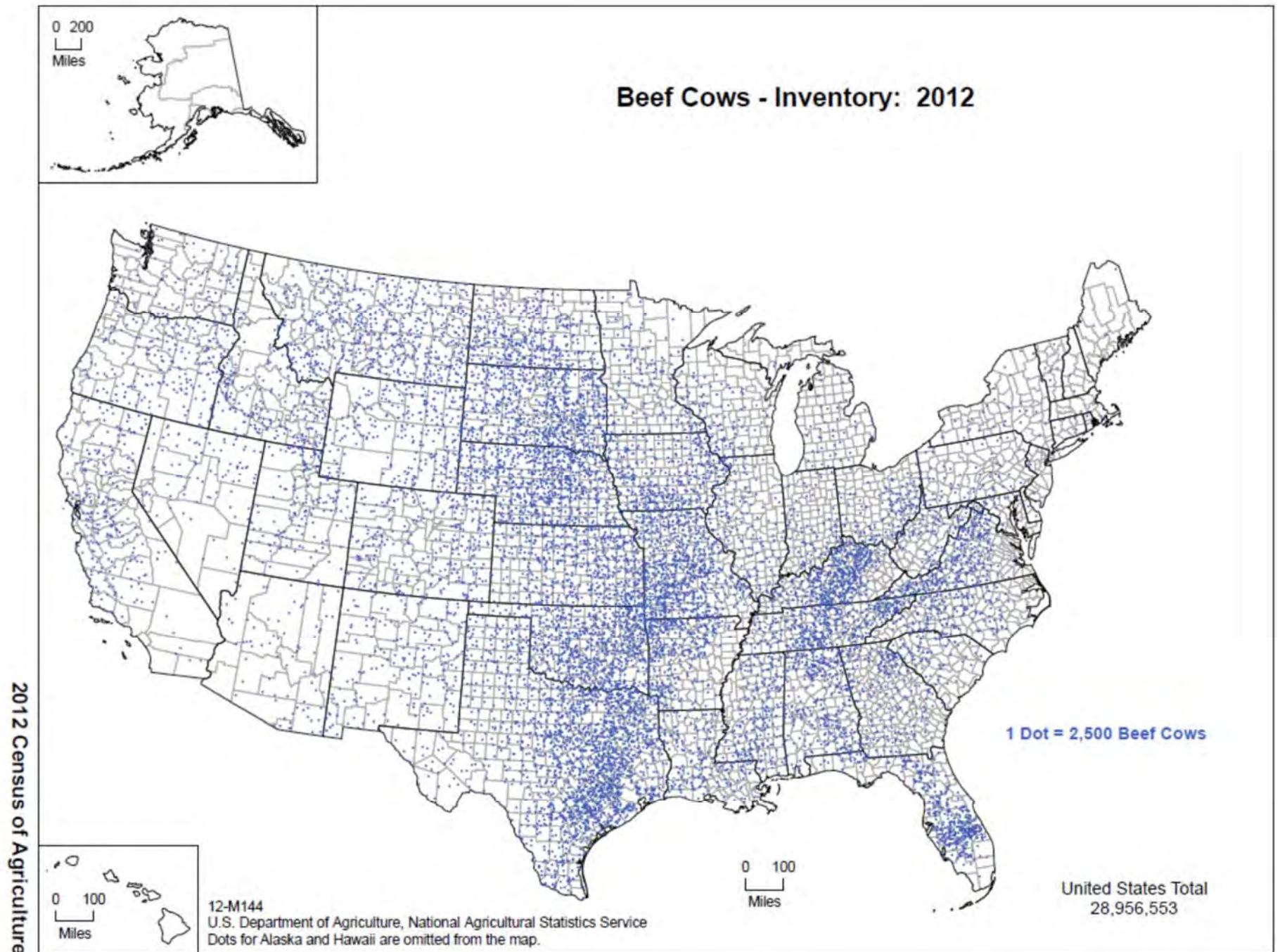
## Resources

- Centers for Disease control and Prevention. (2015). The Food Production Chain - How Food Gets Contaminated. *Centers for Disease Control and Prevention*. Available at: <https://www.cdc.gov/food-safety/outbreaks/investigating-outbreaks/production-chain.html>
- Ohio State University Extension. (2011). Public Relations. *Beef resource handbook* (page 14-1).
- Ohio State University Extension. (2008). Manure Management and Environmental Quality. *Goat resource handbook* (pages 153-154).
- Ohio State University Extension. (2011). Showing and Selling. *Sheep resource handbook for market and breeding projects* (page 100).
- Ohio State University Extension. (2000). Dealing with the General Public and the Media. *Swine resource handbook for market and breeding projects* (page 23-1).
- United States Department of Agriculture. (2014). 2012 Census Ag Atlas Maps. *Livestock and Animals*. Available at: [https://www.agcensus.usda.gov/Publications/2012/Online\\_Resources/Ag\\_Atlas\\_Maps/Livestock\\_and\\_Animals/](https://www.agcensus.usda.gov/Publications/2012/Online_Resources/Ag_Atlas_Maps/Livestock_and_Animals/)

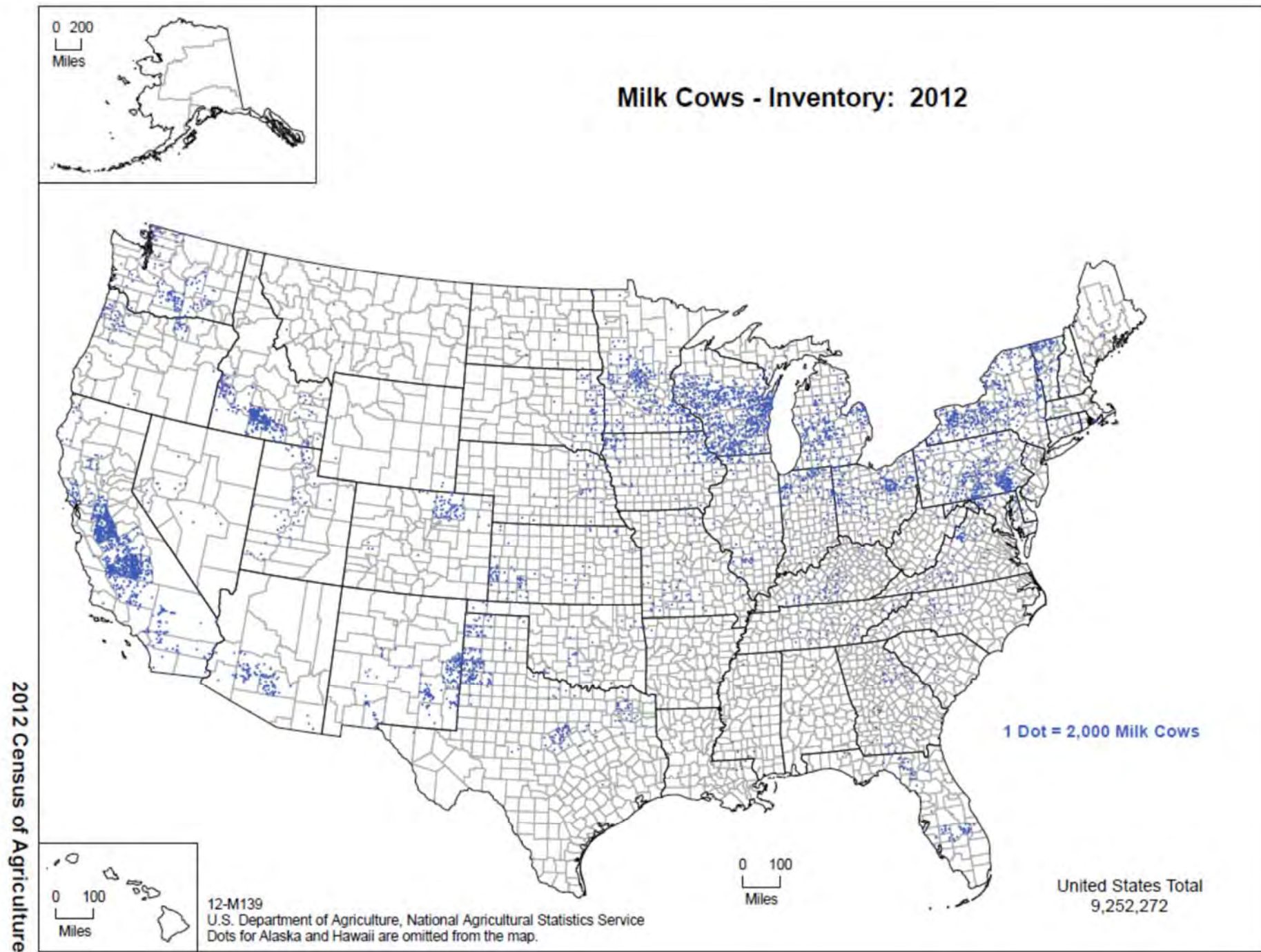
ADVOCACY: WHERE OUR FOOD COMES FROM - HANDOUT 1

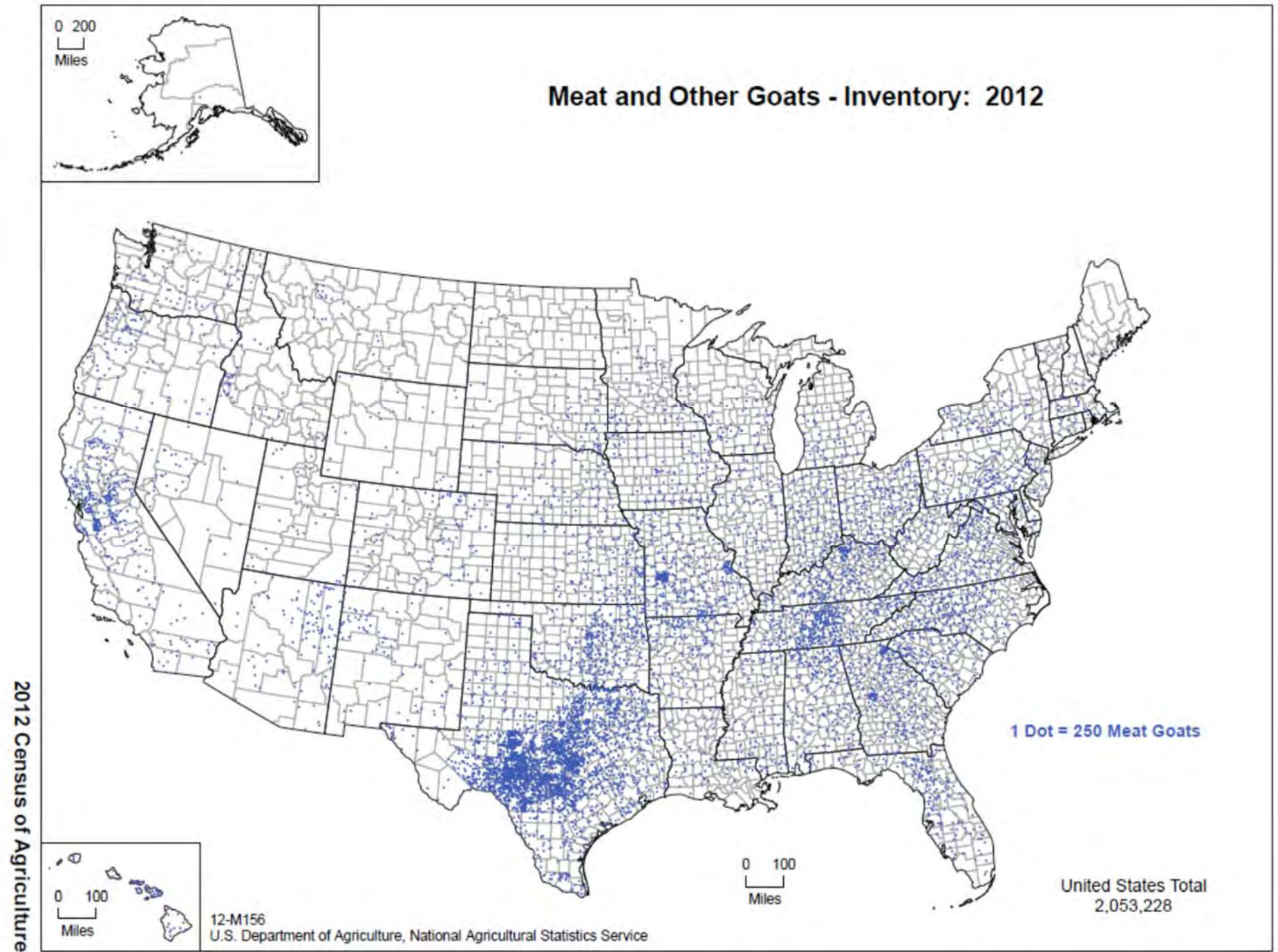




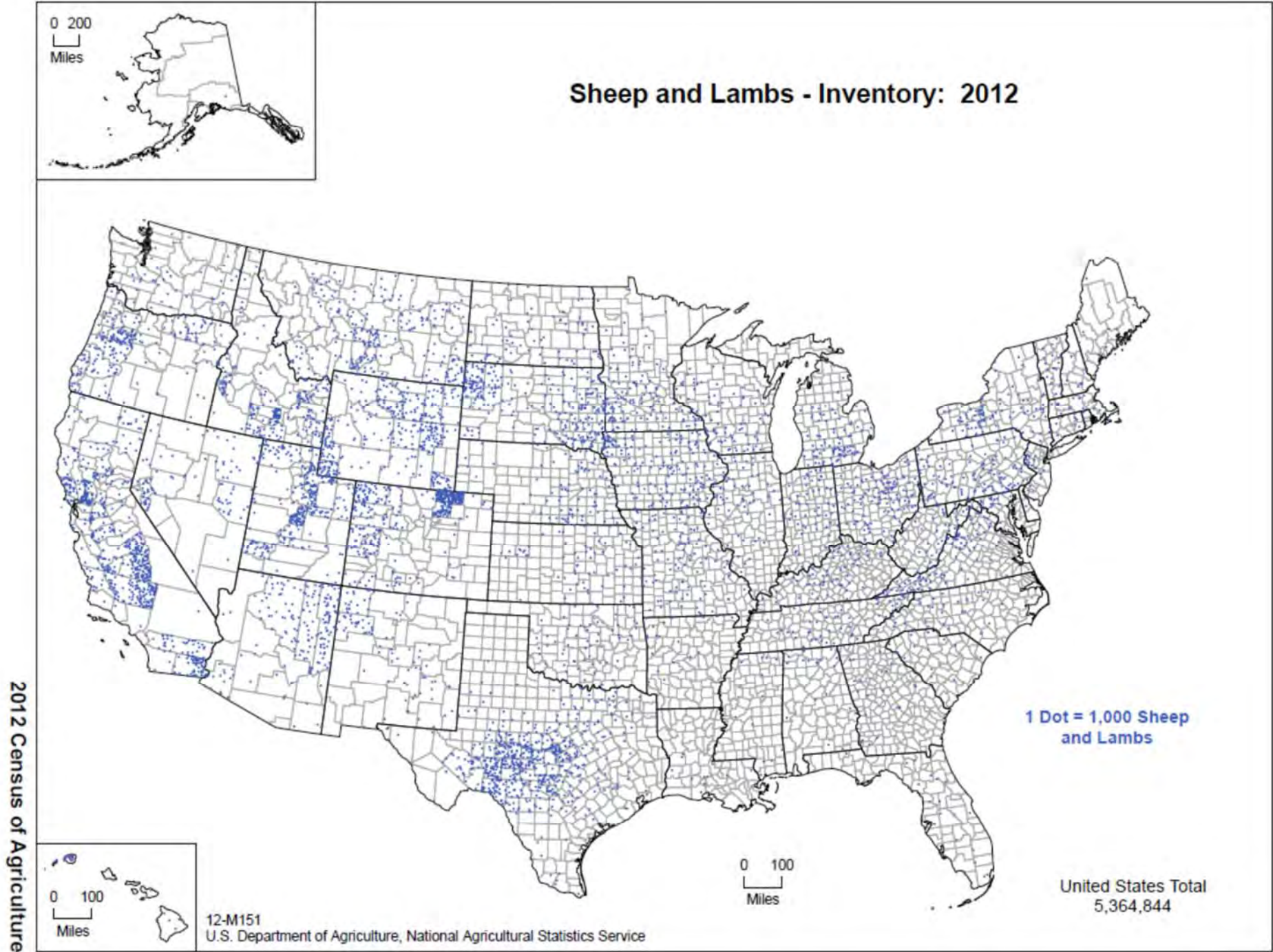


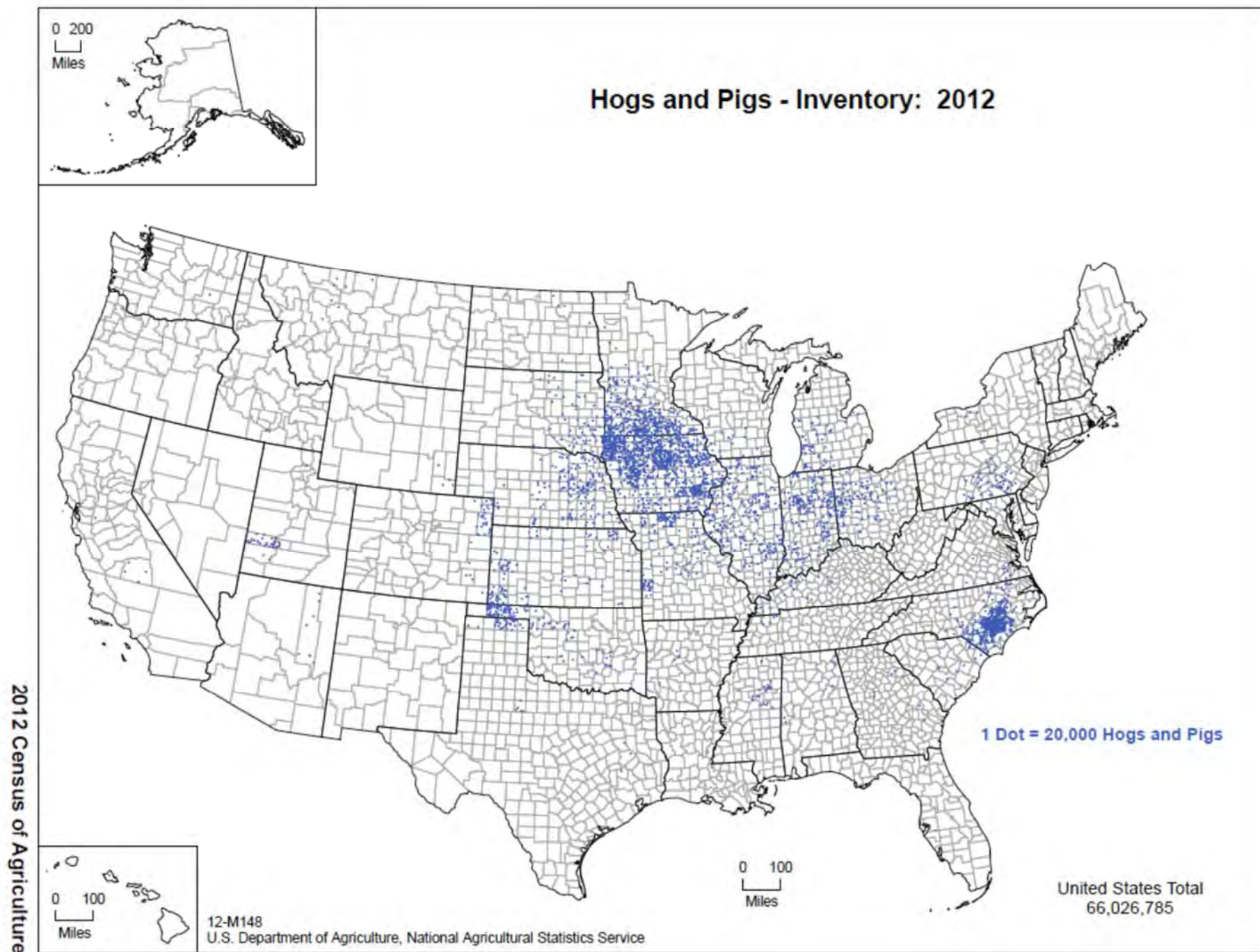














# Environment: Caring For My Animal

Scott Nash, Regional Youth Development Educator

## Goal (learning objective)

Youth will learn how bedding material used in the pen can affect animal comfort. Animal comfort affects performance and growth, ultimately influencing meat quality.

## Supplies

- Bowl (metal or plastic) - one for each type of bedding material
- Two quarts of each bedding material: straw, sawdust, woodchips, sand
- One gallon of water
- Colander
- Small fan
- Garbage bag
- Paper towels

## Pre-lesson preparation

- Chill the bowls so they are cold before the activity.

## Lesson directions and outline

Livestock need a place to lie down that is warm and dry during cold weather. When it is hot they need a place that is clean and cool. Have youth discuss ideas on how to keep animals comfortable.

## Conducting the activity (DO)

1. Have youth measure 2 quarts of each bedding item into a chilled bowl. Ask: Which bedding will be the warmest?
2. Have youth hold their hands in each type of bedding for at least one minute. Ask: Which bedding is the warmest?
3. Add 1 quart of water to each bowl of bedding material. Ask: Which bedding will hold the most water?
4. After 5 minutes strain the bedding through a colander. Measure the amount of water drained from each of the bedding materials.
5. Have youth hold the wet bedding material with the fan blowing on their hands for a couple minutes.

## What did we learn? (REFLECT)

- Ask: Which bedding material absorbed (soaked up) the most water? Which would be better to use at the county fair?
- Ask: How did the fan blowing, while holding the cold bedding make you feel? What if it was in the winter?
- Ask: If an animal is cold and shivering, how does that affect growth? What if the animal gets too hot?

## Why is that important? (APPLY)

- Ask: Which bedding would you use? Why?
- Ask: How does this principle of animal bedding apply to how you live?
- Ask: How does this principle apply to how you take care of yourself?
- What can we do to take care of others in the community especially in the winter?

## Resources

Ohio State University Extension. (2011). Management Practices. *Beef resource handbook* (page 3-1).

Ohio State University Extension. (2008). Housing Facilities. *Goat resource handbook* (pages 147-149).

Ohio State University Extension. (1999). *Quality assurance and animal care: youth education program curriculum guide* (Unit 3, level 1).

Ohio State University Extension. (2011). Management Practices. *Sheep resource handbook for market and breeding projects* (page 21).

Ohio State University Extension. (2000). Space Requirements for My Market Hog. *Swine resource handbook for market and breeding projects* (pages 11-4, 11-6, and 11-7).

# Housing My Animal

Scott Nash, Regional Youth Development Educator

## Goal (learning objective)

Youth will learn that animals are healthier and grow efficiently when they have enough pen space.

## Supplies

- Closet or small room with a door containing a small table with snacks and water
- Paper and pencils or colored pencils
- Copies of example pen spaces for cattle, sheep, hogs, or goats
- Measuring tape to measure the dimension of the meeting space

## Pre-lesson preparation

- Obtain a copy of the Ohio resource handbook for the species you lead (see references/resources below).
- Study the space requirements for the species.
- Make copies of the suggested pens in the handbook.
- Measure and record the dimensions of the meeting space.

## Lesson directions and outline

- Share the following information with the youth:

Animals need shelter, food, water and enough pen space to be able to gain weight and grow.

To help make a correlation between the space needed for animals, our meeting room dimensions are \_\_\_\_ (share room measurement).

Beef cattle need a stall that is from 20 to 40 square feet per animal with 2 feet of feed bunk space per animal. They need a minimum of 200 square feet of outside or dry lot area.

Hogs need a minimum of 8 square feet per animal with at least 5 square feet under roof. When using a self feeder, provide a minimum of 1 space per four pigs. One space per two pigs would be optimum.

Sheep require 6 to 10 square feet per lamb in a barn with up to 1 foot of feed trough space.

Goats need 8 to 12 square feet per animal in the barn with about 1 foot of feed trough space and 20 to 25 square feet of space in an outside lot area.

Provide access to clean water for all animals. It's best if the animals travel to water. Do not put water near feeding or bedding areas. This will help keep the pen cleaner.

## Conducting the activity (DO)

1. Designate a small room, bathroom, or closet with a door to represent a small pen.
2. Place three or more youth in the confined space. The room should be crowded. Have them perform regular daily activities: walk around the room, eat, drink, and lie down.
3. After no more than 5 minutes, have the youth come out one at a time. When they are all out, have them discuss with the group how it felt to have so many people in the small space.

## Activity 2

1. With paper and pencils have the youth design a pen for the animal they are raising. Ask them to keep in mind that the animal will get bigger as it grows to make the weight requirements for the fair.

## What did we learn? (REFLECT)

- Ask: How did you feel when you were in the room? Why did you feel that way?
- Ask: the last person to come out how it felt to be in the room alone.

### Why is that important?

- Ask: Why is it important to provide adequate space for your animal? (Ability to exercise, room to lie down in a dry place, and enough room so the animals won't have to compete for food. When animals have to compete for space they expend energy, keeping them from gaining as much weight as possible. They may not gain enough weight to qualify for the fair and be eligible for the sale.)
- Ask: Where is having adequate space important in your own life? Why?

### Resources

- Ohio State University Extension. (2011). Management Practices. *Beef resource handbook* (pages 3-1 and 3-2).
- Ohio State University Extension. (2008). Housing Facilities. *Goat resource handbook* (page 149).
- Ohio State University Extension. (1999). *Quality assurance and animal care: youth education program curriculum guide* (Unit 3, level 1).
- Ohio State University Extension. (2011). Management Practices. *Sheep resource handbook for market and breeding projects* (page 21).
- Ohio State University Extension. (2000). Space Requirements for My Market Hog. *Swine resource handbook for market and breeding projects* (pages 11-1 and 11-2).



# Safe Animal Handling

Scott Nash, Regional Youth Development Educator

## Goal (learning objective)

Youth will learn about the role of animal flight zones in safely handling and moving animals.

## Supplies

- Table
- Magnets - animal shapes where available
- Plastic farm animals and fence
- Wire - a short strand of bar wire and a short strand of smooth wire
- Nails or other objects that should not be in the pen of an animal
- Flight zone diagram that can be found at <http://www.grandin.com/behaviour/principles/flight.zone.html> OR Figure 4.01 on page 4-2 in *Beef resource handbook* (listed in Resources section)

## Pre-lesson preparation

- Study the flight zone diagram and become familiar with the term “point of balance”

## Lesson directions and outline

### Introduction

Explain to the youth that all animals have a point of balance as well as a flight zone. Understanding how to approach animals and move them properly will keep youth and animals safe.

A key point is to make sure the pen is free from any hazards such as broken boards, protruding nails, wire, etc. Make sure there are no electrical wires or sharp edges the animal can come in contact with.

## Conducting the activity (DO)

Activity 1 - To demonstrate how livestock move away as someone moves into the animal's flight zone

1. Place one magnet on a flat surface.
2. Use the second magnet to approach the first, making sure the ends with the same magnetic polarity are pointed at each other. (The magnets will repel each other and the first will move away from the second.)

Activity 2 - To illustrate how flight zones work with people

1. Have one volunteer stand in front of the group.
2. As you talk about flight zones and personal space, approach the volunteer closer and closer until he or she moves back.
3. Try this again with one male and one female volunteer. Ask the girl to stand still and have the boy approach her until she moves back. Discuss how flight zones and personal space change depending on how well they know each other.

### Activity 3

1. On the table, set up the fence with a gate and place a plastic farm animal.
2. Have a participant demonstrate how they might approach the animal to turn it in a certain direction and move it through the gate.
3. Place nails, wire, or other objects on the table near the animal then work to drive the animal through the gate to avoid the objects.

**What did we learn? (REFLECT)**

- Ask: What happened when you moved the magnets closer together? (The magnets are like animals and act as if they have a flight zone)
- Ask: What happens to the magnets if you put opposite ends towards each other? Why? (Discuss polarity)
- Ask: What happened when the leader approached the volunteer when talking about flight zones? Why?
- Ask: What happened when the boy approached the girl? Why?
- Ask: What happens when nails, wire, or other objects are in the way when you try to move an animal?

**Why is that important? (APPLY)**

- Ask: Why is it important to know how to approach an animal to make it move in a certain direction? (Approaching them correctly will get the animal to move in the right direction and hopefully keep it from running away.)
- Ask: How does understanding flight zone and personal space help us when we communicate with others? (We are able to recognize by a person's body language how close we can approach him or her, allowing for more successful communication.)
- Ask: If a person is uncomfortable because you are in his or her flight zone, is the person listening to you?
- Ask: Why do we need to keep nails, wire, or other objects out of the pen of an animal? (Keeping the animal facility free from foreign objects can keep the animal from getting injured.)

**Resources**

- Ohio State University Extension. (2011). Working Safely With Livestock. *Beef resource handbook* (pages 4-1 through 4-5).
- Ohio State University Extension. (2008). Working Safely with Goats. *Goat resource handbook* (pages 31-33).
- Ohio State University Extension. (2011). Working Safely with Sheep and Caring for Animals. *Sheep resource handbook for market and breeding projects* (pages 103 and 136).
- Ohio State University Extension. (2000). Caring for Animals *Swine resource handbook for market and breeding projects* (page 24-2).

# Temperature and Ventilation (Air Flow) in the Barn

Scott Nash, Regional Youth Development Educator

## Goal (learning objective)

Youth will learn how temperature and airflow in the barn (or stall) impact animal growth and performance.

## Supplies

- Small room or closet with a door that closes
- Heat lamp or small heater
- Fan
- Ohio Learning Lab Kit you wish to use (either specific species or all species). Check with your local extension office on the availability of the kit and to check it out
- Animal comfort zones (diagrams in learning lab kit)- make enough copies for group
- (Optional) If you cannot create a cold room for Activity 3:
  - Bucket or large pan
  - Chilled water
  - Large bag of ice

## Pre-lesson preparation

- Study animal comfort zones
- Study the effect of heat and cold stress on gain
- Review the environment and preferred thermal conditions for swine

## Lesson directions and outline

### Introduction

Explain to the youth that animals need to be housed and cared for in a place where the temperature and ventilation allow them to grow and gain for optimal performance. This can be achieved by understanding the temperatures where a species is most comforta-

ble.

Airflow or ventilation keeps the air free of harmful odors that make it difficult for animals and humans to breathe. Poor ventilation has a negative impact on animal performance and health.

### Conducting the activity (DO)

#### Activity 1

1. Place the heat lamp or heater in the small room and turn it on.
2. Have as many youth as possible enter the small room wearing coats.
3. Close the door of the room for a few minutes with the youth inside and the heat left on.

#### Activity 2

1. Leave the heater on but place a fan in the room.
2. Have as many youth as possible enter the room wearing short-sleeved shirts.
3. Open the door to the room, and if the room has a window, open it.

#### Activity 3

1. Make the room as cold as possible
2. Have only a few youth at a time enter the room and close the door for a few minutes.

### Optional Activity 3

1. Fill the bucket or pan two-thirds full of ice and chilled water. *Note: do this 10-20 minutes before starting so water is ice cold; stirring will help speed up the cooling process*
2. Have youth put both hands in the ice water for 60-90 seconds (remove hands sooner if they become too cold).
3. While doing this, have youth close their eyes and imagine how it would feel if their whole body was in the frigid ice water.

### What did we learn? (REFLECT)

- Ask: How did you feel with the heat on, wearing a coat with the door closed?
- Ask: How did you feel when the room was cold?
- Ask: How did you feel when the fan was on and the door was open?
- Ask: When did you feel the most comfortable? Why?

### Why is that important? (APPLY)

- Ask: In what ways do temperature and ventilation affect the animal you are raising?
- Ask: What will you do to make sure your animal is comfortable?
- Ask: How do temperature and airflow affect you at home?
- Ask: What impacts do temperature and airflow have on your community when an animal-feeding operation is nearby?

## Resources

- National Pork Producers. (2007). *Youth Pork Quality Assurance Plus Youth Manual*, (pages 104-105).
- Ohio State University Extension. (2011). Management Practices. *Beef resource handbook* (page 3-1).
- Ohio State University Extension. (2008). Housing Facilities. *Goat resource handbook* (pages 147-149).
- Ohio State University Extension. (1999). *Quality assurance and animal care: youth education program curriculum guide* (Unit 3, level 1).
- Ohio State University Extension. (2011). Management Practices. *Sheep resource handbook for market and breeding projects* (page 21).
- Ohio State University Extension. (2000). Space Requirements for My Market Hog. *Swine resource handbook for market and breeding projects* (pages 11-4, 11-6, and 11-7).
- Ohio State University Extension. (1999). *Quality Assurance and Animal Care: Youth Education Curriculum Guide*, Unit 3, Level 2. (*Note: This document is available in the Learning Lab Kits and is the same for all species*)

# What's Your Plan?

Jim Wilson, Regional Youth Development Educator

## Goal (learning objective)

Youth will analyze their particular circumstances to determine if they are adequately prepared to successfully raise a livestock project.

## Supplies

- Flipchart (or paper)
- Markers
- Masking tape
- Pencils - enough for group
- Calculators - enough for small groups to share
- Copies of the *4-H Livestock Project Planning Worksheet* (Handout 1) - enough for group
- Copies of the *Seven Steps in Selecting Market Project Animals* (Handout 2) - enough for group

## Pre-lesson preparation

- Obtain current prices for feeds (grains and hay) that members might choose to use by visiting local feed stores
- Secure realistic purchase and sale prices youth might expect related to this project - visit with your local 4-H Professional for suggestions
- Review the Introduction section of your *Ohio Resource Handbook*

## Lesson directions and outline

Ask the group "Who has gone on a trip or family vacation? Did you just choose a place to go and suddenly you were there, or did you or your parents have to make several arrangements to insure an enjoyable experience? What were some of the things they needed to do before going on the trip?"

Emphasize there were several steps that had

to occur (where to stay, what to visit, how to get there, how much it will cost, etc.). The same is true in preparing for a successful 4-H livestock project experience.

## Conducting the activity (DO)

Section A (20-30 minutes)

1. Have members brainstorm all the things or information they will need to know about in planning a successful livestock project. Have someone write responses on the flipchart or on separate pieces of paper and post on a wall. *Note: if they are missing major segments from the worksheet, provide subtle hints. If some ideas are too vague, ask for more specificity.*
2. After brainstorming, discuss and group all responses into categories.
3. Relate that selecting project animals is similar to one phase of planning a family trip – you have to know where you're going and how to get there before you can start. Introduce the concepts from the Seven Steps in Selecting Market Project Animals. Encourage youth to discuss industry standards, average daily gain, plus preliminary and initial purchase animal weights.

Section B (30 minutes - continue as part of this meeting or finish up at next meeting)

4. Introduce the *4-H Livestock Project Planning Worksheet*. Have each member work with their parent to complete the *4-H Livestock Project Planning Worksheet* – some individuals may need help with possible feed or animal prices.
5. Ask youth to share some of their ideas and results they came up with when completing the worksheet.

**What did we learn? (REFLECT)**

- Ask: What did you learn while doing these activities?
- Ask: Were the results what you had expected? Why or why not?
- Ask: What things, if any, will you need to do so you can be prepared for your project?

**Why is that important? (APPLY)**

- Ask: Why do you think project planning is important to have a successful experience?
- Ask: Where else might you use these planning skills in the future?

**Resources**

Ohio State University Extension. (2011). Management Practices. *Beef resource handbook* (pages 1-1 to 1-3).

Ohio State University Extension. (2008). Housing Facilities. *Goat resource handbook* (pages 5-10).

Ohio State University Extension. (2011). Management Practices. *Sheep resource handbook for market and breeding projects* (pages 5-8).

Ohio State University Extension. (2000). Space Requirements for My Market Hog. *Swine resource handbook for market and breeding projects* (pages 1-1 to 1-3).

Wilson, J. (2014). *Plan for Market Animal SUCCE\$\$ Building on 4-H Fundamentals - 4-H Livestock Project Planning Worksheet*. University of Idaho Extension.

Wilson, J. (2014). *Seven Steps in Selecting Market Project Animals - Thinking Backwards to Get Ahead*. University of Idaho Extension.

Wilson, J. (2014). *4-H Market Livestock Budget Template*. University of Idaho Extension.

**FACILITIES: WHAT'S YOUR PLAN – HANDOUT 1**

**4-H Livestock Project Planning Worksheet**

Member's Name: \_\_\_\_\_

This worksheet is designed to encourage communication while helping members and their parent(s) carefully consider the various aspects and costs associated with a given livestock project – **before purchasing an animal**. Developing a project plan and budget increases the potential for member success and in having a positive 4-H experience.

**General Considerations:**

1. What species do you want to take? \_\_\_\_\_

2. What type of project do you plan to take (circle):    Market    Breeding    Pet

{If you selected the Market option, do you understand that the final result of this project is to finish an animal that will be sold, harvested and converted into food products?}    Yes  
No

3. Have you read the project requirements for this specific project (circle one)?    Yes    No  
{If not, contact your leader or go on-line [extension.ag.uidaho.edu/kootenai](http://extension.ag.uidaho.edu/kootenai) for a copy of the requirements}

4. How much time **each day** are you willing to commit to this project? \_\_\_\_\_

5. How much money do you want to invest in this project?    \$\_\_\_\_\_

**Facilities:**

6. Are all your facilities (listed below) adequate, or are improvements needed {inc. estimated cost}?

Y	N	Shelter/barn:	_____	\$	_____
Y	N	Fences:	_____	\$	_____
Y	N	Feed Equip:	_____	\$	_____
Y	N	Water Equip:	_____	\$	_____

7. Do you have facilities necessary to provide basic health care treatments (circle one)?    Yes    No

8. Do you have a veterinarian that works with your chosen species (circle one)?    Yes    No

{If not, you may want to seek out a veterinarian to help guide you in knowing what health care treatments your potential project animals should have received, and to assist in ongoing health care matters.}

9. What is your plan for disposing of animal waste (manure) / odor control: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

~ ~ ~ Over ~ ~ ~

**Animals:**

10. How many projects animals do you plan to raise? \_\_\_\_\_

11. What are potential sources for purchasing your project animal(s)? \_\_\_\_\_

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## 12. Animal Purchase / Feed Projections

{Completing the ***“Thinking Backwards to Get Ahead”*** worksheet may be helpful in determining purchase and projected final weights for market project animals.}

	Animal 1	Animal 2
A) Projected Purchase Weight (lbs.)		
B) Estimated Purchase Price (total \$/hd)	\$	\$
C) Estimated Final Weight (lbs.)		
D) Projected Weight Gain (lbs.) // {C – A = D}		

<b>Feed Conversion Ratio</b> (avg. lbs. feed needed to produce 1 lb. gain) <b>Beef</b> = 6 lbs <b>Sheep</b> (.75 ADG) = 4 lbs <b>Swine</b> = 4 lbs <b>Goat</b> = 7.5 lbs <b>Sheep</b> (.50 ADG) = 6 lbs		
E) Estimated Pounds of Feed Needed {Feed Conversion Ratio value x Projected Weight Gain }		
(1) Estimated Cost for Grain {Est. Feed Needed x % ration from Grain x Cost/lb of Grain}	\$	\$
(2) Estimated Cost for Hay {Est. Feed Needed x % ration from Hay x Cost/lb of Hay}	\$	\$
F) Total Estimated Feed Costs	\$	\$

**Marketing:**13. Do you plan to market any of your project animals this year (circle one)? Yes NoIf yes, how (circle)? Stock Sale Private Treaty Classified Ad Other

Who are some prospective buyers you might contact? \_\_\_\_\_

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14. What is the total projected sale value for: Animal 1 = \$\_\_\_\_\_, Animal 2 = \$\_\_\_\_\_  
 {Estimated Final Weight x Sale Price/lb = Sale Value}



## FACILITIES: WHAT'S YOUR PLAN – HANDOUT 2

### Seven Steps in Selecting Market Project Animals

*“Thinking Backwards to Get Ahead” by Jim Wilson, UI Area 4-H/Youth Extension Educator*

1. Determine the projected proper finished weight your project animal needs to be.

Industry standards:

Beef = 1,100 – 1,400 lbs.

Swine = 240 – 290 lbs.

Sheep = 110 – 135 lbs.

Goats = 60 – 90 lbs.

2. Estimate the average daily gain (ADG) that you will achieve from weigh-in to Fair. *{Note: while some Fairs do not require a specific ADG, maintaining efficient gains can improve final product quality and project profitability.}*

Industry standards:

Beef = at least 3.0 lbs./day

Swine = at least 1.8 lbs./day

Sheep = at least 0.6 lbs./day

Goats = at least 0.35 lbs./day

3. Use a calendar to determine the number of days from your preliminary weigh-in to Fair weigh-in (the feeding period); do not include the day of the initial weigh-in in your count. For this example, the following data was used:

Beef = 136 days

Swine = 90 days

Sheep = 59 days

Goats = 59 days

Note: State 4-H Policies recommends the following length of feed periods:

Beef = 130 – 150 days

Sheep = 55 – 65 days

Swine = 80 – 100 days

Goats = 55 – 65 days

4. Multiply the number of days in the feeding period (step 3) by the estimated average daily gain (step 2) - *{note: you can adjust the ADG based on past experience}*. This gives you the number of pounds your animal would gain during the feeding period. Subtract this from the projected finished weight range (step 1) to estimate how much your animal should weigh at preliminary weigh-in.

Beef: 136 days x 3.0 ADG = 408 lbs. gain → Preliminary weigh-in target = 692 – 992 lbs.

Swine: 90 days x 1.8 ADG = 162 lbs. gain → Preliminary weigh-in target = 78 – 128 lbs.

Sheep: 59 days x 0.6 ADG = 35 lbs. gain → Preliminary weigh-in target = 75 – 100 lbs.

Goats: 59 days x 0.35 ADG = 21 lbs. gain → Preliminary weigh-in target = 39 – 69 lbs.

5. Determine the number of days from date of purchase to preliminary weigh-in.
6. Estimate the average daily gain that will be achieved from date of purchase to preliminary weigh-in.
7. Multiply the number of days to the preliminary weigh-in (step 5) by the estimated average daily gain prior to weigh-in (step 6). Subtract that total from your projected preliminary weigh-in target weight range (step 4). The resulting figure then provides you with an estimated weight range for your project animal at the time of purchase.

**Remember: Plan Now to Avoid Disappointment Later!**

# Castration, Dehorning/Disbudding, and Docking

Scott Jensen, Extension Educator

## Goal (learning objective)

Youth will learn why management practices of castration, dehorning (disbudding), and docking are important and how these practices should be properly performed.

## Supplies

- Handout 1 - Castration, Dehorning, and Docking Equipment (enough copies for group)
- Handout 2 - Castration, Dehorning, and Docking Equipment Answer Key (one copy)
- Pens or Pencils (enough for group)

## Pre-lesson preparation

- Make copies of Handouts 1 and 2.
- Work with county extension personnel to do farm visits of local producers to view castration demonstrations of all species
  - Try to incorporate a demonstration of dehorning tools while at the cattle and/or goat farm visit.
  - Inquire with the sheep producer to incorporate a tail docking demonstration.
- If farm visits and/or live animals are not available, visit with your local veterinarian for a visit and demonstration of tools (and procedures) for castration, tail docking, and dehorning.
- Coordinate and communicate site visit date and time logistics with parents.

## Lesson directions and outline

Ask the youth to define castration, dehorning and docking. Have them share ideas of why livestock producers use those practices.

After the youth share their answers, review the following information with them:

Market livestock animals should be raised with the goal in mind of providing the consumer with a safe, wholesome, and enjoyable eating experience. Additionally, animals should be raised in a stress-free environment and provided with proper care. Animal health, carcass quality and consumer satisfaction can be positively influenced by proper castration, dehorning, and docking practices. For any of these management practices, care should be taken to minimize pain and suffering.

**Castration:** Castration is the removal of a male animal's testicles. This can be done in a non-surgical manner in cattle, sheep, and goats with the use of an elastrator. The elastrator places a very small but strong elastic band over the scrotum and above the testicles, cutting off the blood supply to the testicles. The testicles will generally slough off in a few weeks. Pigs' testicles are held tight to the body so they must be surgically removed. This can be done quite easily with a scalpel or sharp knife. Cattle, sheep, and goats can also be castrated surgically. Castration should be done at as young of an age as possible.

Castration improves meat quality. Uncastrated males tend to have a much stronger flavored meat. The meat is also generally leaner and drier, leading to decreased tenderness and lower consumer satisfaction. Castration can also make the animals much safer to be around as intact males tend to be more aggressive in their behavior towards other animals or humans.

Dehorning/disbudding: Horns on animals can and do cause bruises and other injuries to animals. Horns can also be a hazard to people and equipment. Dehorning/disbudding is the practice of removing an animal's horns or horn buds, depending on the age of the animal and the stage of horn growth. Dehorning/disbudding should be done between 7-10 days of age for goats and prior to 3 months of age for cattle. It should be pointed out that perhaps the most simple and effective method of dehorning is to select polled breeding stock (not always possible within some breeds and species).

Horns can be removed by using caustic paste, an electric dehorning iron, or with a mechanical dehorner (spoons, tubes, scoop type dehorner – all for use on cattle only). Caustic paste is placed on the horn bud. Care must be taken to not get the paste on yourself or in the animal's eyes. Electric dehorning irons are placed over the horn bud and burn the bud and surrounding tissue to “kill” the horn. For cattle, mechanical methods can be used. Care should be taken to keep the wound as clean as possible. Blood-stop powder should be on hand to help combat bleeding.

If you are unfamiliar with any of the dehorning/disbudding practices, you should have an experienced adult or your veterinarian teach you the proper technique.

Tail docking: Tail docking is a common practice in sheep and swine production. It involves removing a portion of the tail by either banding (elastator) or cutting.

Tails are docked on sheep to prevent problems with fly strike. Fly strike is a condition where manure accumulates in the hair/wool of a lamb's tail to the point that it provides habitat for fly larva to develop. The larva then begin to eat away at the soft tissue surrounding the anus of the lamb. It is recommended that lamb tails be docked at the distal end of the caudal fold (American Veterinary Medical Association).

Some producers will dock the tails of pigs to prevent young pigs from chewing on each other's' tails. Tail chewing can cause open sores and infection.

### Conducting the activity (DO)

1. Distribute Handout 1 to members.
2. Have members work individually to complete the handout.
3. Check for completion, review answers as a group.
4. Do farm/site visits or demonstration of equipment.

### What did we learn? (REFLECT)

- Ask: Why is castration important for meat animals?
- Ask: What are two methods used for dehorning?
- Ask: How can castration, dehorning, and/or tail docking be viewed as beneficial to the animal?

### Why is that important? (APPLY)

- Ask: What is the real purpose of castration, dehorning, and tail docking? (Improved meat quality for the consumer while improving the health and safety of the animal and safety for the handler).
- Ask: Where else can you apply this same type of knowledge?

## Resources

- Ohio State University Extension. (2011). Management Practices. Beef resource handbook (page 3-6 and 11-8 through 11-9).
- Ohio State University Extension. (2008). Herd Management and Diseases. Goat resource handbook (pages 79-83).
- Ohio State University Extension. (2011). Management Practices. Sheep resource handbook for market and breeding projects (pages 41-46).
- Ohio State University Extension. (2000). Baby Pig Management. Swine resource handbook for market and breeding projects (pages 21-1 through 21-10).
- Western Beef Resource Committee. (2010). Cow/Calf Management Guide. Cattle producer's library. CL749 and CL750.

## HEALTH AND DISEASES: CASTRATION - HANDOUT 1

### CASTRATION, DEHORNING AND DOCKING EQUIPMENT

**Directions:** Match the image to the description. Write the letter (of the tools listed on the right) next to the description/name of the tool in the list below.

1. Elastrator Bands \_\_\_\_\_

2. Electric Iron \_\_\_\_\_

3. Caustic Paste \_\_\_\_\_

4. Tooth Nipper \_\_\_\_\_

5. Barnes-Style Dehorner \_\_\_\_\_

6. Band Castrating Tool \_\_\_\_\_

7. Emasulcatome (Burdizzo) \_\_\_\_\_

8. Emasculator \_\_\_\_\_

A



B



C



D



E



F



G



H





9. This sheep demonstrates an example of a \_\_\_\_\_ tail.



10. These lambs have \_\_\_\_\_ on the tails to \_\_\_\_\_ them.



11. This is an example of a \_\_\_\_\_ male hog.

**Directions:** Use the terms listed below to answer questions 9 through 20.

**Terms**

Dock  
Castration  
Testosterone  
2 and 10  
Needle Teeth  
3 and 21  
Testicles  
Boars  
Cryptorchid (used twice)  
Elastrator bands  
Short-docked  
Castrated  
4 and 14  
Tainted  
1 to 3

12. Clipping these in a newborn pig is necessary because piglets may bite each other or the sow's udder, leaving small cuts to become infected. \_\_\_\_\_.
13. Lambs between \_\_\_\_\_ and \_\_\_\_\_ days old should be all docked. And the rams or male lambs \_\_\_\_\_.
14. Castration of the male goat or buck kids usually occurs between \_\_\_\_\_ to \_\_\_\_\_ weeks of age.
15. Calves should be castrated between \_\_\_\_\_ and \_\_\_\_\_ weeks of age.
16. Castrated males have a better disposition and are more docile than males that have not been castrated because of decreased levels of the hormone \_\_\_\_\_.
17. The best time to castrate a pig is between \_\_\_\_\_ and \_\_\_\_\_ days of age.
18. \_\_\_\_\_, is the surgical removal of the two \_\_\_\_\_.
19. Pork from \_\_\_\_\_ or uncastrated male pigs at slaughter weight, may have an odor during cooking that is very offensive to many people. This is called a "boar odor" or a "\_\_\_\_\_ " odor.
20. An animal is considered a \_\_\_\_\_ because the testicle(s) failed to descend during development.



## HEALTH AND DISEASES: CASTRATION- HANDOUT 2 (ANSWER KEY)

### CASTRATION, DEHORNING AND DOCKING EQUIPMENT

**Directions:** Match the image to the description. Write the letter (of the tools listed on the right) next to the description/name of the tool in the list below.

1. Elastrator Bands   **H**  

2. Electric Iron   **C**  

3. Caustic Paste   **A**  

4. Tooth Nipper   **F**  

5. Barnes-Style Dehorner   **G**  

6. Band Castrating Tool   **B**  

7. Emasulcatome (Burdizzo)   **D**  

8. Emasculator   **E**  

**A**



**B**



**C**



**D**



**E**



**F**



**G**



**H**





9. This sheep demonstrates an example of a SHORT-DOCKED tail.



10. These lambs have ELASTRATOR BANDS on the tails to DOCK them.



11. This is an example of a CRYPTORCHID male hog.

**Directions:** Use the terms listed below to answer questions 9 through 20.

**Terms**

Dock  
Castration  
Testosterone  
2 and 10  
Needle Teeth  
3 and 21  
Testicles  
Boars  
Cryptorchid (used twice)  
Elastrator bands  
Short-docked  
Castrated  
4 and 14  
Tainted  
1 to 3

12. Clipping these in a newborn pig is necessary because piglets may bite each other or the sow's udder, leaving small cuts to become infected. NEEDLE TEETH.
13. Lambs between 4 and 14 days old should be all docked. And the rams or male lambs CASTRATED.
14. Castration of the male goat or buck kids usually occurs between 1 to 3 weeks of age.
15. Calves should be castrated between 2 and 10 weeks of age.
16. Castrated males have a better disposition and are more docile than males that have not been castrated because of decreased levels of the hormone TESTOSTERONE.
17. The best time to castrate a pig is between 3 and 21 days of age.
18. CASTRATION, is the surgical removal of the two TESTICLES.
19. Pork from BOARS or uncastrated male pigs at slaughter weight, may have an odor during cooking that is very offensive to many people. This is called a "boar odor" or a "TAINTED" odor.
20. An animal is considered a CRYPTORCHID because the testicle(s) failed to descend during development.

# External Parasites

Shannon Williams and Sarah D. Baker, Extension Educators

## Goal (learning objective)

Youth will:

- Learn about common livestock external parasites
- Learn about parasite control options
- Learn about vocabulary related to parasites

## Supplies

- Handout 1 – Pest Control Examples (enough copies for group)
- Handout 2 – External Parasites (enough copies for group)
- Sticks (enough for all members but 2 to have a stick)
- Fishing line (2' of line for each stick)
- Plastic flies, plastic insects, or black ribbon (one for each stick)
- Bite-size snack (two packages)

## Pre-lesson preparation

- Read/review the list of external parasites for specific species (see resources below)
- Make copies of Handout 1 and Handout 2
- Familiarize yourself with the signs and symptoms an animal will exhibit when suffering from specific external parasite
- Purchase/prepare snack
- Obtain sticks
- Obtain fishing line, cut fishing line into 2' sections and tie fishing line to sticks
- Tie plastic flies (or insects or black ribbon) to the end of the fishing line
- Practice lesson

## Lesson directions and outline

Ask the youth to share some types of parasites they are aware of. Have the youth define what a parasite does. After the youth share their answers discuss the following information:

Parasites are organisms that live off of, in or on another organism (its host). Livestock are susceptible to both internal and external parasites. Parasites can cause reduced weight gain, poor appetite, diarrhea and other health problems. External parasites live “outside” of “hosts” body. External parasites not only transmit diseases, but they are a constant source of irritation and can make animals very uncomfortable.

Examples of external parasites of livestock include the following:

- **SWINE:** The most common external parasites of swine are lice and mange. If pigs are seen constantly rubbing on feeders, gates, and buildings, they likely have external parasites. The hog louse has a dark body and is big enough to be seen on the skin (normally around the flank and abdomen). The lice suck blood through the skin causing irritation and itching. Mange, the result of mite infestation, may be seen first as raised areas of skin covered with brown scabs around the ears and neck. Pig-to-pig contact is the major means of transmission of lice and mange. Control consists of sanitation and the use of agents to kill the lice and manage mites. Products are available as topical sprays and powders, pour-ons, injections, and feed additives. Consult your veterinarian for advice in establishing an effective plan.



- **SHEEP:** The most common external parasites of sheep are lice, ticks, and mange. Lice spend their entire lives on the sheep or goat. Both immature and adult stages suck the blood or feed on the skin. Louse-infected animals are usually recognized by their dull, matted coat, or excessive scratching behavior. Lice are generally transmitted from one animal to another by contact. Control of louse is difficult since pesticides do not kill the louse egg. The eggs of most species will hatch 8-12 days after pesticide application, so retreatment is necessary 2 weeks following the first application. Sheep ticks (ked) are brown hairy flies that resemble the look of a tick. This wingless fly is about 4-6 mm long and has a small head that is broad. The legs of the sheep ked are very strong and tipped with claws. Sheep ked live their whole lives in the wool of sheep. They are most commonly found on the neck, shoulders, and stomach of sheep. If removed from the sheep, females can only live for 7-10 days. Treatment for sheep ticks is most effective following shearing, Spraying or dipping once a year will usually keep the ticks under control.
  - **BEEF:** The most common external parasites of beef are flies, lice, and grubs. There are two major types of flies that are major pests to cattle: the horn fly and the face fly. Horn flies are about 1/8-inch-long and are biting flies. They appear in spring and continue until fall and feed primarily on the backs of cattle. Face flies do not bite and are the same sizes as a house fly. They cluster around the head and face, and irritate the eyes. There are two types of lice: biting and sucking. Lice cause cattle to rub and lose their hair, and sucking lice feed on their blood. Normally, lice are a bigger problem during cold weather. Grubs found on cattle include heel flies. They lay their eggs on cattle while cattle graze in the spring and summer. Larvae hatch from the eggs, burrow through the skin, and travel through the body for about eight months. They chew through the skin on the animal's back and drop to the ground in the spring. An adult fly emerges from the larva that was dropped to the ground about five weeks later.
  - **GOATS:** Many external parasites such as flies and ticks, affect goats in warm weather. Lice affects goats more during the winter months. Flies are pests and can cause problems around eyes and irritated flesh. Ticks and lice are blood sucking and will cause goats to itch and rub.
  - It is always a good management practice to consult with a licensed veterinarian to develop an effective external parasite management program.
- Conducting the activity (DO)**
1. Ask for two volunteers to be the “animals” for this activity.
  2. The remaining members will be the “external parasites,” half will be flies and half will be biting lice.
  3. Provide each “external parasite” a stick
  4. One “animal” will have flies and one “animal” will have biting lice.
  5. Provide each “animal” a snack package. They can only eat the snack one at a time. And the “animals” need to react to the pest the way an animal would react.
  6. At your cue, the “external parasites” can annoy their “animal” for two minutes.
  7. After two minutes, stop the activity.
  8. Ask the “animals” the following questions:
    - a. How did they enjoy eating their snacks?
    - b. What did they do to stop the “attack” from the external parasites?
    - c. How successful were they in eating and enjoying their snack?
  9. Ask the “external parasites” the following questions:
    - a. Did playing this role provide some insight as to what your animal may be experiencing?
  10. Review Handout 1 products and label information to see what products will help control specific external parasites. Be sure and look at dosage and withdrawal times.

**What did we learn? (REFLECT)**

- Ask: What external parasites can your project animal be exposed to?
- Ask: Why do external parasites cause animals to lose weight and/or go off feed?
- Ask: Which products could you use on your animal to control external parasites? What is the dosage and withdrawal time?

**Why is that important? (APPLY)**

- Ask: Why is it important for us to control external parasites on our 4-H animals?
- Ask: Why is it important to read product labels?
- Ask: How is Quality Assurance impacted by parasites?

**Resources**

Ohio State University Extension. (2011). Health Maintenance. *Beef resource handbook* (pages 5-1 through 5-6).

Ohio State University Extension. (2008). Herd Management and Diseases. *Goat resource handbook* (pages 79-93).

Ohio State University Extension. (2011). Health Maintenance and Diseases. *Sheep resource handbook for market and breeding projects* (pages 67-72).

Ohio State University Extension. (2000). Diseases & Their Control. *Swine resource handbook for market and breeding projects* (pages 9-1 through 9-14).

## HEALTH AND DISEASES: EXTERNAL PARASITES – HANDOUT 1

### PEST CONTROL EXAMPLES

#### FLY TAGS



#### DUST BAG & FLY SPRAY





## LABEL INFORMATION – Y-TEX PYTHON INSECTICIDE CATTLE EAR TAGS

Compendium of Veterinary Products - Y-TeX® PYthon® Insecticide Catt... <https://valleyvet.cypsservice.com/product/view/basic/1344012?route=pro>

Y-TeX® PYthon® Insecticide Cattle Ear Tags (Y-TEX CORPORATION)



White papers

Coupons

Other

Image

### Y-TEX CORPORATION

1825 BIG HORN AVENUE, CODY, WY, 82414

Telephone: 800-443-6401

Website: [www.ytex.com](http://www.ytex.com)

Email: [ytexinfo@ytex.com](mailto:ytexinfo@ytex.com)



Every effort has been made to ensure the accuracy of the information published. However, it remains the responsibility of the readers to familiarize themselves with the product information contained on the USA product label or package insert.

## Y-TEX® PYTHON® INSECTICIDE CATTLE EAR TAGS

### Y-TeX

*For use on Beef and Dairy Cattle (including Lactating) and Calves to Control Horn Flies, Face Flies, Lice, Gulf Coast Ticks, Spinose Ear Ticks, and Aid in Control of Stable Flies, Black Flies, House Flies and small Horse Flies.*

**Keep Out of Reach of Children**

### CAUTION

#### ACTIVE INGREDIENTS:

<b>Zetacypermethrin, S-enantiomer</b>	10%
S-cyano (3-phenoxyphenyl) methyl (±) cis/trans 3-(2, 2-dichloroethenyl)-2, 2 dimethylcyclopropane-carboxylate*	
*Cis/trans isomer ratio: Max. 55% (±) cis and Min. 45% (±) trans	
<b>Piperonyl Butoxide</b>	20%
(butylcarbityl) (6-propylpiperonyl) ether and related compounds	
<b>OTHER INGREDIENTS</b>	70%
<b>TOTAL</b>	100%

- Synergized pyrethroid formula for maximum effectiveness against horn flies.
- Also controls face flies, lice, ear ticks, and aids in control of other biting flies.
- Can be used on lactating dairy cows.
- No withdrawal time required.
- Guaranteed against loss due to tag or button failure.\*

Snap-Lok® collar for superior retention\*

Ribbed design for season-long durability

Long taper and rounded edges for durability

Large surface area for insecticide effectiveness

### GUARANTEE

\*This guarantee is a limited guarantee, limited to the replacement of tags only, if the tags failed after being properly applied, to remain in the animal's ear for a five (5) month period due to tag breakage or separation from button.

### DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling. The labeling must be in the possession of the user at the time of pesticide application.

**Summer Season:** To control horn flies for about 3-4 months and aid in control of face flies, apply 1 tag per animal in late spring. To control horn flies, face flies, lice, Gulf Coast ticks and spinose ear ticks for 4-5 months, and to aid in control of stable flies, black flies, house flies and small horse flies, apply two tags per animal (1 in each ear) when flies appear in spring. Apply 2 tags to large bulls for optimum horn fly protection.

**Winter Season:** For season-long lice control, apply tags in late fall. To control biting lice, shortnosed sucking lice and aid in control of other sucking lice, apply 1 tag per calf or 2 tags per mature animal (1 in each ear).

Apply as shown with the Y-TEX 2-piece tagging system. All animals in the herd should be tagged. To minimize development of insecticide resistance, remove used tags at end of fly and lice seasons, and follow Y-TEX's recommended tag rotation program.

## LABEL INFORMATION – CORATHON INSECTICIDE CATTLE EAR TAGS

Compendium of Veterinary Products - Corathon® (BAYER HEALTHCARE LLC)

<https://valleyvet.cyps-service.com/product/view/basic/1040060?route=pro>

Corathon® (BAYER HEALTHCARE LLC)



White papers

Coupons

Other

Image

**BAYER HEALTHCARE LLC**  
**Animal Health Division**  
**P.O. BOX 390, SHAWNEE MISSION, KS, 66201-0390**

Customer Service Tel.: 800-633-3796

Customer Service Fax: 800-344-4219

Website: [www.bayer-ah.com](http://www.bayer-ah.com)



Every effort has been made to ensure the accuracy of the information published. However, it remains the responsibility of the readers to familiarize themselves with the product information contained on the USA product label or package insert.

### **CORATHON®**

#### **Bayer Animal Health**

Insecticide Cattle Ear Tag for use on Beef and Non-Lactating Dairy Cattle to Control Face Flies, Horn Flies, Gulf Coast Ticks and Spinose Ear Ticks for up to 5 months

For use with Allflex® Universal Total Tagger with red pin and black clip.

- Controls horn flies (including pyrethroid- and chlorinated hydrocarbon-resistant horn flies), Gulf Coast ticks, face flies and spinose ear ticks for up to 5 months.
- Contains 50% organophosphate insecticides.
- FlyberTek® allows for maximum insecticide holding capacity and even dispersion of insecticide.

ACTIVE INGREDIENTS:	Percent By Weight
Coumaphos	15%
Diazinon	35%
OTHER INGREDIENTS:	50%
TOTAL	100%

Net Contents: 2 Pouches of 10 Tags Each, 0.5 oz (14 grams) per tag

STOP - Read the label before each use.

Keep Out of Reach of Children.

#### **CAUTION**

**PRECAUCION AL USUARIO:** Si usted no puede leer o entender inglés, no use este producto hasta que la etiqueta le haya sido explicada ampliamente.

(TO THE USER: If you cannot read or understand English, do not use this product until the label has been fully explained to you.)

#### **PRECAUTIONARY STATEMENTS**

##### **HAZARDS TO HUMANS AND DOMESTIC ANIMALS**

#### **CAUTION**

Harmful if absorbed through skin. Causes moderate eye irritation. Avoid contact with eyes, skin or clothing. Prolonged or frequently repeated skin contact may cause allergic reactions in some people. Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco or using the toilet. Wear chemical-resistant gloves made of rubber or any waterproof material (thickness equal to or greater than 14 mils) when applying tags.

**ENVIRONMENTAL HAZARDS**

This pesticide is highly toxic to birds, fish and wildlife. Do not apply directly to water. Do not contaminate water when disposing of used tags.

<b>CORATHON® QUICK FACTS</b>
<ul style="list-style-type: none"><li>• Controls horn flies (including pyrethroid- and chlorinated hydrocarbon-resistant horn flies), Gulf Coast ticks, face flies and spinose ear ticks for up to 5 months.</li><li>• Contains 50% organophosphate insecticides.</li><li>• FyberTek® allows for maximum insecticide holding capacity and even dispersion of insecticide.</li></ul>
<b>WHERE TO APPLY</b>
<ul style="list-style-type: none"><li>• Beef and Non-Lactating Dairy Cattle.</li></ul>
<b>HOW TO APPLY</b>
<ul style="list-style-type: none"><li>• Use Allflex® Universal Total Tagger with red pin and black clip to apply tags to cattle.</li></ul>
<b>COVERAGE</b>
<ul style="list-style-type: none"><li>• All mature animals in the herd should be tagged.</li><li>• For optimum control of horn flies, face flies, Gulf Coast ticks and spinose ear ticks, attach one tag to each ear (two tags per animal) per mature animal.</li><li>• Use one ear tag per calf.</li><li>• For adequate control of horn flies, face flies, Gulf Coast ticks and spinose ear ticks, attach one tag per mature animal.</li></ul>
<b>RE-APPLY</b>
<ul style="list-style-type: none"><li>• Corathon® has been proven to be effective against horn flies and face flies for up to 5 months.</li><li>• Replace as necessary.</li><li>• Remove tags at end of fly season or prior to slaughter.</li></ul>
<b>QUESTIONS?</b>
<ul style="list-style-type: none"><li>• For questions or comments, call toll-free 1-800-633-3796.</li></ul>

**DIRECTIONS FOR USE**

It is a violation of Federal law to use this product in a manner inconsistent with its labeling. This labeling must be in possession of the user at the time of pesticide application.

**IMPORTANT**

Read the entire Directions for Use, Conditions of Sale and Disclaimer of Limited Warranty and Limitation of Damages before using this product.

**CONDITIONS OF SALE**

The directions on this label are believed to be adequate and must be followed carefully. This product has been tested under different environmental conditions similar to those that are ordinary and customary for use of the product. However, it is impossible to eliminate all risks associated with the



## LABEL INFORMATION – PROZAP INSECTRIN DUST (DUST BAGS)

Compendium of Veterinary Products - Prozap® Insectrin Dust (CHEM... <https://valleyvet.cvpSERVICE.com/product/view/basic/1086028?route=pr>

Prozap® Insectrin Dust (CHEM-TECH, LTD.)



White papers

Coupons

Other

Image

**CHEM-TECH, LTD.**

Wholly Owned Subsidiary of Neogen Corporation

Distributed by NEOGEN CORPORATION

1006 NORTH HIGHWAY 5, PLEASANTVILLE, IA, 50225

Telephone: 515-287-8778

Website: [www.neogen.com](http://www.neogen.com)



Every effort has been made to ensure the accuracy of the information published. However, it remains the responsibility of the readers to familiarize themselves with the product information contained on the USA product label or package insert.

### PROZAP® INSECTRIN DUST

*Chem-Tech*

#### SPECIMEN LABEL

ACTIVE INGREDIENTS:	
Permethrin*	0.25%
OTHER INGREDIENTS:	99.75%
TOTAL:	100.00%

\* (3-phenoxyphenyl)methyl (+/-) cis/trans 3-(2,2-dichloroethenyl)-2,2-dimethylcyclopropanecarboxylate (Cis/Trans ratio: Min 35% (+/-) cis and max. 65% (+/-) trans.)

EPA Reg. No.47000-149

EPA Est. No. 47000-IA-01

**KEEP OUT OF REACH OF CHILDREN**

#### CAUTION

#### FIRST AID

**Have Product Container or Label with You When Calling a Poison Control Center, Doctor or Going in for Treatment.**

#### If on Skin or on clothing:

- Take off contaminated clothing.
- Rinse skin immediately with plenty of water for 15-20 minutes.
- Call a poison control center or doctor for further treatment advice.

#### If in Eyes:

- Hold eye open and rinse slowly and gently with water for 15 to 20 minutes.
- Remove contact lenses, if present, after the first 15 minutes, then continue rinsing eyes.
- Call a poison control center for treatment advice.

For 24-hour emergency information on this product, call 1-800-498-5743 (US & Canada) or 1-651-523-0318

#### PRECAUTIONARY STATEMENTS

#### HAZARDS TO HUMANS AND DOMESTIC ANIMALS



**BEEF AND DAIRY CATTLE AND HORSES**

Can be used in dust bags, this shaker can and mechanical dust applicator.

***Horn Flies, Lice, Face Flies:***

Place contents of this package in any commercially available dust bag, suspend bag in areas frequented by cattle or in gateways or lanes through which the animals must pass daily for water, feed or minerals. Bags may also be placed in loafing sheds or in front of mineral feeders. For dairy cows, bags may be suspended in the exit through which the cows leave the milking barn. The bags should hang 4 to 6 inches below the back line of the cattle. For reduction of *Face Flies*, bags must be located so animals will be forced to use them daily and hung at a height so that the face is dusted.

***Horn Flies, Lice:***

Direct Application: Apply 2 oz. of dust per animal by shaker can or dust glove over the head, neck, shoulders, back and legs.

**SWINE*****Lice on Swine Direct Application:***

Apply only 1 ounce per head as uniform coat to the head, shoulder and back by use of a this shaker can or suitable mechanical dust applicator. Do not apply more often than once every 10 days. In severe infestation, both animals and the bedding may be treated. Do not ship animals for slaughter within 5 days of treatment.

**POULTRY*****To control Northern Fowl Mites and Lice:***

Apply at a rate of 1 lb. per 100 birds. Ensure thorough treatment of vent area.

***To control Northern Fowl Mites and Lice in Poultry Houses:***

Apply to floors, roosts and interior surfaces at a rate of 1 lb. per 40 square feet. Do not apply directly to eggs or nest liter. Do not contaminate feed or drinking water.

**PETS****USE ONLY ON DOGS OR CATS:**

Consult a veterinarian before using this product on debilitated, aged, pregnant, nursing, or medicated animals.

***To [control] [kill] Fleas, Ticks and Lice:***

Use product only outside or in a well-ventilated area. Wearing household latex or rubber gloves, dust entire animal avoiding pet's eyes, nose, mouth and genital areas. Rub or brush pet's hair to work dust down to the skin paying close attention to legs and feet. Use 1/2 oz. on pets 20 pounds and under and 1 oz. on pets over 20 pounds. Reapply every two weeks. This product should not be applied by children. Do not use on puppies or kittens under 12 weeks of age. Dust pet bedding and doghouse using a shaker can or other dust applicator.

**ANTS*****To control ants, carpenter ants:***

Treat doors, around window frames, ant trails and hills, cracks and crevices and other areas of entry.

**STORAGE AND DISPOSAL**

Do not contaminate water, food, or feed by storage or disposal.

**PESTICIDE STORAGE:** Store in a cool, dry and secure area. Store in original sealed container away from food or feed.

**CONTAINER DISPOSAL:**

**If empty:** Do not reuse this container. Place in trash or offer for recycling if available.

**If partly filled:** Call your local solid waste agency for disposal instructions. Never place unused product down any indoor or outdoor drain.

**DISCLAIMER**

**DISCLAIMER:** To the extent permitted by applicable law, seller makes no representation or warranty, either express or implied, for results due to misuse, improper handling or improper storage of this material. Nor does Seller assume any responsibility for injury to persons, crops, animals, soil or property arising out of misuse, improper handling or improper storage of this material.

OR

**LIMITED WARRANTY**

To the extent permitted by applicable law, Neogen Corporation makes no warranty concerning uses which extend beyond the use of the product under normal conditions in accord with the statements made on this label. To the extent by applicable law, Neogen Corporation shall not be liable for (1) any consequential, incidental or special damages related in any way to this product or its uses, or (2) any damages related in any way to resistance to pesticides.

OR

**CONDITIONS OF SALE AND LIMITATION OF WARRANTY AND LIABILITY**

**NOTICE:** Read the entire Directions for Use and Conditions of Sale and Limitation of Warranty and Liability before buying or using this product. If the terms are not acceptable, return the product at once, unopened, and the purchase price will be refunded.

To the extent permitted by applicable law Manufacturer and Seller warrant that this product conforms to the chemical description on the label and is reasonably fit for the purposes stated in the Directions for Use, subject to the inherent risks referred to above, when used in accordance with directions under normal use conditions. To the extent permitted by applicable law this warranty does not extend to the use of this product contrary to label instructions, or under abnormal conditions or under conditions not reasonably foreseeable to or beyond the control of Seller or Manufacturer,

## LABEL INFORMATION – ABSORBINE FLYS-X LIVESTOCK READY TO USE INSECTICIDE

Compendium of Veterinary Products - Absorbine® Flys-X® Livestock ...

<https://valleyvet.cvp-service.com/product/view/basic/1099067?route=pr>

Absorbine® Flys-X® Livestock Ready to Use Insecticide (W.F. YOUNG, INC.)

**Label** White papers Coupons Other Image

**W.F. YOUNG, INC.**  
**302 BENTON DRIVE, EAST LONGMEADOW, MA, 01028-5990**  
Telephone: 413-526-9999  
Order Desk: 800-628-9653  
Fax: 413-526-8990  
Website: [www.absorbine.com](http://www.absorbine.com)  
Email: [animalhealthcare@absorbine.com](mailto:animalhealthcare@absorbine.com)



Every effort has been made to ensure the accuracy of the information published. However, it remains the responsibility of the readers to familiarize themselves with the product information contained on the USA product label or package insert.

### ABSORBINE® FLYS-X® LIVESTOCK READY TO USE INSECTICIDE

*W.F. Young*

(AQUEOUS)

CONTAINS PYRETHRINS, a botanical insecticide

FOR USE ON LIVESTOCK

ACTIVE INGREDIENTS:

Pyrethrins	0.1%
Piperonyl Butoxide*	1.0%
OTHER INGREDIENTS:	98.9%
TOTAL:	100.0%

\*(butylcarbityl) (6-propylpiperonyl) ether and related compounds

KEEP OUT OF REACH OF CHILDREN

CAUTION

READ ENTIRE LABEL BEFORE EACH USE

ON ANIMAL USE - USE ONLY ON HORSES, CATTLE, PONIES AND DOGS

EFFECTIVE, FAST-ACTING, READY TO USE INSECTICIDE

DIRECTIONS FOR USE

It is a violation of Federal Law to use this product in a manner inconsistent with its labeling.

**General Precautions & Use Restrictions**

Entry Restrictions:

- Except when applying to dogs, foals, horses and livestock, do not allow others to enter treated area until sprays have dried.

Application Restrictions:

- Except when applying to dogs, foals, horses and livestock, do not apply this product in a way that will contact workers or other persons either directly or through drift. Only protected handlers may be in the area during application.

- Do not apply using a high pressure hand-wand or hand-held fogger in enclosed spaces.

- Not for use in or around floor drains or sewers.

- Remove or cover exposed food and drinking water before application.

- Remove or cover dishes, utensils, food processing equipment and food preparation surfaces or wash them before use.

- Do not apply more than 1 time per day.

- Remove pets, birds and cover fish aquarium before surface spraying.

- Do not use on foals or puppies less than 12 weeks of age.

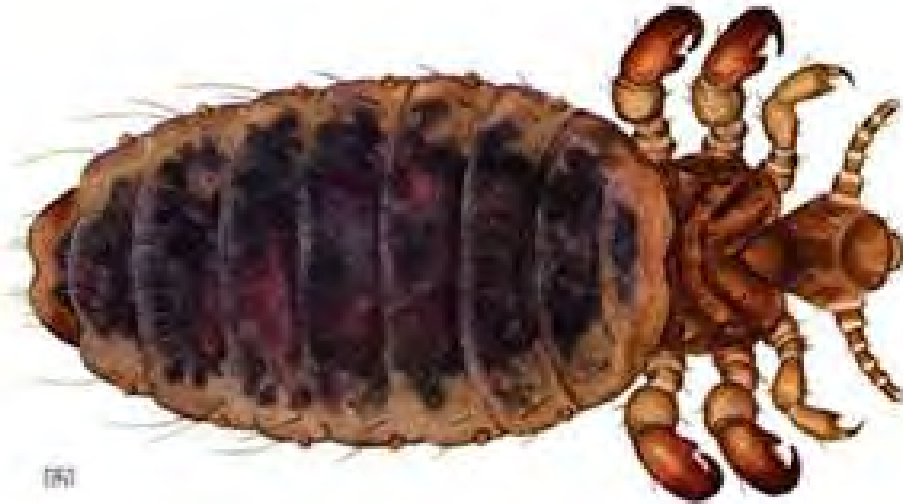
- Do not apply this water-based spray on or around electrical equipment due to the possibility of shock hazard.

**HORSE AND LIVESTOCK SPRAY:** Effective, fast acting, ready to use insecticide. Apply with conventional sprayers or a cloth. To protect cattle and horses from horn flies, house flies, mosquitoes and gnats, apply a light mist sufficient to wet the surface of the hair. To kill stable flies, horse flies and deer flies, apply at a rate of 2-4 ounces per adult animal sufficient to wet the hair thoroughly. Repeat treatment daily or at intervals necessary to give continued protection. To kill face flies, apply with a cloth dampened with the spray. To kill blood sucking lice, apply to the infested areas of the animal. Use a stiff brush to get the spray to the base of the hair. Repeat every 2-3 weeks if required.

**DOG AND FOAL INSECTICIDE USE:** To kill fleas and brown dog ticks on premises and on dogs. Effective, fast-acting insecticide.

## EXTERNAL PARASITES

### LICE



---

### MANGE





**TICKS**



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**SHEEP TICK (KED)**



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**HORN FLY**



**FACE FLY**



---

**GRUB**





# What Does a Healthy Animal Look Like?

Rikki Ruiz, Extension Educator

## Goal (learning objective)

Youth will learn about the differences between healthy and sick animals and the causes of sickness.

## Supplies

- Paper and pen (or pencils, enough for group)
- Flip chart paper (post-it) and 8 markers (enough so that each smaller group has 2 flip chart sheets and a marker)
- Handout 1 - "Pictures of Healthy and Unhealthy Animals" (enough copies for the group)

## Pre-lesson preparation

- Read/review the resources from the Ohio Resource Handbooks (see resources)
- Review the web resources (see resources)

## Lesson directions and outline

Share the following information with the youth:

Animal behavior is a significant factor in determining an animal's health. Normal animal behavior includes an animal who stays with the herd, eyes are bright, nose moist without discharge, no wounds, and is eating normally.

Signs of sick animals can include an animal that is irritable, listless, lame, fever, away from the group, not eating or drinking etc. Several factors can play a part in an animal's health. Some of these include; feed and feed storage, water trough, pasture condition, types of plants that animal has access too, weather conditions, etc.

Distribute Handout 1 and have youth share the differences they see from the pictures of healthy and unhealthy animals.

## Conducting the activity (DO)

1. Have youth count off into groups.
2. Have 1 group representative get 2 sheets of flip chart paper and a marker.
3. Have the group appoint a recorder, title 1 sheet of flip chart paper "Normal" the other sheet "Abnormal".
4. Have the groups discuss (and record) what they consider normal animal behaviors and physical conditions and what they consider as abnormal behaviors and physical conditions.
5. After groups have discussed and created their lists, have them share their findings with everyone.
6. Have members remain in smaller groups, after you read each scenario to the group, have the smaller groups determine if the animal is sick or not. Have groups note their findings to share with everyone after all the scenarios have been read.
7. Read the following scenarios to the groups:
  - a. Scenario 1: Sheep are usually curious and energetic animals, however your sheep is acting depressed. Your sheep is hanging its head, with droopy eyes. He is distant and not eating or drinking like usual. Your sheep doesn't want to socialize with others and is panting very rapidly. You have given your sheep fresh water and fresh hay, but he's not interested in either.
  - b. Scenario 2: Cattle are usually curious and energetic animals, however your steer or heifer is acting depressed. The animal has its head down and when it picks it up it has droopy ears. It is distant and not eating or drinking like usual. Your steer or heifer doesn't want to socialize with others and is panting very rapidly. You have given your animal fresh water and fresh hay, but it's not interested in either.

- c. Pigs are usually curious and energetic animals, however your pig is acting depressed. Your pig is moving slowly, with sunken eyes. The animal is distant and not eating or drinking like usual. Your pig doesn't want to socialize with others and is panting very rapidly. You have given your pig fresh water and feed, but it's not interested in either.
8. Lead a discussion as a larger group. Ask the following questions:
- a. Which animals were sick? Why or why not?
  - b. Did the scenarios provide enough information to help you decide if the animal is sick or not?

#### **What did we learn? (REFLECT)**

- Ask: What other things could cause an animal to not feel well?
- Ask: What's the best way for you to recognize if your animal is sick?

#### **Why is that important? (APPLY)**

- Ask: How can you apply this to your 4-H project?
- Ask: How can you apply this to your health or the health of your family?

## **Resources**

- Green, J.W., Black, L., & Willis, P. (2013). 4-H Science Inquiry Video Series. *Journal of Extension* [On-line], 51(3). Available at: <https://joe.org/joe/2013december/tt7.php>
- Jones, J. (2007). Keeping Your 4-H Market Animals Healthy (4-H 140). Oregon State University Extension Service. Available at: <https://catalog.extension.oregonstate.edu/sites/catalog.extension.oregonstate.edu/files/project/pdf/4-h140.pdf>
- Ohio State University Extension. (2011). Health Maintenance. *Beef resource handbook* (pages 5-2 through 5-6).
- Ohio State University Extension. (2008). Herd Management and Diseases. *Goat resource handbook* (pages 88-93).
- Ohio State University Extension. (2011). Health Maintenance and Diseases. *Sheep resource handbook for market and breeding projects* (67-70).
- Ohio State University Extension. (2000). Diseases and Their Control. *Swine resource handbook for market and breeding projects* (pages 9-1 through 9-13).
- Washington State University (n.d.). Cattle, Swine, and Small Ruminants. *Animal Disease Screening Tools*. Available at: <http://vetextension.wsu.edu/4-h-fair/>

HEALTH & DISEASES: WHAT DOES A HEALTHY ANIMAL LOOK LIKE – HANDOUT 1

Pictures of Healthy and Unhealthy Animals



*Picture of a healthy cow*



*Picture of an unhealthy calf*





*Picture of a healthy sheep*



*Picture of an unhealthy sheep*





*Picture of a healthy pig*



*Picture of an unhealthy pig*





*Picture of a healthy goat*



*Picture of an unhealthy goat*

*\*All photos are stock images found on the internet*



# Injection Sites and Techniques

Shannon Williams, Extension Educator

## Goal (learning objective)

Youth will learn about proper injection technique and appropriate locations to administer injections.

## Supplies

- 1 orange or 1/2 banana - one per youth
- Syringes - 6cc or 12cc - one per youth (can be shared)
- Needles - 18 x 1/2 or 3/4 - one per youth (can be shared)
- Dyed sterile water in vaccine bottles (can be shared)
- Sharp knives for use by adult volunteer
- Handout 1 - "Appropriate Injection Sites" (enough copies for group)

## Pre-lesson preparation

- Check with your local veterinarian early to have them save sterile water.
  - a. Draw some of the water out of each bottle and replace it with a SMALL amount of food coloring. Red or green works best.
- Study recommended injection sites for species (see resources).

## Lesson directions and outline

Share the following information with the youth:

At some point in time, it is necessary to give all animals an injection. This could be a vaccine to prevent a disease or a medication to treat a disease. It is important to use proper injection technique and to administer injections in recommended locations as not to damage the meat.

## Conducting the activity (DO)

1. Discuss with youth the importance of properly restraining the animal when giving an injection.
2. Discuss with youth the difference between subcutaneous (sq) and intermuscular (im) injections.
3. Show youth the correct locations for injections on the species they are interested in.
4. Demonstrate to the group how to correctly fill a syringe with "medication."
5. Have youth fill their syringe with 1cc of "medication."
6. Have youth inject the piece of fruit, administering:
  - a. One sq injection
  - b. One im injection
7. Cut the fruit to see if they administered the "medication" in the proper location.

## What did we learn? (REFLECT)

- Ask: What are some reasons why we would give an animal an injection?
- Ask: Where are the proper locations for injections on their animal? Why those locations?

## Why is that important? (APPLY)

- Ask: What could happen if an injection was given in the wrong location?
- Ask: What could happen if you were given an injection in the wrong location?

## Resources

Ohio State University Extension. (2011). Health Maintenance. *Beef resource handbook* (pages 5-7 through 5-8).

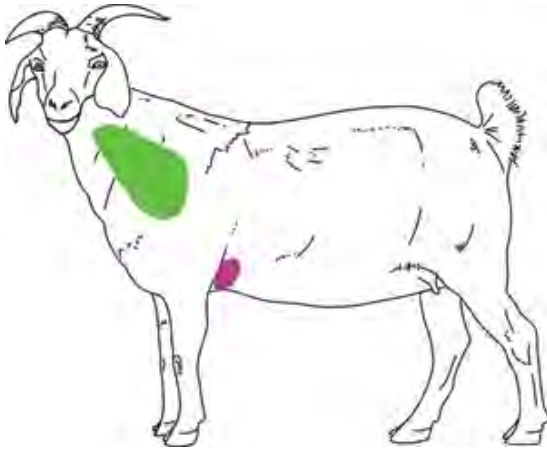
Ohio State University Extension. (2008). Caring for Animals *Goat resource handbook* (pages 165-166).

Ohio State University Extension. (2011). Health Maintenance and Diseases. *Sheep resource handbook for market and breeding projects* (pages 71-72).

Ohio State University Extension. (2000). Caring for Animals. *Swine resource handbook for market and breeding projects* (pages 24-7 through 24-9).

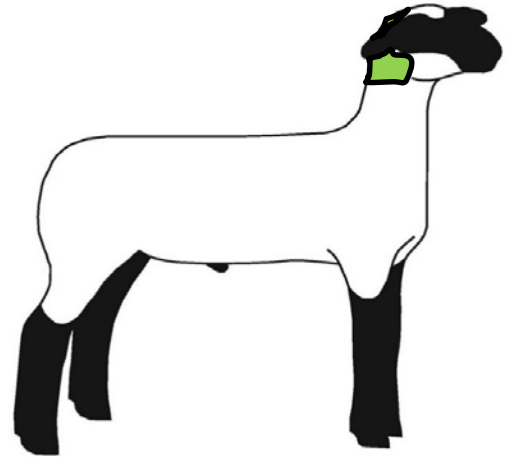
## HEALTH & DISEASES: INJECTION SITES AND TECHNIQUES – HANDOUT 1

### APPROPRIATE INJECTION SITES

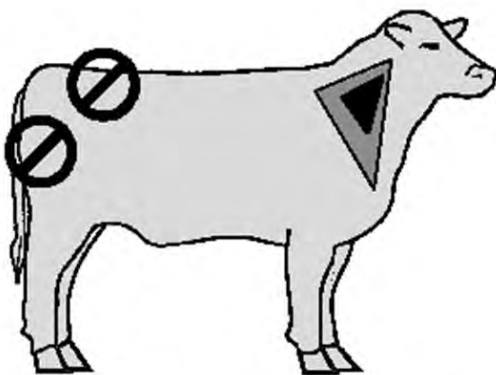


*Photo courtesy of Langston University*

Goats – correct placement is in the dark area in the neck and the area in the armpit



Sheep – correct placement is in the dark area in the neck



Do Not Inject



Subcutaneous (SC)



Intramuscular (IM)

Cattle – correct placement is in the areas in the neck

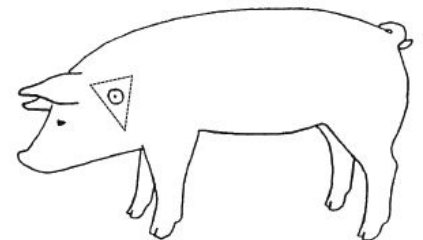


Photo courtesy of National Pork Board Fact Sheet

Swine – correct placement is the area in the neck and the areas in the armpit and flank



# Internal Parasites

Shannon Williams, Extension Educator

## Goal (learning objective)

Youth will:

- Learn about common livestock internal parasites
- Learn about parasite control options
- Learn about vocabulary related to parasites

## Supplies

- Handout 1 – Ivomec (enough copies for group)
- Handout 2 – Safeguard (enough copies for group)
- Handout 3 - Cydectin (enough copies for group)
- Worm life cycle (1 copy)

## Pre-lesson preparation

- Read/review the list of external parasites for specific species (see resources below)
- Make copies of the Handouts
- Familiarize yourself with the signs and symptoms an animal will exhibit when suffering from specific internal parasites
- Practice lesson

## Lesson directions and outline

Ask the youth to share some types of internal parasites they are aware of. Have the youth define what a parasite does. After the youth share their answers discuss the following information:

All livestock are exposed to internal parasites, especially in a corral or pen situation. Infection with internal parasites is usually acquired by ingestion of egg-forms of a parasite. Internal parasites live inside the body of the host and then are passed through the body in the manure to finish their life cycle. They can then be ingested by another animal. Parasites may cause reduced weight gain, poor appetite, diarrhea

and other health problems. The best prevention is to reduce your animals' exposure to parasites by providing a clean environment (beginning at birth) and avoiding overcrowding of pens or premises. If possible, avoid pasturing or housing in damp areas and when possible rotate pastures or housing areas to avoid high burdens of parasites. There are also several products available for control of internal parasites, but a good biosecurity plan helps reduce the number of internal parasites. Consult your local veterinarian for advice in establishing an effective plan.

Examples of internal parasites in livestock include:

- **SHEEP:** The most common internal parasites of sheep include stomach and intestinal worms. Noticeable symptoms of parasites include poor weight gain, depression, listlessness, broken wool, and whiteness (anemia) around the eyes and gums. In advanced stages, a large swelling forms under the jaw, sometimes called "bottle jaw". Most of the damage caused by internal parasites is due to mechanical irritation of the tissue they affect and the obstruction of an organ when there are too many worms. The ability and tendency of sheep to graze close to the ground where larvae numbers are high, drastically increases their exposure to parasites.

- **BEEF:** The most common internal parasites of cattle include stomach and lung worms, although there are many species of worm parasites that can affect them. Liver flukes, tapeworms, and single-celled protozoan parasites called *Coccidia* can also be very prevalent in beef cattle. Most of the internal parasites in cattle are found in the abomasum (true stomach) or the small intestine. These parasites can cause anemia, scouring, depression, indigestion, poor appetite, loss of weight, and decreased milk production for cows. Cattle of all ages, but particularly young cattle, are normally affected.
- **GOATS:** The common internal parasites include lungworms, stomach worms, tapeworms and coccidian. Noticeable symptoms of parasites can be poor weight gain, poor appetite, depression, listlessness and bloody scours. Goats of all ages can be affected but young and poorly nourished animals are affected the most by internal parasites. Good management and proper sanitation can reduce parasite infestation.
- **SWINE:** The most common internal parasites that infect pigs are roundworms, stomach worms, lung worms, thread worms, and kidney worms. Each of these worms affects different ages of pigs from 10 day old pigs to older hogs and breeding stock. These internal worms can cause bloody diarrhea, liver damage, outright illness, decreased appetite, and poor digestion. It is of utmost importance to have a good deworming program to prevent spread of internal parasites. Depending on the species, a single female can lay up to one million eggs in one day. These eggs can remain viable in the environment for up to thirty years. They can become infective 10 days after being laid.

It is always a good management practice to consult with a licensed veterinarian to develop an effective internal parasite management program.

### Conducting the activity (DO)

1. Discuss the various internal parasites and their life cycles.
2. Review the labels of the products available for control.
3. Have youth report which parasites are controlled with each product. How is the product administered? What is the withdrawal time?
4. Discuss what biosecurity measures they can take to reduce the number and incidence of internal parasites.

### What did we learn? (REFLECT)

- Ask: What internal parasites is your project animal susceptible to?
- Ask: Which product can use you and meet the withdrawal time for your market animal sale?
- Ask: What biosecurity measures can you take to reduce the chance of your animal having internal parasites?

### Why is that important? (APPLY)

- Ask: Why is it important for us to control internal parasites on our 4-H animals?
- Ask: Why is biosecurity important?
- Ask: Why is it necessary to read the entire label before you administer a product to your animal?

## Resources

- Ohio State University Extension. (2011). Health Maintenance. *Beef resource handbook* (pages 5-2 through 5-4).
- Ohio State University Extension. (2008). Herd Management and Diseases. *Goat resource handbook* (pages 88-89).
- Ohio State University Extension. (2011). Health Maintenance and Diseases. *Sheep resource handbook for market and breeding projects* (pages 68).
- Ohio State University Extension. (2000). Diseases & Their Control. *Swine resource handbook for market and breeding projects* (pages 9-10 through 9-12).

## **IVOMEC®1% INJECTION FOR CATTLE AND SWINE**

**Merial**

**(ivermectin)**

NADA 128-409, Approved by

the FDA 67306, 67307,

67308, 67309

**1% Sterile Solution**

**A Parasiticide for the Treatment and Control of Internal and External**

**Parasites of Cattle and Swine Consult your veterinarian for assistance**

**in the diagnosis, treatment and control of parasitism.**

### **INTRODUCTION**

IVOMEC® (ivermectin) is an injectable parasiticide for cattle and swine. One low-volume dose effectively treats and controls the following internal and external parasites that may impair the health of cattle and swine: gastrointestinal roundworms (including inhibited *Ostertagia ostertagi* in cattle), lungworms, grubs, sucking lice, and mange mites of cattle; and gastrointestinal roundworms, lungworms, lice, and mange mites of swine. Discovered and developed by scientists from Merck Research Laboratories, ivermectin is a novel chemical entity. Its convenience, broad-spectrum efficacy, and safety margin make IVOMEC Injection a unique product for parasite control of cattle and swine.

### **PRODUCT DESCRIPTION**

Ivermectin is derived from the avermectins, a family of potent, broad-spectrum antiparasitic agents isolated from fermentation of *Streptomyces avermitilis*.

IVOMEC Injection is a clear, ready-to-use, sterile solution containing 1% ivermectin, 40% glycerol formal, and propylene glycol, q.s. ad 100%. IVOMEC Injection is formulated to deliver the recommended dose level of 200 mcg ivermectin/kilogram of body weight in cattle when given subcutaneously at the rate of 1 ml/110 lb (50 kg). In Swine, IVOMEC Injection is formulated to deliver the recommended dose level of 300 mcg ivermectin/kilogram body weight when given subcutaneously in the neck at the rate of 1 ml per 75 lb (33 kg).

### **MODE OF ACTION**

Ivermectin is a member of the macrocyclic lactone class of endectocides which have a unique mode of action. Compounds of the class bind selectively and with high affinity to glutamate-gated chloride ion channels which occur in invertebrate nerve and muscle cells. This leads to an increase in the permeability of the cell membrane to chloride ions with hyperpolarization of the nerve or muscle cell, resulting in paralysis and death of the parasite. Compounds of this class may also interact with other ligand-gated chloride channels, such as those gated by the neurotransmitter gamma-aminobutyric acid (GABA).

The margin of safety for compounds of this class is attributable to the fact that mammals do not have glutamate-gated chloride channels, the macrocyclic lactones have a low affinity for other mammalian ligand-gated chloride channels and they do not readily cross the blood-brain barrier.

## INDICATIONS

**Cattle:** IVOMEK Injection is indicated for the effective treatment and control of the following harmful species of gastrointestinal roundworms, lungworms, grubs, sucking lice, and mange mites in cattle:

**Gastrointestinal Roundworms** (adults and fourth-stage larvae):

*Ostertagia ostertagi* (including inhibited *O. ostertagi*)

*O. lyrata*

*Haemonchus*

*placei*

*Trichostrongyl*

*us axei*

*T. colubriformis*

*Cooperia oncophora*

*C. punctata*

*C. pectinata*

*Oesophagostomum*

*radiatum*

*Bunostomum phlebotomum*

*otomum*

*Nematodirus helvetianus* (adults only)

*N. spathiger* (adults only)

**Lungworms** (adults and fourth-stage larvae):

*Dictyocaulus viviparus*

**Cattle Grubs** (parasitic stages):

*Hypoderma bovis*

*H. lineatum*

**Sucking Lice:**

*Linognathus vituli*

*Haematopinus*

*eurysternus*

*Solenopotes*

*capillatus* **Mites**

(scabies):

*Psoroptes ovis* (syn. *P. c. communis* var. *bovis*)

*Sarcoptes scabiei* var. *bovis*

**Persistent Activity**

IVOMEK Injection has been proved to effectively control infections and to protect cattle from reinfection with *Dictyocaulus viviparus* and *Oesophagostomum radiatum* for 28 days after treatment; *Ostertagia ostertagi*, *Trichostrongylus axei* and *Cooperia punctata* for 21 days after treatment; *Haemonchus placei* and *Cooperia oncophora* for 14 days after treatment.

**Swine:** IVOMEC Injection is indicated for the effective treatment and control of the following harmful species of gastrointestinal roundworms, lungworms, lice, and mange mites in swine:

**Gastrointestinal Roundworms:**

Large roundworm, *Ascaris suum* (adults and fourth-stage larvae)

Red stomach worm, *Hyostromy/us rubidus* (adults

and fourth-stage larvae) Nodular worm,

*Oesophagostomum* spp. (adults and fourth-stage

larvae) Threadworm, *Strongyloides ransomi*

(adults)

**Somatic Roundworm Larvae:**

Threadworm, *Strongyloides ransomi* (somatic larvae)

Sows must be treated at least seven days before farrowing to prevent infection in piglets.

**Lungworms:**

*Metastrongy/us* spp. (adults)

**Lice:**

*Haematopinus suis*

**Mange Mites:**

*Sarcoptes scabiei* var. *suis*

**DOSAGE**

**Cattle:** IVOMEC Injection should be given only by subcutaneous injection under the loose skin in front of or behind the shoulder at the recommended dose level of 200 mcg of ivermectin per kilogram of body weight. Each ml of IVOMEC contains 10 mg of ivermectin, sufficient to treat 110 lb (50 kg) of body weight (maximum 10 ml per injection site).

Body Weight (lb)	Dose Volume (ml)
220	2
330	3
440	4
550	5
660	6
770	7
880	8
990	9
1100	10

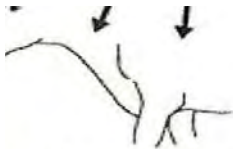
**Swine:** IVOMEC Injection should be given only by subcutaneous injection in the neck of swine at the recommended dose level of 300 mcg of ivermectin per kilogram (2.2 lb) of body weight. Each ml of IVOMEC contains 10 mg of ivermectin, sufficient to treat 75 lb of body weight



	Body Weight (lb)	Dose Volume (ml)
Growing Pigs	19	1/4
	<del>75</del>	<del>1/2</del>
	150	2
Breeding Animals (Sows, Gilts, and Boars)	225	3
	300	4
	375	5
	450	6

## ADMINISTRATION

**Cattle:** IVOMEK Injections to be given subcutaneously only, to reduce risk of potentially fatal clostridial infection of the injection site.



When using the 200, 500

Animals should be appropriately restrained to achieve the proper route of administration. Use of a 16-gauge 1/2" to 1/4" needle is suggested. Inject under the loose skin in front of or behind the shoulder (see illustration).

When using the 200, 500 or 1000ml pack size, use only automatic syringe equipment.

Use sterile equipment and sanitize the injection site by applying a suitable disinfectant. Clean, properly disinfected needles should be used to reduce the potential for injection site infections.

No special handling or protective clothing is necessary.

**Swine:** IVOMEK® (ivermectin) Injection is to be given subcutaneously in the neck. Animals should be appropriately restrained to achieve the proper



When using the 200 mL

route of administration. Use of a 16- or 18-gauge needle is suggested for sows and boars, while an 18- or 20-gauge needle may be appropriate for young animals. Inject under the skin, immediately behind the ear (see

illustration).

When using the 200 ml, 500 ml or 1000 ml pack size, use only automatic syringe equipment. As with any injection, sterile equipment should be used. The injection site should be cleaned and disinfected with alcohol before injection. The rubber stopper should also be disinfected with alcohol to prevent contamination of the contents. Mild and transient pain reactions may be seen in some swine following subcutaneous administration.

### **Recommended Treatment Program**

**Swine:** At the time of initiating any parasite control program, it is important to treat all breeding animals in the herd. After the initial treatment, use IVOMEC Injection regularly as follows:

#### **BREEDING ANIMALS**

**Sows:** Treat prior to farrowing, preferably 7-14 days before, to minimize infection of piglets.

**Gilts:** Treat 7-14 days prior to breeding. Treat 7-14 days prior to farrowing.

**Boars:** Frequency and need for treatments are dependent upon exposure. Treat at least two times a year.

#### **FEEDER PIGS**

##### **(Weaners/Growers/Finishers)**

All weaner/feeder pigs should be treated before placement in clean quarters.

Pigs exposed to contaminated soil or pasture may need retreatment if reinfection occurs.

#### **NOTE:**

- (1) IVOMEC Injection has a persistent drug level sufficient to control mite infestations throughout the egg to adult life cycle. However, since the ivermectin effect is not immediate, care must be taken to prevent reinfestation from exposure to untreated animals or contaminated facilities. Generally, pigs should not be moved to clean quarters or exposed to uninfested pigs for approximately one week after treatment. Sows should be treated at least one week before farrowing to minimize transfer of mites to newborn baby pigs.
- (2) Louse eggs are unaffected by IVOMEC Injection and may require up to three weeks to hatch. Louse infestations developing from hatching eggs may require retreatment.
- (3) Consult a veterinarian for aid in the diagnosis and control of internal and external parasites of swine.

#### **Special Minor Use**

**Reindeer:** For the treatment and control of warbles (*Oedemagenatarandi*) in reindeer, inject 200 micrograms ivermectin per kilogram of body weight, subcutaneously. Follow use directions for cattle as described under **ADMINISTRATION.**

**American Bison:** For the treatment and control of grubs (*Hypodermabovis*) in American bison, inject 200 micrograms ivermectin per kilogram of body weight, subcutaneously. Follow use directions for cattle as described under **ADMINISTRATION.**

**RESIDUE WARNING:** Do not treat reindeer or American bison within 8 weeks (56 days) of slaughter.

#### **WARNING**

#### **NOT FOR USE IN HUMANS.**

**Keep this and all drugs out of the reach of children.**

The Material Safety Data Sheet (MSDS) contains more detailed occupational safety information. To report adverse effects, obtain an MSDS or for assistance, contact Merial at 1-888-637-4251.

**RESIDUE WARNING:** Do not treat cattle within 35 days of slaughter. Because a withdrawal time in milk has not been established, do not use in female dairy cattle of breeding age. A withdrawal period has not been established for this product in pre-ruminating calves. Do not use in calves to be processed for veal. Do not treat swine within 18 days of slaughter.

#### **PRECAUTIONS**

Transitory discomfort has been observed in some cattle following subcutaneous administration. A low incidence of soft tissue swelling at the injection site has been observed. These reactions have disappeared without treatment. For cattle, divide doses greater than 10 ml between two injection sites to reduce occasional discomfort or site reaction. Use sterile equipment and sanitize the injection site by applying a suitable disinfectant. Clean, properly disinfected needles should be used to reduce the potential for injection site infections.

Observe cattle for injection site reactions. Reactions may be due to clostridial infection and should be aggressively treated with appropriate antibiotics. If injection site infections are suspected, consult your veterinarian.

This product is not for intravenous or intramuscular use. Protect

product from light.

IVOMEC Injection for Cattle and Swine has been developed specifically for use in cattle, swine, reindeer, and American bison **only**. This product should not be used in other animal species as severe adverse reactions, including fatalities in dogs, may result. Restricted Drug (California) - use only as directed.

### **When to Treat Cattle with Grubs**

IVOMEC effectively controls all stages of cattle grubs. However, proper timing of treatment is important. For most effective results, cattle should be treated as soon as possible after the end of the heel fly (warble fly) season. Destruction of *Hypoderma* larvae (cattle grubs) at the period when these grubs are in vital areas may cause undesirable host-parasite reactions including the possibility of fatalities. Killing *Hypoderma lineatum* when it is in the tissue surrounding the esophagus (gullet) may cause salivation and bloat; killing *H. bovis* when it is in the vertebral canal may cause staggering or paralysis. These reactions are not specific to treatment with IVOMEC, but can occur with any successful treatment of grubs. Cattle should be treated either before or after these stages of grub development. Consult your Veterinarian concerning the proper time for treatment. Cattle treated with IVOMEC after the end of the heel fly season may be retreated with IVOMEC during the winter for internal parasites, mange mites, or sucking lice without danger of grub-related reactions. A planned parasite control program is recommended.

### **Environmental Safety**

Studies indicate that when ivermectin comes in contact with soil, it readily and tightly binds to the soil and becomes inactive over time. Free ivermectin may adversely affect fish and certain aquatic organisms. Do not permit water runoff from feed lots to enter lakes, streams or ponds. Do not contaminate water by direct application or by improper disposal of drug containers. Dispose of containers in an approved landfill or by incineration. As with other avermectins, ivermectin is excreted in the dung of treated animals and can inhibit the reproduction and growth of pest and beneficial insects that use dung as a source of food and for reproduction. The magnitude and duration of such effects are species and life-cycle specific. When used according to label directions, the product is not expected to have an adverse impact on populations of dung-dependent insects.



## **HOW SUPPLIED**

IVOMEK Injection for Cattle and Swine is available in four ready -to-use pack sizes:

The 50 ml pack is a multiple-dose, rubber-capped bottle. Each bottle contains sufficient solution to treat 10 head of 550 lb (250 kg) cattle or 100 head of 38 lb (17.3 kg) swine.

The 200 ml pack is a soft, collapsible pack designed for use with automatic syringe equipment. Each pack contains sufficient solution to treat 40 head of 550 lb (250 kg) cattle or 400 head of 38 lb (17.3 kg) swine.

The 500 ml pack is a soft, collapsible pack designed for use with automatic syringe equipment. Each pack contains sufficient solution to treat 100 head of 550 lb (250 kg) cattle or 1000 head of 38 lb (17.3 kg) swine.

The 1000 ml is a soft, collapsible pack designed for use with automatic syringe equipment. Each pack contains sufficient solution to treat 200 head of 550 lb (250 kg) cattle or 2000 head of 38 lb (17.3 kg) swine.

**IVOMEK**, Cattle Head Logo and Pig

Head Logo are registered trademarks  
of Merial Limited. U.S. Pat. 4,199,569  
& 4,853,372

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Manufactured by: Merial Saude Animal Ltda., Paulinia, Sao Paulo, CEP 13140-970, Brazil

Manufactured for: Merial Limited, Operational  
Headquarters, 3239 Satellite Blvd. Duluth, Georgia  
30096-4640, U.S.A. 1050-1491-03 / Rev. 07-2007

**SAFE-GUARD® MEDICATED DEWORMER FOR SWINE (EZ SCOOP®)****Intervet/Merck Animal Health**

(fenbendazole)

Type B Medicated Feed

**EZ Scoop®** (Scoop Included)**2 TO 12 DAY TREATMENT REGIMEN FOR THE REMOVAL OF:**

**Lungworms:** (*Metastrongylus apri*, *M. pudendotectus*). **Gastrointestinal Worms:** Adult and larvae (L3, L4 stages -liver, lung, intestinal forms) large roundworms (*Ascaris suum*), nodular worms (*Oesophagostomum dentatum*, *O. quadrispinulatum*), small stomach worms (*Hyostrongylus rubidus*), adult and larvae (L2, L3, L4 stages-intestinal mucosa\ forms) whipworms (*Trichuris suis*). **Kidneyworms:** Adult and larvae (*Stephanurus dentatus*). **DOSAGE REGIMEN:** 9 mg fenbendazole per kg body weight (4.08 mg fenbendazole per lb body weight) over a period of 3 to 12 days.

**ACTIVE DRUG INGREDIENT**Fenbendazole 1.8% (8.172 g/lb)**GUARANTEED ANALYSIS:**Calcium (Ca) (min) 20.0%Calcium (Ca) (max) 24.0%**OTHER INGREDIENTS:**

Rice Hull s, Calcium Carbonate and Mineral Oil.

**DIRECTIONS FOR USE:**

Safe-Guard® EZ Scoop® premix should be mixed to a concentration of 10 to 300 grams fenbendazole per ton of feed prior to feeding.

**For Group Feeding (Pigs, Gilts, Sows or Boars):** Examples of Mixing and Feeding Rates for Safe-Guard® EZ Scoop® P remix:

Pounds of Safe-Guard® E Z Scoop® pre mix per ton of swine feed based on pig weight and average daily feed consumption:							
Pig Wt (lbs)	Average daily feed consumption (lbs)	Treatment Period					
		3 days		6 days		12 days	
		lbs premix	Treats approximately:	lbs premix	Treats approximately:	lbs premix	Treat s approximately:
50	3.20	5.2	208 pigs	2.6	104 pigs	1.3	52 pigs
75	4.25	5.8	156 pigs	2.9	78 pigs	1.5	39 pigs
100	5.30	6.2	125 pigs	3.1	62 pigs	1.6	31 pigs
150	6.80	7.3	98 pigs	3.7	49 pigs	1.8	24 pigs
200	8.00	8.3	83 pigs	4.1	41 pigs	2.1	20 pigs

**For Individual 400 lb Sow Feeding:** Mix 1 level scoop (1.07 ounces) of Safe-Guard® EZ Scoop® premix into 4 to 6 lbs of an individual 400 lb sow's daily ration and feed once daily for 3 consecutive days.

There is no pre-slaughter withdrawal period as Safe-Guard® EZ Scoop® can be fed to day of slaughter.

CONSULT YOUR VETERINARIAN FOR ASSISTANCE IN THE DIAGNOSIS , TREATMENT AND CONTROL OF PARASITISM.

**Store at or below 25°C (77°F),**

Distributed by : **Intervet Inc.**, Millsboro, DE 19966

**The name EZ SCOOP is a registered trademark of North American Nutrition.**

Net Weight	
10 lbs (4.54 kg)	584410-B
20 lbs (9.08 kg) (2 x 10 lb)	884430-B

**CVP No.:** 1047391.1

**CYDECTIN®**  
**Boehringer Inge/heim**  
**(moxidectin)**

**Oral Drench for**

**Sheep Antiparasitic**

NADA 141-247,

Approved by FDA

Contains 1 mg

moxidectin/ml

For Treatment and Control of Infections Due to Internal Parasites of Sheep.

Consult your veterinarian for assistance in the diagnosis, treatment, and control of parasitism.

**PRODUCT DESCRIPTION:** CYDECTIN Oral Drench for Sheep is a ready-to-use solution containing 0.1% moxidectin. Moxidectin is an endectocide in the milbemycin chemical class which shares the distinctive mode of action characteristic of macrocyclic lactones. Moxidectin acts by interfering with chloride channel-mediated neurotransmission in the parasite. This results in paralysis and elimination of the parasite .

**INDICATIONS:** CYDECTIN Oral Drench for Sheep, when administered at the recommended dose level of 0.2 mg moxidectin/2.2 lb (0.2 mg/kg) body weight, is effective in the treatment and control of adult and larval (L4) stages of the following internal parasites of sheep:

**Parasites**

*Haemonchus contortus* - Adult and L4

*Teladorsagia circumcincta* - Adult and L4

*Teladorsagia trifurcata* - Adult and L4

*Trichostrongylus axei* - Adult and L4

*Trichostrongylus colubriformis* - Adult and L4

*Trichostrongylus vitrinus* - Adult and L4

*Cooperiacurticei* - Adult and L4

*Cooperia oncophora* - Adult and L4

*Oesophagostomum columbianum* - Adult and L4

*Oesophagostomum venulosum* - Adult and L4

*Nematodirus battus* - Adult and L4

*Nematodirus filicollis* - Adult and L4

*Nematodirus spathiger* - Adult and L4

**ADMINISTRATION :** CYDECTIN Oral Drench is ready-to-use. Administer 1 ml per 11 lb (1 ml per 5 kg) body weight into the mouth of the sheep, using any standard drenching equipment. Check dose rates and equipment before drenching. Do not overdose. Do not mix with any other products before administration. Avoid contaminating the drench solution.

**DOSAGE:** The recommended rate of administration for CYDECTIN Oral Drench for Sheep is 1 ml per 11 lb (5 kg) body weight to provide 0.2 mg moxidectin/2.2 lb (0.2 mg/kg) body weight. The table below will assist in the calculation of the appropriate volume of drench in 1.0 ml increments and it must be administered based on the weight of animal being treated.

**Body Weight\Dose\**

11 lb	5 kg	1 ml
22lb	10 kg	2 ml
33lb	15 kg	3 ml
44 lb	20 kg	4ml
55 lb	25 kg	5ml
66 lb	30 kg	6 ml
77lb	35 kg	7 ml
88lb	40 kg	8 ml
99lb	45 kg	9 ml
110 lb	50 kg	10 ml
121 lb	55 kg	11 ml
132 lb	60 kg	12 ml
143 lb	65 kg	13 ml
154 lb	70 kg	14 ml
165lb	75 kg	15 ml



**HUMAN WARNINGS:** Not for use in humans. Keep this and all drugs out of the reach of children. To obtain a copy of the material safety data sheet (MSDS) which provides more detailed occupational safety information or to report adverse reactions attributable to exposure to this product.

**RESIDUE WARNINGS:** Sheep must not be slaughtered for human consumption within 7 days of treatment. Because a withholding time in milk has not been established for this product, do not use in female sheep providing milk for human consumption.

**ENVIRONMENTAL WARNINGS:** Studies indicate that when moxidectin comes in contact with the soil, it readily and tightly binds to the soil and becomes inactive. Free moxidectin may adversely affect fish and certain aquatic organisms. Do not contaminate water by direct application or by improper disposal of drug containers.

**ANIMAL SAFETY WARNINGS:** CYDECTIN Oral Drench for Sheep has been formulated specifically for oral use in sheep and should not be given by any other route of administration. Do not use in sick, debilitated, or underweight animals. This product should not be used in other animal species as severe adverse reactions, including fatalities in dogs, may result.

**ANIMAL SAFETY:** A well-controlled U.S. study has demonstrated an adequate margin of safety to allow treatment of sheep four months of age and older with Cydectin Oral Drench. In this study no signs of toxicity were seen in sheep given up to 5 times the recommended dose. Reproductive safety studies evaluating the use of Cydectin Oral Drench in breeding ewes and rams have not been conducted in the U.S.

**STORAGE:** Store product at or below 77°F (25°C). Protect from light.

**DISPOSAL:** Do not contaminate water by direct application or by improper disposal of drug containers. Dispose of containers in an approved landfill or by incineration.

© 2012, 2011 Boehringer Ingelheim Vetmedica, Inc. All Rights Reserved. Cydectin is a registered trademark of Boehringer Ingelheim Vetmedica, Inc.  
Restricted Drug (CA) - Use Only As Directed

Manufactured for: **Boehringer Ingelheim Vetmedica, Inc.**, St. Joseph, MO 64506 U.S.A.

Contents	NDC	
1 L	0010-3840-01	B8F8/B8F9  80733747 80728948, R.0/80728921, R.0 384001-01/384002-01
4L	0010-3840-02	B9F0/B9F1  80733720 80728557, R.0/80728549, R.0 384004-02/384005-02

# Reading Medication Labels

Alaena Wilfong, Extension Educator

## Goal (learning objective)

Youth will learn how to read, interpret, and identify all the parts of a medication label and insert.

## Supplies

- Handout 1 - "Medication Label" - enough copies for group.
- Handout 2 - "Medication Insert" - enough copies for group.
- Handout 3 - "Medication Insert and Medication Label Parts" - enough copies for group.
- Handout 4 - "Guide to Reading Drug Label; on Outside of Container" - enough copies for group.
- Handout 5 - "Medication Insert" - 1 copy - answer key for your reference
- Handout 6 - "Medication Label" - 1 copy - answer key for your reference
- Tape or glue sticks - enough for everyone to share
- Scissors - enough for everyone to share

## Pre-lesson preparation

- Make photo copies of the above handouts.
- Review the materials.
- Practice the lesson.

## Lesson directions and outline

Share the following information with the youth:

Many types of products have labels and it is important to read them before using the product. Using medication on animals is no different. It is crucial that you read a product and understand the label before using it on an animal.

There are many different parts to a medication label and finding each piece of information may be difficult. However, with some practice you can find each important part of the medication label you need.

## Conducting the activity (DO)

1. Review with the youth Handout 4.
2. Review with the youth Handouts 1, 2, and 3.  
Youth will be matching parts to the appropriate spots on the Medication Label and Medication Insert.
3. Have youth carefully cut out the medication label parts out first (bottom of Handout 3).
4. Have youth tape (or glue) medication label parts on Handout 1.
5. Have youth carefully cut out the medication insert parts (top of Handout 3).
6. Have youth tape (or glue) medication insert parts on Handout 2.
7. Once youth have finished both examples, discuss each part, use the answer key.

## What did we learn? (REFLECT)

- Ask: What is something you learned from the medication label that you did not know before you read it?
- Ask: Why should you administer medication to an animal according to the practice label?
- Ask: What are reasons why it is important to read a label before administering any type of medication?

**Why is that important? (APPLY)**

- Ask: How do you keep your animal safe by reading labels before administering medication to animals?
- Ask: How does following medication label information help you with Quality Assurance Practices? Why is that important?
- Ask: How can you apply what you learned when reading medicine labels on medicine that a doctor prescribes to you or a family member?

**Resources**

Ohio State University Extension. (2011). Caring for Animals. *Beef resource handbook* (pages 12-7 through 12-12 ).

Ohio State University Extension. (2008). Caring for Animals. *Goat resource handbook* (pages 164-170).

Ohio State University Extension. (2011). Caring for Animals. *Sheep resource handbook for market and breeding projects* (pages 140-144).

Ohio State University Extension. (2000). Caring for Animals. *Swine resource handbook for market and breeding projects* (pages 24-6 through 24-13).

Ohio State University Extension. (1999). Learning Lab Kits: Beef, Sheep, Swine, and Goat. Available from: <http://www.ohio4h.org/books-and-resources/learning-lab-kits> *Note: check first with your local county extension office on availability to check out*

# Medication Label

\_\_\_\_\_ **OMNIBIOTIC** \_\_\_\_\_  
(hydrocillin)

**Directions for use: See package insert**

**Warning:** The use of this drug must be discontinued for 30 days before treated animals are slaughtered for food. Exceeding the highest recommended dosage level may result in antibiotic residues in meat or milk beyond the withdrawal time.

**Store between 2° and 8° C (36° and 46° F).**  
**Keep dry and away from light.**

\_\_\_\_\_ Net Contents: 100 ml  
Distributed by  
**USA Animal Health, Inc.** \_\_\_\_\_



# Medication Insert

## OMNIBIOTIC

(Hydrocillin in Aqueous Suspension)

For use in Beef Cattle, Lactating and Non-Lactating Dairy

Cattle, Swine and Sheep

*Read Entire Brochure Carefully*

*Before Using This Product*

**For Intramuscular Use Only**

**Active Ingredients:** Omnibiotic is an effective antimicrobial preparation containing hydrocillin hydrochloride. Each ml of this suspension contains 200,000 units of hydrocillin hydrochloride in an aqueous base.

**Indications:** **Cattle** - bronchitis, foot rot, leptospirosis, mastitis, metritis, pneumonia, wound infections; **Swine** - erysipelas, pneumonia; **Sheep** - foot rot, pneumonia, mastitis; and other infections in these species caused by or associated with hydrocillin-susceptible organisms.

### Recommended Daily Dosage

*The usual dose is 2 ml per 100 lb of body weight given once daily. Maximum dose is 15 ml/day.*

Body Weight	Dosage
100 lb	2 ml
300 lb	6 ml
500 lb	10 ml
750 lb or more	15 ml

*Continue treatment for 1 to 2 days after symptoms disappear.*

**Caution:** 1. Omnibiotic should be injected deep within the fleshy muscle of the neck or thigh. Do not inject this material in the hip or rump, subcutaneously, into a blood vessel, or near a major nerve because it may cause tissue damage. 2. If improvement does not occur within 48 hours, the diagnosis should be reconsidered and appropriate treatment initiated. 3. Treated animals should be closely observed for at least 30 minutes. Should a reaction occur, discontinue treatment and immediately administer epinephrine and antihistamines. 4. Omnibiotic must be stored between 2° and 8° C (36° to 46° F). Warm to room temperature and shake well before using. Keep refrigerated when not in use.

**Warning:** Milk that has been taken from animals during treatment and for 48 hours (4 milkings) after the last treatment must not be used for food. The use of this drug must be discontinued for 30 days before treated animals are slaughtered for food.

**How Supplied:** Omnibiotic is available in vials of 100 ml.

TAKE TIME



OBSERVE LABEL  
DIRECTIONS



HEALTH AND DISEASES: READING MEDICATION LABELS – HANDOUT 3



*Medication Insert Parts* (10)

<b>Species and Animal Class</b>	<b>Approved Uses</b>
<b>Dosage</b>	<b>Route of Administration</b>
<b>Cautions and Warnings</b>	<b>Storage Requirements</b>
<b>Withholding Times</b>	<b>Sizes Available</b>
<b>Name of Drug</b>	<b>Active Ingredients</b>



*Medication Label Parts* (7)

<b>Name of Drug</b>	<b>Name of Distributor</b>
<b>Storage</b>	<b>Cautions and Warnings</b>
<b>Active Ingredients</b>	<b>Quantity of Contents</b>
<b>Withholding Times</b>	

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## Guide to Reading Drug Label on Outside of Container

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**Active Ingredients:** Chemical name(s) of what is in the drug.

**Withholding/Withdrawal Times:** Withdrawal time is the period that must elapse after the last treatment and before processing (harvest/slaughter) of the animal for its meat or harvesting animal products (milk, eggs) for human consumption. It is the time it takes for the drug/chemical to be used up by the animal's body after it has been administered (or the time it takes a drug/chemical to wear off). A residue is a substance that remains in an animal's body tissues after the animal has been exposed to that substance. The substance can enter the animal's body as a feed or water additive, as an injection or external treatment.\*

**Cautions and Warnings:** Tells things to be cautious about when using the product. Examples: (a) Do not give to certain kinds of animals, (b) do not give too much, (c) pay attention to withholding times (see above).

**Storage:** Tells how the medication should be kept while not in actual use. Many medications may lose their potency when exposed to moisture, direct light, warm and/or freezing temperatures. Most also lose effectiveness with time. The label will indicate how the product should be stored to retain maximum strength.

**Quantity of Contents:** Tells how much is in the container. Usually in metric units [liquid measure: 1 fluid ounce = 29.6 milliliters (ml), 1 cubic centimeter (cc) = 1 milliliter (ml); dry measure: 1 pint = 551 milliliters (ml)].

**Lot Number:** (may also be referred to as serial number) A manufacturer's reference number indicating the day or batch in which this product was made. These numbers are needed if the product is recalled.

**Date of Expiration:** Discard (do not use) drugs when this date is reached.

---

\*Remember, you are responsible for everything your animal consumes even if it is an accident.

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# Medication Insert

Name of Drug

**OMNIBIOTIC**

Active Ingredients

(Hydrocillin in Aqueous Suspension)

For use in Beef Cattle, Lactating and Non-Lactating Dairy

Species and  
Animal Class

Cattle, Swine and Sheep

Read Entire Brochure Carefully

Before Using This Product

**For Intramuscular Use Only**Approved  
Uses

**Active Ingredients:** Omnibiotic is an effective antimicrobial preparation containing hydrocillin hydrochloride. Each ml of this suspension contains 200,000 units of hydrocillin hydrochloride in an aqueous base.

**Indications:** **Cattle** - bronchitis, foot rot, leptospirosis, mastitis, metritis, pneumonia, wound infections; **Swine** - erysipelas, pneumonia; **Sheep** - foot rot, pneumonia, mastitis; and other infections in these species caused by or associated with hydrocillin-susceptible organisms.

## Recommended Daily Dosage

The usual dose is 2 ml per 100 lb of body weight given once daily. Maximum dose is 15 ml/day.

Dosage

Body Weight	Dosage
100 lb	2 ml
300 lb	6 ml
500 lb	10 ml
750 lb or more	15 ml

Continue treatment for 1 to 2 days after symptoms disappear.

Cautions  
and Warnings

**Caution:** 1. Omnibiotic should be injected deep within the fleshy muscle of the neck or thigh. Do not inject this material in the hip or rump, subcutaneously, into a blood vessel, or near a major nerve because it may cause tissue damage. 2. If improvement does not occur within 48 hours, the diagnosis should be reconsidered and appropriate treatment initiated. 3. Treated animals should be closely observed for at least 30 minutes. Should a reaction occur, discontinue treatment and immediately administer epinephrine and antihistamines. 4. Omnibiotic must be stored between 2° and 8° C (36° to 46° F). Warm to room temperature and shake well before using. Keep refrigerated when not in use.

Route of  
AdministrationStorage  
Requirements

**Warning:** Milk that has been taken from animals during treatment and for 48 hours (4 milkings) after the last treatment must not be used for food. The use of this drug must be discontinued for 30 days before treated animals are slaughtered for food.

Withholding  
TimesSizes  
Available

**How Supplied:** Omnibiotic is available in vials of 100 ml.

OBSERVE LABEL  
DIRECTIONS

# Medication Label

Name of Drug \_\_\_\_\_

**OMNIBIOTIC**

Active Ingredients \_\_\_\_\_

(hydrocillin)

**Directions for use: See package insert**

Cautions  
and Warnings \_\_\_\_\_

**Warning:** The use of this drug must be discontinued for 30 days before treated animals are slaughtered for food. Exceeding the highest recommended dosage level may result in antibiotic residues in meat or milk beyond the withdrawal time.

Withholding  
Times \_\_\_\_\_

**Store between 2° and 8° C (36° and 46° F).** \_\_\_\_\_ **Storage**  
**Keep dry and away from light.**

Quantity  
of Contents \_\_\_\_\_

Net Contents: 100 ml

TAKE TIME



OBSERVE LABEL  
DIRECTIONS

Distributed by

**USA Animal Health, Inc.** \_\_\_\_\_ **Name of Distributor**

# Medication Label

\_\_\_\_\_ **OMNIBIOTIC** \_\_\_\_\_  
(hydrocillin)

**Directions for use: See package insert**

**Warning:** The use of this drug must be discontinued for 30 days before treated animals are slaughtered for food. Exceeding the highest recommended dosage level may result in antibiotic residues in meat or milk beyond the withdrawal time.

**Store between 2° and 8° C (36° and 46° F).**  
**Keep dry and away from light.**

\_\_\_\_\_ Net Contents: 100 ml  
Distributed by  
**USA Animal Health, Inc.** \_\_\_\_\_





# Medication Insert

## OMNIBIOTIC

(Hydrocillin in Aqueous Suspension)

For use in Beef Cattle, Lactating and Non-Lactating Dairy

Cattle, Swine and Sheep

*Read Entire Brochure Carefully*

*Before Using This Product*

**For Intramuscular Use Only**

**Active Ingredients:** Omnibiotic is an effective antimicrobial preparation containing hydrocillin hydrochloride. Each ml of this suspension contains 200,000 units of hydrocillin hydrochloride in an aqueous base.

**Indications:** **Cattle** - bronchitis, foot rot, leptospirosis, mastitis, metritis, pneumonia, wound infections; **Swine** - erysipelas, pneumonia; **Sheep** - foot rot, pneumonia, mastitis; and other infections in these species caused by or associated with hydrocillin-susceptible organisms.

### Recommended Daily Dosage

*The usual dose is 2 ml per 100 lb of body weight given once daily. Maximum dose is 15 ml/day.*

Body Weight	Dosage
100 lb	2 ml
300 lb	6 ml
500 lb	10 ml
750 lb or more	15 ml

*Continue treatment for 1 to 2 days after symptoms disappear.*

**Caution:** 1. Omnibiotic should be injected deep within the fleshy muscle of the neck or thigh. Do not inject this material in the hip or rump, subcutaneously, into a blood vessel, or near a major nerve because it may cause tissue damage. 2. If improvement does not occur within 48 hours, the diagnosis should be reconsidered and appropriate treatment initiated. 3. Treated animals should be closely observed for at least 30 minutes. Should a reaction occur, discontinue treatment and immediately administer epinephrine and antihistamines. 4. Omnibiotic must be stored between 2° and 8° C (36° to 46° F). Warm to room temperature and shake well before using. Keep refrigerated when not in use.

**Warning:** Milk that has been taken from animals during treatment and for 48 hours (4 milkings) after the last treatment must not be used for food. The use of this drug must be discontinued for 30 days before treated animals are slaughtered for food.

**How Supplied:** Omnibiotic is available in vials of 100 ml.

TAKE TIME



OBSERVE LABEL  
DIRECTIONS

HEALTH AND DISEASES: READING MEDICATION LABELS – HANDOUT 3



*Medication Insert Parts* (10)

<b>Species and Animal Class</b>	<b>Approved Uses</b>
<b>Dosage</b>	<b>Route of Administration</b>
<b>Cautions and Warnings</b>	<b>Storage Requirements</b>
<b>Withholding Times</b>	<b>Sizes Available</b>
<b>Name of Drug</b>	<b>Active Ingredients</b>



*Medication Label Parts* (7)

<b>Name of Drug</b>	<b>Name of Distributor</b>
<b>Storage</b>	<b>Cautions and Warnings</b>
<b>Active Ingredients</b>	<b>Quantity of Contents</b>
<b>Withholding Times</b>	

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## Guide to Reading Drug Label on Outside of Container

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**Active Ingredients:** Chemical name(s) of what is in the drug.

**Withholding/Withdrawal Times:** Withdrawal time is the period that must elapse after the last treatment and before processing (harvest/slaughter) of the animal for its meat or harvesting animal products (milk, eggs) for human consumption. It is the time it takes for the drug/chemical to be used up by the animal's body after it has been administered (or the time it takes a drug/chemical to wear off). A residue is a substance that remains in an animal's body tissues after the animal has been exposed to that substance. The substance can enter the animal's body as a feed or water additive, as an injection or external treatment.\*

**Cautions and Warnings:** Tells things to be cautious about when using the product. Examples: (a) Do not give to certain kinds of animals, (b) do not give too much, (c) pay attention to withholding times (see above).

**Storage:** Tells how the medication should be kept while not in actual use. Many medications may lose their potency when exposed to moisture, direct light, warm and/or freezing temperatures. Most also lose effectiveness with time. The label will indicate how the product should be stored to retain maximum strength.

**Quantity of Contents:** Tells how much is in the container. Usually in metric units [liquid measure: 1 fluid ounce = 29.6 milliliters (ml), 1 cubic centimeter (cc) = 1 milliliter (ml); dry measure: 1 pint = 551 milliliters (ml)].

**Lot Number:** (may also be referred to as serial number) A manufacturer's reference number indicating the day or batch in which this product was made. These numbers are needed if the product is recalled.


**Date of Expiration:** Discard (do not use) drugs when this date is reached.

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\*Remember, you are responsible for everything your animal consumes even if it is an accident.

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# Medication Insert

Name of Drug		<b>OMNIBIOTIC</b>		Active Ingredients											
		(Hydrocillin in Aqueous Suspension)													
For use in Beef Cattle, Lactating and Non-Lactating Dairy		Cattle, Swine and Sheep		Species and Animal Class											
Read Entire Brochure Carefully		Before Using This Product													
<b>For Intramuscular Use Only</b>															
<p><b>Active Ingredients:</b> Omnibiotic is an effective antimicrobial preparation containing hydrocillin hydrochloride. Each ml of this suspension contains 200,000 units of hydrocillin hydrochloride in an aqueous base.</p>															
Approved Uses	<p><b>Indications:</b> <b>Cattle</b> - bronchitis, foot rot, leptospirosis, mastitis, metritis, pneumonia, wound infections; <b>Swine</b> - erysipelas, pneumonia; <b>Sheep</b> - foot rot, pneumonia, mastitis; and other infections in these species caused by or associated with hydrocillin-susceptible organisms.</p>														
<p><b>Recommended Daily Dosage</b> The usual dose is 2 ml per 100 lb of body weight given once daily. Maximum dose is 15 ml/day.</p>															
Dosage	<table border="1"> <thead> <tr> <th>Body Weight</th> <th>Dosage</th> </tr> </thead> <tbody> <tr> <td>100 lb</td> <td>2 ml</td> </tr> <tr> <td>300 lb</td> <td>6 ml</td> </tr> <tr> <td>500 lb</td> <td>10 ml</td> </tr> <tr> <td>750 lb or more</td> <td>15 ml</td> </tr> </tbody> </table>		Body Weight	Dosage	100 lb	2 ml	300 lb	6 ml	500 lb	10 ml	750 lb or more	15 ml			
Body Weight	Dosage														
100 lb	2 ml														
300 lb	6 ml														
500 lb	10 ml														
750 lb or more	15 ml														
Continue treatment for 1 to 2 days after symptoms disappear.															
Cautions and Warnings	<p><b>Caution:</b> 1. Omnibiotic should be injected deep within the fleshy muscle of the neck or thigh. Do not inject this material in the hip or rump, subcutaneously, into a blood vessel, or near a major nerve because it may cause tissue damage. 2. If improvement does not occur within 48 hours, the diagnosis should be reconsidered and appropriate treatment initiated. 3. Treated animals should be closely observed for at least 30 minutes. Should a reaction occur, discontinue treatment and immediately administer epinephrine and antihistamines. 4. Omnibiotic must be stored between 2° and 8° C (36° to 46° F). Warm to room temperature and shake well before using. Keep refrigerated when not in use.</p>				Route of Administration										
	<p><b>Warning:</b> Milk that has been taken from animals during treatment and for 48 hours (4 milkings) after the last treatment must not be used for food. The use of this drug must be discontinued for 30 days before treated animals are slaughtered for food.</p>				Storage Requirements										
Sizes Available	<p><b>How Supplied:</b> Omnibiotic is available in vials of 100 ml.</p>				<p>Withholding Times</p> <p><b>TAKE TIME</b></p>  <p><b>OBSERVE LABEL DIRECTIONS</b></p>										

# Medication Label

Name of Drug \_\_\_\_\_

**OMNIBIOTIC**

Active Ingredients \_\_\_\_\_

(hydrocillin)

**Directions for use: See package insert**

Cautions  
and Warnings \_\_\_\_\_

**Warning:** The use of this drug must be discontinued for 30 days before treated animals are slaughtered for food. Exceeding the highest recommended dosage level may result in antibiotic residues in meat or milk beyond the withdrawal time.

Withholding  
Times \_\_\_\_\_

**Store between 2° and 8° C (36° and 46° F).** \_\_\_\_\_ **Storage**  
**Keep dry and away from light.**

Quantity  
of Contents \_\_\_\_\_

Net Contents: 100 ml

TAKE TIME



OBSERVE LABEL  
DIRECTIONS

Distributed by

**USA Animal Health, Inc.** \_\_\_\_\_ **Name of Distributor**



# Preventable Practices

Alaena Ruth, Extension Educator

## Goal (learning objective)

Youth will learn common precautions to take to prevent diseases with their animals and how to keep records of these measures.

## Supplies

- Handout 1 - "Treatment Record Worksheet for Beef" (enough copies for group)
- Handout 2 - "Treatment Record Worksheet for Sheep" (enough copies for group)
- Handout 3 - "Treatment Record Worksheet for Swine" (enough copies for group)
- Handout 4 - "Show Records Worksheet" (enough copies for group)
- Handout 5 - "Treatment Records Worksheet Answer Key" (one copy for you)
- Paper and pencils (enough for group)

## Pre-lesson preparation

- Read/review lesson and resources.
- Practice the activity.
- Make copies of the handouts listed above.

## Lesson directions and outline

Share the following information with the youth:

The health of any animal or herd of animals should be a top priority for an animal owner. It is important to take precautionary measures to ensure your animal(s) do not get diseases. There are several ways that an animal owner can prevent or control health problems. It is also important to document activities that are done with any animal.

Preventable Practices:

- Keep your animal's space and living conditions clean. Livestock will always perform better in a comfortable and clean area. Keeping their area clean will also help to keep animals from picking up organisms that cause disease. (Ask youth to name a couple diseases that can be prevented by keeping living areas clean. Ringworm or hoof/foot rot).
- Separate new animals on the farm from existing animals for at least 30 days. Also, separate animals you may have taken to a show from the animals you did not take to the show. Keeping animals that have been in contact with other livestock that are not on your farm is important for disease prevention. When you take an animal to a show it is in contact with many different animals that could harbour diseases that might be transmitted to your animals.
- Vaccinate animals as part of your health program. Many diseases can be prevented before they have a chance to cause harm to your animal using vaccinations. It is also extremely important to keep records of these vaccinations to manage the health of your animals. (Ask youth to name some diseases that veterinarians recommend vaccinating for, then name all examples listed here. Brucellosis, bovine viral diarrhea, tetanus, rabies, pneumonia, black leg.)
- Ensure animals are being fed a proper ration. When there is a lack of certain nutrients in a ration, some health problems may occur.
- Keep movement in and out of the animal's area to a minimum. Tracking mud and other debris from pen to pen with equipment or shoes may increase disease spread. It is also important to keep visitors and other animals out of the land your animal is on due to organisms being carried on skin, clothes,

feet, hair, manure, and hides.

- Use clean tools and equipment to clean or treat animals. This includes dehorning tools, tractors, needles, gloves and syringes. Diseases can easily be spread through blood and feces, so when using any tools that encounter either, make sure to replace or clean with disinfectant before use on another animal.
- Make sure equipment like tractors, pitch forks, apple forks, feed scoops, feed pans and water buckets are cleaned regularly. Diseases can easily be spread through blood and feces, so when using any tools or equipment that encounter either spend the time to make sure things are clean.
- Maintain records. From the day you receive your animal to the day it leaves your care, you should maintain feed and health records of your animal. This is the very best way to keep track of expenses, vaccinations, and well-being of your animal. Records are also important if the plan is to sell your animal to a buyer and they need to know the history of the animal before purchase.

### Conducting the activity (DO)

#### Activity 1

1. Make a list of ways to limit outside contact in and around your animal's area.
2. Make a list of ways to keep tools and equipment used on and around animals clean.
3. Share your ideas with the group.

#### Activity 2

1. Have youth complete each treatment activity (Handouts 1, 2, and 3) IM= Intramuscular - in the muscle, SQ = Subcutaneous - below the skin, not in the muscle.
2. Have youth complete Handout 4, at least one show they would take their animal to.
3. Review answers with the group, go through correct answers using the answer key (Handout 5).

### What did we learn? (REFLECT)

- Ask: What is one new way you learned about to control disease spread in your herd?
- Ask: What are the benefits of using preventable practices with your animals?
- Ask: Why is keeping records crucial for more than just medications and treatments?

### Why is that important? (APPLY)

- Ask: Why is it important to keep records to maintain your health?
- Ask: What benefits do you see by using preventable practices for your animals?
- Ask: How does preventable practices and record-keeping impact consumers? How does it make you feel as a producer?

### Resources

- Ohio State University Extension. (2011). Health Maintenance. *Beef resource handbook* (pages 5-1 through 5-6 and 12-1 through 12-15).
- Ohio State University Extension. (2008). Herd Management and Diseases. *Goat resource handbook* (pages 85-93).
- Ohio State University Extension. (2011). Health Maintenance and Diseases. *Sheep resource handbook for market and breeding projects* (pages 67-72).
- Ohio State University Extension. (2000). Diseases & Their Control. *Swine resource handbook for market and breeding projects* (pages 9-1 through 9-14 and 24-5 through 24-17).

## Quality Assurance Medication Label/Treatment Record Activity

“Ben,” #123, the Hereford steer you plan to exhibit at the fair next month, is lame in the left front leg. Today the veterinarian has diagnosed the steer’s problem as **foot rot** and gave “Ben” an initial treatment at the time of the examination. The veterinarian has left additional, prescribed medication with you to continue the treatment. The directions on the medication instruct you to give the steer **1cc per 100 pounds body weight, once daily, for 3 days**. You are to begin tomorrow and to give it by intramuscular injection. Your steer weighs 1,000 pounds. Remember, your veterinarian treated the steer today, **April 3, 20XX**, around 5:00 p.m. and you will treat it three more days as directed.

The hold (withdrawal) time on this product is 14 days.

April 20XX						
S	M	T	W	R	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

### Bottle Label

<b>Emily Edwards, D.V.M.</b> <b>100 Quality Ave.</b> <b>Hometown, OH 43000</b> <b>614.555.5555</b>	<b>Owner:</b> Jennifer Wilson	<b>Date:</b> April 3, 20XX
	<b>Animal ID:</b> Hereford #123 - Ben <b>Indications:</b> Foot Rot	
	<b>Directions:</b> 1cc per 100 lbs. body weight, IM once daily, for 3 days	
	<b>Precaution:</b> Avoid the muscle tissues of high carcass value	
	<b>Warning:</b> >>> Use of this drug must be discontinued for 14 days before slaughter or market for food <<<	
	<b>Product/Active Ingredient(s):</b> Hydrocillin	
<b>Expiration Date:</b> September 30, 20XX		

### Treatment Record

for Vaccines, Drugs/Medications, and Medicated Feed

Event (date/time)	Animal Identification	Condition	Estimated Weight	Treatment Given (Medication, amount, route of administration)	Name of Person (who performed the event)	Withdrawal (meat/milk/eggs, days/hours)	Result (recovered, sold, died)	Withdrawal Completed Date

HEALTH AND DISEASES: PREVENTABLE PRACTICES – HANDOUT 2

GPP #2.

Youth Quality Assurance Medicine Label/Treatment Record Activity Sheet (Sheep)

Today is **May 15, 20XX**. Your name is **Lynn Monroe**. Your Suffolk marker lamb "Elmo" (ear tag #3159) that you are planning to take to the county fair July 2-7, 20XX, is lame on the left front leg. When you examine it, you find the foot smells bad and the hoof wall is separating from the sole. These findings lead you to believe the lamb has **foot rot**. The veterinarian who regularly cares for your animals is **Angela Adams, D.V.M.** She examined the animal and gave you (prescribed) the bottle of medication listed below and instructed you to give the treatment today at 3:00 p.m.. Your lamb weighs about 100 pounds.

Using the information on the label of the bottle, please fill in ALL of the information in the first row of the treatment chart below.

BOTTLE LABEL

ANGELA ADAMS, D.V.M.  
100 Quality Avenue  
Hometown, OH 43200  
614-555-5050

OWNER: Lynn Monroe  
ANIMAL ID: Lamb #3159  
DIRECTIONS: Give 5 ml (cc) intramuscularly on May 15, 20XX.  
PRECAUTION: Avoid the muscle tissues of high carcass value.  
**WARNING:** USE OF THIS DRUG MUST BE DISCONTINUED FOR 10 days BEFORE  
SLAUGHTER OR MARKET FOR FOOD.  
PRODUCT/ACTIVE INGREDIENT(S): Biomycin  
EXPIRATION DATE: August 15, 20XX

DATE May 15, 20XX  
INDICATIONS: Foot rot

MAY 20XX						
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

Treatment Record								
for Vaccines, Drugs/Medications, and Medicated Feed								
Event (date and time)	Animal Identification	Condition	Estimated Weight	Treatment Given (medication, amount, route of administration)	Name of Person (who performed the event)	Withdrawal (meat/milk/eggs, days/hours)	Result (recovered, sold, died)	Withdrawal Completed Date

## Quality Assurance Medication Label/Treatment Record Activity

Today is July 12, 20XX, and your name is Jenny Jones. Two days ago the market hog, "Spot" (a 200 lb. blue-butt barrow with the ear notch 36–7), you have been raising since April started having breathing difficulty. Yesterday, Spot failed to eat and would not move around unless forced to do so. At your request, Dr. Bruce E. Losis, the local veterinarian, has examined your hog and diagnosed his problem as **pneumonia**. He administered medications at that time and recorded the treatment on your chart (not shown). He also left you with more medicine for you to give today. You have just finished giving the follow-up medication as the veterinarian had directed.

### July 20XX

S	M	T	W	R	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

### Bottle Label

Bruce E Losis, D.V.M.  
100 Quality Ave.  
Hometown, OH 43200  
614.555.5050

Owner: Jenny Jones	Date: July 11, 20XX
Animal ID: Hog #36-7	Indications: Pneumonia
Directions: give 5 ml (cc) subcutaneously on July 12	
Precaution: Use care in injections to avoid infections	
Warning: >>>Use of this drug must be discontinued for 7 days before slaughter or market for food<<<	
Product/Active Ingredient(s): Biomycin	
Expiration Date: August 01, 20XX	

### Treatment Record

for Vaccines, Drugs/Medications, and Medicated Feed

Event (date and time)	Animal Identification	Condition	Estimated Weight	Treatment Given (medication, amount, route of administration)	Name of Person (who performed the event)	Withdrawal (meat/milk/eggs, days/hours)	Result (recovered, sold, died)	Withdrawal Completed Date



HEALTH AND DISEASES: PREVENTABLE PRACTICES – HANDOUT 4

<div>Show Records</div> <div>for Activies and Shows that your animals have attended</div>								
	Event (date and time)	Animal Identification	Show	City, State	Contact with Animals? (yes/no)	Travel Time	Separation Time (time needed to be separated from the rest of herd)	Completed Separation Time
Beef								
Lamb								
Swine								

# HEALTH AND DISEASES: PREVENTABLE PRACTICES – HANDOUT 5

## Answer Keys

Beef:

Treatment Record								
Treatment (date and time)	Animal Identification (name, species, sex, ID number, description)	Condition being treated	Estimated weight	Treatment given (medication dispensed, amount and route of administration) >>> also include product lot/ serial number if available <<<	Person who gave treatment (print name)	Instructed (meat/milk/egg) Withdrawal (days/hours)	Results (recovered, sold, or died)	Withdrawal Completed (date and time)
Apr 03, 'XX @ 5:00 p.m.	Ben • Beef Steer #123 Hereford	Foot Rot	1,000 lbs.	Hydrocillin, 10cc IM	Emily Edwards	14 days meat	X	04-17-XX 5:00 p.m.
Apr 04, 'XX @ 5:00 p.m.	Ben • Beef Steer #123 Hereford	Foot Rot	1,000 lbs.	Hydrocillin, 10cc IM	Roger Wilson	14 days meat	X	04-18-XX 5:00 p.m.
Apr 05, 'XX @ 5:00 p.m.	Ben • Beef Steer #123 Hereford	Foot Rot	1,000 lbs.	Hydrocillin, 10cc IM	Roger Wilson	14 days meat	X	04-19-XX 5:00 p.m.
Apr 06, 'XX @ 5:00 p.m.	Ben • Beef Steer #123 Hereford	Foot Rot	1,000 lbs.	Hydrocillin, 10cc IM	Roger Wilson	14 days meat	X	04-20-XX 5:00 p.m.

Lamb:

Treatment Date & Time	Animal ID • Name • Species • ID Number • Description	Condition Being Treated	Estimated Weight	Treatment Given (Medication Dispensed, Amount and Route of Administration) Also include product lot/serial # if available	Print Name of Person Who Gave Treatment	Instructed Milk/Meat Withdrawal	Results/ Comments (recovered, sold, or died)	Date & Time Withdrawal Complete
May 15, 2001 3:00 p.m.	Elmo Mkt lamb #3159 Suffolk	Foot rot	100 lbs.	Biomycin 5 ml IM	Lynn Monroe	10 days Meat	X	May 25, 2001- 3:00 p.m.

Swine:

<div>Treatment Record</div> <div><i>for Vaccines, Drugs/Medications, and Medicated Feeds</i></div>								
Treatment (date and time)	Animal Identification (name, species, sex, ID number, description)	Condition being treated	Estimated weight	Treatment given (medication dispensed, amount and route of administration --- also include product lot/serial number if available)	Person who gave treatment (print name)	Instructed (meat/milk/egg) Withdrawal (days/hours)	Results (recovered, sold, or died)	Withdrawal Completed (date and time)
July 12, 'XX  @ 2:00 p.m.	Spot • Market Hog #36-7 • Barrow Blue-Butt	Pneumonia	200 lbs.	Biomycin 5 ml (cc) SQ	Jenny Jones	7 days meat	X	07-19-XX 2:00 p.m.

# Reading Medication Labels

Alaena Ruth, Extension Educator

## Goal (learning objective)

Youth will learn how to better understand a medication label and calculate proper dosages to administer to different animals.

## Supplies

- Handout 1 “Medication Label Worksheet” - make enough copies for group
- Handout 2 “Medication Insert” - make enough copies for group
- Handout 3 “Medication Label Worksheet Answer Key” - make one copy
- Pens or Pencils enough for group

## Pre-lesson preparation

- Make copies of the Handout 1 and Handout 2 for group
- Make one copy of Handout 3, for leader use (answer key)

## Lesson directions and outline

Ask the youth to share any experiences they have had reading medication labels on medications they needed to give their animal.

Share the following information with the youth:

Reading labels on medications you give to your animals is important to ensure the health and well-being of your animal. The medication label provides information on how to properly administer, store, and calculate the dose of the medication. Labels also share information on how to ensure no residues are left in your animal and what types of animals the medication may not be suitable for.

## Conducting the activity (DO)

1. Ask for a volunteer to distribute Handout 1 and 2 to the group.
2. Have youth complete Handout 1 on their own.
3. Once everyone has finished, go through the answers with them from the answer key (Handout 3).

## What did we learn? (REFLECT)

- Ask: Why is it important to read the medication label first, before administering medication to your animal?
- Ask: What do you consider the most important part of the medication label? Why?

## Why is that important? (APPLY)

- Ask: Are there any other people you can think of that may need to read the label of a drug before administering it?
- Ask: What could happen if you didn't read the label of a medication before using or administering it to your animal?
- Ask: What could happen if you didn't read the label of a medicine the doctor prescribed for you to take?

## Resources

Ohio State University Extension. (2011). Caring for Animals. *Beef resource handbook* (pages 12-7 through 12-14).

Ohio State University Extension. (2008). Caring for Animals. *Goat resource handbook* (pages 160-170).

Ohio State University Extension. (2011). Caring for Animals. *Sheep resource handbook for market and breeding projects* (pages 136-146).

Ohio State University Extension. (2000). Caring for Animals. *Swine resource handbook for market and breeding projects* (pages 24-2 through 24-13).

Pratt, P., Leech, R., Thompson, J., Blevins, P., Gregg, C., Stogdale, E., McAndrew, H. (2015). *Good production practices: reading a medication label*. Publication APSC-100P. Virginia Cooperative Extension. Retrieved from <https://www.pubs.ext.vt.edu/APSC/APSC-100/APSC-100-PDF.pdf>.



## HEALTH AND DISEASES: READING MEDICATIONS (L2) – HANDOUT 1

# Medication Label Worksheet

Using the medication label and insert below answer the following questions.

1. What is the name of this medication? \_\_\_\_\_
2. How should this medication be administered? \_\_\_\_\_
3. Looking at the temperature this medication should be stored at, where should it be stored  
\_\_\_\_\_
4. List two cautions you should remember when administering this medication.  
\_\_\_\_\_
5. What is the withdrawal time on this medication, for cattle? \_\_\_\_\_ for swine? \_\_\_\_\_
6. What is the dosage for a swine weighing 300 lbs? \_\_\_\_\_
7. Can the entire dosage from question 6 be administered to the same injection site? \_\_\_\_\_



### DOSAGE AND ADMINISTRATION:

#### Cattle:

**Single-Dose Therapy (BRD Treatment):** Administer, by subcutaneous injection, a single dose of 7.5-12.5 mg/kg of body weight (3.4-5.7 mL/100 lb).

**Multiple-Day Therapy (BRD Treatment):** Administer daily, a subcutaneous dose of 2.5-5 mg/kg of body weight (1.1-2.3 mL/100 lb). Treatment should be repeated at 24-hour intervals for three days. Additional treatments may be given on Days 4 and 5 to animals that have shown clinical improvement but not total recovery.

**Single-Dose Therapy (BRD Control):** Administer, by subcutaneous injection, a single dose of 7.5 mg/kg of body weight (3.4 mL/100 lb). See insert for examples of conditions that contribute to high risk.

Administered dose volume should not exceed 20 mL per injection site.

#### Swine:

Administer, either by intramuscular or subcutaneous (behind the ear) injection, a single dose of 7.5 mg/kg of body weight (3.4 mL/100 lb). Administered dose volume should not exceed 5 mL per injection site. For the control of colibacillosis, administration should be initiated within the first 60 days post-weaning when clinical signs are present in at least 2% of the animals in the group. See package insert for full dosage and administration information.

### INDICATIONS:

**Cattle:** Baytril® 100 is indicated in beef and non-lactating dairy cattle for:

**Single-Dose Therapy:** the treatment of bovine respiratory disease (BRD) associated with *Mannheimia haemolytica*, *Pasteurella multocida*, *Histophilus somni* and *Mycoplasma bovis* in beef and non-lactating dairy cattle; and for the control of BRD in beef and non-lactating dairy cattle at high risk of developing BRD associated with *M. haemolytica*, *P. multocida*, *H. somni* and *M. bovis*.

**Multiple-Day Therapy:** the treatment of bovine respiratory disease (BRD) associated with *Mannheimia haemolytica*, *Pasteurella multocida* and *Histophilus somni* in beef and non-lactating dairy cattle.

**Swine:** Baytril® 100 is indicated for:

The treatment and control of swine respiratory disease (SRD) associated with *Actinobacillus pleuropneumoniae*, *Pasteurella multocida*, *Haemophilus parasuis*, *Streptococcus suis*, *Bordetella bronchiseptica* and *Mycoplasma hyopneumoniae*. The control of colibacillosis in groups or pens of weaned pigs where colibacillosis associated with *Escherichia coli* has been diagnosed.

**CONTAINS PER mL:** Enrofloxacin 100 mg. Excipients: L-arginine base 200 mg, n-butyl alcohol 30 mg, benzyl alcohol (as a preservative) 20 mg and water for injection q.s.

### RESIDUE WARNINGS:

**Cattle:** Animals intended for human consumption must not be slaughtered within 28 days from the last treatment. This product is not approved for female dairy cattle 20 months of age or older, including dry dairy cows. Use in these cattle may cause drug residues in milk and/or in calves born to these cows. A withdrawal period has not been established for this product in pre-ruminating calves. Do not use in calves to be processed for veal.

**Swine:** Animals intended for human consumption must not be slaughtered within 5 days of receiving a single injection dose.

**HUMAN WARNINGS:** Not for use in humans. Keep out of reach of children. See package insert.

For customer service or to obtain product information, including a Safety Data Sheet, call 1-800-633-3796.

For medical emergencies or to report adverse reactions, call 1-800-422-9874.


**STORAGE CONDITIONS:** Protect from direct sunlight. Do not refrigerate or freeze. Store at 20-30°C (68-86°F), excursions permitted up to 40°C (104°F). Precipitation may occur due to cold temperature. To redissolve, warm and then shake the vial.

**Read package insert carefully for complete details.**

Commercial products are named in this publication for informational purposes only. University of Idaho Extension does not endorse these products and does not intend discrimination against other products which also may be suitable.

## HEALTH AND DISEASES: READING MEDICATIONS (L2) – HANDOUT 2

# Medication Insert

<b>Name of Drug</b> _____		<b>OMNIBIOTIC</b>	<b>Active Ingredients</b> _____										
		(Hydrocillin in Aqueous Suspension)											
<b>For use in Beef Cattle, Lactating and Non-Lactating Dairy Cattle, Swine and Sheep</b>		<b>Species and Animal Class</b> _____											
<b>Read Entire Brochure Carefully Before Using This Product</b>													
<b>For Intramuscular Use Only</b>													
<b>Approved Uses</b> _____	<b>Active Ingredients:</b> Omnibiotic is an effective antimicrobial preparation containing hydrocillin hydrochloride. Each ml of this suspension contains 200,000 units of hydrocillin hydrochloride in an aqueous base.												
	<b>Indications:</b> <b>Cattle</b> - bronchitis, foot rot, leptospirosis, mastitis, metritis, pneumonia, wound infections; <b>Swine</b> - erysipelas, pneumonia; <b>Sheep</b> - foot rot, pneumonia, mastitis; and other infections in these species caused by or associated with hydrocillin-susceptible organisms.												
	<b>Recommended Daily Dosage</b> The usual dose is 2 ml per 100 lb of body weight given once daily. Maximum dose is 15 ml/day.												
<b>Dosage</b> _____	<table border="1"><thead><tr><th>Body Weight</th><th>Dosage</th></tr></thead><tbody><tr><td>100 lb</td><td>2 ml</td></tr><tr><td>300 lb</td><td>6 ml</td></tr><tr><td>500 lb</td><td>10 ml</td></tr><tr><td>750 lb or more</td><td>15 ml</td></tr></tbody></table>			Body Weight	Dosage	100 lb	2 ml	300 lb	6 ml	500 lb	10 ml	750 lb or more	15 ml
Body Weight	Dosage												
100 lb	2 ml												
300 lb	6 ml												
500 lb	10 ml												
750 lb or more	15 ml												
	Continue treatment for 1 to 2 days after symptoms disappear.												
<b>Cautions and Warnings</b> _____	<b>Caution:</b> 1. Omnibiotic should be injected deep within the fleshy muscle of the neck or thigh. Do not inject this material in the hip or rump, subcutaneously, into a blood vessel, or near a major nerve because it may cause tissue damage. 2. If improvement does not occur within 48 hours, the diagnosis should be reconsidered and appropriate treatment initiated. 3. Treated animals should be closely observed for at least 30 minutes. Should a reaction occur, discontinue treatment and immediately administer epinephrine and antihistamines. 4. Omnibiotic must be stored between 2° and 8° C (36° to 46° F). Warm to room temperature and shake well before using. Keep refrigerated when not in use.												
	<b>Warning:</b> Milk that has been taken from animals during treatment and for 48 hours (4 milkings) after the last treatment must not be used for food. The use of this drug must be discontinued for 30 days before treated animals are slaughtered for food.												
<b>Sizes Available</b> _____	<b>How Supplied:</b> Omnibiotic is available in vials of 100 ml.												
	<b>Route of Administration</b> _____												
	<b>Storage Requirements</b> _____												
	<b>Withholding Times</b> _____												
	<b>TAKE TIME</b>  <b>OBSERVE LABEL DIRECTIONS</b>												

## HEALTH AND DISEASES: READING MEDICATIONS (L2) – HANDOUT 3

### Medication Label Worksheet Answer Key:

1. Baytril 100
2. Subcutaneous injection for cattle and either subcutaneous or intramuscular for swine
3. Should be stored in a cool dark room with no access to direct sunlight.
4. a) this medication is not approved for female dairy cattle 20 months or older. b) do not use in calves to be processed as veal
5. a) 28 days. b) 5 days.
6. 10.2 ml
7. No (it must be given in 3 different injection sites)

# Animal Recordkeeping for Disease Prevention

Gail Silkwood, Extension Educator

## Goal (learning objective)

Youth will:

- Learn why keeping records is necessary for disease prevention
- Learn about the various ways and methods of keeping records
- Practice using different recordkeeping types

## Supplies

- Handout 1 “Scenarios” (make 2 copies)
- Handouts 2-6 (combine into a packet, make enough copies for smaller groups)
  - Handout 2 “Sample Animal Health Record #1”
  - Handout 3 “Sample Animal Health Record #2”
  - Handout 4 “Sample Animal Health Record #3”
  - Handout 5 “Sample Animal Health Record #4”
  - Handout 6 “Smartphone Applications for Recordkeeping”
- Paper and Pencils (enough for everyone)
- Medication and feed label samples (enough for smaller groups have 1 of each)

## Pre-lesson preparation

- Make 2 copies of Handout 1 - save 1 copy for your reference, cut up the other copy so that each smaller group has at least 1 scenario.
- Make photocopies of the packet of Handouts 2-6 - make enough so each smaller group has a set.
- Read and review the handouts.
- Practice the lesson.

## Lesson directions and outline

Share the following information with the youth:

Records can assist you in assuring that you are producing a product that is safe for consumers to eat. It is critical to maintain detailed, accurate records of information about your animal such as:

- Medications (type, frequency, withdrawal)
- Diseases
- Injury
- Vaccinations
- Feed
- Financial

Records tell you about the financial success or failure of your project. They tell you how well your animal performed, how successful you were with the project, and what changes you need to make in management to improve performance.

Have the youth share any information they have on Smartphone Apps that can be used to keep records or track activities. Have a discussion on ways that Smartphone Apps could be used to track animal records.

**Conducting the activity (DO)**

1. Have members count off into smaller groups.
2. Provide each group with:
  - a. Handout 1
  - b. The packet of Handouts 2-6
  - c. Feed label samples
  - d. Medication label samples
  - e. Paper and Pencils - enough for every member
3. Provide 10-15 minutes for the groups to review the scenarios and labels. Groups need to discuss and decide what information needs to be recorded and which record sheet or application they would use. Have members record the appropriate information on the chosen record.
4. Have groups share their scenario, a brief summary of their discussion and what record they decided to use.

**What did we learn? (REFLECT)**

- Ask: What did you learn about recordkeeping?
- Ask: Why is it important to keep detailed record?
- Ask: Is recordkeeping something that can be done quickly?
- Ask: What are some ways to help track or save records?

**Why is that important? (APPLY)**

- Ask: What are some other examples of detailed records?
- Ask: How does recordkeeping impact Quality Assurance?

**Resources**

Boleman, C., Chilek, K., Coufal, D., Kiet, L., & Sterle, J. (2010). Medication Labels and Feed Tags. *Quality Counts: Quality Assurance Character Education*. (pages 3-51 through 3-57). The Texas A&M University System. Retrieved from: [http://agrifecdn.tamu.edu/qualitycounts/files/2010/11/E4H-010\\_editproof3.pdf](http://agrifecdn.tamu.edu/qualitycounts/files/2010/11/E4H-010_editproof3.pdf)

Ohio State University Extension. (2011). Caring for Animals. *Beef resource handbook* (pages 12-1 through 12-6 and 11-12 through 11-13).

Ohio State University Extension. (2008). Caring for Animals. *Goat resource handbook* (pages 159-169, 155).

Ohio State University Extension. (2011). Caring for Animals. *Sheep resource handbook for market and breeding projects* (pages 135-139).

Ohio State University Extension. (2000). Caring for Animals. *Swine resource handbook for market and breeding projects* (pages 24-1 through 24-5).



## **HEALTH AND DISEASES: ANIMAL RECORDKEEPING FOR DISEASE PREVENTION – HANDOUT 1**

### **Scenario 1**

Tiffany has just purchased 25 bred Suffolk ewes to start her flock. She plans to raise crossbred lambs for local 4-H members. Which animal health records should she expect to receive from the farm where she purchased these animals? Which record keeping forms below would you recommend for her? Why?

### **Scenario 2**

George owns a large ranch (5,000 acres) with a herd of 500 commercial cows. He has not kept very good records in the past, but is now looking to update his records to make better management decisions. He has a brother, 2 sons and 2 ranch hands that help with the farming and cattle. The ranch is in an isolated area of Idaho with little to no cell phone or Internet service available while away from the ranch house. Which record keeping form or app would you recommend for George. Why?

### **Scenario 3**

Keeley has just purchased a property that has empty swine barns on it. She has secured an FHA Farm Loan to start a swine breeding operation and plans to stock it with 200 head of gilts to begin her business. She also plans to hire a herd manager, and three ranch hands. What record keeping form or app would you recommend for Keeley? Why?

### **Scenario 4**

Colleen has purchased two dairy goats that she plans to milk for her own family's use. One goat is already milking and the other is due to kid in 30 days. What record keeping form or app would you recommend for Colleen? Why?

### **Scenario 5**

Carl is the manager for a grass fed steer program. The calves arrive to his facility just after weaning and will stay for 90 – 120 days before being shipped to a finishing feedlot. What record keeping form or app would you recommend for him? Why?

### **Scenario 6**

John and his brother Jason are raising 5 wether goats that will be sold by the whole, half or quarter to private individuals for custom processing. What record keeping form or app would you recommend to them? Why?

### **Scenario 7**

Carla is raising 4 market hogs that she got as weaner pigs. These animals will be raised and butchered by her for family and friends. What record keeping form or app would you recommend to her? Why?

## SAMPLE ANIMAL HEALTH RECORD #1

## Market Animal Health Record

*\*University of Idaho 4-H Record Book*

[illegible]

## SAMPLE ANIMAL HEALTH RECORD #2

### Permanent Individual Animal Record

#72101

Complete one of these forms for each Breeding and/or Non-Market Project Animal. This permanent record can be added to each subsequent year and attached to your main 4-H Animal Record, thus eliminating additional writing. This record is NOT locked allowing you to cut and paste additional pages, as you need them and enabling you to more easily add to this record each year. Disregard the pages that do not apply to your project.

Animal's name	Registration number		
Sex	Breed		
Birthdate	Tattoo	RE	LE
Sire	Dam		

# Health Record

Record all health management practices and/or treatments given to this project animal. It should include any vaccinations, treatment of diseases, de-worming, etc.

[illegible]

## Health Record (continued)

[illegible]

## Breeding Record

[illegible]



# Production Record

[illegible]

# Milk Production Record

[illegible]

### SAMPLE ANIMAL HEALTH RECORD #3

**Farm Name:** \_\_\_\_\_

**Farm Physical Address:**\_\_\_\_\_

**Herd Manager:** \_\_\_\_\_

**Phone Number:** \_\_\_\_\_

[illegible]

## SAMPLE ANIMAL HEALTH RECORD #4

NO.	ID	DATE	CLINICAL SIGNS	DIAGNOSIS	TREATMENT PLAN	DURATION OF TREATMENT	DOSAGE & ROUTE OF ADMIN.	ANIMAL RECOVERED ? (Yes or No)
1.								
2.								
3.								
4.								
5.								
6.								
7.								

## SMARTPHONE APPLICATIONS FOR RECORDKEEPING

### Android

Angus Mobile App from American Angus Association

Cattle Manager from CDI – Apps for Good

Cattle Tracker from JJ Stitt

### Apple

4-H Livestock Record by Learning Games Lab, NM State University

iCattleMgrpro by RGResources

iLivestockMgr by RGResources

Ranch Records from University of Wyoming

Angus Mobile App from American Angus Association

Cattle Tracker from JJ Stitt

Show Pig from Zoetis, Inc

SMARTSoft iFarm by CPF IT Center (Swine)

# Veterinary Client Relationships

Gail Silkwood, Extension Educator

## Goal (learning objective)

Youth will learn how to establish a sound veterinarian-client-patient relationship and why it is important.

## Supplies

- Handout 1 - "Scenarios" (enough copies for group)

## Pre-lesson preparation

- Read/review Handout 1.
- Understand what a valid veterinarian-client-patient relationship (VCPR) is and how it is created.

## Lesson directions and outline

Begin by asking youth what they think a Veterinarian-Client-Patient relationship is: If they struggle, see if they can define each element (veterinarian, client and patient) separately, then come back to the original question. Once they have their definition, share the following information with them:

According to the American Veterinary Medical Association a VCPR is: "Veterinarian-Client-Patient relationship (VCPR). A VCPR means that all of the following are required:

1. The veterinarian has assumed the responsibility for making medical judgments regarding the health of the patient and the client has agreed to follow the veterinarian's instructions.
2. The veterinarian has sufficient knowledge of the patient to initiate at least a general or preliminary diagnosis of the medical condition of the patient. This means that the veterinarian is personally acquainted with the keeping and care of the patient by virtue of:
  - a. A timely examination of the patient by the veterinarian, or
  - b. Medically appropriate and timely visits by the veterinarian to the operation where the patient is managed.
3. The veterinarian is readily available for follow-up evaluation or has arranged for the following:
  - a. Veterinary emergency coverage, and
  - b. Continuing care and treatment.
4. The veterinarian provides oversight of treatment, compliance and outcome.
5. Patient records are maintained."

It is important to establish a valid veterinarian-client-patient relationship (VCPR) for any animal. Without this relationship, a veterinarian will be unable to provide medication or diagnosis which are important in maintaining your animal's health.



**Conducting the activity (DO)**

1. Review what a valid Veterinarian-Client-Patient Relationship (VCPR) is with the group.
2. Have youth break up into either smaller groups or teams.
3. Distribute Handout 1.
4. Have groups review the scenarios in Handout 1 and decide if it is a valid VCPR, why or why not? If it is not a valid VCPR what would they do to make a valid VCPR in the scenario?

**What did we learn? (REFLECT)**

- Ask: How would you establish a valid VCPR?
- Ask: Why is it important to maintain a valid VCPR?

**Why is that important? (APPLY)**

- Ask: How can this relationship impact your animal?
- Ask: Why is a valid VCPR important from a quality assurance standpoint?

**Resources**

- American Veterinary Medical Association. (2016). <https://www.avma.org/>
- Ohio State University Extension. (2011). Caring for Animals. *Beef resource handbook* (pages 12-5 through 12-8).
- Ohio State University Extension. (2008). Caring for Animals. *Goat resource handbook* (pages 159-164).
- Ohio State University Extension. (2011). Caring for Animals. *Sheep resource handbook for market and breeding projects* (pages 135-140).
- Ohio State University Extension. (2000). Caring for Animals. *Swine resource handbook for market and breeding projects* (pages 24-1 through 24-6).

## **HEALTH AND DISEASES: VETERINARY CLIENT RELATIONSHIPS – HANDOUT 1**

### **SCENARIOS**

#### **Scenario 1**

Jen has three dairy goats that she milks for her family's personal use. One of her does seems to be lethargic and losing weight. She uses an internet search to identify what might be wrong based on the symptoms the goat is displaying and creates a treatment plan based on these search results. Is this a valid Veterinarian-Client-Patient Relationship (VCPR)?

#### **Scenario 2**

Tiffany's 4-H lamb appears to be lame. She takes him to a local veterinary clinic for examination. The veterinarian completed a general health exam and discovered the lamb is suffering from a plugged sweat gland. The veterinarian provided treatment to Tiffany's lamb and gave her directions to care for the lamb at home. Is this a valid VCPR?

#### **Scenario 3**

Brett's market steer appears to be suffering from bloat. His family raises cattle and has dealt with this issue before. Brett calls the local veterinarian who has been their family vet for nearly 15 years for confirmation of his diagnosis. The veterinarian listens to Brett explain the symptoms and situation before giving him a treatment plan over the phone. Is this a valid VCPR?

#### **Scenario 4**

Breanna's pig has spent the hot summer day wallowing in his mud hole. When Breanna goes to feed him, the pig is in his shelter but he is listless and warmer to the touch than normal. Breanna takes the pig's temperature, which is elevated and notices that his skin is pinker than normal. She suspects he is suffering from sunburn. It is late Saturday and the veterinary clinic is already closed for the day. She uses an internet search to find an online veterinary clinic that has a live chat option. She explains the situation, the pig's temperature and answers other health details to the chat operator, who then gives Breanna a treatment plan. Is this a valid VCPR?

#### **Scenario 5**

Amy's lamb appears to be scratching her body on whatever objects she can and appears to be very uncomfortable. She isn't eating regularly and is beginning to lose body condition. Amy examines the animal closer, including taking her temperature and finds the lamb is covered with small brown wingless pests. She calls a friend who is more experienced with sheep and the friend explains that her veterinarian calls these Sheep Keds and gives Amy the directions that her vet gave to her. Is this a valid VCPR?

# Inviting Buyers To The Market Animal Sale

Steve Harrison, Extension Educator

## Goal (learning objective)

Youth will learn how to invite buyers to the market animal sale.

## Supplies

- Samples of market animal sale invitation letters (enough for group)
- Paper and pencils (enough for group)

## Pre-lesson preparation

- Review the information contained in a market animal sale invitation letter (see .pdf links in references/resources below).
- Be prepared to teach youth how to prepare a buyer invitation.
- Have youth role play a buyer invitation presentation.

## Lesson directions and outline

### Background information

One of the most important aspects of a business including market animal projects is marketing your product. The price you receive for your product is the top indicator of profit potential.

Businesses market their products in many different ways: posters, press release, commercial, advertisement in written news magazines, newspaper or social media, website etc. You may also want to think about how others market their product in a grocery store? Farmer's market? Mall? Bookstore?

## Conducting the activity (DO)

1. Distribute copies of sale invitation letters.
2. Ask for a volunteer to record answers provided by the group. Ask: What components should be in a market animal sale invitation?
3. Review the components of a sale invitation letter from resource materials. Make sure items not mentioned get captured.
4. Distribute pencils and paper.
5. Have members write a buyer invitation letter.
6. Ask: Who should you send invitation letters to? Ask: When should invitation letters be sent or delivered?
7. Ask for a volunteer to record answers provided by the group. Ask: What should you do when you deliver your invitations? How should you dress? What is appropriate to say?
8. Review resource materials for appropriate buyer interactions. Make sure items not mentioned get captured.
9. Ask for volunteers to role play a buyer/seller conversation.
10. Ask for volunteers to his/her letter to the group.

## Alternate Activities

1. Have youth create a power point presentation about their projects and upcoming sale. Have youth make a presentation to local businesses or community groups.
2. Have youth create a YouTube video to promote their projects and sale.
3. Have youth write a list of their personal skills. Older youth may want to structure their skills into a resume to promote themselves for a job.

## What did we learn? (REFLECT)

- Ask: Why is it important to invite buyers to attend the market animal sale at the fair?
- Ask: How do you feel when you are able to promote yourself and your project?
- Ask: Do you need to take time to practice what you are going to say to buyers? Why?
- Ask: Do you need to plan your invitation letters?

## Why is that important? (APPLY)

- Ask: Why does McDonald's advertise new items on their menu?
- Ask: How does marketing impact consumer confidence?
- Ask: Where else is marketing important to your life? Why?

## Resources

Antoni, Al De. (2006). A Guide to Writing Better Buyer's Letters. Oregon State University. Retrieved from [http://extension.oregonstate.edu/harney/sites/default/files/o\\_writing\\_better\\_buyer\\_s\\_letters\\_\\_for\\_youth\\_.pdf](http://extension.oregonstate.edu/harney/sites/default/files/o_writing_better_buyer_s_letters__for_youth_.pdf)

Ohio State University Extension. (2011). Marketing. *Beef resource handbook* (page 10-9).

Ohio State University Extension. (2008). Caring for Animals. *Goat resource handbook* (pages 162-163).

Ohio State University Extension. (2011). Showing and Selling. *Sheep resource handbook for market and breeding projects* (page 101).

Ohio State University Extension. (2000). Selling the Project Animal. *Swine resource handbook for market and breeding projects* (pages 13-1).

University of California Division of Agriculture and Natural Resources.(n.d.). Marketing Your 4-H and FFA Livestock Animal Project. *The 4-H Experience: Learn By Doing*. Retrieved from <http://cemendocino.ucanr.edu/files/77498.pdf>

# Thank You Letters

Steve Harrison, Extension Educator

## Goal (learning objective)

Youth will learn how to construct a thank you letter to show appreciation to project supporters.

## Supplies

- Small thank you cards (enough for group)
- Blue or black pens
- Copies of Handout 1 - *Thank You Samples* (enough for group)
- Copies of Handout 2 - *Guide to writing thank you notes for 4-H awards and animals sold at auction* (enough for group)
- Meeting space with table and chairs

## Pre-lesson preparation

- Review Handout 1 and Handout 2
- Make photocopies of Handout 1 and Handout 2 - enough for group

## Lesson directions and outline

### Introduction

Each contribution, from the smallest donation to the largest, are gifts that donors (individuals or companies) feel they are able to give.

Receiving a sincere thank-you will go a long way towards making sure the donor includes the 4-H program in their plans for next year's donations. Sponsorship does not just "happen," it is something that donors budget and plan for all year long.

## Conducting the activity (DO)

1. Have youth brainstorm a list of what items they think should be included in a thank you letter. Then review to see if they captured the key elements of a thank you letter listed below:
  - Greet the donor
  - Express your gratitude
  - Discuss the use of the donation; say something nice about it and how you will use it
  - Thank the donor again
  - Closing salutation/regards
2. Distribute copies of Handout 1, allow enough time for members to read/review the two samples
3. Ask: Which note would you prefer receiving?
4. Ask: Which individual (Jason or Jeffrey) would be more likely to receive support in the future? Why?
5. Distribute copies of Handout 2, recap the elements of a thank-you letter while going through the handout
6. Have youth write a practice thank-you note

## What did we learn? (REFLECT)

- Ask: How do you feel when you receive thanks for something you have given or done?
- Ask: What other ways can you think of to thank others?

## Why is that important? (APPLY)

- Ask: Why is it important to write thank-you letters?
- Ask: Where else is giving thanks important in your life? Why?

## Resources

- Anderson, E. (n.d.). *Guide to writing thank-you notes for 4-H awards and animals sold at auction*. Oregon State University Extension. Retrieved from: [http://oregonstate.edu/dept/kbrec/sites/default/files/documents/4h/How\\_to\\_Write\\_TY.pdf](http://oregonstate.edu/dept/kbrec/sites/default/files/documents/4h/How_to_Write_TY.pdf)
- Ohio State University Extension. (2011). Marketing. *Beef resource handbook* (pages 10-10 through 10-11).
- Ohio State University Extension. (2008). Preparing Your Animal for Show. *Goat resource handbook* (pages 177-178).
- Ohio State University Extension. (2011). Showing and Selling. *Sheep resource handbook for market and breeding projects* (page 101).
- Ohio State University Extension. (2000). Selling the Project Animal. *Swine resource handbook for market and breeding projects* (pages 13-1 through 13-2)
- Ohio State University Extension. (1999). *Quality Assurance and Animal Care: Youth Education Program Curriculum Guide*. Unit 3, Level 1.
- Wilson, J. (2013). *Writing Stock Sale Buyer Thank you Notes*. University of Idaho Extension. Retrieved from <https://www.uidaho.edu/~media/UIda-ho-Responsive/Files/Extension/county/Kootenai/Writing-Buyer-Thank-You-Notes.ashx>



## MARKETING: THANK YOU LETTERS – Handout 1

### Thank You Note Samples

Below are two examples of buyer thank you notes. Carefully compare the content and place yourself in the buyer's position.

*August 28, 2013*

*Dear Mr. Jones,*

*Thank you for buying my animal. While I didn't get as much as some of the other members, I appreciate your support. I plan to take a market hog again next year.*

*Jason Clover*

*August 28, 2013*

*Dear Mr. Jones,*

*Thank you very much for buying my market hog at the 4-H Stock Sale. I know that economic times are difficult and appreciate you generously bidding \$1.30/pound which was well above the floor price.*

*As a result, I have been able to reimburse my parents for the animal purchase and feed costs. I placed the remaining money into savings to help with purchasing next year's project animal, and to help towards my college education.*

*This year I learned a great deal about responsibility from the daily care and management of my project animal. I really enjoyed learning more about the different amino acids related to swine nutrition.*

*Thanks again for your wonderful support. I hope to see you again at the 2014 North Idaho Fair. Your ongoing support of our local 4-H members and programs is truly appreciated.*

*Sincerely  
Jeffrey Clover*

## MARKETING: THANK YOU LETTERS – Handout 2

### Guide to writing thank-you notes for 4-H awards and animals sold at auction

- Use stationery or plain note cards and proper postage. Avoid the pre-inscribed 'Thank you!' cards, there are more appropriate choices for this time. Stay away from full-size sheets - note cards are best, as your message will be brief, and would look silly swimming around on a full-size page.
- When you are writing a thank you note, always plan ahead. Be sure the message is clear and that all the information needed is in a logical sequence--you don't want to confuse the reader.
- Use blue or black ink. Colored ink or markers are not the best choices.
- Hand-write the notes, even if your handwriting is not so good. Thank-you notes are traditionally written in cursive, unless the sender is a young writer in which case printing may be a better choice.
- Take the time to write as neatly as possible.
- Keep it short and sweet yet vivid and complete.
- *Think of how you would feel to receive a thank-you note like the one you are sending.*

#### 1. Greet the Giver

- ✓ Dear Mr. Smith,

#### 2. Express Your Gratitude

- ✓ Thank you so much for purchasing my 4-H market hog at the auction.  
OR
- ✓ Thank you so much for sponsoring the embroidered jacket for the Best Female Beef.  
ETC.

From the smallest donation to the largest, each individual and company gives what they feel they are able to and receiving a sincere thank-you will go a long way towards making sure they include the 4-H program in their plans for next year's donations. Sponsorship does not just "happen," it is something that donors budget and plan for all year long.

#### 3. Discuss Use

- ✓ I plan to start a savings account for college.  
OR
- ✓ I will be proud to wear this jacket; I have worked very hard on my beef project.  
ETC.

Say something nice about the item and how you will use it. Let's say it's something you actually love and will use a lot - then say so.

Be a little personal. Is this your first year of 4-H or first year in this project? Write something about that. Is this your last year of 4-H and you are heading to college? Write something about that, perhaps telling the donor where you are going to college and what you plan to study, maybe even how 4-H has helped prepare you for your college endeavors.

#### 5. Thanks again

- ✓ Thanks again for attending the auction.
- OR
- ✓ Thanks again for your generous donation.

It's not overkill to say thanks again. So say it.

#### 6. Regards

Simply wrap it up. Use whatever works for you: *Yours Truly, With Thanks, Sincerely, Regards*. Then sign your name and you're done.

Now get it in the mail! Make sure the envelope is properly and neatly addressed to ensure it will be delivered to the recipient.

Adapted from "How to Write a Thank-You Note" by Leslie Harpold and "How to Write a Thank-You Note" on e-How.com.



# 5 Basic Nutrients

Sarah D. Baker, Extension Educator

## Goal (learning objective)

Youth will learn about the five major types of feed nutrients. In addition, youth will learn how much water livestock drink per day, on average.

## Supplies

- Handout 1 “BEEF Nutrition and Feeding: The Essential Nutrients Handout” make enough copies for your group
- Handout 2 “SHEEP Nutrition Handout” make enough copies for your group
- Handout 3 “SWINE Nutrition Handout” make enough copies for your group
- Handout 4 “GOAT Nutrition Handout” make enough copies for your group
- Handout 5 “Feed Word Bank Worksheet” make enough copies for your group
- 8oz. drinking glass/cups (enough for your group)
- 1-1gal. container (milk jug, etc.)
- 1-5gal. bucket
- Water

## Pre-lesson preparation

- Make copies of the handouts
- Read the handouts to familiarize yourself with the content
- Practice the activities

## Lesson directions and outline

Share the following information with the youth:

All feeds are made up of nutrients. Just like people, livestock must have certain nutrients in their daily feed to remain healthy and continue to grow.

There are five categories of essential nutrients for beef, goats, shee and swine. Ask for volunteers to list them. (Write/post each category on a separate sheet of paper; distribute Handouts 1-4 if youth need hints).

- Water
- Energy
- Protein
- Minerals
- Vitams

(Consider having youth divide into four groups, each taking one of the four species handouts and recording what they see as the 3 most important points for each of the five nutrient categories. Come back into one group, then have each species, sharing their 3 points for Water and discuss similarities/differences, then do the same for Energy, Protein, Minerals and Vitamins - actively engaging youth in learning what each nutrient group provides. Having samples of various feed ingredients would help youth to visualize the different categories).

Instructor Notes;

Water is the most important nutrient and should be available free choice. It should be clean, fresh and accessible. Water is necessary for digestion, carrying food nutrients and waste products, cooling the body, and lubricating the joints.

Energy from carbohydrates and fats enhance movement and produce heat to keep the body warm. Excess energy feeds are stored as fat.

Proteins consist of 20 amino acids. they are the building blocks to make body tissues like muscle, internal organs, bones, blood and skin.

Minerals are needed in small amounts to help build bones and teeth. The three primary minerals are salt, calcium and phosphorus.

Vitamins are classified as either fat-soluble or water-soluble. They are required in small amounts for healthy eyes, nasal passages, lungs, blood and strong bones.

### **Conducting the activity (DO)**

#### **Activity 1**

1. Distribute Handout 5, every member should have a copy.
2. Have each member name feed sources that they feed their animals. Have them write these feed sources on their Feed Word Bank Worksheet (if not already listed).
3. For each feed ingredient, check whether it is primarily used as a source of protein, energy, mineral, or vitamin. Discuss options.

#### **What did we learn? (REFLECT)**

- Ask: What nutrient group is the most important to animal health? Why?
- Ask: What energy feedstuff does your animal eat the most of?
- Ask: What protein source do you feed your animal?

#### **Why is that important? (APPLY)**

- Ask: Why is it important to observe and record your animal's daily eating habits?
- Ask: What nutrient(s) are important to your growth?
- Ask: How does nutrition impact your life?

#### **Activity 2**

1. Discuss/share the following:

Water is the basis of all life, and is the most important part of an animal's diet. As livestock producers, you need to know how much clean drinking water your animals need each day.

Let's start with some comparisons:

- The average child drinks about six glasses of water per day. Is this more or less than a 500lb calf?
  - A 350 pound animal needs between one and five gallons of drinking water a day
  - A 500 pound animal needs between two and six gallons of drinking water a day;
  - A 750 pound animal needs 10-15 gallons per day;
  - A steer weighing 1000 pounds or more needs 20 gallons or more of cool, clean drinking water a day
  - On this handout, what differences do you notice?
2. Have a volunteer distribute the cups to members
  3. Have members fill their glass with water and pour into the 1-gallon container and have members count how many glasses it takes to fill the 1-gallon container.
  4. Have members fill the 5-gallon bucket with a 1-gallon container and have members count how many 1-gallon containers it takes to fill the 5-gallon bucket.

#### **What did we learn? (REFLECT)**

- Ask: Were you surprised at how much water it took to fill the 1-gallon container and the bucket?
- Ask: Do you think your animal would drink more water if it was available?
- Ask: What nutrient group is the most important to animal health? Why?
- Ask: How much water does a 1000lb steer need?
- Ask: How much water does a 200lb hog need?
- Ask: How much water does a 100lb lamb need?
- Ask: What happens if your animal goes off feed?

#### **Why is that important? (APPLY)**

- Ask: What could happen if your animal does not get enough water? How do you feel if you don't have water?
- Ask: How does nutrition impact your life?
- Ask: Why is it important to observe and record your animal's daily eating habits?

## Resources

Kuhl, G., Adams, J.P., and Astroth, K. (n.d.). How Much Water? –Kansas 4-H Beef Leader Notebook (S100). (pages 66-69). Kansas State University.

National 4-H Council. (2005). Bite Into Beef. BU-08143 (pages 16-17).

Ohio State University Extension. (2011). Nutrition and Feeding. *Beef resource handbook* (pages 7-1 through 7-7).

Ohio State University Extension. (2008). Nutrition. *Goat resource handbook* (pages 51-55).

Ohio State University Extension. (2011). Nutrition. *Sheep resource handbook for market and breeding projects* (pages 49-50).

Ohio State University Extension. (2000). Nutrition. *Swine resource handbook for market and breeding projects* (pages 8-1 through 8-3).



## **BEEF Nutrition and Feeding: The Essential Nutrients Handout**

**Source:** Beef Resource Handbook 4-H 117R. (2001). The Ohio State University Extension. Chapter 7. Pages 7-1 through 7-7.

### ***Water***

Water is an extremely important part of an animal's diet. It is found in every cell in the body. It helps keep the body cool and carries other nutrients throughout the body. Water also helps the body form waste materials.

Be sure cattle have plenty of fresh water every day. Limitations on water intake depress animal performance more quickly and more drastically than any other nutrient deficiency. Domesticated animals can live about sixty days without food but only seven days without water. Hearing and sight are impaired without water.

Cattle will drink up to 20 gallons or more of water in one day, depending on their weight and the environmental temperature. For example, a calf that drinks three gallons a day in the winter, will drink nine gallons a day in the summer.

Water should be at a comfortable temperature. Drinkable water is usually between 40°F and 65°F. Steers that have access to cool drinking water will gain between 0.3 to 0.4 pounds more per day than those drinking warm water.

Therefore, you may want to occasionally check water temperature. Dip a thermometer into the water. Do not allow the thermometer to rest on the bottom. Touching the heated bottom of the pan can result in higher temperatures. Check the temperature over several cold days. Water temperatures of at least 40°F should minimize mechanical water system problems and maintain animal performance.

### ***Energy***

Energy is used for growing and also for producing a calf. Carbohydrates and fats give beef cattle most of the energy they need. Examples of carbohydrates that you eat are bread and potatoes. Grains cattle eat which are high in energy include corn, barley, wheat, and oats. Other feeds, like hay, are intermediate in energy while corn stalks are low in energy.

There are several different ways to measure energy levels. The two most common methods are Total Digestible Nutrients (TDN) and the Net Energy (NE) systems. The Net Energy system is becoming more common. While you may still use the older TDB system, some labs are now only reporting feed energy in Net Energy values.

### ***Protein***

Beef cattle use protein to build muscles, hair, hooves, and tissues inside their bodies. Protein works with carbohydrates so the animal will grow properly. Proteins are made up of small building blocks called "amino acids". We eat meat and eggs, which are high in protein. Soybean oil meal and alfalfa hay (legumes) are examples of livestock feeds that are high in protein.

Cattle protein supplements may be composed of a natural protein source or may contain some Non-Protein Nitrogen (NPN). For example, a common natural protein supplement is soybean meal, and a common NPN source is urea. Urea is better suited for older cattle on higher energy diets.

Note: Urea cannot be given to calves until their rumens are developed, so calves must be older than four months. Animals under 450 pounds generally gain more efficiently on natural protein sources. The amount of urea fed in the rations should not exceed one percent of the total ration or three percent of the concentrate mixture.

### ***Minerals***

Minerals are needed to build strong bones and teeth and to make blood, muscle, and nerves. Some minerals may need to be supplemented directly in the ration. Salt, calcium, and phosphorus are minerals needed in larger amounts than other minerals. (*Table 7.01*) Cattle should have a salt-mineral box to supply them with the extra minerals they do not get from their feed. This box should be accessible to cattle at all times. Minerals needed in smaller amounts are called trace minerals. Examples of trace minerals are calcium and phosphorus. We eat cheese and drink milk to get calcium and phosphorus. For beef cattle, grass and hay can be a source of calcium, while grains are high in phosphorus. Beef is an excellent source of many trace minerals for us.

### ***Salt***

Feeds generally do not contain adequate amounts of salt, the main source of sodium. Sodium can be supplemented as sodium chloride or sodium bicarbonate, and both forms are easily absorbed by the animal. Iodized salt should always be used to avoid an iodine deficiency. Cattle fed maintenance rations while confined in a dry lot often consumer high levels of mineral mixtures, perhaps from boredom.

### ***Calcium and Phosphorus***

A calcium to phosphorus ratio of less than 1:1 or more than 8:1 may reduce performance. The typical calcium to phosphorus ratio is 1.5 to 2.0:1 for beef cattle. However, high levels of calcium from legumes do not appear to depress gains in growing rations. Calcium supplementation will probably be needed for growing steers and heifers receiving some grain.

### ***Phosphorus***

Phosphorus is often deficient in forage diets. Around calving time, cows should have free-choice access to 10-12% phosphorus mineral. An example would be ½ dicalcium phosphate. At other times of the year, cows and stockers would need a mineral consisting of 25-35% dicalcium phosphate or 7-8% phosphorus.

### ***Magnesium***

A mineral that may be deficient in feed is magnesium. The result of such a deficiency is called grass tetany, grass staggers, or magnesium tetany.

***Magnesium tetany*** results when cattle, particularly cows that are milking and grazing on lush pastures, use up their existing body supplies of magnesium without a steady replacement from their diet. Another likely group to get magnesium tetany is cows in late gestation because of the nutritional requirements of the growing fetus. However, any animal that is grazing lush, green pastures of either grass or small

grain is running the risk of magnesium tetany. A high level of calcium will also tie up the availability of magnesium. Therefore, you should use dolomitic lime if magnesium is deficient in your area.

Symptoms of magnesium tetany include nervousness and irritability. Often, muscle twitching, usually in the face, eyelids, ears or flanks, will occur. Animals may bellow loudly while in the pasture or do some frenzied galloping. Later, animals will exhibit a staggering gait and fall down. After falling, they go into convulsions and eventually die. Mineral supplements containing magnesium and grain should be readily available to encourage consumption.

### ***Vitamins***

There are two categories of vitamins, water-soluble and fat-soluble. Produced in the rumen of the animal. Produced in the rumen of the animal, B complex vitamins are soluble. Fat-soluble vitamins of importance to cattle are A, D, E, and K. Cattle usually receive enough vitamin D from sunlight or from sun-cured hay. Vitamin E is usually received through feed, while vitamin K is produced in the rumen.

Vitamin A may need to be supplemented if green, leafy forages are not available. Vitamin A can be supplemented in the diet or by an injection. One million International Units of vitamin A palmitate injected intramuscularly (for example, when cows are palpated for pregnancy) will meet their vitamin A needs for two to four months. In the mineral mix, add 10,000 to 50,000 International Units per 0.1 to 0.2 lbs. of mineral mix. Be very cautious if you are mixing your own vitamin-mineral mix. Only a very small amount of vitamin A pre-mix is needed and mistakes in mixing can lead to toxicity situations. Vitamin A will not remain stable very long in homemade mineral mixes (approximately 2-3 weeks). Utilize or request protected forms of vitamin A for your vitamin-mineral mix.

## **SHEEP Nutrition Handout**

**Source:** Sheep Resource Handbook 4-H 194R. (2000). The Ohio State University Extension. Chapter 4. Pages 49 through 50.

Nutrients are elements in feed that are used by the animal for growth and production. Nutrients are normally divided into five categories: Water, protein, carbohydrates, minerals, and vitamins.

### ***Water***

Water is the main constituent of the body. Two-thirds of the body is water, thus, an animal can live much longer without feed than water. Water helps the body digest food and carries nutrients to body tissues. It also helps get rid of wastes and keeps the body regulated. Sheep should always have access to a supply of clean, fresh water.

### ***Protein***

Proteins are the building blocks of the body. They are very complex chemicals, made up of amino acids that are used to build muscle, blood, internal organs, and skin. They also help form parts of the nervous system and the skeleton. Proteins can be used as energy too. When feed contains too much protein, the extra protein is used as energy. Soybean oil meal and fish meal are high in protein. Corn and barley are lower in protein.

### ***Energy***

Carbohydrates and fats are used to supply energy for lambs. The main use of energy is to make chemical reactions, resulting in conversion of feed to meat. Energy nutrients that are not used are stored as fat until needed. Sugar, starch, and fiber are carbohydrates. Corn oil and tallow are fats. Fat furnishes two and one-fourth times more energy than equal amounts of carbohydrates.

### ***Minerals***

Minerals are needed in small amounts and are used to build bones and teeth and in chemical reactions necessary for many life processes. Salt (NaCl) is a regulator in the body and sheep need 7-11 grams daily. Salt should only be fed in loose form to ensure that sheep can get enough to eat. Calcium is essential for bone growth and maintenance. Legumes (alfalfa) are high in calcium. Calcium can be supplemented by adding limestone to the ration. Phosphorus is needed in bone growth also. Phosphorus deficiencies can be overcome by feeding dicalcium phosphate. Iodine is another important mineral and is best supplied by feeding. There are minor minerals that are important such as copper and selenium. Feeding a trace mineral salt will help avoid deficiencies or toxicities.

### ***Vitamins***

Vitamins are needed in small amounts by sheep. All the necessary vitamins except for Vitamin A, D, and E are produced in the rumen of the mature sheep. Vitamin A is available from green feeds, such as hay, and stored in the liver for 3-4 months. Vitamin D is made available from the sun shining on the skin. Vitamin E and the mineral selenium are important for the prevention of white muscle disease. Selenium should be supplied in the diet in areas that are selenium deficient, like some parts of Idaho. Vitamin E is important for maintaining the healthiness of body cells, and thus, is important for reproduction because it maintains the cells of the reproductive organs. Wheat germ meal, dehydrated alfalfa meal, and some green feeds are good sources of Vitamin E.

## **SWINE Nutrition Handout**

**Source:** Swine Resource Handbook 4-H 134R. (2001). The Ohio State University Extension. Chapter 8. Pages 8-1 through 8-3.

In general, nutrients are divided into five categories: Water, protein, carbohydrates, minerals, and vitamins. Except for water, which is largely supplied separately, nutrients are supplied to animals in the food materials we provide them (known as feedstuffs).

### **Water**

Water is so common that we seldom think of it as a true nutrient, but it is the most essential and the cheapest of all nutrients. Water is the largest single component of a pig's body. It also passes through the body, transporting nutrients and removing wastes. Depriving pigs of water reduces feed consumption and limits growth and feed efficiency. Therefore, ample water should be provided continuously. A pig needs to drink two to three pounds of water for every pound of feed it eats.

Water is usually taken into the body at a lower temperature than the body itself, therefore, a portion of the body's heat or energy must be used in the warming of the water. In hot weather, this can be a comforting advantage, but in the winter, it can be a serious disadvantage. If the water is ice cold, the pig will drink less. Reduced water consumption will limit performance as significantly as a lack of any other nutrient.

It is important that you make certain your animals always have all the fresh, clean water they need and that it is relatively cool in the summer and warmer in the winter.

### **Protein**

Proteins are composed of 20 simpler building blocks called amino acids, and it is actually the amino acids that are the essential nutrients. Pigs, in fact, do not specifically need protein, but rather require amino acids for the formation of muscle and other body proteins.

Ten of the amino acids are called essential, because these cannot be produced within the pig's body. The pig's growth or performance can be limited by a lack of even one of the essential amino acids, even if the other nine are adequately supplied. The ten essential amino acids that must be provided in swine diets are: lysine, threonine, tryptophan, methionine, cysteine, isoleucine, histidine, valine, arginine, and phenylalanine. Most cereal grains are limiting in lysine, threonine, tryptophan, and methionine. Therefore, when one evaluates feed ingredients, these amino acids are most important in determining protein quality.

### **Energy**

Energy is technically not a nutrient, but is a result of metabolism of carbohydrates (starch) and fats that are in a pig's diet. Carbohydrates and fats are the main source of energy in the diet. They are the primary fuels that are used in maintaining body temperature and producing muscular movement.

Energy must be provided in large amounts over what is needed for maintenance to achieve optimum growth and reproduction responses. Energy is needed in many chemical changes that occur within the body. Because energy is needed constantly by a growing pig, the body stores some energy in the form of fat. The major source of dietary energy for the growing pig is from the carbohydrate component of grains in their feed.

### ***Minerals***

Minerals are needed in body tissues and to assist in some of the body's chemical reactions. In particular, calcium, phosphorus, and salt (often referred to as macro-minerals) are major needs. Calcium is important in bone formation. Phosphorus is also involved in bone building and assists in energy utilization. Salt is important for maintaining good appetites and water consumption in hogs.

Other minerals are needed in small amounts and are called trace minerals (or micro-minerals). These include iron, copper, zinc, magnesium, manganese, iodine, and selenium.

Of all farm animals, the pig is the most likely to suffer from mineral deficiencies. This is due to the following:

1. Hogs are primarily fed cereal grains which are low in minerals (except calcium).
2. The skeleton of a pig, in contrast to those of other animals, supports greater weight in proportion to its size, which means it needs more mineral content than most animals.
3. Hogs do not consume great amounts of roughages, which would balance the mineral deficiencies of grain.
4. Hogs are fed to grow at a maximum rate and are marketed before they reach full maturity. Emphasis on rapid growth and lean meat production requires adequate mineral concentrations, yet under these conditions, minerals are often overlooked in diet formulations. Most minerals are supplied in purchased supplements.

### ***Vitamins***

Vitamins are compounds that assist the body in the assimilation and use of the other nutrients. They are described in two classes, fat soluble (A, D, E, K), and water soluble (the B vitamins). The body can keep reserves of the fat soluble vitamins for a time, but the water soluble vitamins must be supplied in the diet daily.

#### **Fat Soluble Vitamins:**

- Vitamin A (carotene) is found in feedstuffs like alfalfa and corn. Converted by the body from carotene, it assists in maintaining the surface or epithelial cells. Such cells make up the outer skin as well as the lining of the digestive and respiratory tracts.
- Vitamin D is in compounds that have been exposed to sunlight. Some Vitamin D is fixed in the animal itself during exposure to sunlight. This vitamin assists in the utilization of calcium.
- Vitamin E's function is for normal muscle activity and reproduction. It helps to prevent the membrane surrounding individual cells from deteriorating, influences the production of various hormones, and defends against infection.
- Vitamin K's function is to help calcium and Vitamin D metabolism. The blood requires Vitamin K to form clots.



Water Soluble Vitamins:

- These vitamins occur or are supplied as chemical compounds in feeds. They assist particularly in the changes of nutrients into energy for growth. They may also assist in maintaining the health and soundness of the lining of the digestive organs. This group is also called the B-complex group. The B Vitamins generally added to swine diets include thiamine, riboflavin, niacin, pantothenic acid, B<sub>12</sub>, and pyridoxine.

## **GOAT Nutrition Handout**

**Source:** Goat Resource Handbook 4-H 135R. (2016). The Ohio State University Extension. Chapter 5. Pages 51 through 55.

Different nutrients are required in different amounts to allow for proper animal growth, milk production and bodily functions. The essential nutrients for goats are: water, energy (carbohydrates and fats), minerals and vitamins.

### ***Water***

Water is the most important nutrient needed to survive. The goat's body is composed of from 50% to 80% water. Water helps with digestion of food and transportation of nutrients throughout the body. It also helps to rid the body of waste and regulate body temperature. A goat may consume up to 4 gallons of water per day, depending on its age and reproductive state, the environmental temperature and the type of feed being consumed. A goat weighing about 100 pounds and not producing milk consumes about 1 gallon of water per day.

### ***Energy (carbohydrates and fats)***

Carbohydrates and fats are used to supply energy for goats. The main use of energy is to make chemical reactions, resulting in conversion of feed to meat. Energy nutrients that are not used are stored as fat until needed. Sugar, starch, and fiber are carbohydrates. The main sources of carbohydrates are forages such as pastures grasses and roughages such as hay. These are considered fibers. High concentrate grains like corn, oats and barley are sugars and starches.

Commonly fed natural sources of fats are whole cottonseed, whole soybeans and tallow. Fat furnishes two and one-fourth times more energy than equal amounts of carbohydrates. Fats come in the form of oils, fatty acids and tallow. Several by-products sometimes fed to goats are higher in fat concentration than forages and cereal grains, such as hominy and distillers grains.

### ***Protein***

Protein is needed for maintenance, growth, pregnancy and lactation. They are the building blocks of the body. Proteins are very complex chemicals, made up of amino acids that are used to build muscle, blood, internal organs, and skin. They also help form parts of the nervous system and the skeleton. Proteins can be used as energy too. When feed contains too much protein, the extra protein is used as energy. Soybean oil meal and fish meal are high in protein. Corn and barley are lower in protein.

### ***Minerals***

Minerals are required to help build strong bones and teeth. They are also required for chemical reactions necessary for many of life's processes. The major minerals, also called macro minerals are called macro because they are required in larger quantities and are denoted as a percentage of the diet. Calcium, magnesium, phosphorus, potassium and salt are some of the important macro minerals.

Micro minerals or trace minerals are required in lesser quantities than macro minerals and are usually designated in parts per million (ppm). Copper, manganese, selenium and zinc are a few examples of

trace minerals. See table 5.1 on page 53 of the Ohio Goat Resource Handbook for more information about minerals.

### ***Vitamins***

Vitamins are organic compounds that are needed in very small amounts and are required for growth, production of milk and fiber and reproduction. There are two classes of vitamins: fat-soluble and water-soluble. The fat-soluble vitamins are A, D, E and K. They are called fat-soluble because they can dissolve in fat solvents such as ether or chloroform and are usually stored in the fat tissues in the body. The water-soluble vitamins are B-complex vitamins and vitamin C. They are called water-soluble because they dissolve in water.

#### **Fat Soluble Vitamins:**

- Vitamin A (carotene) is found in feedstuffs like alfalfa and corn. Converted by the body from carotene, it assists in maintaining the surface or epithelial cells. Such cells make up the outer skin as well as the lining of the digestive and respiratory tracts.
- Vitamin D is in compounds that have been exposed to sunlight. Some Vitamin D is fixed in the animal itself during exposure to sunlight. This vitamin assists in the utilization of calcium.
- Vitamin E's function is for normal muscle activity and reproduction. It helps to prevent the membrane surrounding individual cells from deteriorating, influences the production of various hormones, and defends against infection.
- Vitamin K's function is to help calcium and Vitamin D metabolism. The blood requires Vitamin K to form clots.
- 

#### **Water Soluble Vitamins:**

These vitamins occur or are supplied as chemical compounds in feeds. They assist particularly in the changes of nutrients into energy for growth. They may also assist in maintaining the health and soundness of the lining of the digestive organs.

## Feed Word Bank

Feed Ingredient	Nutrient Category				
	Energy	Protein	Mineral	Vitamin	Water
<input type="checkbox"/> Alfalfa Hay					
<input type="checkbox"/> Barley					
<input type="checkbox"/> Beet Pulp					
<input type="checkbox"/> Calcium					
<input type="checkbox"/> Cobalt					
<input type="checkbox"/> Copper					
<input type="checkbox"/> Corn					
<input type="checkbox"/> Cottonseed Meal					
<input type="checkbox"/> Dicalcium Phosphate					
<input type="checkbox"/> Grass Hay					
<input type="checkbox"/> Grass/Pasture					
<input type="checkbox"/> Iodine					
<input type="checkbox"/> Milo					
<input type="checkbox"/> Molasses					
<input type="checkbox"/> Oats					
<input type="checkbox"/> Salt					
<input type="checkbox"/> Soybean Meal					
<input type="checkbox"/> Straw					
<input type="checkbox"/> Wheat					
<input type="checkbox"/> Water					

Instructions:

1. Check the box next to each feed ingredient that you feed to your animal.
2. List any additional feed ingredients you feed your steer that are not listed in the black rows at the bottom of the Ingredient list.
3. Place an X in the column to represent which nutrient category your feed ingredient is.

# Average Daily Gain (ADG)

Cindy A. Kinder, Extension Educator

## Goal (learning objective)

*Note: Conduct the Frame Size & Market Ready Weights lesson first*

Youth will:

- Learn about feeding to market ready weights
- Learn to monitor feed rations during feeding periods
- Learn what “market ready” means
- Learn how to monitor if their animal is on track to be market ready

## Supplies

Members will need to bring the following items:

- Animal initial weight information and timely weight information (every 30, 15, or 7 days depending on species) during the feeding period
- Beginning Planning & Record Worksheet (from the Frame Size and Market Ready Weights activity)
- Side photo of their market animal at the beginning of their project
- Copies of Market Animal Growth Charts (distribute the appropriate growth chart to what each member is raising)
  - a. Handout 1 - “Market Beef Growth Chart”
  - b. Handout 2 - “Market Goat Growth Chart”
  - c. Handout 3 - “Market Lamb Growth Chart”
  - d. Handout 4 - “Market Swine Growth Chart”
- Handout 5 “Market Projects Photo Page” (enough copies for group)
- Pencils, pens (enough for group)
- Rulers and calculators (enough for groups to share )

## Pre-lesson preparation

- Average Daily Gain (ADG) can be defined as the average amount of weight a market animal will gain each day during the feeding period.
- ADG can be calculated by taking the amount of weight an animal has gained since the last weight and dividing the weight by the number of days since that last weight.
- Conduct the Frame Size and Market Ready Weights Activity first to determine animals target market weight.
- Have members bring a side-view photo of each project animal, preferably from the beginning of the project. Side view images will help members see the change in their animal over time.
- Make copies of the Handouts 1-5.
- Review the activity and refer to the resources section to familiarize yourself with the activity and information covered.

## Lesson directions and outline

Begin by asking members what they think “Average Daily Gain: is (if they youth struggle, define each word separately. Share the definition from the pre-lesson preparation section before moving on). Discuss what information is needed to calculate ADB (see pre-lesson preparation).

Share the following information with the youth:

Plotting change in weight over time will help you determine if your market animal is on track to be what is called “market ready” at fair time. It is important to set project goals and identify a target final weight.

Weight gained should be monitored and documented (on the growth chart) from the beginning of the project to fair time. Regular weighing intervals are typically every 10, 15, or 30 days depending on the species.

Monitoring weight gain can help you determine if feed rations need to be adjusted so that animals make it to fair, market ready.

Industry average for average daily gain (adg) for each species is as follows: Beef 2.5 lbs/day, Swine 1.7 lbs/day, Sheep .5 lbs/day and Meat Goat .3lbs/day.

### **Conducting the activity (DO)**

1. Follow the directions on the growth chart to determine a predicted growth rate using the initial weight and estimated final weight of each animal.
2. Have youth calculate what his/her animal's required average daily gain needs to be to reach the estimated final weight.
3. Encourage members to determine which feeds help animals grow faster; which results in slower growth rates?
4. Have members attach his/her animal's beginning side-view picture to Handout 5; have them share how his/her animal's condition has changed since the beginning picture was taken.
5. As part of an ongoing activity, have members weigh project animals every 10, 15 or 30 days (depending on species), record those weights on the Market Growth Chart and plot the "actual" growth of each animal.
6. Help members determine if animals are above or below the predicted growth rate and what changes (if any) are needed in their feeding program.
7. Work with members to finish the growth chart and take an ending photo of their animal.

### **What did we learn? (REFLECT)**

- Ask: What is ADG and how is it calculated?
- Ask: What are some factors that influence how fast an individual animal will grow?
- Ask: What can a livestock producer do to speed up or slow down an animal's growth rate?
- Ask: What is your species minimum industry standard for ADG

### **For the on-going activity**

- Ask: Is your predicted ADG from the Market Growth Chart achievable?
- Ask: Why might your animal's actual growth be above or below the predicted ADG?
- Ask: How should you adjust your feeding if they are below your predicted ADG?
- Ask: How did your animal change over the feeding period? Are there any changes you would make next year?

### **Why is that important? (APPLY)**

- Ask: What could happen if you try to change your animal's ration too quickly?
- Ask: Besides raising livestock, where else might you need to track change and make gradual changes over time?

Monitoring and adjusting the feed program, based on actual growth, is important to insure that a member's project animal is in market ready condition come fair time.

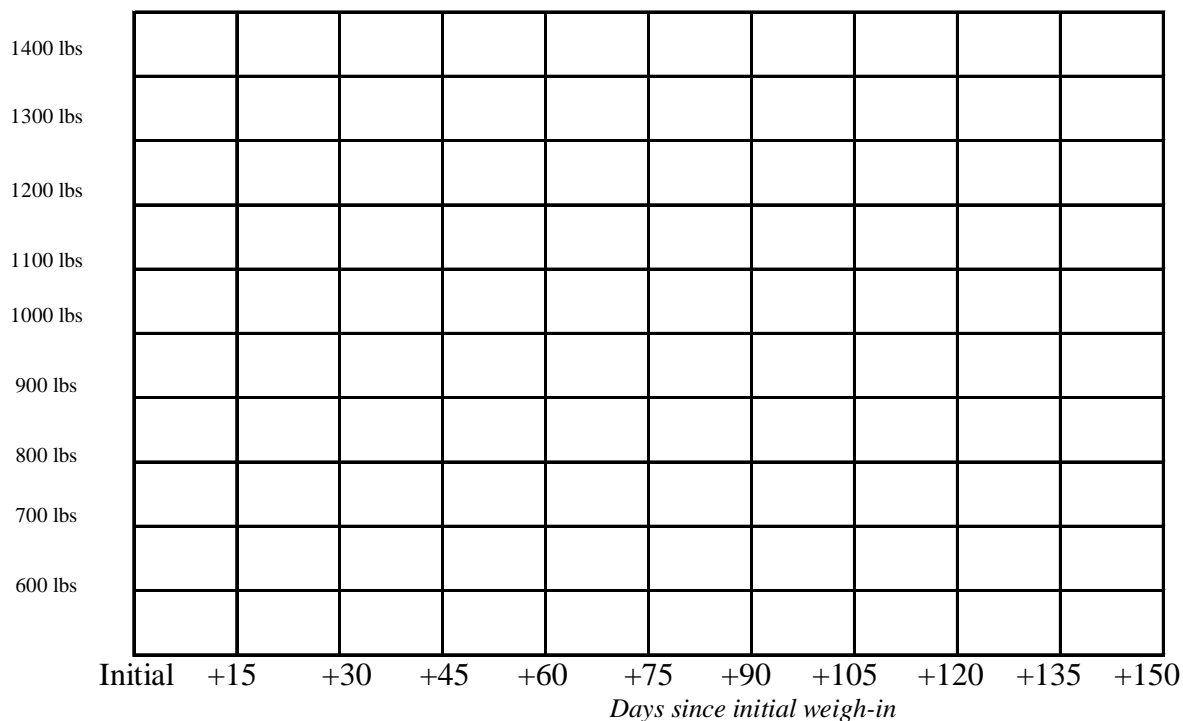


## Resources

- Kinder, C.A. & Williams, S. (2013). Livestock Science Experiment. *Average Daily Gain (ADG) Market Weight, Feed Conversion*. University of Idaho Extension. Retrieved from <https://www.uidaho.edu/~media/UIIdaho-Responsive/Files/Extension/county/Gooding/4-H/animal-science/Experiment-Topics-for-club-work.ashx>
- Ohio State University Extension. (2011). Nutrition and Feeding. *Beef resource handbook* (pages 7-19 through 7-30).
- Ohio State University Extension. (2008). Nutrition. *Goat resource handbook* (pages 55-66).
- Ohio State University Extension. (2011). Nutrition. *Sheep resource handbook for market and breeding projects* (page 51-56).
- Ohio State University Extension. (2000). Nutrition. *Swine resource handbook for market and breeding projects* (pages 8-11 through 8-13).

## Market Beef Growth Chart

To achieve success with your 4-H Market Beef project, it is important you know the estimated final weight of your animal and your progress toward that goal throughout the feeding period. The chart below enables you to plot the predicted growth curve (immediately after the initial weigh-in) and then plot the actual weight of your animal at various times during the feeding period to determine if you are “on target.”



Initial weight: \_\_\_\_\_ Estimated final weight: \_\_\_\_\_

1. Mark the initial weight at the appropriate location on the left-hand side of the table.
2. Mark the estimated final weight at the appropriate location for the number of days in the feeding period.
3. Connect these two points with a straight line. Label this your “predicted” rate of growth.
4. Record your animal’s weight in the table below and the chart above each time it is weighed during the feeding period. Connect this point with the previous actual weight. Is the actual growth curve above or below your predicted growth line? Why?

## Progressive Project Weight Record

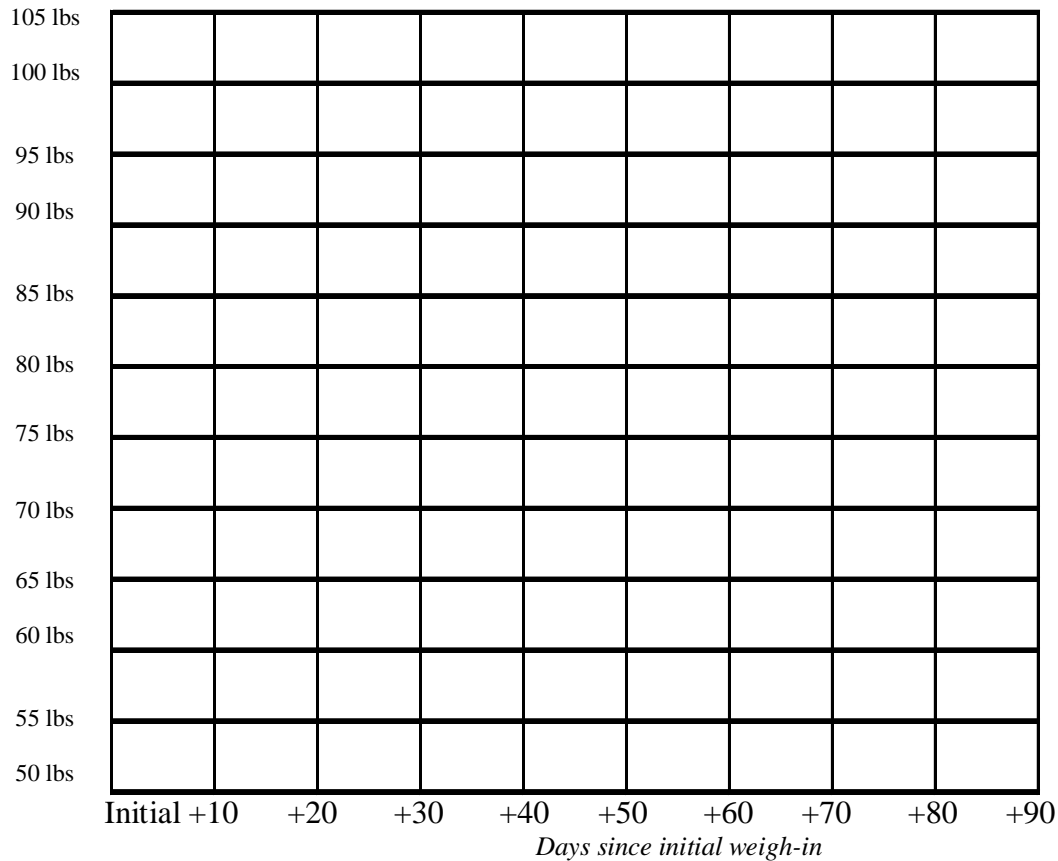
Weigh date									
Days since last weigh day	XXXXXX								
Current weight									
A.D.G. (since last weigh date)	XXXXXX								

Tracking animal weight can tell you where your animal is compared to your goal. After each weigh day ask yourself; do you need to feed more grain or hay?

Typical influences in A.D.G. can be feed, water, weather, and illness. Ask yourself is the A.D.G. normal? What caused any problems?

**NUTRITION: AVERAGE DAILY GAIN – HANDOUT 2****Market Goat Growth Chart**

To achieve success with your 4-H Market Goat project, it is important you know the estimated final weight of your animal and your progress toward that goal throughout the feeding period. The chart below enables you to plot the predicted growth curve (immediately after the initial weigh-in) and then plot the actual weight of your animal at various times during the feeding period to determine if you are “on target.”



Initial weight: \_\_\_\_\_

Estimated final weight: \_\_\_\_\_

1. Mark the initial weight at the appropriate location on the left-hand side of the table.
2. Mark the estimated final weight at the appropriate location for the number of days in the feeding period.
3. Connect these two points with a straight line. Label this your “predicted” rate of growth.
4. Record your animal’s weight in the table below and the chart above each time it is weighed during the feeding period. Connect this point with the previous actual weight. Is the actual growth curve above or below your predicted growth line? Why?

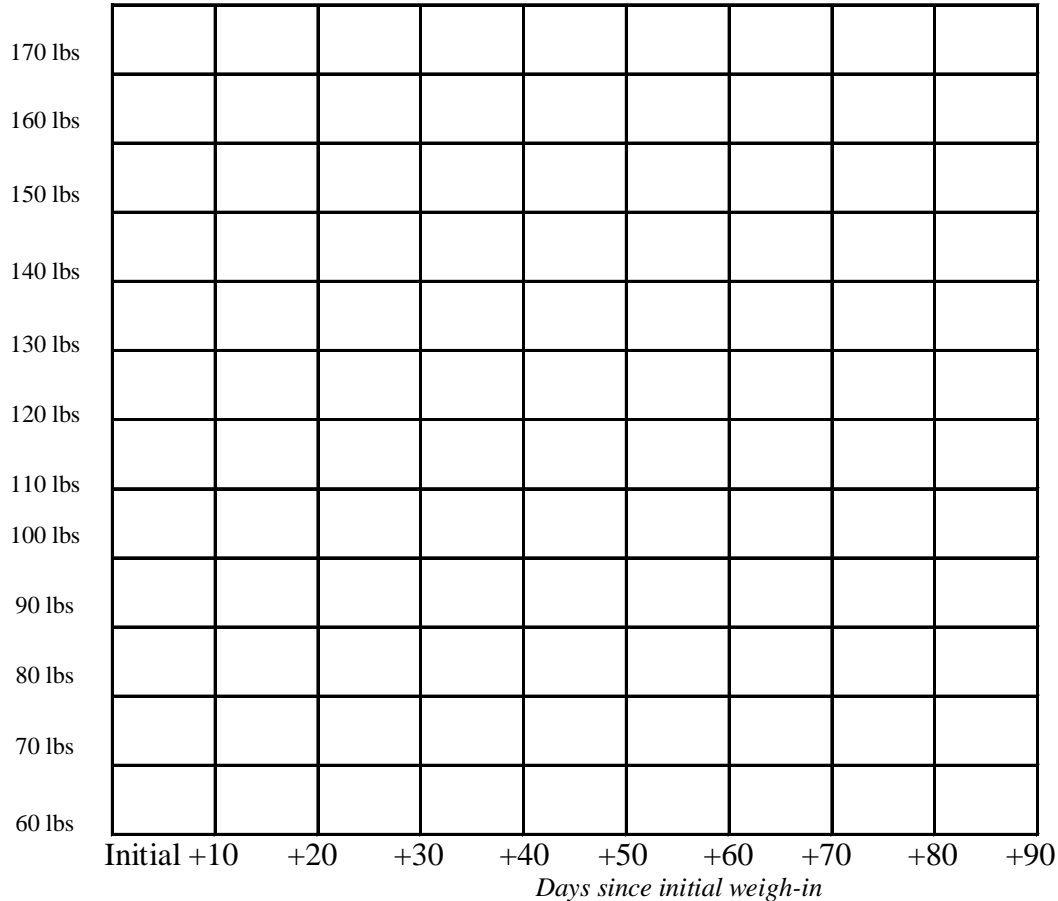
**Progressive Project Weight Record**

<b>Weigh date</b>									
<b>Days since last weigh date</b>	XXXXXX								
<b>Current weight</b>									
<b>A.D.G. (since last weigh date)</b>	XXXXXX								

Tracking animal weight can tell you where your animal is compared to your goal. After each weigh day ask yourself; do you need to feed more grain or hay? Typical influences in A.D.G. can be feed, water, weather, and illness. Ask yourself is the A.D.G. normal? What caused any problems?

**NUTRITION: AVERAGE DAILY GAIN – HANDOUT 3****Market Lamb Growth Chart**

To achieve success with your 4-H Market Lamb project, it is important you know the estimated final weight of your animal and your progress toward that goal throughout the feeding period. The chart below enables you to plot the predicted growth curve (immediately after the initial weigh-in) and then plot the actual weight of your animal at various times during the feeding period to determine if you are “on target.”



Initial weight: \_\_\_\_\_ Estimated final weight: \_\_\_\_\_

1. Mark the initial weight at the appropriate location on the left-hand side of the table.
2. Mark the estimated final weight at the appropriate location for the number of days in the feeding period.
3. Connect these two points with a straight line. Label this your “predicted” rate of growth.
4. Record your animal’s weight in the table below and the chart above each time it is weighed during the feeding period. Connect this point with the previous actual weight. Is the actual growth curve above or below your predicted growth line? Why?

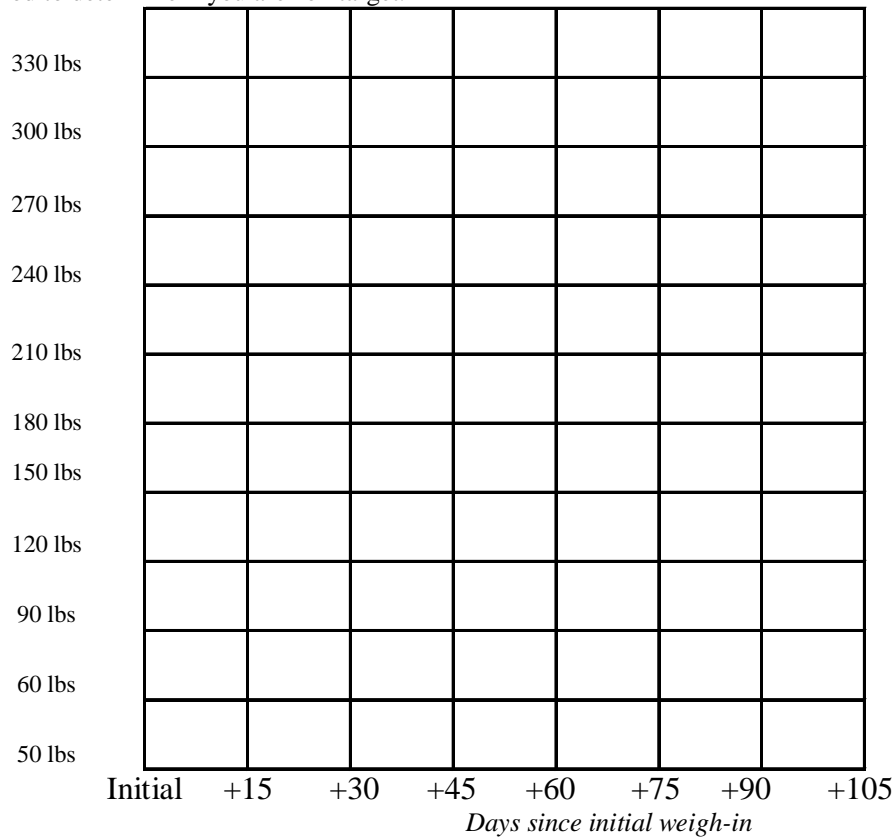
**Progressive Project Weight Record**

<b>Weigh date</b>									
<b>Days since last weigh date</b>	XXXXXX								
<b>Current weight</b>									
<b>A.D.G. (since last weigh date)</b>	XXXXXX								

Tracking animal weight can tell you where your animal is compared to your goal. After each weigh day ask yourself; do you need to feed more grain or hay? Typical influences in A.D.G. can be feed, water, weather, and illness. Ask yourself is the A.D.G. normal? What caused any problems?

**NUTRITION: AVERAGE DAILY GAIN – HANDOUT 4****Market Swine Growth Chart**

To achieve success with your 4-H Market Swine project, it is important you know the estimated final weight of your animal and your progress toward that goal throughout the feeding period. The chart below enables you to plot the predicted growth curve (immediately after the initial weigh-in) and then plot the actual weight of your animal at various times during the feeding period to determine if you are “on target.”



Initial weight: \_\_\_\_\_ Estimated final weight: \_\_\_\_\_

1. Mark the initial weight at the appropriate location on the left-hand side of the table.
2. Mark the estimated final weight at the appropriate location for the number of days in the feeding period.
3. Connect these two points with a straight line. Label this your “predicted” rate of growth.
4. Record your animal’s weight in the table below and the chart above each time it is weighed during the feeding period. Connect this point with the previous actual weight. Is the actual growth curve above or below your predicted growth line? Why?

**Progressive Project Weight Record**

<b>Weigh date</b>									
<b>Days since last weigh date</b>	XXXXXX								
<b>Current weight</b>									
<b>A.D.G. (since last weigh date)</b>	XXXXXX								

Tracking animal weight can tell you where your animal is compared to your goal. After each weigh day ask yourself; do you need to feed more grain or add any supplements?

Typical influences in A.D.G. can be feed, water, weather, and illness. Ask yourself is the A.D.G. normal? What caused any problems?

**Market Projects  
Photo Page**

Place Beginning Photo Here

**Beginning Weigh-in Date**\_\_\_\_\_ **Beginning Weight**\_\_\_\_\_

**Ending Weigh-in Date**\_\_\_\_\_ **Ending Weight**\_\_\_\_\_

**Average Daily Gain**\_\_\_\_\_

Place Ending Photo Here



# Basic Nutritional Requirements - Ruminant

Samantha Graf, Extension Educator

## Goal (learning objective)

Youth will:

- Learn basic vocabulary as it relates to ruminant nutrition
- Learn how to classify basic feed ingredients into nutrient groups
- Learn why different ruminant growth stages have different nutritional requirements
- Sheep: ewe, ram, lamb, lactation, gestation (See “Classifying Feed Ingredients Into Nutrient Groups” in *Sheep Resource Handbook for Market and Breeding Projects*, chapter 4, pages 50 - 51).
- Goat: doe, buck, kid, lactation, gestation (See “Feedstuffs” in *Goat Resource Handbook*, chapter 5, pages 56-57).

## Supplies

*Note: A matching set of cards is needed PER GROUP (each group of members and a set for activity leader)*

- Member flash cards (green)
- Leader flash cards (black)
- Member matching categories (green)
- Leader matching categories (black)
- Tape

Additional supplies

- Bag of assorted candy

## Pre-lesson preparation

- Be able to discuss vocabulary relative to ruminant nutrition - roughage, concentrate, salt, vitamins, fats, carbohydrates, minerals, energy, proteins and water.
- Be able to discuss specific species terms as follows:
  - Beef: heifer, cow, steer, calf, lactation, gestation (See “Classifying Feed Ingredients Into Nutrient Groups” in *Beef Resource Handbook*, chapter 7, pages 7-2 through 7-7).

- Print off sets (enough of flash and matching category cards for each group of members and a set for activity leader). Each ‘group’ should have a set of green and black cards (flash and matching category).
- Play the game with family members.

## Lesson directions and outline.

### Introduction

Proper nutrition for ruminants is the foundation to a healthy animal. This lesson will lead members to understand the vocabulary as it relates to ruminant nutrition. The proper vocabulary in nutrition is important due to the complicated concept of creating a balanced feed ration (discussed in later lessons).

Categorizing and a solid understanding of vocabulary allows members to build up to a level of knowledge required to utilize the Pearson square to build a complete ration, recognizing differences in nutritional requirements at various growth stages.

## Conducting the activity (DO)

1. Have youth form into groups of three or four.
2. Provide each group a set of green flash cards and black matching category cards.
3. Explain how the game works:  
 The game is similar to black-out bingo. Black cards go across the top to make the categories (Energy, Protein, Vitamins etc.). The green cards are to be taped to it.  
 Organize black cards first (member and leader) before green cards are called out.  
 The leader shuffles their set of green cards and will randomly select and call out what is on the green card drawn.  
 Teams need to correctly place the called-out card in the correct category. Steps repeat until the team has completed a 3 x 3 grid of cards and calls out "Yummy".
4. Check for understanding.
5. Play game.
6. Award candy to winning team.
7. Repeat game, beginning from start, as many times as desired.

## What did we learn? (REFLECT)

- Ask: What new vocabulary terms did you learn?
- Ask: What are the 5 nutrient groups that feed can be classified into?
- Ask: BEEF (Refer to *Bite into Beef*, page 16, "Feed Word Bank" activity)
  - a. What category does corn fit into? (energy)
  - b. Where does grass hay fit? (energy)
  - c. Where does oats fit? (energy)

- Ask: SHEEP (Refer to *Rams, Lambs & You*, page 15, "Feeding Your Market Lamb" activity)
  - a. What category does cracked corn fit into? (energy)
  - b. Where does soybean meal fit? (protein)
  - c. Where does chopped alfalfa hay fit? (energy)
- Ask: GOAT (Refer to *Just Browsing*, page 24, "My Word!" activity)
  - a. What category does forage fit into? (energy)
  - b. Where does phosphorus fit? (vitamins & minerals)
  - c. Where does silage fit? (energy)

## Why is that important? (APPLY)

- Ask: Why is it important for us to know this classification system? (Proper nutrition is the foundation to a healthy animal. Members will know what to feed their ruminant animal.)
- Ask: Are there any other areas where this information can be applied? (Future careers such as animal nutritionist, Extension agent, rancher, etc.; other ruminant animal nutritional needs.)

## Resources

- National 4-H Council. (2005). *Bite into Beef*. (pages 6-7).
- National 4-H Council. (2003). *Just Browsing*. (page 24).
- National 4-H Council. (2003). *Rams, Lambs & You*. (page 15).
- Ohio State University Extension. (2011). Nutrition and Feeding. *Beef resource handbook*. (pages 7-1 through 7-7).
- Ohio State University Extension. (2008). Nutrition. *Goat resource handbook*. (pages 56-57).
- Ohio State University Extension. (2011). Nutrition. *Sheep resource handbook for market and breeding projects*. (pages 50-51).

<b>Whole Grain Barely</b>  (Energy)	<b>Whole Grain Oats</b>  (Energy)	<b>Wheat</b>  (Energy)
<b>Corn</b>  (Energy)	<b>Milo</b>  (Energy)	<b>Beet Pulp</b>  (Energy)
<b>Molasses</b>  (Energy)	<b>Whole Grain Rye</b>  (Energy)	<b>Buckwheat</b>  (Energy)
<b>Soybean Hulls</b>  (Energy)	<b>Dried Whey</b>  (Energy)	<b>Cottonseed Meal</b>  (Protein)

<p><b>Linseed Meal</b></p> <p>(Protein)</p>	<p><b>Corn Gluten Meal</b></p> <p>(Protein)</p>	<p><b>Distillers Grain</b></p> <p>(Protein)</p>
<p><b>Brewers Grain</b></p> <p>(Protein)</p>	<p><b>Blood Meal</b></p> <p>(Protein)</p>	<p><b>Fish Meal</b></p> <p>(Protein)</p>
<p><b>Dicalcium Phosphate</b></p> <p>(Vitamins &amp; Minerals)</p>	<p><b>White Salt</b></p> <p>(Vitamins &amp; Minerals)</p>	<p><b>Trace Mineral Salt</b></p> <p>(Vitamins &amp; Minerals)</p>
<p><b>Ground Limestone</b></p> <p>(Vitamins &amp; Minerals)</p>	<p><b>Vitamin Pre-Mix</b></p> <p>(Vitamins &amp; Minerals)</p>	<p><b>Forages</b> (hay, pasture, alfalfa cubes)</p> <p>(Energy)</p>

<b>Corn Gluten Feed</b>  (Energy)	<b>Whole Soybeans</b>  (Protein)	<b>Soybean Meal</b>  (Protein)
<b>Whole Cottonseed</b>  (Energy)	<b>Bone Meal</b>  (Vitamins & Minerals)	<b>Wheat Middlings</b>  (Energy)

<b>Whole Grain Barely</b>	<b>Whole Grain Oats</b>	<b>Wheat</b>
<b>Corn</b>	<b>Milo</b>	<b>Beet Pulp</b>
<b>Molasses</b>	<b>Whole Grain Rye</b>	<b>Buckwheat</b>
<b>Soybean Hulls</b>	<b>Dried Whey</b>	<b>Cottonseed Meal</b>



<b>Linseed Meal</b>	<b>Corn Gluten Meal</b>	<b>Distillers Grain</b>
<b>Brewers Grain</b>	<b>Blood Meal</b>	<b>Fish Meal</b>
<b>Dicalcium Phosphate</b>	<b>White Salt</b>	<b>Trace Mineral Salt</b>

<b>Ground Limestone</b>	<b>Vitamin Pre-Mix</b>	<b>Forages</b> (hay, pasture, alfalfa cubes)
-------------------------	------------------------	--

<b>Wheat Middlings</b>	<b>Whole Cottonseed</b>	<b>Soybean Meal</b>
<b>Whole Soybeans</b>	<b>Bone Meal</b>	<b>Corn Gluten Feed</b>

<b>Energy</b> (Carbohydrates & Fats)	<b>Energy</b>
<b>Proteins</b>	<b>Proteins</b>
<b>Vitamins &amp; Minerals</b>	<b>Vitamins &amp; Minerals</b>

# Body Condition Scoring

Tyenne Roland, Extension Educator

## Goal (learning objective)

Youth will learn what a body condition score is and how to determine what score an animal should receive.

## Supplies

- Body Condition Score Handouts (make enough copies for the group)
- Videos about body condition scoring (see resources)
- Pictures of animals of various body condition scores (see resources)
- 9 Hula Hoops, labeled 1 through 9
- Computer with internet connection
- An outdoor area or large room where youth can move
- Table

## Pre-lesson preparation

- Read and review the lesson and resources
- Make photocopies of the Body Condition Score Handouts
- Watch the YouTube videos (see resources)

## Lesson directions and outline

Each species of animals can be scored on a number system based on their appearance to determine a body condition score.

A body condition score is determined by the amount of body fat or lack of body fat and is expressed numerically.

- Pigs, sheep, goats and dairy cows are based on a 1-5 scale with one being very thin and five being overly fat.

- Beef cattle and horses are on a 1-9 scale with one being emaciated (very thin) and nine being very obese (fat).

As you discuss the numbers of body condition score, share the handouts and take time to watch the videos with the youth.

An animal's body condition score can vary throughout the year. The body condition is typically dependent on the environment and amount of feed the animal has access to. It should be measured a couple times a year to ensure good health. By assessing the animal and assigning a body condition score, the producer has the ability change their nutritional and management strategies to meet the needs of the animal. This will help keep the animal in the optimal condition and not waste the producers feed resources. It is important that animals being ready to breed are not too fat or too thin. This could cause a reduced pregnancy rate or affect milk production after the animal gives birth.

## Conducting the activity (DO)

1. Review the numerical body condition scores for each species with the youth.
2. Place the labeled hula hoops around the room.
3. Display pictures of animals one at a time. Have youth move to the numbered hula hoop that they think matches the body condition score of the animal displayed.
4. Allow youth time to transition to the hula hoop. Once they have selected their hoop, ask the group to share why they chose that score
5. Once all images have been gone through, gather the images together and have the group arrange the images in order from thinnest animal to fat-test. Have youth discuss the differences that they see.

### What did we learn? (REFLECT)

- Ask: What areas of the animal do you look at to determine body condition score?
- Ask: Is it easy to tell apart an animal with a body condition score of 1 compared to a 5 in pig, sheep or goat? Or a 1 to a 9 in beef?
- Ask: Is it easy to compare a 1 to a 3 in pig, sheep or goat?

### Why is that important?

- Ask: What is the benefit of having your animal score at least an average body condition score?
- Ask: What body condition score would you want people to see when looking at the animals that are in your care?

### Resources

Iowa State University. Center for Food Security and Public Health. (2011) NVAP Module 21: Animals' Fitness to Travel. Body Condition Score - Swine. Retrieved from: <https://research.unc.edu/files/2012/11/Body-Condition-Scoring-Swine.pdf>

Ockert, Katie. (2015). Body Condition Scoring in Goats. Michigan State University. Retrieved from [https://www.canr.msu.edu/news/body\\_condition\\_scoring\\_in\\_goats](https://www.canr.msu.edu/news/body_condition_scoring_in_goats)

Kott, Dr. Rodney and Surber, Dr. Lisa. (2013). Body Condition Scoring in Sheep. Montana State University. Retrieved from: <https://articles.extension.org/pages/66823/what-is-body-condition-scoring-in-sheep>.

Ohio State University Extension. (2011). Nutrition and Feeding. *Beef resource handbook* (pages 7-19 through 7-22).

Ohio State University Extension. (2008). Caring for Animals. *Goat resource handbook* (pages 159-164).

Ohio State University Extension. (2011). Caring for Animals. *Sheep resource handbook for market and breeding projects* (pages 135-139).

Ohio State University Extension. (2000). Nutrition. *Swine resource handbook for market and breeding projects* (pages 8-5 through 8-14).

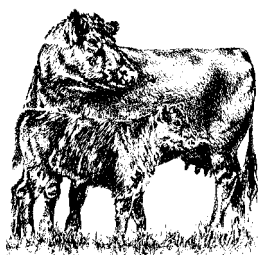
Western Beef Resource Committee. (2016). Cattle Producer's Handbook Management Section. *Condition Scoring of Beef Cattle*.

### YouTube Videos:

Oklahoma State University. (2014). Body Condition Scoring for Meat Goats. Retrieved from: <https://www.youtube.com/watch?v=rnxwwGP7sqA>

Purdue University Extension. (2007). Body Condition Scoring Beef Cattle. Retrieved from: <https://www.youtube.com/watch?v=ObjekWP1rHs>

Purdue University Extension. (2018). Body Condition Scoring Ewes. Retrieved from: <https://www.youtube.com/watch?v=iKgtWy8gf6M>



# Cattle Producer's Handbook

Management Section

720

## Condition Scoring of Beef Cattle

*Patrick A. Momont, Extension Beef Specialist, University of Idaho**Richard J. Pruitt, Associate Professor  
South Dakota State University*

The nutritional requirements of the animal must be met to attain high levels of cow performance and efficient use of feed resources. Precise feeding of beef cows is complicated, however, under diverse range and pasture environments. Monitoring body condition during the production cycle is an effective means of evaluating the cow herd's nutritional program.

### Body Condition Scoring

Cow body condition scoring is a method of categorizing breeding animals by their degree of body reserves. Numerical values, derived through subjective visual appraisal and (or) manual palpation, are assigned to each cow according to apparent external fat cover, muscle appearance, and apparent skeletal features.

While several numbering systems for assessing condition scores are in use, they all are based on the

same range of cow body condition, and all serve the same function. A system using the relative rankings of 1 through 9, which is commonly used throughout the United States, is described in Table 1. Key anatomical reference points for evaluating cow body condition are shown in Fig. 7.

Researchers have reported strong positive correlations between condition scores and the percent body fat of cows. In fact, condition scores are more indicative of an animal's relative body fatness than other objective linear measurements such as weight to height ratios and backfat probes. Research shows visual appraisal alone can accurately evaluate body condition, which is beneficial considering that palpating all cows may not be practical under certain circumstances. A simplified reference guide containing key points and backfat estimates for each condition score is shown in Table 2.

**Table 1. Body condition scoring system for beef cows.**

Score	Condition	Description
1	Severely emaciated	Individual spinous processes, shoulder, rib, and hip bones are obvious. No apparent fat cover. Shoulder, loin, and rear quarter muscle has marked atrophied appearance. Physically weak (Fig. 1).
2	Extremely thin	Same as 1 but not weakened (Fig. 2).
3	Very thin	Individual spinous processes, shoulder, rib, and hip bones are obvious. No apparent fat cover. Only slight muscle atrophy (Fig. 3).
4	Slightly thin	Individual spinous processes no longer apparent. Rear ribs, hip, and pin bones evident. Slight fat cover over shoulder and foreribs only. No visible muscle atrophy (Fig. 4).
5	Moderate	Last two ribs noticeable. Small amount of fat over shoulder, foreribs, and loin. Slight or no fat on brisket or over hip and pin bones (Fig. 5).
6	Slightly fleshy	Individual ribs are not evident. Moderate fat covering over shoulder, loin, and foreribs. Some fat in brisket and over last ribs and hip bones (Fig. 6).
7	Fleshy	Very smooth profile due to fat deposits. Considerable fat covering over shoulder, rib, loin, and hip. Fat fills out brisket, flanks, and tailhead.
8	Obese	When viewed from behind, back and hips have square appearance, and tailhead is full due to excessive fat deposits. Flanks appear deep, and brisket is full and distended with fat.
9	Very obese	Excessive fat deposits cause a rippled appearance over loin, hip, and tailhead. Neck appears short due to fullness of brisket. Heavy deposition of udder fat noticeable in dry cows.



**Table 2. Key points for condition scoring beef cows.**

Reference point	1	2	3	4	5	6	7	8	9
Physically weak	yes	no	no	no	no	no	no	no	no
Muscle atrophy <sup>1</sup>	yes	yes	slight	no	no	no	no	no	no
Outline of spine visible	yes	yes	yes	slight	no	no	no	no	no
Outline of ribs visible	all	all	all	3 to 5	1 to 2	0	0	0	0
Fat in brisket and flanks	no	no	no	no	no	some	full	full	extreme
Outline of hip and pin bones visible	yes	yes	yes	yes	yes	yes	slight	no	no
Fat udder and patchy fat around tailhead	no	no	no	no	no	no	no	slight	yes
Backfat estimate, inches	0	0	.05	.11	.19	.29	.41	.54	.68

<sup>1</sup> Muscles of loin, rump, and hindquarter are concave, indicating loss of muscle tissue.



**Fig. 1. Condition score 1—severely emaciated.**



**Fig. 2. Condition score 2—extremely thin.**



**Fig. 3. Condition score 3—very thin.**



**Fig. 4. Condition score 4—slightly thin.**



**Fig. 5. Condition score 5—moderate.**



**Fig. 6. Condition score 6—slightly fleshy.**

## Condition Scores and Cow Performance

### Reproductive Performance

Condition scores can be used to manage the cow herd toward a desired level of reproductive performance. Cows of higher body condition at calving and during early lactation are more likely to cycle and become pregnant early in the breeding season.

Results from a 3-year study in western South Dakota indicate that the likelihood of estrus by the beginning of the breeding season increases with higher cow body condition scores (Table 3). The probability of cows conceiving early and becoming pregnant during a 60-day breeding season is also greater as condition score increases (Table 4).

**Table 3. Cow body condition and probability of cycling by the beginning of breeding season.**

Condition score	Probability based on pre-calving condition score	Probability based on pre-breeding condition score
2	—	.05
3	.09	.12
4	.19	.28
5	.35	.52
6	.55	.74
7	.74	.89
8	.86	—

**Table 4. Cow body condition and reproductive performance.**

Condition score	Probability of pregnancy during a 60-day breeding season		Probability of conceiving in the first 21 days of the breeding season	
	Early calvers	Late calvers	Early calvers	Late calvers
Based on condition score at calving:				
3	.88	—	.51	—
4	.93	.88	.58	.41
5	.96	.93	.65	.56
6	.98	.96	.72	.70
7	.99	.97	.77	.81
8	.99	.99	.82	.89

Based on condition score at the beginning of breeding season:

2	.81	.60	.29	.23
3	.91	.80	.44	.36
4	.96	.91	.60	.50
5	.98	.97	.75	.65
6	.99	.99	.85	.77
7	1.00	.99	.92	.86

Late-calving cows that are thin (condition score 3 or less) have the poorest chances of cycling and becoming pregnant. Cows that calve early could be one condition score less at the beginning of the breeding season than late calvers and still have the same probability of conceiving. Higher levels of nutrition for late-calving cows and early calving of heifers will ensure that a majority of the cow herd cycles early in the breeding season.

Several studies indicate that average body condition or cows with condition scores of 5 at calving and at the beginning of the breeding season will have relatively high levels of reproductive performance. Many management factors in addition to nutrition and body condition will affect reproductive performance of the beef cow herd. What is considered ideal body condition may vary with location, breed, month of the breeding season, and management system. The optimum body condition at various times of the year will also depend on what level of reproductive performance is expected.

To obtain relatively high reproductive performance and still avoid excessive feed costs, nutritional programs should match cow body condition with an expected level of performance. For the scoring system described, a change in one condition score is equivalent to a 60- to 80-pound change in weight. A cow with a condition score of 7 could stand to lose 140 pounds of body weight if condition score 5 is the goal. A condition score 3 cow would need to gain 140 pounds. These weight changes do not include weight gain of the fetus and fluids associated with pregnancy.

## Calf Performance

Lactating cows use their body fat as an energy source for milk production. In general, heavier milking cows lose more body condition during lactation than average milkers when both groups are provided a similar level of nutrition. As a result, the heaviest calves may often be suckling the thinnest cows.

Several university studies have shown that weaning weights of calves are not related to cow body condition scores. Changes in management and feeding programs from spring to summer and fall may have allowed for compensatory growth of calves that were previously undernourished in these studies. Only under severe nutritional restriction of the cow (loss of two or more condition scores) has it been determined that weaning weights of calves are depressed (Table 5).

**Table 5. Effects of cow condition score change from March until May calf performance.**

	Condition score change, March to May		
	Maintained	Lost one	Lost two or more
205-day adjusted weight, lb	607	606	586

- **Cows should be at least a condition score of 5 at calving and the beginning of the breeding season for high levels of reproductive performance.** Late-calving cows require higher condition scores than early calvers for the same level of reproductive performance.
- **Breed heifers to calve 20 to 30 days before the mature cows.** In the future, this practice will increase the likelihood that thin, young cows will cycle and conceive during a fixed breeding season.
- **Avoid using condition scores as a primary selection tool for culling cows in the fall.** Milking ability and cow body condition can be related. The thin cows may be weaning heavier calves.

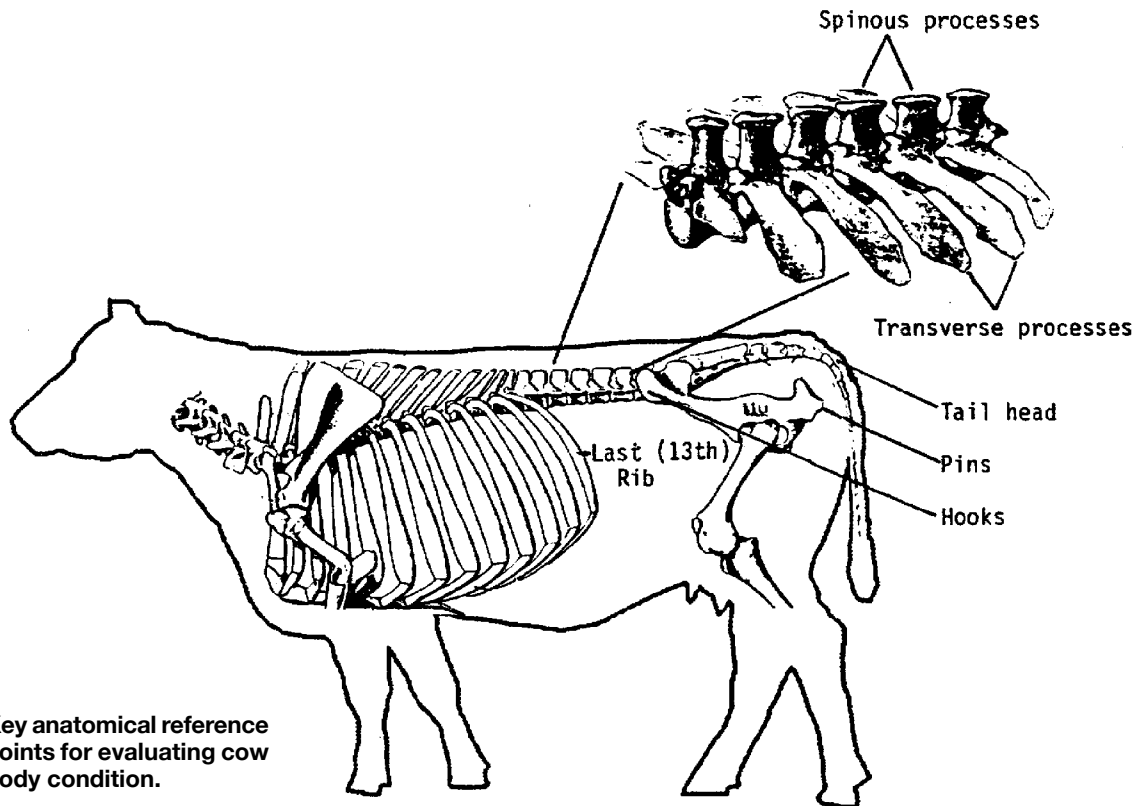


Fig. 7. Key anatomical reference points for evaluating cow body condition.



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# Body condition scoring of sheep

J. Thompson and H. Meyer

Throughout the production cycle, sheep producers must know whether or not their sheep are in condition (too thin, too fat, or just right) for the stage of production: breeding, late pregnancy, and lactation.

Weight at a given stage of production is the best indicator, but as there is a wide variation in mature size between individuals and breeds, it is extremely difficult to use weight to determine proper condition. Body condition scoring describes the condition of a sheep, is convenient, and is much more accurate than a simple eye appraisal.

A body condition score estimates condition of muscling and fat development. Scoring is based on feeling the level of muscling and fat deposition over and around the vertebrae in the loin region (Figures 1–3). In addition to the central spinal column, loin vertebrae have a vertical bone protrusion (spinous process) and a short horizontal protrusion on each side (transverse

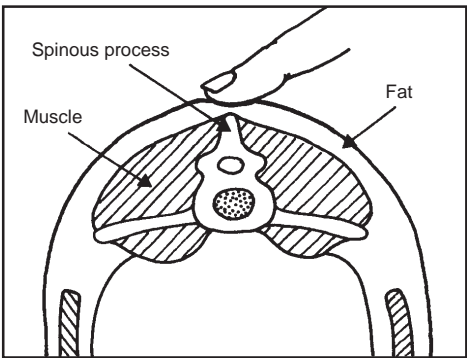


Figure 1.—Feel for the spine in the center of the sheep's back, behind its last rib and in front of its hip bone.

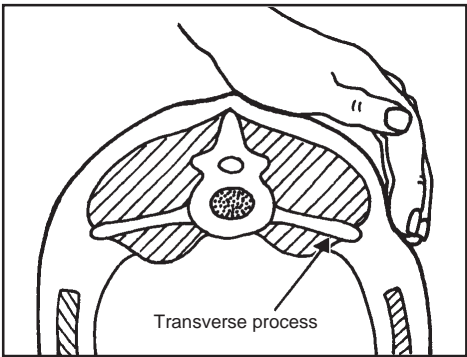


Figure 2.—Feel for the tips of the transverse processes.

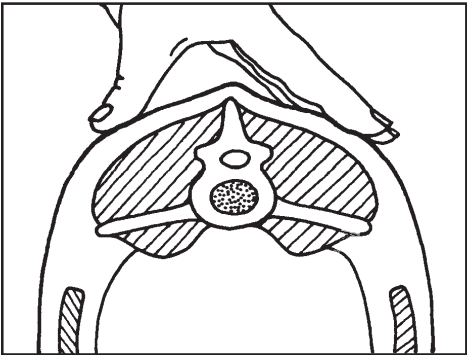


Figure 3.—Feel for fullness of muscle and fat cover.

James M. Thompson, Extension sheep specialist, and Howard H. Meyer, associate professor of animal sciences; Oregon State University.



process). Both of these protrusions are felt and used to assess an individual body condition score.

The system used most widely in the United States is based on a scale of 1 to 5. The five scores (Figures 4–8) are:

**Condition 1 (Emaciated)**

Spinous processes are sharp and prominent. Loin eye muscle is shallow with no fat cover. Transverse processes are sharp; one can pass fingers under ends. It is possible to feel between each process.

**Condition 2 (Thin)**

Spinous processes are sharp and prominent. Loin eye muscle has little fat cover but is full. Transverse processes are smooth and slightly rounded. It is possible to pass fingers under the ends of the transverse processes with a little pressure.

**Condition 3 (Average)**

Spinous processes are smooth and rounded and one can feel individual processes only with pressure. Transverse processes are smooth and well covered, and firm pressure is needed to feel over the ends. Loin eye muscle is full with some fat cover.

**Condition 4 (Fat)**

Spinous processes can be detected only with pressure as a hard line. Transverse processes cannot be felt. Loin eye muscle is full with a thick fat cover.

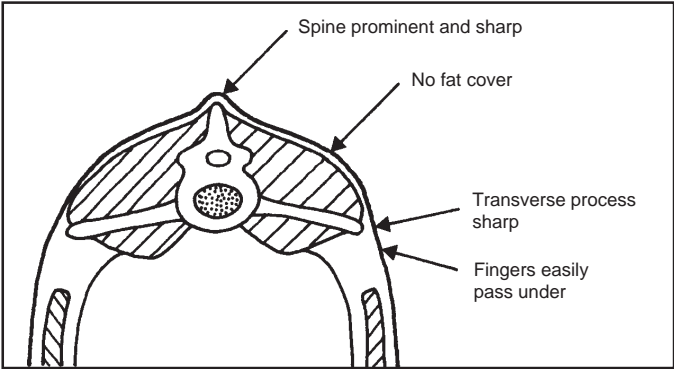


Figure 4.—Condition 1

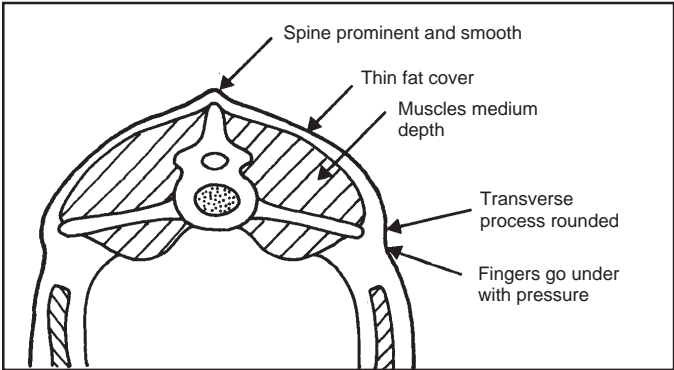


Figure 5.—Condition 2

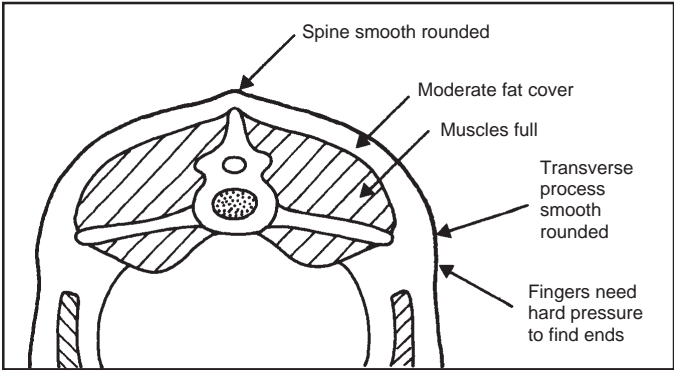


Figure 6.—Condition 3

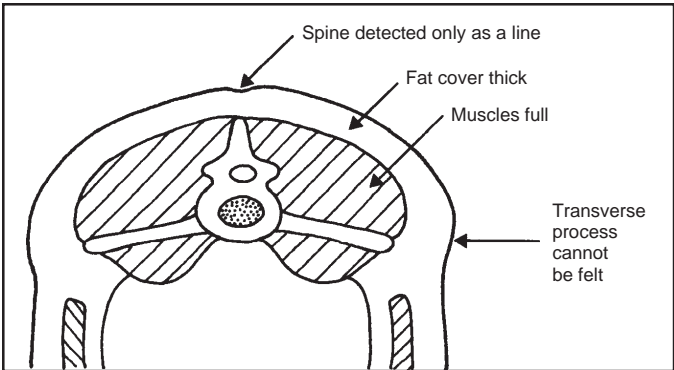


Figure 7.—Condition 4



**Condition 5 (Obese)**

Spinous processes cannot be detected. There is a depression between fat where spine would normally be felt. Transverse processes cannot be detected. Loin eye muscle is very full with a very thick fat cover.

The system contains everything from emaciated sheep to those that are grossly obese due to overfeeding or being nonproductive. In most typical sheep flocks, over 90 percent of the sheep should have a body condition score of 2, 3, or 4. It is recommended that half scores be used between 2 and 4, giving the following scores: 1, 2, 2.5, 3, 3.5, 4, and 5.

The intermediate half scores are helpful when an animal's condition is not clear. Keep in mind that placing an exact score is not as important as being able to assign a relative score. A body condition score of 3 versus a 3.5 is not such a big deal, but the relative difference between a 2.5 and 4 certainly is of concern.

Other than practical experience, there is little available research comparing condition scores with performance. The majority of the research reported has dealt with the relationship of body condition score at breeding to ovulation rate and subsequent lambing percentage. Generally, the better the body condition score at mating, the higher the ovulation rate and therefore the higher the potential lambing percentage. However, ewes with a condition score greater than 4 at breeding tend to have a higher incidence of barrenness. Ewes with a condition score less

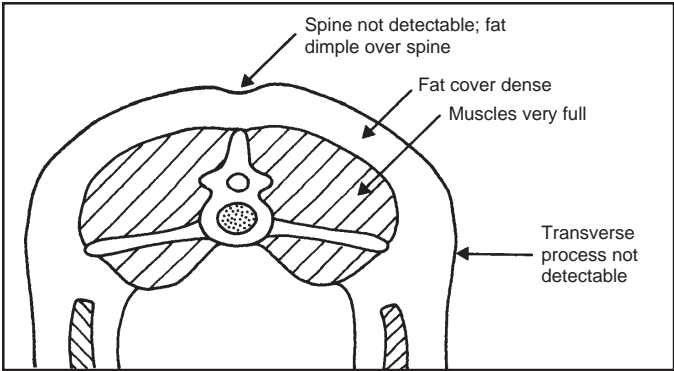


Figure 8.—Condition 5

than 3 at breeding will be more responsive to the effects of flushing than those with condition scores at 3.0–3.5 at mating.

Two research trials conducted by Oregon State University found that ewe body condition score at lambing had an effect on total pounds of lamb weaned per ewe. Ewes with a body condition score of 3 to 4 at lambing lost fewer offspring and weaned more pounds of lamb than those with a condition score of 2.5 or less.

In one study, ewes with a body condition score of 4 at lambing had a total weight of lamb weaned per ewe that was 82 percent greater than ewes with a body condition score of 2.5. The total weight weaned was 113 pounds versus 62 pounds per ewe. The increase in total weaning weight was due to improved lamb survival and heavier weaning weights.

In the other study, there was a 33 percent difference in total weight of lamb weaned (64 versus 85 pounds per ewe) between ewes with pre-lambing body condition scores of 2.5 to 3.5. This increase in pounds of lamb weaned was primarily due to improved lamb survival for offspring from the

ewes with the higher body condition score.

Some suggested (optimum) condition score values for the various stages of the production cycle are:

Production stage	Optimum score
Breeding	3–4
Early–Mid Gestation	2.5–4
Lambing (singles)	3.0–3.5
(twins)	3.5–4
Weaning	2 or higher

The scores suggested above should allow for optimum productivity in highly prolific ewes. On average, a difference of one unit of condition score is equivalent to about 13 percent of the live weight of a ewe at a moderate (3–3.5) body condition score. Thus, a ewe with a maintenance weight of 150 pounds would need to gain approximately 20 pounds to go from a body condition score of 2.5 to 3.5.

Body condition scoring is a subjective way to evaluate the status of a sheep flock—a potential tool for producers to increase production efficiency in their flocks.

**For further reading**

Khan, K., H.H. Meyer and J.M. Thompson. 1992. Effect of pre-lambing supplementation and ewe body condition score on lamb survival and total weight of lamb weaned. Proceedings Western Section American Society of Animal Science 43:175.

Russel, A. 1991. Body condition scoring of sheep. In: E. Boden (Ed.) Sheep and Goat Practice. p 3. Bailliere Tindall, Philadelphia.



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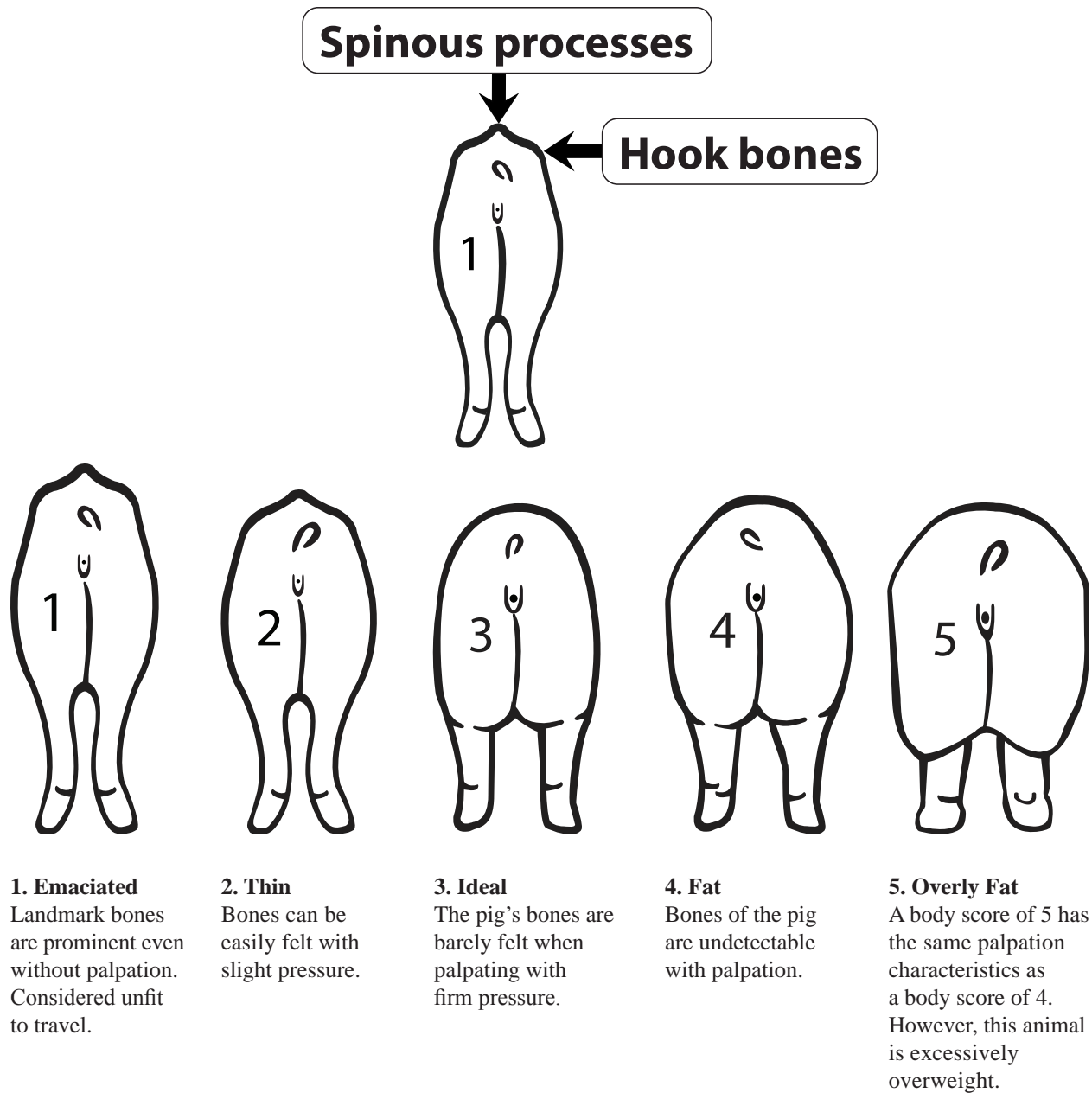
Extension Service, Oregon State University, Corvallis, O.E. Smith, director. This publication was produced and distributed in furtherance of the Acts of Congress of May 8 and June 30, 1914. Extension work is a cooperative program of Oregon State University, the U.S. Department of Agriculture, and Oregon counties.

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# Body Condition Score- Swine



# Body condition scoring in goats

Body condition scoring is a great way to evaluate the nutritional status of your goats.

Katie Ockert, Michigan State University Extension - November 3, 2015

Body condition scoring is a management tool that can be used to evaluate the nutritional status of animals. Body condition, or fat cover, is an indication of the energy reserves in an animal. Body condition scoring for goats uses a range from 1.0 to 5.0, with 0.5 increments. Healthy goats should have a body condition scoring between 2.5 to 4.0. Goats with a body condition scoring of 1.0, 1.5 or 2.0 indicate a management or health problem. A body condition scoring of 4.5 or 5 indicate an excessive amount of condition that could be detrimental to the goat's health; these scores are very rarely observed in goat herds under a standard management system.

Michigan State University Extension advises that it's important to note that body condition scoring cannot be assigned by simply visually evaluating an animal. The animal must be touched and felt in three specific areas of the body. The first is the lumbar area, which is the area of the back behind the ribs containing the loin. The second is the sternum, or breast bone, and the third is the ribs and intercostal (between the rib) spaces.

When palpating the lumbar area, you will be able to feel the lumbar vertebrae, which have a vertical protrusion called the spinous processes, and two horizontal protrusions called the transverse process. By running your hand over this area, try to gently grasp the processes with your fingertips and hand. Moving to the sternum and the rib cage, you must feel the amount of fat cover in each of the areas.

## Body condition score (BCS) ratings

BCS 1.0 = The goat is visually emaciated and weak. The backbone is highly visible and forms a continuous ridge. The flank is hollow and ribs are clearly visible. There is no fat cover and fingers can easily penetrate into the intercostal spaces.

BCS 2.0 = The goat's backbone is still visible with a continuous ridge. Some ribs can be seen and there is a small amount of fat cover. Ribs are still felt and intercostal spaces are smooth, but can still be penetrated.

BCS 3.0 = The backbone is not prominent, ribs are barely discernible and an even layer of fat covers the ribs. Intercostal spaces are felt using pressure.

BCS 4.0 = The backbone and ribs cannot be seen. The side of the animal is sleek in appearance.

BCS 5.0 = The backbone is buried in fat and the ribs are not visible. The rib cage is covered with excessive fat.

For more detailed descriptions for how to determine body condition scores, visit Langston University's publication, "Body Condition Scores in Goats."

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## Beef Body Condition Scores



# Swine Body Condition Scores

## Scoring Sow Body Condition

One of the keys to sow lifetime productivity is ensuring that the breeding female is in ideal body condition. To effectively assign a subjective body condition score, sow herd managers must be able to determine the amount of muscle and fat a sow has down her back.

Several tools are available to help assess sow body condition. These tools, reviewed below, will help sow managers use reference points to more consistently assign sow body condition scores (BCS) from 1 to 3. In the simplest

terms, a BCS of 1 means the sow is too thin and her daily feed allowance should be increased. A BCS of 3 means the sow is too fat and her daily feed allowance should be reduced. Emaciated sows with less condition than BCS 1 or obese sows with more condition than BCS 3 are not good candidates to remain in the sow herd. Fat sows often have lower feed intake in lactation, which may impair subsequent reproductive performance. A BCS of 2 is "ideal" and her daily feed allocation should remain the same.

### Body Condition Scores 1, 2 and 3

When evaluating body condition, stand behind the sow and view the shape down her back and to her shoulders, paying close attention to the edges of her back. As a sow gains muscle and fat, her back becomes wider and more flat. The red diagrams below will help you visualize the angularity of a sow's back with a score of 1, 2 or 3.



**Last Rib Palpation**  
A common reference point for sow body condition training aids is a sow's last rib, therefore it is important to be able to accurately identify this location. To find the last rib, press your fingers into the sow's side just forward of the flank. When you feel the curvature of the last rib, follow it upward to the backbone.



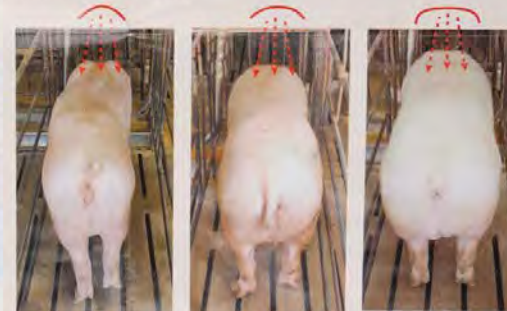
**Ultrasound Backfat Depth**  
Palpate the last rib and follow it up to the sow's backbone, then move 2 1/2 inches off the midline to position the ultrasound transducer to measure backfat depth. It is important to use a consistent location when measuring sow backfat. Check the ultrasound manufacturer's recommendations.



**Flank-to-Flank Weight Estimates**  
A cloth tape can be used to estimate sow weight by measuring it from flank to flank. Use the equation: Sow weight (lb.) = (DLB x Flank measurement in inches) x 425. Saw weight and backfat measurements can be used to estimate daily feed intake requirements. Cloth tapes are available from Kansas State University: <http://www.ksu.edu/ksu/FeedIntake>.



**Sow Body Condition Caliper**  
The sow body condition caliper is a new training tool to evaluate sow body condition. The caliper measures the angularity of the back at the last rib. As the sow gains weight, fat and muscle, her back will become wider and more flat. Be sure the arms of the caliper are not pressed into the sow's skin. Contact Mark Knaus, North Carolina State University, for more information about the sow caliper at: [mknaus@ncsu.edu](mailto:mknaus@ncsu.edu).



**BCS 1 - Thin**  
Ribs, hip bones and backbone curve upward with slight pressure. These sows are not thin and their daily feed allowance should be increased.  
Last rib backfat 6-10; 8-10 in (19-25 mm)<sup>a</sup>  
Caliper reading: 8 to 11

**BCS 2 - Ideal**  
Ribs, hip bones and backbone can be palpated with firm pressure but cannot be observed visually. The daily feed allowance for these sows is correct.  
Last rib backfat 11-13; 11-13 in (28-33 mm)<sup>a</sup>  
Caliper reading: 12 to 15

**BCS 3 - Fat**  
Ribs, hip bones and backbone cannot be palpated. Reduce daily feed allowance to bring these sows to a more ideal body condition.  
Last rib backfat 14-17; 13-17 in (33-43 mm)<sup>a</sup>  
Caliper reading: 16 to 17

<sup>a</sup> Backfat levels also vary with genetic stock. Check your genetic supplier and environment to see if backfat values appropriate for your herd.



Stand far back body condition sows were identified using the Kansas sow body condition caliper.

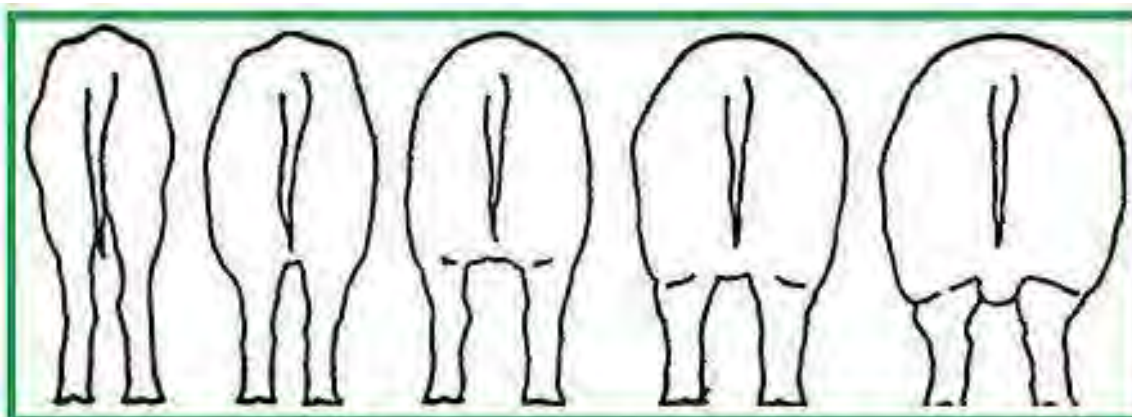


• Poster copy by  
Dale Miller and Mark Knaus  
• Photos by Donna Voth  
• Translation by Angela D'Monijm,  
IMV Technologies USA



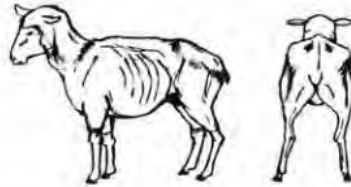
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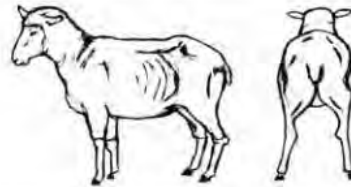
Score	Last rib backfat depth (mm)	Condition	Body Shape
1	<15	Emaciated	Hips, spine prominent to the eye
2	15 – 18	Thin	Hips, spine easily felt without pressure
3	18 – 20	Ideal	Hips, spine felt only with firm pressure
4	20 – 23	Fat	Hips, spine cannot be felt
5	>23	Overfat	Hips, spine heavily covered

# Sheep Body Condition Scores



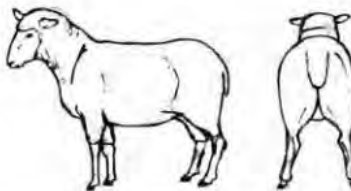
Condition score 1

Appearance angular and narrow  
Backbone raised and sharp  
Hollow behind ribs  
Tail feels bony  
Neck bones prominent



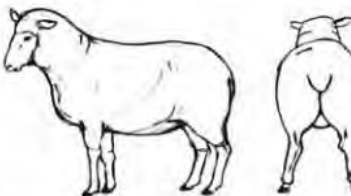
Condition score 2

Backbone raised but smooth  
Ribs are easily felt  
Tail bone easily detectable  
Thin neck



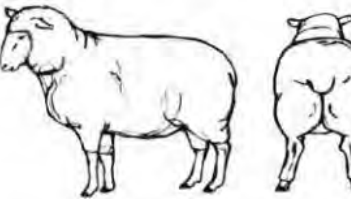
Condition score 3

Backbone slightly raised  
Ribs smooth, can just be felt  
Tail bones barely detectable



Condition score 4

Appearance well rounded  
Backbone can just be felt  
Ribs are covered  
Tail firm and rounded



Condition score 5

Appearance very well rounded  
Backbone barely detectable  
Ribs cannot be felt  
Tail fat and broad

# Body Condition Scoring Goats

	Score	Spineous process	Rib cage	Loin eye
<b>1</b>	<b>Very thin</b>	Easy to see and feel, sharp	Easy to feel and can feel under	No fat covering
<b>2</b>	<b>Thin</b>	Easy to feel, but smooth	Smooth, slightly rounded, need to use slight pressure to feel	Smooth, even fat cover
<b>3</b>	<b>Good condition</b>	Smooth and rounded	Smooth, even feel	Smooth, even fat cover
<b>4</b>	<b>Fat</b>	Can feel with firm pressure, no points can be felt	Individual ribs cannot be felt, but can still feel indent between ribs	Thick fat
<b>5</b>	<b>Obese</b>	Smooth, no individual vertebra can be felt	Individual ribs cannot be felt. No separation of ribs felt.	Thick fat covering, may be lumpy and "jiggly"

Source: [www.smallstock.info](http://www.smallstock.info)



# Budgeting for Feed Expenses

Scott Jensen, Extension Educator

## Goal (learning objective)

Youth will learn how to develop a budget for expected feed expenses in raising market livestock animals.

## Supplies

- Computer with Microsoft Excel
- 4-H Market Livestock Budget Template Excel spreadsheet from <https://www.uidaho.edu/-/media/UIIdaho-Responsive/Files/Extension/4-H/Projects/PP-4-H-Livestock-Budget-Template.xls>

## Pre-lesson preparation

- Read and rereview lesson
- Practice using the 4-H Market Livestock Budget Template

## Lesson directions and outline

Feed costs are the largest expense in raising livestock. Animals “partition” feed in a specific order. They first meet their maintenance requirement (what they need to just stay alive), followed by growth, lactation, and then reproduction. Growth only comes when we supply animals with nutrition levels above their maintenance needs. The more they consume on a daily basis above their maintenance needs, the faster they put on weight.

Animals that are fed to gain weight quicker will require fewer days on feed to reach market weight. This will result in less feed overall going towards maintenance and more to your saleable product.

Examples:

- Beef steer weighs in at 800 lbs. with an estimated finish weight of 1,300 lbs. If fed a ration of hay and steer chow to achieve a 4 lb. average daily gain, it will require 125 days on feed to gain the needed 500 lbs. The same steer fed to gain 3

pounds per day will require 167 days on feed to gain the needed 500 lbs. The steer fed to gain only 3 lbs. per day will require an extra 42 days on feed to reach the desired market weight. Youth (and parents) should also remember the need for a project animal to be ready and at market weight on weigh-in day at the fair.

- Market lamb weighs in at 75 lbs. with an estimated finish weight of 135 lbs. If fed a ration of 25% high quality alfalfa hay and 75% high quality grain mix to achieve a .85 average daily gain, it will require approximately 70 days on feed to reach a finish weight of 135 lbs. The same lamb fed to gain .5 pounds per day will require 125 days on feed to reach the desired finish weight. The slower gaining lamb will unlikely be in ideal market condition at the fair if it even makes minimum weight requirements to be eligible.

## Conducting the activity (DO)

1. Download the 4-H Market Livestock Budget Template.
2. Have youth complete a budget for each of their market livestock projects.

## What did we learn? (REFLECT)

- Ask: How much feed will be required to get your project to market weight?
- Ask: What will be the anticipated feed cost?
- Ask: How can feed a better quality ration save you money?

**Why is that important?**

- Ask: Why would it be more important for a market animal to reach market weight more quickly?
- Ask: Where else can you apply this same type of knowledge?
- Ask: Have you heard the phrase that time is money? What might that mean in terms of feeding and other aspects of livestock production?

**Resources**

Ohio State University Extension. (2011). Nutrition and Feeding. *Beef resource handbook* (pages 7-19 through 7-26).

Ohio State University Extension. (2008). Nutrition. *Goat resource handbook* (pages 64-78).

Ohio State University Extension. (2011). Nutrition. *Sheep resource handbook for market and breeding projects* (pages 56-65).

Ohio State University Extension. (2000). Nutrition. *Swine resource handbook for market and breeding projects* (pages 8-5 through 8-14).

# Digestive Systems

Sarah D. Baker, Extension Educator

## Goal (learning objective)

Youth will learn about the differences, parts and functions between ruminant and monogastric digestive systems.

## Supplies

- Copies of Handout 1 “Ruminant vs Monogastric Digestive System” make enough copies for group
- Copies of Handout 2 “Ruminant Digestive System – Parts and Functions” make enough copies for group
- Copies of Handout 3 “Monogastric Digestive System – Parts and Functions” make enough copies for group
- Computer (may need speakers depending on facility and group size)
- Internet connection to view YouTube video
- Slices of bread cut into 4 squares (each member will need one square of bread)
- Sandwich size Ziploc baggies (one bag for each member)
- One, three-ounce cup for holding liquid (one cup for each member)
- 1 Liter of bottle of soda
- 1 Quart of orange juice
- 1 Pitcher of water

## Pre-lesson preparation

- Purchase supplies (bread, soda, orange juice, Ziploc baggies)
- Make copies of Handouts 1, 2, and 3 for group
- Prepare bread slices
- Make arrangements to do the meeting in a location that has internet connection, tables, and chairs
- Read/review lesson
- Watch video
- Test computer/internet connection and video before meeting [https://youtu.be/JSIzjgpF\\_7g](https://youtu.be/JSIzjgpF_7g)

## Lesson directions and outline

Share the following information with the youth:

The definition of digestion is the process of breaking down food by mechanical and enzymatic action in the stomach and intestines into substances that can be used by the body. The digestive system performs five major functions:

1. Food intake
2. Storage
3. Digestion
4. Absorption
5. Elimination of waste

These functions take place in a special system called the digestive tract. Each feedstuff is broken down into smaller units so it can be utilized by the body, or eliminated from the body. The digestion process prepares food for absorption and use by the animal's body.

There are two main digestive systems in livestock:

1. Ruminant

## 2. Monogastric

The main differences between ruminants and monogastrics are monogastrics only have one compartment to their stomach, whereas ruminants have four compartments: rumen, reticulum, omasum, and abomasum.

Ruminants chew their food numerous times through a process called regurgitation or rumination. That means their food travels first from their mouth to the esophagus, then down to the rumen. From the rumen, the food travels to the reticulum where it can then come back up the esophagus into the mouth. It is then chewed again and the process is repeated. The rumen is a big fermentation vat that allows ruminants to digest cellulose (found in plants). Microorganisms, such as bacteria, are found inside the rumen and digest feed. The reticulum is a part of the rumen and works to help digest foods. It is also called the honeycomb because it looks like a honeycomb made by bees. The omasum also helps digest feed and squeezes water from the feed. It is called “many plies” because it has many folds. The abomasum, also called the true stomach, is the fourth compartment and is similar to the human stomach. Here digestive juices are produced and help pass the feed into the small intestine and then into the large intestine.

Sheep, goats, and deer are examples of other ruminant animals.

Monogastric digestive systems begin with the ingestion of food into their mouth. The tongue and the teeth gather feed and break it down into smaller pieces in order to make it easier for the animal to digest. Food travels down the esophagus, which is a long tube that carries the feed from the mouth to the stomach. The stomach serves as a reservoir for short term storage and digestion where enzymes break down the feed components so that they may enter and be absorbed into the blood stream. Any remaining undigested food travels into the small intestine, where it is broken down further. After the small intestine has removed all available nutrients from the feed, the remaining material is passed into the large intestine and finally excreted from the body through the rectum or anus.

Hogs, horses, and humans are all examples of monogastrics.

## Conducting the activity (DO)

1. Ask for volunteers to distribute Handouts 1, 2, and 3 to the group.
2. Review the background information with the group.
3. Share the video that will be of most interest to the youth: *CEV Multimedia: Ruminant Digestive Systems: A Closer Look DVD Lesson Preview* (available at: <https://www.youtube.com/watch?v=M8EF-267Z1wM>) or *Digestive Physiology of the Ruminant* available at <https://www.youtube.com/watch?v=3xQ83mbfn5s>
4. Discuss whichever video you chose to view with the group.
5. Discuss the differences between monogastric and ruminant digestive systems.
6. Ask the following questions:
  - a. What does the esophagus do?
  - b. Name the four parts of the ruminant stomach.
  - c. What happens to food in the reticulum?
  - d. What is the function of the small intestine?
7. Divide class into 3 groups.
8. One group will get water, one group will get orange juice and one group will get soda.
9. Pour 3 ounces of specified liquid for your group into small cups and distribute to appropriate group.
10. Place a piece of bread into a small Ziploc bag.
11. Add three ounces of specified liquid into Ziploc bag with bread.
12. Discussion:
  - a. What is the function of the Ziploc bag? The Ziploc bag acts as the stomach or rumen of the animal.
  - b. What does the liquid represent? The liquid acts as the enzymes or bacteria inside the stomach or rumen
  - c. Once the liquid is added to the bag, observe what happens to the bread.

d. Have one person from each liquid group share:

- Orange Juice (OJ)
- Soda
- Water

13. Have members massage or gently squeeze their bag. Have each group shared what happened after this.

- a. Discuss the mechanical action of the squeezing, what does that represent? (Muscles in the stomach or rumen). What is the liquid doing to the bread? (Liquid is acting like acid and breaking down the food, in this case the bread).
- b. Discuss the differences in rate of breakdown of the bread based on the type of liquid used.
- c. Discuss the differences in rate of breakdown of bread based on the amount of massaging/squeezing.

14. Following observation of what bread is most dissolved or digested, discuss the differences among the groups.

15. After discussion, discard baggies and contents into trash.

### What did we learn? (REFLECT)

- Ask: Name the five basic functions that the digestive system performs. (Food intake, storage, digestion, absorption, elimination of waste)
- Ask: What type of digestive system do humans have? (Monogastric)
- Ask: What is a livestock species that has a similar stomach to humans? (Horses and hogs)
- Ask: What type of digestive system do sheep and beef have? (Ruminant)
- Ask: What is the difference between a ruminant and monogastric digestive system? (The number of stomach compartments - ruminant has four; monogastrics have one).

### Why is that important? (APPLY)

- Ask: Are there foods that are harder to breakdown than others? Why? (Yes, plant matter is more difficult to digest compared to meat. Cellulose is hard to break down)
- Ask: Why do ruminants have four stomach compartments and monogastrics have only one? (There are four compartments to help digest and use the cellulose-rich plant material the animal consumes)
- Ask: Which has more complex food to breakdown? (Ruminant)

### Resources

CEV Multimedia. (n.d.). *Ruminant digestive systems: a closer look*. Retrieved from: <https://www.youtube.com/watch?v=M8EF267Z1wM>

Ohio State University Extension. (2011). Nutrition and Feeding. *Beef resource handbook* (pages 7-1 through 7-7).

Ohio State University Extension. (2008). Nutrition. *Goat resource handbook* (pages 49-55).

Ohio State University Extension. (2011). Nutrition. *Sheep resource handbook for market and breeding projects* (pages 49-55).

Ohio State University Extension. (2000). Digestive System. *Swine resource handbook for market and breeding projects* (page 7-1).

Thelen, J. (2016). A Stomach At Work. *Animal science anywhere*. Michigan State University Extension. Retrieved from: [msue.anr.msu.edu/uploads/236/65684/4H1659\\_ASA-DigestiveSystem\\_2016.pdf](https://msue.anr.msu.edu/uploads/236/65684/4H1659_ASA-DigestiveSystem_2016.pdf)

## NUTRITION: DIGESTIVE SYSTEMS – HANDOUT 1

### Ruminant vs Monogastric Digestive System

#### RUMINANT

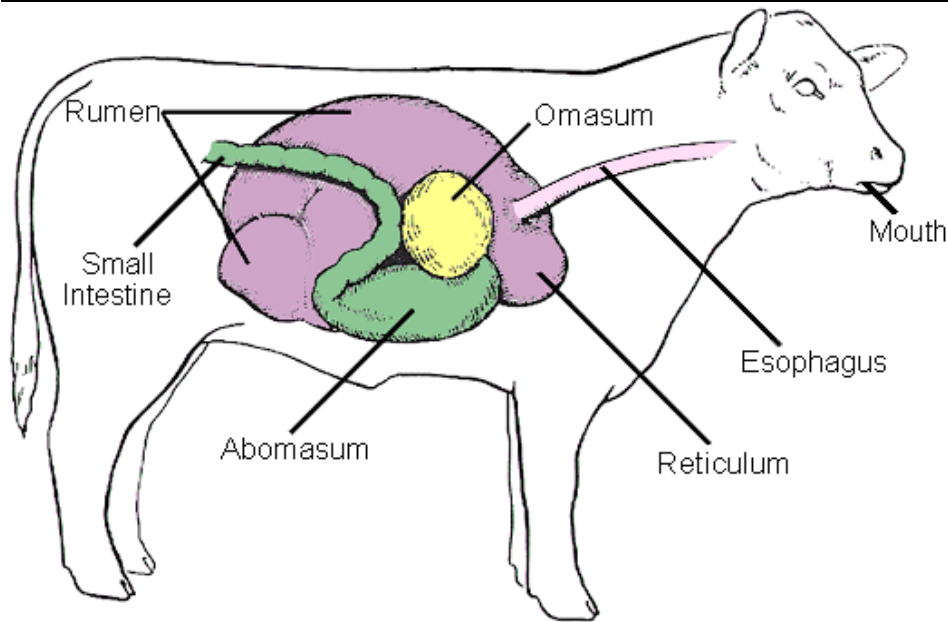


Image from: <http://www2.ca.uky.edu/agripedia/agmania/ias/asc106/girumin.asp>

#### MONOGASTRIC

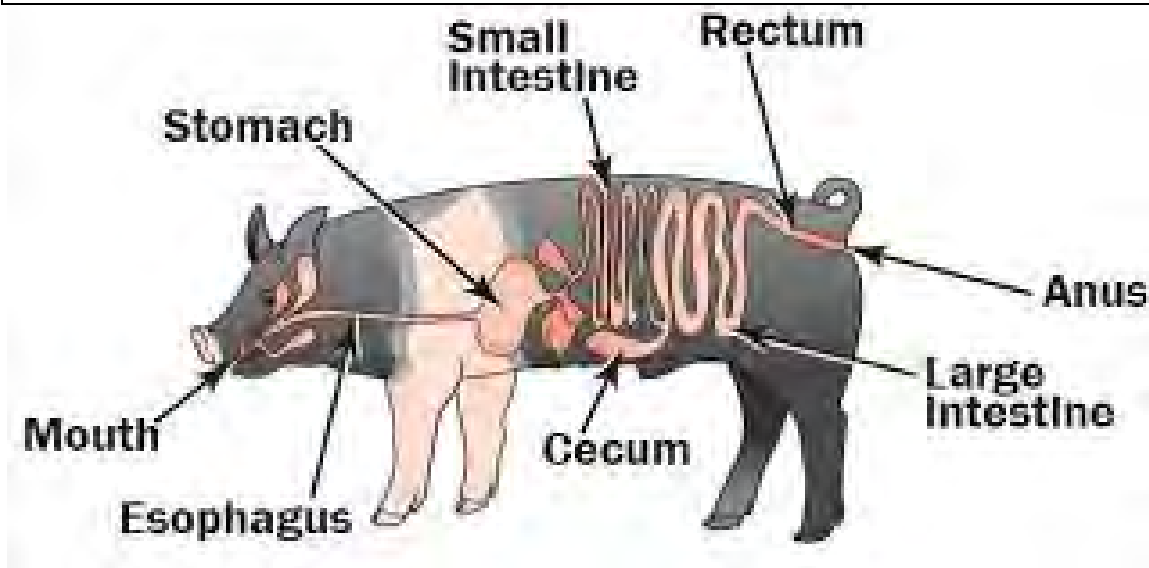


Image from: [http://4h.msue.msu.edu/uploads/files/Livestock/Animal\\_Digestion\\_-\\_A\\_Stomach\\_at\\_Work.pdf](http://4h.msue.msu.edu/uploads/files/Livestock/Animal_Digestion_-_A_Stomach_at_Work.pdf)

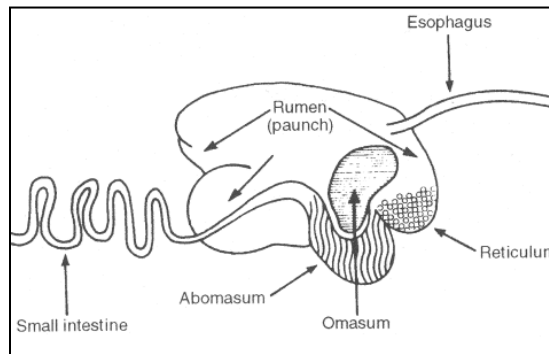
## NUTRITION: DIGESTIVE SYSTEMS – HANDOUT 2

### Ruminant Digestive System Parts and Functions

*Adapted from: Ruminant Digestive System (n.d.). Jimmy L. Rodgers. University of Idaho 4-H Beef Curriculum*

#### Parts of the Ruminant Stomach

1. Rumen
2. Reticulum
3. Omasum
4. Abomasum



*Image from: <http://ag.ansc.purdue.edu/sheep/ansc442/semprojs/nutrition/digest.htm>*

#### Functions of the Ruminant Stomach

1. Rumen: Functions as a storage area for food; aids in the breakdown of coarse particles through bacterial action.
2. Reticulum (honeycomb): Honeycomb-like walls retain foreign materials that could injure the digestive system; sorts feed particles by detecting large particles that need to be further digested; regurgitates food particles back to the mouth to be re-chewed.
3. Omasum: Acts as a filter by removing water from feed through muscle contractions; many folds or layers of muscle squeeze the moisture away from the feed particles, while also continuing to break down particle size.
4. Abomasum (true stomach): Acids and enzymes further digest feed and get them ready to travel to the small and large intestines.



## Monogastric Digestive System Parts and Functions

### Parts of the Monogastric Digestive System

1. Esophagus
2. Stomach
3. Small Intestine
4. Cecum
5. Large Intestine
6. Rectum

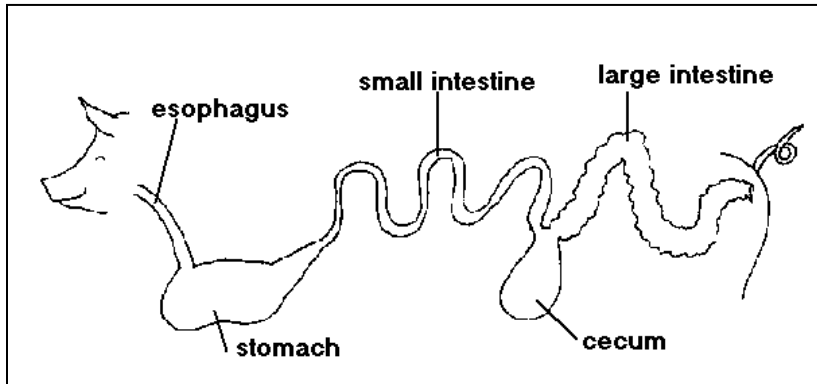


Image from:

[https://www.ncsu.edu/project/ansci\\_feeds/gi\\_tract/gi\\_tract.htm](https://www.ncsu.edu/project/ansci_feeds/gi_tract/gi_tract.htm)

### Functions of the Monogastric Digestive System

1. Esophagus: Transports feed from the mouth to the stomach.
2. Stomach: Secretes acids and enzymes that begin digestion of food.
3. Small Intestine: Where most digestion occurs. Enzymes secreted by the small intestine breakdown food and nutrients are absorbed into the blood stream.
4. Cecum: Where fiber is digested by microbes.
5. Large Intestine: As material passes through the large intestine, water is absorbed back into the animal's body.
6. Rectum: Waste is removed from the animal's body via the rectum and anus.

# Feed Labels

Sarah D. Baker, Extension Educator

## Goal (learning objective)

Youth will learn about ingredients and identify types of information found on feed labels.

## Supplies

- Handout 1 “Feed Tag Worksheet” (enough copies for group)
- Handout 2 “Cereal Box Worksheet” (enough copies for group)
- Several, different examples of cereal boxes (enough for when group breaks up into small groups)
- Handout 3 “Calf Starter” feed label
- Handout 4 “Lamb Grower” feed label
- Handout 5 “Pig Grower” feed label
- Handout 6 “Goat Grower” feed label
- Pencils and paper (enough for group)
- Flip chart and marker

## Pre-lesson preparation

- Make copies of the handouts
- Practice the activity
- Read through handouts and resources listed to familiarize yourself with the concepts and vocabulary

## Lesson directions and outline

- Share the following information with the youth:

Proper animal nutrition is the key to a successful livestock business and a 4-H livestock project. Animals require proper nutrition for growth and development. Feed tags provide us important information about nutrients and ingredients to help us choose a feed that will meet the animal’s needs and give us the performance we expect.

Anyone selling feed commercially must supply a label or tag with each bag of feed. You should always read the tag to make sure you are getting what you want in the product and that you are not getting something that you don’t want. Unless you can understand what is written on these tags, you won’t know if you are providing your animal with the proper nutrition.

Processed livestock feeds are grouped into two primary categories:

- **Complete feed** are those products containing all of the nutrients (except water and roughages) required by your animal. You can open the bag and empty the contents directly into the feeder.
- **Supplements** are products that are added or mixed into feed. They supply things such as additional protein, vitamins, minerals, and other ingredients that may be lacking in the base feed. Supplements are usually added in small, specified amounts and are not to be fed as the total ration.

Now let’s take a closer look at what we can find on feed tags and cereal box labels.

## Conducting the activity (DO)

1. Divide members into small groups
2. Have youth take out copies they brought from home and/or distribute samples to each group:
  - a. Cereal box labels
  - b. Feed tags
3. Have groups examine and compare information on the cereal boxes and feed tag as a group; record what similarities they find.
4. Distribute and have groups complete Handout 2 "Cereal Box Worksheet."
5. When done, distribute and have groups complete Handout 1 "Feed Tag Worksheet."

## What did we learn? (REFLECT)

- Ask: What did you discover while doing this activity?
- Ask: What similar information did you find on feed tags and cereal box labels? (record answers on flip chart)
- Ask: By law, feed tags must include some specific details, what types of information did you find on the feed tag? (record answers on flip chart; reference outline below regarding primary points)

### Key Feed Tag Information:

**Product Name and Brand Name:** A product name is always present and a brand name may also be present. A feed tag usually contains a unique name to identify the feed (Beef Start, Calf Starter, etc.).

**Purpose of Feed:** A statement specifying the species and animal classes for which the feed is intended (Starting/Preconditioned Beef Cattle, Growing/Finishing Beef Heifers, etc.)

**Medication and Active Drug Ingredients:** If a drug is used in the feed, the word MEDICATED must appear below the name with a statement and purpose of medication (claim statement), followed by a listing of the active drug ingredients and the amount of drug in the product.

**Guaranteed analysis:** Gives information on various

nutrients present in the feed. This will include:

- a. Minimum percentage of crude protein (percentage of equivalent protein from non-protein nitrogen, if any): The amount of crude or total protein in a feed is guaranteed. Crude protein is determined by multiplying the nitrogen content of a feed by the factor 6.25.
- b. Minimum percentage of crude fat: Fat has an energy value approximately 2.25 times the value of carbohydrate feedstuffs.
- c. Maximum percentage of crude fiber: Crude fiber is a measure of the indigestible or non-useful portion of a feed. Feeds having low fiber values tend to be higher in digestible energy or total digestible nutrients than those feeds having high fiber values.
- d. Minimum and maximum percentage of calcium.
- e. Minimum percentage of phosphorus.
- f. Minimum and maximum percentage of salt.
- g. Minimum Vitamin A in International Units (IU) per pound.

Note: The guarantees do not reflect the quality of feeding value of a feed. There is a difference in quality of various feed sources. For example, copper sulfate is 80-90% digestible, whereas copper oxide is only 0-10% digestible. Even different sites where the same mineral is collected will vary in digestibility.

**Ingredient Statement:** Lists ingredients used to manufacture the feed, starting with the highest concentration/amount. Similar types of ingredients may be listed individually or collectively.

Note: When non-protein nitrogen (NPN) is added to feedstuffs, a statement of "for ruminants only" must appear underneath the name of the feed. Additionally, it must also have a guarantee for crude protein which has been supplied from non-protein nitrogen.

**Feeding Instructions:** Directs how the product should be fed

**Warnings and Cautions:** Should be listed if any medications are added

**Distributor Name & Address:** Identifies the company

making or distributing the feed

Net Weight: Indicates weight of the feed in the bag

Ask: What are the sources of protein, energy, vitamins and minerals listed on your feed tag?

Ask: Why is it important to know what is in the feed we provide our animals?

### Why is that important? (APPLY)

- Ask: Where else might it be important to know the ingredients or nutritional value of a product?
- Ask: Besides feed or food, are there other settings where it is important to know about the quality of the various parts/components to insure you get a good value for the money you invest?

## Resources

Malone, B. & Schwartz, V. (n.d.). Lesson 3: Interpreting Feed Labels. *Putting Science into Animal Science Projects*. Ohio State University Extension. Retrieved from <http://www.ohio4h.org/statewide-programs/animal-sciences/livestock/livestock-resources>

National 4-H Council. (2005). Bite Into Beef. BU-08143 (page 11).

Ohio State University Extension. (2011). Nutrition and Feeding. *Beef resource handbook* (pages 7-1 through 7-16).

Ohio State University Extension. (2008). Nutrition. *Goat resource handbook* (pages 51-55).

Ohio State University Extension. (2011). Nutrition. *Sheep resource handbook for market and breeding projects* (pages 49-50).

Ohio State University Extension. (2000). Nutrition. *Swine resource handbook for market and breeding projects* (pages 8-1 through 8-3).

## NUTRITION: FEED LABELS – HANDOUT 1

### Feed Tag Worksheet

*Questions adapted from “Putting Science into Animal Science Projects” (The Ohio State University Extension) by Bonnie Malone & Vicki Schwartz.*

**Answer the following questions using the feed label provided for the species you raise.**

1. What is the major ingredient in this feed?
2. How many active ingredients are in this feed?
3. Is this feed medicated? If yes, what is the purpose of the medication?
4. If necessary, how many days prior to slaughter should you quit feeding this feed?
5. At what weight range should this ration be fed?
6. Can you feed this feed to all livestock, or is it only permitted for one species?
7. Fill in the following table for your feed tag:

Minimum Crude Protein Level	
Minimum Crude Fat Level	
Maximum Crude Fiber Level	
Range of Calcium Level	
Range of Phosphorus Level	
Range of Salt Level	
Minimum Selenium Level	

## NUTRITION: FEED LABELS – HANDOUT 2

### Cereal Box Worksheet

*Adapted from: "How to Read Feed Tags" Beef, Level II, (University of Idaho Extension 4-H Beef Curriculum), 1994, Kirk Astroth, Extension Specialist, 4-H Youth Programs, Kansas State University.*

Cereals are required to include nutrition information on the box. The label includes a list of ingredients which appear in order from most to least. It also lists percentages of recommended daily allowances and amounts of some nutrients per serving.

1. Name of Cereal:
2. Main Ingredient:
3. Serving Size:
4. Servings per package:
5. What does U.S. RDA mean?
6. Which vitamins are listed?
7. Does this cereal provide all of your daily need (100%) for any of the nutrients? If so, which ones?
8. Which nutrients increase when milk is added?
9. Which nutrients are minerals?

## NUTRITION: FEED LABELS – HANDOUT 3

### **Calf Starter Formulated for Starting Calves**

#### **Medicated**

For the prevention of coccidiosis in ruminating and non-ruminating calves including veal calves, and cattle caused by *Eimeria bovis* and *Eimeria zornia*. Feed for at least 28 days during periods of coccidiosis exposure or when experience indicates that coccidiosis is likely to be a hazard. Coccidiostats are not indicated for use in adult animals due to continuous previous exposure.

#### **Active Drug Ingredients**

*Decoquate*.....27.2g/ton

#### **Guaranteed Analysis**

*Crude Protein*.....min 20.00%

*Crude Fat*.....min 3.00%

*Crude Fiber*.....max 6.00%

*Acid Detergent Fiber (ADF)*.....min 7.00%

*Calcium*.....min 0.50%

*Phosphorus*.....min 0.60%

*Selenium*.....min 0.45 PPM

*Vitamin A*.....min 15,000 IU/lb.

*Vitamin D*.....min 4,000 IU/lb.

#### **Ingredients**

Corn, Corn Distillers Grains with Solubles, Dehulled Soybean Meal, Wheat Middlings, Dried Whey, Dehydrated Alfalfa Meal, Dicalcium and Monocalcium, Phosphate, Calcium Carbonate, Salt, Potassium Sulfate, Magnesium Sulfate, Choline Chloride, Vitamin A supplement, Vitamin E Supplement, D-Activated Animal Sterol (source of Vitamin D-3), Niacin, Vitamin B-12 Supplement, Riboflavin, d-Calcium Pantothenate, Menadione Dimethylpyrimidinol Bisulphite (source of Vitamin K Activity), d-Biotin, Thiamine Mononitrate, Pyridoxine Hydrochloride, Folic Acid, Zinc Sulfate, Ferrous Sulfate, Manganous Sulfate, Copper Sulfate, Ethylene Diamine Dihydriodide, Cobalt Sulfate and Sodium Selenite.

#### **Feeding Directions**

Feed 1.6 lbs. Per 100 lbs. body weight per day to deliver 22.7 mg Decoquate per 100 lbs. body weight per day. Feed this complete calf starter pellet free-choice along with hay and milk replacer for the first month. For the second through the third month, feed this starter free-choice with water and hay. Starting at 120 days of age, gradually change from this starter feed to a growing program.

**Warning: DO NOT FEED TO COWS PRODUCING MILK FOR FOOD.**

Manufactured By:

Adventure Mills Livestock Feeds

Cowtown, OH 43210

Net Weight 50 pounds (22.7 Kilograms)

Or as shown on shipping document



**NUTRITION: FEED LABELS – HANDOUT 4**

**Net Weight 50 Pounds**

**GRO-MOR**

**16% Lamb Finisher B**

**Medicated**

For the prevention of coccidiosis caused by *Eimeria ovina*.  
*E. crandallis*, *E. ovinoidalis*, *E. ninakohlyakimovae*, *E. parva*  
and *E. intricate*

**Active Drug Ingredient**

Lasalocid.....30 gm/ton

**Guaranteed Analysis**

Crude Protein.....Min. 16.00%

(Includes not more than 1.0% Crude protein equivalent from nonprotein nitrogen)

Crude Fat.....Min 2.50%

Crude Fiber.....Max 4.75%

Calcium.....Min 0.40%.....Max 0.50%

Phosphorus.....Min 0.60%

Salt.....Min 0.40%.....Max 0.60%

**Ingredients**

Grain Products, Animal Protein Products, Plant Protein Products, Dicalcium Phosphate, Calcium Carbonate, Salt, Potassium Chloride, Magnesium Oxide, Vitamin A Acetate in Gelatin, D-Activated Animal Sterol (Source of Vitamin D3) Vitamin E Supplement, Menadione Dimethylprimidinol Bisulfite (Source of Vitamin K), Riboflavin Supplement, D-Calcium Pantothenate, Niacin, Vitamin B12 Supplement, Choline Chloride, Zinc Oxide, Ethylene Diamine Dihydroiodide, Cobalt Carbonate, and Sodium Selenite.

**Caution**

The safety of Lasalocid in unapproved species and breeding animals has not been established. Do not allow horses or other equines access to Lasalocid as ingestion may be fatal. Feeding undiluted or mixing errors resulting in excessive concentrations of Lasalocid could be fatal to sheep.

**Feeding Directions**

Feed as the sole ration to lambs from 80 pounds body weight to market. Feed continuously to provide not less than 15 mg. nor more 75 mg. of Lasalocid per head per day depending on body weight. Provide plenty of clean fresh water.

Manufactured by:

XYZ Feed Company

Sheep Division

**PIG GROWER**

**MEDICATED**

For pigs from 30 pounds to 75 pounds

ADMINISTER TO SWINE IN A COMPLETE FEED FOR REDUCTION OF THE INCIDENCE OF CERVICAL ABCESES; TREATMENT OF BACTERIAL SWINE ENTERITIS (SALMONELLOSIS OR NECROTIC ENTERITIS CAUSED BY SALMONELLA CHOLERAEEUIS AND VIBRIONIC DYSTENTERY).  
MAINTENANCE OF WEIGHT GAINS IN THE PRESENCE OF ATROPHIC RHINITIS.

**ACTIVE DRUG INGREDIENT**

CHLOROTETRACYCLINE.....100G/ton

**GUARANTEED ANALYSIS**

CRUDE PROTEIN.....MIN. 19.00%  
LYSINE.....MIN 1.10%  
CRUDE FAT.....MIN 5.0%  
CRUDE FIBER.....MAX 4.0%  
CALCIUM.....MIN 0.60%  
CALCIUM .....MAX 1.10%  
PHOSPHORUS.....MIN. 0.55%  
SALT.....MIN 0.40%  
SALT.....MAX 0.90%  
SELENIUM.....MIN 0.30 PPM  
ZINC .....MIN 140.00 PPM

**INGREDIENTS**

Grain Products, Plant Protein Products, Processed Grain By-Products, Animal Fat, Animal Protein products, Calcium Phosphate, Lignin Sulfonate, Ground Limestone, Salt, L-Lysine Monohydrochloride, Methionine Supplement, Zinc Oxide, Zinc Sulfate, Ferrous Sulphate, Manganous Oxide, Copper Sulfate, Calcium Iodate, Sodium Selenite, Vitamin A Acetate, Dimethylpyrimidinol Bisulphite, Riboflavin Supplement, Thiamine Mononitrate, Folic Acid, Choline Chloride, Pyridoxine Hydrochloride, Biotin, Ethoxyquin (as a preservative)

**FEEDING DIRECTIONS**

Feed as the only ration to pigs weighing from 30 pounds to 75 pounds bodyweight.

**WARNING**

Withdraw 10 days prior to slaughter; contains high levels of copper; do not feed to sheep.

MANUFACTURED BY SKILLATHON FEEDS  
NET WEIGHT 50 POUNDS (22.7 KILOGRAMS)  
OR AS SHOWN ON THE SHIPPING DOCUMENT

## NUTRITION: FEED LABELS – HANDOUT 6

### Goat Starter

### Medicated

### Starter for Growing Kids

For the prevention of coccidiosis caused by *Eimeria ovina*, *E. crandallis*, *E. ovinoidalis*, *E. ninakohlyakimovae*, *E. parva* and *E. intricate* in goats maintained in confinement.

### Active Drug Ingredient

Lasalocid (As Lasalocid Sodium).....90 G/ton

### Guaranteed Analysis

Crude Protein.....	Min. 20.00%
Crude Fat.....	Min 2.50%
Crude Fiber.....	Max 10.0%
Calcium.....	Min 0.75%
Calcium.....	Max 1.25%
Phosphorus.....	Min 0.55%
Salt.....	Min 0.40%
Salt.....	Max 0.90%
Selenium.....	Min 0.30 ppm
Vitamin A.....	Min 2,000 IU/lb

### Ingredients

Processed Grain By-Products, Grain Products, Plant Protein Products, Forage Products, Roughage Products, Molasses Products, Ground Limestone, Salt, Lignin Sulfonate, Potassium Sulfate, magnesium Sulfate, Magnesium Oxide, Sodium Selenite, Calcium Propionate, Vitamin E Supplement, Vitamin A Acetate, Vitamin D-3 Supplement, Zinc Sulfate, Zinc Oxide, Sodium Molybdate, Manganous Oxide, Calcium Iodate, Cobalt Carbonate, Ferrous Sulfate.

### Feeding Directions

GOAT STARTER MEDICATED contains 45 mg of lasalocid per pound. Feed continuously as the sole ration to growing kids from 1 to 6 weeks of age at the rate of 0.33-1.55 pounds per head per day to provide not less than 15 mg and not more than 70 mg of lasalocid per head per day. Provide clean fresh water at all times.

### Caution

The safety of lasalocid in unapproved species has not been established; do not allow horses or other equine access to lasalocid as ingestion may be fatal; feeding undiluted or mixing errors resulting in excessive concentrations of lasalocid could be fatal to sheep.

Manufactured by Skillathon Feeds  
Net Weight 50 Pounds (22.7 Kilograms)  
Or as shown on the shipping document



# Monogastric Nutrition

Nikola Dalton, Extension Educator

## Goal (learning objective)

Youth will:

- Understand basic vocabulary as it relates to monogastric nutrition
- Understand the different growth stages of monogastrics
- Understand why there are different nutritional requirements during different growth stages

## Supplies

- Handout 1 - "Vocabulary Definitions" (make enough copies for the group)
- Microwave

Supplies listed below are for each group (kitchen and treats), adjust accordingly if working as one large group

### Kitchen supplies

- 1 large microwave safe bowl
- 1 medium microwave safe bowl
- 1 9x13 cake pan
- 1 spatula or wooden spoon
- Tin foil
- Cooking spray (i.e. Pam)

### Treat supplies

- 4 cups "Rice Krispies" type cereal
- 2 cups "Cheerios" type cereal
- 1 cup "Trix" type cereal
- 1 cup "Fruit Loops" type cereal
- 1 bag (10 1/2 ounce) miniature marshmallows
- 1/4 cup butter or margarine

## Pre-lesson preparation

- Be able to discuss vocabulary relative to monogastric nutrition - roughage, concentrate, salt, vitamins, fats, carbohydrates, minerals, energy, proteins and water.
- Read "Digestive System" in *Swine Resource Handbook for Market and Breeding projects*, chapter 7, page 7-1.
- Review "Classifying Feed Ingredients Into Nutrient Groups" in *Swine Resource Handbook for Market and Breeding projects*, chapter 8, page 8-5.
- Read "Feeding Your Growing Pigs" in *Swine Resource Handbook for Market and Breeding projects*, chapter 8, pages 8-11 through 8-13.
- Practice activity with family members.

## Lesson directions and outline.

Proper nutrition in a monogastrics is the foundation to a healthy animal. This lesson will lead members to understand nutritional requirements for different growth and reproductive stages as it relates to monogastric nutrition. For all animals there are five essential nutrients that are required and that feed can be classified. They include: carbohydrates (or energy), protein, fats, vitamins and minerals, and water. In the lesson these will be discussed more in depth

A monogastric is defined as an animal with a simple stomach or as a non-ruminant. Monogastrics can be omnivores or carnivores. An omnivore is an animal that eats both plant and animal materials. A carnivore is defined as an animal that eats other animals. Examples of a monogastric include swine, poultry, cats and dogs. Swine and poultry are considered omnivores while cats and dogs are both carnivores. Some special monogastrics such as rabbits and horses have a complex large intestine that allows them to digest plant materials. Rabbits and horses are herbivores; animals that only eat plants. To understand more about the differences between a monogastric and ruminants please see: Digestive Systems (Level 2, 3) Animal Science Lesson Plan under Nutrition.

The understanding of the nutritional requirements for the varied growth stages of a monogastric is important due to the complicated concept of creating a balanced feed ration (discussed in later lessons).

With this lesson youth should have a solid foundation to build upon and begin to evaluate feeding requirements as well as recognizing the differences in nutritional requirements in relation to the growth stages.

### Conducting the activity (DO)

1. Discuss the order of nutrition needs for a monogastric (for this lesson we will be referencing swine: as our monogastric):
  - a. Water - is an essential nutrient for all stages of growth. Different amounts of water are required at different stages of growth but usually a swine drinks about 2-3 pounds of water per pound of feed. A sow in lactation would require more water due to her production of milk. Water intake can also be dependent on environmental temperatures and stressors. Water should be clean and cool and have animals should have access at all times.
  - b. Fats – should be found in normal ingredients in pig feed and are essential to their diet. Fats are found in binders and palatability enhancers such as molasses or corn oil.
  - c. Maintenance –keeps the animal's body functioning at normal levels. Roughly 50% of the animal's food intake is used just for maintenance. This ration is comprised mainly of ENERGY feedstuffs.
  - d. Growth – This food intake is used to grow muscle, bone, and other body parts. This ration has mainly ENERGY feedstuffs in it, but also contains a small amount of PROTEIN. This is in addition to the Maintenance ration.
  - e. Reproduction - nutrition is important to health of the sow or gilt and for the proper development of the piglets during gestation. The reproduction ration has higher levels of PROTEIN as well as MINERALS & VITAMINS. This is in addition to the Maintenance and Growth rations.
  - f. Lactation - nutritional rations are used once a sow or gilt has farrowed. Lactation requires increased levels of PROTEIN and MINERALS & VITAMINS. This is in addition to the Maintenance and Reproduction rations.
2. Have youth get into groups of 3 or 4:
3. Provide each group a set of the kitchen and treat supplies.
4. Explain the activity to the members before start-

ing:

- a. Show members the cereal representations of the growth stages:
  - Maintenance - Rice Krispies type cereal
  - Growth - Cherrios type cereal
  - Reproduction - Fruit Loops type cereal
  - Lactation - Trix type cereal
  - Vitamins & Minerals - Marshmallows and butter
- b. Sample Question: Your breeding sow has farrowed and is lactating. What stage(s) of growth is she in? How many rations should be included in her daily feed ration?
5. For the above scenario all of the rations. Members should include small amounts of each ingredient (not all at once) over the course of the questions, all items should be in the pan by the last question.
6. Have members line pans with tin foil.
7. Scenario 1: Your market barrow is 100 pounds. What stage of growth is she in? How many rations should be included in her daily feed ration? (Maintenance and Growth)
8. Scenario 2: Your breeding gilt is at 220 pounds (assume this is your “ideal” weight for this animal). What stage of growth is he in? How many rations should be included in his daily feed ration? (Maintenance and Reproduction)
9. Scenario 3: Your sow has farrowed and lactating. What stage of growth is she in? How many rations should be included in her daily feed ration? (All - add all remaining cereals to pan)
10. Place butter and marshmallows into medium microwave bowl and cook until marshmallows are melted, stir well. These items represent minerals and vitamins which should be added (and mixed) to cereals in pan
11. Let cool for 10 minutes and enjoy!

### What did we learn? (REFLECT)

- Ask: How many growth stages are there for monogastrics and what are they called?
- Ask: What are the 5 nutrient groups that feed can be classified into?

### Why is that important? (APPLY)

- Ask: Why is it important for us to know the different growth stages? (Proper nutrition is the foundation to a healthy animal)
- Ask: Why should we care about feeding different rations in the separate growth stages?
- Are there other areas where this information can be applied? (Future careers, other monogastric animal nutritional needs)

## Resources

- Branch, A.(n.d.). *Beef nutrition web quest*. Ag 310 Applied Livestock Management Beef Nutrition. Retrieved March 25, 2015 from <http://communities.naae.org/thread/4170>
- National 4-H Council. (2004). *The Incredible Pig* (pages 19-20).
- National 4-H Council. (2004). *Putting the Oink in Pig*. (page 20).
- Ohio State University Extension. (2011). *Nutrition. Swine resource handbook for market and breeding projects*.(pages 8-1 through 8-18).
- U.S. Food and Drug Administration. (2014). *Animal Feed: See, Touch and Do A Hands-On Lesson Plan on the Basics of Animal Nutrition*. Retrieved March 25, 2015 from <http://www.fda.gov/AnimalVeterinary/ResourcesforYou/AnimalHealthLiteracy/ucm280837.htm>

## **NUTRITION: MONOGASTRIC NUTRITION – HANDOUT 1**

### **Vocabulary Definitions**

**Water:** The most essential nutrient and the cheapest nutrient. Pigs need access to clean, cool water at all times.

**Proteins:** Pigs need to contain feeds with essential amino acids. Amino acids are considered the building blocks of protein. The most important protein feeds for pigs are oil bearing feeds like soybean and linseed. Proteins found in approved animal by-products are also useful in pig diets. Cereal grains like corn, oats and wheat can be fed but must be feed with oil bearing feeds or approved animal by-products

**Energy:** Is not technically a nutrient but is a result of carbohydrates and fats that are in pigs diets. Energy is required in large amounts to provide for growth and maintenance

**Fats:** Fat furnishes two and one-fourth times more energy than equal amounts of carbohydrates. Cereal grains contain fats.

**Carbohydrates:** Sugar, starch, and fiber are carbohydrates and are found in most cereal grains

**Vitamins:** They are compounds that assist the body in the assimilation and use of the other nutrients. They are described as water soluble and fat soluble.

**Minerals:** Needed in body tissues and to assist in some of the body's chemical reaction. Calcium is important in bone formation. Phosphorus also helps in bone building and assists in energy utilization.

**Salt:** Is an important mineral for maintaining a good appetite and water consumption

**Roughage:** Is not fed to pigs because they have a monogastric, simple stomach. Roughages need to be broken down through digestion in a ruminant stomach. Hay is considered a roughage.

**Concentrate:** A concentrate is typically made from feedstuffs like wheat, corn, soybeans. A concentrate diet includes vitamins and minerals combine together with the other feedstuffs to make a ration easily digested by pigs.



# Animal By-Products

Rikki Ruiz, Extension Educator

## Goal (learning objective)

Youth will identify products they use in daily life that contain animal by-products.

## Supplies

- Copies of Handouts 1-3 (as a packet, enough for group)
  - Handout 1 - "Sheep By-Products Worksheet"
  - Handout 2 - "Cow By-Products Worksheet"
  - Handout 3 - "Pig By-Products Worksheet"
- Copies of Handouts 4-6 (as a packet, enough for group)
  - Handout 4 - "By-Products from Sheep"
  - Handout 5 - "By-Products from Cows"
  - Handout 6 - "By-Products from Pigs"
- Copies of Handouts 7-9 (1 copy for you)
  - Handout 7 - "Sheep By-Products Worksheet Answer Key"
  - Handout 8 - "Cow By-Products Worksheet Answer Key"
  - Handout 9 - "Pig By-Products Worksheet Answer Key"
- Pencils - enough for group

## Pre-lesson preparation

- Make photocopies of the handouts above.
- Read/review the handouts and terminology.

## Lesson directions and outline

Share the following information with the youth:

Livestock by-products are a part of many manufactured items that we use daily. Utilizing by-products enables us to use 99% of every animal. There are animal by-products in toothpaste, baseball equipment, clothing, items in your medicine cabinet, paint brushes and more.

### Conducting the activity (DO)

1. As a warm up, brainstorm with the group by-products that come from sheep, cows and pigs.
2. Have a volunteer distribute to each member a packet of Handouts 1-3.
3. Provide 10-15 minutes for members to work through the packet. Remember, they are working from the worksheet first so be prepared for questions, have them answer it to the best of their ability.
4. Once the group has completed the packet to the best of their ability, distribute the packet of Handouts 4-6.
5. Go through Handouts 1-3, reference your answer key (Handouts 7-9).
6. Ask: Were there any surprises as you worked through the worksheet?
7. Ask: Did anyone get all of the questions right for species that you don't work with?
8. Ask: Are there any similar by-products among the species?

**What did we learn? (REFLECT)**

- Ask: Why are by-products important?
- Ask: Why do we need to be knowledgeable about by-products?
- Ask: Are there any items that you use regularly that you didn't know were a by-product?

**Why is that important? (APPLY)**

- Ask: What are some specific ways consumers would be impacted, if by-products were not available?
- Ask: How might your understanding of by-products impact your decisions as a producer?
- Ask: What are some other settings where by-products are generated and put to good use?

**Resources**

Farm Credit. (2014). Everything But the Baa...*Knowledge Center: Education and Awareness*. Available at: <https://farmcreditknowledgecenter.com/Education-and-Awareness/Teaching-Materials/Educator-Resources-Blog/July-2014/Everything-But-the-Baaa.aspx>

Farm Credit. (2014). Everything But the Moo...*Knowledge Center: Education and Awareness*. Available at: <https://farmcreditknowledgecenter.com/Education-and-Awareness/Teaching-Materials/Educator-Resources-Blog/July-2014/Everything-But-the-Moo.aspx>

Farm Credit. (2014). Everything But the Oink...*Knowledge Center: Education and Awareness*. Available at: <https://farmcreditknowledgecenter.com/Education-and-Awareness/Teaching-Materials/Educator-Resources-Blog/July-2014/Everything-But-the-Oink.aspx>

National Agriculture in the Classroom (n.d). Teacher Center. *Ag-Knowledge*. Available at: <http://www.ag-classroom.org/teacher/agknow.htm>

Ohio State University Extension. (2011). Beef Carcass Evaluation. *Beef resource handbook* (pages 8-14 through 8-16).

Ohio State University Extension. (2008). Dairy Goats, Meat Goats, Fibert, Utility, and Pygmy Goats. *Goat resource handbook* (pages 112, 120, 127).

Ohio State University Extension. (2011). Sheep Products. *Sheep resource handbook for market and breeding projects* (pages 81-90).

Ohio State University Extension. (2000). Pork Products. *Swine resource handbook for market and breeding projects* (pages 5-1 through 5-8).

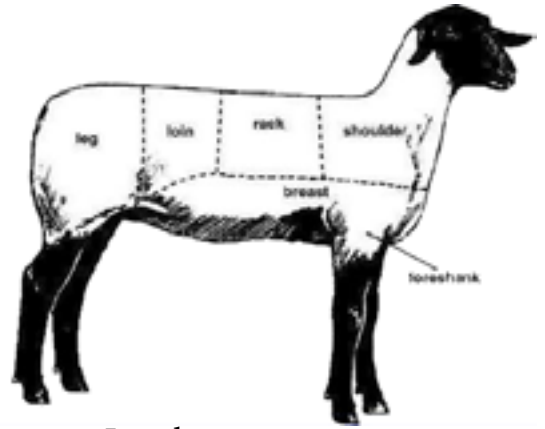
# Everything But the Baaaa.....

## Sheep By-Products Worksheet

Name: \_\_\_\_\_

### True or False?

*Do the products listed below come from sheep? Write true next to the products you think come from sheep and false after the ones that you don't think come from sheep.*



- \_\_\_\_\_ 1. Lanolin
- \_\_\_\_\_ 2. Lamb chops
- \_\_\_\_\_ 3. Peanut butter
- \_\_\_\_\_ 4. Yarn
- \_\_\_\_\_ 5. Baseballs
- \_\_\_\_\_ 6. Paper
- \_\_\_\_\_ 7. Paints

- \_\_\_\_\_ 8. Lumber
- \_\_\_\_\_ 9. Concrete
- \_\_\_\_\_ 10. Tennis balls
- \_\_\_\_\_ 11. Instrument strings
- \_\_\_\_\_ 12. Leg of Lamb
- \_\_\_\_\_ 13. Artists' brushes
- \_\_\_\_\_ 14. Drum heads

### Matching

*Match the product on the left to the part of the sheep that you think it came from on the right. You may use the parts of the sheep more than once.*

#### Products

- \_\_\_\_\_ 1. Surgical sutures
- \_\_\_\_\_ 2. Fabrics
- \_\_\_\_\_ 3. Rack of lamb
- \_\_\_\_\_ 4. Nitrogen fertilizer
- \_\_\_\_\_ 5. Chewing gum
- \_\_\_\_\_ 6. Clothing
- \_\_\_\_\_ 7. Solvents

#### Parts of the Sheep

- a. Intestines
- b. Hide and Wool
- c. Retail Meats
- d. Manure
- e. Fats and Fatty Acids

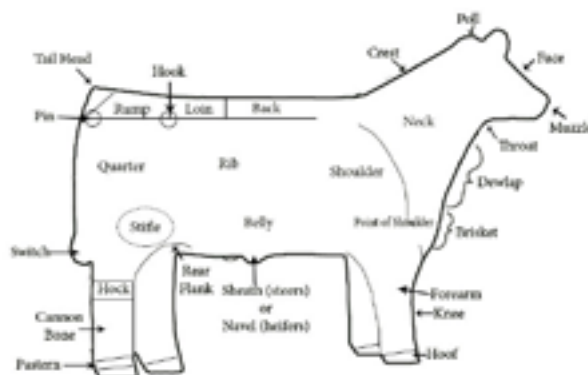
# Everything But the Moo.....

## Cow By-Products Worksheet

Name: \_\_\_\_\_

### True or False?

*Do the products listed below come from cows? Write true next to the products you think come from cows and false after the ones that you don't think come from cows.*



- |                           |                                  |
|---------------------------|----------------------------------|
| _____ 1. Medicine         | _____ 8. Solid wood fence boards |
| _____ 2. Anti-aging cream | _____ 9. Salt                    |
| _____ 3. Mashed potatoes  | _____ 10. Deodorant              |
| _____ 4. Felt             | _____ 11. Instrument strings     |
| _____ 5. Chewing gum      | _____ 12. Fertilizer             |
| _____ 6. Paper            | _____ 13. Plastics               |
| _____ 7. Cosmetics        | _____ 14. Rubber                 |

### Matching

*Match the product on the left to the part of the cow that you think it came from on the right. You may use the parts of the cow more than once. Some parts may not be used.*

#### Products

- \_\_\_\_\_ 1. Pasta
- \_\_\_\_\_ 2. Candles
- \_\_\_\_\_ 3. Sheet rock
- \_\_\_\_\_ 4. Phosphorus
- \_\_\_\_\_ 5. Chewing gum
- \_\_\_\_\_ 6. Refined sugar
- \_\_\_\_\_ 7. Shampoo
- \_\_\_\_\_ 8. Dyes & inks
- \_\_\_\_\_ 9. Air filters
- \_\_\_\_\_ 10. Hormones

#### Parts of the Cow

- a. Brain
- b. Blood
- c. Hooves/Horns
- d. Internal Organs
- e. Fat
- f. Milk
- g. Manure
- h. Skin
- i. Hair
- j. Bones

# Everything But the Oink.....

## Pig By-Products Worksheet

Name: \_\_\_\_\_

### True or False?

*Do the products listed below come from pigs? Write true next to the products you think come from pigs and false after the ones that you don't think come from pigs.*

- |          |              |           |                  |
|----------|--------------|-----------|------------------|
| _____ 1. | Footballs    | _____ 8.  | Lumber           |
| _____ 2. | Bacon        | _____ 9.  | Yarn             |
| _____ 3. | Carrots      | _____ 10. | Bone China       |
| _____ 4. | Insecticides | _____ 11. | Insulin          |
| _____ 5. | Heart Valves | _____ 12. | Pork Chops       |
| _____ 6. | Paper        | _____ 13. | Artists' brushes |
| _____ 7. | Crayons      | _____ 14. | Drum heads       |

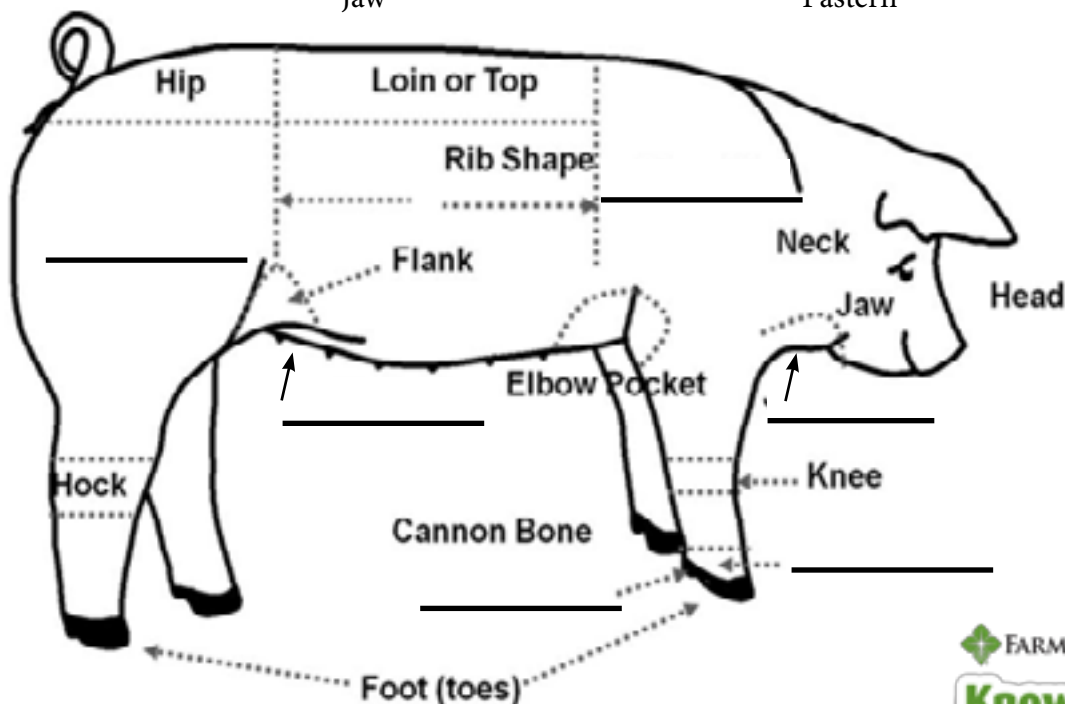
### Label

*Using the word bank below, label the missing parts of the pig. Not all words will be used.*

Ham  
Hock  
Foot  
Dewclaw  
Hip

Loin  
Flank  
Shoulder  
Jowl  
Jaw

Head  
Underline  
Neck  
Knee  
Pastern



# Everything But the Baaaa.....

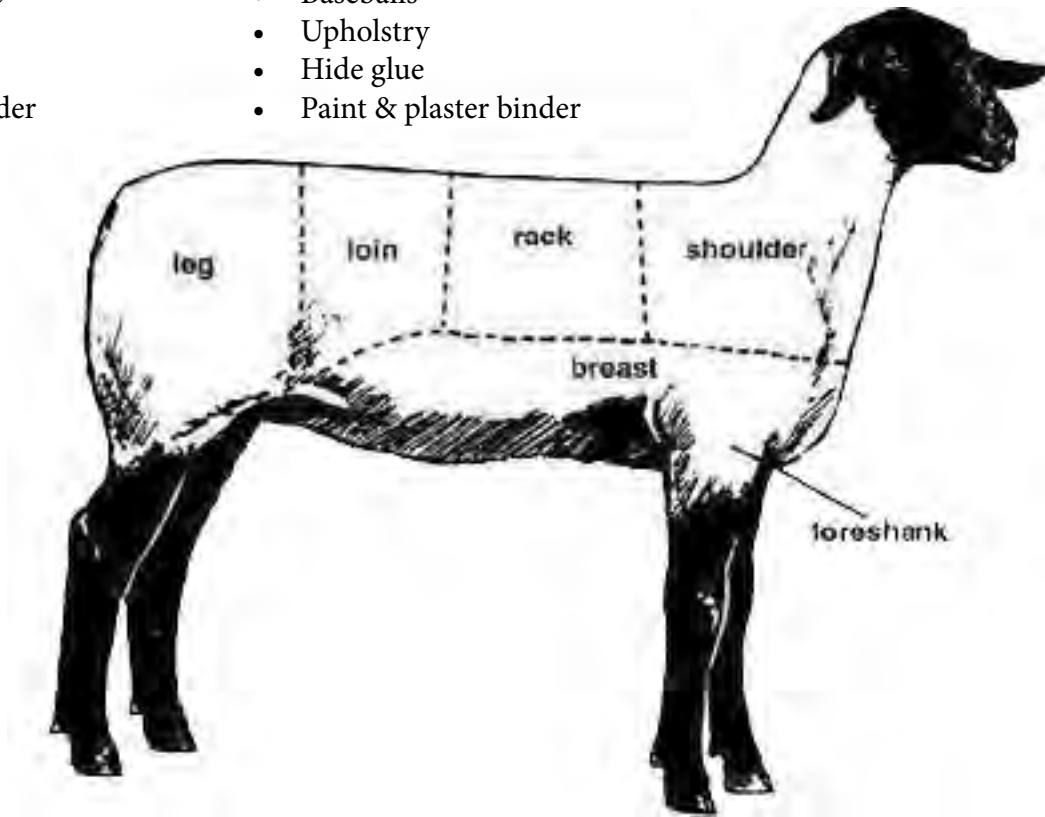
## By-Products from Sheep

### *From Hide and Wool...*

- Lanolin
- Clothing
- Drum heads
- Luggage
- Yarns
- Artists' brushes
- Sports equipment
- Fabrics
- Rouge base
- Insulation
- Rug pads
- Asphalt binder
- Textiles
- Ointment base
- Tennis balls
- Worsted fabric
- Felt
- Carpet
- Footwear
- Woolen goods
- Baseballs
- Upholstry
- Hide glue
- Paint & plaster binder

### *From Fats and Fatty Acids...*

- Explosives
- Solvents
- Chewing Gum
- Paints



### *From Manure...*

- Nitrogen fertilizer
- Potash
- Phosphorus
- Minor minerals

### *From Intestines...*

- Sausage casings
- Instrument strings
- Surgical sutures
- Tennis racquet strings

### *And Of Course the Retail Meats....*

- Leg of Lamb
- Lamb shoulder roasts
- Lamb chops
- Rack of lamb
- Lamb riblets and spareribs
- Lamb burgers
- Lamb kabobs
- Lamb shanks

*so many products come from sheep  
that we really do use everthing but  
the baaa!*



# Everything But the Mooooo.....

## By-Products from Cows

### From Brain...

- Anti-aging cream medicines

### From Blood...

- Pasta
- Cake mixes
- Dyes & inks
- Adhesives
- Minerals
- Medicines
- Laboratory research materials

### From Bones...

- Refined sugar
- Charcoal
- Fertilizer
- Glass

### From Hair...

- Air filters
- Brushes
- Felt
- Isulation
- Plaster
- Textiles

### From Manure...

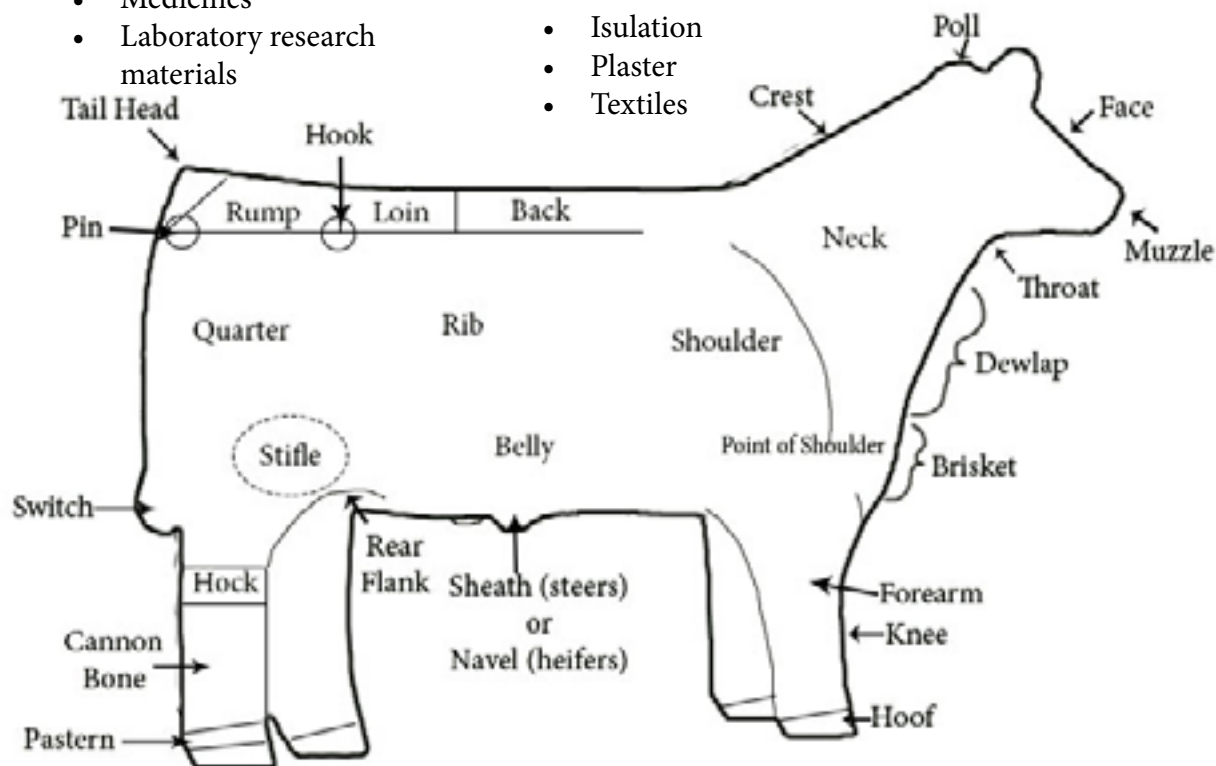
- Fertilizer
- Nitrogen
- Phosphorus

### From Internal Organs...

- Instrument strings
- Tennis racquet strings
- Hormones, enzymes, vitamins & other medical material

### From Fat...

- Chewing gum
- Candles
- Detergents
- Fabric softner
- Deodorant
- Shaving cream
- Perfume
- Pet food
- Cosmetics
- Creams & lotions
- Crayons
- Paint
- Oil & lubricants
- Biodiesel
- Plastics
- Waterproofing agents
- Cement
- Ceramics
- Chalk
- Explosives
- Fireworks
- Matches
- Fertilizer
- Antifreeze
- Insulation
- Linoleum
- Rubber
- Textiles
- Medicines



### From Hooves and Horns...

- Adhesives
- Plastics
- Pet food
- Plant food
- Photo film
- Shampoo & conditioner
- Emery boards
- Lamination
- Wallpaper
- Plywood

### From Milk...

- Adhesives
- Plastics
- Cosmetics
- Medicines

### From Skin...

- Gelatin
- Flavorings
- Emery boards
- Sheet rock
- Wallpaper
- Adhesives
- Medicines
- Candies & confectionary

so many products come from cows  
that we really do use everthing but  
the moooo!



# Everything But the Oink.....

## By-Products from Pigs

### From Blood...

- Medicines
- Sticking agent
- Leather treating agent
- Plywood Adhesive
- Protein source in feeds
- Fabric printing and dyeing

### From Brain...

- Cholesterol
- Other medicines

### From Hair...

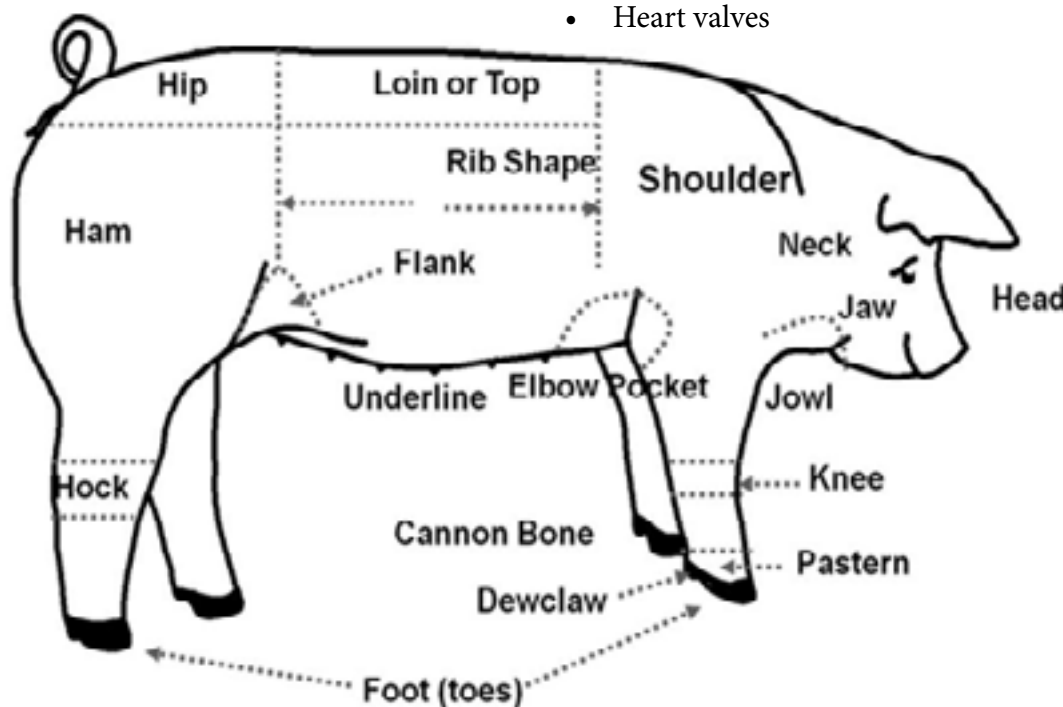
- Artist's brushes
- Insulation
- Upholstery

### From Internal Organs...

- Isulin
- A variety of medicines
- Surgical sutures
- Heart valves

### From Skin...

- Gelatin
- Footballs
- Porcine Burn Dressings
- Luggage, purses
- Gloves and shoes
- Pigskin garmets
- Drumheads



### From Bones...

- Glue
- Buttons
- Bone China
- Bone Meal
- Minerals for feed
- Fertilizer
- Porcelain enamel
- Glass
- Water filters

### From Fatty Acids and Glycerine...

- |                |                    |                   |             |
|----------------|--------------------|-------------------|-------------|
| • Insecticides | • Nitroglycerine   | • Waterproofing   | • Matches   |
| • Weed killers | • Plastics         | • agents          | • Putty     |
| • Lubricants   | • Plasticizers     | • Fiber softeners | • Inulation |
| • Oil polishes | • Printing rollers | • Crayons         | • Linoleum  |
| • Rubber       | • Cellophane       | • Chalk           |             |
| • Cosmetics    | • Floor waxes      | • Phonograph      |             |
| • Antifreeze   | • Cement           | • records         |             |

### From Meat Scraps...

- Commercial feeds
- Pet food

AND OF COURSE: bacon, ham, sausage, pork chops, ribs, BBQ and more!

so many products come from pigs that  
we really do use everthing but the  
oink!

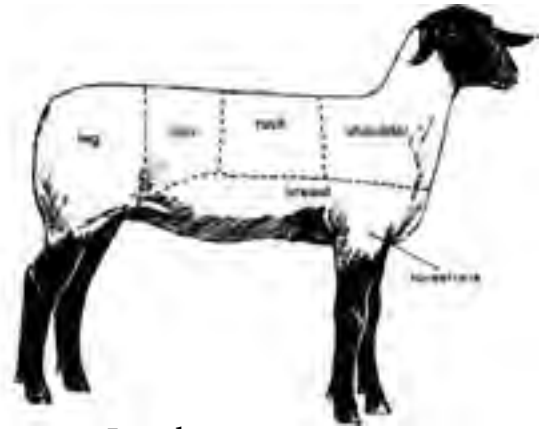
# Everything But the Baaaa.....

## Sheep By-Products Worksheet

Name: Answer Key

### True or False?

*Do the products listed below come from sheep? Write true next to the products you think come from sheep and false after the ones that you don't think come from sheep.*



- |              |    |               |
|--------------|----|---------------|
| <u>True</u>  | 1. | Lanolin       |
| <u>True</u>  | 2. | Lamb chops    |
| <u>False</u> | 3. | Peanut butter |
| <u>True</u>  | 4. | Yarn          |
| <u>True</u>  | 5. | Baseballs     |
| <u>False</u> | 6. | Paper         |
| <u>True</u>  | 7. | Paints        |

- |              |     |                    |
|--------------|-----|--------------------|
| <u>False</u> | 8.  | Lumber             |
| <u>False</u> | 9.  | Concrete           |
| <u>True</u>  | 10. | Tennis balls       |
| <u>True</u>  | 11. | Instrument strings |
| <u>True</u>  | 12. | Leg of Lamb        |
| <u>True</u>  | 13. | Artists' brushes   |
| <u>True</u>  | 14. | Drum heads         |

### Matching

*Match the product on the left to the part of the sheep that you think it came from on the right. You may use the parts of the sheep more than once.*

#### Products

- |          |    |                     |
|----------|----|---------------------|
| <u>c</u> | 1. | Rack of lamb        |
| <u>a</u> | 2. | Surgical sutures    |
| <u>b</u> | 3. | Fabrics             |
| <u>e</u> | 4. | Chewing gum         |
| <u>b</u> | 5. | Clothing            |
| <u>e</u> | 6. | Solvents            |
| <u>d</u> | 7. | Nitrogen fertilizer |

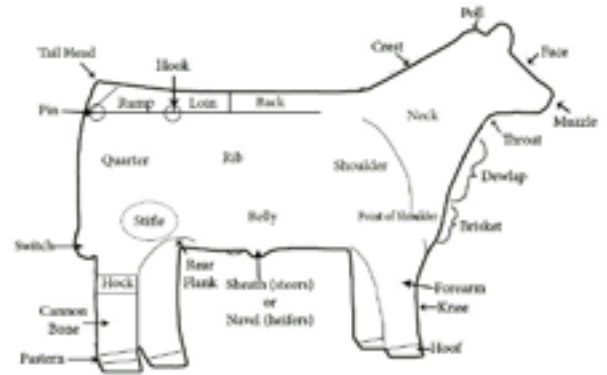
#### Parts of the Sheep

- |    |                      |
|----|----------------------|
| a. | Intestines           |
| b. | Hide and Wool        |
| c. | Retail Meats         |
| d. | Manure               |
| e. | Fats and Fatty Acids |

*Everything But the Moo.....*

# Cow By-Products Worksheet

Name: Answer Key



## True or False?

*Do the products listed below come from cows? Write true next to the products you think come from cows and false after the ones that you don't think come from cows.*

- |              |    |                  |              |     |                         |
|--------------|----|------------------|--------------|-----|-------------------------|
| <u>True</u>  | 1. | Medicine         | <u>False</u> | 8.  | Solid wood fence boards |
| <u>True</u>  | 2. | Anti-aging cream | <u>False</u> | 9.  | Salt                    |
| <u>False</u> | 3. | Mashed potatoes  | <u>True</u>  | 10. | Deodorant               |
| <u>True</u>  | 4. | Felt             | <u>True</u>  | 11. | Instrument strings      |
| <u>True</u>  | 5. | Chewing gum      | <u>True</u>  | 12. | Fertilizer              |
| <u>False</u> | 6. | Paper            | <u>True</u>  | 13. | Plastics                |
| <u>True</u>  | 7. | Cosmetics        | <u>True</u>  | 14. | Rubber                  |

## Matching

*Match the product on the left to the part of the cows that you think it came from on the right. You may use the parts of the cows more than once.*

## Products

- \_\_\_b\_\_\_ 1. Pasta  
\_\_\_e\_\_\_ 2. Candles  
\_\_\_h\_\_\_ 3. Sheet rock  
\_\_\_g\_\_\_ 4. Phosphorus  
\_\_\_e\_\_\_ 5. Chewing gum  
\_\_\_j\_\_\_ 6. Refined sugar  
\_\_\_c\_\_\_ 7. Shampoo  
\_\_\_b\_\_\_ 8. Dyes & inks  
\_\_\_i\_\_\_ 9. Air filters  
\_\_\_d\_\_\_ 10. Hormones

## Parts of the Cow

- Brain
- Blood
- Hooves/Horns
- Internal Organs
- Fat
- Milk
- Manure
- Skin
- Hair
- Bones

# Everything But the Oink.....

## Pig By-Products Worksheet

Name: Answer Key

### True or False?

*Do the products listed below come from pigs? Write true next to the products you think come from pigs and false after the ones that you don't think come from pigs.*

<u>True</u>	1.	Footballs	<u>False</u>	8.	Lumber
<u>True</u>	2.	Bacon	<u>False</u>	9.	Yarn
<u>False</u>	3.	Carrots	<u>True</u>	10.	Bone China
<u>True</u>	4.	Insecticides	<u>True</u>	11.	Insulin
<u>True</u>	5.	Heart Valves	<u>True</u>	12.	Pork Chops
<u>False</u>	6.	Paper	<u>True</u>	13.	Artists' brushes
<u>True</u>	7.	Crayons	<u>True</u>	14.	Drum heads

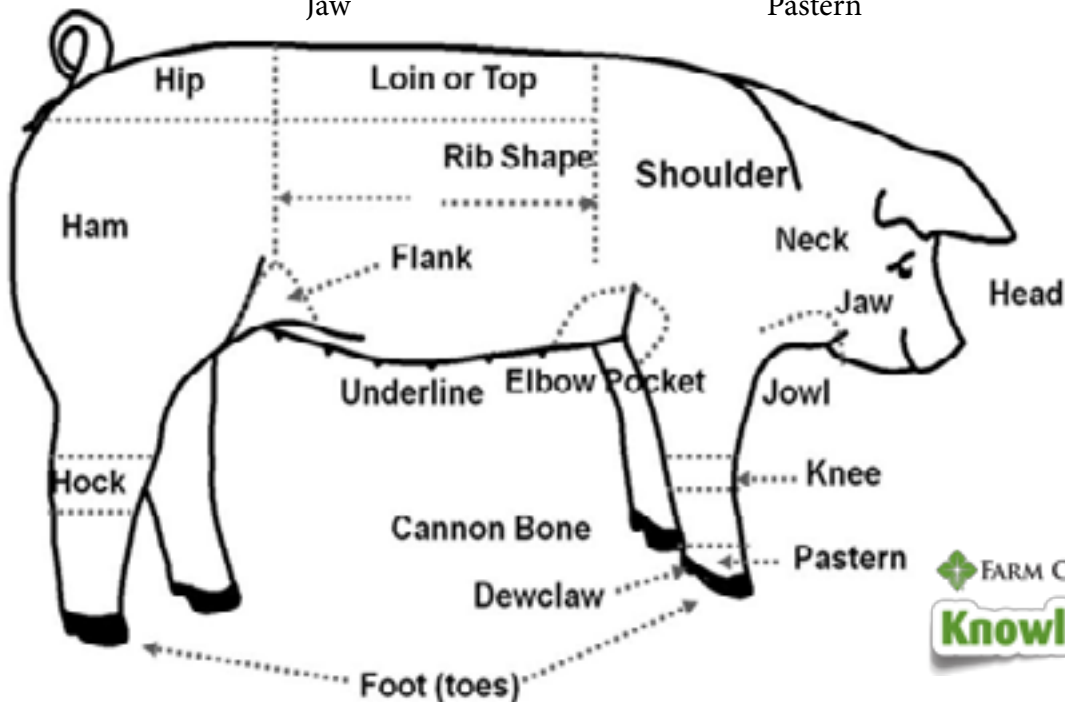
### Label

*Using the word bank below, label the missing parts of the pig. Not all words will be used.*

Ham  
Hock  
Foot  
Dewclaw  
Hip

Loin  
Flank  
Shoulder  
Jowl  
Jaw

Head  
Underline  
Neck  
Knee  
Pastern



# Animal Welfare - Handling

Rikki Ruiz, Extension Educator

## Goal (learning objective)

Youth will learn how to move livestock safely by using animal behaviors (blind spot, flight zone and point of balance).

## Supplies

None

## Pre-lesson preparation

- Study the flight zone diagram available at:
  - Understanding Flight Zone and Point of Balance for Low Stress Handling of Cattle, Sheep and Pigs available at: <http://www.grandin.com/behaviour/principles/flight.zone.html>
  - Youth Beef Quality Assurance Program Manual for the Pacific Northwest (Chapter 1, page 5) available at: <https://pubs.wsu.edu/ItemDetail.aspx?ProductID=14995>
- Read/review lesson

## Lesson directions and outline

Ask the youth to share the meaning of a flight zone or personal space. Have them share examples.

Share the following information with the youth:

Understanding animal behavior can help prevent injury, undue stress, and physical exertion for both animals and their handlers.

Animals have natural instincts which may be used to one's advantage when they need to be moved. A key to moving livestock safely is utilizing the animal's blind spot, flight zone, and point of balance.

Flight zone is the distance you are from an animal before it moves away. It is similar to what humans refer to as "personal space". If someone enters your personal space, you tend to move away far enough to feel comfortable again. If you enter a livestock's flight zone, it will move away until it feels comfortable again.

## Conducting the activity (DO)

1. Divide the room into groups of two and have each person stand, facing each other approximately 15 feet apart.
2. Have each person take one step towards each other and stop.
3. Ask: Do they feel comfortable at this distance?
4. Repeat steps 2 and 3 until one of the pair feels uncomfortable.
5. When both participants have reached a point to where they both feel uncomfortable, have them discuss the variance in space between them.
6. Have each group report back:
  - a. How much space is between them?
  - b. How they feel about the distance?
  - c. Do both members feel uncomfortable at the same distance?

## What did we learn? (REFLECT)

- Ask: Why is it important to work with your animal?
- Ask: Do animals have larger flight zones if they are not use to people? What can you do at home to work with your animal?
- Ask: Are animal's flight zones the same? Why? Why not?
- Ask: How does stress impact an animal's flight zone?

**Why is that important? (APPLY)**

- Ask: Why is animal safety important? How does this impact Quality Assurance?
- Ask: How can understanding an animal's flight zone be helpful when moving livestock?

**Resources**

Grandin, T. (2015). *Understanding Flight Zone and Point of Balance for Low Stress Handling of Cattle, Sheep, and Pigs*. Colorado State University. Available from: <http://www.grandin.com/behaviour/principles/flight.zone.html>

Kinder, C.A., Glaze, J.B., Church, J.A., Jensen, S., Williams, S., and Nash, S.(2008). *Youth Beef Quality Assurance: Program Manual for the Pacific Northwest*. PNW593. University of Idaho, Oregon State University Extension, and Washington State University. Available at: <https://pubs.wsu.edu/ItemDetail.aspx?ProductID=14995>

Ohio State University Extension. (2011). Working Safely with Livestock. *Beef resource handbook* (pages 4-1 through 4-5 and 12-2 through 12-3).

Ohio State University Extension. (2008). Working Safely with Goats. *Goat resource handbook* (pages 31-34, and 159).

Ohio State University Extension. (2011). Working Safely with Sheep. *Sheep resource handbook for market and breeding projects* (pages 103-105 and 136).

Ohio State University Extension. (2000). Working Safely with Swine. *Swine resource handbook for market and breeding projects* (pages 14-1 through 14-2 and 24-2).



# Animal Welfare - Hauling

Rikki Ruiz, Extension Educator

## Goal (learning objective)

Youth will learn about the safety concerns of hauling livestock.

## Supplies

- Livestock trailer
- Pens and paper - enough for group

## Pre-lesson preparation

- Provide, or ask for a volunteer to bring a livestock trailer to the meeting
- Review resource section about transportation precautions for beef, sheep/goats, and swine
- Read/review lesson

## Lesson directions and outline

Share the following information with the youth:

Hauling livestock is a common practice among 4-Hers. Safety is a major concern in transporting your livestock. It is important to be patient and calm during the loading process so you do not scare or stress the animals.

Most animal related accidents are the result of “people problems.” Poor judgement and lack of understanding are major causes of accidents involving animals. Plan ahead to allow plenty of time to move animals, so there is no need to hurry. Do not try to handle animals when you are angry. Other common problems should also be avoided, such as horseplay (people play), attempting a task without enough help, not providing proper and safe facilities, and not wearing personal protective equipment.

## Conducting the activity (DO)

1. Make sure the livestock trailer is parked safely, in an area where group members can walk in and around the trailer easily.
2. Have members do an “inspection” of the trailer - interior and exterior and make notes of their inspection.
3. Ask volunteers to share their findings. As elements are discussed, do a walk through of the trailer noting areas where animals or members could be pinched or squeezed in. Make special notation if there were any protrusions, broken or sharp objects.
4. Visit with members about the importance of maintaining trailers - floors, cleanliness, tires, working lights, valid licensing, etc.
5. Practice the process of opening and closing trailer doors and making sure the doors are secure.
6. Ask for volunteers to be animals and work through the process of loading and unloading. Make sure the animal can see the person (handler) as the person enters and exits the trailer to help the animal unload. Look for ways that the animal can maintain visibility during the loading and unloading process.



### What did we learn? (REFLECT)

- Ask: Why is it important to check or inspect trailers before hauling?
- Ask: Does hauling animals cause stress? Why?
- Ask: How do trailers impact flight zones?
- Ask: How does your animal react to your emotions?
- Ask: What personal protective equipment is appropriate for handlers when loading/unloading animals? Why?

### Why is that important? (APPLY)

- Ask: Why is trailer cleanliness important? Are biosecurity measures needed?
- Ask: Why is preparation and planning important? How can you apply this to other areas of your life?
- Ask: Are there other items that need to be considered before hauling an animal? (Brand Inspection, bill of sale, health certificate, amount of time needed to get to facility)
- Ask: How does hauling stress impact the animal? Are there impacts to the carcass?

### Resources

- Carroll, H. (2014). *Tips & Preparation for Safe Cattle Hauling*. iGrow.org. South Dakota State University Extension. Available from: <http://igrow.org/live-stock/beef/tips-preparation-for-safe-cattle-hauling/>
- Grandin, T. (2015). *Understanding Flight Zone and Point of Balance for Low Stress Handling of Cattle, Sheep, and Pigs*. Colorado State University. Available from: <http://www.grandin.com/behaviour/principles/flight.zone.html>
- Livestock trailer safety. (2012) Farm and Ranch eXtension in Safety and Health (FReSH) Community of Practice. Retrieved from <http://www.extension.org/pages/64391/livestock-trailer-safety>
- Ohio State University Extension. (2011). Working Safely with Livestock. *Beef resource handbook* (pages 4-1 through 4-5, 10-6 and 12-4).
- Ohio State University Extension. (2008). Working Safely with Goats. *Goat resource handbook* (pages 31-34, and 159-163).
- Ohio State University Extension. (2011). Working Safely with Sheep. *Sheep resource handbook for market and breeding projects* (pages 103-104).
- Ohio State University Extension. (2000). Showing Your 4-H Market Hog. *Swine resource handbook for market and breeding projects* (pages 12-7 through 12-8, 24-3 and 24-5).
- Pempek, J., High, R., Eastridge, M., & Botheras, N. (2013). *Transport and Care of Sheep and Goats*. Department of Animal Sciences, The Ohio State University. Available from: <http://articles.extension.org/pages/68912/transport-and-care-of-sheep-and-goats>
- Vansickle, J. (2008). *Preparing Pigs for Transport*. Nationalhogfarmer.com Available from: <http://www.nationalhogfarmer.com/behavior-welfare/0915-preparing-pigs-transport>

# Animal Welfare - Moving

Rikki Ruiz, Extension Educator

## Goal (learning objective)

Youth will learn how to move livestock safely by using animal behaviors (blind spot, flight zone and point of balance).

## Supplies

None

## Pre-lesson preparation

- Study/review the flight zone diagram - Understanding Flight Zone and Point of Balance for Low Stress Handling of Cattle, Sheep and Pigs available at: <http://www.grandin.com/behaviour/principles/flight.zone.html>
- Youth Beef Quality Assurance Program Manual for the Pacific Northwest (Chapter 1, page 5) available at: <https://pubs.wsu.edu/ItemDetail.aspx?ProductID=14995>
- Read/review lesson

## Lesson directions and outline

Share the following information with the youth:

Understanding animal behavior can help prevent injury, undue stress, and physical exertion for both animals and their handlers.

Animals have natural instincts which may be used to one's advantage when they need to be moved. A key to moving livestock safely is utilizing the animal's blind spot, flight zone, and point of balance.

Point of Balance is the position in the flight zone where the animal switches the direction it moves as you cross the line. The point of balance can vary, but it's generally near an animal's shoulder. If you cross the flight zone in the front, it will move backward. Approaching from behind the point of balance makes the animal move forward.

## Conducting the activity (DO)

1. Have the group break up into groups of two and identify themselves as either Volunteer #1 or Volunteer #2.
2. Volunteer #1 portrays the "animal". Have the volunteer stand with their arms outstretched, the volunteer's arms marks their point of balance.
3. Volunteer #2 portrays the "handler".
4. Have the handler start by standing at the animal's point of balance. Ask the "animal": How does this make you feel?
5. Ask the handler step in front of the animal's point of balance into the flight zone. What does the animal do? (The animal should back up or move) Ask the animal: Why did you move?
6. Ask the handler to move back to the animal's point of balance, then move into the animal's flight zone (don't repeat prior area).

## What did we learn? (REFLECT)

- Ask: What happened when the handler stepped in front of the animal? What would happen if the handler stepped behind the animal?
- Ask: Where is the animal's point of balance?
- Ask: Are animal's flight zones the same? Why? Why not?

**Why is that important? (APPLY)**

- Ask: How do flight zones impact handler safety?  
Why do we need to take precautions to protect not only the animal but the handler?
- Ask: How do flight zones get impacted in the show pen?
- Ask: How can understanding an animal's flight zone be helpful when moving livestock?
- Ask: How does understanding flight zone and personal space help us when we communicate with others?

**Resources**

Grandin, T. (2015). *Understanding Flight Zone and Point of Balance for Low Stress Handling of Cattle, Sheep, and Pigs*. Colorado State University. Available from: <http://www.grandin.com/behaviour/principles/flight.zone.html>

Kinder, C.A., Glaze, J.B., Church, J.A., Jensen, S., Williams, S., and Nash, S.(2008). *Youth Beef Quality Assurance: Program Manual for the Pacific Northwest*. PNW593. University of Idaho, Oregon State University Extension, and Washington State University. Available at: <https://pubs.wsu.edu/ItemDetail.aspx?ProductID=14995>

Ohio State University Extension. (2011). Working Safely with Livestock. *Beef resource handbook* (pages 4-1 through 4-5).

Ohio State University Extension. (2008). Working Safely with Goats. *Goat resource handbook* (pages 31-34, and 159).

Ohio State University Extension. (2011). Working Safely with Sheep. *Sheep resource handbook for market and breeding projects* (pages 103-104 and 136).

Ohio State University Extension. (2000). Working Safely with Swine. *Swine resource handbook for market and breeding projects* (pages 14-1 through 14-2 and 24-2).

# Biosecurity

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Sarah D. Baker, Extension Educator

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## Goal (learning objective)

Youth will:

- Learn the definition of biosecurity
- Learn how to create a biosecurity plan
- Learn the differences between external and internal biosecurity procedures

## Supplies

- Handout 1, “How to Develop a Simple Biosecurity Plan”. Make the appropriate number of copies for your group
- Handout 2, “Internal and External Biosecurity Worksheet”. Make the appropriate number of copies for your group
- Handout 3, “Did you know?” Make the appropriate number of copies for your group
- Handout 4, “Internal and External Biosecurity Worksheet Questions” Make the appropriate number of copies for your group
- Pens or Pencils (enough for group)

## Pre-lesson preparation

Background information:

*Quality Assurance:* Market livestock projects bring new responsibilities for 4-H youth. Members are providing a product for consumers to eat. Consumers will choose to buy, not to buy, a product from their perception of the value of that product. If your product (steak, roast, etc.) wasn’t “good”, the consumer will not purchase it again. What would happen to a business if no one purchased its products again? This pertains to you as a livestock producer, or producer of food. When quality is high, consumers will buy your product again. Livestock products must be safe, wholesome, and produced in a way that meets consumer approval.

Who is in charge of quality assurance in the livestock industry? When you feed a steer, sheep, pig or goat and sell it in the Livestock Sale at the fair, who is responsible for assuring that the meat eaten by the consumer is a high-quality and safe product? The retailer? The packer? The member? The breeder? Everyone involved in the livestock industry is obligated to do their part to provide a safe, wholesome, and quality product to the consumer.

*Biosecurity:* Biosecurity is a combination of management practices designed to prevent the introduction and transmission of diseases and disease-causing agents into a herd. The goal of biosecurity is to prevent, minimize, or control cross-contamination of body fluids (feces, urine, saliva, etc) between animals, between animals to feed and between animals to equipment that may directly or indirectly contact animals.

Biosecurity can be either external or internal. External biosecurity is keeping diseases out of a herd, whereas internal biosecurity is keeping diseases already in one more segments of the herd from

spreading to other segments. However, all biosecurity measures should be focused on the prevention of the entry of unwanted diseases!

Maintaining a biosecurity program is the cheapest, most effective means to control disease, and no disease prevention program will be effective without it.

According to the National Beef Quality Assurance Program (NCBA, 2012), implementation of a good biosecurity program should focus on the following:

- Controlling disease within the herd
  - Vaccinate the herd against all endemic diseases
  - Use low stress management for movement and processing
  - Isolate sick animals
  - Maintain a closed herd, if possible
  - Purchase feed from reputable sources
  - Minimize fence line contact with neighboring animals
  - Do not place cattle of different ages in the same pen
  - Keep records of all disease occurrences
- Purchasing replacement animals
  - Quarantine all new animals for 30-60 days
  - Test new animals for disease
  - Purchase animals from healthy and reputable herds
- Environmental and pest control
  - Provide human foot baths at entrances and exits of confinement facilities
  - Provide timely manure and dead animal removal
  - Keep grounds and feed bunks as dry as possible
  - Have an insect control program in practice
  - Have a rodent control program
- Disinfection
  - Clean and remove as much organic material as possible, before disinfecting
  - Choose a disinfectant that will work against the pathogen you want to control
  - Be aware of any toxic, harmful or corrosive effects of the disinfectant
  - Follow the label on the disinfectant package
- Visitors
  - Minimize the number of visitors to the facility and their contact with animals
  - Be sure all visitors have clean clothing/coveralls, boots, and hands
  - Be sure all vehicles or equipment brought on the farm are disinfected
  - Do not allow foreign visitors on the farm until they have been in the country for 5 days. Do not allow foreign visitors to bring clothing, foods, or accessories they have had in another country onto the farm
- Employees
  - Be sure all employees understand and follow the biosecurity protocol
  - Realize that employee owned animals (horses, dogs, etc) can be a possible source of contamination to your facility.

These statements can be applied to swine, as well as sheep and goats.

**Conducting the activity (DO)****Activity 1 - Developing a Biosecurity Plan**

1. Distribute Handout 1 “How to Develop a Simple Biosecurity Plan”
2. Have youth share the definition of biosecurity
3. Lead a discussion by asking the following questions (have members write answers on the worksheet):
  - a. What are possible diseases that your animal may come into contact with?
  - b. What is the critical control point or monitoring location for that possible disease?
  - c. What is the corrective action needed to stop or prevent the spread of the potential disease?
  - d. What records should you keep to implement your biosecurity plan?
4. Each biosecurity plan should have the following:
  - a. List of possible diseases
  - b. List of critical control points
  - c. List of methods of protection or corrective action
  - d. List of records to be kept
5. Have members share their plan with others.

**Activity 2 - Internal & External Biosecurity Measures**

1. Distribute Handout 2 “Internal & External Biosecurity Worksheet”
2. Distribute Handout 3 “Did you know?”

3. Have members volunteer to read out loud the information on both handouts.
4. Discuss the examples.
5. Distribute Handout 4 “Internal & External Biosecurity Worksheet Questions”.
6. Have members provide examples of internal and external biosecurity measures and complete the table on the worksheet.
7. Encourage members to share examples with others in the group.

**Activity 3- Spreading Disease One Touch at a Time**

*Adapted from Dr. Susan Kerr, WSU Extension, What Goes Around Comes Around Biosecurity Activity.*

1. Mark off an area that will contain the entire group. Use rope, chairs or land marks to make boundaries.
2. Have the group assemble themselves inside the boundary. There should be enough room so that everyone can move around freely and not bump into each other too much.
3. Have participants raise both hands above their heads.
4. Choose one participant to be the ‘disease carrier’. Make sure the participant is identifiable (wearing a certain color shirt, or have them carry something to identify themselves as the ‘carrier’).
5. The ‘carrier’ will enter the boundary and wander around randomly. Each time the ‘carrier’ touches a member of the group member, that member drops one arm. If a member is touched twice by the ‘carrier’, they must stop moving around and stand still. Each participant standing still represents a sick individual.
6. The activity continues until all participants within the boundary are sick or the time available has run out (the concept will become apparent within 5-10 minutes).



7. Ask participants the following questions:

- a. What did they see happening?
- b. How is this activity similar to what happens when an animal carrying a disease is introduced into a herd?
- c. Why should we be concerned about biosecurity and animal health?
- d. Are there any similarities between disease transmission amongst animals and disease transmission amongst humans (i.e. catching a cold at school)?
- e. How can they reduce the risk of contracting a disease (cold) at school? Is this the same for animals?

**What did we learn? (REFLECT)**

- Ask: What is your definition of biosecurity?
- Ask: What is the difference between external and internal biosecurity?
- Ask: How is animal biosecurity similar to keeping ourselves healthy?

**Why is that important? (APPLY)**

- Ask: Why is it important to prevent diseases rather than treat them? Costs?
- Ask: Do you let your friends borrow your supplies at the Fair (brushes, water buckets, etc.)? Why or why not?
- Ask: Can you spread a disease from your animal to your friend's animal?
- Ask: Evaluating quality assurance of your project is something like looking into a mirror - reflect on your project for a moment. Do you like what you see? More importantly, will the person who purchases your animal like it?

**Resources**

- Beef Quality Assurance. (2010). National BQA Manual (pages 14-15).
- Kerr, S. (2015). Biosecurity Activity: What Goes Around Comes Around. Washington State University Extension. <http://vetextension.wsu.edu/wp-content/uploads/sites/8/2015/05/Biosecurity-Activity-What-Goes-Around-Comes-Around1.pdf>
- National 4-H Council. (2005). Beef Helper's Guide. National 4-H Curriculum. BU-08146 (page 17).
- National Cattlemen's Beef Association. (2010).
- Ohio State University Extension. (2011). Management Practices. *Beef resource handbook* (page 12-2 through 12-5).
- Ohio State University Extension. (2008). Caring for Animals. *Goat resource handbook* (pages 159-163).
- Ohio State University Extension. (2011). Caring for Animals. *Sheep resource handbook for market and breeding projects* (pages 136-139).
- Ohio State University Extension. (2000). Quality, Caring for Animals, and Swine Resources. *Swine resource handbook for market and breeding projects* (pages 4-1, 24-1 through 24-4, and Resources 3)
- Pork.org. (2014). Establish and Implement an Effective Health Management Plan. *Youth Pork Quality Assurance Plus Handbook Version 2.0*. Chapter 2 (pages 27-39). <http://old.pork.org/filelibrary/youthpqa/plus/2014/ypqahandbook.pdf>



## **How to Develop a Simple Biosecurity Plan**

*Adapted from: Youth Beef Quality Assurance Program Manual for the Pacific Northwest, PNW 593.  
Chapter 5. Biosecurity. Page 32.*

### **1. Conduct a disease potential analysis.**

- a. Develop a list of possible diseases that your animal(s) may come into contact with. For example, possible diseases may include ringworm, lice, pneumonia, or foot rot, etc.

### **2. Determine monitoring locations/critical control points.**

- a. Critical control points (CCP) are places at which control or prevention can be applied and are essential to prevent, eliminate, or reduce a disease. The identification of CCP is important in controlling the spread of a disease. An example of a CCP may include the receiving area for new livestock, fence line, feed bunk, or water tank.

### **3. Prevent disease spread.**

- a. The goal of a biosecurity plan is to keep the disease agent from entering and spreading among the herd. Protection may be done in a variety of methods depending on the CCP. For example: increasing immunity of the herd, isolating new animals, quarantining sick animals, using disinfectants, and/or cleaning equipment or clothing. Producers need to determine at each CCP what the correct mode of action is. These actions also need to be understood by all workers within the operation.

### **4. Record keeping.**

- a. Keep records of what was done to facilities and animals. Examples of records may include animal identification, vaccinations given, medications given, visitors, and date of facility cleaning.

**Biosecurity Table 1.** Examples of monitoring locations, causes of disease spread, and corrective actions.

*From: Youth Beef Quality Assurance Program Manual for the Pacific Northwest, PNW 593, Chapter 5. Biosecurity. Page 30.*

Monitoring locations/CCP	Disease & Mode of spread	Corrective action
Fence line	Entry of stray animals Entry of people / visitors Example: respiratory and reproductive diseases	- Maintain fences to keep out strays and unknown animals. - Establish fences, gates, signs to stop and inform people.
Facility entrance	Visitors, clothes, footwear  Example: foot-and-mouth disease	- Allow public to enter designated areas away from livestock. Restrict visitors who have been out of the US in the past two weeks. - Provide protective covers for footwear or on-farm boots and/or on-farm coveralls.
Barn/Receiving pen for newly arrived animals	Animal carrying disease Example: respiratory diseases, lice	- Isolate for 3-4 weeks. - Know status of herd of origin.
Vehicles – cars, trucks, motorbikes, and trailers Parking lot	Manure on or in vehicle (including tires & undercarriage) Example: <i>E.coli</i> , <i>Salmonella</i> , enterotoxaemia.	- Restrict vehicles to public area only. - Wash vehicle and tires.
Farm personnel	Clothes, footwear Example: <i>E.coli</i> , <i>Salmonella</i>	Wear boots, clothes or coveralls specific for this farm only.
Raw feed products and standing water in pen/pasture	Contaminated feed and water  Example: <i>BSE</i> , beef measles, liver flukes, foot rot	- Don't feed ruminant-derived protein. - Remove standing water. - Keep dogs, cats, rodents and wildlife out of feed and feeding areas.
Feed bunks and water tanks	Personnel Contaminated feed and water Example: beef measles, <i>Salmonella</i> and <i>E. coli</i>	Provide clean feed, clean out water source often, and provide restrooms for personnel,
Manure/bedding pile	Contaminated manure in feed and water Example: <i>E.coli</i> , flies	Use separate tractor bucket to move feed than manure. Don't apply lagoon water to hay or grazing areas.
Equipment box/tack room	Brushes, combs, etc. Example: ringworm, lice	Clean equipment.
Pastures/common allotments	Animals Example: brucellosis, leptospirosis, BVD	Vaccinate.
Squeeze chute Clip chute	Needles and equipment Example: anaplasmosis	Exchange needles and clean equipment.

Use Table 1 above to help fill in the following blanks to make your own Biosecurity Plan for your livestock animal:

#### BIOSECURITY PLAN

\_\_\_\_\_  
(insert your name)

- What are possible diseases that your animal may come into contact with?
  - *Examples: Blackleg, Brucellosis, BSE, BVD, Enterotoxaemia, Flies, Foot Rot, Lice, Liver Fluke, Trichomoniasis, Ringworm, Warts, Other?*
  
- What is the critical control point or monitoring location for that possible disease?
  - *Examples: Feed bunk/pan, water tank, fence line, barn, squeeze/clip chute, manure pile, pasture, vehicles, equipment box, other?*
  
- What is the corrective action needed to stop or prevent the spread of the potential disease?
  - *Examples: Vaccinations, isolating new animals, quarantining sick animals, using disinfectants, cleaning equipment, wear clean clothing, feed proper and clean feed, cleaning feed storage area, clean water, other?*
  
- What records should you keep to implement your biosecurity plan (attach records to this plan)?
  - *Examples: vaccinations given, date equipment was cleaned, etc.*

## QUALITY ASSURANCE: BIOSECURITY – HANDOUT 2

### Internal and External Biosecurity Worksheet

*Adapted from: Establish and Implement an Efficient and Effective Health Management Plan. Youth Pork Quality Assurance Plus Handbook Version 2.0. Chapter 2. Pages 30-32.*

#### External Biosecurity:

- Control wildlife and pests to prevent contact with your animal(s) by including the use of perimeter fencing and bird screening.
- When contemplating the purchase of new animals, ask your veterinarian to discuss the health maintenance program you should start when the new animals get to your home.
- When possible, establish an isolation facility for quarantining new animals at your home that is remote and/or isolated from the existing herd. During the quarantine period, observe and test for diseases, vaccinate, medicate, and acclimate the new animal as recommended by your veterinarian
- Limit the number of visitors to your facility and minimize their contact with your animals. Question visitors about recent contact with other animals.
- Consider supplying disposable plastic boots to all visitors. Require everyone to at least wash hands, before entry to animal areas.
- Change clothes and boots after visiting other farms, livestock markets, or fairs.
- Limit use of equipment and tools, including scales, to those that have been cleaned and disinfected if they have been used on another farm or ranch.
- Clean and disinfect your truck and trailer after each use.

#### Internal Biosecurity:

- Work with your veterinarian to periodically survey your animals for different disease challenges.
- When possible, operate all-in/all-out (AIAO) with cleaning and disinfecting between groups of animals.
- Establish a traffic pattern for both animals and people that prevents exposure of younger animals to older animals, their manure or people who have recently been in contact with them.
- Develop a routine check of all equipment and have an emergency plan for feed and water delivery.
- Provide dedicated boots and coveralls at strategic sites in the pen. Wash hands when boots and coveralls are changed. Because boot disinfection is sometimes difficult, disposable boots may be better if regular boots cannot be dedicated to a single site.

## **Did You Know?**

*Adapted from: National Beef Quality Assurance Program Manual, page 15*

### **Infectious Disease can be spread by:**

- The introduction of diseased animals or healthy animals incubating a disease.
- Introduction of healthy animals who have recovered from disease but are now carriers
- Vehicles, equipment, clothing, and shoes of visitors or employees who move between herds.
- Contact with inanimate objects that are contaminated with disease organisms.
- Carcasses of dead livestock that have not been disposed of properly.
- Feedstuffs, especially high risk feedstuffs which could be contaminated with feces.
- Contaminated water (surface drainage water, etc.)
- Manure handling and aerosolized manure and dust.
- Non-livestock (horses, dogs, cats, coyotes, raccoons, other wildlife, rodents, birds, and insects).

#### QUALITY ASSURANCE: BIOSECURITY – HANDOUT 4

### Internal and External Biosecurity Worksheet Questions:

*Adapted from: Establish and Implement an Efficient and Effective Health Management Plan. Youth Pork Quality Assurance Plus Handbook Version 2.0. Chapter 2. Pages 30-32.*

**Name an example of External Biosecurity:** *Isolation of new animals to test for unwanted diseases that are not already in your herd.*

**Name an example of Internal Biosecurity:** *Stopping the movement or cross-fostering of baby piglets that have diarrhea.*

**Read the description below and identify the statement as an internal or external biosecurity measure:**

Biosecurity Measure	External	Internal
Locate new animals away from livestock herds and major transportation routes		
Work with your veterinarian to regularly survey your animals for different diseases challenges		
Control wildlife and pests to prevent contact with your animal(s).		
Establish an isolation facility for quarantining new animals to your home, farm, or ranch.		
Operate all-in/all-out with cleaning and disinfecting between groups of animals.		
Limit the number of visitors to your facility.		
Establish a traffic pattern for both animals and people that prevents exposure of younger animals to older animals, their manure, or people who have recently been in contact with them.		
Develop a routine check of all equipment and have an emergency plan for feed and water delivery.		
Minimize visitors' contact with your animals.		
Supply disposable plastic boots to all visitors.		
Change clothes and boots after visiting other farms, livestock markets, or Fairs.		
Wash hands when boots and coveralls are changed.		
Use disposable boots if regular boots cannot be dedicated to a single site at your home, farm, or ranch.		
Limit use of equipment and tools to those that have been cleaned and disinfected if they have been used on another farm or ranch.		
Clean and disinfect your truck and trailer after each use.		

# Carcass Terminology

Scott Nash, Regional Youth Development Educator

## Goal (learning objective)

Youth will learn carcass terminology to help them have a better understanding of meat quality.

## Supplies

- Handout 1, “Definitions” enough copies for the group
- Handout 2, “Carcass Terminology Cards” 1 set copied on card stock (can be laminated to help make more durable and last several years)
  - a. After cards are printed, cut cards out to separate terms from definitions.
  - b. On the back of each card assign a number (1-54).

## Pre-lesson preparation

- Read and review the resource materials.
- Familiarize yourself with carcass terminology handout 1.
- Make copies.
- Practice the activity, work through correctly matching definitions and terms to help you be ready to lead youth through the activity.

## Lesson directions and outline

### Background Information

Being able to talk about youth raised animal projects will help youth be able to share the importance of meat quality with the consumer. Giving youth confidence to discuss the role they play in the quality assurance process is critical to ensure high quality, consistent, safe and wholesome food is provided to consumers. By learning carcass terminology youth gain knowledge to have the confidence to share answers to questions an uninformed person may ask.

The matching activity described below is a fun way for youth to learn carcass terminology.

### Conducting the activity (DO)

1. Review Handout 1 with youth.
2. Divide the group into at least two teams. The number of youth attending the meeting may determine if you need to have more teams. Make sure older and younger youth are equally interspersed in the groups.
3. Explain to the youth the objective of the activity is to match the term with the correct definition. All of the cards should be laid out on the table face down (can be in number order).
4. The game is played like concentration - youth call out a number, when the card is read out loud the youth need to call another number in an attempt to match the correct term and definition.
5. If the cards match the team keeps matching cards and calls out another number. If the cards don't match, turn the cards back over and it is the next team's turn.
6. Proceed in this manner until all of the cards have been matched. Make sure all youth have the opportunity to choose a card and answer. You may choose to recognize the winning team with a prize.

### What did we learn? (REFLECT)

- Ask: What terms and definitions were new to you?
- Ask: Can you think of other carcass terms and definitions that weren't in the game?
- Ask: How will learning the terminology help you discuss raising a market animal?



**Why is that important? (APPLY)**

- Ask: Why do you think you should know what these terms mean? (Be better able to talk to consumers or people that don't understand the meat industry)
- Ask: Why is that important? (To help people understand that meat animal production provide high quality, safe, consistent and wholesome food source)
- Ask: How did playing the game help you learn to pay attention to what other are doing?
- Ask: How will this help you at home? At school? While you are with friends?

**Resources**

Ohio State University Extension. (2011). Carcass Evaluation. *Beef resource handbook* (pages 8-1 through 8-11 and G-1 through G-12).

Ohio State University Extension. (2008). Meat Goats. *Goat resource handbook* (pages 118-126).

Ohio State University Extension. (2011). Carcass Evaluation and Meats. *Sheep resource handbook for market and breeding projects* (pages 73-75).

Ohio State University Extension. (2000). Quality. *Swine resource handbook for market and breeding projects* (pages 4-6 through 4-7 and G-1 through G-4).

## QUALITY ASSURANCE: CARCASS TERMINOLOGY – HANDOUT 1

### Definitions

**Backfat** – See External Fat Thickness. It is a layer of fat between the skin (hide) and muscle. This term is typically used for hogs but can be used for all market animal species.

**Carcass** – the muscle, bone and fat associated with the slaughter of an animal, left after the removal of the head, hide and internal organs.

**Cutability** – the percentage of boneless, closely trimmed retail cuts.

**Dark Cutter** – a condition when the lean meat of a beef carcass has a darker than normal color. This condition usually results from the animal being stressed prior to harvesting. This causes the meat to be less desirable.

**Dressing Percentage** – is the hot carcass weight divided by live weight and the percentage of the carcass that can be processed into wholesale cuts.

**External fat thickness** – the measurement of the subcutaneous fat over the ribeye or loin eye measured in tenths of an inch. The measurement is taken between the 12<sup>th</sup> and 13<sup>th</sup> rib of cattle and lambs and between the 10<sup>th</sup> and 11<sup>th</sup> ribs of a hog.

**Flank Streaking** – the development of fat streaking inside the flank muscles of lambs is one of the determining factors to identify the quality grade of lambs.

**High Priced Cuts** – are wholesale cuts of meat that typically are higher in value. Examples of these cuts are the Loin and Rib (or Rack when referring to lamb).

**Hot carcass weight or HCW** – is the weight of the carcass of an animal at the packing plant after the internal organs have been removed just prior to the carcass being put in the cooler. It is a factor used in determining yield grade.

**Intramuscular fat or IMF** – the amount of fat flecks found in the longissimus dorsi (ribeye) muscle when the carcass is split between the 12<sup>th</sup> and 13<sup>th</sup> ribs of cattle, also referred to as marbling. The amount of IMF is used to determine Quality grade of beef. The higher amount equals a higher Quality grade.

**KPH** – kidney, pelvic and heart is the amount of fat found in the regions of the kidney, pelvis and heart as a percentage of the carcass weight. KPH makes up about 3 percent of the total carcass and is a factor used in determining yield grade.

**Lean** – is a term used to express the amount of muscle that is free from fat. A higher percent of lean equals more muscle and less fat.

**Loin eye Area** – See Loin Muscle Area. The number of square inches of muscle in a cross section of the longissimus dorsi muscle.

**Loin Muscle Area** – the number of square inches in a cross section of longissimus dorsi (loin eye) muscle. This is measured by cutting the loin between the 10<sup>th</sup> and 11<sup>th</sup> ribs and measuring the cut surface area of the muscle. Typically a term used in describing muscle amount in hogs.

**Longissimus dorsi** – is a major muscle in the beef rib and loin; lamb rack and loin; and the pork loin. It is the longest and largest muscle in the back and is exposed when a carcass is ribbed.

**Palatability** – is the taste of the meat and includes: juiciness, flavor, taste and tenderness. Quality grade affects palatability.

**Percent Lean** – is a term used in hogs as a way to define the proportion of the carcass that is lean meat.

**Quality Grade** – The factors associated with palatability characteristics of the edible portion of meat; including color, texture, firmness, marbling and age. This term is typically used to for cattle and lambs.

**Retail Cuts** – the cuts of meat the consumer buys at the meat counter or the meat department at a store.

**Ribbed or Ribbing** – a term used to describe when a carcass is split (cut) prior to being processed into wholesale cuts. A beef and lamb carcass are ribbed between the 12<sup>th</sup> and 13<sup>th</sup> ribs. A hog carcass is ribbed between the 10<sup>th</sup> and 11<sup>th</sup> ribs.

**Ribeye Area** – the surface area of the longissimus dorsi (eye) muscle between the 12<sup>th</sup> and 13<sup>th</sup> rib of a beef or lamb carcass. It is measured in square inches and is a factor in determining yield grade. It is an important indicator of muscling and is the location where quality grade in beef is determined.

**Ultrasound** – high frequency sound waves used to measure external fat thickness, ribeye area, loin eye area and intramuscular fat percentage on live animals.

**USDA** – United States Department of Agriculture is responsible for the regulations and guidelines used for determining grading carcasses.

**Wholesale Cuts or primal cuts** – the major cuts the carcass is divided (cut) into prior to being shipped to a grocery store.

**Yield Grade** – identifies carcasses for differences in cutability or yield of boneless, closely trimmed retail cuts. Yield grade of a beef carcass is determined by the amount of external fat, the amount of kidney, pelvic and heart fat, the ribeye area and the hot carcass weight. Yield grade of a lamb carcass is determined by the amount of external fat. Range is from 1 to 5. 1 equals more muscle less fat. 5 equals excess fat compared to muscle.

**10<sup>th</sup> Rib Fat**- See External Fat Thickness. A layer of fat between the skin and the measure, measured at the 10<sup>th</sup> rib. This term is used for hogs.

**12<sup>th</sup> Rib Fat Thickness** – See External Fat Thickness. A layer of fat between the hide and the muscle, measured at the 12<sup>th</sup> rib. This term is used for cattle and lambs.

<b>Backfat</b>	A layer of fat between the skin (hide) and muscle.
<b>Carcass</b>	The muscle, bone and fat associated with the slaughter of an animal, left after the removal of the head, hide and internal organs.
<b>Cutability</b>	The percentage of boneless, closely trimmed retail cuts.

<b>Dark Cutter</b>	A condition when the lean meat of a beef carcass has a darker than normal color.
<b>Dressing Percentage</b>	The hot carcass weight divided by live weight and the percentage of the carcass that can be processed into wholesale cuts.
<b>External fat thickness</b>	The measurement of the subcutaneous fat over the ribeye or loin eye measured in tenths of an inch.

<b>Flank Streaking</b>	The development of fat streaking inside the flank muscles of lambs is one of the determining factors to identify the quality grade of lambs.
<b>High Priced Cuts</b>	Wholesale cuts of a carcass that typically are higher in value. Examples of these cuts are the Loin and Rib (or Rack when referring to lamb).
<b>Hot carcass weight or HCW</b>	The weight of the carcass of an animal at the packing plant after the internal organs have been removed just prior to the carcass being put in the cooler.

<b>Intramuscular fat or IMF</b>	The amount of fat flecks found in the ribeye muscle when the carcass is split between the 12 <sup>th</sup> and 13 <sup>th</sup> ribs of cattle, also referred to as marbling.
<b>KPH</b>	Kidney, pelvic and heart is the amount of fat found in the regions of the kidney, pelvis and heart as a percentage of the carcass weight in cattle. A factor in determining Yield Grade.
<b>Lean</b>	A term used to express the amount of muscle that is free from fat. A higher percent of lean equals more muscle and less fat.



<b>Loin eye Area</b>	The number of square inches of muscle in a cross section of the longissimus dorsi muscle. Measured between the 10 <sup>th</sup> and 11 <sup>th</sup> ribs on a hog.
<b>Loin Muscle Area</b>	The number of square inches in a cross section of longissimus dorsi (loin eye) muscle. This is measured by cutting or ribbing the loin between the 10 <sup>th</sup> and 11 <sup>th</sup> ribs on a hog and measuring the cut surface area of the muscle.

<b>Longissimus dorsi</b>	A major muscle in the beef rib and loin; lamb rack and loin; and the pork loin. It is the longest and largest muscle in the back and is exposed when a carcass is ribbed.
<b>Palatability</b>	How meat tastes and includes: juiciness, flavor, taste and tenderness. Quality grade affects palatability.
<b>Percent Lean</b>	A term used in hogs as a way to define the proportion of the carcass that is lean meat.

<b>Quality Grade</b>	The factors associated with palatability characteristics of the edible portion of meat; including color, texture, firmness, marbling and age. This term is typically used to for cattle and lambs.
<b>Retail Cuts</b>	The cuts of meat the consumer buys at the meat counter or the meat department at a grocery store.
<b>Ribbed or Ribbing</b>	A term used to describe when a carcass is split (cut) prior to being processed into wholesale cuts. A beef and lamb carcass are ribbed between the 12 <sup>th</sup> and 13 <sup>th</sup> ribs. A hog carcass is ribbed between the 10 <sup>th</sup> and 11 <sup>th</sup> ribs.

<b>Ribeye Area</b>	The surface area of the longissimus dorsi (eye) muscle between the 12 <sup>th</sup> and 13 <sup>th</sup> rib of a beef or lamb carcass. Measured in square inches and is a factor in determining yield grade.
<b>Ultrasound</b>	High frequency sound waves used to measure external fat thickness, ribeye area, loin eye area and intramuscular fat percentage on live animals.
<b>USDA</b>	United States Department of Agriculture. It is responsible for the regulations and guidelines used for determining grading carcasses.

<b>Wholesale Cut or Primal Cuts</b>	The major cuts the carcass is divided (cut) into prior to being shipped to a grocery store.
<b>Yield Grade</b>	The system used to identify carcasses for differences in cutability or yield of boneless, closely trimmed retail cuts. Used for cattle and lambs. Ranges from 1 to 5.
<b>10<sup>th</sup> Rib Fat</b>	A layer of fat between the skin and the measure, measured at the 10 <sup>th</sup> rib. This term is used for hogs.

## **12<sup>th</sup> Rib Fat Thickness**

A layer of fat between the hide and the muscle, measured at the 12<sup>th</sup> rib. This term is used for cattle and lambs.

# Ethics: Consequences of Unethical Behavior

Erika Jeffries, IT & Curriculum Specialist

## Goal (learning objective)

Youth will:

- Learn about the consequences of unethical behavior
- Discern the need for good character and safe food products and the relationship between the two
- Understand the ethical implications of the decisions one makes while raising livestock

## Supplies

- Handout 1, “The ripple effect”. Make the appropriate number of copies for your group
- Handout 2, “IAFE (International Association of Fairs and Expositions) Code of Show Ring Ethics”. Make the appropriate number of copies for your group
- Chalkboard with chalk or easel pad with marker

## Pre-lesson preparation

- Read/review “The ripple effect activity/consequence wheel” at <http://www.crosscultured.com/documents/Family%20&%20Community/Consequence%20Wheel.pdf>
- Read/review your state’s 4-H policies. Policies and procedures of University of Idaho Extension 4-H Youth Development are at <http://www.uidaho.edu/extension/4h>
- Find your state’s 4-H mission and 4-H vision statements to share with the youth
- Review your county or local fair rule book
- Do a practice run of the ripple effect activity so you understand how choices and consequences fit into the wheel

## Lesson directions and outline

### Introduction

Read aloud to the group:

A clear mission and vision are the guiding principles for any 4-H Youth Development program. These principles dictate how programs are initiated, conducted, and evaluated.

An example of a 4-H mission statement is:

4-H empowers youth to reach their full potential through working and learning in partnership with caring adults.

An example of a 4-H vision statement is:

4-H...A leader in developing Idaho’s youth to become responsible, productive citizens, meeting the changing needs of a diverse society.

The previous activities have touched on very important principles and ethics that apply to livestock projects. The development of character and life skills are valuable tools you need to become successful and contributing members of society. There are important things to think about as far as choices you make and the consequences to those choices.



**Conducting the activity (DO)**

1. Distribute handout 1, “The ripple effect”, and Handout 2, “IAFE Code of Show Ring Ethics”
2. Read handout 1 to the group.
3. Have participants work through and complete the ripple effect activity.
4. Lead a discussion about consequences, asking questions such as:
  - Do you know what your state 4-H code of conduct is?
  - Where can you find a copy of the 4-H policies and procedures for your state?
  - Are the rules the same for every county fair?
5. Ask for volunteers to share their responses to question 1 of the ripple effect activity or their ripple map.
6. Do a review with the group of questions 8, 9, and 10 of the ripple effect activity:
7. Read handout 2 to the group. Ensure that participants understand that there is an expectation to abide by the state code of conduct, policies and procedures as well as the IAFE Code of Show Ring Ethics. These documents outline expectations of all program participants.

**What did we learn? (REFLECT)**

- Ask: When do we, as 4-H participants, agree to abide by the code of conduct or other policies set forth by the 4-H program?
- Ask: Where do you find the rules for your county fair?
- Ask: Who do you ask if you have questions about 4-H rules?

**Why is that important? (APPLY)**

- Ask: Name ways that you can support making good choices and meeting expectations outlined in the code of conduct.
- Ask: How can we look out for bad choices before they affect our lives?

**Resources**

Andestic, A. (2013). Helping kids see the consequences of their choices: The tree and the toilet bowl activity. Retrieved from <http://talltreesgrowdeep.com/helping-kids-see-the-consequences-of-their-choices/>

Collier, C. (2005). Consequences Wheel. Cross Cultural Developmental Education Services. Retrieved from <http://www.crosscultured.com/documents/Family%20&%20Community/Consequence%20Wheel.pdf>

International Association of Fairs and Expositions. (n.d.). IAFE Code of Show Ring Ethics. Retrieved from <https://s3.amazonaws.com/iafe/website/documents/ShowRingCodeofEthics.pdf>

University of Idaho Extension 4-H Youth Development. (2014). 4-H Youth Development Policies and Procedures 2014-2016 (Publication 91605). Retrieved from <http://www.uidaho.edu/extension/4h>



## ETHICS: CONSEQUENCES OF UNETHICAL BEHAVIOR - HANDOUT 1

### The Ripple Effect

When you throw a pebble into a pond, it makes ripples. The same holds true for the ripples that are made by the choices you make. This activity will look at how choices play out, challenging you to think about and explore immediate and long-term consequences of good choices as well as bad choices.

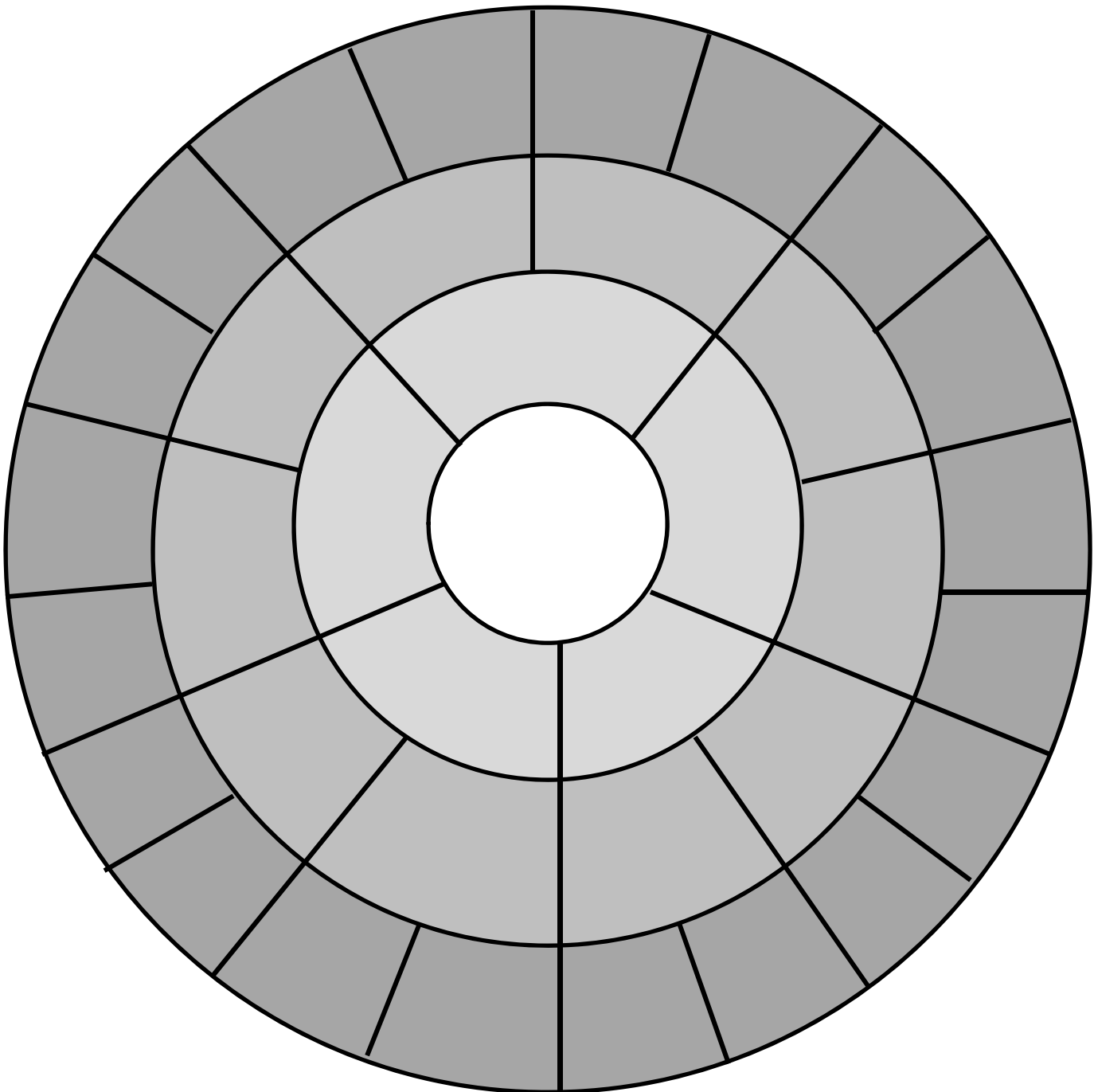


1. In the table below write down a good choice that you made (next to the thumbs up) and a bad choice (next to the thumbs down) in the left-hand column. Next think about the consequences of those choices —both good and bad. What were the immediate and long-term consequences of those choices?

Choices that you made	Immediate Consequence	Long-Term Consequence
	Good:     Bad:	The fruits of your choice:
	Good:     Bad:	The mess you had to clean up:

Adapted from “Consequences of Choices” activity, TallTreesGrowDeep.com

2. Think about a choice you will make with your livestock project. Write this in the center circle of the ripple map
  3. In the five spaces just outside of the center circle, write five separate direct consequences of this choice.
  4. In the next ring, record at least two things that could (or did) happen because of these consequences.
  5. Repeat for the outer ring. If the effects of an action are primarily negative, are there any positive consequences?
- Consequence Wheel by Dr. Catherine Collier



6. Our choices are bigger than just us. For the choice that you identified, list five ways this choice impacts others, your community, and the world.

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_

7. It's easy to see, after the fact, the impact a bad choice makes. How can we look out for bad choices before they affect our lives?

8. What are the consequences of unethical behaviors or of violating the Idaho 4-H Code of Conduct (available from <http://www.uidaho.edu/extension/4h>)?

9. Have you heard about or read the International Association for Fairs and Expositions (IAFE) Code of Show Ring Ethics?

10. What are the consequences and penalties for actions prohibited by the code?

# Ethics: Pillars of Character

Erika Jeffries, IT & Curriculum Specialist

## Goal (learning objective)

Youth will:

- Learn about the six pillars of character: respect, responsibility, trustworthiness, fairness, caring, and citizenship
- Discern the need for good character and safe food products and the relationship between the two
- Understand the ethical implications of the decisions one makes while raising livestock

## Supplies

- Handout 1, “Learning by example”. Make the appropriate number of copies for your group (double-sided document)
- One print of each of the character images – Handouts 2–7 (intended to display around room)
- Tape
- Chalkboard with chalk or easel pad with marker

## Pre-lesson preparation

Note: This lesson can be facilitated fully in 1 hour or split into two sessions.

- Read/review the following sections in *Quality Counts* (see resources list below):

Chapter 1, lesson 1 - Activity 1

Chapter 1, lesson 5 - Activities 1-3

- Visit the Character Counts! website and review information about the six pillars of character at <https://charactercounts.org/program-overview/six-pillars>
- Arrive early to the meeting area to allow time to hang up character images around the room

## Lesson directions and outline

### Conducting the activity (DO)

1. Read, “Learning by example” (handout 1, page 1) to the group or have someone else read it.
2. Lead a discussion, asking questions such as:
  - What was the first bad decision that was made?
  - What other bad decisions were there?
  - What could they do if they were in Tommy’s situation?
  - How do you go about making those decisions?
  - What would it be like if there were no rules?
  - What responsibilities do we have to the animals we own?
3. Read “Ethical expectations of 4-H participants” (handout 1, page 2) to the group.
4. Lead a discussion about the pillars, asking questions such as:
  - How do you define good character?
  - How do you know a person is someone you can trust and respect? Is it based on what that person says, does, or both?
  - How does a person’s character affect the decisions he or she makes?
  - Why are these traits important in a person who raises or exhibits livestock?
5. Ask participants to name ways that they can demonstrate each trait in carrying out their livestock projects. Have someone capture responses on the chalkboard or easel pad.
6. Read the first scenario (below), and ask the group what should be done. After the group has provided their answers, ask the group:

- Which pillars of character are important in making this decision?
- Are any of the pillars in conflict?
- Are there any other solutions to this dilemma?

Scenario 1: It is December 23, and when you go out to feed your show pigs you notice that you do not have enough feed to last through the holidays. You and your father go to the feed store to pick up some more feed. Since your show is not far away, you can no longer feed the medicated feed because of the withdrawal time. But the feed store clerk tells you they're out of non-medicated feed. He offers to sell you the medicated feed at the same price as non-medicated feed. (Correct answer is C)

You should:

- A. Take the medicated feed. The show doesn't do drug tests anyway.
  - B. Turn down the offer of medicated feed, thinking that you can find a neighbor who can let you borrow enough feed to last through the holidays.
  - C. Decline the feed and politely inform the store clerk that it's important to follow the rules about using medicines and drugs.
  - D. Tell the clerk that what they are suggesting is illegal.
7. Repeat with each scenario, identifying the most correct answer after the group discussion.

Scenario 2: Before you can make a decision about the feed, the store owner comes along. He's overheard the conversation and tells you that your neighbor Bob, whose son also has show pigs, has just bought a ton of non-medicated feed and might share with you. When you get home your dad calls Bob, who says you're welcome to as much as you need until the feed store gets some more. He says that he and his family are going out of town and tells you where to find the feed. You and your little brother hop on the four-wheeler and go to get the feed. After loading it, you admire the fine-quality pigs Bob's son has. While looking at them, you realize that some of the pigs are validated to another exhibitor in the county. (Correct answers B and C)

You should:

- A. Get your brother and leave.
- B. Point out to your little brother what you see and tell him that it is wrong and why.
- C. Tell your dad what you saw and have him call the county Extension office.
- D. Call Bob and ask him what the deal is.

Scenario 3: The fun at Bob's hasn't ended yet. While loading the feed, your little brother knocks over a storage cabinet in the barn. What comes out of the cabinet is a surprise: illegal drugs. There are no animals in Bob's pens that these drugs could legally be given to. (Correct answer is B)

You should:

- A. Call Bob and ask him what is going on.
- B. Tell your dad and ask him to call your county Extension office.
- C. Tell all of your friends what you saw in Bob's barn and let them know that he is cheating and using illegal drugs to make his show pigs better.
- D. Unload the feed into Bob's barn and leave as soon as possible to try to erase all evidence that you were there.

Scenario 4: Your father recently agreed to be the project leader for your 4-H club. One of his duties is to locate swine projects for the members of the club. He wants to do this as fairly as he can, so he finds a breeder who has enough high-quality pigs for everyone. He schedules a day to go pick up the pigs and you decide to ride with him. When you get there the breeder shows you a pig he has set aside for you. He knows that you are a good feeder so he wants you to have this pig that is better than the rest. (Correct answers are A and D)

You should:

- A. Politely decline the pig.
- B. Take the pig. You should get first choice anyway because your dad is the one who went and purchased the pigs for everyone.
- C. Take the pig. If you don't someone else will, and you will have to show against a better pig.

D. Take the good pig back and draw for the pig with the other members. You may get lucky and draw this one anyway.

Scenario 5: The pig you've raised for the county show is overweight and the show is just 2 days away. A buddy offers to help with some sort-of-legal practice that will get the weight off the pig in time for the show. If you don't take the help, your pig probably won't qualify. (Correct answers are C and D)

You should:

- A. Take the help. You have spent a great deal of time with your pig and really want to show.
- B. Take the help. The practice is sort-of legal. It hasn't been identified as illegal. Besides, others are sure to be cheating, and this practice isn't considered cheating yet.
- C. Decline the help and look for an alternative that is sort-of-more legal.
- D. Decline the help. Try to naturally and legally get the weight off and hope that your pig can lost the weight for the show. Learn from this mistake and do better with your next swine project.

#### **What did we learn? (REFLECT)**

- Ask: What are some of the ethical decisions that you face when raising livestock for a 4-H project?
- Ask: Do you know the rules at your fair?
- Ask: Are the rules fair? Why or why not?

#### **Why is that important? (APPLY)**

- Ask: Why are there rules for raising and showing livestock projects?
- Ask: Do we expect the meat and the other food products we purchase to be safe to eat? Whose job is it to make sure food is safe?

## **Resources**

Boleman, C., Chilek, K., Coufal, D., Keith, L., & Sterle, J. (2011). Quality counts. Texas A&M AgriLife Extension. Retrieved from [http://agrilifecdn.tamu.edu/qualitycounts/files/2010/11/pdf\\_1733.pdf](http://agrilifecdn.tamu.edu/qualitycounts/files/2010/11/pdf_1733.pdf)

Character Builder. (2015). Six pillars of character. Retrieved from <http://characterbuilder.management/wp-content/uploads/2015/04/SixPillars.jpg>

Josephson Institute of Ethics. (2009). Character counts! The six pillars of character. Retrieved from <https://charactercounts.org/program-overview/six-pillars/>

University of Idaho Extension. (2006). Ethical expectations of 4-H participants. *4-H animal project record book* (page 2). Retrieved from <http://www.uidaho.edu/extension/4h/documents-records>



## **ETHICS: PILLARS OF CHARACTER - HANDOUT 1**

### **Learning by Example by Larry Mrozinski**

When Tommy was 8 years old, his father registered a lamb born on December 24 as being born on January 2. His father said to Tommy, "It's okay, kid; everybody does it."

When Tommy was 9 years old, his father bred the family's flock of purebred ewes with a ram of another breed and registered the lambs as purebreds. His father said to Tommy, "It's okay, kid; everybody does it."

When Tommy was 10 years old, his 4-H leader and county agent tagged and weighed newly purchased lambs a month after the ownership deadline. They both told him, "It's okay, kid; everybody does it."

When Tommy was 11 years old, his parents bought him a registered ewe lamb to show at the county fair and changed the ear tag to their own flock tag. His parents said, "It's okay, kid; everybody does it."

When Tommy was 12 years old, his grandparents bought him a show lamb and left it with the breeder who fed and fit the lamb until the day before the county fair. The breeder and his grandparents said, "It's okay, kid; everybody does it."

When Tommy was 13 years old, his veterinarian issued health papers for sheep he never inspected and that had foot rot and lamb fungus. He said, "It's okay, kid; everybody does it."

When Tommy was 14 years old, his neighbor used an electric animal prod on his lamb to get it to brace. He told Tommy, "It's okay, kid; everybody does it."

When Tommy was 15 years old and after winning the Grand Champion Market Lamb at the county fair, he saw his dad having a beer with the judge and paying the judge \$200 for making his son's lamb champion. The judge and his father said, "It's okay, kid; everybody does it."

When Tommy was 16 years old, his FFA advisor falsified the number of Tommy's winning sheep proficiency award entry. His advisor said, "It's okay, kid; everybody does it."

When Tommy was 17 years old, his uncle used Lasix on his market lamb at the state fair to make it weigh into a lighter class. His uncle said, "It's okay, kid; everybody does it."

When Tommy was 18 years old, his brother pumped the loin of his lamb at a national sheep show. His brother said, "It's okay, kid; everybody does it."

When Tommy was 19 years old, his entire family knew that he'd given clenbutural to his market lambs. They told him, "It's okay, kid; everybody does it."

When Tommy was 20 years old, a friend offered him cocaine. His friend said, "It's okay, kid; everybody does it."

When Tommy was arrested later that night for using cocaine and called his family to ask them to bail him out of jail they told him, "How could you have brought such a disgrace to your family? You never learned any of that at home. Where did you go wrong?" After hearing of his arrest, Tommy's 4-H leader, FFA advisor, county agent, grandparents, uncle, veterinarian and neighbors were also shocked. If there's one thing the adult world can't stand it's a kid who breaks the rules.

## **ETHICS: PILLARS OF CHARACTER - HANDOUT 1, PAGE 2**

### **Ethical Expectations of 4-H Participants**

All participants within the Idaho 4-H program (Extension staff, volunteers, parents, members, etc.) are expected to conduct themselves in an ethical manner at all times. Ethics are principles of accepted behavior that outline how individuals should act. Ethics deals with the ability to tell right from wrong and being committed to do what is right. While some situations may occur where there is not a “clear cut” answer to whether the action or practice is ethical, an ethical alternative always exists. Using the Six Pillars of Character (established by the Josephson Institute) can help guide you in making ethical decisions.

### **The Six Pillars of Character**

**Trustworthiness** – Be honest. Don’t deceive, cheat, or steal. Be reliable. Do what you say you’ll do. Have the courage to do the right thing. Build a good reputation. Be loyal. Stand by your family, friends, and country.

**Respect** – Treat others with respect. Be tolerant of differences. Use good manners, not bad language. Be considerate of the feelings of others. Don’t threaten, hit, or hurt anyone. Deal peacefully with anger, insults, and disagreements.

**Responsibility** – Do what you are supposed to do. Persevere: keep on trying! Always do your best. Use self-control. Be self-disciplined. Think before you act; consider the consequences.

**Fairness** – Play by the rules. Take turns and share. Be open-minded; listen to others. Don’t take advantage of others. Don’t blame others carelessly.

**Caring** – Be kind. Be compassionate and show you care. Express gratitude. Forgive others. Help people in need.

**Citizenship** – Do your share to make your school and community better. Cooperate. Get involved in community affairs. Stay informed; vote. Be a good neighbor. Obey laws and rules. Respect authority. Protect the environment.

\* Use this acronym to help you remember that people with good character are terrific: (TRRFCC)

Ethics is an important part of everyday life. If you choose to act unethically or allow others around you to do so, you not only tarnish your reputation but also discredit your family, club, and the 4-H program. No prize or award is worth this in the long run. Remember, only one person ultimately controls the decisions you make—you. As a 4-H participant, we trust you will make ethical choices not only within the program, but in everyday life, too.

<https://charactercounts.org/program-overview/six-pillars/>















# Ethics: Sportsmanship

Erika Jeffries, IT & Curriculum Specialist

## Goal (learning objective)

Youth will:

- Learn the importance of setting personal goals
- Explain and understand the difference between gamesmanship and sportsmanship
- Commit to exhibiting good sportsmanship at all times

## Supplies

- Handout 1, “Steps for writing goals”—appropriate number of copies for group
- Handout 2, “Gamesmanship or sportsmanship”—appropriate number of copies for group
- Pens or pencils
- Paper
- Chalkboard with chalk or easel pad with marker

## Pre-lesson preparation

- Read/review the following sections in *Quality Counts* (see resources list). Note: This is a 164 page document, specific pages are as follows:

Chapter 4, lesson 1 - Activities 1 and 3

Chapter 4, lesson 2 - Activities 1 and 2

## Lesson directions and outline

## Conducting the activity (DO)

1. Ask youth to think about their motivations for having a livestock project and to write their thoughts on paper.
2. Explain that there are usually two main reasons why people do extracurricular activities: to have fun and/or to feel worthy or successful.
3. Write these two categories on the easel pad or board and ask participants to share the motivations they have written down. Write their responses under one of the categories. Ask youth which category they think is appropriate? How do you define good character?
4. Discuss their various motivations with the participants. Be sure to ask why caring for and exhibiting livestock is much more than winning and losing. Explain the connection with and importance of personal growth, becoming mature and responsible, and increasing knowledge.
5. Ask participants to share how their personal motivations might affect decisions made while raising or showing their project animals. How might an individual's motivations cause them to take actions that many people would not see as being appropriate?
6. Ask participants, What is sportsmanship? Sportsmanship is exhibiting livestock with honor.
7. Ask participants, What is gamesmanship? Gamesmanship is all about winning for gain or glory. Discuss the difference between sportsmanship and gamesmanship.

8. Read the following: **Success is the achievement of**  
Read each statement in handout 2 and ask whether it represents gamesmanship (G) or sportsmanship (S)

- Picking up a show stick that someone drops in the show ring **S**
- Jabbing someone else's animal in the show ring **G**
- Being dishonest about an animal's age when registering **G**
- Teaching a younger exhibitor how to clip and fit a steer **S**
- Opening a gate for someone who has had a pig penned **S**
- Showing an animal in the wrong breed or division **G**
- Letting another exhibitor borrow a brush **S**
- Telling the judge that your animal weighs a different amount than what the card says **G**
- Taking leadership of the county showmanship training to help others **S**
- Blocking the judge's view of another animal in the class **G**
- Sharing your knowledge about selecting projects with others **S**
- Depriving your animal of the appropriate amount of feed and water to get its weight down **G**
- Helping a younger exhibitor carry a bucket of water **S**

#### **What did we learn? (REFLECT)**

- Ask: Why should we strive for sportsmanship, not gamesmanship?
- Ask: What can you do at the club or at the show to promote sportsmanship?

#### **Why is that important? (APPLY)**

- Ask: What character traits connect to sportsmanship?
- Ask: How does sportsmanship impact the industry? How?

#### **Resources**

Boleman, C., Chilek, K., Coufal, D., Keith, L., & Sterle, J. (2003). Quality counts. Texas A&M AgriLife Extension. Retrieved from [http://agrilifecdn.tamu.edu/qualitycounts/files/2010/11/pdf\\_1733.pdf](http://agrilifecdn.tamu.edu/qualitycounts/files/2010/11/pdf_1733.pdf)

University of Idaho Extension. (2006). Ethical expectations of 4-H participants. *4-H animal project record book* (page 2). Retrieved from <http://www.uidaho.edu/extension/4h/documents-records>

## **ETHICS: SPORTSMANSHIP - HANDOUT 1**

### **Steps for Writing Goals**

1. Make sure the goal is something you really want, not just something that sounds good.
2. Write a goal in the positive instead of the negative (for example, "I will. . .").
3. Write your goal in complete detail.
4. Make sure you set your goal high enough.
5. WRITE IT DOWN!

#### **Example:**

##### **My personal goals are:**

To practice showing my steer four times a week  
To brush my steer twice a week  
To clean the pig pen three times a week  
To help my younger sister feed her calf  
To participate in at least three shows this year  
To improve my math grades  
To lead a showmanship clinic this year for my club

##### **My personal goals are:**

## ETHICS: SPORTSMANSHIP - HANDOUT 2

### Gamesmanship OR Sportsmanship?

*Read each statement below. Does it represent gamesmanship or sportsmanship?*

- Picking up a show stick that someone drops in the show ring
- Jabbing someone else's animal in the show ring
- Being dishonest about an animal's age when registering
- Teaching a younger exhibitor how to clip and fit a steer
- Opening a gate for someone who has had a pig penned
- Showing an animal in the wrong breed or division
- Letting another exhibitor borrow a brush
- Telling the judge that your animal weighs a different amount than what the card says
- Taking leadership of the county showmanship training to help others
- Blocking the judge's view of another animal in the class
- Sharing your knowledge about selecting projects with others
- Depriving your animal of the appropriate amount of feed and water to get its weight down
- Helping a younger exhibitor carry a bucket of water

### **SPORTSMANSHIP**

**is about exhibiting livestock with honor**

Sportsmanship = livestock exhibition is a contest governed by high standards of integrity and ethics.

### **GAMESMANSHIP**

**is all about winning for gain and glory**

Gamesmanship = livestock exhibition is a chance to win by doing whatever you can get away with.

# Ideal Market Animal

Scott Nash, Regional Youth Development Educator

## Goal (learning objective)

Youth will learn that they are raising animals that will become food products for consumers.

## Supplies

- Handouts of current industry standards (ideal animals for each species) See Handouts
- Pictures of animals that have too much fat (see pictures attached)
- Pictures of animals that are light muscled (see pictures attached)
- Picture of beef ribeye area, lamb ribeye area, and swine loin area with different levels of fat and muscle (see pictures attached)
- Paper and pencils

## Pre-lesson preparation

- Prepare to talk to the youth about the purpose of raising meat animals - for food. Reviewing the industry standards will help youth understand why it's important to know acceptable weights and carcass traits.
- Be prepared to use the pictures to talk to the youth about differences in fat and muscle and why it matters.
- Have members come to the meeting with information about the prior year's animal including species, beginning weight, final weight, carcass measurements, and quality grade (if available).
- Have members come to the meeting with information about this year's animal including species, birthdate, and beginning weight.
- Visit with county Extension personnel to determine the amount of days on feed for each species.

## Lesson directions and outline

- Using the Industry Standards handouts, share industry-acceptable weights and carcass characteristics of market animals. Explain to the youth that carcass characteristics are defined by body type and muscling.
- Display the ribeye and loin eye pictures. Discuss any muscle and fat differences that can be identified from the pictures.

## Conducting the activity (DO)

### Activity 1

1. Ask for a volunteer to distribute paper and pencils to the group.
2. Provide the youth with a copy of each species' industry standards. As needed, review the range of each trait.
3. Have the youth list the weight, carcass measurements, and quality grade of a previous project they raised.
4. Have the youth project the final weight and trait measurements of animals they are raising now.

### Activity 2

1. Divide the youth into groups of 2-3 people.
2. Make sure the group has a copy of the industry standards for the species they are raising.
3. Give the groups a picture of the live animal with the ribeye or loin eye picture and the carcass information.
4. Have the groups review the picture and animal information to determine if the animal met industry acceptability.
5. Have the groups share their findings with the rest of the youth.

**What did we learn? (REFLECT)**

- Ask: Why do we raise market animals in 4-H?
- Ask: What did you learn from the pictures of the live animals and carcass information?
- Ask: What can you do to raise an animal that fits the industry standards?

**Why is that important? (APPLY)**

- Ask: Why does it matter if meat animals raised by youth meet industry standards?
- Ask: What can you tell a consumer about youth-raised meat animals?

**Resources**

American Meat Science Association. (2013). Beef grading. *Meat evaluation handbook* (27-35).

American Meat Science Association. (2013). Lamb and mutton grading. *Meat evaluation handbook* (pages 124-125).

Kinder, C.A., Glaze, B.J., Church, J.A., Jensen, S., Williams, S., Nash, S. 2008. Beef Quality Assurance Program Manual. University of Idaho Extension. PNW 593.

Ohio State University Extension. (2011). Beef Carcass Evaluation. *Beef resource handbook* (pages 8-2 - 8-6).

Ohio State University Extension. (2008). Meat Goats. *Goat resource handbook* (page 118).

Ohio State University Extension. (2011). Carcass Evaluation and Meats. *Sheep resource handbook for market and breeding projects* (pages 73-78).

Ohio State University Extension. (2000). Quality. *Swine resource handbook for market and breeding projects* (pages 4-3 - 4-7).

University of Idaho Extension 4-H handouts (2015).

Photo credit: Cindy A. Kinder

Ribeye and Loin Photos

Beef Industry Standards

Swine Industry Standards

Sheep Industry Standards

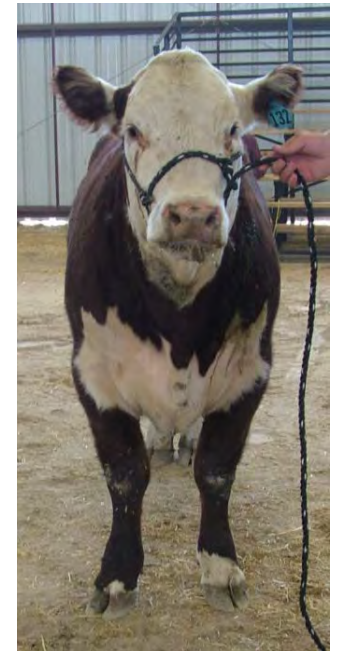


# Industry Standards Animal Science Lesson Plan

Pictures by  
Cindy A. Kinder  
University of Idaho  
Gooding/Camas Extension Educator

# Beef Industry Goals

• Goal	Target	Range
• Age at market	14 – 18 months	12 – 30 months
• Live Weight	1250 – 1300 lbs	1000 – 1500 lbs
• Dressing %	60% - 63%	56% - 66%
• Carcass Weight	700 – 850 lbs	550 – 950 lbs
• Fat Thickness	<.50 inches	.20 - .80 inches
• Ribeye	12.5 – 13.9 in. <sup>2</sup>	10.0 – 17.0 in. <sup>2</sup>
• Quality Grade	Choice or higher	Select to Prime
• Yield Grade	3.0 or less	1.0 to 4.0



Tag No.132  
Live Wt 1104  
Carcass Wt 686  
Ribeye 13.2  
Back Fat .25  
KPH 2.5  
Quality Grade  
Select

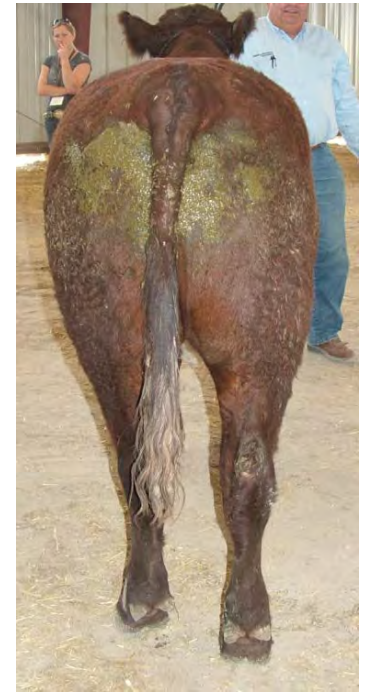
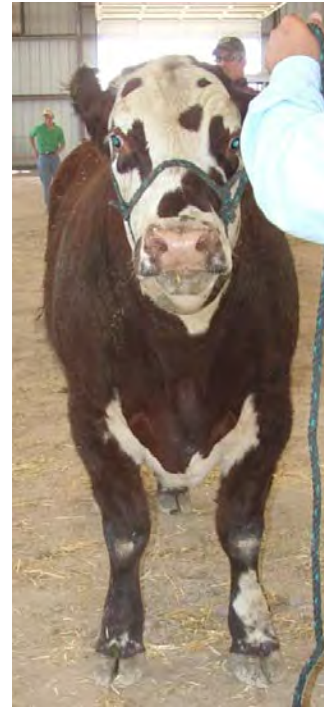


Tag No. 122  
Live Wt 1421  
Carcass Wt 907  
Ribeye 12.0  
Back Fat .75  
KPH 2.5  
Quality Grade  
MD Choice





Tag No. 121  
Live Wt 1258  
Carcass Wt 794  
Ribeye 14.0  
Back Fat .4  
KPH 2.5  
Quality Grade  
MT 40 Choice



Tag No. 68  
Live Wt 1306  
Carcass Wt 844  
Ribeye 13.1  
Back Fat .3  
KPH 2.0  
Quality Grade  
Sm 50 Choice -







# Sheep Industry Goals for Market Lambs

• Goal	Target	Range
• Age at market	6 – 8 months	6 – 14 months
• Live Weight	125 – 140 lbs	115 – 160 lbs
• Carcass Weight	65 – 75 lbs	60 – 85 lbs
• 12 <sup>th</sup> Rib Fat	.20 - .30 inches	.10 - .50 inches
• Ribeye Area	2.85 in. <sup>2</sup>	2.0 – 3.5 in. <sup>2</sup>
• Quality Grade	Choice or higher	Choice– to Prime
• Yield Grade	3.0 or less	1.0 to 5.0



Tag No. 2727  
Live Wt 137  
Carcass Wt 83  
Ribeye 4.1  
Back Fat .25  
KPH 3.0  
Quality Grade  
Choice +



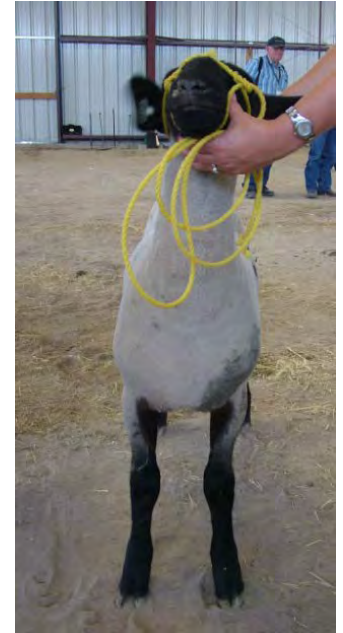


Tag No. 2735  
Live Wt 133  
Carcass Wt 83  
Ribeye 3.7  
Back Fat .2  
KPH 1.5  
Quality Grade  
Choice





Tag No. 5184  
Live Wt 130  
Carcass Wt 78  
Ribeye 3.9  
Back Fat .17  
KPH 1.5  
Quality Grade  
Choice



Tag No. 129  
Live Wt 145  
Carcass Wt 81  
Ribeye 3.5  
Back Fat .12  
KPH 2.5  
Quality Grade  
Choice





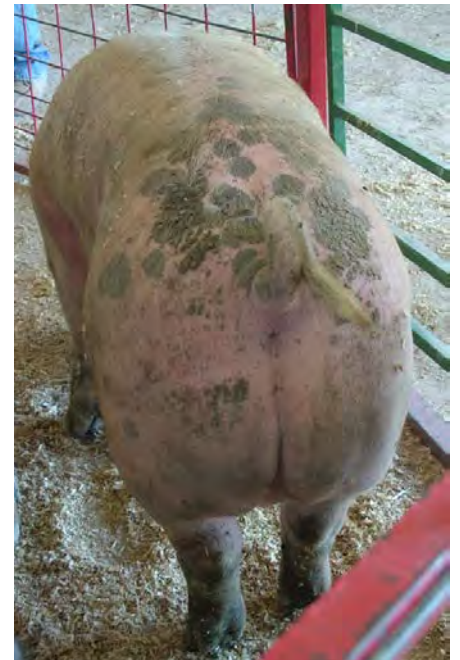
# Swine Industry Goals

• Goal	Target	Range
• Age at market	155 – 165 days	145 – 180 days
• Live Weight	260 – 280 lbs	210 – 300 lbs
• Carcass weight	195 lbs	160 – 220 lbs
• Backfat	.60 - .80 in.	.30 – 1.5 in.
• Loin Eye Area	6.5 – 7.1 in. <sup>2</sup>	4.5 – 10.0 in. <sup>2</sup>
• USDA Grade	U.S. # 1	U.S. # 1 to U.S. # 4
• Percent Lean	54%	48% to 58%



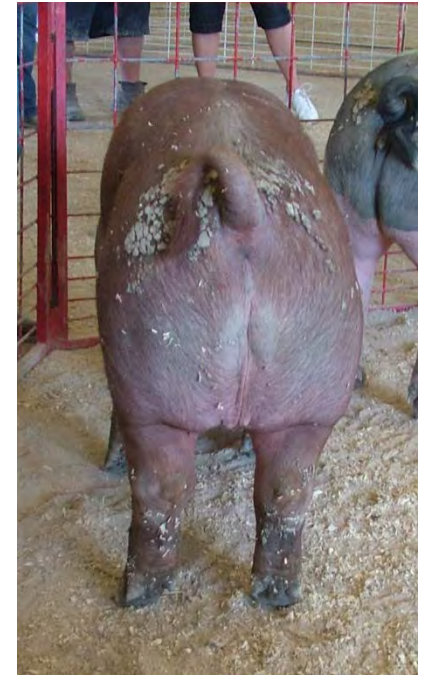


Tag No. 1732  
Live Wt 295  
Carcass Wt 217  
Ribeye 7.2  
Back Fat .9

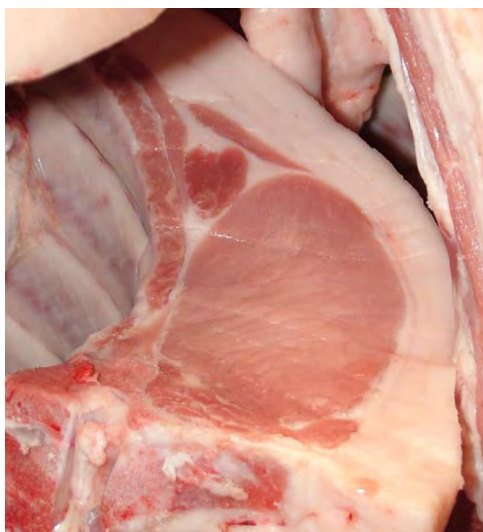


Tag No. 1874  
Live Wt 300  
Carcass Wt 220  
Ribeye 8.1  
Back Fat .6



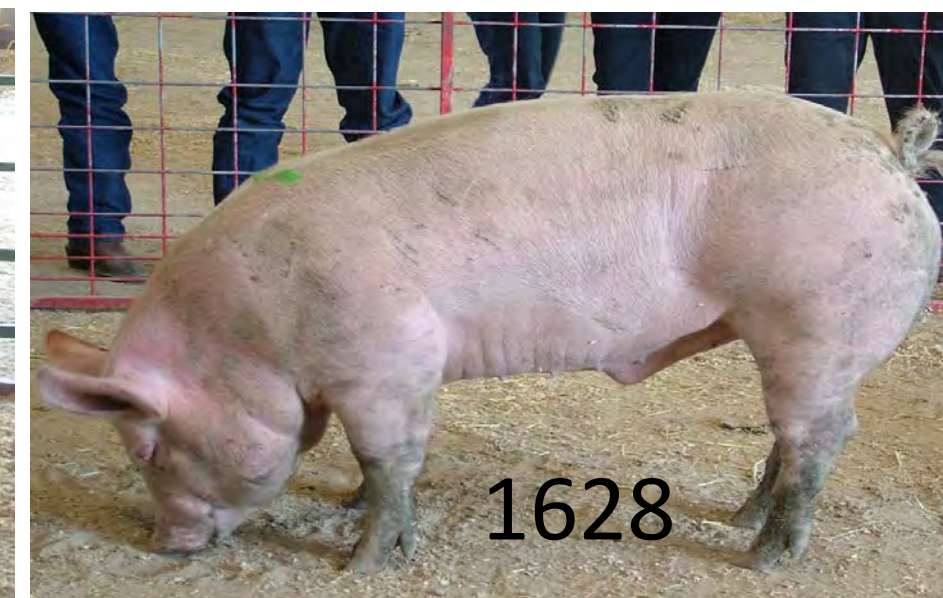
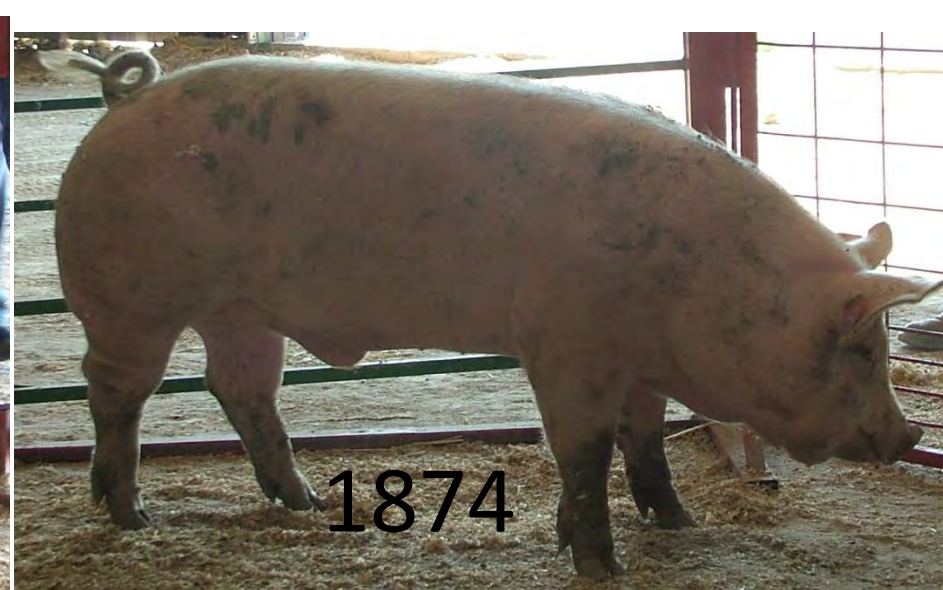


Tag No. 1889  
Live Wt 290  
Carcass Wt 220  
Ribeye 7.05  
Back Fat 1.2



Tag No. 1628  
Live Wt 310  
Carcass Wt 224  
Ribeye 8.75  
Back Fat .9





# Recognizing Wholesale and Retail Cuts

Scott Nash, Extension Educator

## Goal (learning objective)

Youth will learn the differences between wholesale meat cuts and retail meat cuts.

## Supplies

Please visit with your Extension Office on the availability of Learning Lab Kits.

- Wholesale Cuts of Beef chart (Beef Learning Lab Kit)
- Wholesale Cuts of Pork chart (Swine Learning Lab Kit)
- Wholesale Cuts of Lamb chart (Sheep Learning Lab Kit)
- Wholesale Cuts of Goat chart (Goat Learning Lab Kit)
- Retail Cuts of Beef chart (Beef Learning Lab Kit)
- Retail Cuts of Pork chart (Swine Learning Lab Kit)
- Retail Cuts of Lamb chart (Sheep Learning Lab Kit)
- Retail Cuts of Goat chart (Goat Learning Lab Kit)
- Copies of Handouts 2, 4, 6, 8 - Wholesale Cuts - Unlabeled. Enough copies for your group, provide them the handout of the animal(s) they are raising. Handouts are attached to this lesson
- Copies of Handouts 1, 3, 5, 7 - Wholesale Cuts - Labeled. Enough copies for your group, provide them the handout of the animal(s) they are raising. Handouts are attached to this lesson
- Pencils (enough for group)
- Tape

## Pre-lesson preparation

- Read/review the handouts and resources.
- Check on Learning Lab Kit availability with your local Extension Office.
- Learn the different wholesale cuts for each species. Be prepared to share with the youth your favorite retail cuts and which wholesale cut it comes from. (It may be a good idea to purchase the actual retail cut to show to the youth).
- Make copies of the handouts.
- Hang-up the Wholesale Cuts Charts for each species - towards the front of the room.

## Lesson directions and outline

Have youth share the differences between wholesale and retail cuts.

Share the following information with the youth:

Wholesale cuts are large meat cuts that the animal carcass is cut into for ease in handling and shipping. Some wholesale cuts are higher in value.

The wholesale cuts in the middle part of the animal are called the “middle meats” and include the loin, rib or rack and are worth more money than shoulder, picnic, chuck or round. Those cuts on either end of the body are called “end meats” such as the shoulder or round and they provide movement so they are a little tougher than the middle meats. The loin doesn’t move in the same way or work like the shoulder so it is more tender.

The retail cuts are the specific cuts that come from the large wholesale cut and are those displayed for sale in the grocery store. It is possible that many different retail cuts come from a large wholesale cut. For example the loin wholesale cut can be cut into retail cuts that include; steaks, chops and roasts.



**Conducting the activity (DO)**

1. Have a volunteer distribute the copies of the unlabeled wholesale cuts handouts (Handouts 2, 4, 6, and 8).
2. Referring to the displayed Wholesale Cuts Charts (for each species) have youth take turns selecting a wholesale cut to discuss.
3. On the handout provided, have youth write the correct wholesale cut name.
4. On the same handout provided, have youth list at least two retail cuts from the wholesale cut identifying with a dollar sign \$ the cuts that are more expensive.
5. Distribute copies of the labeled wholesale cuts handouts (Handouts 1, 3, 7, 7).
6. Have youth share their results.
7. Ask: Have youth share their favorite retail cut. Why?

**What did we learn? (REFLECT)**

- Ask: Which retail cuts are more expensive? Why?
- Ask: Are there similarities or differences where the more expensive retail cuts come from amongst the species?

**Why is that important? (APPLY)**

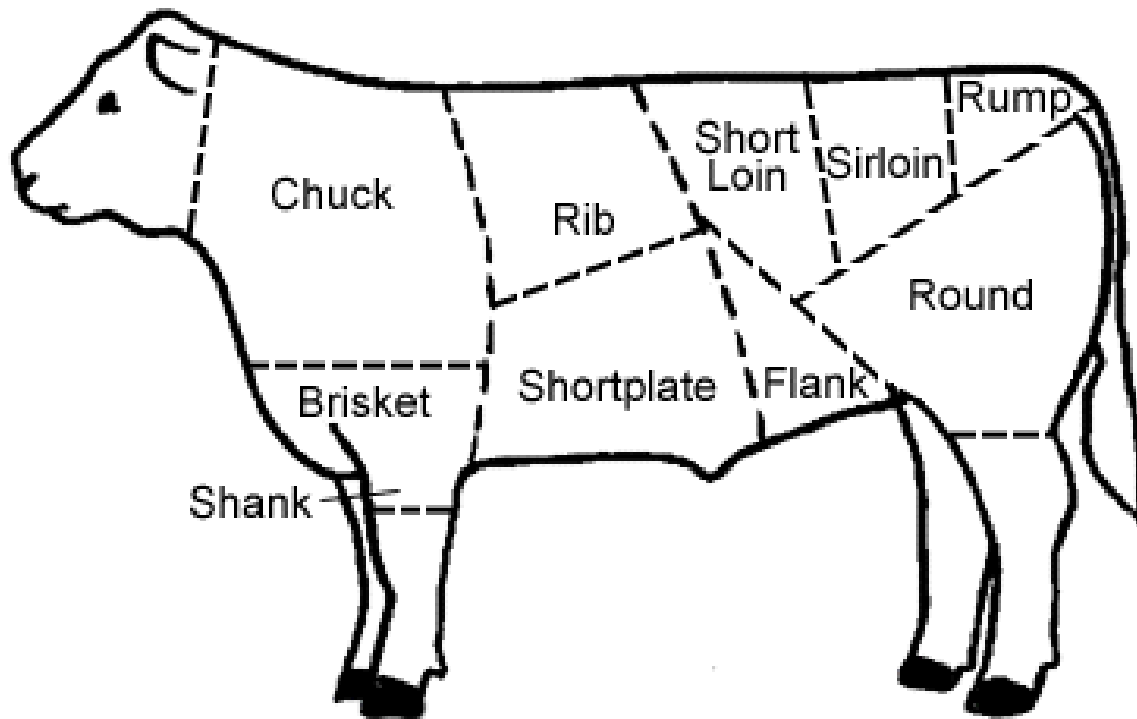
- Ask: Why is it important to know the difference between wholesale and retail cuts? How does this knowledge help them as a producer?
- Ask: How will this help you when you shop for meat at the grocery store?
- Ask: What can you share with other consumers to help them understand why meat cuts have different prices?

**Resources**

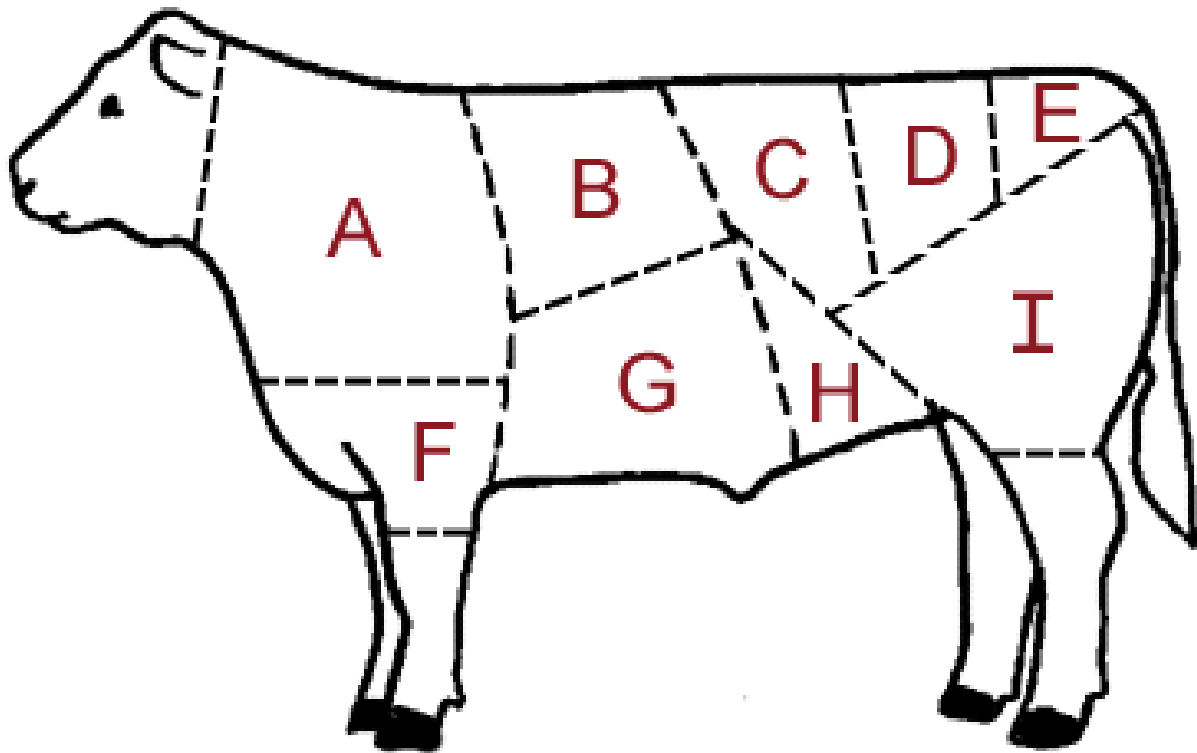
- Ohio State University Extension. (2011). Beef Carcass Evaluation. *Beef resource handbook* (pages 8-11 through 8-12 and Color Photos (CP) CP-14 and CP-15).
- Ohio State University Extension. (2008). Meat Goats. *Goat resource handbook* (pages 121-125).
- Ohio State University Extension. (2011). Carcass Evaluation and Meats. *Sheep resource handbook for market and breeding projects* (pages 77-83).
- Ohio State University Extension. (2000). Pork Products. *Swine resource handbook for market and breeding projects* (pages 5-1 through 5-3).
- Ohio State University Extension. (1999). Learning Lab Kits: Beef, Sheep, Swine, and Goat. Available from: <http://www.ohio4h.org/books-and-resources/learning-lab-kits>



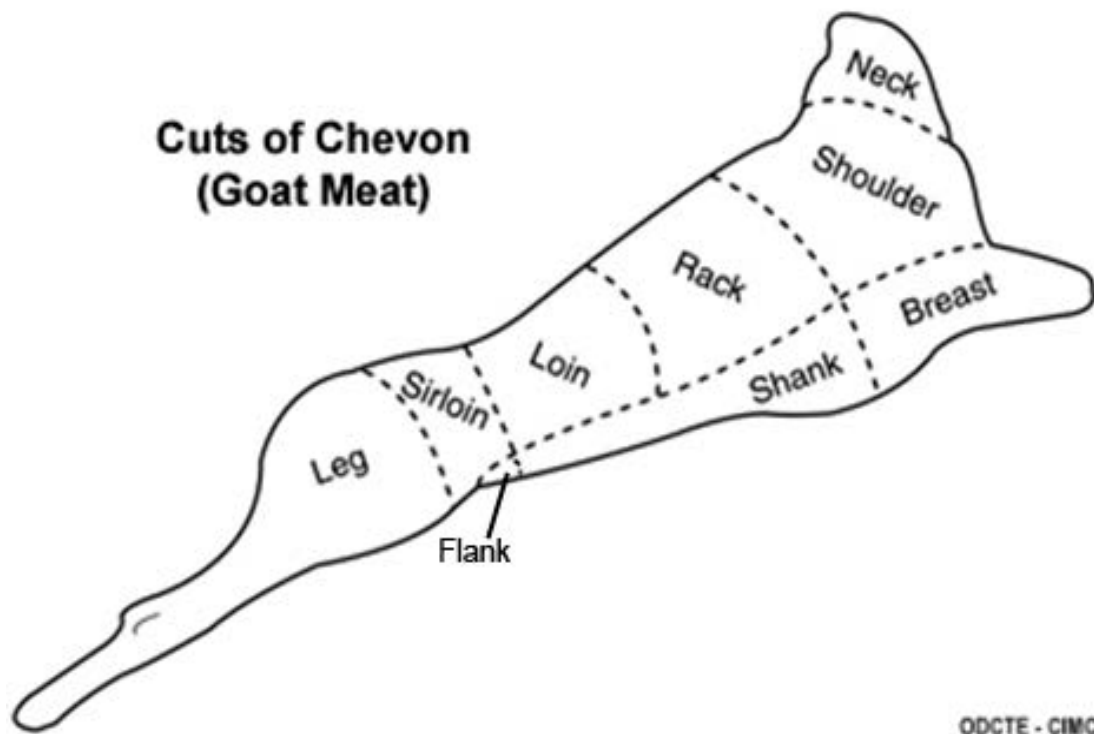
### Wholesale Cuts of Beef



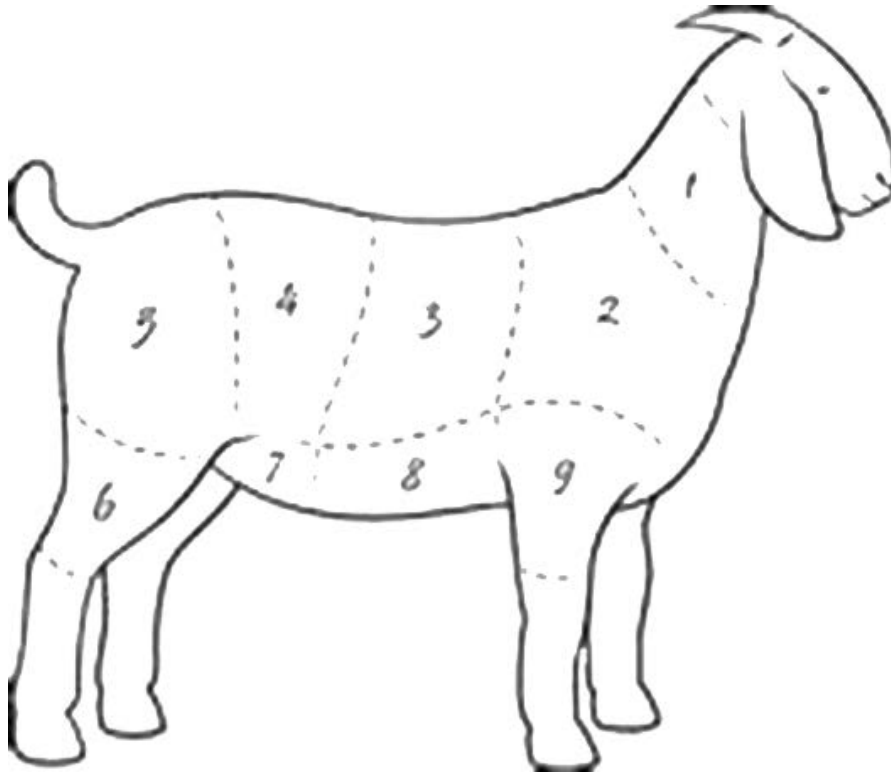
### Wholesale Cuts of Beef



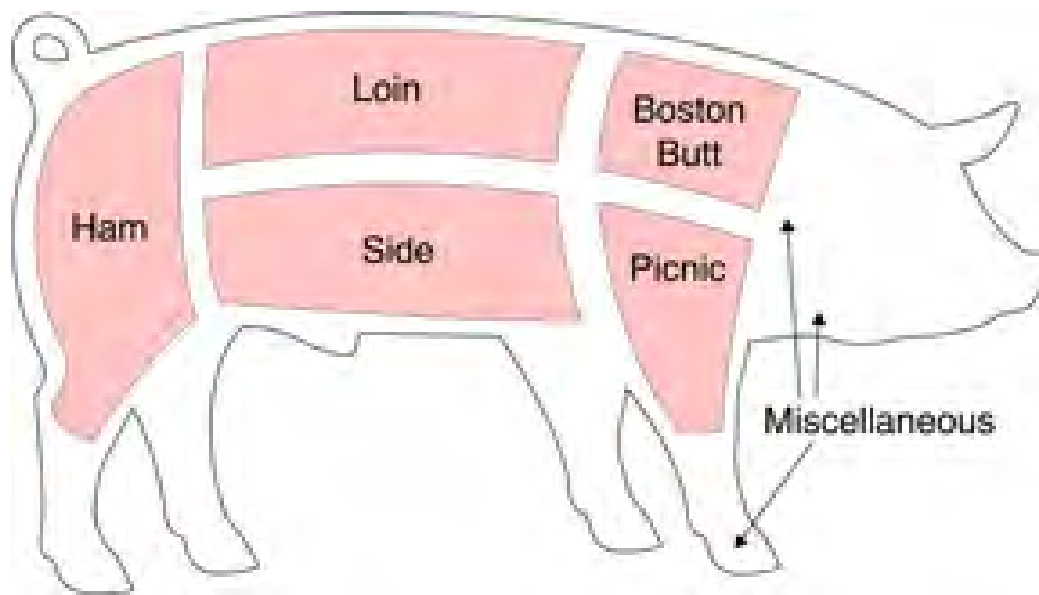
## Wholesale Cuts of Chevron (Goat)



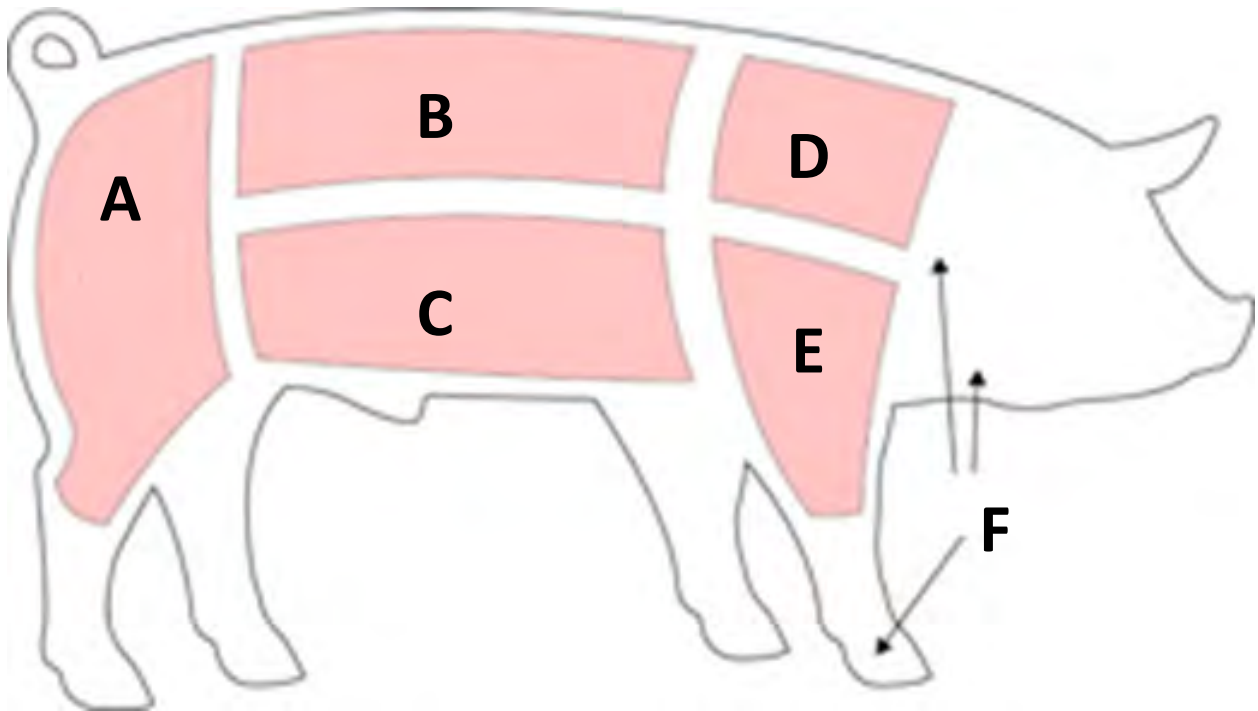
### Wholesale Cuts of Chevron (Goat)



## Wholesale Cuts of Pork

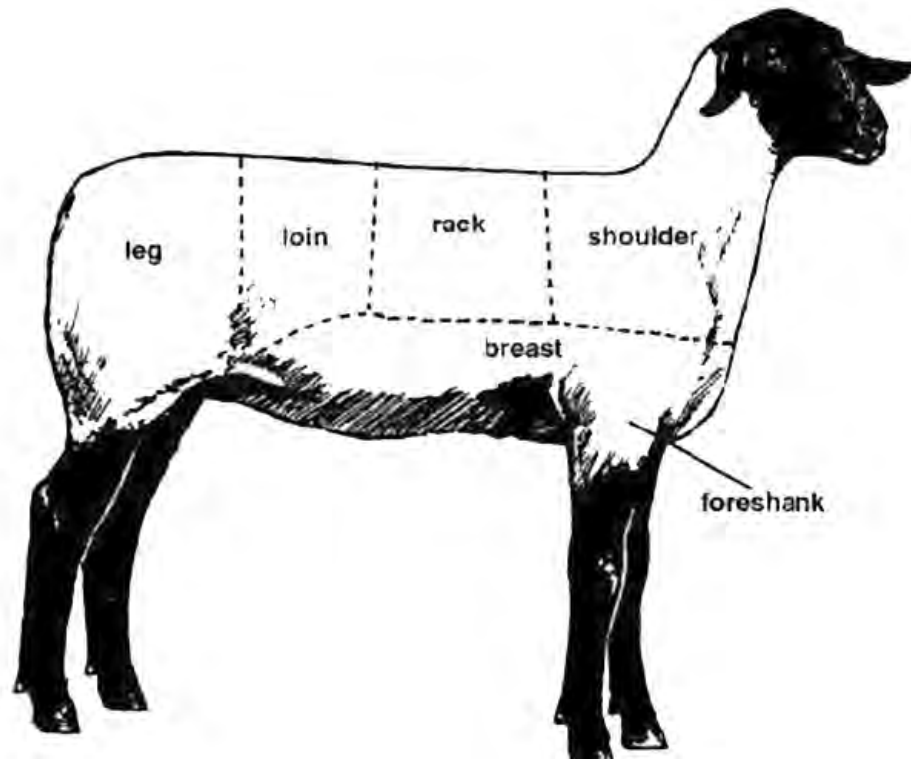


## Wholesale Cuts of Pork

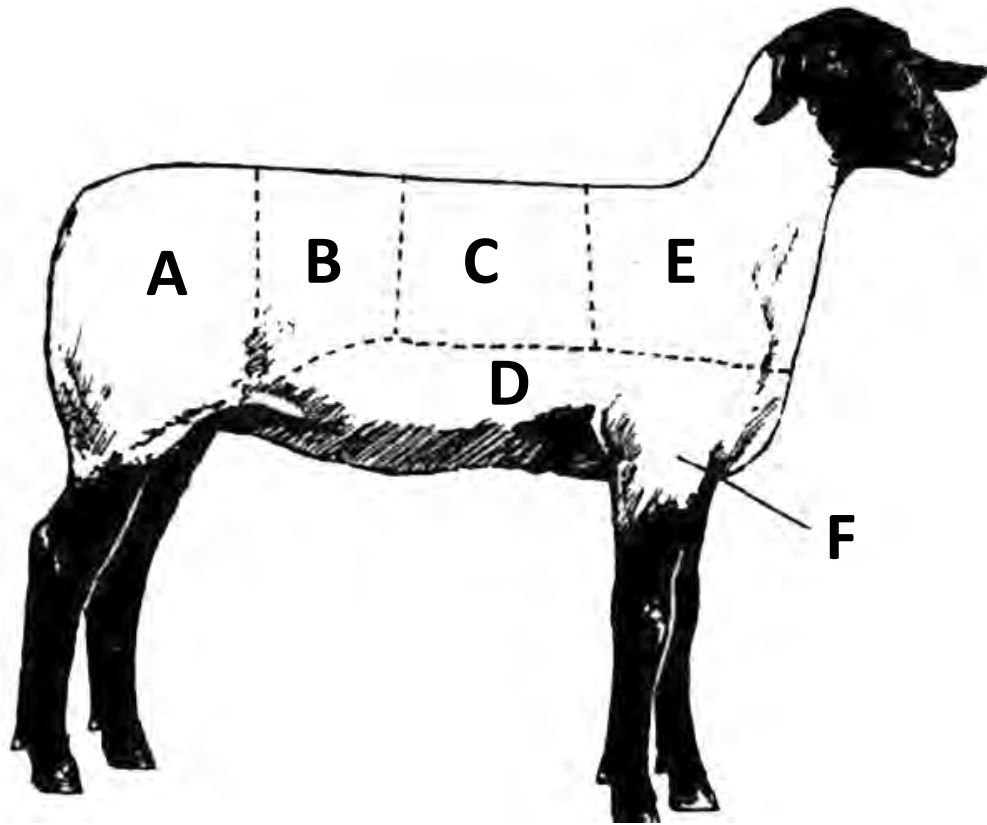




## Wholesale Cuts of Lamb



## Wholesale Cuts of Lamb



# Why is Quality Assurance Important?

Alaena Ruth & Sarah D. Baker, Extension Educators

## Goal (learning objective)

Youth will learn about their role in quality assurance and why quality should be important to each one of them, as producers and consumers of animal products.

## Supplies

- Chocolate cupcakes for each participant plus five extra
- Basic recipe for 24-28 cupcakes
  - Cupcake liners
  - 1 box chocolate cake mix
  - 1 1/4 Cups water
  - 1/2 Cup vegetable oil
  - 3 eggs
- Combine all ingredients, bake for 14-19 minutes at 350 degrees. Let cupcakes cool before frosting
- 1 can of prepared chocolate frosting.
- Mustard
- Solid food injector
- Napkins
- Disposable gloves for serving cupcakes.

## Pre-lesson preparation

- Bake cupcakes and frost cupcakes
- Take the five extra cupcakes and inject them with mustard, using the solid food injector.
- Replace five normal cupcakes with five mustard cupcakes.

## Lesson directions and outline

Share the following information with the youth:

Once you get your livestock project, you are now a member of the livestock industry. Your project animal will become food for a consumer in your county, state, or maybe even nation.

It is your responsibility as the producer of that livestock project to ensure that the product you are selling at the sale will end up a safe, wholesome, and quality product on someone's plate.

What is quality assurance? A promise you make by being involved in the livestock industry is the animal you raise for consumer use will be a safe, wholesome product.

Think back to when you received a product that made you disappointed in it. Would you consider purchasing the same product if it did not meet your expectations? When consumers consider a product to be high quality, they will choose to buy that product over another. If consumers purchase a product that does not meet their standards, they will buy a different product instead.

In the livestock industry, the products that we produce for consumers are also expected to be of high-quality, safe, and that they were produced in and harvested in a humane way.

Ask: When you raise an animal for the county fair and sell it, who's job is it to ensure that the products from your animal, such as meat, are safe and high quality? (The retailer? The processor? The breeder? You?)

Everyone who is a part of the livestock industry plays an integral role in helping to provide safe and wholesome products to consumers. This is known as quality assurance.

Quality Assurance begins for livestock producers from the moment an animal is conceived inside its mother to the time that a product reaches the consumer. There are many aspects to raising and caring for livestock and each aspect has quality assurance tied into it.

Quality Assurance for the producer includes the following:

- Genetics – ensuring the right breeding combinations for the end goal.
- Management - guaranteeing that your animals are comfortable and have all their needs met.
- Nutrition – providing the proper nutrients and balancing rations to meet your animal's needs.
- Animal Husbandry – allowing the proper housing size to permit the animal to grow properly and safely as well as follow safe handling practices.
- Veterinary Health – prevention of disease, injection techniques, drug usage and dosage, and residues and withdrawal times.

### Conducting the activity (DO)

1. Discuss with the group what quality assurance is.
2. Hand out one cupcake to each member, randomly including the mustard cupcakes.
3. Have the youth eat the cupcakes. After the youth have eaten the cupcakes, provide the youth who received a mustard cupcake a normal cupcake.

### What did we learn? (REFLECT)

- Ask: How did you feel when you ate the mustard filled cupcake? Did that product meet your expectations? Would you buy that product again?
- Ask: What are some factors that may influence the quality of the product we produce?
- Ask: What is your role in assuring safe animal products to consumers?

### Why is that important? (APPLY)

- Ask: Why is it important that you contribute safe products to the food chain?
- Ask: What is a negative effect that improper quality assurance could lead to?
- Ask: How does it feel when you buy a product that breaks the first time you use it?
- Ask: How will this activity affect other things you do? At school? At home? At work?

### Resources

Ohio State University Extension. (2011). Caring for Animals. *Beef resource handbook* (pages 12-5 through 12-6).

Ohio State University Extension. (2008). Caring for Animals. *Goat resource handbook* (pages 115, 162-163).

Ohio State University Extension. (2011). Caring for Animals. *Sheep resource handbook for market and breeding projects* (pages 136-139).

Ohio State University Extension. (2000). Caring for Animals. *Swine resource handbook for market and breeding projects* (pages 24-2 through 24-5).

Pederson, L., and Buckley, J. (2015). Hands On Youth Quality Assurance Training. *Making A Difference*. North Dakota State University. Available at: <https://www.ag.ndsu.edu/impactstatements/impact-statements/2015-statements/15area-l-pederson-lm.pdf/view>

# Animal Identification

Gail Silkwood, Extension Educator

## Goal (learning objective)

Youth will learn about animal identification methods and why they are necessary for record keeping.

## Supplies

- Photocopies of Handout 1 - "What Form of Identification Should I Use?" (enough for group)
- Photocopies of Handout 2 - "Methods of Animal Identification" (enough for group)
- Pencils (enough for group)
- Internet access to research animal identification types
- Flipchart paper and markers

## Pre-lesson preparation

- Make photocopies
- Secure a meeting facility that has internet access
- Review the resources in the Ohio State University Extension Handbook for the species you will be discussing (see Resources section of this lesson)
- Read/Review lesson
- Review the handouts and terminology

## Lesson directions and outline

Using the flipchart paper and markers, have the youth make a list of animal identification methods.

Discuss the following information with the youth (Be sure to highlight the items the youth listed):

It is essential to understand how important individual animal identification is to tracking animal health and movement throughout their life. There are many styles and types of animal identification. Tags, tattoos, neck chains, leg bands, brands, paint brands, nose prints and ear notching are just a few. Asking

youth to research and identify the most cost-effective method for their farm will help them explore options that they may not have considered in the past.

## Conducting the activity (DO)

1. Ask for a volunteer to distribute Handout 1
2. Have youth research the different animal identification methods. They need to record on Handout 1 if the method is permanent, semi-permanent or temporary. In addition, they need to record if the method is appropriate to utilize on their animal.
3. Ask for a volunteer to distribute Handout 2 and instruct the youth to use this handout or access the internet to learn about different types of identification.
4. Give the group 10-15 minutes to research identification methods.
5. Have members share their work with the group.

## What did we learn? (REFLECT)

- Ask: Why is animal identification important?
- Ask: How do animal identification methods change amongst the species? Why?

## Why is that important? (Apply)

- Ask: How does animal identification impact quality assurance?
- Ask: How is herd health impacted by animal identification?

## Resources

Boleman, C., Chilek, K., Coufal, D., Keith, L., & Sterle, J. (2011). Quality counts. Texas A&M AgriLife Extension. Retrieved from [http://agrilifecdn.tamu.edu/qualitycounts/files/2010/11/pdf\\_1733.pdf](http://agrilifecdn.tamu.edu/qualitycounts/files/2010/11/pdf_1733.pdf).

Neary, M. & Yager, A. (2002). Methods of Livestock Identification. Farm animal management @ Purdue. AS-556-W. Retrieved from: <https://www.extension.purdue.edu/extmedia/as/as-556-w.pdf>.

Ohio State University Extension. (2011). Management Practices. Beef resource handbook (page 3-7).

Ohio State University Extension. (2008). Herd Management and Diseases. Goat resource handbook (pages 83-84).

Ohio State University Extension. (2011). Management Practices. Sheep resource handbook for market and breeding projects (page 31).

Ohio State University Extension. (2000). Ear Notching. Swine resource handbook for market and breeding projects (page 10-1 through 10-2).



**RECORDKEEPING: ANIMAL IDENTIFICATION – HANDOUT 1**

**WHAT FORM OF IDENTIFICATION SHOULD I USE?**

My project animal species: \_\_\_\_\_

<b>Animal Identification Method</b>	<b>Is the method permanent, semi-permanent, or temporary</b>	<b>Is the identification method appropriate or not appropriate, for your animal? If not appropriate, which animal(s) is it appropriate to use that method with?</b>
Ear Notching		
Ear Tag		
Tattoo		
Brand		
Leg Band		
Neck Chain		

# Farm Animal Management @Purdue

## Methods of Livestock Identification

Michael Neary, *Extension Animal Scientist*

Ann Yager, *Animal Sciences Student*

**PURDUE**  
UNIVERSITY

Purdue University  
Department of  
Animal Sciences

Animal identification is the basis for keeping accurate production records of the herd/flock. Individual animal identification allows producers to keep records on an animal's parentage, birth date, production records, health history, and a host of other important management information. Accurate records provide the producer with enough information to make individual or whole herd/flock management decisions. In many instances, the producer needs to be able to quickly identify an animal. A successful identification system makes this task more efficient. Identification is also important to indicate ownership of a particular animal, or to indicate the herd/flock of origin.

There are many identification systems, but selection should be based on the method that best fits an operation's needs. Factors such as size of the operation, type of records kept,

nence, and how easy or difficult the method is to apply. Two different methods should be used to assure permanent identification. Once a system has been selected, it is important to be consistent with providing each animal a unique and permanent identification number that matches with each method used. Be careful not to duplicate numbers over a minimum of a ten-year period.

When an animal is born/purchased, it should be identified immediately with only one unique number, which will serve as its identification number until it departs from the herd/flock.

### Numbering Systems

There are many numbering systems that can be used to identify animals in a herd. One of the most commonly used and highly recommended systems uses a combination of letters and numbers, designating birth year and birth order,

**Table 1: Letter identification system.**

1990 – Z	1994 – D	1998 – H	2002 – M	2006 – S	2010 – X
1991 – A	1995 – E	1999 – J	2003 – N	2007 – T	2011 – Y
1992 – B	1996 – F	2000 – K	2004 – P	2008 – U	2012 – Z
1993 – C	1997 – G	2001 – L	2005 – R	2009 – W	2013 – A

*Source: Beef Cattle Identification Methods. Nelson et al.*

and source of replacement breeding stock, determines which system(s) to choose. When selecting forms of identification, consider the application methods for each type, along with visibility from a distance, equipment needed for application, cost, perma-

respectively. Such a system is shown in Table 1. The letters O, Q, V, and I are not used, they could be mistaken as numbers. This leaves 22 letters, which when combined with numbers can form the basis for individual animal identification. This system ensures a unique

number will not be replicated over a 22-year period. For example, an animal with the ID number L10 or L010 was the 10th animal born into the herd in 2001.

Table 2: Number identification system		
Year of Birth	Birth Order	ID
1995	1st	5001
2002	10th	2510
2011	100th	1100
2015	50th	5050
2021	150th	1650

Another system, which can be used for smaller herds of less than 500, consists of using only numbers to indicate birth year and birth order. The ID number is made up using the last digit of the birth year as the first number of the identification number. The next three numbers of the ID correspond to the birth order. To avoid duplication in this system, use \_001 -- \_499 for the first ten years (from 1990-2000), and \_500 -- \_999 for the second ten years (from 2001-2010), rotating every ten years. For example, in Table 2, the animals born in 1995, 2011, and 2015 are identified using the last digit of their birth year, and the ending from \_001 -- \_499, depending on their birth order. The animals born in 2002 and 2021 are identified using the last digit of their birth year, followed by adding their birth order to a number from \_500 -- \_999, to get the last three digits of their ID number.

Identification Methods

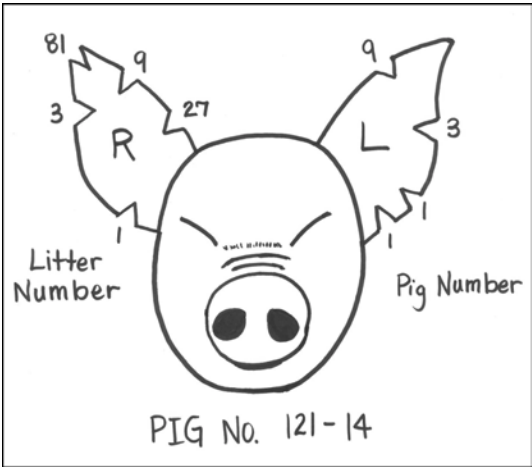
**Ear Notching (Figure 1)** Ear notching is widely used in the swine industry as a system of animal identification. There are variations in systems, but all of them identify a pig by litter number and individual pig number. Ear notching can also be used in other animal species, but it is not utilized as widely as it is in the swine industry.



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**Figure 1:** A pig after removal of a v-shaped notch at the 3-position on the right ear.

Ear notching involves removing V-shaped portions of the pig's ear that correspond to a specific litter number and also an individual pig number from that litter. Not all operations find it necessary to notch ears at processing, and some may only notch a litter number, or the week of birth. It is necessary to notch a pig's ears for litter and individual numbers when the pig needs to be recognized separately from other pigs. Pigs being kept as replacement breeding stock and for exhibition purposes need to be ear notched. Ear tags are often used in conjunction with ear notches in a breeding herd.



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**Figure 2:** Ear notching system used by the purebred swine associations of the United States.

There are many systems of ear notching, but when using the system of ear notching required by the purebred swine associations of the United States, the litter number is notched in the pig's right ear, and the individual pig number is notched in the pig's left ear (See Figure 2). The notches from the right and left ear should combine to give each pig a unique identification number. The notches are numbered from the bottom of the ear, with the number one being next to the head. Multiplying this number by three will give the next notch number (i.e., 3, 9, 27) which is adjacent to the area where the previous notch was located. Start at the bottom of the ear next to the head and continue to the top of the ear, then work back toward the head. The exception to this is the tip of the right ear, which is the position for the 81-notch.

Each notch, with the exception of the 81-notch, can only have two notches for any single number. For example, a pig identified as 28-3 would be the third pig from the twenty-eighth litter. This pig would have one notch each at the 27 and 1 position on the right ear, and one notch at the 3 position on the left ear. A pig identified as 18-2 would have two notches each at the 9 and 1 positions on the appropriate ear.

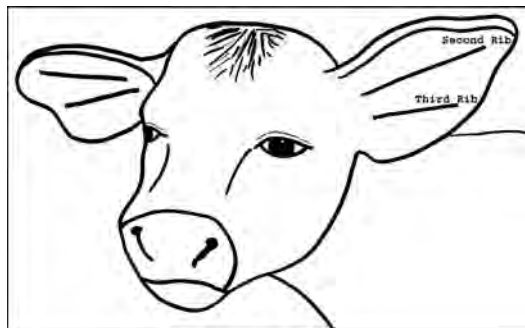


**Figure 3:** Ear tagging pliers and plastic, pre-numbered tag.

To notch ears, use an appropriate sized notcher, according to the age of the animal. It is important to keep the equipment in disinfectant to prevent infection. Ear notching causes minimal stress to the pigs, and they can be returned immediately back to the crate. The notches will bleed, but not heavily, and a scab will form in about a day. The notches will be completely healed in about a week. It is usually easiest to notch ears at the same time as other pig processing procedures. Registered pigs must be notched within 7 days of birth.

### Ear Tags

Ear tags are another common form of identification used in all species. A number of companies make and sell ear tags and corresponding applicators. The flexible, plastic tags can be bought pre-numbered (Figure 3), or they can be purchased as blank tags. The producer can use ear tag ink to number them accordingly. The tags come in a variety of colors and sizes. Selection depends on the age of the animal and the environment where the animal lives.



**Figure 4:** Diagram illustrating the 2nd and 3rd ribs of the ear.

The tags are pierced through the animal's ear, and allow for an animal to be identified from the front and the back, if the tag is numbered on both sides. Tags should be installed between the second and third cartilage rib (Figure 4) of one or both ears, using an applicator gun that



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**Figure 5:** Freeze brand number 'D98' on the rump.

corresponds to the type of ear tag being used. Ear tags are easy to use, flexible in all types of weather, inexpensive, and usually easy to read. There can also be limitations with ear tags. They can be ripped from the ear, or become lost if not applied properly. Permanent marking ink is used to number blank ear tags. However, the ink can fade over time. It is recommended that another method of identification be used along with ear tags.

### Freeze Branding

Freeze branding is another method of animal identification that allows for animals to be identified from a greater distance than with ear tags. Brands can be read any time of the year. Freeze branding, similar to hot branding, involves the use of branding irons, with letters and numbers, being chilled in liquid nitrogen or dry ice and alcohol. Upon application to the animal's hide, the

chilled branding iron kills the cells that produce color pigment in the hair follicles, but does not kill the growth follicles. After freeze branding, white or colorless follicles are produced in the branded region, which results in a permanent brand (Figure 5).

Freeze branding irons come in various sizes and are usually made of copper, copper alloy (brass), or bronze, because of their temperature holding capacity. Some recommended equipment and items to have on hand include:

- Holding chute for restraint of the animal
- Container for liquid nitrogen or dry ice and alcohol
- Electric clippers with a surgical blade
- Grooming equipment for cleaning the brand site
- Gloves
- Squirt bottle with a solution of 95% isopropyl alcohol
- Branding irons
- Timing device



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**Figure 6:** Branding irons soaking in a wooden box filled with liquid nitrogen.

<b>Table 3: Application times</b>	
<b>Hair color</b>	<b>Application time at weaning (Add 15 seconds for yearlings)</b>
Black	45 seconds
Dark Red	1 minute
Yellow	1 minute, 15 seconds
White	2 minutes, 15 seconds

The branding procedure consists of cooling the irons in liquid nitrogen or dry ice and alcohol, until they are ready for use (Figure 6). The irons are ready for use when the "boiling" of the liquid surrounding the irons diminishes. While



the irons are being cooled, restrain the animal in the squeeze chute, and begin clipping the hair in the branding area, usually in a rectangular shape, followed by brushing or using a blower to remove any loose hair or dirt. Apply the alcohol over the clipped area. This allows for increased penetration of the cold through the skin, and also removes some skin oils. Align the cooled branding iron over the branding region, and apply with firm, constant pressure, making sure the whole iron has contact with the skin, and remains in the same position (Figure 7). Start timing the length of the application, and when the appropriate time (see Table



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**Figure 7:** Chilled branding irons being applied to the rump area.

3) has elapsed, remove the iron, and place it back in the liquid nitrogen. Irons that have just been used will need adequate time in the liquid nitrogen for re-cooling before being used again.

After the application, the area will begin to swell, and will continue to be swollen for 48-72 hours. About 20 to 30 days after the swelling has subsided, the brand will form a scab. Once the scab has disappeared, white or colorless hair will begin to grow in the branded region, and by 3 months after branding, new hair growth should be complete. The success of the freeze brand depends on several factors: the age of the animal, hair color,

time of year, branding site, method of application, and a little luck.

Older animals require an extended application time because the pigment-producing hair follicle is harder to kill. White animals also require an extended application time because you are actually performing a bald brand, to kill the entire hair follicle. This allows for the skin to be seen as a brand, which provides a more visible brand for this color of animal. The time of the year that the brand is applied affects how easily the pigmented cells are destroyed. During spring and fall, the hair follicles are the most active, and therefore, most easily destroyed.

The branding site can vary between the shoulder, and the rump, with the rump being more desirable due to its flat, muscular characteristics. How well the brand area is prepared, and how well the brand is applied affects the clearness of the brand. If a branding iron is moved during application, or pressure is not applied equally and firmly, the resulting brand will look streaky or smudged due to colored hair follicles in the branded area, or could cause an "8" to look like a "3." Freeze brands are permanent and easily visible from a distance. Disadvantages of freeze branding include the permanency of this method and the fact that a brand can never be removed or replaced, and the up front costs of purchasing all the needed materials and equipment.

## Electronic Identification

There are many different forms of electronic identification used in the world today. Of these, the most common include electronic ear tags, microchips, and electronic collars. When using electronic ear tags, it is best to use an additional method of identification, in case the tag becomes lost.

Microchips are a form of identification that involves the implanting of an elec-



tronic chip, with a miniature radio transponder and antenna, under the skin of an animal. The most common implant site is near the neck, between the shoulder blades, or near the base of the ear. The transponder can also come in the form of a bolus that can be ingested by ruminant animals. A benefit of using microchips is that they are permanent and relatively painless to implant. Drawbacks to microchips include: the possibility that the chip may migrate into the meat of a market animal; specialized equipment is needed to read and implant the chips, and they are not readable from a distance.

Electronic collars are similar to neck chains, except they have an attached tag with an electronic number that can be read by a scanner. Electronic collars are easy to use, but they can become a nuisance and can cause choking if they are not adjusted properly to the growth of the animal or if they become hooked on protrusions.

With each of these electronic ID methods, a scanner interprets the radio signal from the tag or implant as a numerical code, which brings up a corresponding computer file for that particular animal. Thus, a production history can be located quickly by scanning the electronic chip. Electronic identification can be used to automatically dispense feed to animals,



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**Figure 8:** Dairy cow with a neck chain and corresponding numbered tag.

and can be beneficial in the milking parlor by providing and recording valuable information during each milking.

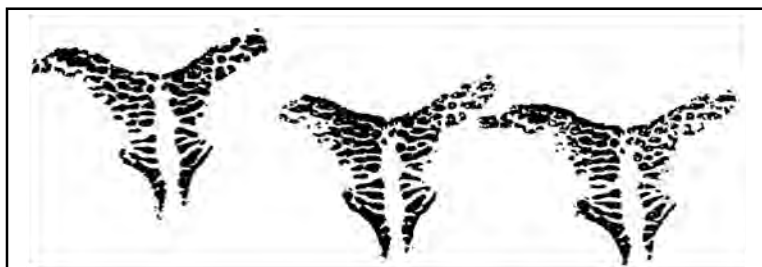
Electronic identification systems will become more refined and industry accepted in the future. These systems have a distinct advantage of being able to store the increasing amount of data the progressive animal manager has to interpret.

## Neck Chains

Neck chains, or ropes, are used as a common method of identification in dairy cattle. The neck chains have a numbered tag attached that corresponds to that animal's identification number (see Figure 8). The chain or rope should be positioned around the animal's neck, tight enough not to slip over their head, but loose enough to allow easy breathing and growth for young animals. They are easy to apply, painless to the animal, and can be seen fairly well. However, if growing animals are not inspected frequently, the chain can become too tight. Chains can also become caught on protrusions that choke the animal. Furthermore, the chains are not permanent, and can be hard to see when animals are grouped together.

## Nose Printing

Nose printing is used as a form of permanent identification, and is most commonly used for the sale and exhibition of sheep and cattle. Nose printing is useful, because it cannot be modified in any way, unlike many other forms of identification. Nose printing is similar to finger printing, in that the lines and dotted pattern from a nose print are specific for each animal, and can be recorded by making an ink print. When two prints of the same animal are compared, there must be six identifiable matching lines or dots common to both prints (see Figure 9 and Figure 10 for examples of acceptable prints). Printing is performed by restraining the animal's head, either in a head gate



**Figure 9:** Three acceptable nose prints of the same sheep, illustrating similar lines and dotted patterns.



**Figure 10:** Acceptable beef nose print.

or with a halter, and placing a minimal amount of ink on the animal's dried nose. The ink is then transferred to an index card, supported by a wooden block or stiff backing, by pressing the card against the animal's nose. If the prints are readable, they should be allowed to dry, and clearly identified with the owner's name and the animal's identification number. Problems associated with nose printing include: the use of too much ink, a build-up of moisture on the animal's nose, and not holding the animal still, which can result in a smeared, unreadable print.

## Paint Branding

Paint branding is a temporary form of identification. It is sometimes used along with a form of permanent identification. Irons similar to those used in freeze

branding or hot branding can be used to print a number on the animal's back using paint. This method of identification may be useful in situations where animals are assigned to specific pens or crates and need to be returned to the same pen or crate after they are

turned out. Examples are a farrowing or gestation barn, a lambing pen, or livestock shows. Paint branding can also be useful when offspring need to be identified with their parents.

For exhibition or sales, paint branding is useful as a form of temporary identification because it is easily visible, and it is used to identify the animal in the sale directory. Prospective buyers can evaluate their selections before purchasing. During most livestock sales or shows, animals are paint branded as they are weighed-in.

The paint numbers are usually applied from the left side of the animal for consistency, in reading the number from the animal's head to its tail. Special paint is poured into a shallow pan, lined with burlap or a similar material to soak up the paint. The appropriate numbered irons are pressed in the paint soaked burlap, and then applied perpendicular to the animal's backbone, by pushing down firmly and with a slight rocking motion, so that the entire brand comes in contact with the animal. Using too much paint causes the excess to run off the animal's back. This produces an illegible brand. It is important to use the correct brand numbers and to be alert for the animal's movements, to prevent smearing the brand.

When using a 6 or a 9, it is necessary to underline the number using the bottom of the number '1' branding iron, to prevent errors in reading the identification number. Between brands, the branding irons

should be allowed to hang to allow any excess paint to drip into the drip pan. Once all branding is complete, the branding irons should be cleaned, removing as much paint as possible.

### **Tattooing**

Tattooing is another form of permanent identification that is commonly used in all species and involves imprinting an identification number/letter combination into the skin of the animal using indelible ink. The tattooing instrument uses number/letter dies made of sharp, needlelike projections that are secured on the application pliers. The ink is usually applied to the tattoo site after it has been disinfected with alcohol. Using the pliers, the identification number is pierced into the skin, and additional ink is rubbed into the punctures. After healing, the permanent tattoo will be visible. For cattle, goats, sheep, and swine, the tattoo is placed above the first rib of the ear so it does not interfere with the use of ear tags. Horses are often tattooed on the inside surface of their lips. Sheep can be tattooed on the inside of their flank, and swine can be tattooed on the shoulder for carcass identification during slaughter. Most purebred animals are required to be registered and permanently identified by their breed associations. Tattooing is the best permanent method of identification for registered animals because it does not harm the animal's appearance or reduce its value in any way.

The best time to tattoo depends on the species of animal. Cattle are easiest to tattoo when they are young calves. Goats and sheep should be tattooed at about 6 months, when the ear tissue is finished growing, and there is more space to apply the tattoo. Horses should be tattooed as late as possible because as the animal

grows, the tattoo will fade and become spread out. Swine can be easily tattooed at a young age, but as the animal's ear or carcass grows, so will the identification number.

To begin tattooing an animal, the animal must be restrained so that firm, constant pressure can be applied until the needles on the dies have protruded deep enough into the skin, to leave a permanent tattoo. When preparing the letters/numbers on the pliers, they will appear backwards as you look at them. It is usually a good idea to check the dies on a piece of paper before application to the animal. Next, locate the area to be tattooed, clean the area with alcohol, and apply the tattoo ink to the area. Squeeze the handles of the tattooing pliers over the tattoo site making sure they are compressed completely. After application, rub additional ink into the piercings. For carcass tattoos in swine, a tattoo hammer is used, and is swung toward the tattoo site with enough force, so that the needles will penetrate the skin. The animal can be released after the number has been recorded. Tattoo equipment should be disinfected between each use.

One disadvantage of tattooing is that the animal must be restrained to apply and read the identification number. In dark-pigmented ears, the number is almost unreadable, unless a flashlight is placed behind the ear. Therefore, it is best to use green tattoo ink in dark pigmented ears. It is also a good idea to use another form of easily visible identification to accompany the tattooing method.

## Summary

Accurate animal identification systems are the basis for data collection and many necessary management practices. Identification of animals within a herd/flock is valuable to producers and managers to make logical decisions based on an animal's records.

Animal identification methods differ, and each has its own benefits. All methods can be useful when used in the correct manner and under the right conditions. Oftentimes, more than one method is used for maximum accuracy. With these stipulations in mind, it is best to determine the needs and expected uses of animal identification on an operation, before choosing the best method(s) of identification.

## References

Battaglia, Richard A., *Handbook of Livestock Management*. 3rd ed. New Jersey: Prentice-Hall, Inc., 2001.

L & H Manufacturing Company, *Freeze Branding: Operating Instructions for L & H Freeze Branders*.

Nelson, L.A., W.L. Singleton, T.M. Lutz, *Beef Cattle Identification Methods*. Purdue University Animal Sciences Department.

Rusk, Clinton P., *Electronic Identification of 4-H Livestock Projects*. Purdue University 4-H Youth Department.

# Livestock Ownership Records

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Sarah D. Baker, Extension Educator & Erika Jeffries, IT & Curriculum Specialist

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## Goal (learning objective)

Youth will:

- Learn what the paperwork requirements are for livestock ownership and transfer of ownership in the state of Idaho.
- Learn the difference between a bill of sale, receipt, proof of ownership form, and a brand inspection.

## Supplies

- Photocopies of the following handouts (enough for group)
  - a. Handout 1 - "Proof of Ownership for 4-H Market Animals in Idaho"
  - b. Handout 2 - "Market Beef Help Sheet"
  - c. Handout 3 - "Bill of Sale Examples Packet" (4 copies for groups)
  - d. Handout 4 - "Correct Bill of Sale Example 1"
  - e. Handout 5 - "Correct Bill of Sale Example 2"
- Pencils (enough for group)
- Flipchart paper and markers

## Pre-lesson preparation

- Make photocopies of Handouts 1, 2, 4, and 5 - enough for group
- Make 4 photocopies of Handout 3
- Read/Review lesson
- Review the handouts and terminology
- Become aware of any additional county requirements

## Lesson directions and outline

Have youth make a list of the types of paperwork that could be provided to show proof of ownership (using flipchart paper and markers). Review the list with them and then share the following information with the youth:

It is important that market livestock projects are properly identified and members have the proper proof of ownership paperwork for that project. The University of Idaho Extension 4-H Youth Development program requires that any 4-H member participating in a 4-H Market animal project must have proof of ownership for their animal, which includes a brand inspection for beef and a bill of sale for goats, sheep, and swine. (UI P&P, page 8). Most Fairs and open shows also require proof of ownership paperwork when you are entering livestock shows across the United States.

### Bill of Sale vs. Receipt

When items are sold, which can range from livestock to a piece of farm equipment, it is important that the sale of those items is recorded properly. In 4-H we refer to a bill of sale in livestock projects. It is extremely important that you have a bill of sale to serve as proof of ownership of an animal. A bill of sale is a legal document made by a "seller" to a purchaser, reporting that on a specific date, at a specific locality, and for a sum of money or other "value received", the seller sold to the purchaser a specific item of personal, or parcel of real property of which he had lawful possession.



**Bill of Sale**  
(For Livestock Transactions other than through Auctions)

This is to certify that on this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_ at \_\_\_\_\_ Place

\_\_\_\_\_ of \_\_\_\_\_  
(Name of Seller) (Full Address)

(On Account of) \_\_\_\_\_

sold to \_\_\_\_\_ of \_\_\_\_\_  
(Name of Purchaser) (Full Address)

(On Account of) \_\_\_\_\_

The following livestock, to wit:

No. of Livestock	Kind	Colour	Brand	Brand Location	Gross Weight	Net Weight	Price/cwt	Amount Paid

I/we, the Seller(s) confirm that the particulars set out above are true and correct in every detail. The livestock listed above are free from all encumbrances.

\_\_\_\_\_  
Signature of Seller

\_\_\_\_\_  
Signature of Purchaser

A bill of sale does not replace a brand inspection for cattle and horses. A valid bill of sale must include:

- Date of the sale
- Complete description of livestock sold
- Name of the purchaser
- Signature of the seller

A receipt is a written acknowledgement that a specified article or sum of money has been received as an exchange. An example, a receipt from Wal-Mart lists the items that were purchased and has the date, store information, and amount of money paid. A receipt is not sufficient documentation to establish livestock ownership.

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ST# 2046 DP# 00008202 TE# 18 TR# 00758

GAIN SHEET	003700044870	1.87	X
GAIN SHEET	003700044870	1.87	X
GAIN SHEET	003700044870	1.87	X
MCCORMICK	006210009170 F	0.54	C
MCCORMICK	006210009170 F	0.54	C
SUBTOTAL		6.69	
COUPON 37000	053700012987	3.00	-
COUPON 37000	053700012987	3.00	-
COUPON 37000	053700012987	3.00	-
COUPON 52100	056210010076 F	1.00	-
COUPON 52100	056210010076 F	1.00	-
SUBTOTAL		4.31	
TAX 1	5.000 %	0.28	
TOTAL		4.03	
CASH TEND		4.03	
CHANGE DUE		0.00	

**# ITEMS SOLD 5**

TC# 9480 6195 8863 6507 9438

- Bill of sale sample <http://www.ownershipid.ca/images/BillofSale.gif>
- Wal-Mart receipt sample <http://thecouponcrusader.blogspot.com>

## Brand Inspection

Why are brands and brand inspections important?

Branding is very important in proving ownership of lost or stolen animals, specifically cattle and horses. Sheep and swine do not need a brand inspection. An unbranded animal is called a “slick,” and is almost impossible to legally identify. No other way is as easily visible as branding, not only for identification, but as a deterrent to theft.

Other methods such as implanted computer chips are positive identification, if a new owner is aware of them, but hot or freeze brands are highly visible and hard to alter. A brand inspection is required when:

- Livestock ownership of cattle or horses’ changes in any manner
- Leaving the state of Idaho
- Animals going to slaughter a brand inspection is good for 96 hours

Generally, it is responsibility of the “seller” or “current owner” to obtain the brand inspection and pay the appropriate inspection fees. Always ask for a brand inspection when buying cattle or horses.

If the seller issues you a bill of sale instead, make sure the bill of sale is valid and you can call for a brand inspection within 10 days from the date of sale. In this case, the buyer is the one responsible for getting the inspection completed within 10 days and paying the inspection fees.

If you accept a bill of sale in lieu of a brand inspection certificate, and the animal is carrying a brand not recorded to the person who issued the bill of sale, you will need to clear the brand before the inspection can be done. Not obtaining a brand inspection when required by the Idaho brand laws is considered an infraction for the first offense and a misdemeanor for the second offense, punishable by a fine not to exceed \$300 and or six months in jail.



What information is required to obtain a brand inspection? Proof of ownership, which can be determined several ways:

- Your recorded brand on the animal/brand card
- Valid and current bill of sale
- Idaho brand inspection or another state's brand inspection
- Purebred registration papers or possibly health papers
- Lip tattoos or other permanent markings are not acceptable for brand recording, but are acceptable for proof of ownership

An annual brand inspection (also known as a “seasonal”) is good for up to 12 months. This brand certificate is designed to allow the livestock owner to travel in and out of the state of Idaho to our neighboring states annually. Idaho has reciprocal agreements with most all neighboring states except Montana and Wyoming. A lifetime certificate can only be issued on horses, mules, and donkeys.

What happens if I can't produce evidence of ownership?

If you can't produce proof of ownership to any brand inspector, deputy brand inspector, or peace officer of the state your livestock can be impounded at the expense of the owner until proof of ownership is established. However, if you can't establish proof of ownership within 10 days the livestock can be sold at public sale in any auction house or sales ring.

There are a lot of opportunities with our neighboring states to obtain animals or participate in events. It is easy to forget that paperwork is needed, confusing as to what's required, or perhaps you don't know what is required. As livestock owners, it is our responsibility to ensure compliance with state livestock transportation requirements.

### Conducting the activity (DO)

1. Have the group split up into 4 groups.
2. Ask for a volunteer to distribute Handout 3 to each group.
3. Each group will answer the following questions for each sample in Handout 3:
  - a. Is this a valid bill of sale?
  - b. What is the bill of sale missing?
  - c. Is there additional information on the bill of sale that is not needed?
  - d. What changes need to be made to the bill of sale to make it valid?
4. Have one person per group report their answers to the questions in front of the entire group
5. Review the issues with the examples as a group:
  - a. Example 1 - No date of purchase
  - b. Example 2 - No description of livestock (only says “hog”); No name of purchaser; No signature of seller
  - c. Example 3 - No signature of seller
  - d. Example 4 - No date of purchase; No description of livestock (only says steer calf.
6. Have a volunteer distribute Handout 4 and Handout 5 to the group.
7. Review and discuss the handouts and compare the wrong examples covered in Handout 3.

### What did we learn? (REFLECT)

- Ask: What did you learn? Any surprises?
- Ask: What is the difference between a receipt and a bill of sale?
- Ask: What document(s) are needed to prove ownership of an animal?
- Ask: What information is required to provide at your initial weigh-in?

## Why is that important? (Apply)

- Ask: Why are ownership records important?
- Ask: How do animal records impact the industry?
- Ask: What happens at school if you don't turn in the right homework assignment?

## Resources

Idaho State Department of Agriculture: Swine Identification and Import Requirements: <http://www.agri.idaho.gov/AGRI/Categories/Animals/import-Export/importswine.php>

Idaho State Department of Agriculture: Sheep & Goat Identification and Import Requirements: <http://www.agri.idaho.gov/AGRI/Categories/Animals/importExport/importsheepgoats.php>

Idaho State Department of Agriculture: Cattle Identification and Import Requirements: <http://www.agri.idaho.gov/AGRI/Categories/Animals/import-Export/importbovine.php>

United States Department of Agriculture Animal and Plant Health Inspection Service: Animal Disease Traceability: [https://www.aphis.usda.gov/aphis/ourfocus/animalhealth/SA\\_Traceability](https://www.aphis.usda.gov/aphis/ourfocus/animalhealth/SA_Traceability)

Idaho State Brand Inspector: <https://isp.idaho.gov/brands/>

University of Idaho Extension 4-H Youth Development Policies & Procedures: <http://www.uidaho.edu/extension/4h/documents-records>

Ohio State University Extension. (2011). Management Practices. *Beef resource handbook* (page 3-7).

Ohio State University Extension. (2008). Herd Management and Diseases. *Goat resource handbook* (pages 83-84).

Ohio State University Extension. (2011). Management Practices. *Sheep resource handbook for market and breeding projects* (page 31).

Ohio State University Extension. (2000). Ear Notching. *Swine resource handbook for market and breeding projects* (page 10-1 and 24-1 through 24-3).

## **Proof of Ownership for 4-H Market Animals in Idaho (page 1)**

It is important that your market livestock project is properly identified and that you have the proper proof of ownership paperwork to prove that you own your project animal. This includes market beef, swine, sheep, and goats. The University of Idaho (UI) Extension 4-H Youth Development program requires that any 4-H member participating in a 4-H Market animal project must have proof of ownership for their animal, which includes a brand inspection for beef and a bill of sale for goats, sheep, and swine. (UI P&P, page 8). Most Fairs and open shows also require proof of ownership paperwork when you are entering livestock shows across the United States.

### **Proof of Ownership**

As stated in UI Policies and Procedures, all beef must have a brand inspection and all sheep, goats, and swine must have a bill of sale. Let's take a closer look at what are the differences between a brand inspection and a bill of sale.

### **Brand Inspection:**

A brand inspection is a physical examination of livestock by a brand inspector to determine ownership of the livestock. A brand inspection includes examination of proofs of ownership, including the visual examination of brands and marks.

The Idaho State Brand Department requires a brand inspection on cattle, horses, mules, and asses when:

- ownership changes in any manner,
- the animal leaves the state of Idaho,
- or the animal is going to slaughter.

It is the responsibility of the seller or current owner to obtain the brand inspection and pay the appropriate inspection fees. When you purchase your market beef project at the beginning of your project year, you must have proof of ownership to prove that that is your animal. Did you purchase your steer from someone? Did someone give you your project animal (grandparent or parent example). Or did you raise your own animal? It is important that you understand the different proof of ownership scenarios.

Here are some questions to ask yourself:

1. Did you raise your own animal? YES or NO?
  - a. YES – if you raised your own animal, the next question to ask yourself is this: Is your name on the Brand Card?
    - i. YES – if your name is on the brand card (thus ensuring the brand on your animal is registered to you), you will not need a brand inspection.
    - ii. NO – if your name is not on the brand card (even though you raised it), you will need a brand inspection because you are transferring ownership from the seller (whom ever's names is on the brand card) to you.
  - b. NO - if you did not raise your own animal, and you had to purchase your animal, you will need a brand inspection when you purchase your animal from the buyer.
2. Did you purchase your animal?
  - a. YES – if you purchased your animal, you will need a brand inspection because you are transferring ownership from the seller to yourself.

**NOTE:** It is important to remember that ALL livestock (cattle and horses) must be brand inspected whether the animal is actually branded or not! A brand inspection establishes “Prima Facie” evidence of ownership.

## **Proof of Ownership for 4-H Market Animals in Idaho (cont.)**

What information is required to obtain a Brand Inspection? To obtain a Brand Inspection, you will need to provide proof of ownership. Ownership of the animal can be determined in several ways:

- Your recorded brand on the animal/brand card.
- Valid and current bill of sale.
- Idaho brand inspection or another state's brand inspection.
- Purebred registration papers or possibly health papers.
- Lip Tattoos or other permanent markings not acceptable for brand recording, but acceptable for proof of ownership purposes.

How do you get a brand inspection? Call your district brand inspector. If you do not know who the local inspector is, contact your local Extension Office, or the State Brand Inspector's Office in Meridian (1-800-772-8442). Before you contact your local brand inspector, make sure you have satisfactory proof of ownership. For most 4-H and FFA market animals, this will include a valid and current bill of sale.

### **Bill of Sale**

A bill of sale is the formal instrument for transfer of title to livestock. In the state of Idaho, a bill of sale must include the following:

1. date of sale
2. description of the livestock sold
3. the name of the purchaser
4. the signature of the seller

Again you will need a bill of sale if you purchased your animal from someone, or if you raised your animal and your name is not on the brand card. This bill of sale will be presented to the Brand Inspector when he or she comes to inspect your animal.

In the state of Idaho, a brand inspection must be done within 10 days after the date of the sale. A Bill of Sale does not replace a brand inspection.

### **Summary/Tips**

- All Idaho 4-H market swine, sheep, and goat projects must have a bill of sale (or proof of ownership if you raised your own)
- All Idaho 4-H market beef projects must have a brand inspection.
- To get a brand inspection in the state of Idaho, you must have valid proof of ownership.
- To prove ownership of your animal, your name must be on the brand card if you raised your own animal, or you must have a valid and current bill of sale.
- A valid and current bill of sale includes:
  - date of sale
    - *Remember that a brand inspection must be done within 10 days after the date of the sale*
  - description of the livestock sold
  - the name of the purchaser
  - the signature of the seller

### **Proof of Ownership for 4-H Market Animals in Idaho (cont.)**

Most 4-H county weigh-ins require your brand inspection paperwork to be turned in at weigh-in in the spring. Even if you are not required to hand it in until Fair with your record book (remember University of Idaho 4-H Youth Development Policies and Procedures require all beef to have a brand inspection), it is a good idea to contact your local brand inspector and get your brand inspection done when you get your steer in the Fall or Spring at the beginning of your project and not wait until the last minute!

If your market animal qualifies and is sold through a market animal sale, the brand inspector will be on site to write a brand inspection, since transfer of ownership is once again occurring when you sell your animal through the Sale. Having the brand inspection paperwork from when you purchased your animal at the beginning of the project year will ensure this is a seamless and easy process on Sale Day.

## RECORDKEEPING: LIVESTOCK OWNERSHIP RECORDS – HANDOUT 2

### MARKET BEEF HELP SHEET

Sometimes it can be confusing on the differences between a bill of sale, proof of ownership form, or a brand inspection with market beef projects. This handout should help clarify any questions you may have.

- **All beef are required to have a brand inspection if you are taking your market beef project in 4-H in the state of Idaho.** *(This is normally required at your local county weigh-in, or prior to the Fair when you turn in your 4-H record book.)*

In order to get a brand inspection on your market beef project, you will need to provide proof of ownership on your animal to the brand inspector. Below are answers to the scenarios that you may encounter:

#### **SCENARIO 1: You raised your own animal and your name is on the Brand Card.**

- REQUIRED: Brand Inspection (you can show the brand card with your name on it to the Brand Inspector when he/she comes to do the brand inspection)
  - Remember, your name must be on the Brand Card and the brand must match what is on your animal! If your name is not on the brand card, you must have a valid and current Bill of Sale.

#### **SCENARIO 2: You raised your own animal, but your name is NOT on the Brand Card.**

- REQUIRED: Brand Inspection (to get a brand inspection, you will need to have a valid and current Bill of Sale to give to the brand inspector)
  - You must have a valid and current Bill of Sale. Even if a family member “gave” this animal to you, you must have a Bill of Sale that indicates they “sold” it to you, so you now have “ownership” of the animal. In Idaho a valid Bill of Sale includes:
    - Date of the sale.
    - Complete description of livestock sold (brand, brand location, sex, breed, etc.)
    - Name of purchaser (this is you).
    - Signature of the seller (family member, or whoever “sold” you the animal).

#### **SCENARIO 3: You purchased your steer in the state of Idaho.**

- REQUIRED: Brand Inspection (to get a brand inspection, you will need to have a valid and current Bill of Sale to give to the brand inspector)
  - In Idaho a valid Bill of Sale includes:
    - Date of the sale.
    - Complete description of livestock sold (brand, brand location, sex, breed, etc.)
    - Name of purchaser (this is you).
    - Signature of the seller (family member, or whoever “sold” you the animal).

#### **SCENARIO 4: You purchased your steer outside of the state of Idaho.**

- REQUIRED: Brand Inspection (to get a brand inspection, you will need to have a valid and current Bill of Sale to give to the brand inspector)
  - A valid Bill of Sale includes:
    - Date of the sale.
    - Complete description of livestock sold (brand, brand location, sex, breed, etc.)
    - Name of purchaser (this is you).
    - Signature of the seller (family member, or whoever “sold” you the animal).

*NOTE: Make sure the brand inspection paperwork has **YOUR** name on it, NOT your parent’s name. The brand inspection paperwork that is turned into to the Extension Office and 4-H Program must show that YOU own the animal, not your parents/guardian.*



# Livestock Bill of Sale

**Seller:**

Printed Name: John Doe

Address: \_\_\_\_\_

City: Mackay

State: ID Zip: 83251

**Buyer:**

Printed Name: Jane Blair

Address: \_\_\_\_\_

City: Mackay

State: ID Zip: 83251

This is to certify that on this \_\_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_, the undersigned Seller, in consideration of the sum of \$ 900<sup>00</sup>, sold to the undersigned Buyer the following described livestock, the title to which the Seller guarantees.

No. Head	Class	Age	Sex	Weight	Brands, Marks, & Description
<u>1</u>	<u>Steer</u>		<u>M</u>	<u>925 lb</u>	<u>→ A, RR, Angus</u>

**Seller:**

John Doe

Date: \_\_\_\_\_

**Buyer:**

Jane Blair

Date: \_\_\_\_\_

Seller & Buyer agree to hold harmless The Cattle Range from any and all claims, demands, suits, or loss which are in any way connected or associated with use of this Bill of Sale.

## SALES RECEIPT

Date: Feb. 16, 2017

Qty.	Description	Price	Amount
1	Hog	\$200 <sup>00</sup>	200 <sup>00</sup>

Subtotal:

Tax: NA

Total: 200<sup>00</sup>

Sale Made with :

☒ Cash

☐ Credit Card

☐ Check, No. \_\_\_\_\_

☐ Other \_\_\_\_\_

# LIVE STOCK BILL OF SALE

Date Sold: May 5, 2017

## SELLER'S

Printed Name: Hugh Bledsoe

Address: 495 Highland Rd

City: Challis

State: ID Zip: 83227

## BUYER'S

Printed Name: Mike Smith

Address: 621 Dollar Road

City: ELIS

State: ID Zip: \_\_\_\_\_

This is to certify that the undersigned has this day in consideration of the sum of

\$ 100<sup>00</sup> x 2 dollars sold the following described livestock. The Title to  
which \_\_\_\_\_ hereby guarantees:

No. Head	Class	Age	Sex	Weight	Brands, Marks & Description
<u>1</u>	<u>Sheep</u>	<u>4 m.</u>	<u>M</u>	<u>55 lb</u>	<u>sublock/hamp X</u>
<u>1</u>	<u>sheep</u>	<u>4 m.</u>	<u>F</u>	<u>65 lb</u>	<u>sublock</u>

Signature of Seller: \_\_\_\_\_

Date: \_\_\_\_\_

Signature of Buyer: Mike Smith

Date: 5-5-17

I sold 1 steer calf to  
Macey Garfield for her 4-H project  
in the sum of \$1,200<sup>00</sup>.

John Doe





# 4-H & FFA Market Beef Bill of Sale



DATE OF PURCHASE: March 15, 2017

DESCRIPTION OF ANIMAL: (one animal per form):

Brand: UI Location of Brand: LR (Left Rib)

Breed: Angus Color/Markings: Black

Sex: Steer (male) Date of Birth: 2-20-16

PURCHASER INFORMATION: (if this is an "extra" steer, put all member's names here)

Buyer's (4-H/FFA member) Name (please print): Jane Doe

Buyer's (4-H/FFA member) Signature: Jane Doe

Buyer's (4-H/FFA member) Address: 1412 W. 1520N, Challis, ID 83226  
(Address) (City) (State) (Zip)

SELLER INFORMATION:

Seller's Name (please print): ZANE DUNBAR






Seller's Signature: Zane Dunbar

Seller's Address: 1115 Cottonwood Lane Mackay ID 83251  
(Address) (City) (State) (Zip)

ADDITIONAL INFORMATION: (vaccinations given, etc):

- 8-Way at Branding (5-20-16)
- Ear tag # 543C out of Sitz Cow & Traveler Bull
- Weaned 9-15-16

RECORDKEEPING: LIVESTOCK OWNERSHIP RECORDS – HANDOUT 5

 	<b>Custer County 4-H &amp; FFA</b> <b>Swine, Sheep, &amp; Goat</b> <b>BILL of SALE</b>	  
<i>Note: You MUST have a signed contract, bill of sale, or other document to prove ownership.</i>		
<b>DESCRIPTION OF ANIMAL (<i>one animal per form</i>):</b> <input type="checkbox"/> Hog <input checked="" type="checkbox"/> Sheep <input type="checkbox"/> Goat		
Breed: <u>Suffolk</u>		
Color: <u>white</u>		
Special Markings/Other: <u>Black face &amp; legs</u>		
Sex: <u>Ewe (female)</u>		
Date of Birth: <u>March 15, 2017</u>		
Ear Tag #: <u>631</u> Scrapie Tag: <u>WX2624-0631</u>		
<b>PURCHASE INFORMATION:</b>		
Date of Purchase: <u>June 1, 2017</u>		
Seller's Name (please print): <u>Bob Clark</u>		
Seller's Signature: <u><i>Bob Clark</i></u>		
Seller's Address: <u>123 Nowhere Lane</u> <u>Challis Idaho</u> <u>83226</u>		
(Address)	(City)	(State)      (Zip)
<b>YOUR INFORMATION (if this is an "extra" animal, put all member's names here):</b>		
Buyer's (4-H/FFA member) Name (please print): <u>John Doe</u>		
Buyer's (4-H/FFA member) Signature: <u><i>John Doe</i></u>		
Buyer's (4-H/FFA member) Address: <u>789 Mountain Drive</u> <u>Mackay Idaho</u> <u>83251</u>		
(Address)	(City)	(State)      (Zip)
<b>COUNTRY OF ORIGIN LABELING (COOL) AFFIDAVIT:</b>		
COOL Law became mandatory 9-30-08 and was modified effective 12-18-15. 4-H & FFA market <u>sheep &amp; goat</u> projects must provide information to document animal origin to buyers. These projects should also maintain a record of animal(s) sold one year from the date of sale.		
As an affidavit is deemed by USDA as an official record of Country of Origin, I attest through first-hand knowledge, normal business records, or producer affidavit(s) that all livestock referenced by this "bill of sale" are of <u>USA</u> origin.		
(list country, example: USA)		



# Making A Plan - Costs to Raise Market Animals

Steve Harrison, Extension Educator

## Goal (learning objective)

Youth will learn how to construct a budget to plan for expenses and revenues for a meat animal project.

## Supplies

- A copy of the Idaho 4-H Livestock Costs and Returns Estimate (budget) for each market species – one copy for each youth in your group (see Resources section on page 2)
- Pencils (enough for group)

## Pre-lesson preparation

- Obtain a copy of the Idaho 4-H Livestock Costs and Returns Estimate for each market species (see Resources section on page 2).
- Study the background and assumptions so you will be familiar with the information in the publications.
- Obtain prices of feed that youth commonly feed.

## Lesson directions and outline

Share the following information with the youth:

One of the most important aspects of a business including market animal projects is building a budget. Budgets help a business monitor expenses and revenues. Tracking expenses and revenue helps a business make a profit.

## Conducting the activity (DO)

Using the flipchart paper and markers, have the youth make a list of things they will need to successfully raise a livestock project. Have the youth list the things they want to help them raise a livestock project. Ask the youth if there are any items on each list that are the same?

1. Discuss the difference between wants and needs. Can I afford a new show box? Do I need to buy a \$500 feeder pig or is \$150-\$200 all I need to spend?
2. Help youth estimate their anticipated revenue. Each cost and return estimate provides an average amount on the money it takes to raise a project animal. Determine your county average or a reasonable projection for your youth to use.
3. Look over the list of operating costs and determine which ones make sense for your youth. (Feed, cost of animal, health costs, and show supplies are the most common).
4. Look at the ownership costs and determine how much should be charged for each one. (It may help to spread major expenses such as a pen, clippers or show box over several years. These items are normally used for the entire length of the project).
5. Have youth fill in the values they decide to use for the expenses and revenues on their copy of the budget worksheet.
6. Add the operation and ownership costs to get a total of all costs.
7. Subtract the total costs from total revenue to determine Net profit.

## Activity 2

Help youth develop a personal budget. This could include an allowance or job for income and entertainment, food and clothes for expenses.

**What did we learn? (REFLECT)**

- Ask: What would be a “break even” sale price to cover feed costs?
- Ask: How can a youth decrease expenses? (i.e. borrow equipment, barter or help adults with chores in exchange for other services such as hauling).
- Ask: How can youth increase income? Sell product at a higher price? Sell other by-products such as manure or wool etc.?
- Ask: Is there any value added because it is a 4-H animal? Example, the customer might want to know what animal was fed and how it was treated or how livestock benefit the environment.
- Ask: How do you feel when you have enough money to meet your needs? Why did you feel that way?

**Why is that important? (APPLY)**

- Ask: Why is it important to make a budget?
- Ask: Where else is budgeting important in your life? Why?

**Resources**

- Harrison, S. and Eborn, B. (2012). *Market Hog Project - Idaho 4-H Livestock Costs and Returns Estimate* (#72995). University of Idaho Extension. Available at <https://www.uidaho.edu/extension/4h/projects>.
- Nash, S. and Eborn, B. (2012). *Market Steer Project - Idaho 4-H Livestock Costs and Returns Estimate* (#72295). University of Idaho Extension. Available at <https://www.uidaho.edu/extension/4h/projects>.
- Nash, S. and Eborn, B. (2012). *Market Goat Project - Idaho 4-H Livestock Costs and Returns Estimate* (#72596). University of Idaho Extension. Available at <https://www.uidaho.edu/extension/4h/projects>.
- Ohio State University Extension. (2011). Introduction. *Beef resource handbook* (page 1-1 through 1-3).
- Ohio State University Extension. (2008). Records and Budgeting. *Goat resource handbook* (pages 155-156).
- Ohio State University Extension. (2011). Management Practices. *Sheep resource handbook for market and breeding projects* (page 28).
- Ohio State University Extension. (2000). Caring for Animals. *Swine resource handbook for market and breeding projects* (pages 24-1 through 24-3).
- Panting, R. and Eborn, B. (2012). *Market Lamb Project - Idaho 4-H Livestock Costs and Returns Estimate* (#72895). University of Idaho Extension. Available at <https://www.uidaho.edu/extension/4h/projects>.

## 4-H Livestock Income Statement

Item	Date	Amount
<b>Gross Reciepts</b>		
(example) Steer	1-Aug	\$2,500.00
<b>Total Income</b>		\$0.00
<b>Operating Expense</b>		
<b>Animal</b>		
(example) Steer	1-Nov	\$1,500.00
<b>Total Animal Expense</b>		\$0.00
<b>Feed</b>		
(example) Show Feed	1-Nov	\$150.00
<b>Total Feed Expense</b>		\$0.00
<b>Equipment/misc.</b>		
(example) Pen		\$475.00
<b>Total Equipment/misc. Expense</b>		\$0.00
<b>Total Expenses</b> total all animal, feed, and equipment/misc.		\$0.00
<b>Total (Gain or loss)</b> total income-total expense		\$0.00

# Artificial Insemination - AI

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Meranda Small, Extension Educator

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## Goal (learning objective)

Youth will learn why artificial insemination (AI) is used in livestock production, the tools and procedures used and the benefits to producers.

## Supplies

- Pictures of AI tools (at end of lesson)
- AI terminology and definitions
- Pictures of female anatomy for beef, swine, sheep and goats
- Flip chart and markers
- Computer with internet access
- Beef Artificial Insemination Video  
<https://www.youtube.com/watch?v=stvnGYcKz60>
- Swine Artificial Insemination Videos  
<https://www.youtube.com/watch?v=yjY0gl1KUvo>  
[https://www.youtube.com/watch?v=hjPPAXck\\_l4](https://www.youtube.com/watch?v=hjPPAXck_l4)
- Sheep Artificial Insemination Video  
<https://www.youtube.com/watch?v=7crTjxw28J0>
- Goat Artificial Insemination Video  
<https://www.youtube.com/watch?v=BiXFbC8T6n0>
- Assign a youth to share pros and cons of using AI on the species they are raising.

## Pre-lesson preparation

Artificial insemination (AI) is the practice of the introduction of sperm into the reproductive tract of the female other than by natural mating. AI allows for the collection of semen from a superior male and placing it into the reproductive tract of a female at the proper time. Semen is collected from the male and is usually frozen. Many straws of semen can be filled from one collection. A small amount of semen is frozen into a plastic straw, then thawed and placed into the female reproductive tract using the proper tools at the end of her standing heat.

**Beef** – AI provided a great advancement in the beef industry because it can genetically improve livestock due to accessibility of quality males. The breeding females must be inseminated at the proper time in their breeding cycle. The general procedure for AI breeding is to follow the AM/PM rule. If the cow shows signs of standing heat at night, breed her the next morning. If she shows signs of heat in the morning, breed her that night.

**Swine** – sows and gilts should be bred 12 to 24 hours after they show standing heat (gilts are to be bred earlier than sows). A second insemination should follow 12 to 24 hours after the first insemination with gilts again on the earlier schedule.

**Sheep** - AI is not a common practice in the sheep industry because ewes have a more complex cervix to pass, which requires more advanced AI equipment and there is difficulty in preserving or extending fresh ram semen. Ram semen doesn't freeze as well as other species and fresh semen has proven difficult to extend past 24 hours.

**Goat** – Females can be inseminated with either fresh or frozen semen from 12 to 18 hours after the onset of heat. Semen from the goat can be processed (extended) and used within 48 hours or frozen into plastic straws for later use.

## Lesson Directions/Outline

**Background Information** - - For swine the AI tool is the AI rod, there are not a lot of other tools or supplies needed. For cattle, beside the AI rod there is a straw cutter, insemination sheaths, a thawing thermos with a thermometer, and tweezers to remove semen straws from nitrogen tank. Explain the difference between how swine semen is deposited versus cattle semen (swine semen is typically in a squeeze bottle or bag) and not frozen but rather kept at room temp while bull semen is kept frozen prior to use, put into thawing bath then deposited).

Review the general benefits of using AI:

- Increases the ability to use outstanding sires. Top sires are accessible to all producers.
- Using sire summaries for beef, boar summaries for swine, ram summaries for sheep and buck summaries for goat, as well as EPD's can help a producer know more about the male before adding the genetics to the herd.
- Improved genetics because of the ability to use superior males, as well as access to genetics from different geographical areas.
- Increases uniformity of the offspring because many females can have offspring from the same male.
- Helps control reproductive diseases because the male is not in physical contact with the female.
- Reduced need of males because many females can be AI bred.
- Management convenience because you can control when the females are bred using reproductive synchronization. Many females can be made ready to breed at the same time using synchronization practices allowing for offspring to be born in the same time frame.

Review the Challenges of using AI:

- The biggest challenge of AI is timing correctly with each female of each species to better increase rate of conception. This also requires knowledge of the signs of heat for each species.
- AI is not a 100% guarantee of conception, which may still require a natural service.
- More time consuming and labor intensive compared to natural service.
- The process of AI can be step sensitive to avoid degradation of semen.
- Storage of semen must be done correctly for each species to ensure it remains viable for use.

**Conducting the Activity (Do)**

- Ask if any of the youth or parents want to share experiences using AI.
- Have the previously assigned youth discuss the pros and cons of using AI for the species they are raising.

- Write a paragraph describing why or why not use AI?
- Review the pictures of the tools and tool definition with the youth.
- If possible, watch the video that pertains to the species of the club members you are leading and discuss.
- Have the youth match the picture to the correct species, tool name and definition.

**What did we learn? (Reflect)**

- Ask: What are some benefits of utilizing this technology?
- Ask: What species benefit the most from using AI?

**Why is that important? (Apply)**

- Ask: How can these benefits help with advancements in the industry?
- Ask: Why is controlling disease a benefit from using AI?

**References/Resources**

- Ohio State University Extension. (2000). *Swine Resource Handbook for Market and Breeding Projects*, (pg 18-4 - 18-6)
- Ohio State University Extension. (2011). *Beef Resource Handbook Reproduction and Genetics*. (pg. 6-4 - 6-6)
- Ohio State University Extension. (2000). *Sheep Resource Handbook for Market and Breeding Projects*. (pg 123)
- Ohio State University Extension. (2008). *Reproduction. Goat Resource Handbook* (pg 40)
- Ohio State University Extension. (2004). *Reproduction. Dairy Resource Handbook* (pg 29)



## AI Terminology & Definitions

### AI Tools & Definitions

- AI Gun - The tool used to place the semen in the cervix of the female once it has been loaded.
- QuickLock AI Gun – tool used to AI sheep and goats once the semen has been loaded.
- AI Gun Sheath - Used to cover the AI Gun to keep it clean and protect the female from the edges of the gun.
- Tweezers - Used to grab the frozen semen straw from the tank. And then put in the thawing thermos.
- Straw Cutter - The tool to cut the semen straw tip before loading it in the gun.
- AI Lube - A solution to use on the AI glove as a lubricant to allow the technician to enter the cow with his arm.
- Thawing Thermos - A liquid container used to heat water to the proper temperature to thaw the semen.
- Semen straw - A small sleeve or straw that semen is place in and then frozen. It must be thawed before placing in the female.
- Sponge Tip AI Rod/Catheter - A rod a sponge tip used to inseminate a sow or a gilt.
- Spiral Tip AI Rod/ Catheter - A rod with a spiral tip used in swine insemination.
- Semen Squeeze Bottle - A bottle filled with semen that attaches to the rod/catheter used in swine insemination.
- Insemination Endoscope - A stainless steel, handheld cannula with a light that is inserted in the vagina to determine placement of the semen.
- Cannula - A small tube used for insertion into a body cavity or duct.
- Catheter - A thin tube that is put into the vulva of the female to inject the semen into her reproductive tract (cervix).
- AI Gloves/Sleeves – A plastic glove usually arm length, worn by the AI technician to allow for easy entry in the cow rectum and to keep the process as clean as possible.

AI Tool	Species Used For			
AI Gun	Beef	Sheep	Goats	
AI Gun Sheath	Beef			
Tweezers	Beef		Goats	
Straw Cutter	Beef		Goats	
AI Lube	Beef	Sheep	Goats	Swine
Thawing Thermos	Beef			
Semen Straw	Beef	Sheep	Goats	
Sponge Tip Rod/Catheter				Swine
Spiral Tip Rod/Catheter				Swine
Semen Squeeze Bottle				Swine
Insemination Endoscope		Sheep	Goats	
Stainless Steel Cannula		Sheep	Goats	
QuickLock AI Gun		Sheep	Goats	
Catheter		Sheep	Goats	Swine
AI Gloves/Sleeves	Beef			



## Artificial Insemination Tools



**A**



**B**



**C**



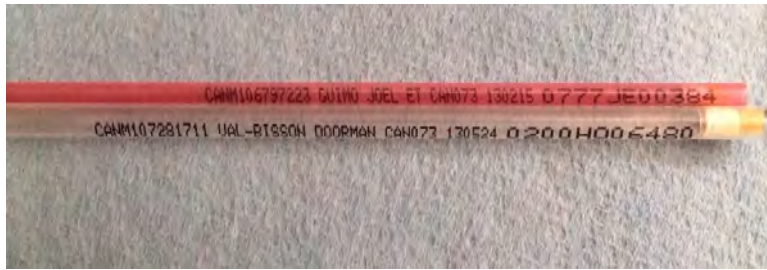
**D**



E



F



**G**



**H**



**I**



**J**



**K**



**L**



**M**





N



O

### AI Tools – Put the Letter by the Correct Tool

AI Gun \_\_\_\_\_

QuickLock AI Gun \_\_\_\_\_

AI Gun Sheath \_\_\_\_\_

Tweezers \_\_\_\_\_

Straw Cutter \_\_\_\_\_

AI Lube \_\_\_\_\_

Thawing Thermos \_\_\_\_\_

Semen Straw \_\_\_\_\_

Sponge Tip AI Rod/Catheter \_\_\_\_\_

Spiral Tip AI Rod/Catheter \_\_\_\_\_

Semen Squeeze Bottle \_\_\_\_\_

Insemination Endoscope \_\_\_\_\_

Catheters \_\_\_\_\_

AI Gloves/Sleeves \_\_\_\_\_

Stainless Cannula \_\_\_\_\_

### **Artificial Insemination Tools – Answer Key**



**Straw Cutter – A**



**AI Gun - B**



**Tweezers – C**



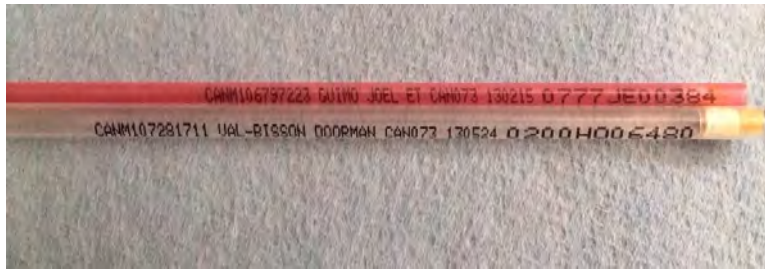
**AI Gun Sheaths – D**



**Thawing Thermos – E**



**Semen Squeeze Bottle – F**



**Semen Straws – G**



**Disposable Catheters – H**



**Stainless Steel Cannula – I**





**Spiral Tip AI Rod/Catheter – J**



**Sponge Tip AI Rod/Catheter – K**



**Insemination Endoscope – L**



**AI Glove/Sleeve – M**



**QuickLock AI Gun and pipette – N**



**AI Lube – O**

# Expected Progeny Differences (EPDs)

Meranda Small, Extension Educator

## Goal (learning objective)

Youth will learn:

- What EPDs are and what they indicate
- Economic importance of EPDs
- Why EPDs are used
- How EPDs help improve the livestock industry

## Supplies

- Handouts with terminology, explanation of traits, and traits of economic importance for beef, swine, sheep and meat goat.
- Worksheets with EPDs and proposed scenarios for beef cattle, swine, sheep and meat goat.
- Four poster boards and markers.

## Pre-lesson preparation

- Print and review lesson plan, handouts and worksheets.
- Gather supplies.

## Lesson directions and outline

### Background Information

Review the handout for each species as a group (HANDOUT 1), so that all youth regardless of project species gain an understanding of EPDs within the livestock industry. Following the review, break youth into four smaller groups and assign each group one of the scenario worksheets. Once each group has completed their scenario, come back together, and have each group take a turn presenting their scenario, the information on the animal, and what and why they selected the animals. Provide posterboard and markers if the groups would like to utilize them for their presentation.

## Conducting the activity (DO)

Assign youth to a species to create the smaller groups that will work together to review the EPDs for their species scenario. Youth need to consider what their operation is like, their production goals and then determine which sire fits best. Provide them a posterboard and markers if they'd like to create a larger version of the sire summary to help them present their management decision to the group.

Once all groups have made their decision, bring the whole group back together and have them take turns presenting on their assigned scenario. Following presentations, review selections with the groups, referencing the answer keys for each species, then discuss the REFLECT and APPLY sections.

## What did we learn? (REFLECT)

- Ask: What are EPDs?
- Ask: What traits are valued across all species?
- Ask: What is the economic importance of EPDs? Is the benefit the same for all market species?

## Why is this important? (APPLY)

- Ask: How did this tool help you make your selection? How has this breeding decision tool helped the livestock industry?
- Ask: Has this practice impacted their livestock project or will it in the future?

## Resources

- Ohio State University Extension. (2011).  
*Reproduction and Genetics. Beef resource handbook* (pg 6-12 - 6-21).
- Ohio State University Extension. (2008).  
*Reproduction. Goat resource handbook* (pg 44-48).
- Ohio State University Extension. (2011).  
*Management Practices. Sheep resource handbook for market and breeding projects* (pg 28-30).
- Ohio State University Extension. (2000). *Selecting Breeding Stock Based on Records and Genetics. Swine resource handbook for market and breeding projects* (pg 16-1 - 16-3, 17-1 - 17-6).
- <https://extension.psu.edu/programs/courses/meat-goat/basic-production/selecting-meat-goats-using-performance-data>

## REPRODUCTION: EPD – HANDOUT 1

### Definitions and Explanations

- EPD: Expected Progeny Difference is a figure used to describe how the offspring of an animal will perform in relation to the average performance of other animals in the breed.
- MPPA: Most Probable Producing Ability provides individual dam record summaries, which are based on the adjusted weaning weight of a dam's progeny. The value is calculated from one or more records on the same dam to predict her future level of performance within a herd. The more progeny raised by the dam, the more accurate the information.
- Sire summaries: a summary of EPD information for various traits of sires and dams that ranks them in comparison to other animals within the breed based on the records of their offspring. These have enabled the livestock industry to make great genetic progress within various species.
- Performance pedigrees: summaries of EPD information for various traits of sires and dams that also includes information on grandsire and granddam.
- Sire: reproductive male
- Dam: reproductive female
- Progeny: offspring

### Beef Traits of Economic Importance

There are four traits for Beef of economic importance which are classified as Reproductive Performance, Growth Rate and Feed Efficiency, Conformation, and Carcass.

- Reproductive performance: traits affected by fertility, calving ease, and maternal ability
  - o Fertility level: in bulls, this trait is determined by conducting breeding soundness exams which will include examination of reproductive organs and measuring scrotal circumference, with larger measurements indicating increased fertility for the bull as well as his daughter's reaching puberty at an earlier age. These daughters will help then increase a herd's productivity.
  - o Calving ease: birth weight is the most influential factor in determining this trait, with a lower birth weight record being more suitable for first calf heifers. Bulls that produce calves with higher birth weights would be better suited for mature cows. Higher weighted calves in heifers may lead to calving issues that could be costly.
  - o Maternal ability: milk is the most importance factor of this trait, as this influences a calf's growth. It also indicates energy requirements of the cow and thus feed costs to meet the requirements. Weaning weight however is considered the most accurate reflection of a cow's maternal ability. This is also a strong indicator of the income that will come in when these calves are sold. It would be valuable to select bulls that produce offspring with high weaning weights, as his daughters will inherit this production trait. But keep in mind the feed resources needed in association with this trait.
- Growth rate: this trait includes the measurement of weight for calves at 205 days of age, or at weaning, postweaning gain, and 365-day weight (yearling). A yearling weight EPD would be the best trait to select for when a production goal is growth. Selection of this trait also



influences an animal's feed efficiency ability, with daily gain from weaning to yearling being compared to feed intake per day to determine the feed to gain ratio. Animals that require a large amount of feed may not make economic sense, especially if they don't also have a large gain.

- Conformation traits: these traits include structural soundness and muscling. Animals that are sound have the potential to perform and be productive for many years. Bulls that have impressive growth traits won't be able to service cows if they are not built correctly to do so or have the strength to cover the environment they'll be in. Furthermore, a bull that is structurally incorrect will pass those traits onto daughters, creating herd cows that will not be as productive long term.
- Carcass traits: these traits are of great value as they influence end product quality and is what the consumer experiences when they consume beef products. These traits include yield grade and quality grade. Yield grade is determined by carcass weight, external fat cover, rib eye area, and percentage of pelvic, kidney, and heart fat. Quality grade is determined by maturity, the animal's age at slaughter, and marbling, the amount of fat within the muscle. A marbling score will be based on tenderness, marbling, juiciness and flavor. These traits are indicative of the bottom dollar value of an animal at the end of its lifecycle.

#### Sheep traits of economic importance

While EPDs are used within the sheep industry and are similar to those used by the beef cattle industry, most breed EPDs for sheep are within flock comparisons only. These are referred to as Flock Expected Progeny differences (FEPDs).

There are three traits for Sheep of economic importance which are classified as Maternal, Growth and Wool.

- Maternal FEPDs: these traits include number of lambs born and pounds of lamb weaned.
  - o Number of lambs born: a positive FEPD indicates an ewe has the ability to produce more lambs than an ewe with a zero or negative FEPD. This trait indicates prolificacy or genetic ability of an ewe. The more lambs a ewe gives birth to and raises per lambing, the more income potential because the ewe has more lambs.
    - Within this trait it's important to be aware of the type of birth (number of lambs born) and rearing (number of lambs raised):
      - S = Single
      - TW = Twin
      - TR = Triplet
      - Q = Quadruplet
  - o Pounds of lamb weaned: this trait indicates reproductive rate, maternal ability of the ewe, lamb survivability, and growth. A FEPD of +6.0 means that ewe should be weaning lambs that are 6 pounds heavier than lambs weaned from ewes with an FEPD of 0. Lambs that weigh more will have the potential to bring more money back to the producer as the lambs are typically sold by the pound.
- Growth FEPDs: included in this value is weight at preweaning, weaning, and postweaning corresponding to the age-weight categories of 30, 60, 90, 120, 180, and 365 of age after lambing. The values are used to evaluate the genetic merit for growth. This indicates a lamb's rate of growth or gain.

- Wool FEPDs: these are listed for grease fleece weight, clean fleece weight, staple length, and fiber diameter. These measurements are typically only taken once in the lifetime of an animal, around yearling age. For operations that are focused more on fiber production rather than carcass, these FEPDs would be heavily evaluated. \*The parameters of wool FEPDs are explained in further detail in the *Sheep resource handbook*\*

#### Swine traits of economic importance

In the swine industry, an EPD value is equal to one-half of the Estimated Breeding Value (EBV). These values have been developed through The National Swine Improvement Federation (NSIF). A negative EPD value is desirable for some traits, while a positive value is desired for others.

- Backfat thickness: a negative value in this trait is ideal, as it indicates less fat on the carcass.
- Feed efficiency: a negative value in this trait is ideal, as it indicates offspring should require less feed and still accomplish a good rate of gain. This in turn relates to the cost of each pound of gain, with more efficient animals being more profitable than animals that require more feed to gain weight.
- Average daily gain: a positive value in this trait is ideal, especially when a production goal is having a fast rate of gain on hogs intended for slaughter.
- Days to market: a negative value in this trait is ideal as it indicates it should take offspring less days to reach market weight for slaughter. This demonstrates an animal's feed efficiency and influences the economic value of the animal. This is also known as Days to 250 lb. EPD.
- 21-day litter weight: a positive value in this trait is ideal
- Number of pigs born alive: a positive value for this trait is ideal. This can be considered a maternal trait as well since it's tied to conception rate. If an operation is more focused on hogs for breeding purposes, this trait would be heavily considered in the selection process.

#### Goat traits of economic importance

When selecting goats based on data, there are two options: Estimated Breeding Values (EBVs) and individual performance within a herd. EBVs are the preferred selection parameter because these numbers focus on genetic estimates for performance across a breed. EBVs are measurements of heritable traits such as number of kids born, weaning and post weaning weights, and carcass traits. While an individual's performance within a herd is still useful information the performance of that individual will be influenced by management and environmental factors in addition to genetics.

Performance data that is collected by producers commonly includes:

- Birth weight – most kids weigh between 5 and 8 pounds. Larger kids may cause kidding difficulty and can add labor requirements. Smaller kids may require help from the producer for the first few days after birth.
- Birth type and rearing type – birth type refers to kids born as single, twin or triplet. To be profitable operations need their does to produce twins and rear them as twins. Most yearling does will produce a single kid. Selecting does and bucks born as twins can boost the genetic likelihood of twinning.

- Weaning weight (adjusted to 90 days) – kids should wean between 40 and 50 pounds at 90 days of age. Kids born as singles normally weigh more at weaning than kids born as twins or triplets.
- 150-day weight (weight adjusted to 150 day) – this is the weight is taken around 150 days of age and is a predictor of post weaning growth. The heavier weight typically means more genetic performance for growth.

#### REPRODUCTION: EPD – BEEF

##### Beef EPD Activity:

Sire	Birth Weight	Weaning Weight	Yearling Weight	Milk
Bull A	-1.1	-4.1	-8.5	+2.0
Bull B	+2.3	+16.1	+43.6	+3.0
Bull C	-1.0	+18.7	+44.8	-5.0

+ indicates that bull's EPD is above the breed's average while a – indicates the bull's EPD is below average. For some traits it'll be good to be below average such as birth weight. However, you'll want an above average number such as yearling weight as that's the end financial return.

Scenario: It's time to breed your cow herd, which are 50% heifers. You only have 30 head, so you figure you'll only need one bull, but he'll need then to work for your entire herd. You'll be selling the entire calf crop this year when they become yearlings, getting paid by the pound.

For this activity, you need to:

1. Decide which bull will work best? Why?
2. What are the good points and bad points for each bull?

#### REPRODUCTION: EPD – SHEEP

##### Sheep EPD Activity:

Tag No.	Birth Type	Rearing Type	Birth Wt.	Lambs Born	Pounds weaned	60-day Wt.	120-day Wt.
1	S	S	12.3	-0.10	+2.6	+5.2	+8.2
2	S	S	14	+0.60	+1.9	+3.2	+4.4
3	TW	S	10.2	+2.10	-1.6	-2.2	-8.2
4	TR	TR	9.6	+1.122	+1.1	+4.4	+9.7

+ indicates that a FEPD is above the flock's average while a – indicates a FEPD is below average.

Scenario: the above rams are terminal sires to be used on Rambouillet x Dorset crossbred ewes for production of feeder lambs that will be finished out in a feedlot on the farm. Ewes are maintained on range conditions typical of sheep production operations throughout the Rocky Mountain region.

For this activity, you need to:

1. Decide which ram will work best? Why?
2. What are the good points and bad points for each ram?

\*This activity is referenced from the *Sheep resource handbook for market and breeding projects*.

#### REPRODUCTION: EPD – SWINE

Swine EPD Activity:

No.	Days to 250 lb. EPD	Back Fat EPD	21 Day Litter Weight EPD	Number Born Alive EPD
A	-1.8	+0.00	+3.8	+.03
B	-2.3	+0.03	+3.0	+.01
C	-1.1	-0.01	+1.7	+.02
D	-0.8	+0.01	+1.8	+.02

\*Negative Fat EPDs means less fat

\*Negative Days to 250 lb. EPDs mean fewer days

Scenario: The herd profits mainly from seedstock sales to other operations that do rotational crossbreeding programs. You use Yorkshire and Duroc boars in your rotation. You also produce your own replacement gilts. You and the operations you sell to raise the hogs in total confinement. Hogs are marketed with high consideration given to carcass merit and percent lean.

For this activity, you need to:

1. Select which gilt should be retained? Why?
2. What are the good points and bad point for the other three gilts?

\*This activity is referenced from the *Swine resource handbook for market and breeding projects*.

## REPRODUCTION: EBV's – GOAT

### Goat EPD Activity

Doe	Birth Type	Adj 90-day wt.	Adj 150-day wt.
1	TW/TW	50	79
2	TW/S	43	75
3	TW/TW	29	49
4	S/S	38	66
Contemporary Avg		49	75

TW = Twin

S = Single

TW/TW = born as a twin and raised as a twin

S/S = born as a single raised as a single

Adj = Adjusted weight to the days of age

### Scenario:

Rank these does as they should be chosen by a commercial Boer goat herd in the western United States. Progeny will primarily be sold as kids to youth exhibitors. 15% of the females will be kept for replacement and the remainder of the kids will be sold to various ethnic markets.

\*This scenario comes from the National 4-H Livestock Judging Contest.

## REPRODUCTION: EPD – KEY

### Answer Key(s)

Bull C is the correct bull for this scenario for the following reasons:

- It has a below average birth weight, meaning better calving ease for heifers and less instance of having to pull a calf.
- Bull C has calves that are well above average for weaning weight which could be viewed as either a positive or negative. Higher weaning weight means the cow will be expending more energy thus possibly needing more feed.
- Bull C's yearling weights are also well above average which is where financial return is the goal.
- Important note: Bull C's milk EPD is below average meaning his daughters will be low milk producers and likely will produce calves that have lower weaning weight leading potentially to lower yearling weights. This outcome is why it may be unwise to keep replacement heifers from Bull C.

If all your cows are mature, Bull B may be a better fit as they should handle birthing larger calves; with a higher-than-average milk production calves will still grow like Bull C. So B's calves and replacement heifers would be worth keeping.

Bull A does produce small calves and its daughters would have high milk production. However, his calves tend to be on the small size meaning less financial return.

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Ram 4 is the correct ram for this scenario for the following reasons:

- While this ram doesn't have the highest birth, pounds weaned, or 60-day weight, it does have the highest 120-day weight which is the trait of most value in this situation as the goal is having heavier lambs at an earlier age.
- With the lowest birth weight and highest 120-day weight, these offspring would have potential to grow the fastest after weaning.

If the operation goal shifted to keeping replacement ewes out of these rams, Ram 4 may still be a good choice as his daughters may have the potential to birth multiple lambs as well as keep those lambs alive to weaning.

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Gilt A is the correct selection for this scenario for the following reasons:

- While this gilt does not have the lowest Days to 250 lb. it is still better than average, and she has an acceptable amount of back fat indicating her lean to fat ration will be acceptable.
- She's expected to have a litter with a better than average 21 Day Litter weight and more piglets born alive.

Gilt B will produce offspring that would reach 250 lb. faster than the other gilts, which stems from a good value for 21 Day Litter Weight. But she has a higher backfat than desired by current market standards and though still above average, has the lowest number of piglets born



alive. Gilts C and D are very similar in that their offspring should reach 250 lb. slightly quicker than average, their litters have good 21 Day Weight, and they have above average number of piglets born alive.

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#### Goat Scenario

The ranking would be 1-2-4-3. The kids from Doe 1 were born and raised as twins. These kids had the highest weight at both 90 and 150 days, both weights are above the contemporary group average. This indicates Doe 1 should have enough milk to have them wean heavier and these kids have the genetic potential to grow the fastest after weaning. Doe 2 would be second even though she was raised as a single she has the next highest weight numbers and grew the fastest after weaning. Doe 3 would be placed last because even though she raised twins, they were the lightest at both weights. Potentially she would have the least amount of milk production because of the weight of the kids and the kids would be the least cost efficient to raise to an acceptable market weight.

# Genetics

Meranda Small, Extension Educator

## Goal (learning objective)

Youth will learn beginning genetics concepts including terminology and the heritability of various traits.

## Supplies

- A chalkboard or dry erase board
- Chalk or dry erase marker
- Photocopies of the following handouts:
  - a. Handout 1 - "Inheritance of Horns" (enough for group)
  - b. Handout 2 - "Cow with Horns" (3 copies, cut out)
  - c. Handout 3 - "Cow without Horns" (5 copies, cut out)
- Paper (enough for group)
- Temporary adhesive or painter's tape
- Computer
- Projector
- Screen (or wall to project on)

## Pre-lesson preparation

- Read/review lesson
- Practice drawing a Punnett Square (a square diagram that is composed of a grid of usually four boxes to determine the possible genotypes of an offspring arising from a particular cross or breeding event)
- Review PowerPoint supplement (the PowerPoint is key to helping youth to learn the terminology and concepts)
- Read/review terminology and concepts for each species (these are found in the PowerPoint)

## Lesson directions and outline

Begin by asking youth to give a definition of heredity. After several youth have had the chance, share the following information with the youth:

Understanding the basics of genetics and the principles of inheritance is important and necessary to improve livestock. Characteristics are passed from generation to generation, a process known as heredity (genetics). Each animal receives half of its inheritance from the male and half from the female. The differences between animals is a result of two factors, heredity (genetics) and environment. Both affect the performance of all animals.

Traits of economic importance:

- Reproductive performance - Fertility level, birthing ease, maternal ability
- Growth rate and feed efficiency
- Conformation traits
- Carcass traits

## Conducting the activity (DO)

1. One potential way to teach this lesson would be to assign it to an older youth to prepare and present using the PowerPoint. Whoever teaches this lesson should not read each slide word for word. The best way would be for the presenter to summarize the information on each slide. Information included in the PowerPoint: Terminology, dominant and recessive genes, traits of economic importance and inherited defects. **Remember this is a Level 2 lesson so some of the information may be hard for a younger member to understand.**
2. Ask for a volunteer to distribute Handout 1.
3. Using the chalk board (or dry erase board) draw a Punnett Square. Start with both the sire and dam being homozygous polled (PP), showing that all offspring would be polled (sample of what the Punnett Square will look like is below). The capital letter P stands for the dominant gene. A small letter p stands for the recessive gene.

Example of a Punnett Square:

		P	DAM	P
P		PP		PP
SIRE				
P		PP		PP

In this square since both parents are homozygous polled, capital PP. In this genetic combination all the resulting offspring will be homozygous polled (PP).

4. When both parents are heterozygous polled, meaning they each have the dominant polled gene, capital P and they both have the recessive horned gene, small p, the genetic make-up of each of these parents is Pp. Draw this square to determine how many offspring will be homozygous polled (PP), how many offspring will be heterozygous polled (Pp) and how many will be homozygous horned (pp).
5. Drawing a Punnett Square with the sire homozygous polled (PP) and the dam heterozygous polled (Pp). Draw another square with the sire homozygous polled (PP) and dam homozygous horned

(pp). Have the youth discuss other potential gene combinations that could be drawn. Draw them as a group. Discuss how this works with other genetic traits (carcass traits, growth, etc.)

## What did we learn? (REFLECT)

- Ask: What is genetics? (The science that studies how animals inherit characteristics or traits from parents and pass these traits to offspring).
- Ask: What are some genetics terms? (reference back to PowerPoint)
- Ask: How does genetics help us improve certain traits in livestock? (Can directly select for traits that improve the value of livestock and livestock products).

## Why is that important? (APPLY)

- Ask: Why is it important to understand the inheritance of certain genetic traits? (so as to avoid selecting traits that could have detrimental health effects).
- Ask: How were your genetics inherited? (Half from mom half from dad).
- Ask: How does understanding genetics help in human health? (Helps with preventing passing of genetic diseases as well as what health concerns individuals should be aware of for themselves. Has influence on the treatment of certain diseases).

## Resources

Ensminger, M.E. (1991). *The stockman's handbook*, 7th Edition. Prentice Hall.

Moser, D.W. (n.d.). *Genetic defects in beef cattle: an update*. Retrieved from: <http://www.asi.k-state.edu/doc/agents/gendefects.pdf>

Ohio State University Extension. (2011). Reproduction and Genetics. *Beef resource handbook* (pages 6-10 through 6-13).

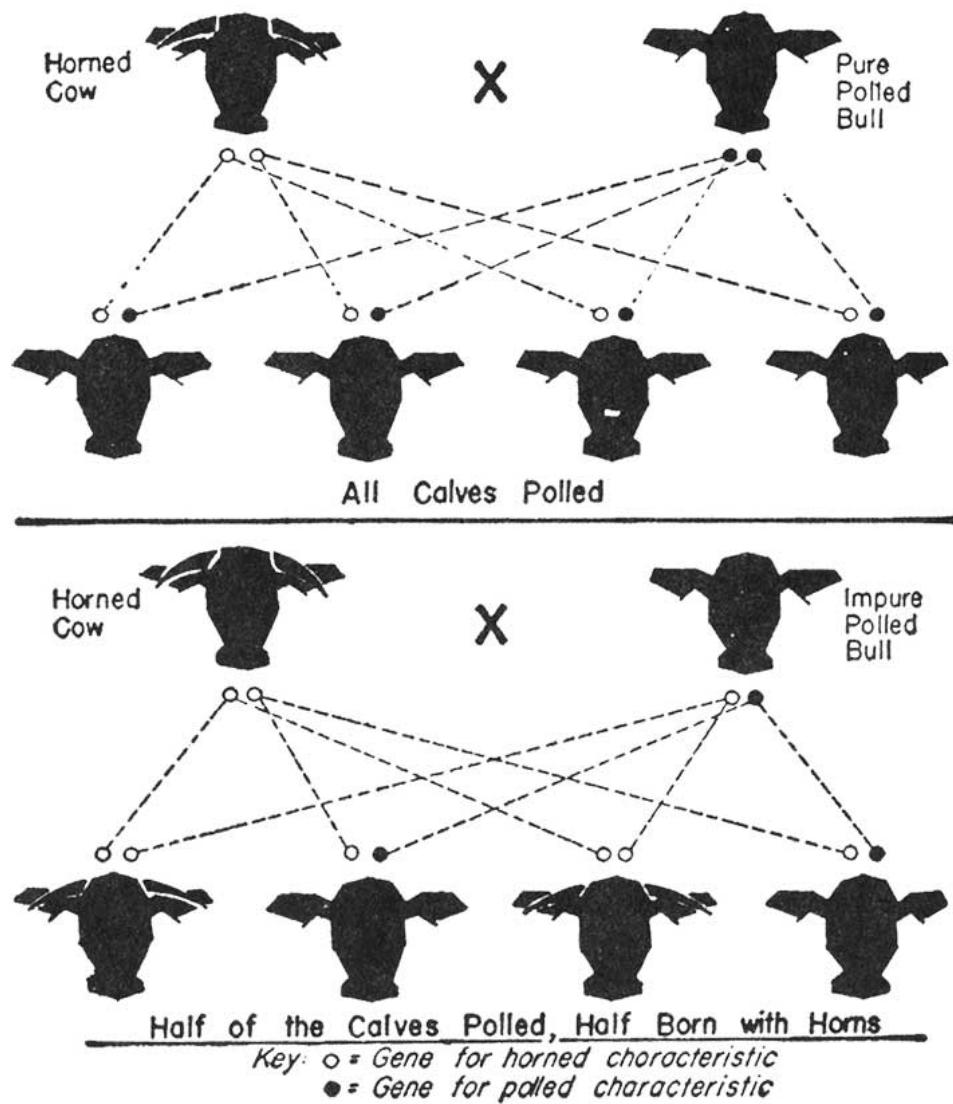
Ohio State University Extension. (2008). Reproduction. *Goat resource handbook* (pages 44-48).

Ohio State University Extension. (2011). Reproduction and Genetics. *Sheep resource handbook for market and breeding projects* (pages 125-130).

Ohio State University Extension. (2000). Genetics. *Swine resource handbook for market and breeding projects* (pages 17-1 through 17-6).

REPRODUCTION: GENETICS – HANDOUT 1

Inheritance of Horns



# Heat Detection

Meranda Small, Extension Educator

## Goal (learning objective)

Youth will learn terminology and understand physical signs and tools that help with heat detection in livestock.

## Supplies

- Copies of Handout 1 “Signs of Estrus in Livestock” (make enough copies for group)
- Copies of Handout 2 “Estrus Detection & Tools” (make enough copies for group)
- Copy of Handout 3 “Estrus Detection & Tools” (make one copy - answer key)

## Pre-lesson preparation

- Make photo copies of Handout 1 and 2 – enough for group
- Make 1 photo copy of Handout 3 – leader use only (answer key)
- Read/Review lesson
- Read/review terminology and concepts for each species

## Lesson directions and outline

Assign a youth to discuss each of the species with the rest of the club using the information provided below. The club leader (volunteer) needs to share the first paragraph.

**For all species** males have a constant supply of testosterone making them able to breed at any time. Males too observe the physical display of heat as well as have the ability to detect pheromones and display the Flehmen response. The Flehmen response is observed when the male animal detects the pheromones from the female, he will roll his nose back and bottom lip up (See picture B in Handout 7).

**Beef:** Cows will show heat for 14-20 hours and 10-16 hours after the last sign of heat she'll ovulate, however sperm should already be present in the female tract. During that 14-20-hour window is when the female should be bred by a bull or Artificial Insemination (AI). If using AI implement the AM/PM rule: if showing heat in the morning breed at night and vice versa. For re-breeding of cows, give her 65 days after calving before trying to re-breed. Heat detection in cows can be accomplished through observation, use of gomer bulls, detector pads, and Free Martin heifers. A Free Martin heifer is typically born as a twin to a bull. These heifers are generally not fertile but are aggressive in detecting heat of other heifers. For estrus synchronization of a herd, the hormone prostaglandin is used and available commercially.

**Sheep:** Estrus lasts 20-42 hours, ovulation occurring in the late period. Sheep are seasonal breeders so may only come into heat at certain times of year (influenced by daylight length). Breed in the fall (September through December) or spring (January through March), placing rams with the ewes 148 days before you want lambing to happen. Manipulation is not as regular of a practice with sheep. Signs of heat are harder to detect in sheep.

**Swine:** Heat detection can be accomplished by applying back pressure and she pushes back or by exposing the female to a boar with a fenced barrier to excite her. Females will show heat 50-60 hours, slightly less for gilts. Ovulation will occur 35-45 hours after the last sign of heat and will take 1-7 hours. Sperm will survive in the female tract for 24-72 hours in all species, so as with cows, sperm for the sow needs to be present prior to ovulation, 12-24 hours after physical heat begins to show. A second breeding of the sow 12-24 hours after the first breeding is standard practice. Commercial forms of swine specific prostaglandin are available for estrus synchronization.

**Goats:** Heat detection requires the herd manager to spend time watching to determine the best time to breed the females. The estrus duration is 12-36 hours. AI in goats is not as common as other species but is done. Goats should be inseminated 12 to 18 hours after the onset of heat. Ovulation occurs from 12 to 36 hours after the first signs of heat. Effective estrous synchronization products are not approved for use in the United States.

### Conducting the activity (DO)

1. Have the group form into smaller groups - try to mix different species if possible.
2. Ask for a volunteer to distribute Handouts 1 and 2.
3. Have members complete Handout 2
4. Check for completion, once group has finished, discuss Handouts 1 and 2 with the group.
5. Ask the following:
  - a. Are there similarities in estrus signs in livestock?
  - b. What are some other ways that you can detect heat in livestock?
6. Share answers in Handout 3 with the group.

### What did we learn? (REFLECT)

- Ask: Can a female become pregnant at any time?
- Ask: What are some signs of heat?
- Ask: Can the onset of estrus be manipulated?

### Why is that important? (APPLY)

- Ask: How does heat or estrus affect herd production overall?
- Ask: How do management practices come into play with heat detection?
- Ask: What are the benefits of synchronizing estrus in a herd?

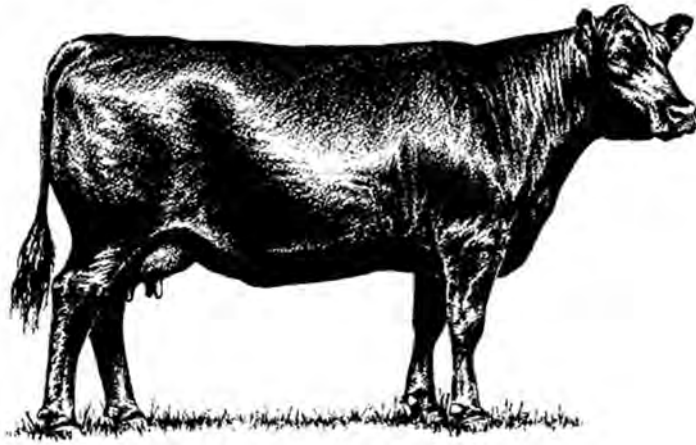
## Resources

- Ohio State University Extension. (2011). Reproduction and Genetics. *Beef resource handbook* (pages 6-3 through 6-7).
- Ohio State University Extension. (2008). Reproduction. *Goat resource handbook* (pages 39-41).
- Ohio State University Extension. (2011). Reproduction and Genetics. *Sheep resource handbook for market and breeding projects* (pages 119-121).
- Ohio State University Extension. (2000). Breeding Management. *Swine resource handbook for market and breeding projects* (pages 18-1 through 18-7).
- Yager, A., Neary, M., & Singleton, W. (2003). Farm Animal Management @ Purdue. *Estrus detection in farm animals*. AS-559-W. Purdue University Cooperative Extension Service.



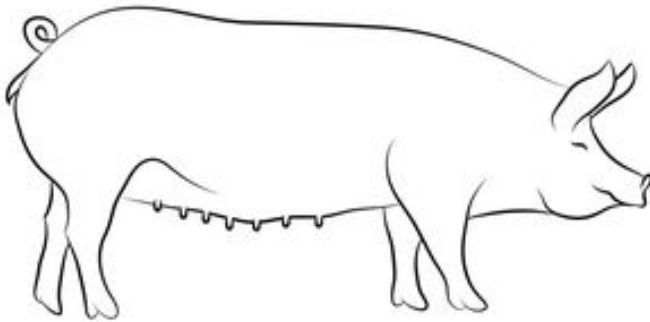
## REPRODUCTION: HEAT DETECTION – HANDOUT 1

### Signs of Estrus in Livestock



#### Signs of Estrus in Cattle

- Standing for other cows, allowing others to ride her
- May try to ride other cows
- Loss of appetite
- Head is up, in air – lot of sniffing/smelling
- Bawling, nervous/excited behavior, walking fences
- Increase in mucous discharge from vulva
- Vulva is red and swollen



#### Signs of Estrus in Swine

- Stands for back pressure
- Ear carriage more erect
- Increased activity
- More vocal
- Sticky discharge from vulva
- Swelling of vulva



#### Signs of Estrus in Sheep

- Nervous/excited behavior, walking fences
- Shaking of the tail
- “Ruttish” behavior around rams – will seek rams out, rub necks or bodies against them
- Slightly swollen vulva



#### Signs of Estrus in Goats

- Standing to be mounted by herd mates
- Flagging (rapid tail wagging)
- Attempting to mount other goats
- Excited behavior, walking fences
- Clear, mucous discharge from vulva
- A swollen, red or wet vulva

## REPRODUCTION: HEAT DETECTION – HANDOUT 2

### Estrus Detection & Tools

**Directions:** Use the terms listed below to answer questions 1-13.

1. The herdsman in image D is demonstrating the \_\_\_\_\_.
2. Images E and F demonstrate the \_\_\_\_\_.
3. The heat detection tool in image A is placed under the chin of the bull and causes paint to be smeared on the back of a cow when mounted. It is called a \_\_\_\_\_.
4. The \_\_\_\_\_ contains a red dye, and is glued on the tail-head between the pins and hooks of the cow. If the cow is mounted, pressure on the device causes the dyes to mix, creating a visible color change as illustrated in image \_\_\_\_\_.
5. \_\_\_\_\_ is one of the signs to identify estrus in gilts and sows.
6. The ram is exhibiting the \_\_\_\_\_ after sniffing an ewe's urine.
7. The presence of a male goat known as a \_\_\_\_\_ can help detect heat in does. Does will respond with increased \_\_\_\_\_.

**Terms/phrases for questions:**

Buck

Erect ears

H

Mounting behavior displayed by females approaching estrus

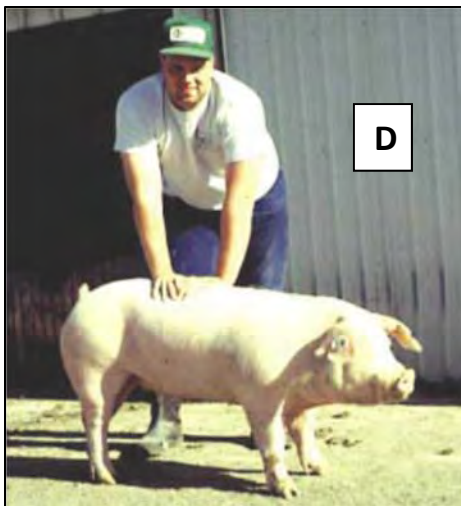
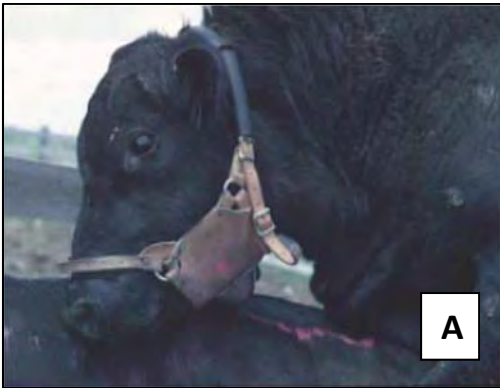
Flehmen response

Heat patch

Chin-ball marker

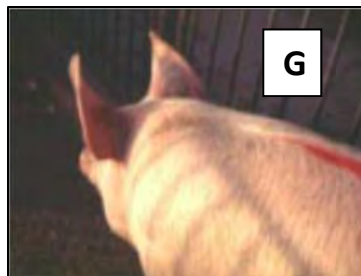
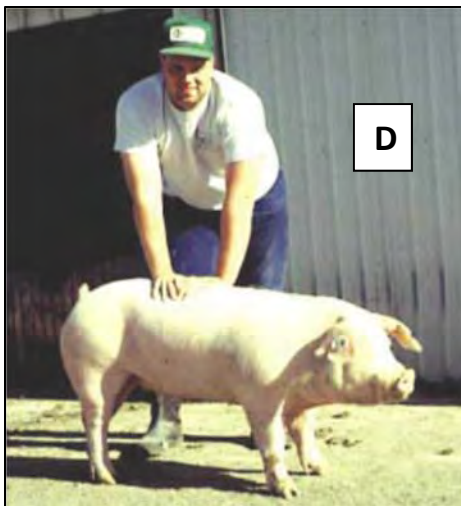
Tail wagging

Back pressure test



## REPRODUCTION: HEAT DETECTION – HANDOUT 3

### Estrus Detection & Tools – ANSWER KEY



**Directions:** Use the terms listed below to answer questions 1-13.

8. The herdsman in image D is demonstrating the Back pressure test
9. Images E and F demonstrate the Mounting behavior displayed by females approaching estrus
10. The heat detection tool in image A is placed under the chin of the bull and causes paint to be smeared on the back of a cow when mounted. It is called a Chin-ball marker.
11. The heat patch contains a red dye, and is glued on the tail-head between the pins and hooks of the cow. If the cow is mounted, pressure on the device causes the dyes to mix, creating a visible color change as illustrated in image H.
12. Erect ears is one of the signs to identify estrus in gilts and sows.
13. The ram is exhibiting the Flehmen response after sniffing an ewe's urine.
14. The presence of a male goat known as a Buck can help detect heat in does. Does will respond with increased tail wagging.

**Terms/phrases for questions:**

Buck

Erect ears

H

Mounting behavior displayed by females approaching estrus

Flehmen response

Heat patch

Chin-ball marker

Tail wagging

Back pressure test



# Hormones Control Everything!

Meranda Small, Extension Educator

## Goal (learning objective)

Youth will learn what the primary hormones are that are responsible for reproduction in the female and male, where each hormone comes from, and what each hormone does. There will also be an explanation of the brain for its role in reproduction.

## Supplies

- Poster board, chalk board, flip chart or dry erase board
- Markers, chalk, or dry erase markers
- Note cards and different colored writing utensils
- Paper (one sheet per youth) and different colored markers
- Copies of the "Hormones" table for youth to complete (Table 1).

## Pre-lesson preparation

- Read/review lesson
- On each note card with a different color write down the hormone, its source, and primary action first for females then males.

## Lesson directions and outline

**Background Information:** Hormones control everything when it comes to reproduction, so it should be deemed necessary to understand them and their importance in the continuation of life.

**Role of the Brain:** Senses external and internal environment of the female and regulates behavior as it is the control center for reproduction. Within the brain is the hypothalamus and pituitary glands. The Hypothalamus responds to external stimulus and reacts by activating the release of hormones within the body. It itself secretes hormones that regulate other hormones as well as other hormones that are influential in growth and metabolism.

The pituitary glands secrete reproductively important hormones as well.

### Female Hormones:

**E2 (Estradiol, predominant Estrogen hormone)-**

Ovary-causes development of sex organs and secondary sex characteristics in the female. Also causes female to exhibit heat (estrus)

**FSH & LH (follicle stimulating hormone & luteinizing hormone)-**Pituitary (attach to the brain)-stimulates development of the follicle (fluid filled gland on ovary)  
**GnRH (gonadotrophin releasing hormone)**

Hypothalamus (in the brain)-triggers release of FSH & LH

**P4 (Progesterone)-**Corpus Luteum (follicle that has matured after egg was ovulated) & placenta-maintains pregnancy

**PGF2-alpha (Prostaglandin F-2 Alpha)-**Uterus-causes regression of the CL, uterine contractions during birth and allows female to come into heat again.

### Male Hormones:

**FSH (follicle stimulating hormone)-**Pituitary-stimulates production and maturation of sperm.

**GnRH (gonadotrophin releasing hormone)-**

Hypothalamus-triggers the release of FSH & LH

**LH (luteinizing hormone)-**Pituitary-causes secretion of male sex hormone, Testosterone

**Testosterone-**Testis-causes development of sex organs and secondary sex characteristics

**Conducting the activity (DO)**

As the instructor explains each hormone, where it is produced in the body and the function of the hormone have the youth complete the blank table. Have the youth use a different colored marker for each hormone (if possible). The result will be a color-coded table of hormones that they built themselves. Have youth volunteers recap each of the primary hormones are for both males and females.

**What did we learn? (REFLECT)**

What would be the result if an animal's body was not producing some of these hormones?  
What may be some of the factors causing low hormonal levels?

**Why is that important? (APPLY)**

Hormones lead to cascading events in the body, and influence to a great extent reproduction. What would be the result of a break in the hormonal chain for a person's body or in livestock reproduction?

**Bonus Activity**

Encourage the youth to on their own research the Biochemical Classification of each of these hormones. Each hormone will either be a peptide, glycoprotein, steroid, or prostaglandin. Have them add that to their hormone table and offer a prize to those who complete it by the next meeting

E2 = steroid

FSH = glycoprotein

LH = glycoprotein

GnRH = peptide

P4 = steroid

PGF2-alpha = prostaglandin

Testosterone = steroid

## Resources

Ohio State University Extension. (2000). *Sheep Resource Handbook for Market and Breeding Projects*. (page 123).

Ohio State University Extension. (2008). *Reproduction*. *Goat Resource Handbook* (page 35-36).

Senger, P.L. (2003). *Pathways to Pregnancy and Parturition*, Second revised edition. Chapter 5

Table 1: Hormones

Female Hormones

Hormone	Site of production	Function

Male Hormones

Hormone	Site of production	Function



# Introduction to Reproduction

Meranda Small, Extension Educator

## Goal (learning objective)

Youth will learn about beginning concepts of reproduction and puberty in livestock.

## Supplies

- Poster displaying a flow chart to summarize the age of puberty onset along with influencing factors (see diagram below), created by you as an example
- Poster paper (for your demonstration poster and enough for team posters)
- Colored markers

## Pre-lesson preparation

- Be prepared to discuss general reproduction. Some information is provided in this lesson and does not vary from species to species
- Research puberty for each species along with physical factors that influence onset of puberty as well as factors unique to species. For example:
  - Beef heifers with a higher fatness will go into puberty earlier than low weight heifers, likely due to metabolic signals effecting hormone production
  - Gilts in a larger group or fenced in a pen next to a male will go into puberty sooner than gilts in small groups or with no male exposure. This is the result of the presence of pheromones and the animals detecting them, initiating a hormonal response
  - The month/season a lamb is born in influences when it will reach puberty, this is in relation to sheep being short day breeders
  - Breed and genetics influence provide a couple examples within a species

See Supplement attached at end of lesson

## Lesson directions and outline

Reproduction is a sequence of events resulting in new life and beginning with development of the reproductive system in the embryo, or unborn animal. After an animal is born, it must grow and achieve puberty, a stage of maturity, by developing the ability to produce fertile gametes, or reproductive cells. This ability must be accompanied by reproductive behavior and copulation or mating. After copulation, the sperm and egg meet, fertilization occurs and development of the embryo follows. The embryo attaches to the inside of the uterus by the placenta, which is where the embryo develops and grows. The fully developed embryo will then be born and the female will begin to lactate or produce milk as nourishment for the newborn. After a time of recovery, the process will happen all over again.

But wait a minute... puberty must take place before any animal is able to reproduce.

**Conducting the activity (DO)**

1. Do a discussion with youth participants. Ask: What is reproduction? What is taking place?
2. Share with the group the prepared poster.
3. Discuss common terms (keep your audience in mind). Discuss ages at which each livestock species reaches puberty (male and female) and influencing factors.
4. After the discussion, break individuals up into groups by species. Have the teams create a poster for their species based on your example and the discussion.
5. Ask teams to share their poster with the group.

**What did we learn? (REFLECT)**

- Ask: What is reproduction?
- Ask: What does reaching puberty allow for?
- Ask: Can we influence puberty in our 4-H animal? How?

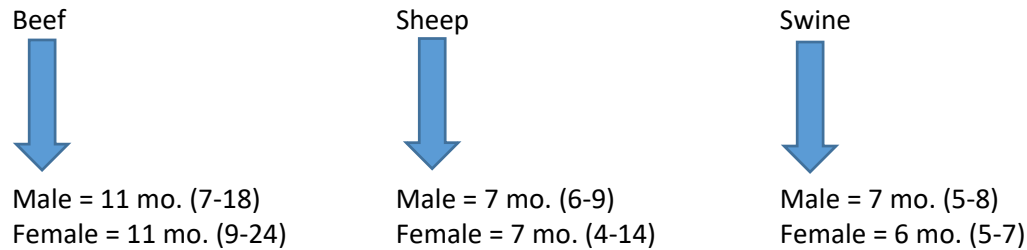
**Why is that important? (APPLY)**

- Ask: Why is successful reproduction important?
- Ask: How is reproduction affected by the onset of puberty in an animal?
- Ask: How is the industry impacted by the ability to influence puberty?

**Resources**

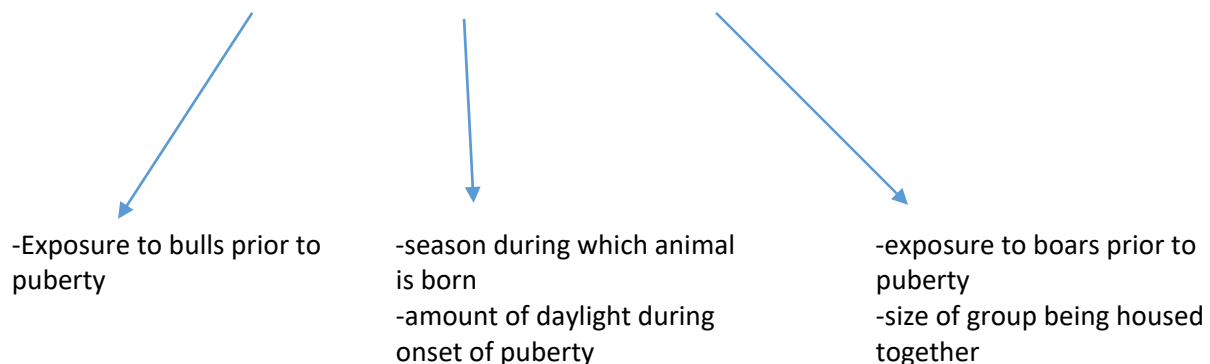
- Ohio State University Extension. (2011). Reproduction and Genetics. *Beef resource handbook* (pages 6-1 through 6-6).
- Ohio State University Extension. (2011). Reproduction. *Goat resource handbook* (pages 35-41).
- Ohio State University Extension. (2011). Reproduction and Genetics. *Sheep resource handbook for market and breeding projects* (pages 119-123).
- Ohio State University Extension. (2000). Selection of Breeding Stock. *Swine resource handbook for market and breeding projects* (pages 15-4 through 15-16).
- Senger, P.L., (2003). *Pathways to Pregnancy and Parturition*. Second revised edition. Chapter 1 (page 1) and Chapter 6 (pages 132-141).

## REPRODUCTION: INTRODUCTION TO REPRODUCTION – SUPPLEMENT 1



- Breed is a general factor that influences onset of puberty in all species for both male and female
- General factors in females in all species that influence onset of puberty include fatness and environmental/social cues
- Hormonal shift is a general factor in males in all species that influences onset of puberty

(Discuss the specifics for the species you are teaching about and any other specific breed factors within that species).



**Goats** - Doelings that are healthy and well managed nutritionally can be bred at 7 to 10 months of age. Bucklings can reach puberty as early as 4 months but 6 to 8 months is typical. As with the other species, the season the animal is born has an effect on puberty onset. Exposure to bucks prior to puberty can affect the onset of puberty.

- Breed is a general factor that influences onset of puberty in all species for both male and female
- General factors in females in all species that influence onset of puberty include fatness and environmental/social cues

Senger, P.L., (2003). Pathways to Pregnancy and Parturition. Second revised edition. Chapter 1 (page 1) and Chapter 6 (pages 132-141).

## Reproduction & Puberty – Chapter 6, pages 132-141

Table 6.1 Average Ages (Range) of Puberty in the Male and Female of Various Species

<u>Species</u>	<u>Male</u>	<u>Female</u>
Cattle	11 mo (7-18)	11 mo (9-24)
Horse	14 mo (10-24)	18 mo (12-19)
Sheep	7 mo (6-9)	7 mo (4-14)
Swine	7 mo (5-8)	6 mo (5-7)

At least two general factors impact the onset of puberty in the female: development of a **threshold body size** (*body maturation and amount of body fat*) and/or composition and exposure to certain **environmental or social cues**. It is thought that the female must develop a certain degree of “**fatness**” before reproductive cycles can be initiated. Several external factors influence timing of puberty that vary among species including: season during which the animal is born (sheep), the amount of daylight during onset of puberty (sheep), the presence or absence of the opposite sex during the **pre-pubertal** period (swine & cattle) and the size of groups (within the same sex) in which the animals are housed (swine).

The breed of the animal has an important influence on the age at which puberty is attained in both the male and female.

Table 6.2 Influence of Breed on Age at Puberty in Domestic Animals

<u>Species</u>	<u>Average Age at Puberty (Months)</u>	
<i>Cattle</i>	<i>Female</i>	<i>Male</i>
Holstein	8	9
Brown Swiss	12	9
Angus	12	10
Hereford	13	11
Brahman	19	17
<i>Sheep</i>		
Rambouillet	9	---
Finnish Landrace	8	---
<i>Swine</i>		
Meishan	3	3
Large White	6	6
Yorkshire	7	7

In the male, the onset of puberty is brought about because of decreased **hypothalamic sensitivity** to negative feedback by **testosterone/estrogen**. *Essentially, in the male elevated levels of hormones are no longer being suppressed allowing him to go into puberty.* This is somewhat the same in the female.

Nutritional intake in a newborn is directed almost exclusively towards body maintenance. Nonessential processes such as reproduction are of low priority. As the animal begins to grow, nutritional needs increase, the animal grows first structurally to a point before fat begins depositing. At this point nutritional needs shift, allowing for more energy to go towards non-vital functions such as reproduction and the onset of puberty. It needs to be emphasized however that “**fatness**” alone does not promote the onset of puberty, both body maturation and amount of body fat are important in regulating the age of puberty onset. “**Fatness**” for puberty in the male is not well understood, though it is known that restriction of energy intake to 70% of recommended amounts delays the onset of puberty in the male.

Month of birth will influence the age of puberty, particularly in **seasonal breeders** such as sheep which begin their cycles in response to short day lengths. Spring-born (February-March) lambs receiving adequate nutrition attain puberty during the following fall (September-October). Age of puberty is about 5-6 months after birth. Fall born lambs do not reach puberty until about 10-12 months after birth. Fall born lambs require twice as much time to reach puberty than spring born. This is because of **seasonal cues** that delay cycling. This then synchronizes **ovulation** in ewes, young and old, which maximizes the chance they'll all get pregnant in the fall and lamb in the spring when nutrients are more readily available and weather conditions are favorable. Again, "fatness" is necessary before this **photoperiod cue** can have effect. In heifers there is evidence that age at puberty is influenced by the season of birth. Heifers born in the fall tend to reach puberty earlier than those born in spring. Exposure in the second six months of life to long days and warmer temps hastens the onset of puberty. Exposure to short days during the first six months of life (fall born) followed by increasing day lengths in the second six months (spring and summer) has been associated with earliest age of puberty in heifers. Spring born ram lambs begin reproductive development at about 10 weeks of age during midsummer while spring born ewe lambs do not reach puberty until 25-35 weeks after birth. Season of birth does not affect age of puberty in bull calves.

Social cues significantly impact the onset of puberty in many species. This is controlled by **olfactory** (*sense of smell*) recognition of **pheromones** (*bodily chemical*). Enhancement of the onset of puberty by the presence of a male has been demonstrated in the ewe, sow and cow. Females that reaching puberty in the presence of a male have greater opportunity to be bred. Certain social cues will inhibit the onset of puberty as well. Gilts (young female pigs) housed in small group have delayed puberty when compared to gilts housed in larger groups. Gilts housed in small groups but exposed to a boar (male pig) will enter puberty at an earlier age than either the large group or small group not exposed to a boar. The presence of the boar, either direct contact or just visual contact will accelerate the onset of puberty in the gilts. This observation is beneficial in the management of swine as age of puberty can then be reduced and breeding can begin earlier. Heifers with high or moderate growth rate and exposure to a bull reach puberty faster than heifers of the same growth rate not exposed to a bull.

### **Word Bank**

uterus – part of the female reproductive tract that is responsible sperm transport, formation of the placenta and housing the fetus throughout gestation

placenta – organ that enable nutritional exchange between mother and fetus

environmental/social/seasonal cues – signals or stimuli that influence reproductive processes

fatness – level of body condition

pre-pubertal – stage of development prior to reaching puberty

testosterone/estrogen – hormones with reproductive influence

seasonal breeders – animals whose reproduction is influenced by time of year; animals that breed only during certain times of year

ovulation – release of eggs to be available for fertilization

photoperiod cue – a reaction in an animal to the period of time during the day when there is daylight

# Parts of Reproductive Systems

Meranda Small, Extension Educator

## Goal (learning objective)

Youth will learn what the major female and male reproductive structures are and functions in beef, sheep, swine and goat.

## Supplies

- Copies of Handout 1 “Beef Reproductive Systems” (make enough copies for group)
- Copies of Handout 2 “Sheep Reproductive Systems” (make enough copies for group)
- Copies of Handout 3 “Swine Reproductive Systems” (make enough copies for group)
- Copies of Handout 4 “Goat Reproductive Systems” (make enough copies for group)
- Paper (enough for group)
- Pens (enough for group)

## Pre-lesson preparation

- Make photocopies of Handouts 1, 2, 3 and 4 - assemble into a packet for each member
- Read/Review lesson
- Read/review handouts
- Be familiar with reproductive systems terminology

## Lesson directions and outline

Share the following information with the youth:

This is basic anatomy identification with just brief explanation of the functions and their importance in reproduction. Why is reproduction important? Reproduction impacts livestock production and for 4-H members, that means market project selection. Reproduction also impacts food, milk and fiber production.

Female reproductive parts overview:

- The female reproductive parts (major structures) include: ovaries, oviducts, uterus, cervix, vagina, and external parts.
- Eggs are produced by the ovaries. After an egg is fertilized it will pass through the oviduct to the uterus.
- The uterus is the place where the fetus develops. There are several types of uterus and complexity varies by species. For example, swine have a highly developed bicornuate uterus because they are litter bearing while humans have a simplex uterus.
- Certain livestock species have unique cervical shape to match the males’ reproductive parts, such as the sow has a cervix with rings that interlock to fit the boar’s corkscrew shaped penis.

Male reproductive parts overview:

- The male reproductive parts (major structures) include: spermatic cord, testes, epididymis, accessory sex glands, and the penis.
- The spermatic cord plays a role in temperature regulation (cremaster muscle)
- Temperature affects sperm production and health.
- Again, certain livestock species have unique penis shapes to interlock with the female’s cervix.

**Conducting the activity (DO)**

1. Ask for a volunteer to distribute a packet of Hand-outs 1,2,3, and 4 to each member.
2. Ask for a volunteer to distribute pens and paper to each member.
3. Have members divide into small groups (ideally one member from each species)
4. Have members discuss the reproductive systems of each species, notate any similarities and differences.
5. Have members as a group reflect on the following questions:
  - a. Why is it important to understand reproductive systems?
  - b. How does this information help you as a producer?
  - c. How is project animal selection impacted by reproduction?
6. After the groups have worked through the activities do a group discussion. Ask groups to share their findings and answers.

**What did we learn? (REFLECT)**

- Ask: What are the major structures of the female reproductive tract?
- Ask: What is fertilization?
- Ask: Is there just one type of uterus?
- Ask: What are the major structures of the male reproductive tract?
- Ask: Why is temperature regulation important for males?

**Why is that important? (APPLY)**

- Ask: Why is reproduction important and how does it affect you?
- Ask: What would happen without reproduction?

**Resources**

- Ohio State University Extension. (2011). Reproduction and Genetics. *Beef resource handbook* (pages 6-2 through 6-3).
- Ohio State University Extension. (2008). Reproduction. *Goat resource handbook* (pages 35-39).
- Ohio State University Extension. (2011). Reproduction and Genetics. *Sheep resource handbook for market and breeding projects* (pages 119-123).
- Ohio State University Extension. (2000). Selection of Breeding Stock. *Swine resource handbook for market and breeding projects* (pages 15-1 through 15-16 and 18-3).
- Senger, P.L., (2003). Pathways to Pregnancy and Parturition. Second revised edition. Chapter 1 (page 1) and Chapter 6 (pages 132-141).



## REPRODUCTION: PARTS OF REPRODUCTIVE SYSTEMS – HANDOUT 1

### BEEF REPRODUCTIVE SYSTEMS

#### REPRODUCTIVE TRACT OF THE BULL

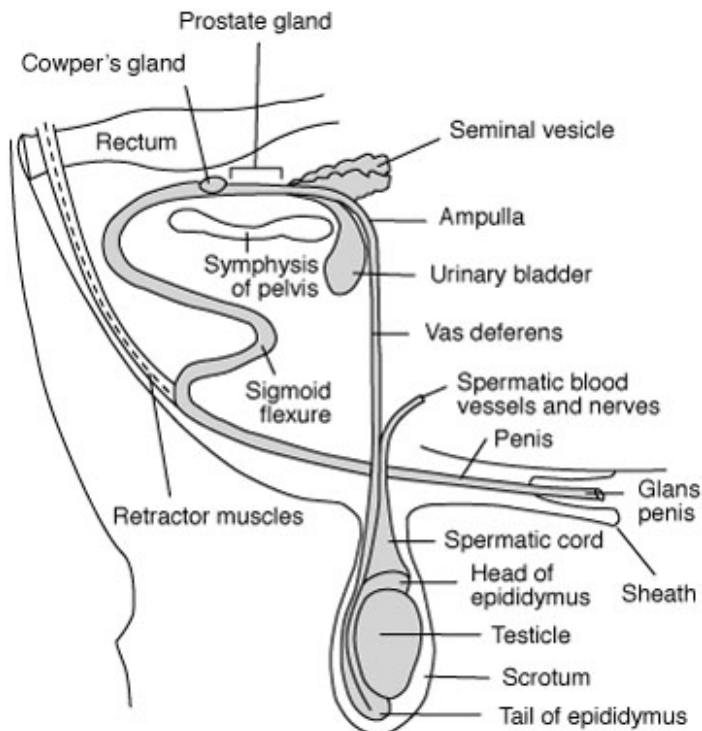


Image from: <http://extension.missouri.edu/p/G2016>

#### REPRODUCTIVE TRACT OF THE COW

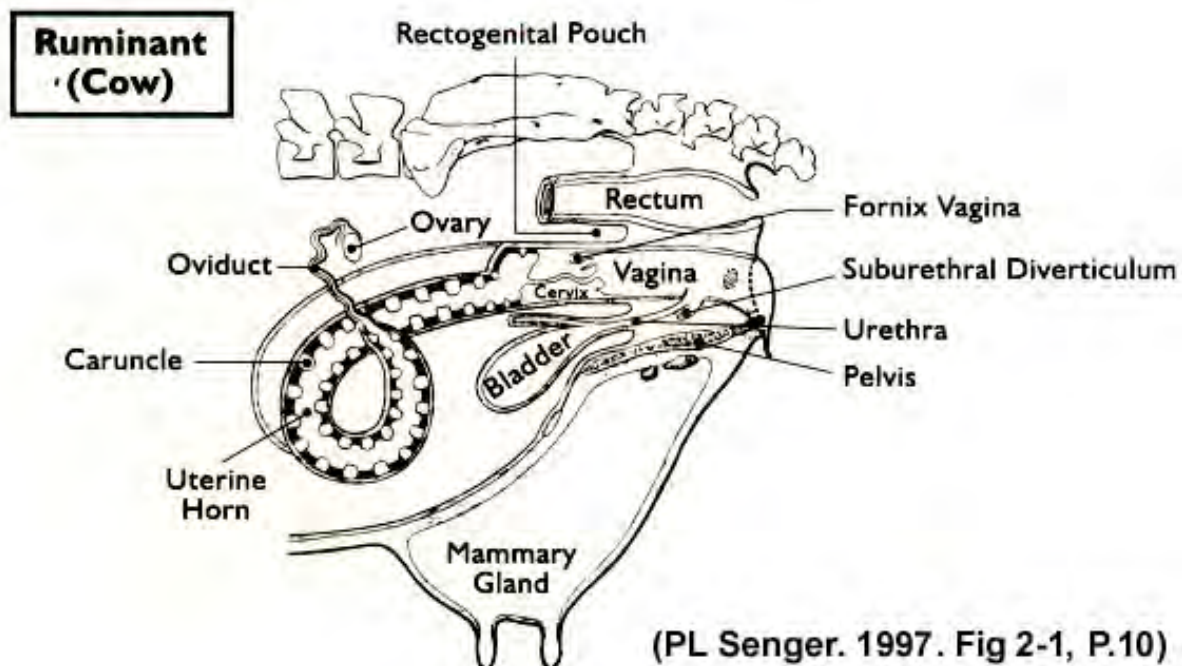
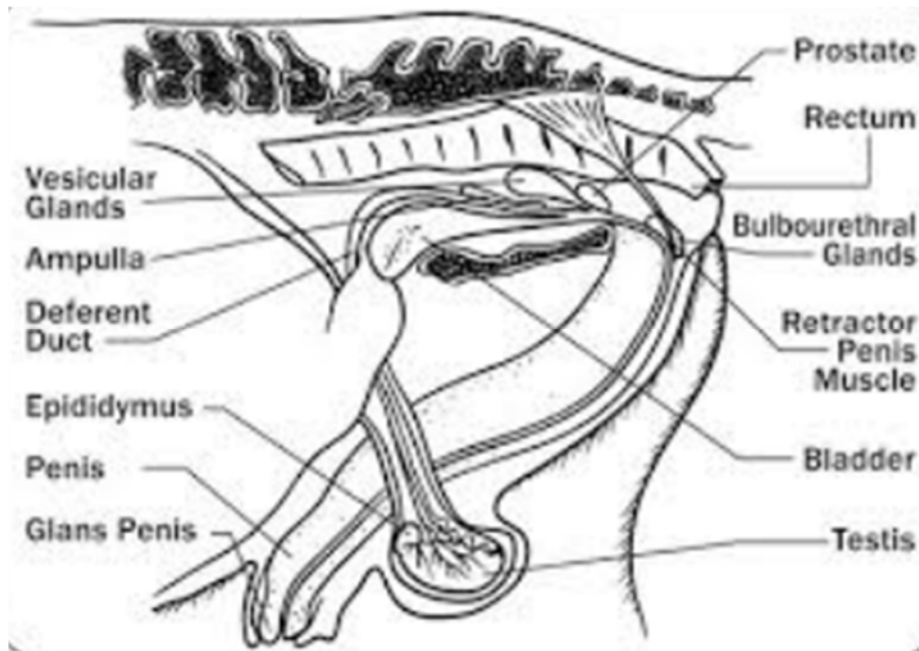


Image from: <http://www.ag.auburn.edu/~bartoff/anatbov1.htm>

## REPRODUCTION: PARTS OF REPRODUCTIVE SYSTEMS – HANDOUT 2

### SHEEP REPRODUCTIVE SYSTEMS

#### REPRODUCTIVE TRACT OF THE RAM



#### REPRODUCTIVE TRACT OF THE EWE

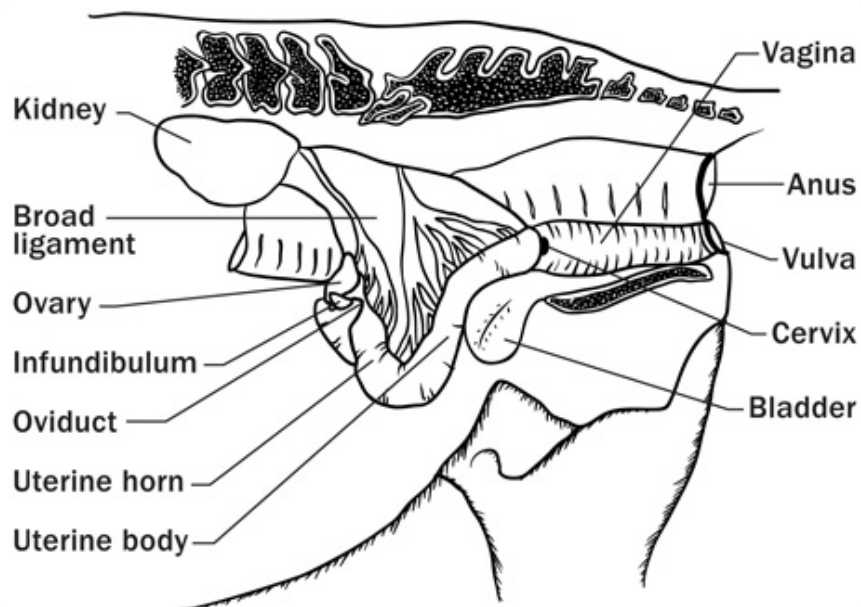
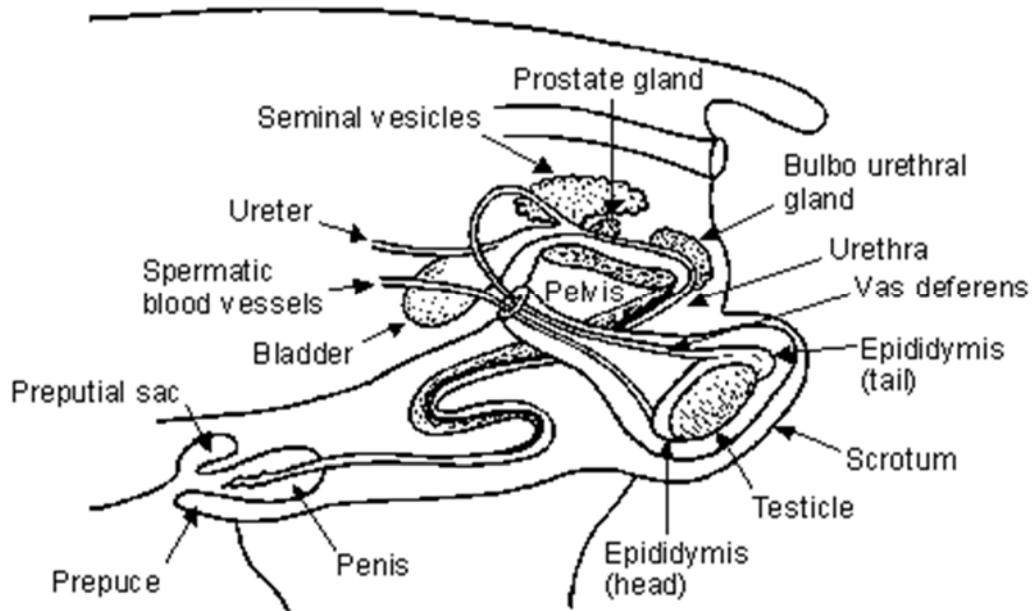


Image from: <http://brookekruse416animalmanagement.weebly.com/sheep-and-goats.html>

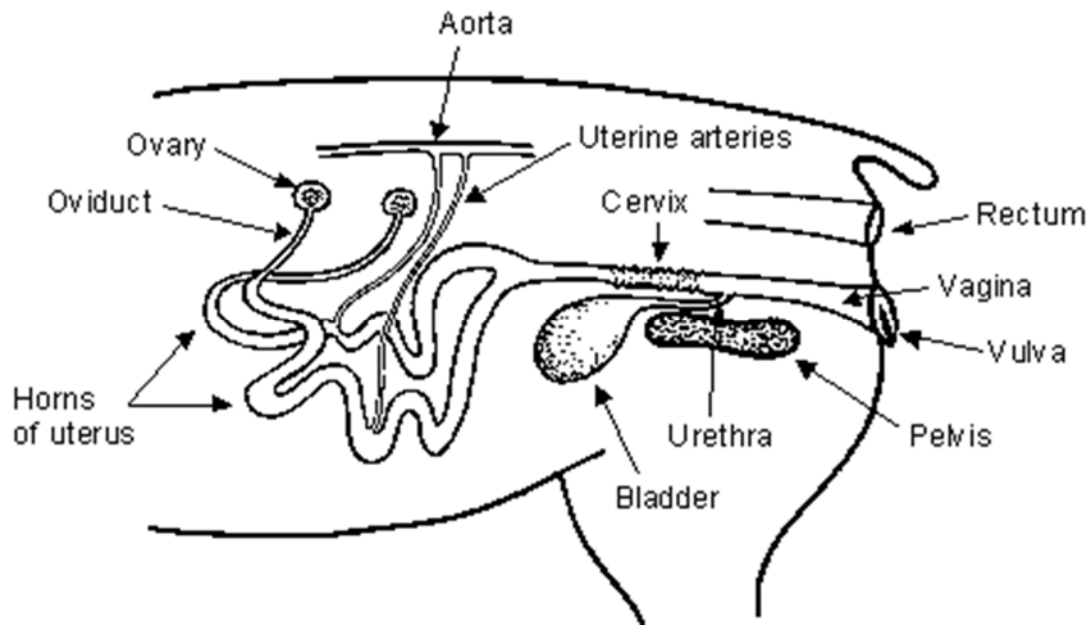
## REPRODUCTION: PARTS OF REPRODUCTIVE SYSTEMS – HANDOUT 3

### SWINE REPRODUCTIVE SYSTEMS

#### REPRODUCTIVE TRACT OF THE BOAR



#### REPRODUCTIVE TRACT OF THE SOW

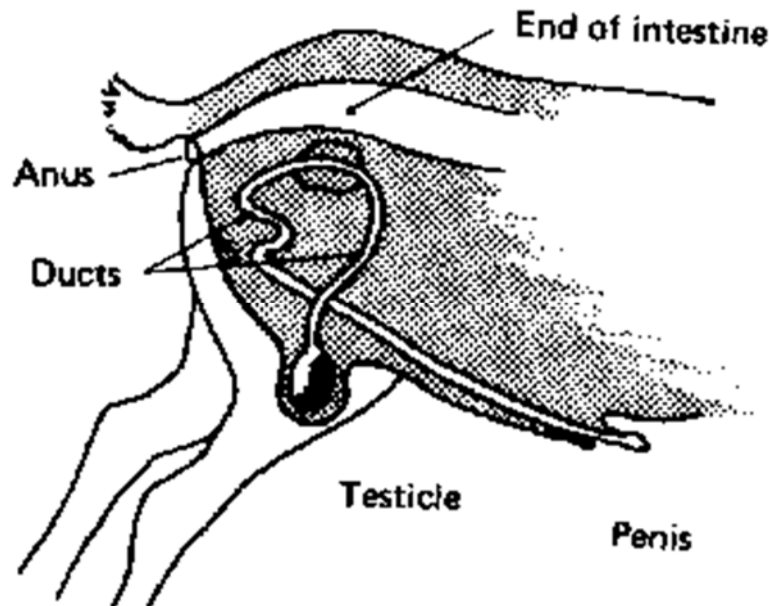


Images from: <http://www.thepigsite.com/pighealth/article/8/reproductive-system/>

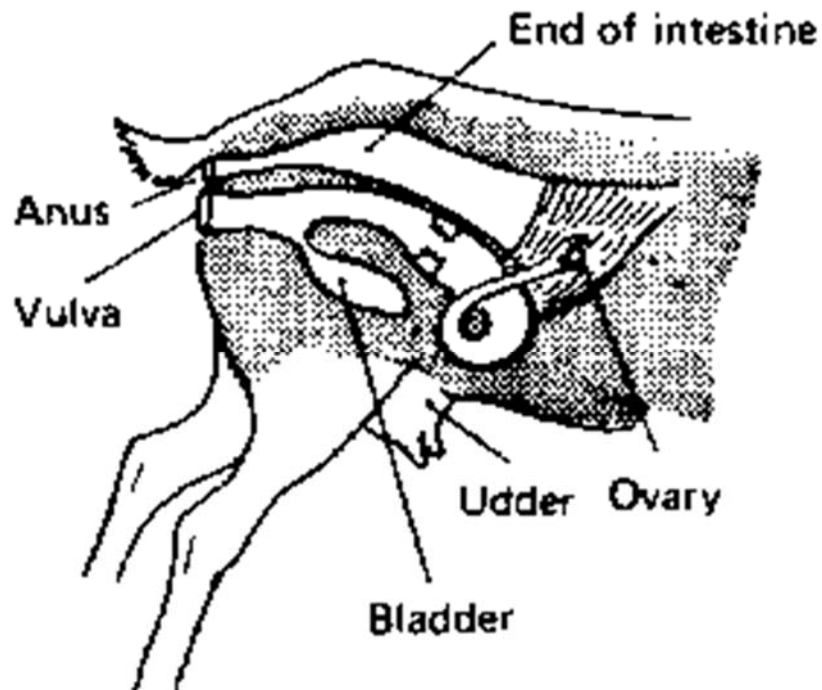
REPRODUCTION: PARTS OF REPRODUCTIVE SYSTEMS – HANDOUT 4

GOAT REPRODUCTIVE SYSTEMS

REPRODUCTIVE TRACT OF THE BUCK



REPRODUCTIVE TRACT OF THE DOE



Images from: [http://www.appropedia.org/Original:Better\\_Farming\\_Series\\_12\\_Sheep\\_and\\_Goat\\_Breeding\\_10](http://www.appropedia.org/Original:Better_Farming_Series_12_Sheep_and_Goat_Breeding_10)

# When Will My Livestock Project Animal Be Born?

Meranda Small, Extension Educator and Steve Harrison, Extension Educator

## Goal (learning objective)

Youth will gain a basic understanding of breeding management decisions such as selection of breeding stock, breeding methods to implement, breeding calendars, and care before, during, and after pregnancy for beef, sheep, goats and swine.

## Supplies

- Photocopies of the following handouts (enough for group):
  - Handout 1 “Beef Calendar”
  - Handout 2 “Sheep Calendar”
  - Handout 3 “Goat Calendar”
  - Handout 4 “Swine Calendar”
  - Handout 5 “Calendar”
- Pens or pencils (enough for group)

## Pre-lesson preparation

- Make photocopies of Handouts 1,2,3, 4 and 5 – enough for group
- Read/review lesson
- Read/review terminology and concepts for each species

## Lesson directions and outline

Share the following information with the youth:

Livestock management decisions are made based on each individual producers’ goals, requiring a producer to ask themselves questions such as:

- Will the offspring be used for breeding or go into meat production market?
- What method of breeding will be used, AI or natural?
- When should females be bred by for birth to occur during a certain time of year?
- How long are the animals in gestation?

These decisions influence everything from what sire is utilized to when breeding needs to occur. For example, to accomplish late winter/early spring calving, a producer will need to breed in May

### Gestation of Livestock

- Cows are pregnant for 283 days or just over 9 months
- Sheep are pregnant for 147 days or just shy of 5 months
- Goats are pregnant for 150 days or 5 months
- Pigs are pregnant for 114 days or just shy of 4 months.

Another important management step a producer needs to address is the care to be given to a breeding animal prior to pregnancy, during and after birth.

- Prior to pregnancy animals should be fed properly to support the amount of energy their body is using to grow a calf, lamb, kid or a litter of piglets.
- Pregnant animals should receive proper vaccinations to keep them healthy as well as help provide initial immunity to their offspring.
- During birthing, livestock should be kept in clean areas, such as not yet used pastures or barns. It may be necessary for a producer to be continually checking their livestock in case birthing assistance is needed.
- After birth, animals will require additional nutrition and need to remain in a clean area while the newborn's immunity develops. It may also be necessary for the producer to ensure that newborns are successfully nursing from their mothers.

### Conducting the activity (DO)

1. Ask for a volunteer to distribute Handout 5 to the group.
2. Have youth organize themselves into four species groups (if needed): beef, sheep, goats and swine.
3. Have youth fill out Handout 5 (the yearly calendar) for their species group. As a group they need to discuss/explore/record what should be done month by month. They should record what decisions are being made and why, and what action(s) are needed.
4. Provide time for the groups to work through the activity. Check for completion, distribute Handouts 1, 2, 3, and 4 to the groups.
5. Have groups review their calendar versus the appropriate Handout (1=Beef, 2=Sheep, 3=Goat, 4=Swine).
6. Have groups share their calendars:
  - a. Ask: Are there similarities between your calendar versus the species calendar?
  - b. Ask: What differences are there between the calendars?
7. Have a discussion as a larger group:
  - a. Ask: Are there similarities in the calendars amongst all species?
  - b. Ask: Any surprises?

### What did we learn? (REFLECT)

- Ask: Is there much planning that goes into breeding management?
- Ask: What are some pre-breeding decisions to consider?
- Ask: What type of care should be provided to animals after birth?

**Why is that important? (APPLY)**

- Ask: What happens to a production system if no planning occurs?
- Ask: How do these decisions impact a production system?
- Ask: How can missed steps through the year impact your 4-H project?

**Resources**

Calendarlabs.com. (n.d.). 2018 Monthly Calendar Template. Retrieved from <https://www.calendarlabs.com/2018-calendar-templates>

Ohio State University Extension. (2011). Management Practices. *Beef resource handbook* (pages 3-3 through 3-6 and 2-13).

Ohio State University Extension. (2008). Reproduction. *Goat resource handbook* (pages 39-41, 67-69).

Ohio State University Extension. (2011). Management Practices. *Sheep resource handbook for market and breeding projects* (pages 32-35).

Ohio State University Extension. (2000). Breeding Management. *Swine resource handbook for market and breeding projects* (pages 18-1 through 20-4 and pages 15-4 through 15-6).



## REPRODUCTION: WHEN WILL MY LIVESTOCK PROJECT ANIMAL BE BORN? – HANDOUT 1

### BEEF CALENDAR

#### January:

Be paying attention and evaluating nutritional status and body condition of herd, being prepared to separate out animals not meeting a healthy standard. Begin feeding in the evening about 2 weeks prior to first expected calf birth to induce day time calving – who wants to check for labor at 2am?

#### February:

Calving will begin so be ready to assist. Increase available feed as cows will have higher nutrient requirements for lactation. Administer vaccination protocol for your herd to calves as they come.

#### March:

Provide nutritional supplements. Vaccinate cow herd. Cull any cows that did not calve – why would this have effect on breeding management and the herd? (Answer: cows that didn't produce a calf are now just consuming feed without a result and may not rebreed so are now of less productivity and value).

**\*\*Branding season begins typically at the end of March and will go into the first part of May\*\***

**\*\*Branding includes castration and dehorning plus additional vaccinations\*\***

#### April:

Cows go out to pasture, unless implementing AI. Check bulls for breeding soundness and/or purchase semen.

#### May:

Bulls go out. Be observing cows for heat if using AI.

#### June:

Yearling heifers should be in heat and bred about 45 days prior to mature cows.

#### July:

Breeding season ends, separate bulls from herd. Implant calves being sold for meat market.

#### August:

Control pests and bacterial afflictions.

#### September:

Vaccinate breeding herd. Sell market calves. Pre-check cows and sell open cows and poor performance cows.

#### October:

Finish selling market calves. Begin bringing herd in from pasture.

#### November:

Finishing bringing in herd and/or move to winter ground. Provide additional feed to sustain cows through pregnancy.

#### December:

Continue winter feeding.

## REPRODUCTION: WHEN WILL MY LIVESTOCK PROJECT ANIMAL BE BORN? – HANDOUT 2

### SHEEP CALENDAR

#### January:

Check ewes regularly for lambing or health problems. Disinfect lambing pens between ewes. Identify lambs before moving them to a mixing pen. Dock, castrate and give lambs appropriate shots. Start lambs on creep feed. Feed ewes according to the number of lambs they have. Ewes nursing twins and triplets have high nutritional needs.

#### February:

Provide plenty of clean, fresh water to sheep, especially nursing ewes. Provide salt and minerals. Make sure lambs have had all shots. Cull ewes that did not breed.

#### March:

Start weaning lambs and reduce ewe's feed. Select lambs to keep and those to market. Plan your deworming program for pastured sheep.

#### April:

Shear all sheep and trim their feet. Get pastures ready for sheep. Separate ewe and ram lambs. Market lambs not being kept as replacements as well as unsound and unproductive ewes. Turn in rams for fall lambing.

#### May:

Pasture ewes. Attend sales to market or purchase breeding stock and then isolate any new breeding stock purchased.

#### June:

Register the purebred replacement lambs. Check sheep for foot rot and treat immediately if observed. Exercise market lambs and show sheep, working with and training them for show.

#### July:

Cull out lambs for show. Check pasture quality and provide pasture shade for animals. Provide plenty of clean water for all sheep.

#### August:

Vaccinate ewes for abortion diseases two weeks before breeding with consultation from a veterinarian. Shear rams for breeding and purchase breeding harness crayons. Get supplies ready for fall lambing and start flushing ewes (providing high amount of quality nutrition). Turn rams in around August 10 for January lambs.

#### September:

Record breeding dates and change crayons in the chin ball marker on rams every 16 days.

#### October:

Continue to change crayons. Check ewes for foot rot problems. Sell rams that are not to be kept for breeding.

#### November:

Check pasture quality, may need to supplement. Shear and trim feet of replacements and brood ewes. Pregnancy check ewes.

#### December:

Give booster vaccines to ewes and starting increasing the energy in the feed. Shear ewe prior to lambing to help with cleanliness of environment for lambs. Check lambing supplies and clean lambing area.

## REPRODUCTION: WHEN WILL MY LIVESTOCK PROJECT ANIMAL BE BORN? – HANDOUT 3

### GOAT CALENDAR

#### January:

Check does regularly for kidding or health problems. Disinfect kidding pens between does. Identify kids before moving them to a mixing pen. Feed does according to the number of kids they have. Does nursing twins and triplets have high nutritional needs.

#### February:

Dock, castrate and give kids appropriate shots. Start kids on creep feed. Provide plenty of clean, fresh water to goats, especially nursing does. Provide salt and minerals.

#### March:

Cull does that did not breed. Start your deworming program for all goats.

#### April:

Start weaning goats and reduce doe's feed. Select kids to keep and those to market. Get pastures ready for sheep. Separate doelings and buck kids. Market kids not being kept as replacements as well as unsound and unproductive does and bucks.

#### May:

Pasture goats. Buy replacement breeding stock and then isolate any new breeding stock purchased. Continue feeding kids.

#### June:

Treat again for parasites. Continue feeding kids. Register the purebred replacement doelings. Start working with show goats and training them for show. Start to flush feed does.

#### July:

Continue to flush feed does. Check pasture quality. Provide plenty of clean water for all goats. Treat for parasites.

#### August:

Vaccinate does for abortion diseases before breeding with consultation from a veterinarian. Start breeding does. Turn bucks in around August 15 for January kids. Market all wethers and doelings that were fed for market.

#### September:

Record breeding dates. Cull non-productive bucks and does.

#### October:

Continue to record breeding dates. Treat for parasites again. Sell bucks that are not to be kept for breeding.

#### November:

Check pasture quality, may need to supplement. Trim feet on all goats that need trimming. Pregnancy check does if needed.

#### December:

Give booster vaccines to does and start increasing the energy in the feed. Check kidding supplies and clean kidding area.

## REPRODUCTION: WHEN WILL MY LIVESTOCK PROJECT ANIMAL BE BORN? – HANDOUT 4

### SWINE CALENDAR

#### January:

Evaluate nutritional status and body condition of herd, be prepared to separate out animals not meeting a healthy standard. Administer pre breeding vaccine.

#### February:

Check heat of sows and gilts. Gilts and sows reproductive cycle is 21 days. Be ready to breed females exhibiting heat. If you order semen for AI make sure you have semen available at the appropriate time. Breed 24 hours after standing heat and again 12-24 hours later. Don't mix females after breeding for at least 21 days.

#### March:

Provide a balanced gestation ration. This ration should contain 14% protein and appropriate levels of vitamins, minerals and energy. Continue to check heat to make sure all sows and gilts are bred.

#### April:

Administer the first dose of pre-farrow vaccine. Continue to observe females for correct body condition. Make sure all sows/gilts are at a body condition of 3 or 4.

#### May:

Administer the second dose of pre farrow vaccine. Make sure sows are not over fed the last 30 days before farrowing. Move sows into farrowing area on day 110 of gestation. Make sure farrowing area is washed and disinfected.

#### June:

Check sows for signs of farrowing. Be present for farrowing and assist if necessary. Inject baby pigs with iron and penicillin within 12 hours. Ear notch baby pigs for identification.

#### July:

Vaccinate baby pigs at 7-10 days of age. Revaccinate baby pigs at 3-5 weeks of age. Vaccinate sows with pre breeding vaccines.

#### August:

Wean baby pigs, make sure they have a balanced ration and appropriate environment. Make sure sows are not overcrowded and begin to observe for signs of heat on day three after weaning. Breed 24 hours after standing heat and again 12-24 hours later.

#### September:

Sell any sows that do not breed back on the second heat cycle. Begin to monitor sows body condition. After 21 days feed to increase body condition of sows that are below a body condition of three. Move baby pigs out of the nursery and transition them to a grower diet.

#### October:

Administer the first dose of pre-farrow vaccine. Continue to observe females for correct body condition. Make sure all sows/gilts are at a body condition of 3 or 4. Continue to check heat to make sure all sows and gilts are bred.

November:

Administer the second dose of pre farrow vaccine. Make sure sows are not over fed the last 30 days before farrowing. Transition grower pigs to a finish diet.

December:

Make sure farrowing area is washed and disinfected. Move sows into farrowing area on day 110 of gestation. Market finished pigs that are the appropriate weight and finish.

## REPRODUCTION: WHEN WILL MY LIVESTOCK PROJECT ANIMAL BE BORN? – HANDOUT 5

January 20XX						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

## Notes:

Jan 01: New Year's Day

February 20XX						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28			

Notes:

Feb 14: Valentine's Day



March 20XX						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

Notes:

April 20XX						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

Notes:

May 20XX						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

Notes:

June 20XX						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

[illegible]

July 20XX						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

Jul 04: Independence Day

Jul 04: Independence Day

August 20XX						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

[illegible]

September 20XX						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30						

[illegible]



October 20XX						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

[illegible]

November 20XX						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

Notes:

December 20XX						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

Dec 25: Christmas

Dec 25: Christmas

# Heinz 57 or Pure - Purebred vs. Crossbred

Meranda Small, Extension Educator

## Goal (learning objective)

Youth will:

- Learn the difference between a purebred and crossbred animal.
- Learn the reasons for each breeding method.
- Learn benefits of crossbreeding and the several different types of crossbreeding systems for each species.

## Supplies

- Copies of Handout 1 “Purebred vs Crossbred” (make enough copies for group)
- Blank sheets of paper (at least 2 sheets per youth)
- Several different colored pencils or pens for each youth
- Flip chart paper and markers

## Pre-lesson preparation

- Make photocopies of Handout 1 – enough for group
- Read/Review lesson
- Using the Ohio Beef Resource Handbook, page 6-15, figures 6.10 and figure 6.11 and page 6-16, figures 6.12 and 6.13. Refer to the Ohio Swine Resource Handbook, 17-3 for examples of swine crossbreeding systems. Most crossbreeding system examples refer to beef or swine, but crossbreeding is done in the sheep industry and goat industry. You may design systems based on those in the handbook to be ready to help youth draw their own examples of crossbreeding systems. Help youth understand they will need to learn important traits in the species they are working with to know the best system to use.

- You could also review: Crossbreeding Systems for Beef Cattle can be found at: [https://www.canr.msu.edu/resources/crossbreeding\\_systems\\_for\\_beef\\_cattle\\_e2701](https://www.canr.msu.edu/resources/crossbreeding_systems_for_beef_cattle_e2701)

## Lesson directions and outline

Share the following information with the youth:

Purebred breeding is done to maintain genetics or characteristics for specific breed purposes. For example, Angus cattle are used for carcass characteristics and hide color and those two characteristics want to be maintained. Crossbred breeding is done with the intent of combining several desirable characteristics from two different breeds. For example, an Angus bull bred to Hereford female, which are characteristically good mothers, would produce higher weaning weight calves. Offspring of these two will have several desirable characteristics appealing to the market, faster growing, heavier weights, etc. Purebred breeding is to maintain and improve genetic influences while crossbreeding can offer heterosis, longevity and profitability (refer to the Purebred vs. Crossbred supplement for more information).

## Conducting the activity (DO)

Ask the youth to share what they know about purebred livestock and crossbred livestock. Have them share the difference. Ask the youth to share if they project animal they are raising is a purebred or a crossbred.

1. Ask for a volunteer to distribute Handout 1. Work with the youth to review the terminology and definitions.
2. Divide the youth into groups or assign a different youth to complete one of the activities listed below. Have youth use flip chart paper and markers or paper and colored pencils.
  - Explain or draw a two-breed terminal cross and

list the advantages

- Explain or draw a three-breed terminal cross and list the advantages
- Explain heterosis or hybrid vigor. Have them share how it can be used to increase profit in a livestock operation
- Design a crossbreeding system with a particular purpose in mind: increased growth, improved carcass traits, mothering ability, milk production, litter number, etc.
- Draw out the breeding system for the animal project they are raising. For example, if they have a brockle faced, black steer the parents could be a black Angus bull bred to a Hereford cow or if they have a red pig with a white belt the parents could have been a Hampshire boar bred to a Duroc gilt.

University Extension. Retrieved from: [https://www.canr.msu.edu/resources/crossbreeding\\_systems\\_for\\_beef\\_cattle\\_e2701](https://www.canr.msu.edu/resources/crossbreeding_systems_for_beef_cattle_e2701).

### **What did we learn? (REFLECT)**

- Ask: What is the difference between a purebred and crossbred animal?
- Ask: What is the purpose for each breeding type?
- Ask: What are some of the crossbreeding systems?

### **Why is that important? (APPLY)**

- Ask: How does purebred breeding influence the industry? What does it provide?
- Ask: How is crossbreeding beneficial?

## **Resources**

Ohio State University Extension. (2011). Reproduction and Genetics. *Beef resource handbook* (pages 6-11 through 6-16).

Ohio State University Extension. (2008). Reproduction. *Goat resource handbook* (pages 44-48).

Ohio State University Extension. (2011). Reproduction and Genetics. *Sheep resource handbook for market and breeding projects* (pages 123-128).

Ohio State University Extension. (2000). Genetics. *Swine resource handbook for market and breeding projects* (pages 17-1 through 17-6, 15-2).

Ritchie, H. (1999). Crossbreeding Systems for Beef Cattle. *Extension Bulletin E-2701*. Michigan State

## REPRODUCTION: PUREBRED VS CROSSBRED – HANDOUT 1

### Terminology

*Pure breeding (straight breeding):* the mating of two animals of the same breed; several types.

*Crossbreeding:* is the mating of animals from two or more different breeds. It provides a commercial producer the chance to increase the production for each female in the herd. A well-planned crossbreeding program can increase overall performance of offspring as much as 20 percent above the average of the parents. This happens through heterosis or hybrid vigor.

*Heterosis (hybrid vigor):* the increase in performance associated with the crossbred animal when compared to the average of the purebred parents.

*Outbreeding:* the continuous use of unrelated animals. Allows one to get the maximum amount of heterozygosity in a flock or a herd.

*Inbreeding:* mating of a male and female that have one (or more) common ancestor(s). Examples include daughter/sire mating and dam/son mating. Inbreeding increases the number of dominant and recessive genes (homozygosity) and may result in lowered reproductive performance and decreased fleece weights (in sheep).

*Linebreeding:* similar to inbreeding which concentrates on continued mating of decedents of a certain animal to produce the desirable traits of those descendants.

*Heterozygosity:* is the way to introduce new genes into the purebred herd by using different male animals on the same females. In a way it is like heterosis only in a purebred situation.

*Longevity:* how long an animal stays in the herd. An animal that has the ability to produce offspring in the herd for many years.

*Profitability:* the ability to raise livestock that will bring a profit to the ranching or farming operation. Raising animals that will allow the producer to make money.

*New breed formation:* the development of a new breed from crossbreeding existing breeds

*Systemic crossbreeding:* involves crossing males and females of certain breeds or crosses to get a specific type of offspring. Examples: two-breed terminal crossing, three-breed rotational cross, roto-terminal cross, etc. Purpose of crossbreeding is to increase both individual and maternal heterosis.

*Terminal cross:* typically, animals from this type of mating are bred strictly for meat production and intended to go into the food chain not back into a herd for reproduction

## Crossbreeding Systems

Examples of the following crossbreeding systems can be found in the Ohio Beef Resource Handbook, page 6-15 & 6-16 and in the Ohio Swine Resource Handbook, page 17-3. These examples could be applied in potential sheep or goat crossbreeding programs.

*Two-breed terminal cross:* a system in which straightbred females are bred to a bull of another breed. The cross ends with the calves. The replacement females are kept with the straightbred females. Therefore, part of the herd must remain straightbred or replacements must be purchased. The producer benefits only from the individual heterosis in the calf (no maternal heterosis).

*Three-breed terminal cross:* a system in which a two-breed cross female, called the "F1", is bred to a male of a third breed. This three-way cross gives the maximum amount of heterosis in both the female (maternal heterosis) and offspring (individual heterosis). The producer either raises the F1 females or purchases them. Breeds used in the cross for the females should be based on maternal characteristics (fertility, birth ease, milking ability, etc.). The breed chosen for the terminal male should complement the female breeds by excelling in fertility level, growth rate, and carcass characteristics. All the offspring from this cross are marketed, no replacements are selected from this three-way cross typically.

*Crisscross/backcross:* a system in which two breeds are used. Female replacements are saved from the crossbred offspring to breed back to one of the parent breeds. From then on, the replacement females are bred to males of the opposite breed of their own sire. Two separate herds must be kept. The only purchases that must be made are males. Though you do not get the maximum heterosis from this cross, the big advantage is that one can raise all their own replacement females.

*Three-breed rotational cross:* a system that includes the use of three breeds of sires in a rotation with the females kept from these crosses. Three breeds are chosen, and each breed is used for two or three years in a row. The females are bred to the breed of males to which they are least related. In this system, 87% of the heterosis possible is obtained.

## Crossbreeding Benefits

Crossbreeding combines the desirable characteristics of two or more breeds because if selected properly, the strong points of one breed can complement the weak points of another breed. Also helps through heterosis (hybrid vigor), a phenomenon that causes crossbreeds to out-produce the average of their straightbred parents. Traits that are low in heritability are the ones that best respond to heterosis and include the reproductive phase through weaning traits. Generally, lower heritable traits, such as fertility, are enhanced through systematic crossbreeding. Highly heritable traits, such as yearling weight and carcass characteristics, are enhanced by individual selection. Much of the advantage in heterosis in traits of low heritability is obtained using the crossbred female. Crossbreeding provides commercial producers the chance to increase the total production of meat per animal in the breeding herd. In the swine industry the crossbred female is the basis for more than 95% of the commercial swine produced in the US. Crossbred females will normally produce more pigs at birth with greater livability and produce more milk, which equals heavier weaning weights. Crossbred offspring also grow faster to market weight as a result of heterosis.



# Common Livestock Breeds and Characteristics

Meranda Small, Extension Educator

## Goal (learning objective)

Youth will learn what several popular livestock breeds are for each species (beef, swine, and sheep) along with some characteristics of those breeds.

## Supplies

- Computer, projector, and screen to present PowerPoint Common Livestock Breeds and Characteristics
- Copies of notes of presentation (optional, enough for group)
- Breeds photos and descriptions from Ohio Learning Lab Kits

## Pre-lesson preparation

Identify the top breeds for each species utilized in US Agriculture Production and research what their distinguishing characteristics are, ex: for swine American Yorkshire is typically a good mother that produces large litters, white in color (susceptible to sunburn), have a big frame and erect ears while the Duroc typically needs less feed per pound of muscle than any other breed, fast growth, feed efficient, vary in color from light gold to dark red and have droopy ears.

## Lesson directions and outline

Ask the youth to share with the group the breed of animal of the species they are raising. Have them discuss the characteristics of the breed.

Explain each breed for each species has characteristics and attributes that make it popular in general and for specific purposes such as reproductive qualities versus meat qualities. For example, large framed cattle that make good mothers versus cattle that muscle well or some sheep breeds are used for wool production more than others leading to why there are differ-

ent breeds for the differing purposes. Understanding these should lead youth to understand why they may or may not select a certain breed for their project.

Ask the youth to share with the group the breed of animal of the species they are raising. Have them discuss the characteristics of the breed.

## Conducting the activity (DO)

1. Popular beef breeds include Angus, Charolais, Gelbvieh, Hereford, Limousin, Red Angus, Short-horn, Maine Anjou and Simmental.
2. Popular dairy cattle breeds include Holstein and Jersey.
3. Popular swine breeds include American Yorkshire, Berkshire, Chester White, Duroc, Hampshire, Poland China, Landrace and Spots.
4. Sheep are categorized as Ram Breed, Ewe Breed or Dual Purpose. Ram breeds are meant for meat, not being used typically for continued breeding purposes. They have good size, growth rate, carcass merit, and ease of lambing. Ewe breeds are highly prolific and have superior mothering abilities. Dual purpose breeds can be used as either ewe or ram depending on the operation. Sheep breeds can also be classified by their wool, Fine, Medium, and Medium to Long Wool breeds. Popular sheep breeds include Merino Wool Sheep, Rambouillet, Suffolk, Hampshire, Dorset, Columbia and South-down.
5. Popular goat breeds include Angora, Spanish Boer, Kiko, Nubian, LaMancha, Alpine, Saanen, and Nigerian Dwarf.
6. Working with the Common Livestock Breeds and Characteristics PowerPoint, ask youth the questions the slides and others to encourage discussion.
7. Following this activity ask youth to find a picture

of a breed not covered and bring with them to the next meeting to share with the group. Also ask them to provide a few of that breed's characteristics (these pictures can be found in the Ohio Learning Lab Kits).

8. Optional activity: Play "Place Your Animal". Print a picture of each animal covered in the presentation. Hand out the pictures until all have been dispersed to the youth group. Have on a table/desk three plastic tubs. One labeled "Meat", second "Reproduction", and the third "Dual/Other". As you go through the presentation, following the explanation of each breed ask who has this animal and then have them place their animal card in what they think is the appropriate bin for that breed based on its characteristics.

### What did we learn? (REFLECT)

- Ask: Is there one single superior breed for any of the species? (No, it comes down to what the production goals are)
- Ask: What are some important reproductive qualities? (Frame size, length of breeding season, number of offspring, milking ability)
- Ask: What are some important meat qualities? (Rate of gain and feed needed for gain, leanness, carcass yield, and marbling)
- Ask: For 4-H, do you want animals that are better for reproduction or for meat? (Depends on the type of project)

### Why is that important? (APPLY)

- Ask: Does selecting the right breed for a certain process affect the success for a producer? Would you select a wool sheep breed if your goal was to produce meat?
- Ask: Why does understanding each breed's qualities make you as a producer, more knowledgeable in producing a better product?
- Ask: Where else can you apply this same type of knowledge? (Example: If you have an ear ache do you go to a doctor that specializes in feet? If your car breaks down do you go to an auto mechanic or

an airplane mechanic?)

## Resources

- Ohio State University Extension. (2011). Selection. *Beef resource handbook* (pages 2-4 through 2-9).
- Ohio State University Extension. (2008). Choosing an Animal. *Goat resource handbook* (pages 21-30).
- Ohio State University Extension. (2011). Sheep Industry and Sheep Breeds. *Sheep resource handbook for market and breeding projects* (pages 107-116).
- Ohio State University Extension. (2000). Your Very First Step - Selection. *Swine resource handbook for market and breeding projects* (pages 3-1 through 3-8).
- Ohio State University Extension. (n.d.). Learning Lab Kits. Beef, Sheep, Swine, and Goat. Available from: <http://www.ohio4h.org/books-and-resources/learning-lab-kits> (NOTE: Check with your local county extension office on availability to check out).
- Small, M. (2014). *Common Livestock Breeds and Characteristics PowerPoint*. University of Idaho Extension.

# Evaluation

Cindy Kinder, Extension Educator

## Goal (learning objective)

Youth will learn about the basics of livestock evaluation and judging through animal parts, terms and judging criteria.

## Supplies

- Animal Parts poster and the part labels from the Ohio Learning Lab Kit (each species)
- Copies of the following (enough for group):
  - Judging Beef Cattle & Oral Reasons 101, PNW 669
  - Judging Sheep & Oral Reasons 101, PNW 679
  - Judging Meat Goat & Oral Reasons 101, PNW 678
  - Judging Swine & Oral Reasons 101, PNW 677

## Pre-lesson preparation

- Review the following:
  - Judging Beef Cattle & Oral Reasons 101, PNW 669
  - Judging Sheep & Oral Reasons 101, PNW 679
  - Judging Meat Goat & Oral Reasons 101, PNW 678
  - Judging Swine & Oral Reasons 101, PNW 677
- Check out Learning Lab Kits from county extension office

## Lesson directions and outline

Have youth discuss why they think learning animal body parts is important to learning about animal evaluation? How is knowing more about animal evaluation important to raising a livestock project?

List the reasons on flip chart paper.

Explain to youth that livestock evaluation and judging can be a fun and exciting activity. Learning the basics of animal judging starts with learning the parts and what the criteria is for animal selection.

## Conducting the activity (DO)

1. Review with youth the handouts, teaching the following sections: Animal Parts, Terms, Selecting your Animal.
2. Challenge youth by using the poster to see how many parts can be identified correctly. Variations of the challenge may include
  - a. A timed event “in 60 seconds or less”
  - b. Teams of youth with the fastest speed and or number correct
  - c. Pin the tail “part” on the poster where one youth is blindfolded and the other is not.

## What did we learn? (REFLECT)

- Ask: What are the main criteria for livestock judging?
- Ask: Name five parts and two terms associated with the animal?

## Why is that important? (APPLY)

- Ask: Why is it important to know the criteria of something? How does that knowledge impact you when you use that item?
- Ask: Why does understanding each breed's qualities make more knowledgeable to produce a better product?
- Ask: How does animal conformation impact animal performance? Or animal quality?

## Resources

- Kinder, C., Mavencamp, D. (2015). Judging Beef Cattle and Oral Reasons 101. University of Idaho Extension. PNW 669. <http://www.cals.uidaho.edu/edcomm/pdf/PNW/PNW669.pdf>
- Kinder, C., Mavencamp, D. (2015). Judging Meat Goats and Oral Reasons 101. University of Idaho Extension. PNW 678. <http://www.cals.uidaho.edu/edcomm/pdf/PNW/PNW678.pdf>
- Kinder, C., Mavencamp, D. (2015). Judging Sheep and Oral Reasons 101. University of Idaho Extension. PNW 679. <http://www.cals.uidaho.edu/edcomm/pdf/PNW/PNW679.pdf>
- Kinder, C., Mavencamp, D. (2015). Judging Swine and Oral Reasons 101. University of Idaho Extension. PNW 677. <http://www.cals.uidaho.edu/edcomm/pdf/PNW/PNW677.pdf>
- Ohio State University Extension. (n.d.). Learning Lab Kits. Beef, Sheep, Swine, and Goat. Available from: <http://www.ohio4h.org/books-and-resources/learning-lab-kits> (NOTE: Check with your local county extension office on availability to check out).
- Ohio State University Extension. (2011). Selection. *Beef resource handbook* (pages 2-1, 2-2, 2-10 and 2-11).
- Ohio State University Extension. (2008). Choosing an Animal. *Goat Resource Handbook* (page 21).
- Ohio State University Extension. (2011). Selection: The First Step. *Sheep resource handbook for market and breeding projects* (page 11-12).
- Ohio State University Extension. (2000). Your Very First Step - Selection. *Swine resource handbook for market and breeding projects* (pages 3-1 through 3-2).

# Frame Size and Market-Ready Weights

Cindy A. Kinder, Extension Educator

## Goal (learning objective)

Youth will learn the differences in frame sizes and market-ready weights for individual animals.

## Supplies

- Project animals with different frame sizes
- Handouts 1-6, Planning & Record Sheets and Frame Score Charts for each species, enough copies for the group
- Copy of the feeding period minimum requirements for project animals. Idaho 4-H minimum feed periods are 130 days for beef, 80 days for swine, 60 days for sheep and goats
- Pencils

## Pre-lesson preparation

- Review and make copies of all of the handouts

## Lesson directions and outline

### Background information

This would be helpful to share with youth prior to them selecting market animal projects for the year. Members should be familiar with animal industry standards, fair weight requirements and project feeding periods. Older youth could be asked to discuss experiences they have had with frame size and market ready weights while raising project animals.

Frame size is determined by age and hip height for beef, wither height for sheep and goats. For swine, body length and the size of the cannon bone. Refer to the frame score charts for each species. Frame size will determine an individual animal's market-ready weight.

### Introduction

Explain to the group that within each species (beef,

sheep, swine and goats) there are animals with small, medium, and large frames. Each breed of animal within a species has a typical frame size. However, there may be multiple frame sizes within a breed.

## Conducting the activity (DO)

1. Review the frame score chart for the species you are leading to help the youth determine frame size of their animal and potential market ready weight.
2. Have the youth circle the projected market weight of their project animal on the species frame score chart.
3. At time of purchase or at the beginning of the project, fill out the beginning planning & record sheet to estimate the market-ready weight of each project animal and its average daily gain.

### For Level 2 and 3 complete the remainder of the beginning planning and record sheet

4. Determine the resources you have by listing the types of feeds you are using.
5. Describe the method of feeding.
6. Complete the beginning planning & record sheet.

## What did we learn? (REFLECT)

- Ask: What did you learn about frame size?
- Ask: What did you learn about market-ready weights?
- Ask: If you have an animal with a small frame, can you expect a heavy-weight animal at fair? Why or why not?
- Ask: If you have an animal with a large frame that is lightweight at fair, what could have happened? What could you have done different?

**Why is that important? (APPLY)**

- Ask: Can the animal you are raising this year meet the individual estimated final weight?
- Ask: How can the frame score of your animal affect the market ready potential at fair time?
- Ask: How does setting goals for the market ready weight of your animal help you in other activities you participate in?

**Resources**

Kinder, C.A. (2013). Livestock Science Experiment. *Frame size and market ready weights*. Retrieved from <https://www.uidaho.edu/~media/UIdaho-Responsive/Files/Extension/county/Gooding/4-H/animal-science/Experiment-Topics-for-club-work.ashx>

Ohio State University Extension. (2011). Selection. *Beef resource handbook* (pages 2-11 through 2-24).

Ohio State University Extension. (2008). Meat Goats. *Goat resource handbook* (pages 115-119).

Ohio State University Extension. (2011). Selection: The First Step. *Sheep resource handbook for market and breeding projects* (pages 9-18).

Ohio State University Extension. (2000). Your Very First Step - Selection. *Swine resource handbook for market and breeding projects* (pages 3-7 through 3-15)



## SELECTION: FRAME SIZE AND MARKET-READY WEIGHTS - HANDOUT 1

### *Beef Beginning Planning & Record Sheet*

One of your market-project goals should be to have a market-ready animal. Knowing what your animal weighs now and its estimated end weight will help you achieve your market-ready goal.

#### General Project Information

Youth Name: \_\_\_\_\_ Weigh-in Date: \_\_\_\_\_

Animal Tag Number: \_\_\_\_\_ Weight: \_\_\_\_\_ Hip Height (inches): \_\_\_\_\_

Breed: \_\_\_\_\_ ESTIMATED FINAL WT:

Animal Tag Number: \_\_\_\_\_ Weight: \_\_\_\_\_ Hip Height (inches): \_\_\_\_\_

Breed: \_\_\_\_\_ ESTIMATED FINAL WT:

Animal Tag Number: \_\_\_\_\_ Weight: \_\_\_\_\_ Hip Height (inches): \_\_\_\_\_

Breed: \_\_\_\_\_ ESTIMATED FINAL WT:

Vaccinations (circle): wormer      8-way type      Other (list): \_\_\_\_\_

#### Estimate Average Daily Gain (ADG) for your steer(s)

Tag No.	Estimated Final Weight		Beginning Weight		Total required gain		# Days in feeding period		Required daily gain
		-		=		÷		=	
		-		=		÷		=	
		-		=		÷		=	

*Think about this...*

1. What does market ready mean? Is your estimated final weight an ideal market weight for the beef industry?
2. The national average for ADG is 2.5 lb/day. Is your required ADG achievable?



## Feeding Your Steer

Steers will consume about 3% of their body weight per day. A fattening ration is 2% in grain and 1% in hay. Make every effort to keep feed waste to a minimum. Grain waste can be 5 to 10% of the amount fed and hay waste 10 to 20%, depending on the facilities and your care in feeding.

List your concentrates (grain): \_\_\_\_\_

List your roughages: \_\_\_\_\_

List any other feeds: \_\_\_\_\_

Describe your feeding method, i.e., free choice, feed truck or by hand, number of times per day, fed in a bunk or feed pan, etc.

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How much do you feed in the beginning? Choose one project animal to fill this out for.

**Grain:** Steer wt x 2% = pounds of grain per day

Pounds of grain per day ÷ 2 feedings per day = pounds of grain per feeding

Steer wt \_\_\_\_\_ x 2 % = \_\_\_\_\_ lb grain per day/2 feedings = \_\_\_\_\_ lb per feeding

**Hay:** Steer wt x 1% = pounds of hay per day

Pounds of hay per day ÷ 2 feedings per day = pounds of hay per feeding

Current Weight									
Est. Grain/day (wt X 2%)									
Est. Hay/day (wt X 1%)									

Steer wt \_\_\_\_\_ x 1 % = \_\_\_\_\_ lb hay per day/2 feedings = \_\_\_\_\_ lb per feeding

*Ask yourself these questions*

1. How much does one scoop of grain weigh? Is one scoop of grain enough to feed per feeding?
2. How many scoops should you feed?
3. Calculate how much grain and hay per feeding you will feed by fair time.
4. Did you feed this amount in the beginning? More or less?

### **Weight & Feed Estimate Record**

Tracking animal weight can tell you where your animal is compared to your goal. Weigh and record your animals' weights. Estimate the amount of feed you should be feeding. The feed amounts are just minimum estimates. You should be feeding more due to the waste factor. If your animal is eating all the grain, increase it (slowly). It is better to push your calf, in the beginning, to get him market ready then run out of time in the feeding period.

*Think about this....*

1. Typical influences in ADG are feed, water, weather, and illness. Is the ADG more or less than predicted? What caused any problems?
2. After each weigh day, do you need to feed more grain or hay?
3. What happens if your animal does not have the ADG you predicted?
4. If your animal is not market ready by fair time, what happens?
5. Is carcass quality affected by your feeding?

## SELECTION: FRAME SIZE AND MARKET-READY WEIGHTS - HANDOUT 2

### *Beef Frame Score Chart*

Feeder cattle fall into three frame sizes: small, medium and large. Differences between breeds play a role in the frame size of a feeder calf. In general, British breeds have small to medium frames and Continental breeds have medium to large frames. Some breeds will have all three sizes. Frame size is determined by the length of the body, height at the hip, and length and size of the cannon bone.

Frame size is important in determining management and indicates how large the mature animal will be. In feedlots, sorting by frame size will help producers feed each size to its market weight. When selecting breeding heifers, animal selection is based on access and quality of feed resources.

Producers estimate the correct finish weight for an animal by determining its approximate frame score and proper finish (ideal slaughter size and weight) for that score. Frame scores are objective, numerical scores that reflect the growth pattern and potential mature size of an animal. Frame score values typically range from 2 (small) to 9 (large) and are calculated based on hip height and age.

In the chart below, find the animal's age in the left-hand column and its hip height in that row to determine its approximate frame score. Now look at the bottom row under the animal's frame score to determine its estimated finish weight. These are projections for average yearling cattle. Actual weights will vary due to muscling, body length, and condition.

<b>Age (months)</b>	<b>Frame Score 4 (medium)</b>	<b>Frame Score 5 (medium)</b>	<b>Frame Score 6 (large)</b>	<b>Frame Score 7/8 (large)</b>
10	45.3"	47.3"	49.3"	51.3"
11	46.2"	48.2"	50.2"	52.2"
12	47.0"	49.0"	51.0"	53.0"
13	47.8"	49.8"	51.8"	53.8"
14	48.5"	50.4"	52.4"	54.4"
15	49.1"	51.1"	53.0"	55.0"
16	49.6"	51.6"	53.6"	55.6"
Estimated Finish Weight	1050 to 1174 lbs	1175 to 1250 lbs	1251 to 1350 lbs	1351 to 1485 lbs

## SELECTION: FRAME SIZE AND MARKET-READY WEIGHTS - HANDOUT 3

### *Sheep and Goat Beginning Planning & Record Sheet*

One of your market-project goals should be to have a market-ready animal. Knowing what your animal weighs now and its estimated end weight will help you achieve your market-ready goal.

#### General Project Information

Youth Name: \_\_\_\_\_ Weigh-in Date: \_\_\_\_\_

Animal Tag Number: \_\_\_\_\_ Weight: \_\_\_\_\_ Shoulder/Wither Height (inches): \_\_\_\_\_

Breed: \_\_\_\_\_ ESTIMATED FINAL WT:

Animal Tag Number: \_\_\_\_\_ Weight: \_\_\_\_\_ Shoulder/Wither Height (inches): \_\_\_\_\_

Breed: \_\_\_\_\_ ESTIMATED FINAL WT:

Animal Tag Number: \_\_\_\_\_ Weight: \_\_\_\_\_ Shoulder/Wither Height (inches): \_\_\_\_\_

Breed: \_\_\_\_\_ ESTIMATED FINAL WT:

Vaccinations (circle): wormer      8-way type      Other (list): \_\_\_\_\_

#### Estimate Average Daily Gain (ADG) for your lamb/goat

Tag No.	Estimated Final Weight		Beginning Weight		Total required gain		# Days in feeding period		Required daily gain
		-		=		÷		=	
		-		=		÷		=	
		-		=		÷		=	

*Think about this.....*

1. What does market-ready mean? Is your estimated final weight an ideal market weight for the sheep/goat industry?
2. The national average for ADG is 0.5 lb/day. Is your required ADG achievable?
3. Typical influences on ADG are feed, water, weather, and illness. How will you manage them?

## Feeding Your Lamb/Goat

Lambs/goats consume about 3 to 3.5% of their body weight per day. Make every effort to keep feed waste to a minimum. Grain waste can be 5 to 10% of the amount fed and hay waste 10 to 20%, depending on the facilities and your care in feeding.

List your concentrates (grain): \_\_\_\_\_

List your roughages: \_\_\_\_\_

List any other feeds: \_\_\_\_\_

Describe your feeding method, i.e., free choice, hand fed, number of times per day, fed in a bunk or feed pan, on or off the ground, etc.

---

*Think about this.....*

1. What happens if your animal does not have the ADG you predicted?
2. If your animal is not market ready by fair time, what happens?

## How much Do You Feed?

A finishing ration is 2 to 2.5% grain and 1% hay. Start your lamb/goat on  $\frac{1}{4}$  to  $\frac{1}{2}$  pound of grain per day, slowly increasing to the finishing ration.

*Think about this.....*

5. How much does one scoop of grain weigh? Is one scoop of grain enough per feeding?
6. How many scoops should you feed?

## Energy and Protein

Energy is needed for increased growth rate. Many different grains are high in energy. Protein is an important nutrient in a lamb/goat finishing ration. Protein is needed to build bone and muscle. Young, fast growing lambs need rations that contain 16 to 18% protein (13 to 15% for goats) to allow them to grow and develop to their muscle potential.

## Minerals

Salt (sodium and chlorine) and calcium and phosphorus are important for lamb rations. Have loose salt (NOT a block) available free choice. Calcium (Ca) and phosphorus (P) should be fed in a ratio of 2.5 parts calcium to 1 part phosphorus.

Read your feed label and fill in the information below.

Name of feed: \_\_\_\_\_ Protein content: \_\_\_\_\_

Calcium content: \_\_\_\_\_ Phosphorus content: \_\_\_\_\_

List of ingredients: \_\_\_\_\_

---

*Think about this.....*

1. What is the main protein source (ingredient) in your feed?
2. Is your feed providing the 2.5 to 1 ratio of Ca to P (Ca:P)?

## Water

Water is the most important nutrient. Explain how your lamb/goat receives fresh, clean water.

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## SELECTION: FRAME SIZE AND MARKET-READY WEIGHTS - HANDOUT 4

### *Sheep and Goat Frame Score Chart*

Find wither height on the left and initial weight at the top to locate the estimated finished weight for your animal. If the initial weight is between the amounts shown, move to the next lower weight; for example, if the beginning weight is 55 lb, use 50 lb.

These are projections for average lambs. Actual weights will vary due to muscling, body length, and condition. Adjustments to estimated final weight can be made as follows: heavy muscle + 5 lb, light muscle -5 lb, thin condition + 5 lb, fat condition -5 lb.

Beginning Weight					
Wither Height	50lbs	60lbs	70lbs	80lbs	90lbs
19"	105-110 lbs				
20"	110-115 lbs	105-110 lbs			
21"	115-120 lbs	110-115 lbs	105-110 lbs		
22"	120-125 lbs	115-120 lbs	110-115 lbs	105-110 lbs	
23"	122-127 lbs	120-125 lbs	115-120 lbs	110-115 lbs	105-110 lbs
24"		122-127 lbs	122-130 lbs	122-130 lbs	115-125 lbs
25"		120-130 lbs	120-132 lbs	130-140 lbs	130-140 lbs
26"			120-135 lbs	120-135 lbs	130-145 lbs
27"			130-140 lbs	130-140 lbs	140-160 lbs
28"				130-160 lbs	130-160 lbs
29"				135-160 lbs	135-160 lbs
30"					140-160 lbs



## SELECTION: FRAME SIZE AND MARKET-READY WEIGHTS - HANDOUT 5

### *Swine Beginning Planning & Record Sheet*

One of your market-project goals should be to have a market-ready animal. Knowing what your animal weighs now and its estimated end weight will help you achieve your market-ready goal.

#### General Project Information

Youth Name: \_\_\_\_\_ Weigh-in Date: \_\_\_\_\_

Animal Tag Number: \_\_\_\_\_ Weight: \_\_\_\_\_

Breed: \_\_\_\_\_ ESTIMATED FINAL WT:

Animal Tag Number: \_\_\_\_\_ Weight: \_\_\_\_\_

Breed: \_\_\_\_\_ ESTIMATED FINAL WT:

Animal Tag Number: \_\_\_\_\_ Weight: \_\_\_\_\_

Breed: \_\_\_\_\_ ESTIMATED FINAL WT:

Vaccinations (circle): wormer 8-way type Other (list): \_\_\_\_\_

Estimate Average Daily Gain (ADG) for your pig(s)

Tag No.	Estimated Final Weight		Beginning Weight		Total required gain		# Days in feeding period		Required daily gain
		-		=		÷		=	
		-		=		÷		=	
		-		=		÷		=	

*Ask yourself these questions*

- What does market-ready mean? Is your estimated final weight an ideal market weight for the pork industry?
- The national average for ADG is 1.8 lb/day. Is your required ADG achievable?
- Typical influences on ADG are feed, water, weather, and illness. How will you manage them?

## Feeding Your Pig

Consistency is the key to feeding. Make sure you feed your animals at the same time every day and that when you have to change batches of feed or increase the amount feed, you do it slowly over a period of 2 to 3 days.

Hand feeding is feeding a known amount of feed to each pig. Hand feeding is done when taming pigs to get to know them better and when watching pig weights to help a pig reach its ideal market weight.

Self-feeders can be used when feeding large groups of pigs. Check the feeder daily, making sure it contains feed and that the feed is flowing to the bottom correctly.

List your concentrates (grain): \_\_\_\_\_

List any other feeds: \_\_\_\_\_

Describe your feeding method, i.e., self-feeders or by hand, number of times per day, in a trough or feed pan, etc.

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*Think about this . . .*

3. What happens if your animal does not have the ADG you predicted?
4. If your animal is not market ready by fair time, what happens?

## How Much Do You Feed?

It takes 3 to 4 pounds of feed for a pig to gain 1 pound of weight. If you know the number of pounds your pig must gain per day, you can estimate the amount of feed you will need per day. Faster-gaining animals will require less feed per pound of gain. More waste also means more total feed required.

Feed:

Required daily gain \_\_\_\_\_ X 4 lb = \_\_\_\_\_ lb of feed needed per day

Keep in mind smaller pigs cannot consume as much as larger pigs. Refer to the table below.

Pig Weight (lb)	Daily Feed Intake (lb)
50-75	2.85
75-125	4.46
125-150	5.58
150-200	6.35
200-255	6.69
225-250	6.8
250-270	7.3

*Think about this.....*

7. How much does one scoop of grain weigh? Is one scoop of grain enough per feeding?
8. How many scoops should you feed?

### **Protein**

Protein is the most important nutrient in a swine ration. Protein is needed to build bone and muscle. If your pig is the lean and heavy-muscled type, you will need to feed a higher-protein-content feed. Pigs need feed with 18% protein (for 50-lb pigs) to 14% protein (for 250-lb pigs) in order to grow properly. Amino acids make up proteins. The right balance of amino acids is critical. Amino acids that need to be supplemented include lysine, tryptophan, threonine, and methionine.

Read your feed label and fill in the information below.

Name of feed: \_\_\_\_\_ Protein content: \_\_\_\_\_

List of ingredients: \_\_\_\_\_

*Think about this.....*

3. What is the main protein source (ingredient) in your feed?
4. Is your feed providing additional amino acids?
5. If pigs can only eat so much a day (refer to the pig weight and daily feed intake table) how can they get the required protein?

### **Water**

Water is important for survival. Explain how your pig receives fresh, clean water.

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## SELECTION: FRAME SIZE AND MARKET-READY WEIGHTS - HANDOUT 6

### *Swine Frame Score Chart*

Estimate amount of muscle and frame size in your animal then find the proper finished weight for USDA #1 grade. If the beginning weight does not permit an efficient economical gain of at least 1.8 pounds per day, consider setting the USDA #2 grade as your goal.

#### Frame Size (pounds)

USDA Grade	Small	Medium	Large	
1	220-250	260-280	280-320	Thick Muscle
2	250-260	270-280	290-320	
3	XX	XX	XX	
1	220-230	250-260	260-270	Moderate Muscle
2	230-240	260-280	280-300	
3	240-260	270-280	290-300	
1	200-220	220-240	240-260	Light Muscle
2	220-240	240-260	260-280	
3	230-240	260-280	270-280	

# Livestock Judging, Note Taking, and Oral Reasons

Cindy Kinder, Extension Educator

## Goal (learning objective)

Youth will learn about the basics of livestock judging, note taking, and organizing notes for oral reasons.

## Supplies

- Photocopies of Handout 1 - "Oral Reasons Worksheet" (enough for group)
- Photocopies of the following judging supplements (make enough copies for specific species members) available at <https://www.uidaho.edu/extension/4h/projects>
  - Judging Beef Cattle & Oral Reasons 101, PNW 669 (PDF)
  - Judging Meat Goat & Oral Reasons 101, PNW 678 (PDF)
  - Judging Sheep & Oral Reasons 101, PNW 679 (PDF)
  - Judging Swine & Oral Reasons 101, PNW 677 (PDF)
- Livestock - enough to judge one (or more) class
- Pencils (enough for group)
- Paper (enough for group)

## Pre-lesson preparation

- Make copies of Handout 1
- Make copies of Judging Supplements
- Secure livestock for the meeting (Who is supplying what? How are the animals getting there?)
- Find and reserve a facility that is easily accessible and safe for livestock and members
- Read/Review lesson
- Review the handouts and terminology for each species

## Lesson directions and outline

Ask for youth that have participated in a livestock judging contest share the experience with the other youth. When the youth have had a chance to share, discuss the following information with the youth:

Judging livestock is comparing the merits of one animal against the merits of other animals. Judging is a very important process in the development of your understanding of livestock and your role as a producer. Producers, breeders, feeders, buyers and packers evaluate livestock for their potential as either breeding or market animals. Judging helps youth:

- Learn livestock breed identification
- Do livestock comparison
- Evaluate and identify valuable traits and characteristics
- Make decisions and defend them in a logical, well-organized manner
- Appreciate the opinions of others

### Conducting the activity (DO)

1. Ask for a volunteer to distribute the PNW handouts to the appropriate species members.
2. Ask for a volunteer to distribute paper for members to use to record notes for the classes they judge.
3. Review with the group how to take notes and appropriate behavior while judging is occurring.
4. Have the members judge and place the livestock class(es), members should take notes for all classes they are judging. They will need to select one class for oral reasons, members should take detailed notes for that class.
5. Review and explain the placings of the class(es).
6. Ask for a volunteer to distribute Handout 1 – Oral Reasons Worksheet.
7. Have the members incorporate the notes for their oral reasons class into the worksheet and fill it out.
8. Have members present their reasons.

### What did we learn? (REFLECT)

- Ask: How should your reasons start? Why?
- Ask: How should you end your reasons?
- Ask: What is in the first column of your notes?
- Ask: What is a grant?

### Why is that important? (Apply)

- Ask: How does judging help with your ability to communicate?
- Ask: Why is it important to evaluate livestock?

### Resources

- Bryan, K. A. (1994). Pennsylvania 4-H Livestock Judging Manual. Penn State College of Agricultural Sciences. Retrieved from: <http://www.aces.edu/4-H-youth/AL4-H/resources/animals/science/documents/Pennsylvania4-HLivestockJudgingManual.pdf>
- Kinder, C. A., Mavencamp, D. (2015). Judging Beef Cattle & Oral Reasons 101. PNW 669. University of Idaho. <http://www.cals.uidaho.edu/edcomm/pdf/PNW/PNW669.pdf>
- Kinder, C. A., Mavencamp, D. (2016). Judging Sheep & Oral Reasons 101. PNW 679. University of Idaho. <http://www.cals.uidaho.edu/edcomm/pdf/PNW/PNW679.pdf>
- Kinder, C. A., Mavencamp, D. (2016). Judging Meat Goat & Oral Reasons 101. PNW 678. University of Idaho. <http://www.cals.uidaho.edu/edcomm/pdf/PNW/PNW678.pdf>
- Kinder, C. A., Mavencamp, D. (2015). Judging Swine & Oral Reasons 101. PNW 677. University of Idaho. <http://www.cals.uidaho.edu/edComm/pdf/PNW/PNW677.pdf>
- Ohio State University Extension. (2011). Selection. *Beef resource handbook* (pages 2-10 through 2-16).
- Ohio State University Extension. (2008). Choosing an Animal. *Goat resource handbook* (pages 21-30).
- Ohio State University Extension. (2011). Selection: The First Step. *Sheep resource handbook for market and breeding projects* (pages 9-18).
- Ohio State University Extension. (2000). Your Ver First Step - Selection. *Swine resource handbook for market and breeding projects* (page 3-7 through 3-15).

## SELECTION: LIVESTOCK JUDGING, NOTE TAKING, AND ORAL REASONS – HANDOUT 1

## ORAL REASONS WORKSHEET

(From PNW669 pg. 12)

Use this worksheet to practice moving your notes into reasons.

I placed the \_\_\_\_\_

Identify class	Placing
----------------	---------

Say how easy or hard it is to place the class

# and ID	Grant	Criticize (est)	Compare (er)
	I started with a(an) _____ (top pair) (outstanding individual) _____ _____	I realize (optional: only if class winner has obvious disadvantages) _____ _____	But in the top pair I placed _____ over _____ because _____ _____
	There is no question _____ _____ Is the (what is the second place animal's advantage?) _____ _____	But when compared to the class winner _____ _____ _____ he/she is second.	Still in the middle pair I used his/her advantage in _____ _____ _____ to place over 3 <sup>rd</sup> . _____
	I realize that _____ is _____ _____ _____ _____	But I placed him/her third because _____ _____ _____ _____	In the bottom pair it is a difficult/easy decision to place _____ _____ over _____ _____
	I admit _____ is a _____ _____ _____ _____	However, _____ is the lightest, smallest, poorest, etc. .... So he/she is 4 <sup>th</sup> .	Thank you.



# Project Animal Selection

Cindy Kinder, Extension Educator

## Goal (learning objective)

Youth will:

- Learn how to set individual goals for their animal project.
- Learn about industry goals and standards.
- Learn about basic criteria when selecting a project animal.
- Practice livestock judging.

## Supplies

- Photocopies of the following handouts (enough for group)
  - Handout 1 - "Which Animal Should I Choose From The Pen?"
  - Handout 2 - "Livestock Judging Card"
- Livestock - enough to judge one (or more) class
- Pencils (enough for group)

## Pre-lesson preparation

- Make copies of Handouts 1 and 2.
- Secure livestock for the meeting (Who is supplying what? How are the animals getting there?) or work with a producer to judge animals at their facility
- Find and reserve a facility that is easily accessible and safe for livestock and members
- Read/Review lesson
- Review the handouts and terminology for each species

## Lesson directions and outline

Have the youth list and discuss what traits they look for when selecting a project animal to raise. After the discussion, share the following information with the youth:

Selection of a project animal should be done carefully, with consideration given to breed, size, and quality. Size and quality are especially important. While management and nutrition have great influence on both, it is a big help to begin with a good animal. Purchasing livestock at high prices does not guarantee success, nor does it mean easier management. A successful project outcome requires that the animal has a desirable genetic background and an excellent environment while in your care.

To be successful in raising and selecting livestock projects, you should know the names of the various parts of the animal and their location on the animal's body. This will help you know what to look for and accurately describe what you see. This knowledge will expand and become permanent as you are involved with raising, showing, and marketing your livestock projects.

### Conducting the activity (DO)

1. Ask for a volunteer to distribute Handout 1
2. Have youth read Handout 1.
3. Review the handout with the group discussing the industry goals and selection qualities.
4. Ask for a volunteer to distribute Handout 2.
5. Review the handout and explain how to use the judging card by marking an X by the number combination. Also review etiquette expectations while judging.
6. Have the members judge and place the livestock class(es).
  - a. Variations of this activity could be printing off on paper 4 classes of livestock, signing up for Judging 101, national swine picture judging, or hoards dairyman judging contest.
7. Review and explain the placings of the class(es).

### What did we learn? (REFLECT)

- Ask: What did you learn?
- Ask: What are your goals for your animal project?
- Ask: What are the basic criteria in selecting livestock?
- Ask: Does your project animal have these qualities?

### Why is that important? (Apply)

- Ask: Why is it important to know the industry standards?
- Ask: What are other examples of industry standards?
- Ask: Why are industry standards important?

### Resources

- Kinder, C. A., Mavencamp, D. (2015). Judging Beef Cattle & Oral Reasons 101. PNW 669. University of Idaho.
- Kinder, C. A., Mavencamp, D. (2016). Judging Sheep & Oral Reasons 101. PNW 679. University of Idaho.
- Kinder, C. A., Mavencamp, D. (2016). Judging Meat Goat & Oral Reasons 101. PNW 678. University of Idaho.
- Kinder, C. A., Mavencamp, D. (2015). Judging Swine & Oral Reasons 101. PNW 677. University of Idaho.
- Ohio State University Extension. (2011). Selection. *Beef resource handbook* (pages 2-10 through 2-16).
- Ohio State University Extension. (2008). Choosing an Animal. *Goat resource handbook* (pages 21-30).
- Ohio State University Extension. (2011). Selection: The First Step. *Sheep resource handbook for market and breeding projects* (pages 9-18).
- Ohio State University Extension. (2000). Your Very First Step - Selection. *Swine resource handbook for market and breeding projects* (page 3-7 through 3-15).

## SELECTION: SELECTION – HANDOUT 1

### Which Animal Should I Choose from the Pen?

Cindy A. Kinder, University of Idaho, Area Extension Educator

I am planning to take a market project. I know what species I have facilities for, but which animal do I choose? My goals this year are to: 1. Have my animal market ready by fair time, 2. Select an animal that is consistent with industry standards and 3. Learn and challenge myself about animal selection and feeding. If I meet my goals, my project is a success no matter where the fair judge places my animal in its quality class.

One thing I learned in my last market project was “what I start with is what I end with”. I could not change the amount of muscling my steer had, and with more muscling the steer would have looked better and been more balanced.

For this year, what do I look for in my project animal? I want my animal to produce market industry goals so I will select an animal I think will have the potential for meeting those standards (see textboxes). I know there are breed differences and differences within a breed as to how it relates to performance. Genetically I know all breeds have good animals and the producer I purchase from selects for carcass traits, so I will select the best animal no matter the color.

#### Market Beef Industry Goals

Age at market: 14 – 18 months

Live weight: 1250-1400 lbs

Hot carcass weight: 700-900 lbs

Kidney, pelvic & heart fat (KPH): 3.0 or less

Fat thickness: .5 or less

Ribeye: 12.5-13.9 square inches

Quality grade: Choice or higher

Yield grade: 3.0 or less.

Besides industry goals I will look at four main qualities.

#### 1. Muscling

Muscling is important to the meat animal industry. Heavy muscled animals produce leaner and less fat. Consumers are very conscious of fat and prefer beef, pork and lamb with less fat. You can see indications of muscling over an animal's top (in the loin area), length of hip, width of stifle, and in the round, ham, and leg region. I will select an animal with good to excellent muscling.

#### 2. Structure, Soundness, Balance

Strong bone and correct skeletal structure is essential for any animal getting to feed and water. You can observe structure in the angle of the shoulder, levelness of top line, hip and dock, pastern and hock angle, and movement. Balance is best identified as uniformity in the appearance of muscle trimness and skeletal structure. I will select an animal with correct structure.

#### Market Pork Industry Goals

Age at market: 156-164 days

Live weight: 260-270 lbs

Hot carcass weight: 195 lbs

Back fat: .6-.8 inches

Loin eye: 6.5-7.1 square inches

USDA Grade: #1

Intramuscular fat:  $\geq 2.5$ -2.9 %

Feed efficiency: 2.4

### 3. Growth & Frame, Skeletal size

Different livestock industries have ideal final weights and carcass weights. Animals can be too small and cost the industry more per pound or too large for handling facilities or most consumers. Indicators of size are: length of body, height at the hip or shoulder, and length and size of cannon bone. I will select an animal that will have good potential for growth.

### 4. Performance, Capacity, Volume

The amount of capacity and condition (fat) an animal has relates to its performance. Indicators of capacity and performance are width of chest floor, width across shoulder blades, rib shape, and weight per day of age. I will select an animal that stands wide, has a deep body and is not too fat.

#### Market Lamb Industry Goals

Age at market: 6 – 10 months

Live weight: 110-150 lbs

Hot carcass weight: 55-75 lbs

Fat thickness: .15-.3 inches

Ribeye: 2.5 square inches minimum

Quality grade: Choice minus or higher

Yield grade: 3.0 or less.

ADG (national average) .68 lbs/day

I know that market animal programs target a specific market date (fair and sale) therefore selection of my project animal is important. My feeder animal must be in the right beginning condition (not prematurely fat, not too thin). As the feeding period ends it is difficult to slow down an animal's performance to achieve the desired target. It is also important not to allow my project animal to fall behind schedule because it will be impossible to speed up and put on the necessary finish to be market ready at fair time. Last year I had \$200 more in feed expenses because I fell behind schedule.

Which animal are you going to choose from the pen? Some questions to ask:

- ❖ How much muscle does my animal have?
- ❖ Can my animal walk correctly? As the animal gets heavier will that change?
- ❖ What is the frame size of my animal: small, medium, large?
- ❖ What will the final fair weight be? Does that meet industry standards?
- ❖ What kind of condition (fat or thin) is my animal in?
- ❖ Am I ready for this year?

# SELECTION: PROJECT ANIMAL SELECTION – HANDOUT 2



## 4-H JUDGING PLACING CARD (Written Reasons on back)

Contestant No. \_\_\_\_\_

Name \_\_\_\_\_ Age \_\_\_\_\_ Birthdate \_\_\_\_/\_\_\_\_/\_\_\_\_ Int. \_\_\_\_\_ Sr. \_\_\_\_\_

Address \_\_\_\_\_

Club/Leader \_\_\_\_\_ Contest \_\_\_\_\_ County \_\_\_\_\_

Fill in the square opposite the placing you determine to be correct for that class.

Class 1	Class 2	Class 3	Class 4	Class 5	Scoring Use Only
1-2-3-4 A	1-2-3-4 A	1-2-3-4 A	1-2-3-4 A	1-2-3-4 A	<b>SCORES</b> 1. _____ 2. _____ 3. _____ 4. _____ 5. _____ 6. _____ 7. _____ 8. _____ 9. _____ 10. _____
1-2-4-3 B	1-2-4-3 B	1-2-4-3 B	1-2-4-3 B	1-2-4-3 B	
1-3-2-4 C	1-3-2-4 C	1-3-2-4 C	1-3-2-4 C	1-3-2-4 C	
1-3-4-2 D	1-3-4-2 D	1-3-4-2 D	1-3-4-2 D	1-3-4-2 D	
1-4-2-3 E	1-4-2-3 E	1-4-2-3 E	1-4-2-3 E	1-4-2-3 E	
1-4-3-2 F	1-4-3-2 F	1-4-3-2 F	1-4-3-2 F	1-4-3-2 F	
2-1-3-4 G	2-1-3-4 G	2-1-3-4 G	2-1-3-4 G	2-1-3-4 G	
2-1-4-3 H	2-1-4-3 H	2-1-4-3 H	2-1-4-3 H	2-1-4-3 H	
2-3-1-4 I	2-3-1-4 I	2-3-1-4 I	2-3-1-4 I	2-3-1-4 I	
2-3-4-1 J	2-3-4-1 J	2-3-4-1 J	2-3-4-1 J	2-3-4-1 J	
2-4-1-3 K	2-4-1-3 K	2-4-1-3 K	2-4-1-3 K	2-4-1-3 K	
2-4-3-1 L	2-4-3-1 L	2-4-3-1 L	2-4-3-1 L	2-4-3-1 L	
3-1-2-4 M	3-1-2-4 M	3-1-2-4 M	3-1-2-4 M	3-1-2-4 M	
3-1-4-2 N	3-1-4-2 N	3-1-4-2 N	3-1-4-2 N	3-1-4-2 N	
3-2-1-4 O	3-2-1-4 O	3-2-1-4 O	3-2-1-4 O	3-2-1-4 O	
3-2-4-1 P	3-2-4-1 P	3-2-4-1 P	3-2-4-1 P	3-2-4-1 P	
3-4-1-2 Q	3-4-1-2 Q	3-4-1-2 Q	3-4-1-2 Q	3-4-1-2 Q	
3-4-2-1 R	3-4-2-1 R	3-4-2-1 R	3-4-2-1 R	3-4-2-1 R	
4-1-2-3 S	4-1-2-3 S	4-1-2-3 S	4-1-2-3 S	4-1-2-3 S	
4-1-3-2 T	4-1-3-2 T	4-1-3-2 T	4-1-3-2 T	4-1-3-2 T	
4-2-1-3 U	4-2-1-3 U	4-2-1-3 U	4-2-1-3 U	4-2-1-3 U	
4-2-3-1 V	4-2-3-1 V	4-2-3-1 V	4-2-3-1 V	4-2-3-1 V	
4-3-1-2 W	4-3-1-2 W	4-3-1-2 W	4-3-1-2 W	4-3-1-2 W	
4-3-2-1 X	4-3-2-1 X	4-3-2-1 X	4-3-2-1 X	4-3-2-1 X	

Class 6	Class 7	Class 8	Class 9	Class 10	
1-2-3-4 A	1-2-3-4 A	1-2-3-4 A	1. _____	1. _____	<b>TOTAL SCORE</b> <div style="border: 1px solid black; width: 100px; height: 40px; margin: 5px 0;"></div> <b>TEAM SCORE</b> <div style="border: 1px solid black; width: 100px; height: 40px; margin: 5px 0;"></div> <b>TEAM PLACING</b> <div style="border: 1px solid black; width: 100px; height: 40px; margin: 5px 0;"></div> <b>AWARD</b> <div style="border: 1px solid black; width: 100px; height: 40px; margin: 5px 0;"></div>
1-2-4-3 B	1-2-4-3 B	1-2-4-3 B	2. _____	2. _____	
1-3-2-4 C	1-3-2-4 C	1-3-2-4 C	3. _____	3. _____	
1-3-4-2 D	1-3-4-2 D	1-3-4-2 D	4. _____	4. _____	
1-4-2-3 E	1-4-2-3 E	1-4-2-3 E	5. _____	5. _____	
1-4-3-2 F	1-4-3-2 F	1-4-3-2 F	6. _____	6. _____	
2-1-3-4 G	2-1-3-4 G	2-1-3-4 G	7. _____	7. _____	
2-1-4-3 H	2-1-4-3 H	2-1-4-3 H	8. _____	8. _____	
2-3-1-4 I	2-3-1-4 I	2-3-1-4 I	9. _____	9. _____	
2-3-4-1 J	2-3-4-1 J	2-3-4-1 J	10. _____	10. _____	
2-4-1-3 K	2-4-1-3 K	2-4-1-3 K	11. _____	11. _____	
2-4-3-1 L	2-4-3-1 L	2-4-3-1 L	12. _____	12. _____	
3-1-2-4 M	3-1-2-4 M	3-1-2-4 M	13. _____	13. _____	
3-1-4-2 N	3-1-4-2 N	3-1-4-2 N	14. _____	14. _____	
3-2-1-4 O	3-2-1-4 O	3-2-1-4 O	15. _____	15. _____	
3-2-4-1 P	3-2-4-1 P	3-2-4-1 P	16. _____	16. _____	
3-4-1-2 Q	3-4-1-2 Q	3-4-1-2 Q	17. _____	17. _____	
3-4-2-1 R	3-4-2-1 R	3-4-2-1 R	18. _____	18. _____	
4-1-2-3 S	4-1-2-3 S	4-1-2-3 S	19. _____	19. _____	
4-1-3-2 T	4-1-3-2 T	4-1-3-2 T	20. _____	20. _____	





4-H CLUB JUDGING CONTEST Reasons Sheet  
Class # \_\_\_\_\_



I placed this class \_\_\_\_\_

My Reasons for placing 1<sup>st</sup> over 2<sup>nd</sup> : \_\_\_\_\_

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My Reasons for placing 2<sup>nd</sup> over 3<sup>rd</sup> : \_\_\_\_\_

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My Reasons for placing 3<sup>rd</sup> over 4<sup>th</sup> : \_\_\_\_\_

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Closing statement: \_\_\_\_\_

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# Skeletal Structure

Cindy Kinder, Extension Educator

## Goal (learning objective)

Youth will learn about livestock skeletal structures in beef, sheep, goat, and swine. In addition, learn about the similarities and differences between livestock and human skeletons.

## Supplies

- The skeletal parts poster in the Ohio Learning Lab Kit (either specific species or all species). Check with your local extension office on the availability of the kit and to check it out.
- Photocopies of the following handouts (enough for group):
  - Handout 1 “Human Skeleton”
  - Handout 2 “Beef Skeletal System”
  - Handout 3 “Sheep Skeletal System”
  - Handout 4 “Goat Skeletal System”
  - Handout 5 “Swine Skeletal System”
- Pens (enough for group)
- Paper (enough for group)

## Pre-lesson preparation

- Make copies of Handouts 1,2,3,4,and 5 assemble into a packet; one for each member
- Read/Review lesson
- Review the handouts and skeletal terminology

## Lesson directions and outline

Share the following information with the youth:

To be successful in raising and selecting livestock, you should know the various parts of your animal and the location of those parts on their body. This will help you know what to look for and accurately describe what you see. While it is not emphasized

as greatly as it is with breeding animals, structural correctness is an important selection criterion when selecting and evaluating market animals.

As a producer, good animal husbandry requires an understanding of many different sciences ranging from nutrition, economics, genetics and veterinary science. Every action you take as a livestock producer will reflect on the quality of the livestock products and the industry.

## Conducting the activity (DO)

1. Ask for a volunteer to distribute the handout packet.
2. Have youth break up into groups of 4 (ideally with one member from each species on each team).
3. Have the groups review the packet, the challenge for the groups is to identify, per species the similar bones shared with humans. Also have the groups record any different bones.
4. After groups have finished have groups share their findings.

## What did we learn? (REFLECT)

- Ask: Are there bones similar amongst all the species?
- Ask: Are your bones similar in size to your project animal?
- Ask: How many bones are in a beef (207), goat (189), sheep (110), pig (216), human (206) skeleton?



## Why is that important? (Apply)

- Ask: Why is it important to understanding the relationship of bones and their functions?
- Ask: How does this information help if your animal is injured?
- Ask: What is a body function that you can see but need to understand in animals? (Digestion)
- Ask: What over processes occur that you don't see but understanding is helpful? (Gas in a Car, Oil in an engine, yeast in bread, protein in wheat, gluten in wheat)

## Resources

Ohio State University Extension. (2011). Selection. Beef resource handbook (pages 2-2 through 2-15 and 12-5).

Ohio State University Extension. (2008). Choosing an Animal. Goat resource handbook (pages 17-30).

Ohio State University Extension. (2011). Selection: The First Step. Sheep resource handbook for market and breeding projects (pages 9-19).

Ohio State University Extension. (2000). Your Ver First Step - Selection. Swine resource handbook for market and breeding projects (page 3-1 through 3-15).

## SELECTION: SKELETAL STRUCTURE – HANDOUT 1

### HUMAN SKELETON

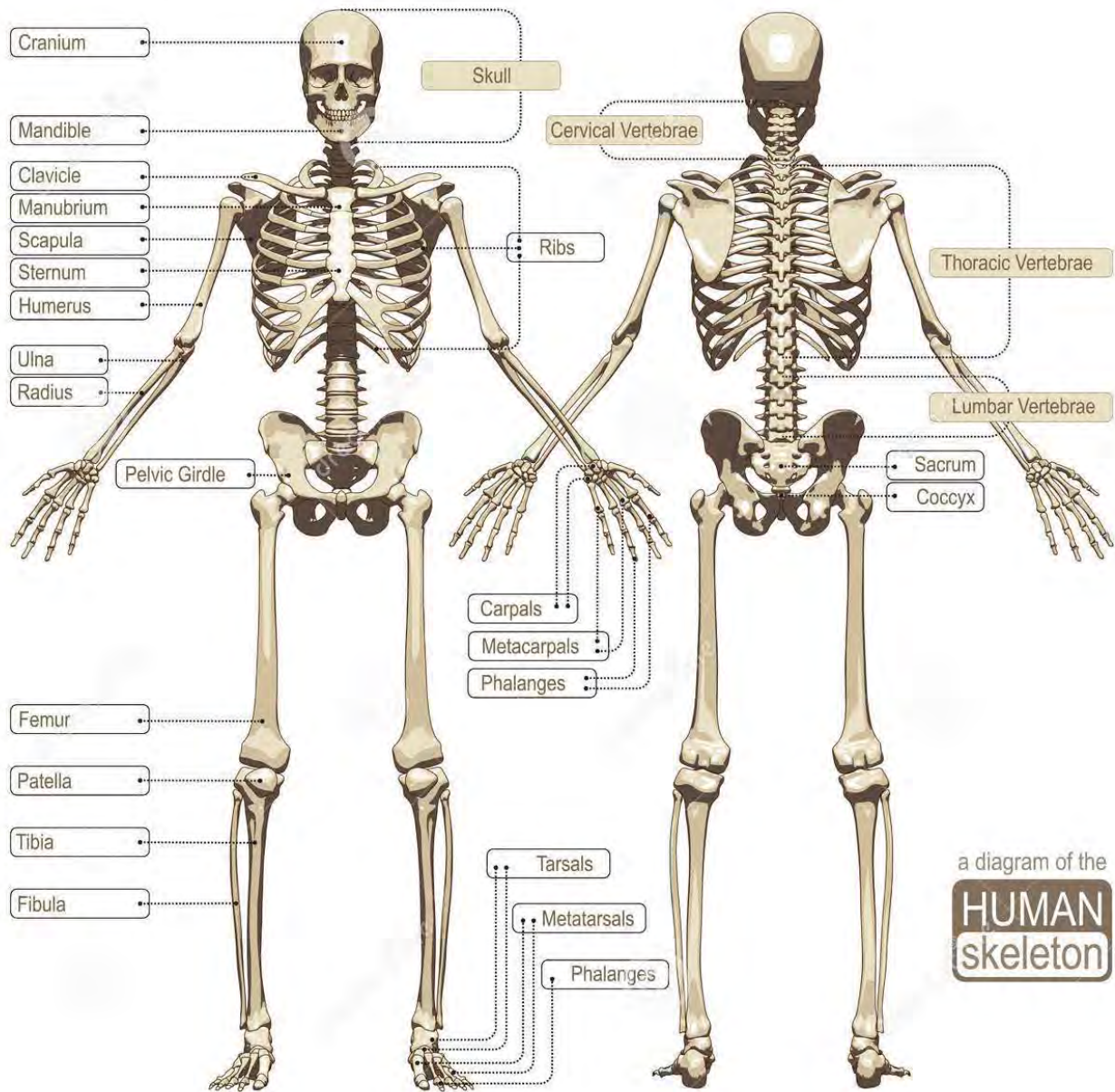


Image from: <https://thumbs.dreamstime.com/z/diagram-human-skeleton-titled-main-parts-skeletal-system-vector-illustration-47476531.jpg>

## SELECTION: SKELETAL STRUCTURE – HANDOUT 2

### BOVINE SKELETAL SYSTEM

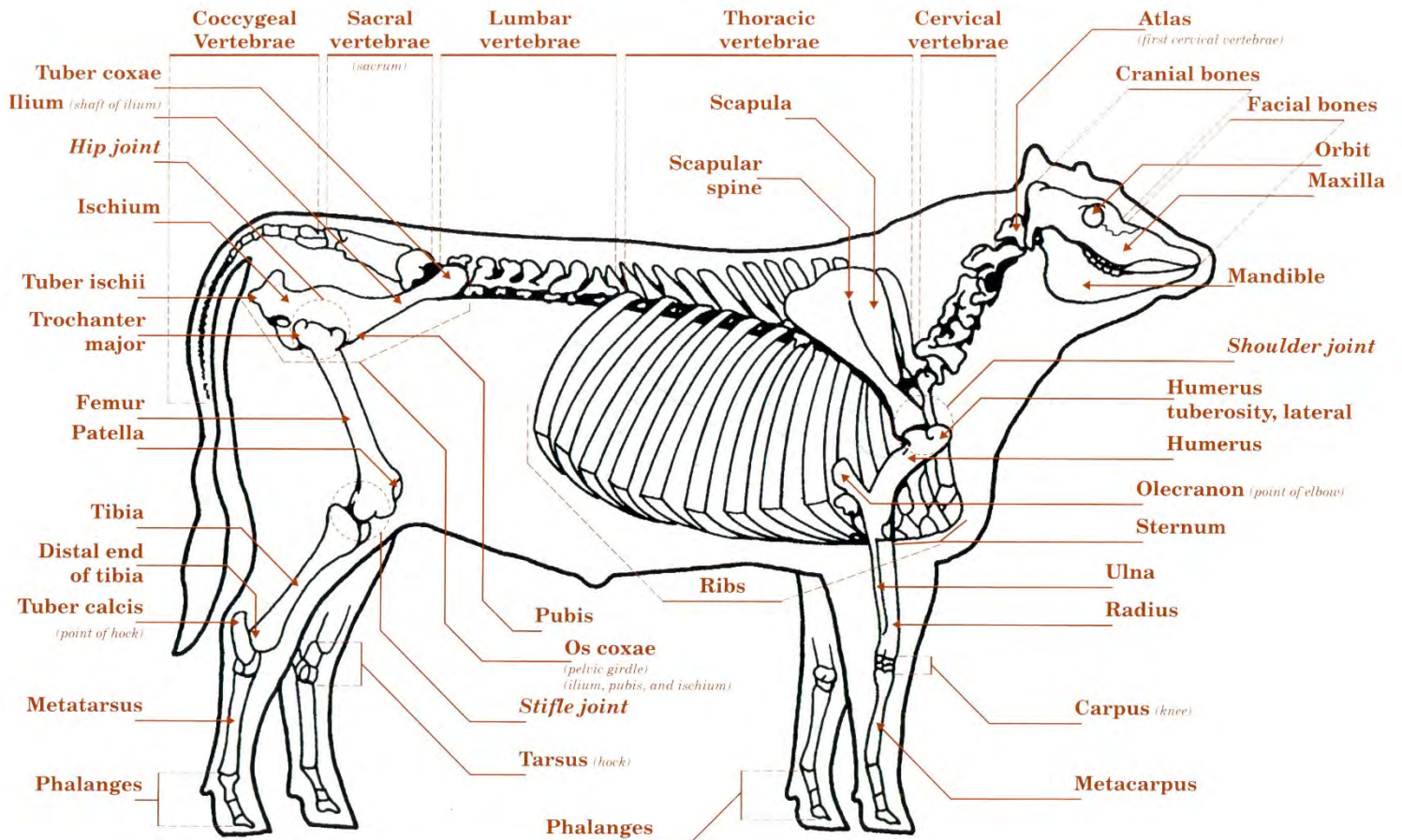
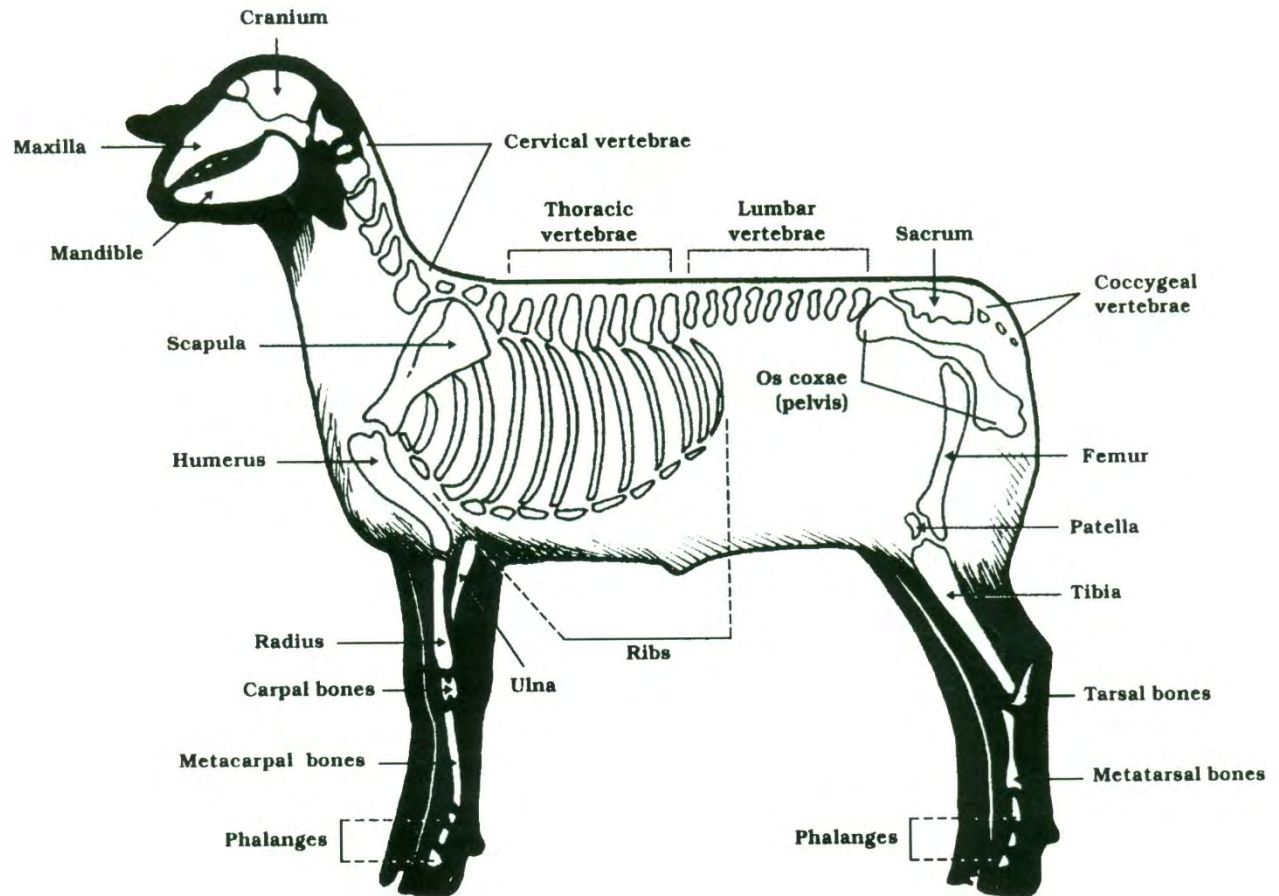


Image from: Beef Resource Handbook, page 2-3

## SELECTION: SKELETAL STRUCTURE – HANDOUT 3

### SHEEP SKELETAL SYSTEM



*Image from: Sheep Resource Handbook for Market and Breeding Projects, page 12*



## SELECTION: SKELETAL STRUCTURE – HANDOUT 4

### GOAT SKELETAL SYSTEM

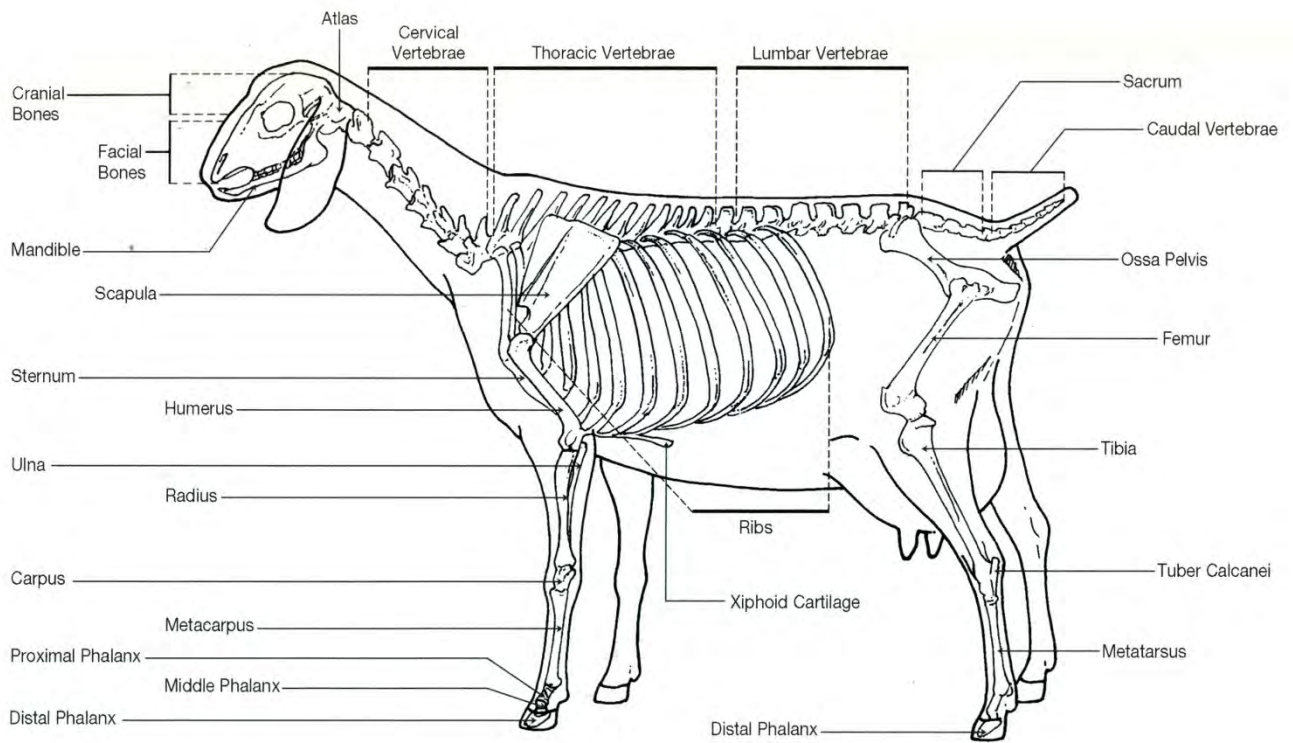
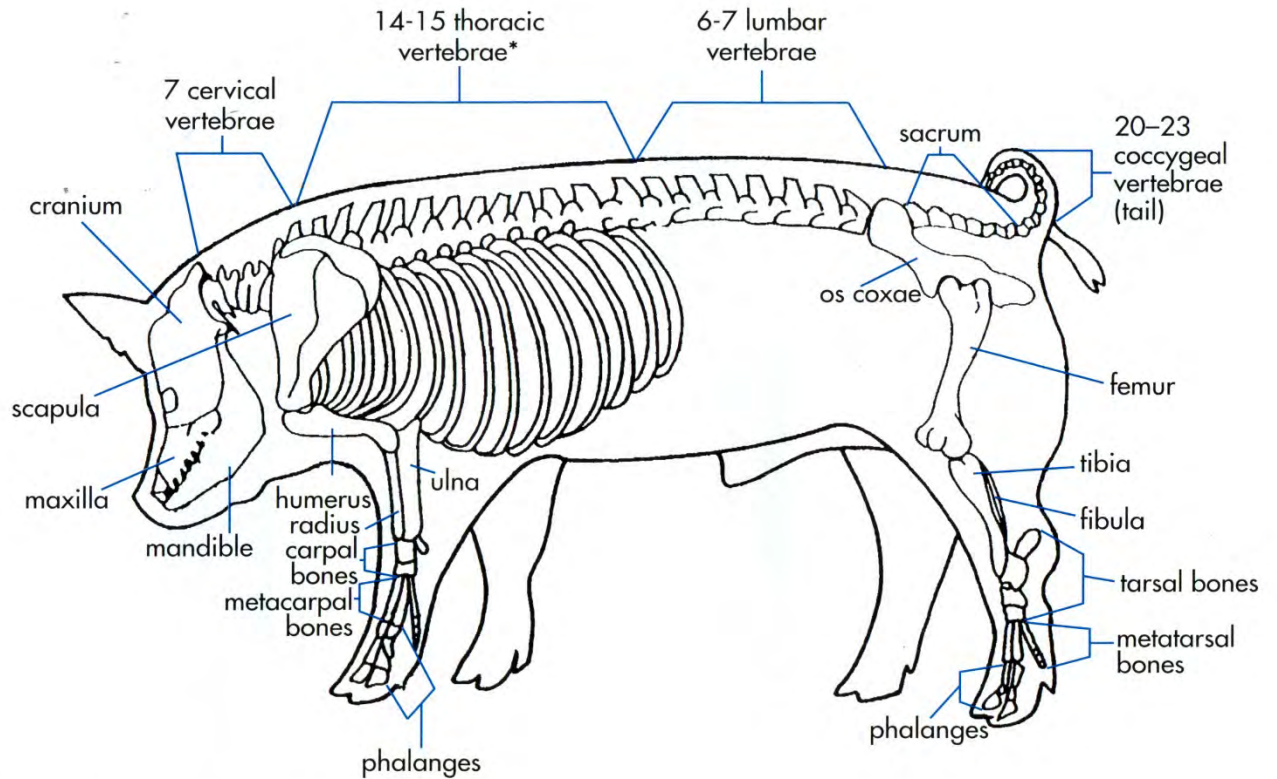


Image from: Goat Resource Handbook, page 23

## SELECTION: SKELETAL STRUCTURE – HANDOUT 5

### SWINE SKELETAL SYSTEM



\*Some pigs may have up to 17 thoracic vertebrae.

*Image from: Swine Resource Handbook for Market and Breeding Projects, page 3-15*

# Structural Conformation

Cindy Kinder, Extension Educator

## Goal (learning objective)

Youth will learn about structural differences in live-stock and the importance of structural correctness.

## Supplies

- The animal parts poster in the Ohio Learning Lab Kit (either specific species or all species). Check with your local extension office on the availability of the kit and to check it out.
- Photocopies of the following handouts (enough for group):
  - Handout 1 - *Beef Resource Handbook*, chapter 2, pages 2-10 through 2-15
  - Handout 2 - *Goat Resource Handbook*, chapter 2, pages 22-26
  - Handout 3 - *Sheep Resource Handbook for Market and Breeding Projects*, chapter 2, pages 11 and 14-16
  - Handout 4 - *Swine Resource Handbook for Market and Breeding Projects*, chapter 3, pages 3-2 and 3-7 through 3-14
- Meeting location with enough space to run a foot-race

## Pre-lesson preparation

This activity can be conducted for a specific species or all species

- Review structural differences in the beef, goat, sheep, and swine resource handbooks (see handouts)
- Review conformation terminology

## Lesson directions and outline

There are many tools available to help with animal selection. They include things such as animal weights,

actual performance data and expected progeny differences. While these tools are helpful visual appraisal is still a key tool in animal selection. Animals, just like people, need to be able to walk and run in order to perform different functions. By taking a good look at the animal you will be able to recognize if they can travel to food, water and shelter comfortably as well as move away from harm.

## Conducting the activity (DO)

1. Ask volunteers to distribute the handouts.
2. While working through the structural faults, have the members stand and adjust their legs so they mimic each fault.
3. Once all the leg structures have been explained, ask for volunteers to represent the different “structural faults”
4. Have volunteers run a relay race with that structural fault (three or four at a time)
  - While members are waiting to run, they can practice walking around with their structural faults. For example, running on tippy toes would be the post-legged structure. Running with heels together would be the splayed-footed structure. Have volunteers experiment with walking with those structures for 5 minutes.

## What did we learn? (REFLECT)

- Ask: What are common structural faults in live-stock?
- Ask: Have you seen animals with any of those faults?
- Ask: Relay race volunteers: was it easy to run the foot-race? If you had to walk all the time that way how would you feel? What hurts?
- Ask: Why is structural correctness important?



## Why is that important? (Apply)

- Ask: If your animal is hurting, how often would they get up to eat and drink? As your animal gets heavier, how would they feel?
- Ask: Relay race volunteers: was it easy to run the footrace? If you had to walk all the time that way how would you feel? What hurts?

## Resources

Ohio State University Extension. (n.d.). Learning Lab Kits. Beef, Sheep, Swine, and Goat. Available from: <http://www.ohio4h.org/books-and-resources/learning-lab-kits>.

Ohio State University Extension. (2011). Selection. *Beef resource handbook* (pages 2-10 through 2-15).

Ohio State University Extension. (2008). Choosing an Animal. *Goat Resource Handbook* (pages 22-26).

Ohio State University Extension. (2011). Selection: The First Step. *Sheep resource handbook for market and breeding projects* (pages 11 and 14-16).

Ohio State University Extension. (2000). Your Very First Step - Selection. *Swine resource handbook for market and breeding projects* (pages 3-2 and 3-7 through 3-14).

University of Tennessee Extension. (2013). Module 5 Swine. *Livestock judging guide*. Available from: [https://extension.tennessee.edu/henderson/Documents/%2713%20Livestock%20Judg%20Guide%20Module%205%20Swine%20\(1\).pdf](https://extension.tennessee.edu/henderson/Documents/%2713%20Livestock%20Judg%20Guide%20Module%205%20Swine%20(1).pdf)

## The Ideal Breeding Heifer



### Ideal Breeding Heifer

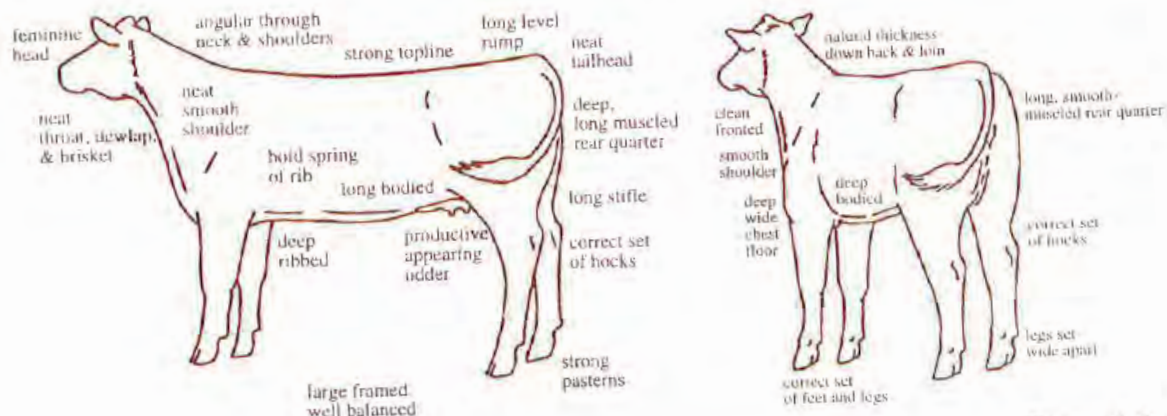
- 5.5-7.0 frame score
- Extra capacity and volume
- Structurally correct
- Feminine

(Figure 2.03)

### Describing the Ideal Heifer

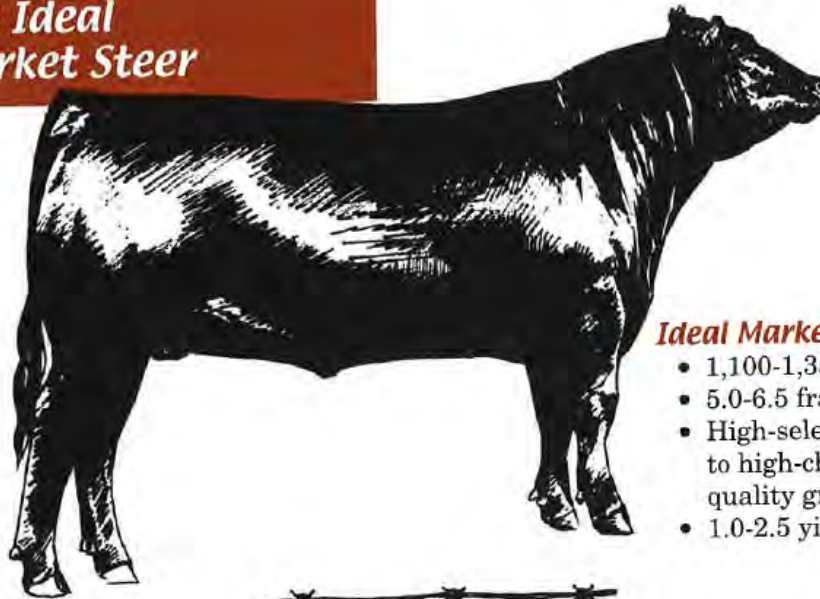
(Figures 2.03 and 2.04)

- Feminine head
- Neat throat, dewlap, and brisket
- Angular through neck and shoulders
- Neat, smooth shoulder
- Strong topline
- Long, level rump
- Smooth tailhead
- Deep, long smooth muscled rear quarter
- Long stifle
- Correct set of hocks
- Strong pasterns
- Productive appearing udder
- Long-bodied
- Bold spring of rib
- Deep-ribbed
- Large frame, well balanced
- Natural thickness down back and loin
- Legs set wide apart
- Correct set of feet and legs
- Deep-bodied
- Deep, wide chest floor
- Clean-fronted



(Figure 2.04)

## The Ideal Market Steer



### Ideal Market Steer

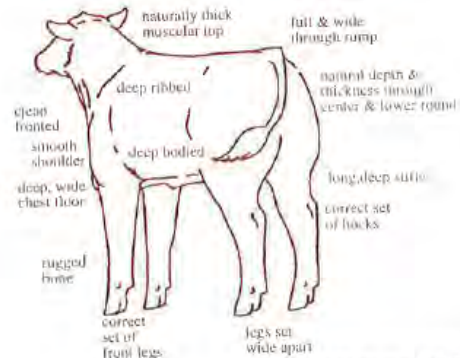
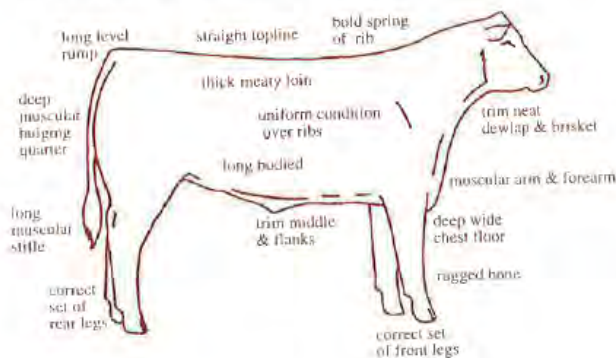
- 1,100-1,350 pounds
- 5.0-6.5 frame score
- High-select to high-choice quality grade
- 1.0-2.5 yield grade

(Figure 2.05)

### Describing the Ideal Market Steer

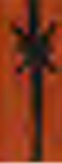
(Figure 2.05 and 2.06)

- Long, level rump
- Straight topline
- Bold spring of rib
- Thick, meaty loin
- Uniform condition over ribs
- Trim, neat dewlap and brisket
- Muscular arm and forearm
- Deep, wide chest floor
- Rugged bone
- Correct set of front legs
- Trim middle and flanks
- Long-bodied
- Correct set of rear legs
- Long, muscular stifle
- Deep, muscular bulging quarter
- Naturally thick, muscular top
- Full and wide through rump
- Natural depth and thickness through center and lower round
- Long, deep stifle
- Correct set of hocks
- Legs set wide apart
- Smooth shoulder
- Clean fronted
- Deep-ribbed
- Deep-bodied



(Figure 2.06)





## Structural Differences

• **Splayfooted or Knock Kneed**—When viewed from the front, the knees are close together and the feet toe out away from each other. This problem is often seen in extremely light-muscled, narrow-chested cattle when the legs are naturally set too close together.

• **Pigeon Toed or Bowlegged**—When viewed from the front or rear, the knees set too far out, causing the toes to turn inward.

• **Cow Hocked**—When viewing the hind legs from the rear, the hocks are turned inward or are placed too close together, causing the toes to turn outward.

• **Buck Kneed**—When the calf is “over at the knees,” or buck kneed, full extension of the knee cannot occur. When observed from the side the legs appear slightly bent. This is usually seen in cattle that are too straight in the shoulder.

• **Calf Kneed**—This is the other extreme, the opposite of buck kneed, where the calf stands “back at the knees” when viewed from the side.

• **Sickle Hocked**—When viewing the rear legs from the side, the hock has too much angle or set, causing the steer to stand too far underneath himself. Often these calves will droop excessively from hooks to pins.

• **Postlegged**—The hock has too little angle or set. The calf is too straight through the joint, resulting in very stiff, restricted movement because of the lack of flexibility. More cattle become unsound because of being postlegged than sickle hocked.



correct



knock kneed  
or splayfooted



bowlegged or  
pigeon toed



correct



cow hocked or  
splayfooted



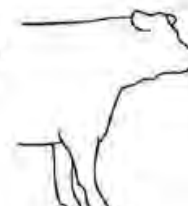
bowlegged or  
pigeon toed



correct



buck kneed



calf kneed



correct



sickle hocked



postlegged

(Figure 2.07)



## Evaluation of Breeding Cattle

When evaluating breeding cattle, several important characteristics must be examined. Body composition, frame size, structural correctness, sex character, and overall balance must be considered when evaluating a breeding animal. Traits that contribute to productivity and longevity must be emphasized. (Figures 2.08a and 2.08b)

### Volume and Capacity

Current emphasis is placed on animals with more three-dimensional (length, width, and depth) volume and capacity, natural muscling, and fleshing ability. Traits that contribute to this include:

- spring of rib
- depth of rib
- width of chest
- more natural thickness and shape down the top
- thickness of quarter
- width and depth of stifle



(Figure 2.08a)

### Frame Size

Modern breeding cattle must exhibit adequate growth for their age. Skeletal height in relationship to age contributes to the animal's overall frame score. Cattle should be above average in height but not extremely tall, and should possess extra length of body. Traits that are desirable in regard to frame score are:

- above average hip height (frame score 6.0-7.0)
- extra length of body
- long rump
- above average weight per day of age

### Structural Correctness

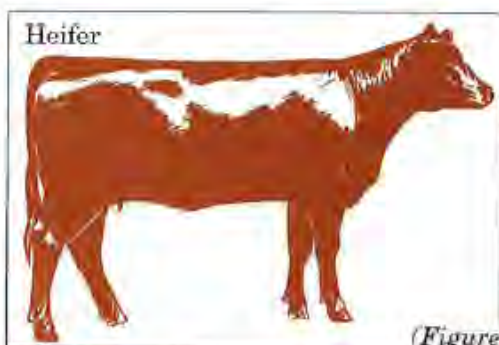
Animals that are more structurally correct will be better able to withstand the rigors of pasture conditions and thus increase their odds of being productive for longer periods of time. Structural correctness is emphasized more in breeding cattle than in market cattle. Look for animals that have the following characteristics:

- stand squarely on front and rear legs
- heavy boned
- move with a long, reaching stride
- level from hooks to pins
- possess adequate set (flex) to the hocks
- proper slope to the shoulder
- large round foot with deep heel

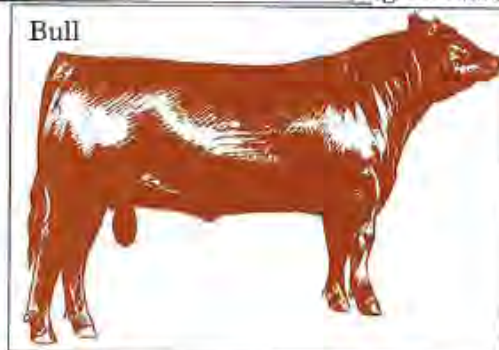


(Figure 2.08b)





(Figure 2.09)



### Sex Character

Differences in sex character are important when judging breeding cattle. There are important differences between females and males. (Figure 2.09)

Femininity is exhibited by a long, refined head that is sharp about the poll. Females should possess a long, trim neck and be smooth about the shoulders.

Masculinity is exhibited by a long head that is slightly broader between the eyes and flatter about the poll. Males should be long necked and display a crest of the neck. Testicular development should be evident and increase with maturity.

### Balance

Traits that relate to balance contribute to the overall appearance of an animal. Characteristics that are considered desirable include:

- straightness of lines
- strong topped
- level rump
- smoothness of shoulder
- clean and trim brisket
- balanced underline

## Evaluation of Market Cattle

When selecting and evaluating market cattle, 4-H members must keep in mind the purpose of these animals. The primary function of market animals is meat production. Therefore, traits such as muscling and finish are emphasized. Frame size and structural correctness are examined but to a slightly lesser degree than in breeding cattle. (Figures 2.10a and 2.10b)

### Muscling

Modern market cattle should exhibit extra muscling down their top and through their quarter. These are the areas from which the high-priced cuts come. Traits that are found in the ideal market steer include:

- natural thickness down the top
- muscular loin
- long, level rump
- wide through the center of the quarter
- wide, deep stifle

### Finish

Finish refers to the amount of fat cover a market animal possesses. An ideal market animal should have the minimal amount of body fat and still be able to reach the Choice quality grade. Desirable traits in regard to finish include:

- smooth and uniform fat cover over ribs
- uniform depth of body
- freedom from fat patches around tailhead
- no excessive fullness in brisket

### Frame Size

Current trends in market cattle frame size have shifted toward moderation. Market cattle should have enough frame to enable them to reach an acceptable market weight (1,100-1,350 lbs.) at 12-18 months of age. Acceptable traits for today's frame size include:

- moderate hip height (frame size 5.0-6.5)
- extra length of body
- long rump



(Figure 2.10a)

### Structural Correctness

While it is not emphasized as greatly as it is with breeding cattle, structural correctness is an important selection criteria when judging market animals. As with breeding cattle, look for animals that:

- stand squarely on front and rear legs
- heavy boned
- move with a long, reaching stride
- nearly level from hooks to pins
- possess adequate set (flex) to the hocks
- have a proper slope to the shoulder



(Figure 2.10b)

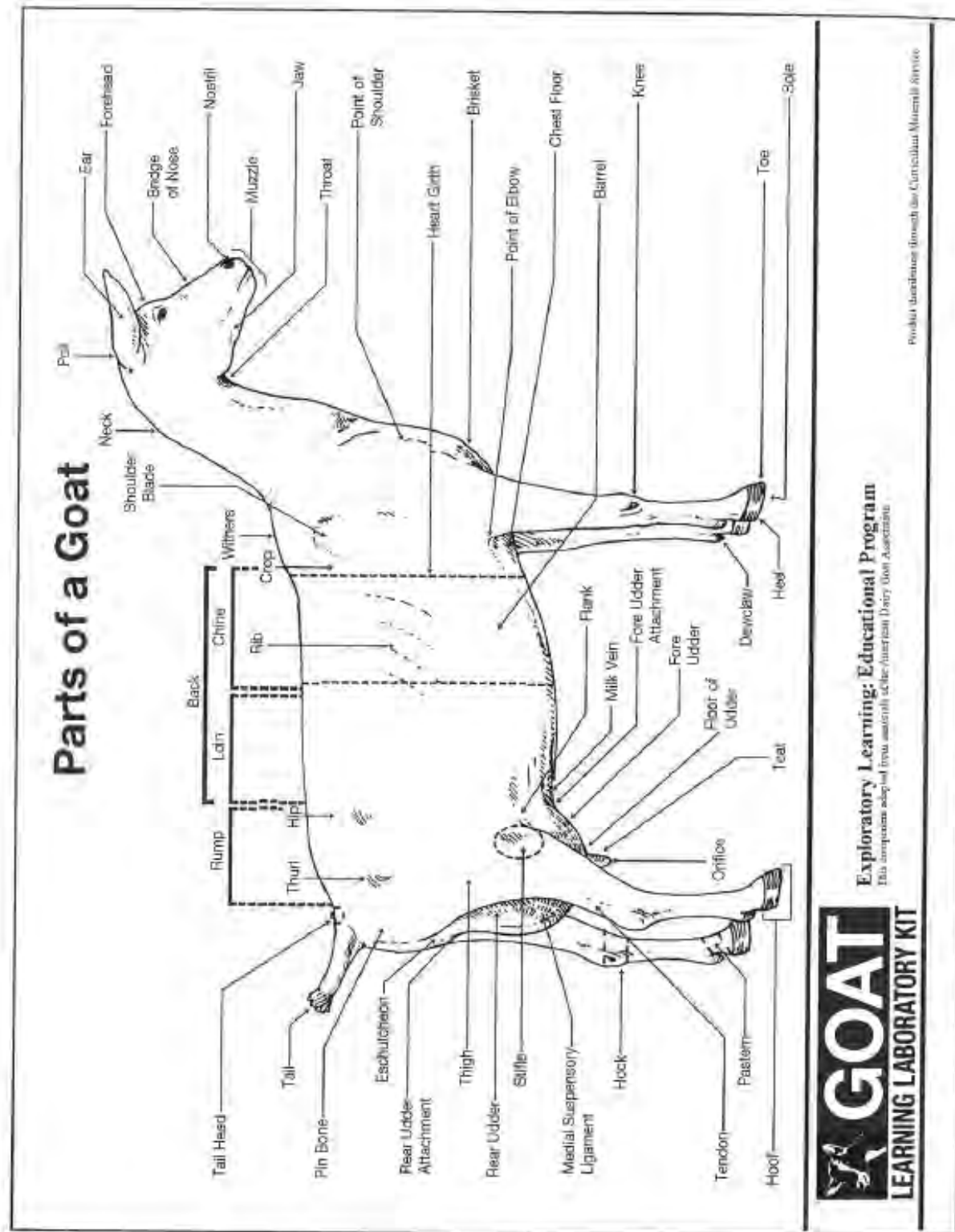
For more information on the selection of beef animals, refer to the Pennsylvania 4-H Livestock Judging Manual that can be found at [www.ohio4h.org/publications](http://www.ohio4h.org/publications) or the Ohio 4-H bulletin 103R Beef, Sheep and Swine Selection and Evaluation. This publication can be purchased at your local Ohio State University Extension office or go to <http://estore.osu-extension.org>.

Ohio residents receive the best price when they order and pick up their purchases at their local Extension office.

### Evaluation of Feeder Calves

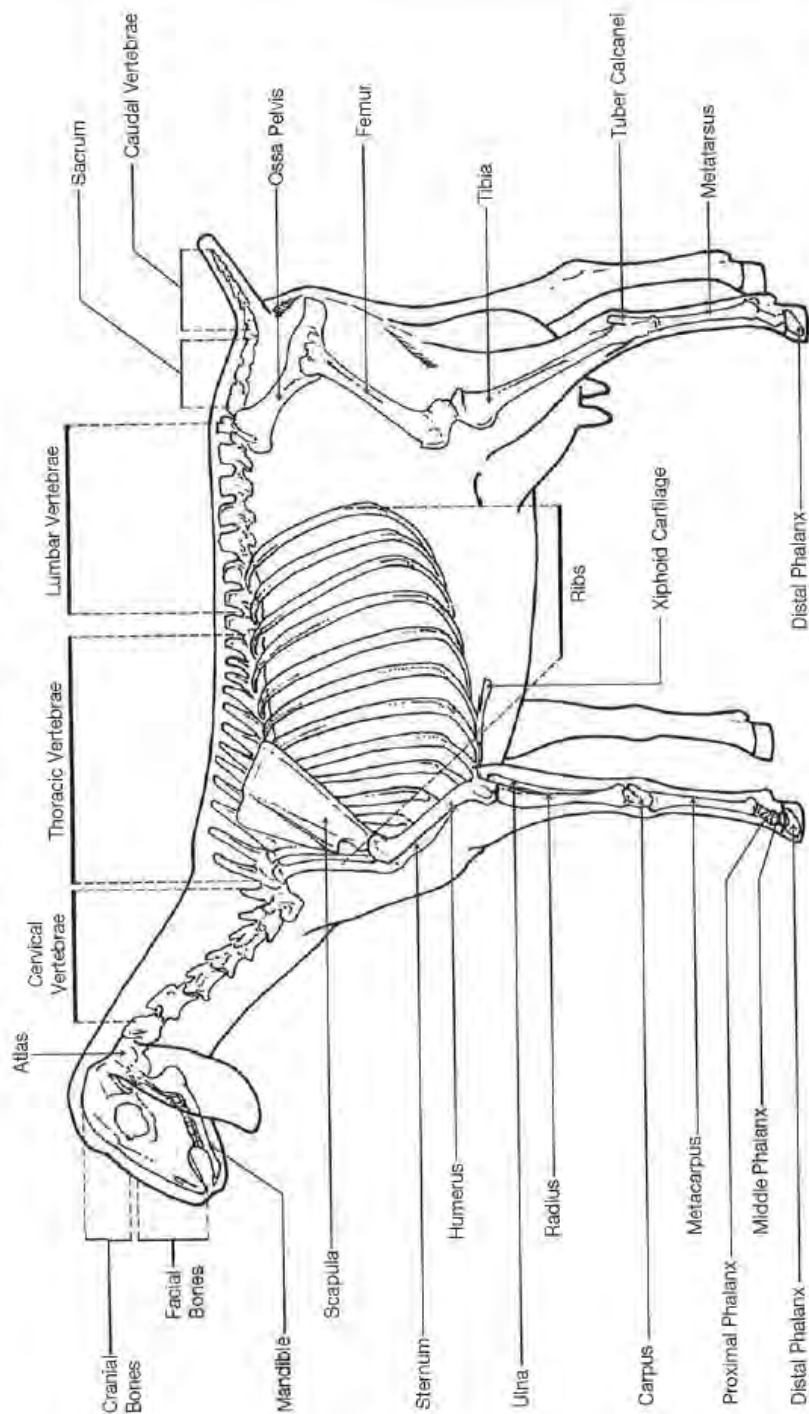
The selection and evaluation of feeder calves is very similar to that of market cattle. Keep in mind the feeder calf will eventually become a market animal so meat production should be emphasized. One significant difference when evaluating feeder calves is that finish, or fat cover, is not a priority. In fact, excessively fat feeder calves can be an indication of small frame size or very early maturity.







## Goat Skeletal System

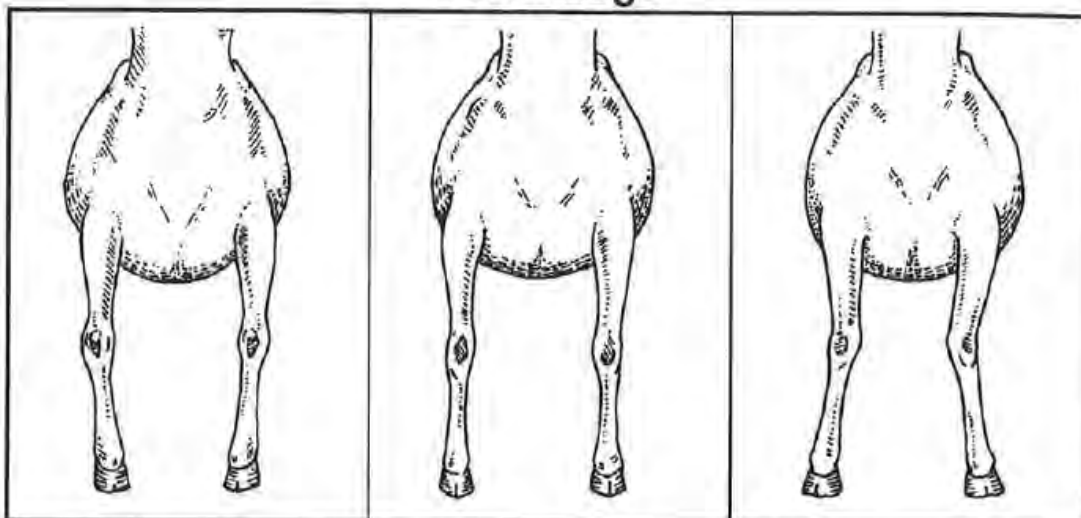


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# Goat Feet and Leg Structure (Part I)

## Front Legs

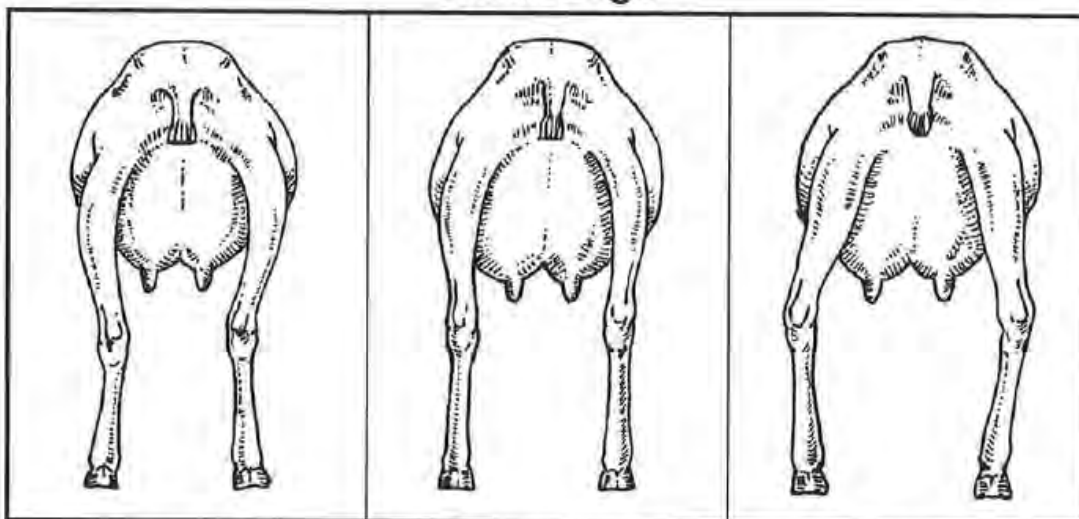


Buckled Knees

Ideal

Knock-Kneed

## Rear Legs



Close at the Hocks

Ideal

Bowlegged

 **GOAT**  
LEARNING LABORATORY KIT

**Exploratory Learning: Educational Program**

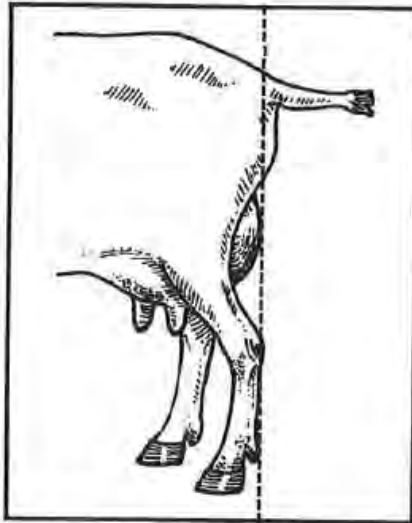
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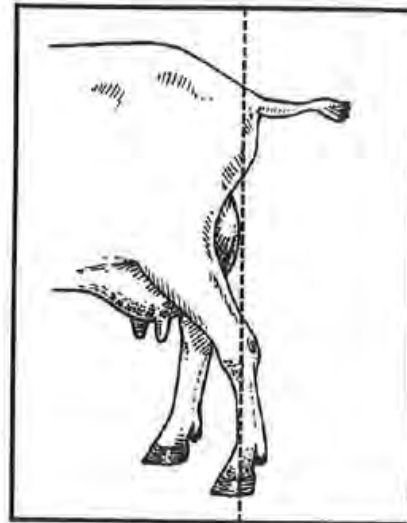




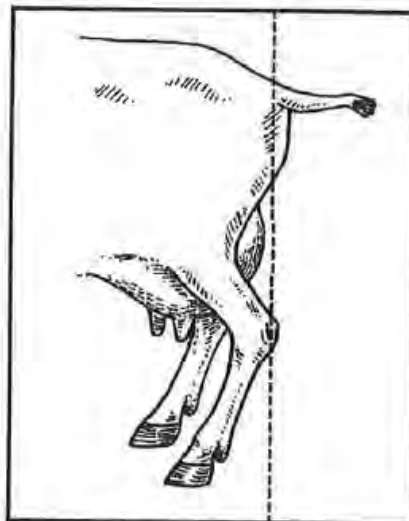
## Goat Feet and Leg Structure (Part II)



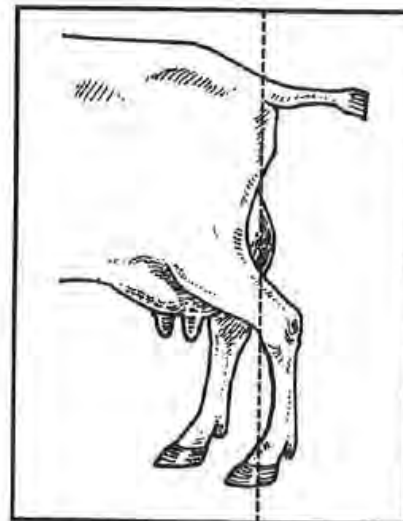
Ideal Rear Legs



Post-Legged



Sickle-Hocked



Weak Pasterns

 **GOAT**  
LEARNING LABORATORY KIT

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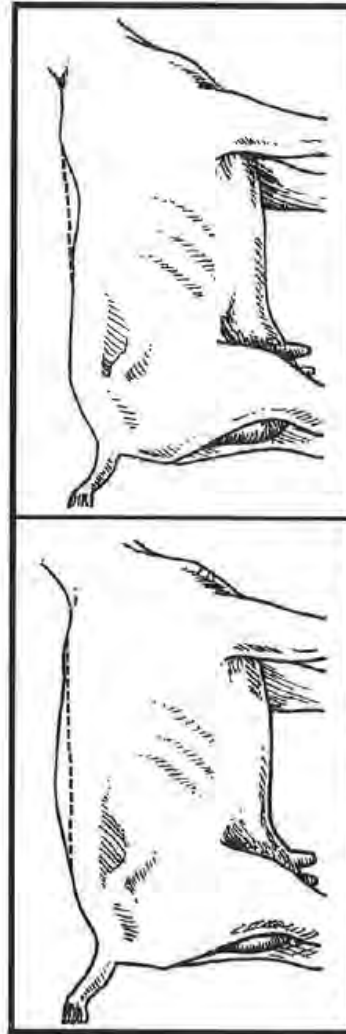
## Goat Topline Structure



Wavy Back

Ideal Back

Sway Back



Roached Back

Weak in the Chine



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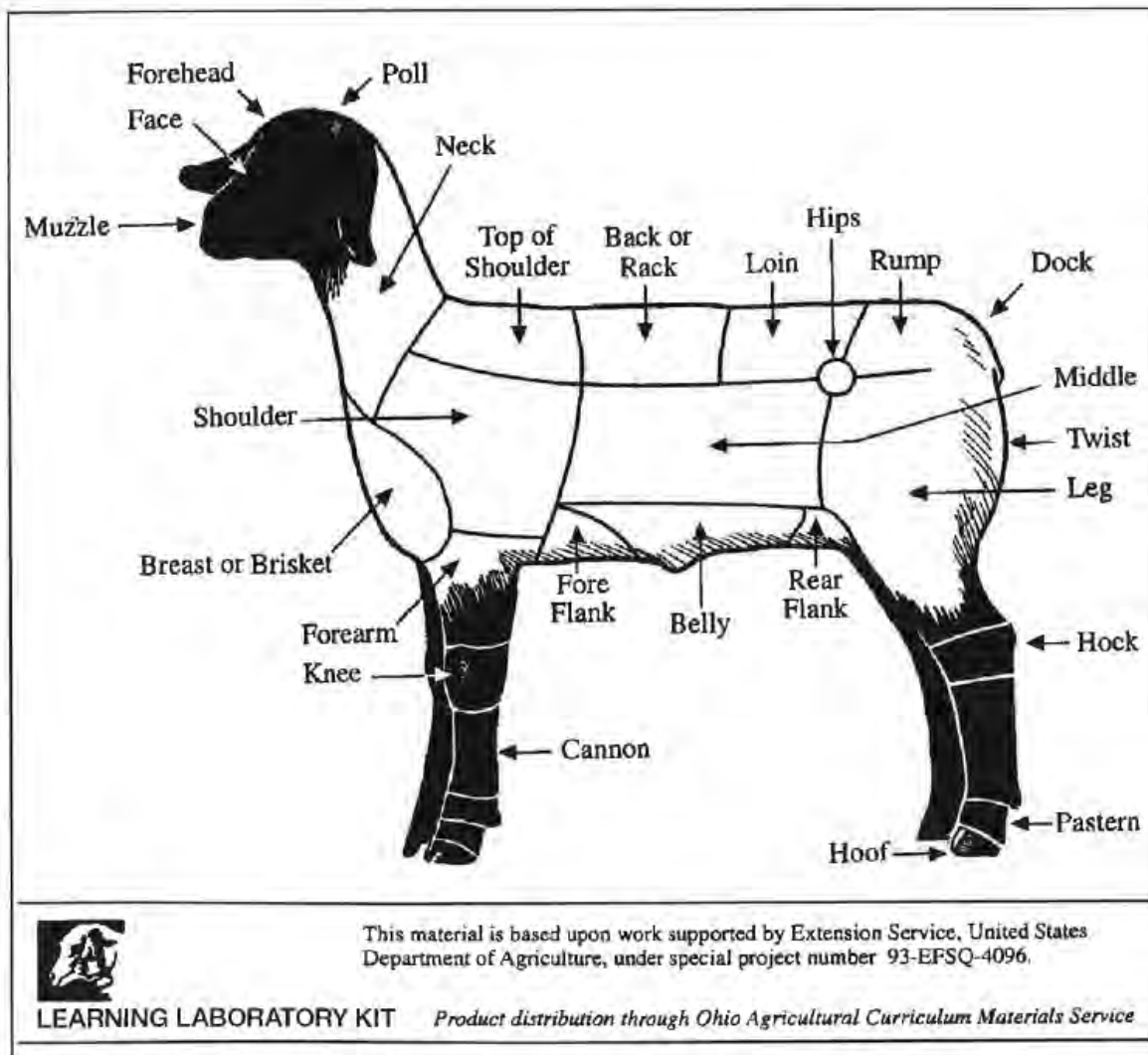


## Judging Market Lambs

The main points to consider in judging market lambs are structure, type, muscling, and finish. (See Figures 3 and 4.) Evaluation of carcass merit is an estimate that measures the relationship between finish and muscle.

## Parts of the Lamb

To be successful in raising and selecting sheep, you should know the names of the various parts of the animal and their locations on the animal's body. Using industry-accepted terms helps you know what to look for and to accurately describe an animal's traits (Figure 1).



**Figure 1**  
*Parts of a Sheep*



## Conformation

An ideal market lamb is one that combines weight and frame, correctness, natural muscling, and trimness. The ideal market lamb weighs between 115 and 140 pounds, has adequate frame, is long-bodied, and is clean and trim throughout the front end and middle. Look for a strong, level topline. Your lamb should be especially long and level through the loin and rump (hindsaddle) standing on a sound, structurally correct set of feet and legs (Figure 3).

## Balance

This is the proportion of body parts. The lamb should be strong-topped and level-rumped, with a long neck and head. It should also be clean and trim (Figure 3). Muscling should be uniform from shoulder getting progressively thicker through to dock.

## Capacity

The body capacity should be moderately deep and square, with the ribs sprung wide throughout

the chest cavity. The depth should continue the length of the animal's body in a uniform manner from the fore flank to the rear flank (Figure 3). Body capacity is important for maintaining health, intake of feed, and adequate reproductive volume.

## Muscle

The ideal market lamb should exhibit extra muscling through its top, hindsaddle, and leg. These are the areas from which the high-priced cuts of meat come from. An indication of muscling is thickness through the center of the leg. When viewed from the rear, the lamb should stand naturally with its legs wide apart. Natural thickness over the top will be visible with a slightly rounded appearance and good width, length, and depth of loin. There should also be good width and length of rump (Figure 4) and muscle expression in the forearm.

NOTE: Natural muscle is round, not square. If the animal is starting to square up over the loin edge, an assessment of over fatness should be made.

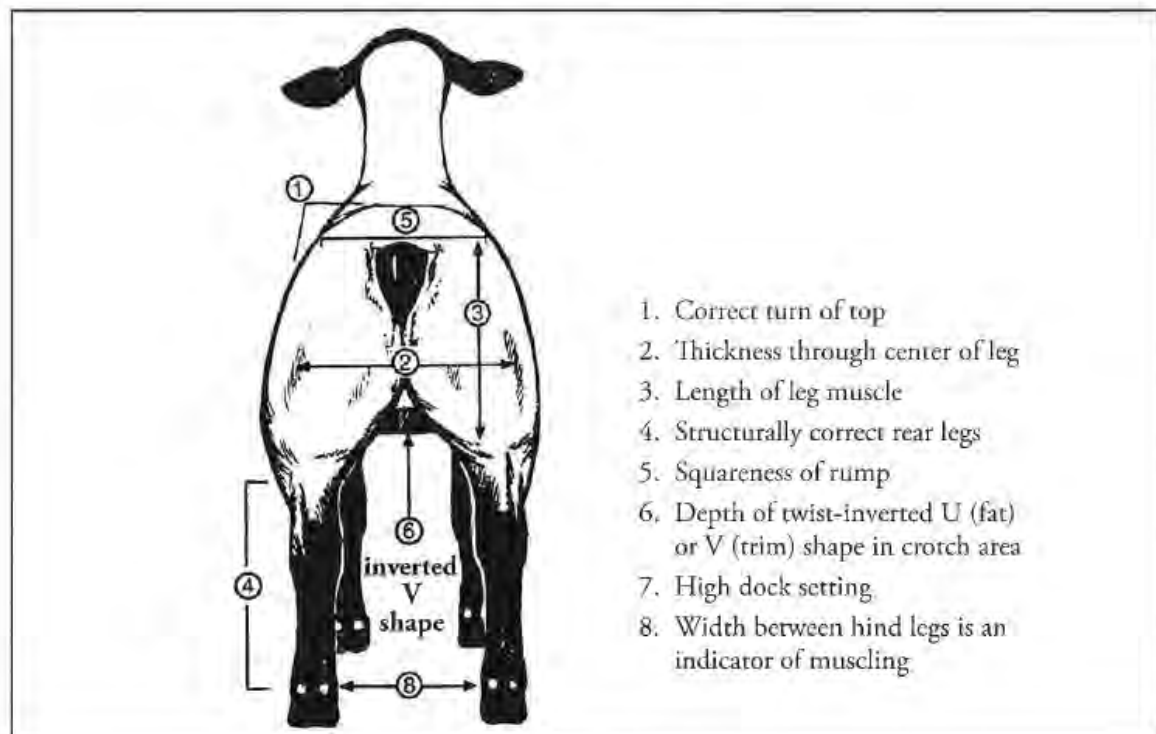


Figure 4



## Structural Soundness

Skeletal correctness in feet, legs, and mouth should be evaluated when selecting a lamb for your project. The lamb should be evaluated on the move as well as being held by someone and being braced if possible. This gives you an idea of how the lamb will look to the judge at the fair whether the lamb is being held or on the move. Evaluate the structural soundness from the ground up.

### Forelegs

The correct placement of the foreleg (Figure 5) has a vertical line from the point of the shoulder to the ground and divides the leg into two equal halves. The line splits the knee, fetlock, and foot.

Calf-kneed (Figure 5) is when the knee is bent slightly backward. A lamb can also have weak pasterns (Figure 5). Buck-kneed (Figure 5) is when the knee is bent slightly forward.

A splayfooted (Figure 5) lamb has toes that point outward. As the lamb walks, the foot will “dish in” toward the other limb. A pigeon-toed animal (Figure 5) is the reverse of one that is splayfooted. The toes point inward and the animal will paddle or “wing-out” as it walks. A knock-kneed lamb (Figure 5) has knees that are set too close together. Often, an animal will be both knock-kneed and splayfooted.

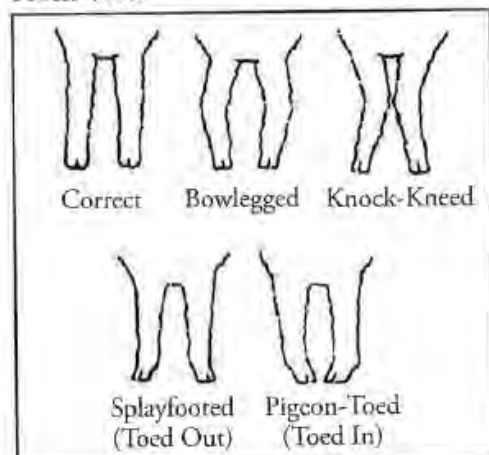
A bowlegged animal (Figure 5) has the opposite condition of a knock-kneed lamb.

### Hind Legs

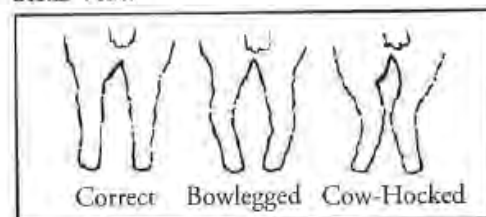
A correctly set hind leg depends on the angle at the hock joint that is formed by the gaskin and cannon bone. Try to visualize a straight edge that touches the pin bones, as illustrated in Figure 5. If the straight line appears to touch the rear edge of the cannon bone, the lamb will have the proper set to the hind leg. This will be true even if the feet are placed more forward or behind the “line.”

## Leg Descriptions and Illustrations

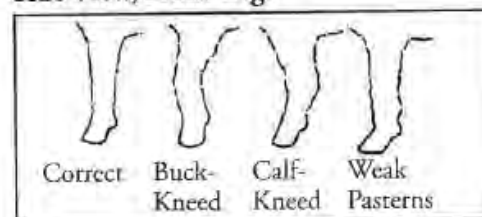
### Front View



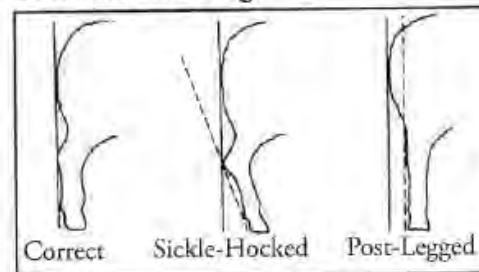
### Rear View



### Side View, Front Legs



### Side View, Rear Legs



**Figure 5**

After viewing several lambs, you will soon realize that the angle at the hocks varies. The greater the degree to which this angle varies, the more incorrect the animal is and the more serious the fault (Figure 5).

The sickle-hocked lamb (Figure 5) has too much set or angle at the hock. In horses, this defect causes curbing, a bony growth on the back of the hock that develops because of strain on the joint. This can occur in sheep, but rarely does, because a sheep does not strain the hock to the same extent as a horse.

A more serious fault is a hind leg that is too straight, or post-legged (Figure 5). This condition changes the angulation of the bones at the hock and the stifle joint and shortens the stride. The patella (knee cap) at the stifle joint may be displaced resulting in a stifled, lame, unsound animal.

Figure 5 illustrates the proper set to the hind leg when the animal is viewed from the rear. Figure 5 shows a cow-hocked lamb. With this condition, the hocks are too close together, the cannons are not parallel and the toes deviate extremely outward. A lamb with this defect has an unsightly, inefficient gait.

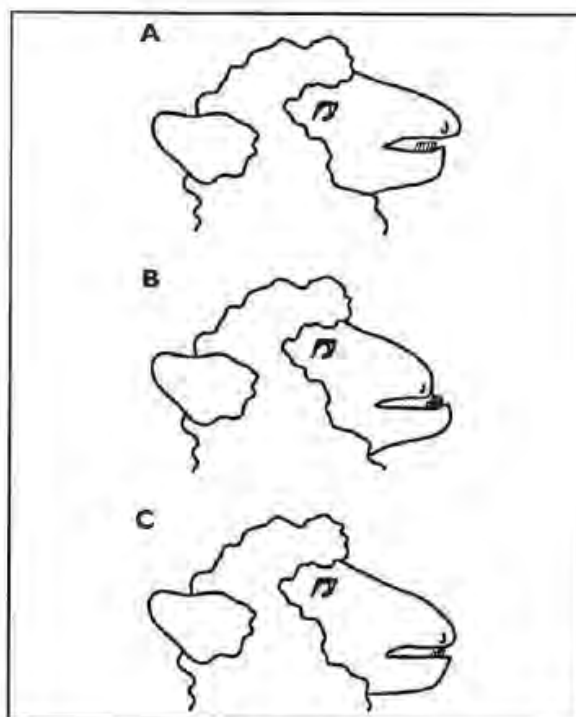
A lamb can also be bowlegged off the hind legs (Figure 5).

## Sheep Jaw Structure

(See Figure 6.)

- A. Undershot (Parrot-mouth)—in this situation the lower jaw is too short.
- B. Overshot (Monkey-mouth)—the lower jaw is too long, and the teeth are in the front of the upper mouth pad.
- C. Normal mouth—the top and bottom jaws are properly aligned. Note that the incisor teeth are flush with the pad on the upper jaw.

Unsound mouth diagrams such as A and B are inherited traits that interfere with the sheep's ability to gather food.



**Figure 6**  
(North Central Region Extension  
Publication #300)

## Finish

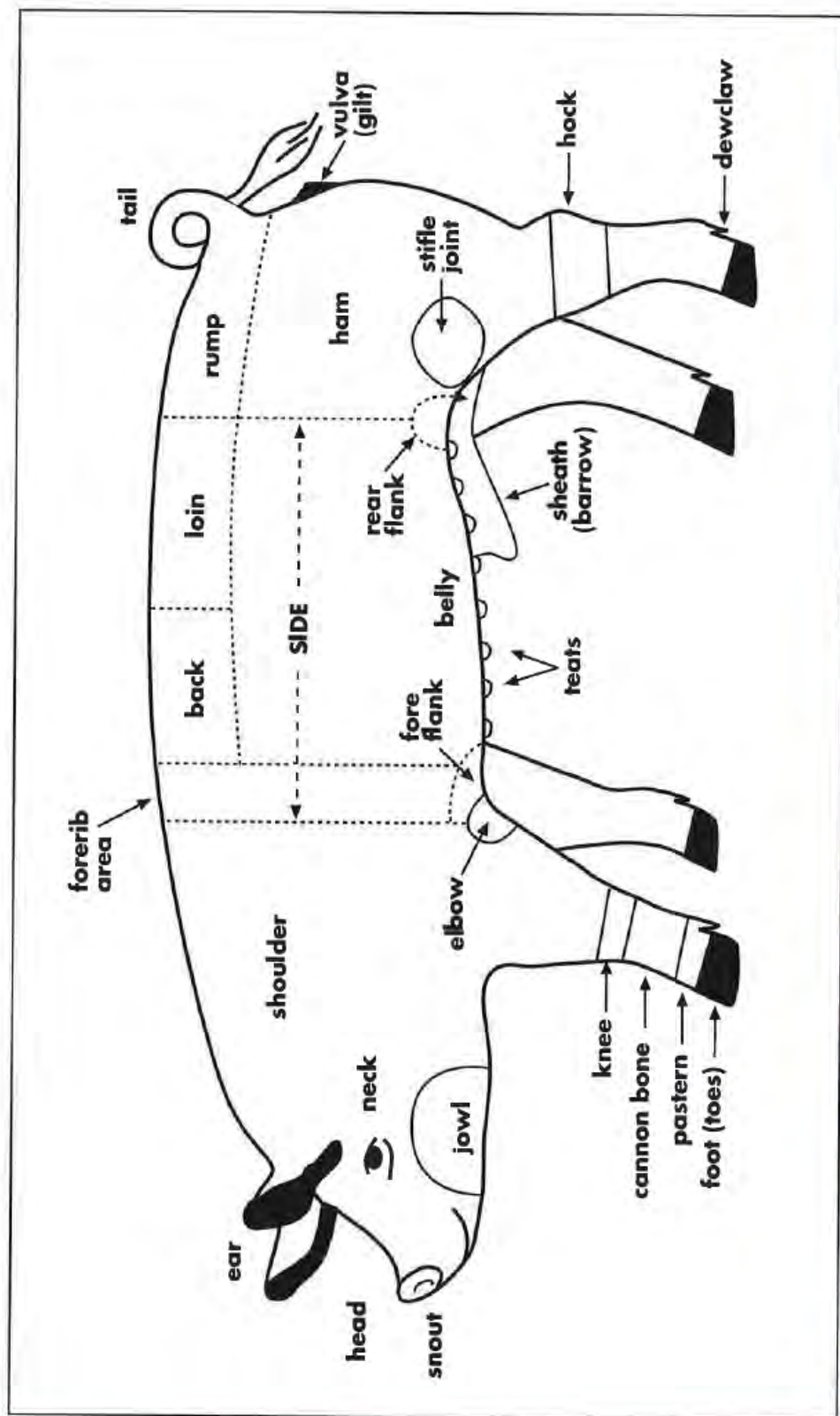
Correct finish is important to determine the cutability (retail value) of a lamb. Finish is the amount of external fat on a lamb. To determine the amount of finish, handle the lamb over the backbone and ribs. Excessive prominence of the backbone and ribs shows a lack of finish. Too much finish is present when you cannot feel the backbone or ribs by normal handling methods. Correct finish is 0.15–0.25 inches of backfat. Desirable traits in regard to finish include: smooth and uniform fat cover over the ribs; no excessive fullness in breast; a uniform fat cover of 0.15–0.25 inches.

Finish or Condition is evaluated in the:

- sternum
- over backbone and loin (12th and 13th rib)
- lower forerib
- flank
- upper rear rib
- twist

The measurement over the 12th and 13th rib is the only measurement used in the current USDA yield grade equation.





This material is based upon work supported by Extension Service, United States Department of Agriculture, under special project number 93-EFSQ-4096

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Figure 3.1  
Parts of the pig

## Breed Associations

Breed	Name of Association	Address
Duroc	National Swine Registry/United Duroc	P.O. Box 2417
Hampshire	Association /Hampshire Swine Registry/	W. Lafayette, IN 47996-2417
Landrace	American Landrace Association/	765/463-3594 (phone)
Yorkshire	American Yorkshire Club	765/497-2959 (fax)
Berkshire	American Berkshire Association	P.O. Box 2436 W. Lafayette, IN 47996-2436
Chester White	Chester White Association	P.O. Box 9758 Peoria, IL 61612-6320
Poland China	Poland China Record Association	P.O. Box 9758 Peoria, IL 61612-6320
Spotted Swine	Spotted Swine Breeders	P.O. Box 9758 Peoria, IL 61612-6320
Tamworth	National Tamworth Swine Association	200 Centenary Road, Winchester, OH 45697
Hereford	National Hereford Hog Record Assoc.	Route 1, Box 37 Flandreau, SD 57028-0037

### Size Consideration/ Structure

Regardless of breed chosen, it is very important when selecting your project pigs to select ones at the right weight and size. If a pig is to weigh 240 pounds by fair time, a 60 pound pig needs 100–110 days to attain that size. Forty pound pigs need 125 days. Select a weight that is appropriate to the amount of time you have from project start until fair time. Expect the average growth rate for a feeder pig to be 1.5–1.75 pounds daily gain.

When selecting size, don't forget to consider frame size as well. Frame size plays an important part in the weight of your pig. If you have a large framed barrow or gilt, it can carry 240–280 pounds much easier and better than a smaller framed animal. The smaller framed pig will appear to be fatter.

### Selecting the Right Type of Pig

Selecting pigs of the right type can be a difficult task because 40–60 pound pigs will not show the differences in body shape that larger pigs do. However, by developing a checklist of characteristics you need to consider for project selection, you can more accurately assess the potential of the project animal.

This list includes:

1. Breed of parents
2. Breed type/appearance
3. Performance history of parents
4. Visual observation and measurement of performance of relatives at 230–260 pounds (Figure 3.2)
5. Carcass evaluation of relatives



**Figure 3.2**  
**Monitor Swine Performance**

Get a picture of a past champion market hog from a county or state fair. Memorize how that ideal market hog is designed. Keep in mind this “ideal” type of pig so you can look for its characteristics as much as possible (Figure 3.3).

## Characteristics You Should Look For

### Conformation

This refers to the general body shape of the pig as determined by its framework or skeleton and muscle structure. A large-framed, longer-sided pig will grow and reach a heavier market weight faster, yielding a carcass with more total muscle than that of a small-framed, shorter-sided pig. Poor management, improper feeding or poor health will prevent either type of pig from developing to its genetic potential.

### Muscle

The ideal muscle pattern in today’s meat hog is long, thick, and smooth. This muscle structure can best be observed by viewing the ham (Figure 3.4). Also, because this muscle structure is somewhat loose, the pig is able to move more freely off his front and rear legs.



**FIGURE 3.3 APPENDIX**

**IDEAL MARKET HOG DESIGN**

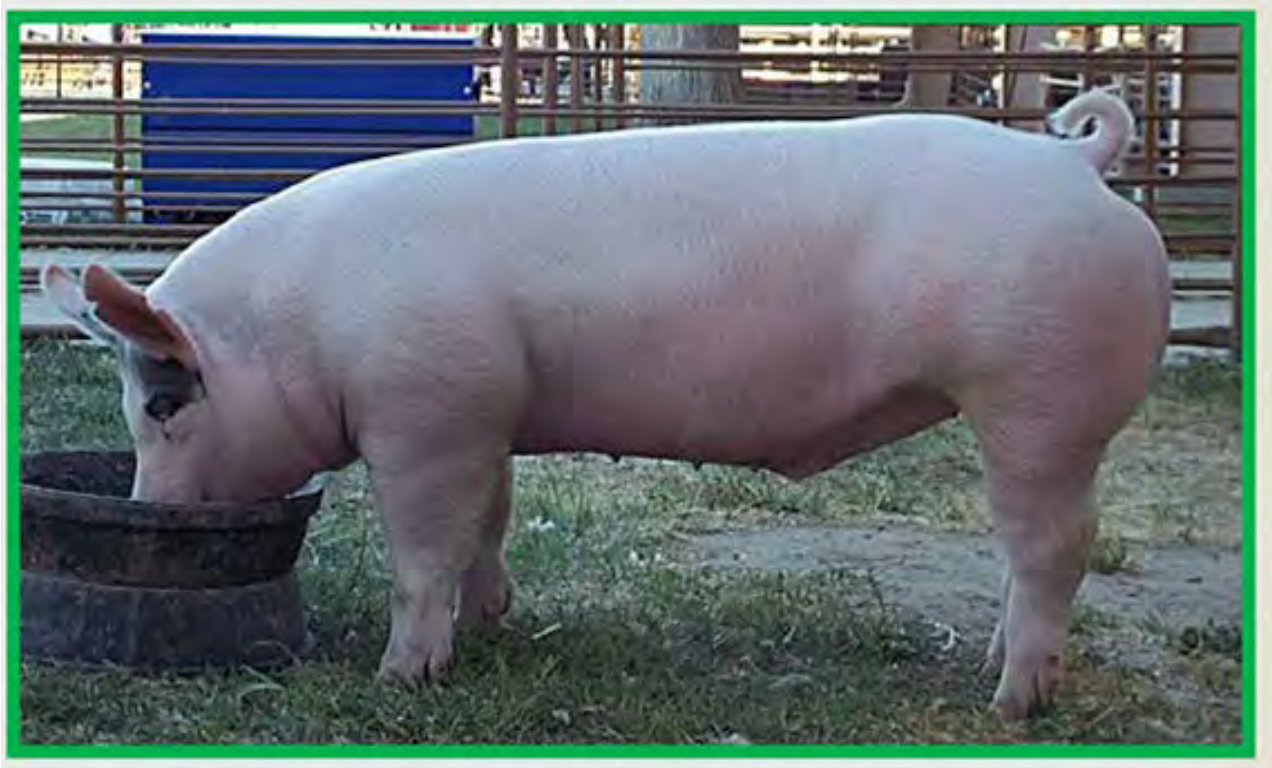
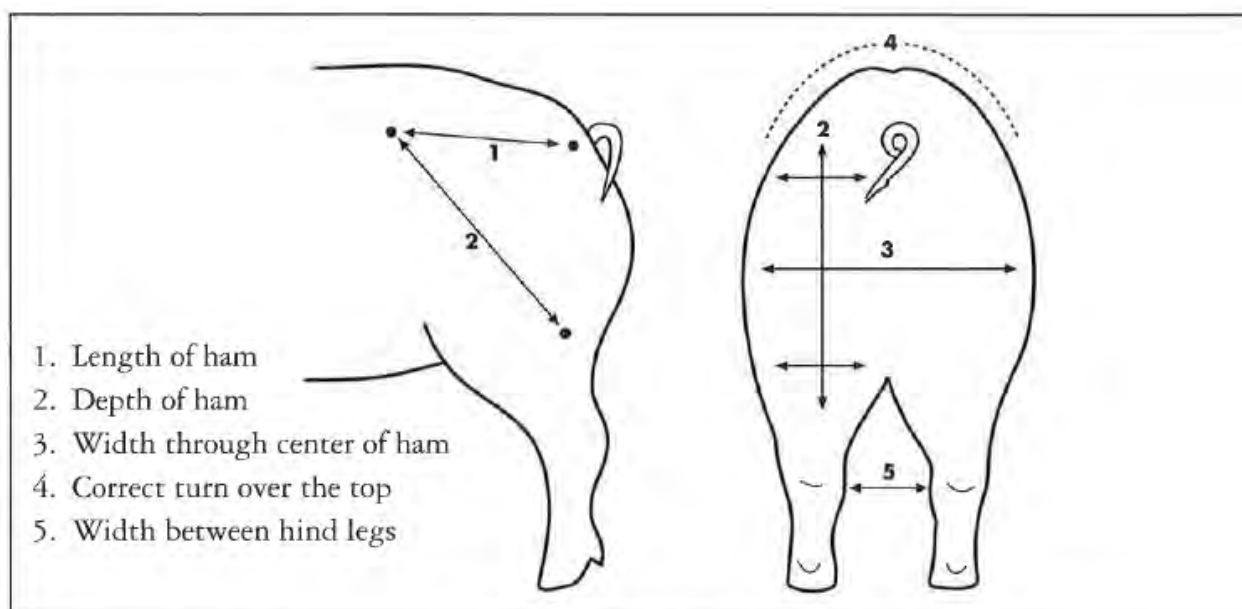


Image from *Livestock Judging Guide* by Neal Smith, University of Tennessee 2013.



**Figure 3.4**  
**Points to consider in appraising muscling.**

Don't confuse type of muscling with the amount of muscle. There is a need for an adequate amount of muscling in the ham and loin region, but it must be long and smooth rather than tight and round. Some extremely thick-muscled pigs may carry an inherited defect known as the Porcine Stress Syndrome (PSS), which contributes to stress susceptibility. When a stress-susceptible

(PSS) pig is excited by movement or fighting, he will begin to tremble and go into shock and may even die. If PSS pigs do not die, they will have carcasses that will yield pale, soft, watery pork. Also, because PSS pigs are often short and steep in their rump structure, females may have more difficulty giving birth. (See Figure 3.5, 3.6, 3.7.)



**Figure 3.5**  
**Light Muscled**



**Figure 3.6**  
**Round Muscled**



**Figure 3.7**  
**Ideal Muscled**



## Fat

Fat has been identified as the pork industries' number one enemy. Fat is a primary concern in our health conscious society. Also, fat is costly to the pork producer because it takes 2½ times the amount of feed to produce a pound of fat versus a pound of lean. (Compare Back Views of Figures 3.8 and 3.9)



**Figure 3.8**  
**Fat Market Hog (Back View)**



**Figure 3.9**  
**Lean Market Hog (Back view)**

A small amount of fat is desirable in market hogs, but a large amount is not. Backfat is the best indicator of total fatness of hogs. Other areas that are good indicators of excess fat that can be observed easily include: lower ham region; area over the loin edge; jowl; middle; elbow pocket; behind the shoulder.

## Structure

In today's confinement rearing of hogs, structural soundness is a necessity. Because of the demand for sound, fast growing, durable and efficient breeding stock, the seedstock producers must produce livestock that adapts to a confinement system in the breeding pens, farrowing crates and finishing floors. Hogs with good structural soundness can adapt to these conditions and produce quality carcasses.

Following are brief descriptions of general and particular characteristics of sound structure in hogs.

It takes several features to ensure soundness. Basic body design on a structurally correct hog includes a relatively flat top, level rump, high tail setting, and a sloping, angular shoulder position, which provides a shock-absorbing effect when walking or standing.

Some particular points important to structural soundness include the following:

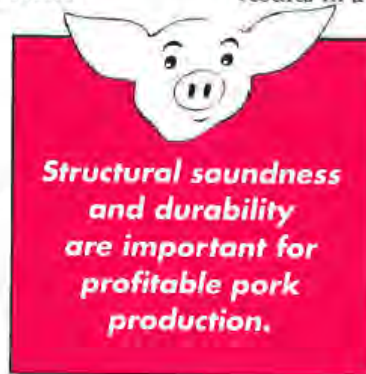
- When the shoulder is too straight, pressure is applied at the shoulder joint and at the knee joint. Because the knee joint offers the least resistance to pressure, the front legs buckle over. Thus, the front legs should angle out of the shoulder into a long, sloping pastern.
- Normal rear leg placement is best described as hocks slightly flexed,

bending into a flexible pastern. This allows the various joints to absorb shock equally.

- The toes should all be evenly sized to allow for more stability on the floor surface. Even toe surface wear occurs because of even weight distribution.
- Larger size of bone is desirable and important for ruggedness and durability, but, not at the expense of structural correctness.
- Desirable movement can best be described as freedom of movement with body weight distributed equally on eight toes.
- Front legs should reach forward with a long, loose stride. A pig will be able to freely raise his head and snout higher than the arch in the center of his back if the skeletal structure is correct. Short, choppy front leg movement appears to be associated with straight shoulders, steep pasterns and strongly arched tops.
- Desirable rear leg action is viewed from the side as long, loose strides with good cushion in both the hock and pastern areas.
- A sound structured market pig should be able to place its rear foot in approximately the same location that the front foot had been, as viewed from the side while walking.

## Structural Soundness

Structural soundness and durability are important for profitable pork production in modern, intensive systems. Study the *undesirable* boar in Figure 3.10. He is steep rumped. The hip (E), stifle (F) and hock (G) lock in a straight line position with each step. This results in more shock to each joint during movement. Also, this boar can be expected to move with a stiff, shuffling gait off his rear legs. Two other structural problems are the top being arched too high and the shoulder blade (A) set in a straight line over the front leg bones. Thus, walking puts stress on the point of the shoulder (B), the knee (C) and the front pastern (D). Sometimes, the pressure will make the knee buckle or remain in a bent position.



Compare the *desirable* structure of the boar in Figure 3.11 to the undesirable boar in Figure 3.10. Observe the more level top line; the longer, more level rump; and the more sloping, angular shoulder blade position (A). The front legs appear to curve slightly backward at the knee (C), and the pasterns (D) slope at about a 60 degree angle. This angularity of the front skeletal structure results in a shock-absorbing or cushioning effect as the boar strides on a hard surface. The rear leg joints also are set with more angle than on the undesirable boar. Notice, too, that the desirable boar appears to stand wider based, with more room between the forelegs. This boar can be expected to move with more action and flexing of knees and hocks.



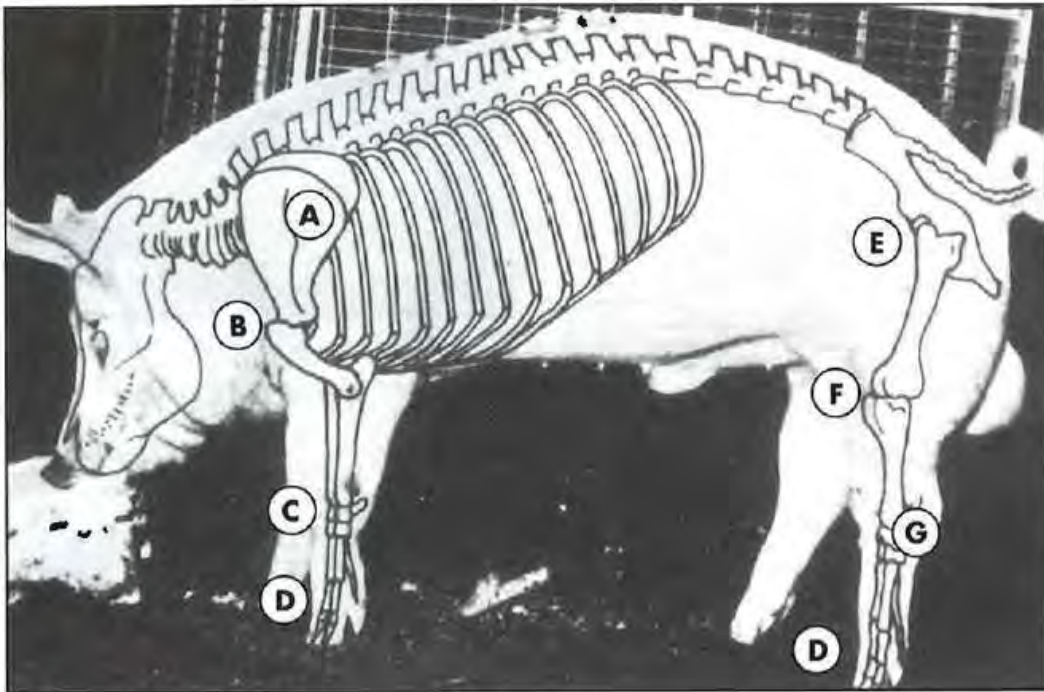


Figure 3.10  
Undesirable Structure

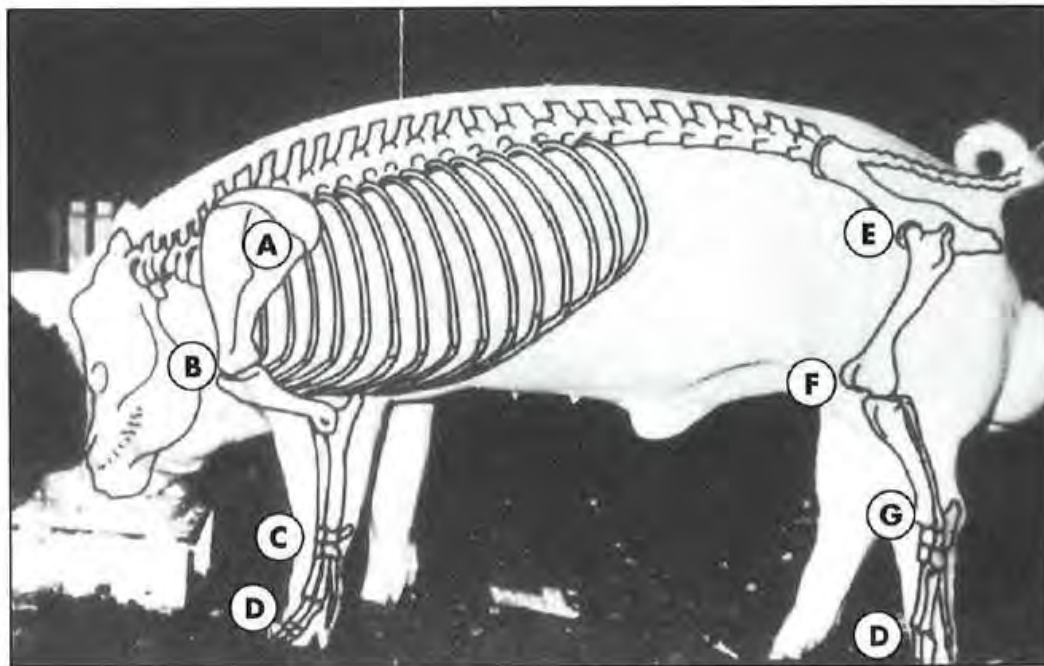


Figure 3.11  
Desirable Structure

## Capacity

The body cavity should be moderately deep and square, with the ribs sprung wide throughout the chest cavity. The depth should continue the length of the animal's body in a uniform manner from the forerib to the rear flank. Body capacity is important for maintaining health, intake of feed, and adequate reproductive volume (Figure 3.12, 3.13).

## Balance

Balance is the proportion of body parts. The pig should be strong topped and level rumped, which allows it to move out freely off its rear legs. (Figure 3.13)



Figure 3.12  
Restricted Capacity



Figure 3.13  
Large Capacity, Well-balanced

# Equipment

Cindy Kinder, Extension Educator

## Goal (learning objective)

Youth will learn about correct, working equipment needed for livestock showmanship and quality classes at the fair

## Supplies

Provide examples of equipment that are in working and non-working order.

Clothing:

- Show Clothes that are clean and pressed. Jeans, long-sleeved, collared shirt, belt, polished boots
- Work clothes
- Tank tops and shorts

Animal equipment:

- Beef: Scotch comb, show halter, show stick, nose lead
- Sheep: Cloth
- Goat: Show collar, choke chain collar
- Swine: Cloth or brush (small, with handle), driving device, spray bottle
- Dairy: Show halter

Table

Beach ball - 1 for each group

3x5 index cards for each species (write Beef, Sheep, Goat, Swine, Dairy on 1 card each)

Flipchart paper and markers

## Pre-lesson preparation

- Review Beef, Sheep, Swine Showmanship videos posted at <https://www.uidaho.edu/extension/4h/projects>
- Familiarize yourself with the showmanship equipment needed for each species
- Check your county's exhibitor guidelines regarding clothing (i.e. sleeve length, foot wear, etc.)

## Lesson directions and outline

Introduction

Showmanship equipment in the showring should be clean, properly adjusted, and in working order. It is important for exhibitors to look the part in the arena as well.

Ask the youth to brainstorm proper show ring dress. Write the responses on the flip chart:

Clothing: When youth step into the show ring, he/she has one chance at making a first impression with the judge (and the public). Clothes should be clean and presentable. Most counties have an exhibitor dress code which outlines specifics regarding sleeve length, collars, fabric type, foot wear, etc. It is important youth know the expectations before stepping into the ring.

Ask the youth to identify show equipment needed for the species they will be exhibiting. List them on the flipchart.

Scotch comb, cloth, brush: These items should be carried in the exhibitor's right back pocket or in a specially designed holder. It is used during the show to "adjust" the animal's coat after the judge has handled it.



**Beef or Dairy Show halter:** A medium show halter is the most useful size because it can be adjusted larger or smaller, fitting most show animals. A properly fitted halter should sit on the bridge of the animal's nose, evenly spaced below the eyes and above the muzzle. The lead strap should be held in the right hand (left hand for Dairy) about 6 to 12 inches from the animal's head. This is usually at the junction of the chain and leather portion of the lead strap. Often, exhibitors will shorten the leather strap a little so it can hang down gracefully without touching the ground. Do not wrap lead straps around your fingers or your hand.

**Goat Show collar:** A show collar has a chain with a leather handle. The collar should be properly adjusted to the size of your animal, not too loose or too tight. Choke chain collars are not recommended.

**Show sticks and driving devices:** For beef exhibitors there are several types of show sticks (wood, fiberglass, aluminium, aluminium alloy, or plastic pipe). Beef show sticks have four sizes (small, medium, large and extra-large). The most commonly used is the large show stick. When selecting a stick the size of the showman and the animal should be taken into consideration. A short stick should not be used by a young exhibitor. The showman must be able to remain in control at the head of the animal and the stick should be long enough so the stick can be used to set hind feet. The skill of the showman guides the decision as to the length and type of end hook needed.

For swine exhibitors, driving devices come in a variety of styles and are typically 36" long.

**Spray bottle:** Spray bottles are used by swine exhibitors to help cool the pig down. These are usually used only once the pig has been penned. However, they can be used if an animal becomes unruly at the out gate. Exhibitors don't carry their spray bottle into the showing but it can be available at ring side when needed.

### **Conducting the activity (DO)**

1. Conduct a relay race. Have your group split up into teams so that there are 6 to 8 members per team.
2. Provide each team with a beach ball
3. At the far end of the room (or area) have a table with all of the equipment on it (both working and non-working) and species cards.
4. From the starting line have 2 members from each team run down to the table. Pick up a species card, and a total of 3 to 4 items of equipment and run back.
5. The next 2 members use the equipment to "show" the beach ball. They have to show the beach ball based on the species card drawn, using all equipment as well.
6. The beach ball is "shown" to the equipment table where the species card and equipment is returned.
7. Run back to the starting line and the next two members take a turn. Repeat the activity until all team members have participated.

### **What did we learn? (REFLECT)**

- Ask: What did you learn?
- Ask: Was there special equipment for some species and not others? Why?
- Ask: Are there special uses of the equipment for some species and not others (i.e. beef show stick is different than the swine show stick)? Why?

### **Why is that important? (APPLY)**

- Ask: Can you do a job if you don't have the correct equipment?
- Ask: What is the importance of making a positive first impression?
- Ask: Why is safety important during showmanship classes?
- Ask: What lifeskills does showmanship teach?

## Resources

Ohio State University Extension. (2011). Getting Ready for the Show. *Beef resource handbook*. (pages 9-12 through 9-18).

Ohio State University Extension. (2008). Preparing Your Animal for Show. *Goat resource handbook* (pages 175-176).

Ohio State University Extension. (2011). Showing and Selling. *Sheep resource handbook for market and breeding projects* (pages 91-93).

Ohio State University Extension. (2000). Showing Your 4-H Market Hog. *Swine resource handbook for market and breeding projects* (pages 12-1 through 12-5)

University of Idaho Extension Beef Showmanship video (#72999) available at: <https://youtu.be/E-7UF-qiSjS4>

University of Idaho Extension Sheep Showmanship video (#72898) available at: <https://youtu.be/2B-VEegUchds>

University of Idaho Extension Swine Showmanship video (#72998) available at: <https://youtu.be/22e-p02oH08>

# Getting Ready for the Show

Cindy A. Kinder, Extension Educator

## Goal (learning objective)

Youth will learn about the importance of preparation.

## Supplies

- Three “mystery” sacks or boxes containing the following items:
  - a. Sack 1: Beef show items including: adhesive, foam, show halter, stick, comb
  - b. Sack 2: Loaf of bread, peanut butter, jelly, plate, butter knife
  - c. Sack 3: Swine show items including: water bottle, cane or show stick, brush or rag
  - d. Sack 4: Sheep and goat show items, cloth, show collar, spray bottle, small brush
- Livestock show supply catalogs

## Pre-lesson preparation

- Review the information in the Ohio Resource Handbook for each species (see resources).
- Obtain livestock show supply catalogs

## Lesson directions and outline

Share the following information with the youth:

Most fairs are held in late summer and fall. Ask the youth to share ideas of why fairs are held at that time of the year.

Members have a certain number of days to prepare their exhibit for fair. Typically the time frame is 150 days for beef, 100 days for swine and 60 days for sheep and goats, 90 days for horse and 100 days for dairy.

Have the youth list the items they need to have to be ready to show. If you have access to livestock show supply catalogs have them make a wish list of items they would like to have to help them prepare for the show.

## Conducting the activity (DO)

1. Split the youth into four groups, have a volunteer come to the front to get a sack, do not let them open/look into the sack initially.
2. Announce to the teams that they have to get ready for a “Beef Show.”
3. Have teams open their sack and prepare for the show.
4. Call on each team to perform their class at the “Beef Show”. The teams that received sack 2, 3 or 4 will not be prepared.
5. Now have the teams get ready for a “Picnic at the Park.”
6. Call on each team to quickly showcase their picnic. The teams that received sack 1, 3 or 4 will not be prepared.
7. Lastly, have the teams get ready for a “Swine Show.” The teams that received sack 1, 2 or 4 will not be prepared.
8. Have the teams perform their class at the “Swine Show.”
9. Now have the groups get ready for the “Sheep or Goat Show.”
10. Have the groups showcase their sheep or goat show. The groups that received sack 1, 2 or 3 will not be prepared.

**What did we learn? (REFLECT)**

- Ask: What team was ready for the Beef Show?  
Swine Show? Picnic at the Park?
- Ask: Although there was not a sack with sheep/  
goat items what materials are needed to prepare  
for their show?
- Ask: Could all teams be successful at each show?  
Why or why not?
- Ask: How did it feel to not be prepared for the  
show?

**Why is that important? (APPLY)**

- Ask: What types of things would be considered  
“preparation” for the fair?
- Ask: Does preparation take time? What are some  
things that could happen without preparation?
- Ask: How can you relate this activity to a job inter-  
view? Who is going to get the job?

**Resources**

Ohio State University Extension. (2011). Getting Ready for the Show. *Beef resource handbook* (pages 9-2 through 9-5 and 9-13 through 9-19).

Ohio State University Extension. (2008). Preparing Your Animal for Show. *Goat resource handbook* (pages 175-177).

Ohio State University Extension. (2011). Showing and Selling. *Sheep resource handbook for market and breeding projects* (pages 91-96).

Ohio State University Extension. (2000). Showing Your 4-H Market Hog. *Swine resource handbook for market and breeding projects* (pages 12-1 through 12-5).

University of Idaho Extension Beef Showmanship video (#72999) available at: <https://youtu.be/E-7UF-qjSjS4>

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University of Idaho Extension Swine Showmanship video (#72998) available at: <https://youtu.be/22e-p02oH08>

# Grooming - Beef

Cindy Kinder, Extension Educator

## Goal (learning objective)

Youth will learn about fitting their beef project for show.

## Supplies

- Copies of Handout 1 - *Grooming Beef Cattle* (enough for group)
- Copies of Handout 2 - *Beef Worksheet* (enough for group)
- Copies of *Fitting for Showtime*
- Flipchart paper and markers
- Colored pencils - enough for 3, different colored pencils for each member of the group
- Show Foam
- Show Adhesive
- Light finishing oil (Final Bloom or Pink Oil)

## Pre-lesson preparation

- Read/review Ohio State University Extension. (2011). Beef resource handbook, Getting Ready for the Show. (pages 9-3 through 9-12).
- Become familiar with Handout 1 – Grooming Beef Cattle

## Lesson directions and outline

Ask the youth why grooming livestock is important. Discuss potential advantages and disadvantages. List the answers on the flipchart.

There are several basic products needed for the show. Have the youth list the products and equipment that can be used. Write the answers on the flipchart.

The main products that will be discussed in the activity are show foam, spray adhesive and light finishing oil.

## Conducting the activity (DO)

1. Distribute Handout 1 and Handout 2 and Fitting for Showtime.
2. Provide three colored pencils (be sure all are different colors) to the group.
3. Teach to the resource materials in the Ohio Beef Resource Handbook.
4. Talk to the youth about the difference between a type of spray sheen, show foam, adhesive and a light finishing oil. Have a volunteer spray each of them so members have an opportunity to see and feel the difference.
5. Have youth color on the worksheet with one colored pencil, the areas where show foam should be applied on the animal.
6. Next, have members use a different colored pencil, coloring the worksheet where adhesive should be applied.
7. Using the third colored pencil, draw arrows on the animal the directions the hair should be combed for both the show foam and adhesive.

## What did we learn? (REFLECT)

- Ask: What are two basic products used in fitting beef for show?
- Ask: What does “boned” mean, as it applies to fitting animals?
- Ask: Why is hair combed forward?
- Ask: What does show foam and adhesive feel like? Are there differences in their uses?

**Why is that important? (APPLY)**

- Ask: Why is it important to select the right product for the use? What are some examples of product choices you make?
- Ask: What safety considerations need to be made when fitting your animal?

**Resources**

Kinder, C. (2013). *Fitting for Showtime*. University of Idaho Extension. Retrieved from <http://extension.uidaho.edu/gooding/files/2013/04/6-beef-fitting.pdf>

Ohio State University Extension. (2011). Getting Ready for the Show. *Beef resource handbook* (pages 9-3 through 9-12).

Steer clipart retrieved from <http://www.showsteers.com/art%20work/>



## GROOMING: BEEF – HANDOUT 1

## GROOMING BEEF CATTLE

Preparing beef cattle for exhibition at livestock shows is done by many people in many different ways. The techniques used are based on individual preference, skill, and knowledge. No matter who does it or how it is done, there are four key steps to grooming beef cattle for exhibition at livestock shows. This handout is a guideline that will describe the steps. They are as follows: **Washing, Drying, Clipping or Trimming, and Fitting.**

### Step 1

#### **Washing**

*Equipment needed:* Soap, Brush, Insect Repellent, Conditioner, Bucket, Water Hose.

To be able to do a nice job preparing the animal for the show, it needs to be clean. The hair needs to be washed. Wet the animal thoroughly. Keep the water away from the ears of the beef. Use a type of soap that will lather well and rinse easily. Apply the soap to the hair. Use a soft brush to scrub the animal and remove excess dirt. Rinse the soap from the animal. **Leaving soap in the hair will burn the hide and cause dandruff.**

To control insects you can use a repellent. Some type of conditioner will make the hair softer and more manageable. Put a small amount of repellent and conditioner in a bucket, mix with water and pour over the animal.

### Step 2

#### **Drying**

*Equipment needed:* Comb, Brush, Water-based Sheen, Spray Bottle, Blower.

Now the beef is clean it is time to get the hair prepared. Generously spray some type of sheen on the hair coat of the animal. This will add shine and bloom to the haircoat. Using a comb and a brush, work the hair in the direction you desire it to go to make the animal look its best. This will also work the repellent, conditioner and sheen into the hair. After the hair has been combed, use the blower to dry the hair. Make sure you blow the hair in the direction you want it because once it dries it is difficult to get it back in place. The hair should be free from cowlicks, curls, and lines; leaving a smooth hair coat when dry. The recommended technique is to start at the head and work toward the rear. Keep the comb handy; you may need to use it while you are drying. **For safety purposes, keep the blower hose away from the legs of the animal.** Proper drying is an important factor in the appearance of the animal.

### Step 3

#### **Clipping or Trimming**

*Equipment needed:* Comb, Flathead Clippers, Sheep-head Clippers, Small Clippers, Clipper Oil, and Grooming Chute.

The animal needs to be **completely** dry when you begin clipping or the blades will dull quickly and the hair won't cut off evenly. **Use extreme care** when using the clippers because they are sharp and can injure you and the animal if used carelessly. If a chute is available, put the beef in it. This will restrain the animal safely.

When you start clipping, use the flathead clippers and start at the tail. Clip the hair in an upward motion starting near the stifle muscle and stopping before the tail head begins to round. By starting at the tail the animal will get used to the sound and feel of the clippers, helping them to relax. Clip excess hair off the sheath or navel. Using a downward motion, clip the hair off the neck starting just in front of the neck and shoulder junction, working toward the head (exact starting and ending points are determined by the conformation of the animal). Make sure you blend the hair in this area. Don't leave a distinct line. If your skill level is high, you may wish to block the neck with the sheep head clippers. Using the flathead

clippers on the neck for summer shows is recommended. This depends on the amount hair on the beef. Clip the hair upward from the brisket to the chin, one clipper width wide. Clip the hair on the head in an upward motion beginning at the cheek, just in front of the ear. Remove all of the hair off the head, leaving a little on the poll if desired. Clip the hair off of the face last. If the animal is not already upset, clipping the face will usually upset them.

The sheep head or small clippers are used next to trim excess hair off of the animal to provide a smooth, neat appearance. Before you begin using them make sure the animal's hair is combed into place. They can be used on the topline, underline, legs, or any other place to blend the excess hair, providing an attractive, balanced look. **Be very careful with sheep head clippers, they are dangerous.** They are recommended for those with a high level of clipping skill. Make sure you have clipper oil. Use it periodically to keep the clippers cool and prolong the life of the blades.

#### **Step 4**

##### **Fitting**

*Equipment needed:* Blower, Comb, Adhesive, Hair Styling Mousse (Show Foam), Final Bloom or light oil, Sheep-head and Small Clippers, Grooming Chute, after show product to remove adhesive.

When you fit the animal begin by blowing the hair. This will remove any dirt and put the hair into place if Step 1 was followed correctly. Using an adhesive, start at the bottom of the rear leg and work toward the hock, combing the hair up at an angle. Apply a small amount of adhesive to a small area at a time. Too much adhesive will cause the hair to get very sticky and unmanageable. This adds the appearance of more bone and appears to straighten the leg. The front legs can be done to the knee in this manner.

The tail head needs to have a square appearance. Apply an adhesive to the tail head to hold it into place. The tail has been groomed in various ways. The most natural way is to make sure the tail is clean and combed to remove snarls or "rats". The tail can be clipped into the shape of a teardrop or cut straight across the bottom. The tail should hang even with the hock of the beef when it is finished.

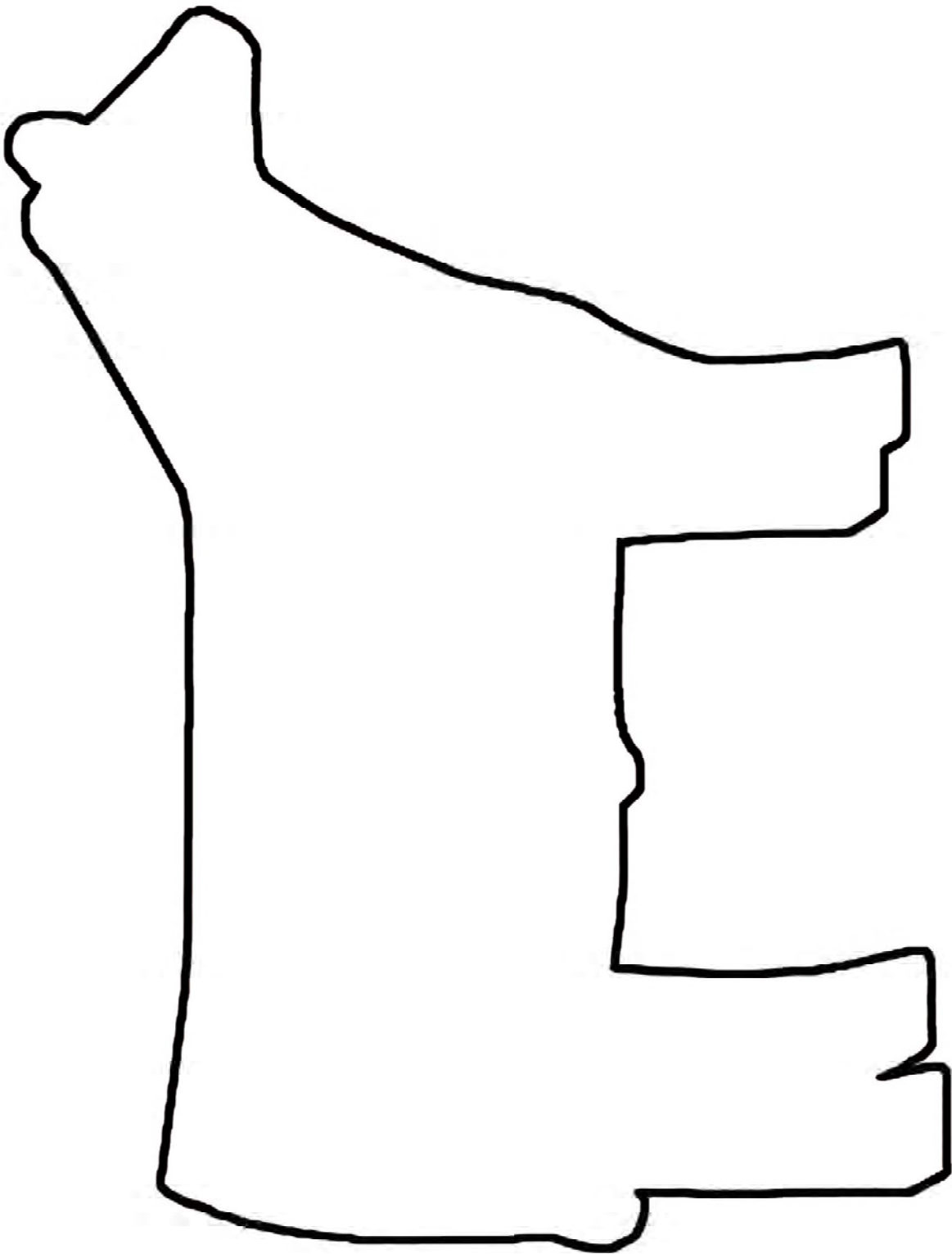
Using the sheep-head or small clippers, trim any excess hair off the legs or tail head to provide a straight, smooth appearance. Spray some type of hair styling mousse (show foam) to the hair to give it set and shine. You may wish to use a blower at this point to give the hair some more body. Prior to entering the show ring, apply final bloom or some type of light oil to provide extra gloss and shine to the hair. Be careful not to spray the areas that have adhesive because the oil will cause the adhesive to lose its holding power. When you finish showing your animal, use an after show product to remove the adhesive, then wash the animal thoroughly. This will help your animal to rest comfortably, reduce stress and keep the hair manageable.

##### **Showing**

Now the beef animal is ready to go into the show ring. Leaving the rope halter on and while still in the chute put the show halter on the beef. Slip the rope halter off and then put it on over the top of the show halter. This will allow you to tie the animal prior to going into the ring if needed. When you remove the animal from the chute, comb the hair and apply the necessary finishing touches.

Make sure your hair is combed, your clothes are clean, and don't chew gum. Have a show stick of the proper length, in your hand (this depends on exhibitor size and animal size) and a comb in your back pocket. Be courteous to the judge and fellow exhibitors, smile, and have fun.

For more information contact, Scott Nash, Regional 4-H Youth Development Educator, University of Idaho Extension, 500 Pocatello Ave., American Falls. ID 83211, 208-317-4375, snash@uidaho.edu





## Fitting for Showtime

The steer is put in the fitting chute and show foam (styling mousse) is applied to the whole side and back. The foam is brushed into the hair in a forward motion. The show foam gives body to the haircoat. Brushing forward helps the steer look smoother and longer

(Photo: Applying show foam)

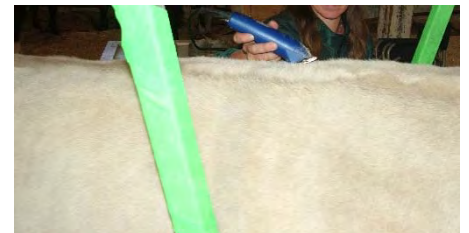
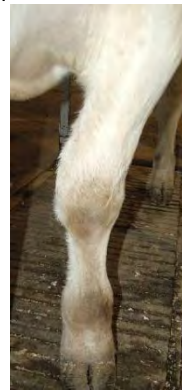
Next the legs of the steer are “boned”.

Spray adhesive is applied to the hair on the legs to help the hair stand up and give the appearance of more bone as well as potentially make the legs look straighter. The adhesive is sprayed on the on the leg hairs and then are combed on an angle forward and up. Start at the hoof line and moved up to the hock on the rear legs and the knee on the front leg. The legs are on all sides. Long hairs can be trimmed.

(Photo: Front leg)



(Photo: Rear legs)



(Photo: Topline)

At the top line the hair is brushed forward and depending if the animal's topline is not straight adhesive can be applied to the hair so the back looks level or straight. The clippers can be used to trim the glued hair so it does not look so obvious.

At the tail head adhesive is applied to make hair stand up and out. The tail head needs to be square so the hip appears level. The clippers can be used to trim the long hair.

(Photo: Clipping tail head hair)



# Halter Breaking and Gentling

Cindy A. Kinder, Extension Educator

## Goal (learning objective)

Youth will:

- Learn about different types of halters and appropriate uses
- Learn about one method of haltering and gentling cattle (beef or dairy), a lamb or goat and gentling a swine

## Supplies

- Flipchart paper and markers
- Rope halter
- Show halter
- Lamb rope halter
- Goat collar
- Horse halter
- Plastic calf head
- Stuffed animal (dog, sheep, calf, etc.)
- Handout 1 - "Halter Breaking" (make enough copies for group)
- Handout 2 - "Halters" (make enough copies for group)

## Pre-lesson preparation

- Make photocopies of Handout 1 and Handout 2
- Gather halters and plastic roping calf head
- Read/review handouts, have an understanding of pressure points used with halters
- Review Ohio State University Extension. (2011). Beef resource handbook Breaking and Training, (pages 3-8 and 3-9) and Getting Ready for the Show. (pages 9-2 through 9-3).
- Review Ohio State University Extension. (2011).

Sheep resource handbook for market and breeding projects, Chapter 8, Showing and Selling (pages 91-93).

- Review Ohio State University Extension. (2008). Goat resource handbook, Chapter 15, Preparing Your Animal for Show. (pages 175-176).
- Review Ohio State University Extension. (2000). Swine resource handbook for market and breeding projects, Showing Your 4-H Market Hog. (pages 12-1 through 12-8).

## Lesson directions and outline

Have the youth brainstorm and discuss the steps necessary to help a first time 4-H member gentle and halter break the project animal they plan to show. List the ideas on flip chart paper. When all the ideas are listed, share the following information with the youth. Take time to recognize the ideas the youth listed.

Halter breaking and gentling is very important for your animals' safety and your own. It plays a critical part to the success of your animal project. Your animal needs to be broke to the halter allowing you to tie the animal up and lead it. Using the proper equipment and method will set you up for success by fair time.

Beef – this first step in breaking and gentling a beef animal is to allow it to settle in to new surroundings for a few days before trying to halter break. Make sure you work with the animal in about a 12' X 12' solid pen. A solid pen can be described as one where the panels holding the pen together are secured to posts with one end of the posts buried in the ground. You can use a long handled broom to rub the back (topline) of the animal to get it used to being touched. As the animal calms down you can move slowly closer until you can scratch the topline of the animal with your hand or a brush. This will help the

animal get used to you. It's best if an adult or older youth helps during this process to keep younger members safe. Once the animal is used to standing you can try to corner the animal using a panel or gate or if available, put in a chute with a head catch to place the halter on the head of the animal.

Depending on your situation you can tie the animal up to a solid post or secure panel (make sure one end of the post is buried in the ground). If you are not ready to tie the animal you may want to let it drag the halter lead rope for a few days allowing the animal to get used to the halter before tying it up. Tie the animal up for a few hours at a time making sure not to leave the animal unattended until it learns how to stand quietly. While the animal is tied try to use a comb and brush on it so it will get used to you rubbing and brushing the hair. Most animals will respond positively when they are scratched in a pleasant manner. Repeat this gentling process until you are able to get the animal to respond when you pull on the halter. As you pull on the halter it will tighten, making the animal move forward to release the pressure. This helps the animal learn to lead when you pull.

As you begin to teach the animal to walk in response to the halter, it is important not to let the animal know it is strong enough to go where it wants to. Control the head and the nose with the halter. When leading the animal keep the head up instead of down. When the head is held up it won't have as much leverage to pull away as when it puts its' head down towards the ground.

Sheep – can be trained to respond to a halter in a similar manner as beef. Typically sheep will gentle down quicker and learn to lead faster than a beef animal.

Goats – can be broke to tie as well in a manner similar to sheep. It can be helpful to teach the goats how to tie and lead with a halter. Goats are generally shown in a collar. Make sure the collar is fitted to the goat. Be careful not to choke the goat when teaching it to work on a collar.

Swine – can be gentled as you spend time letting the pig get used to you. Make sure as you come in contact with the pig your movements are slow and

deliberate. Work to get your pig tame enough so that you can put your hands on it. Use a brush or a rag to help your pig get used to being touched. You don't want you animal to become a pet but you want it to respond favorably when you use a brush or rag to groom and clean it. Train your animal to walk or drive in the direction you want it to move. Use a driving device that you will use in the show ring for consistency. Once your pig is trained to drive start taking it out the pen to get it used to new surroundings, provide exercise and increase the stamina of the pig. Some show classes can take 15 to 30 minutes to complete.

All of these processes take time and repeated practice. Make sure you are consistent and patient. Animals learn from the behavior and treatment of the handler.

### Conducting the activity (DO)

1. Demonstrate putting the halter on the plastic calf head or the stuffed animal head.
2. Have members practice putting on the halter on the plastic calf head or stuffed animal model. (It is a common mistake for youth and adults to put halters on wrong - upside down or backwards).
3. Have youth practice putting the coat collar on the stuffed animal.
4. Have a volunteer distribute the handouts to the group.
5. Review with members the parts of the halter:
  - a. Headstall
  - b. Nose piece
  - c. Chin rope or strap
  - d. Lead rope
6. Review proper fitting of the halter on the animal's head. The lead strap should always be on the animal's left side.
7. Discuss with members how pressure is applied at the cheek and show where the pressure is placed when the halter is put on upside down (the pressure is at the ear).



8. Show the difference between a horse halter and a rope halter. Demonstrate how the horse halter does not put pressure at the cheek whereas the rope halter does.
9. Show the difference between a chain strap and a rope strap under the chin, explain how that can cause an animal to move and react differently.
10. Review Handout 1, discuss the method of halter breaking a calf or lamb.

Ohio State University Extension. (2000). Showing Your 4-H Market Hog. *Swine resource handbook for market and breeding projects* (pages 12-1 through 12-8).

### What did we learn? (REFLECT)

- Ask: What are the differences between a horse halter and a beef halter?
- Ask: Where is pressure applied to teach your animal to lead?
- Ask: What are the similarities between a beef halter and a lamb halter?

### Why is that important? (APPLY)

- Ask: Why is it important to practice leading and working with your animal?
- Ask: Why is it important to work with the appropriate equipment? What can happen if you have the wrong equipment?
- Ask: Where else in life is having the right equipment important?

## Resources

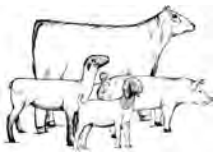
Kinder, C.A. (2016). Halter Breaking. *Champion of Knowledge: 801*. University of Idaho Extension.

Kinder, C.A. (2016). Halters. *Champion of Knowledge: 802*. University of Idaho Extension.

Ohio State University Extension. (2011). Getting Ready for the Show. *Beef resource handbook* (pages 9-2 through 9-3).

Ohio State University Extension. (2008). Preparing Your Animal for Show. *Goat resource handbook* (pages 175-176).

Ohio State University Extension. (2011). Showing and Selling *Sheep resource handbook for market and breeding projects* (pages 91-93).



# Champion of Knowledge

Publication

No.

CK BEEF:

801

## ***Halter Breaking***

*By:**Cindy A.**Kinder,**University of**Idaho**Extension*

After members have selected their animal they need to halter break it as soon as possible. Some animals are not fit for being a show animal. Their temperament does not allow them to be gentle and worked with in a close manner. Some animals like working only with their owners and do not like crowds or loud noises. Members need to find out as soon as possible what kind of temperament their animal has. It will take about two weeks to properly gentle a calf however, members will be able to tell in 3 or 4 days if their animal will gentle down. There are many ways to halter break your animal. The following has been very successful. Make sure an adult or older member helps younger members during the halter breaking process.

1. Halter and let the calf drag the halter for a couple days, this way the calf understands the rope will stop them, as they step on it.
2. Tie the calf to a secure post. Approximately two feet from the ground leaving about two feet of space between the calf and post.
3. If the calf throws himself, and is not in danger, let him lay and think the situation over. Don't yell at or frighten him.
4. Assuming the calf is not in danger of hurting himself, leave the calf tied up, for several hours, making sure not to leave them unattended.
5. Continue this practice, taking time to comb and brush the animal each time it is tied up. This will get it used to you and help to calm it down because the animal will realize you are there not to hurt it. Pull on the halter as you are working with the animal to determine when it is ready to start trying to get it to lead.
6. Repeat this process until the calf is able to be untied and led around the pen without risk of trying to get away. You can practice leading your animal to and from water when you have had it tied up for several hours. Members will be able to tell when the calf understands and respects them as a safe handler.
7. Members can also start practicing stopping with the calf's head up, when stopping at the post or panel. This is good showmanship practice.

### Tips for success:

- When having calves tied, up be mindful of how long the rope is between the post and the calf. Having it too long will allow the calf to get tangled up in the rope and injured. Also having the rope too high is a problem, if they fall. Some calves will pull back against the post and not release. Make sure your calf learns to release.
- Members and families should have a quite gentle manner around the calves. This reduces the stress of people and animals.
- Understanding animal flight zones is important as the animal becomes tamer those zones get smaller.

This procedure and time schedule can be adjusted to fit the temperament of the calf. Remember, some animals are NOT suitable as project calves. Find out early so there is time to get another calf.



# Champion of Knowledge

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802

## ***Halter Breaking***

*By:*  
*Cindy A.*  
*Kinder,*  
*University of*  
*Idaho*  
*Extension*

Halters are a “tool” to use when halter breaking livestock. There are many kinds of halters, using the correct one and using it properly is important.

You should know the parts of the halter, their purpose, and where it is located when placed on the animal. Understanding the relationship of the halter parts and the underlying pressure points is helpful when teaching your calf to be respectful of the halter. Teaching them to lead when they are young or smaller in weight is easier and less stressful on you and the calf and insures success at show time.



**Headstall:** Is used to keep the halter on top of the head; it is set over the poll and behind the ears of your animal. Pressure points under the headstall and behind the ears causes your animal to move forward when leading.

**Nose piece:** Keeps the halter on the face of the animal; goes over the bridge of the animal's nose approximately one inch below the eyes. Pressure points on top of the nose causes your animal to move backward. Be careful because sore/rub spots can form here.

**Adjustment loop:** Allows the halter to be adjusted smaller or larger and allows the halter to ‘fit’; it should be on the right side of the head. Pressure points under the loop causes the animal to turn.

**Chin rope or strap:** Keeps the halter from coming off the nose; goes under the animal's chin and cheek area, is made of rope or chain. Pressure points under the chin rope cause the animal to move forward. Chain straps are found on show halters and are used if you need more pressure after the animal has been trained to lead. Jerking on the chain is strongly discouraged because it causes more harm than good.

**Eye Loop:** Holds the lead of the halter and is located on the left side of the head.

# Champion of Knowledge

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No.  
CK BEEF:  
802

**Lead:** Is used to tie up and hold onto the animal; is located on the left side of the animal's cheek. The lead is used to provide pressure on all pressure points found on the animal's head.

Halter breaking is teaching your animal to respond to pressure. Applying pressure with the halter causes your animal to move so that the pressure is released. The release of constant pressure is the reward that teaches your animal to lead.

There are three main halter types.

**Rope type halter:** Made with three strand nylon or sisal rope. A rope halter is used for the initial halter breaking because rope does not pinch the animals. Caution should be taken when using the nylon rope because it is slippery and hard to hold onto when tying the animal for the first time. Wearing gloves is recommended when using this rope. Leads can be different lengths. Having a short lead when halter breaking for the first time can make it difficult to tie up. Too long of leads can be dangerous as you or your calf can get tangled in the rope. A good length for the lead for cattle is 12 to 14 feet. For lambs the lead is 4 to 6 feet.

**Show type halter:** Made of leather or nylon material and has a chain chin strap. One to two weeks before your show you should introduce the show halter and practice with it. Some animals don't like the chain feeling and must get used to it. The chain adds more pressure and with that comes more response from your animal. If your animal cannot absolutely work with the chain strap you could cover it with vet wrap.

**Horse type halter:** This halter should never be used for cattle because it does not provide the pressure points to aid in the animal learning to walk when pressure is applied to the points.



Rope Halter



Cattle Show Halter



Horse Halter

# Showmanship

Cindy Kinder, Extension Educator

## Goal (learning objective)

Youth will:

- Learn about showmanship
- Learn about showring etiquette and sportsmanship
- Learn exhibiting tips to help them handle their animal and be successful in the showring

## Supplies

- Access to the internet and a TV
- A laptop or computer that can be connected to the TV
- An HDMI cable or compatible cable with the TV and computer you are using.
- Check out the showmanship DVD from the county extension office (you will need a DVD player and a TV if you use the DVD)
- 5' piece of string (bailing twine) for each team of two members (beef, sheep, and goat)
- Swine members will use their hand and arm or pig show stick
- Swine driving devices (optional)
- Area large enough to represent the showring full of animals and showmen.

## Pre-lesson preparation

- Review Livestock Showmanship DVD for each species to become familiar with showing of livestock

- This activity can be done with:
  - Goat members as they need to practice leading, stopping, and setting up with the collar.
  - Sheep members as they need to practice leading, turning, stopping, and setting up without a halter.
  - Swine members as they need to practice moving and directing their hog to demonstrate control while positioning themselves appropriately (animal always between them and the judge).
  - Beef members as they need to practice leading, spacing, stopping, and setting up with the halter.

## Lesson directions and outline

### Introduction

Showmanship contests are a fun way to demonstrate skills and knowledge. It is important to realize that showmanship is used every time an exhibitor enters a quality class. The object is to present your animal to the judge using methods that will make your animal look its' best. This will require a personal evaluation of the animal being shown prior to entry into its class.

Showmanship success begins at home. It takes time to halter break or train an animal so that it is responsive to an exhibitor's commands. The methods used are not difficult to learn, but it does take effort, patience and animal cooperation.

Have experienced youth share what they have learned that has helped them prepare for showing an animal.

A show animal should be trained to walk, stop, set up quickly or drive in the show ring when asked. When preparing for a show, it is important to practice using

several short periods of time rather than a few long, drawn-out sessions. It is also wise to know information about the project and animal should a judge decide to use questions as a tie breaker.

After the introduction discussion, view the showmanship video that pertains to the species club you are leading. You may want to stop the video periodically to have the youth share the positives or the negatives they see during the video. Then conduct the activity.

### Conducting the activity (DO)

1. Explain to youth that they will be participating in a mock show, ask the group to pair off so they have a partner.
2. Give each team a piece of string or pig stick. One teammate will be the showman and one will be the project animal.
3. Have the “animal” hold the string as if it was a halter. Holding the string in their left hand. Do not tie the string on the member.
4. Have the exhibitor stand next to the animal (facing the same direction) hold the string in one hand next to the “animals” head and the other hand as if holding the lead strap of a show halter. (Goat members as if holding the collar, sheep members as if holding their sheep and swine members should direct their animal with their hands or stick).
5. Have all the teams practice circling, stopping and setting up, as if in a mock show.
6. Have the beef members hold their animal’s heads “very close” on the string (next to their cheek) and “far away” on the string (2 ft. gap between them).
7. Once they have practiced then have the members switch roles and practice the mock show again.
8. Teach members the following showing tips:
  - The importance of making a good first impression as soon as they step into the arena (don’t stop showing).
  - Keeping an animal set up and its’ head up (cat-

tle, sheep and goats).

- Keeping their eyes on the judge and their animal at all times (it is important that exhibitors are aware of where the judge is in the arena and what their animal is doing).
- The importance of keeping the animal between them and the judge at all times (Beef members do not stand on the opposite side).
- Spacing animals while working in the arena and in the lineup.
- Show ring etiquette and sportsmanship.

### What did we learn? (REFLECT)

- Ask: Why is showmanship important?
- Ask: How can showmanship be practiced at home?
- Ask: How does it feel to be the animal? How can that help you be a better showman?
- Ask: What can you do differently in handling your animal?

### Why is that important? (APPLY)

- Ask: Why is having knowledge about your livestock project important?
- Ask: Why is good sportsmanship important in showmanship?
- Ask: What do showman reflect to the community about the industry? 4-H?

## Resources

- Ohio State University Extension. (2011). Getting Ready for the Show. *Beef resource handbook*. (pages 9-13 through 9-18).
- Ohio State University Extension. (2008). Preparing Your Animal for Show. *Goat resource handbook* (pages 175-176).
- Ohio State University Extension. (2011). Showing and Selling. *Sheep resource handbook for market and breeding projects* (pages 97-98).
- Ohio State University Extension. (2000). Showing your 4-H Market Hog. *Swine resource handbook for*



*market and breeding projects* (pages 12-4 and 12-5)

University of Idaho Extension Beef Showmanship video (#72999) available at: <https://youtu.be/E-7UF-qiSjS4>

University of Idaho Extension Sheep Showmanship video (#72898) available at: <https://youtu.be/2B-VEegUchds>

University of Idaho Extension Swine Showmanship video (#72998) available at: <https://youtu.be/22e-p02oH08>



# USDA Quality Grade and Yield Grade

Scott Nash, Regional Youth Development Educator

## Goal (Learning Objective):

- To learn the USDA Quality Grades of beef and lamb.
- To learn the difference between quality grades and yield grades.
- To learn the USDA Pork Grades and factors influencing pork quality.

## Supplies Needed:

- A copy of each of the color pictures of USDA Marbling Scores for Beef (attached to this lesson.)
- A copy of each of the color pictures of beef and lamb rib eyes (attached to this lesson.)
- A copy of each of the color pictures of swine loin eyes (attached to this lesson.)
- Flipchart paper and markers.

## Pre-Lesson Preparation:

- Become familiar with the factors used to determine quality grade in beef and lamb. Become familiar with the how yield grade is determined in beef and lamb. Become familiar with how USDA grade is determined in swine and the factors that influence pork quality.
- \*You may want to assign this lesson to an older youth to learn about and teach the other youth at the meeting.

## Lesson Directions/Outline:

### Background information

- Ask the youth to list what they know about quality and yield grade. Quality grades in beef and lamb are used to predict palatability (eating quality) characteristics such as tenderness, juiciness and flavor. Beef carcass quality grades are based on maturity and marbling. Maturity is the age of the animal. Most youth raised market animals are less than 30 months of age and considered young animals. Marbling is the intramuscular fat (the small flecks of fat inside

the muscle) that can enhance the flavor, juiciness and tenderness of the meat. A higher amount of marbling means a higher quality grade. Beef quality grades for young animals are Prime, Choice, Select and Standard. To determine quality grade, once a carcass has been split into two halves it is cut or ribbed between the 12<sup>th</sup> and 13<sup>th</sup> ribs. This exposes the ribeye area allowing the marbling to be viewed in the meat. The amount of marbling is the key factor in determining quality grade. The more marbling the higher the quality grade. Prime and Choice carcasses typically provide the better eating experience and are in higher demand by consumers (Beef Resource Handbook pgs. 8-2 – 8-3.)

- The quality grade of a lamb carcass is based on conformation, maturity, flank streaking and amount of external fat. The lamb should be younger than 12 months of age. Most youth raised lambs are approximately 8 months old. Flank streaking is the amount of fat on the surface of the flank muscle (Sheep Resource Handbook pgs. 73-75.) Lamb quality grades are Prime, Choice, Good and Utility.
- Yield grade in beef refers to the expected yield of boneless, closely trimmed retail cuts and is determined by considering external fat thickness, ribeye muscle, hot carcass weight and kidney, pelvic and heart fat. The single factor used in determining lamb yield grade is the amount of external fat. Yield grades are expressed in numerical scores ranging from 1 through 5. Yield grade 1 is more desirable because it represents a leaner carcass with more muscularity. When a carcass becomes fatter and/or is less muscular the numerical yield grade becomes higher. A yield grade 5 is the least desirable because it will have more fat in proportion to muscle and represents the lowest yield of actual meat. When the carcass

has been cut or ribbed between the 12<sup>th</sup> and 13<sup>th</sup> ribs the amount of external fat thickness can be measured as well as the size of the ribeye. These measures will help determine a preliminary yield grade for the animal.

- A trained ultrasound technician can collect an image by scanning the animal to get a picture of the ribeye area and fat thickness between the 12<sup>th</sup> and 13<sup>th</sup> ribs. This will allow the technician to estimate quality grade of beef as well as estimate yield grade of beef and lambs.
- USDA grades in swine range from U.S. No. 1 to U.S. No. 4. The numerical grades are based on expected muscle yield of four lean cuts—ham, loin, Boston shoulder and picnic shoulder. A U.S. No. 1 hog has less than 1" inch backfat and a U.S. No. 4 hog has greater than 1.50" inches of backfat. The numerical grade can move up or down based on the amount of backfat and amount of muscle. However, a carcass with backfat of 1.75" or greater must be graded a U.S. No. 4. Typically, USDA grade is determined in swine by measuring the amount of fat and loin eye area between the 10<sup>th</sup> and 11<sup>th</sup> rib using ultrasound or by cutting (ribbing) the carcass in that spot after the animal has been harvested (Figure 4.1 and 4.3, Swine Resource Handbook pg. 4-5.)
- Pork quality is determined by muscle color, muscle firmness, marbling (intramuscular fat) and external fat (Swine Resource Handbook pg. 4-16 and 4-17.)
- Since the meat goat industry is relatively new, there are not any official standards for meat goat quality and yield. In Chapter 8 Ohio State University Goat Resource Handbook on page 118 it shares many of the selection criteria for meat goats are based on visual evaluation. Table 8.1 on page 119 lists projected carcass weights based on various live weights. Table 8.2 on page 120 discusses wholesale cuts and weights. Page 124 has a chart of Chevron wholesale cuts.
- Goat meat is not readily available in grocery stores but can be found in specialty markets, small butcher shops and farmers markets. More information about goat carcasses and grading can be found in the resource section from the University of Kentucky.

- One environmental factor that can impact carcass quality (acceptability) of all the species is stress. This refers to the stress (or lack thereof) the animal experiences while it is being cared for. Stress can be influenced by animal management, nutrition, animal husbandry and even animal hauling. An animal placed under stress by not having the proper care in any of these areas can cause a reduction in carcass quality and result in a low merchandising value of that carcass. For example, stress in beef cattle will cause the meat to be dark and the carcass referred to as a "dark cutter".
- For more information on quality assurance refer to the "Why is Quality Assurance Important?" lesson in this series.

### Conducting the activity

1. Review the beef quality grade pictures from the attached **Marbling Photos**. Shuffle the pictures and have youth organize them in order from most to least amount of marbling. Have the youth share why they ranked the marbling photos in that order.
2. Distribute the beef ribeye pictures. Have the youth rank them in order from best potential yield grade to worst. Ask the youth to explain the ranking.
3. Distribute the lamb ribeye pictures. Have the youth rank them in order from best potential yield grade to worst. Ask the youth to explain the ranking.
4. Distribute the swine loin eye pictures. Have the youth rank them in order from best potential USDA Grade to worst. Ask the youth to explain the ranking.

### Additional activities:

Cupcake Activity found in the Youth Beef Quality Assurance PNW 593 pgs. 41-43

Why is Quality Assurance Important? Found at: <http://www.uidaho.edu/extension/4h/projects>

### What did we learn?

- What are two factors that help determine quality grade in beef? In lambs?
- Explain the difference between Quality Grade and Yield Grade.

- What factors determine USDA grade of swine? What factors determine pork quality?

#### **Why is that important?**

- Why should Quality Grade in beef or lamb or the U.S. No. grade of swine matter to the consumer?
- Why is it important to the producer to have a lower Yield Grade number in beef or lamb and lower U.S. No. grade in swine?
- What impact does animal stress have on carcass quality?

reduction of stress in animal care which impacts quality in Beef lamb and pork... yield and eating experience is linked to quality but are ways to market food animal products. yield and eating experience are not a food safety issue. and pork quality was not covered.

## **References**

Beef Resource Handbook. 2011. Chapter 8, pages 8-3 through 8-9. Ohio State University Extension.

Swine Resource Handbook for Market and Breeding Projects. 2000. Chapter 4, pages 4-4 through 4-6 and pages 4-16 through 4-19. Ohio State University Extension.

Sheep Resource Handbook for Market and Breeding Projects. 2011. Chapter 6, pages 73-75. Ohio State University Extension.

Goat Resource Handbook. 2008. Chapter 8, pages 118-125. Ohio State University Extension.

[Goats; More than just a lawn mower Grading and Carcass ...](#)

[www.uky.edu](http://www.uky.edu) › instruction › asc300

Youth Beef Quality Assurance PNW 593, pgs. 41-43.

#### **Additional Resources:**

Meat Evaluation Handbook, American Meat Science Association. 2001. Beef Grading, pgs. 25-27.

Meat Evaluation Handbook, American Meat Science Association. 2001. Lamb and Mutton Grading, pgs. 120-122 and 124-125.

Meat Evaluation Handbook, American Meat Science Association. 2001. Pork Grading Composition and Grading, pgs. 87-90, 93 and 98-99.

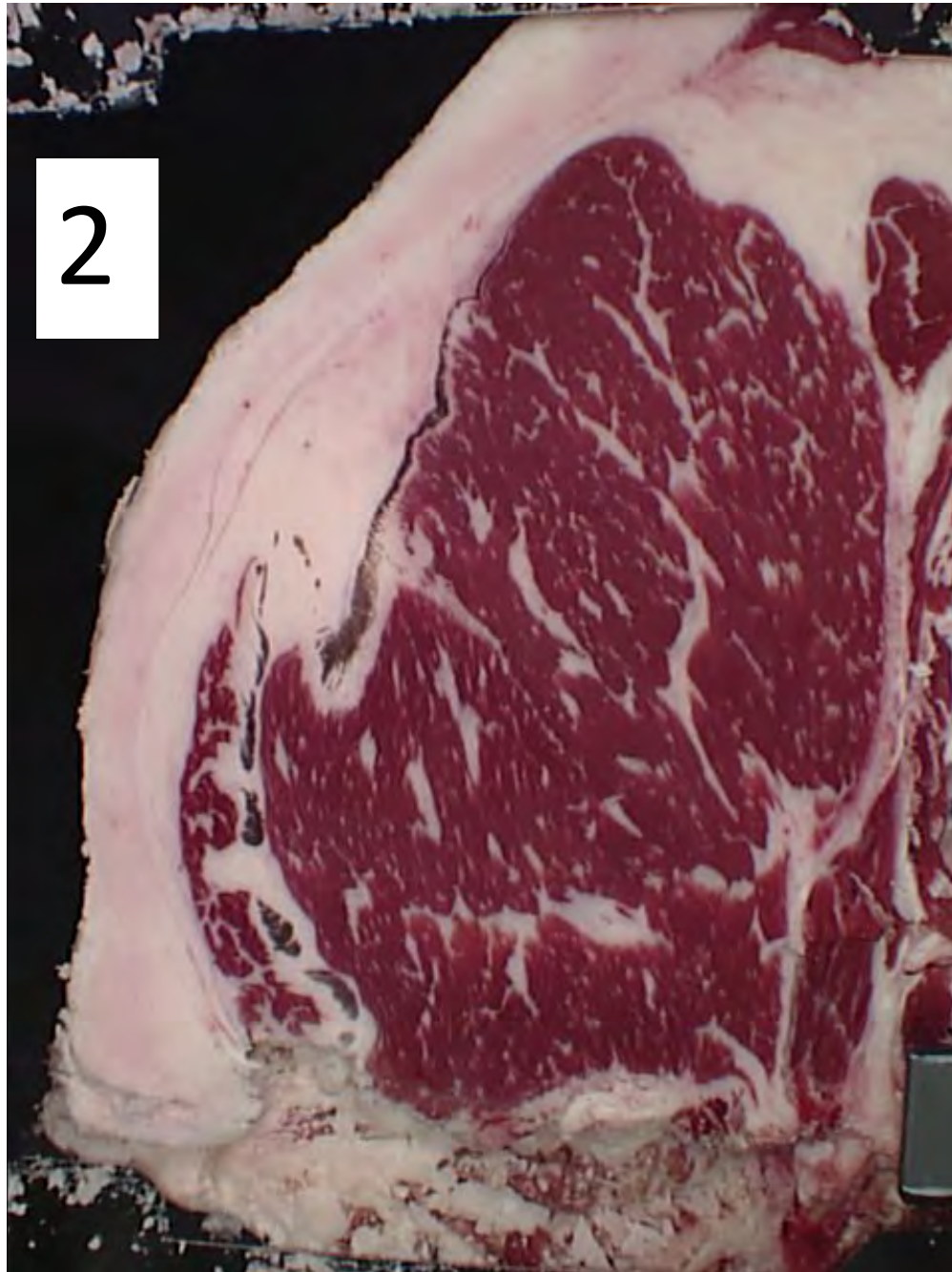
Quality Assurance is really a term used for animal care and management as it relates to meeting well being guidelines and production of a safe wholesome product for consumers. If this is to be linked to Quality Assurance then there needs to be an emphasis on

## Beef Cattle Degree of Marbling Pictures for Quality and Yield Grade Lesson



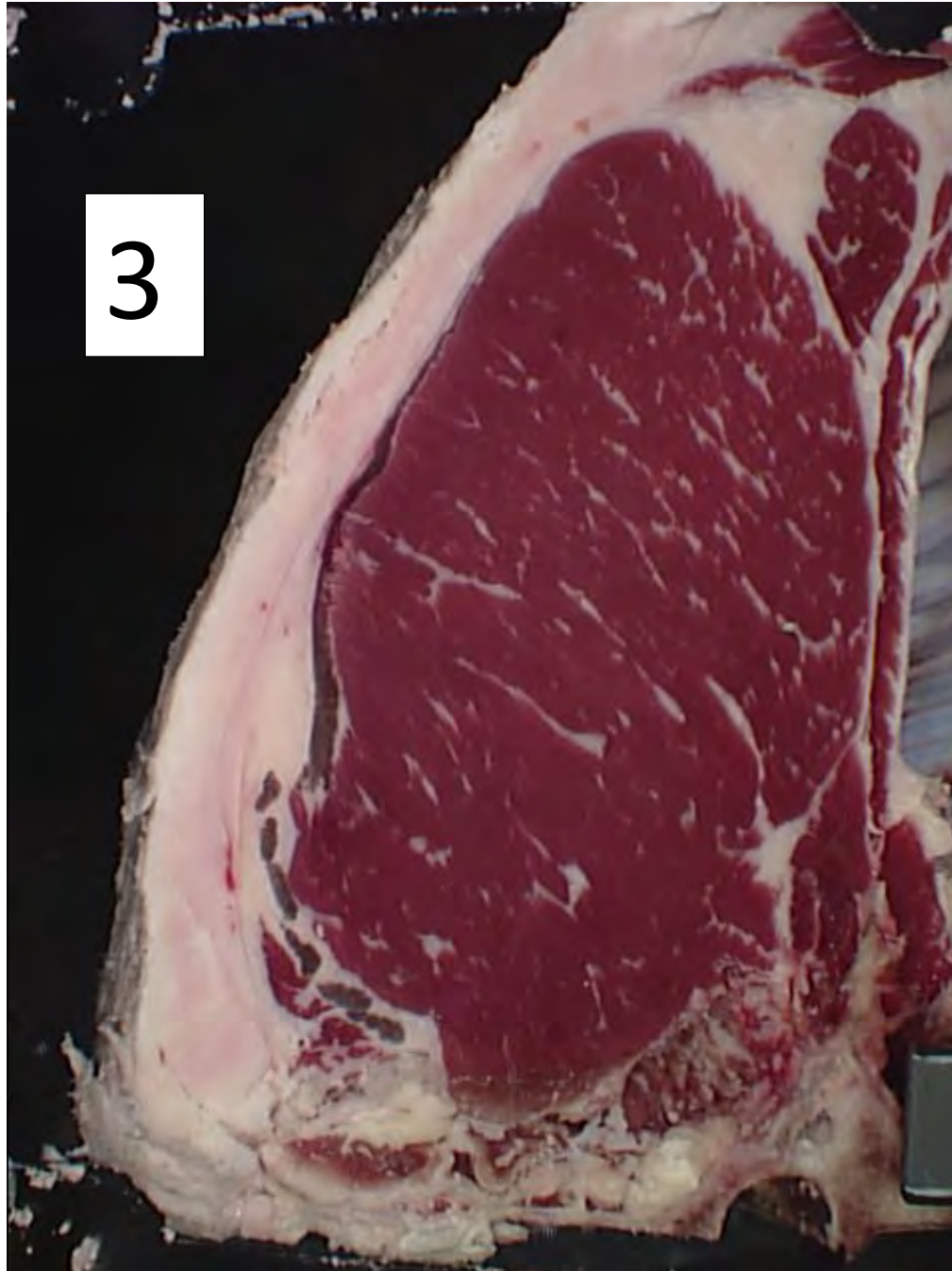


Beef Cattle Degree of Marbling Pictures for Quality and Yield Grade Lesson





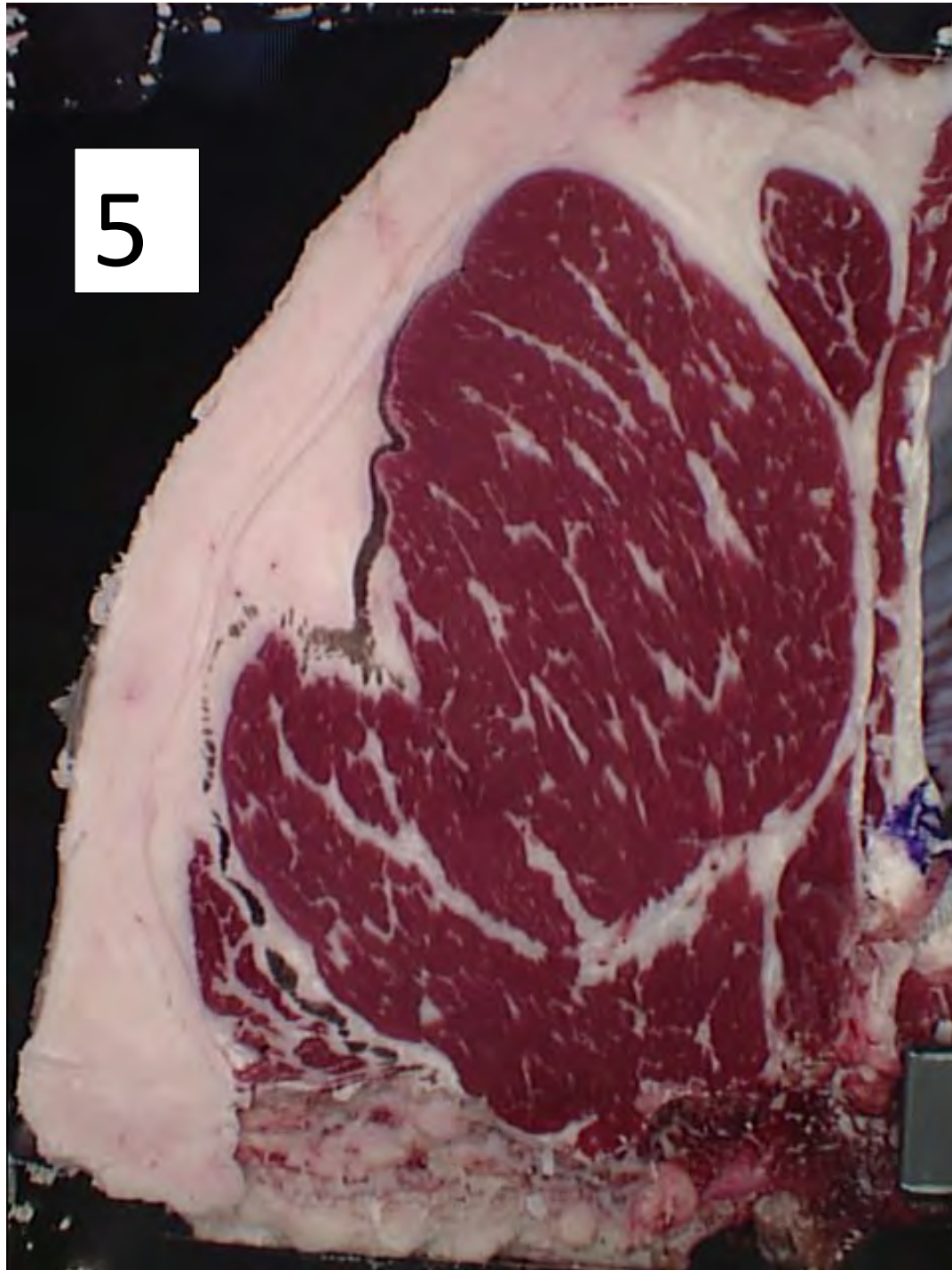
## Beef Cattle Degree of Marbling Pictures for Quality and Yield Grade Lesson



## Beef Cattle Degree of Marbling Pictures for Quality and Yield Grade Lesson

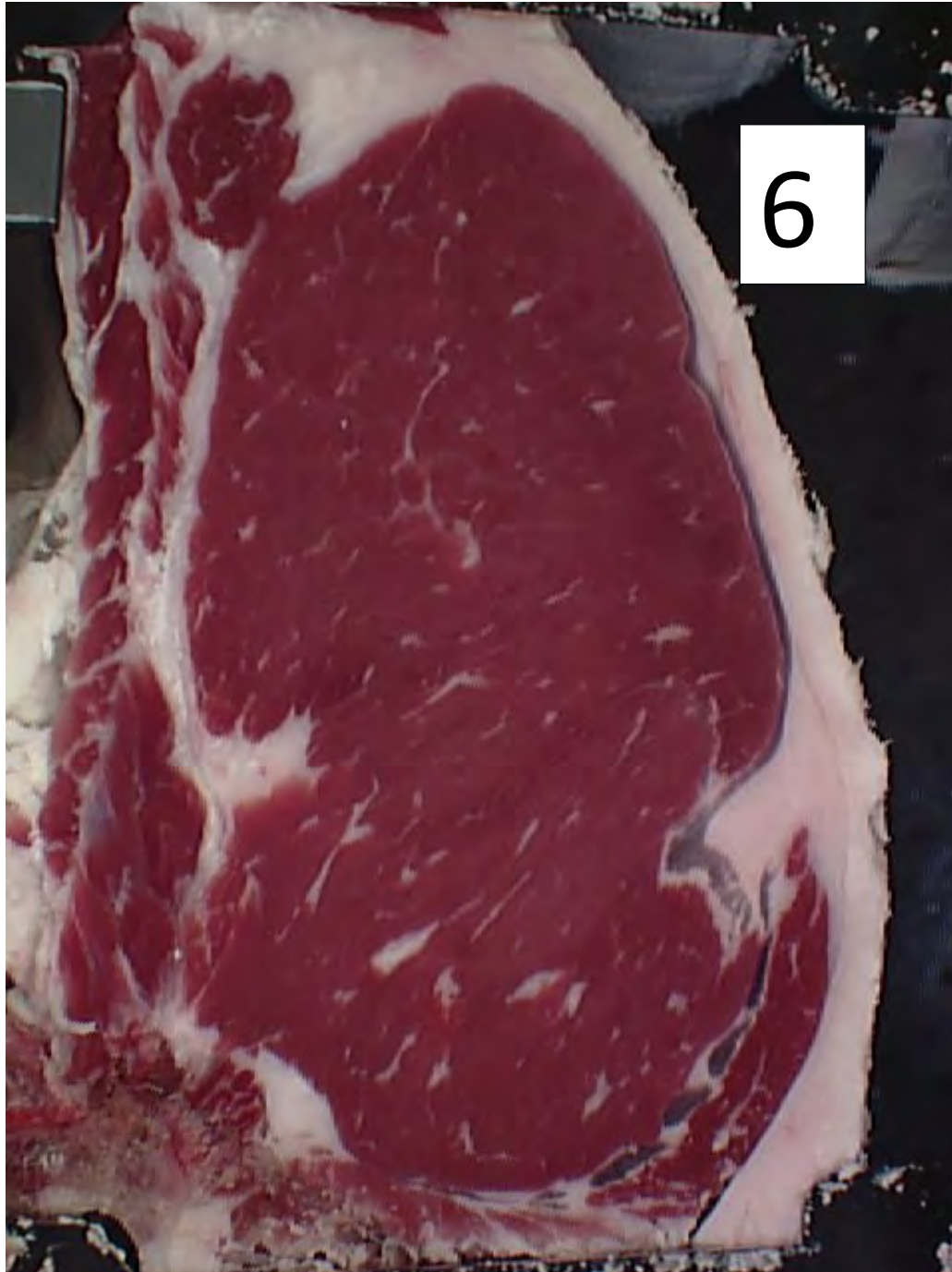


Beef Cattle Degree of Marbling Pictures for Quality and Yield Grade Lesson

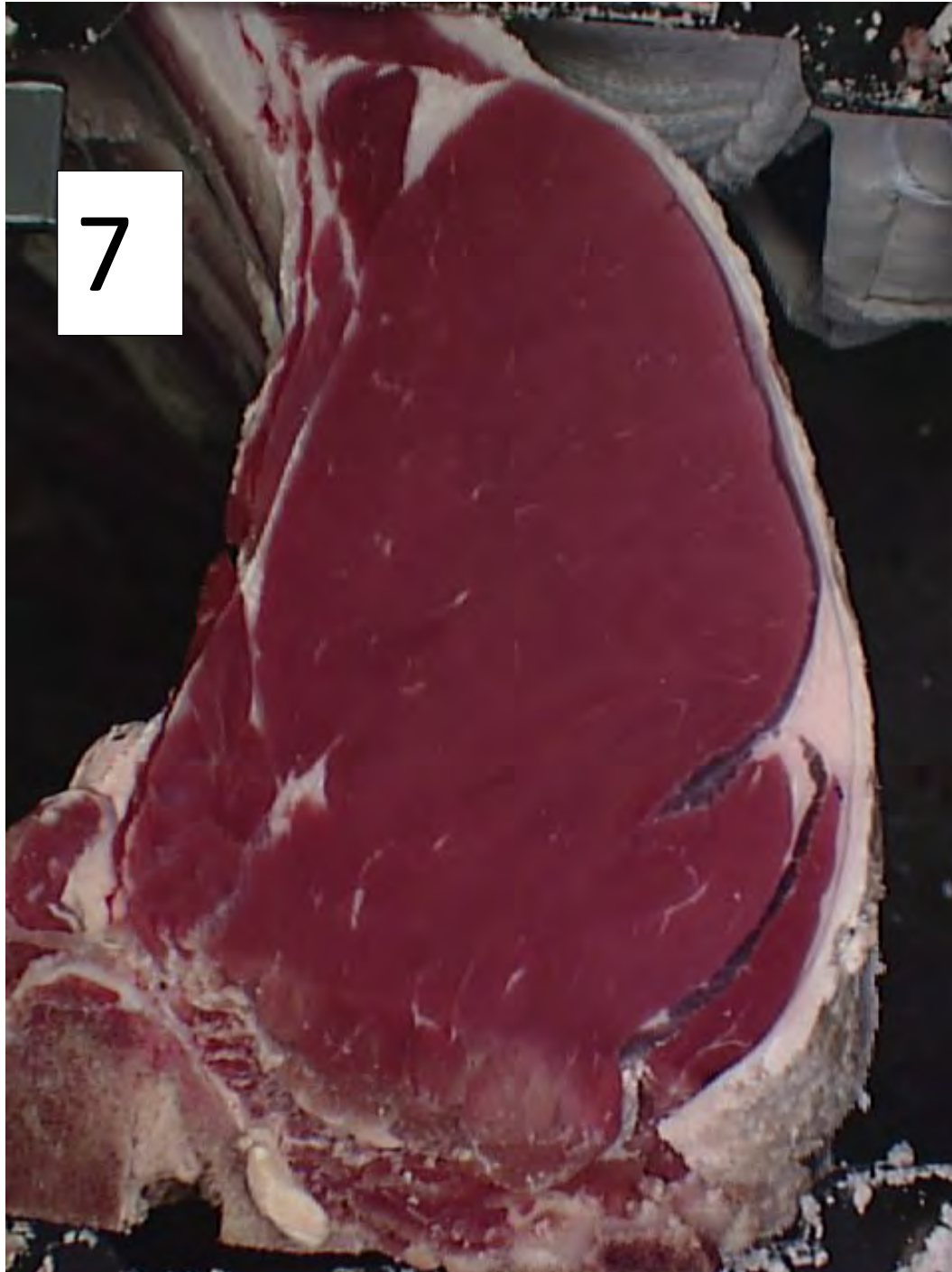




Beef Cattle Degree of Marbling Pictures for Quality and Yield Grade Lesson

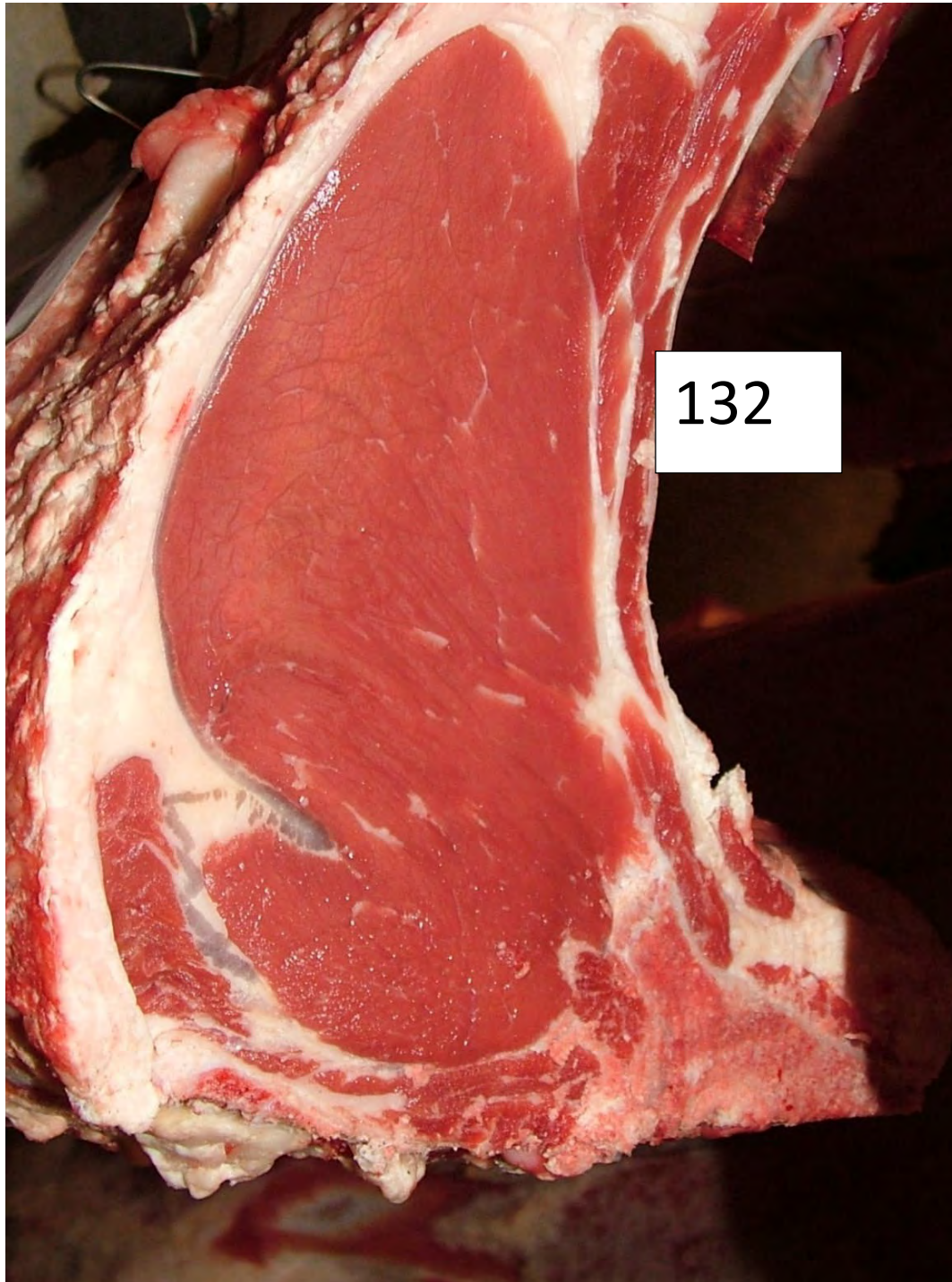


## Beef Cattle Degree of Marbling Pictures for Quality and Yield Grade Lesson



**QUALITY ASSURANCE: IDEAL MARKET ANIMAL – BEEF RIBEYE PHOTOS**

Photo Credit: Cindy A. Kinder





68





122



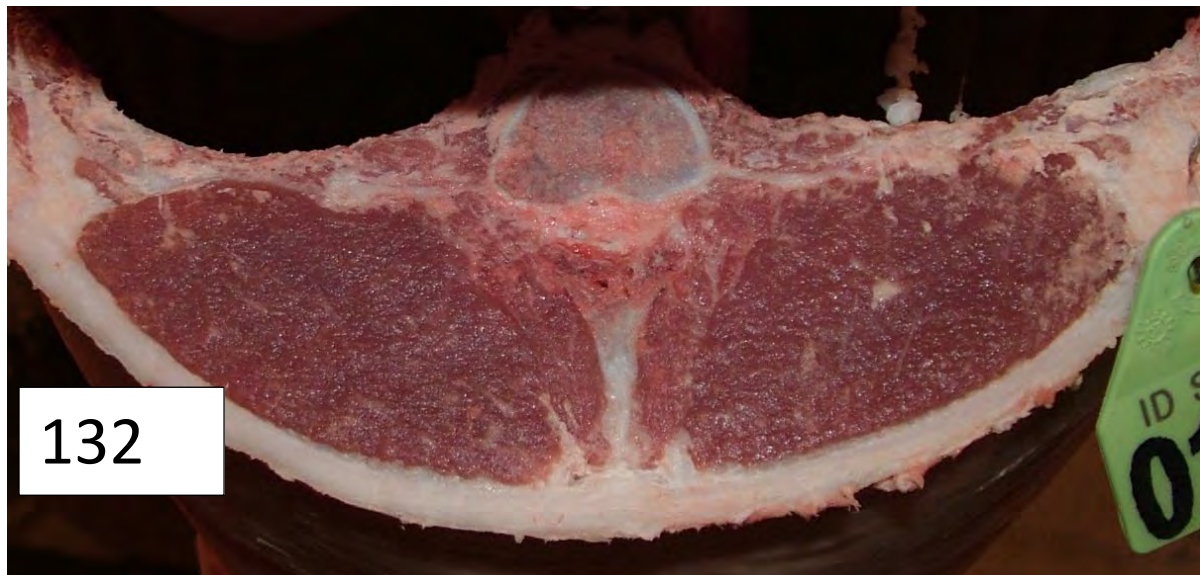
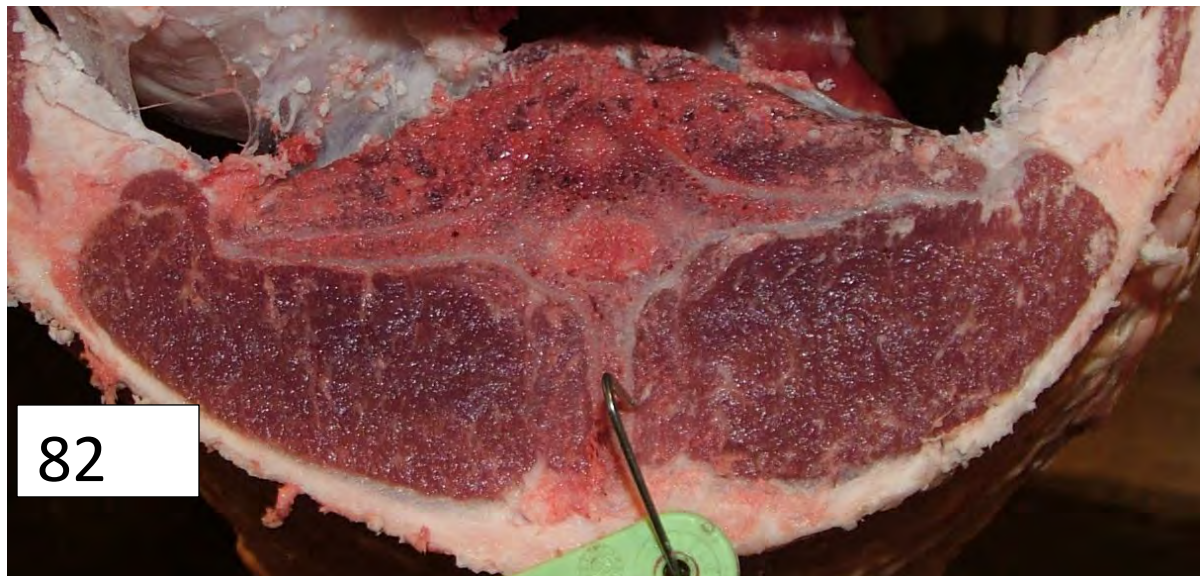


1509



**QUALITY ASSURANCE: IDEAL MARKET ANIMAL – LAMB RIBEYE PHOTOS**

Photo Credit: Cindy A. Kinder

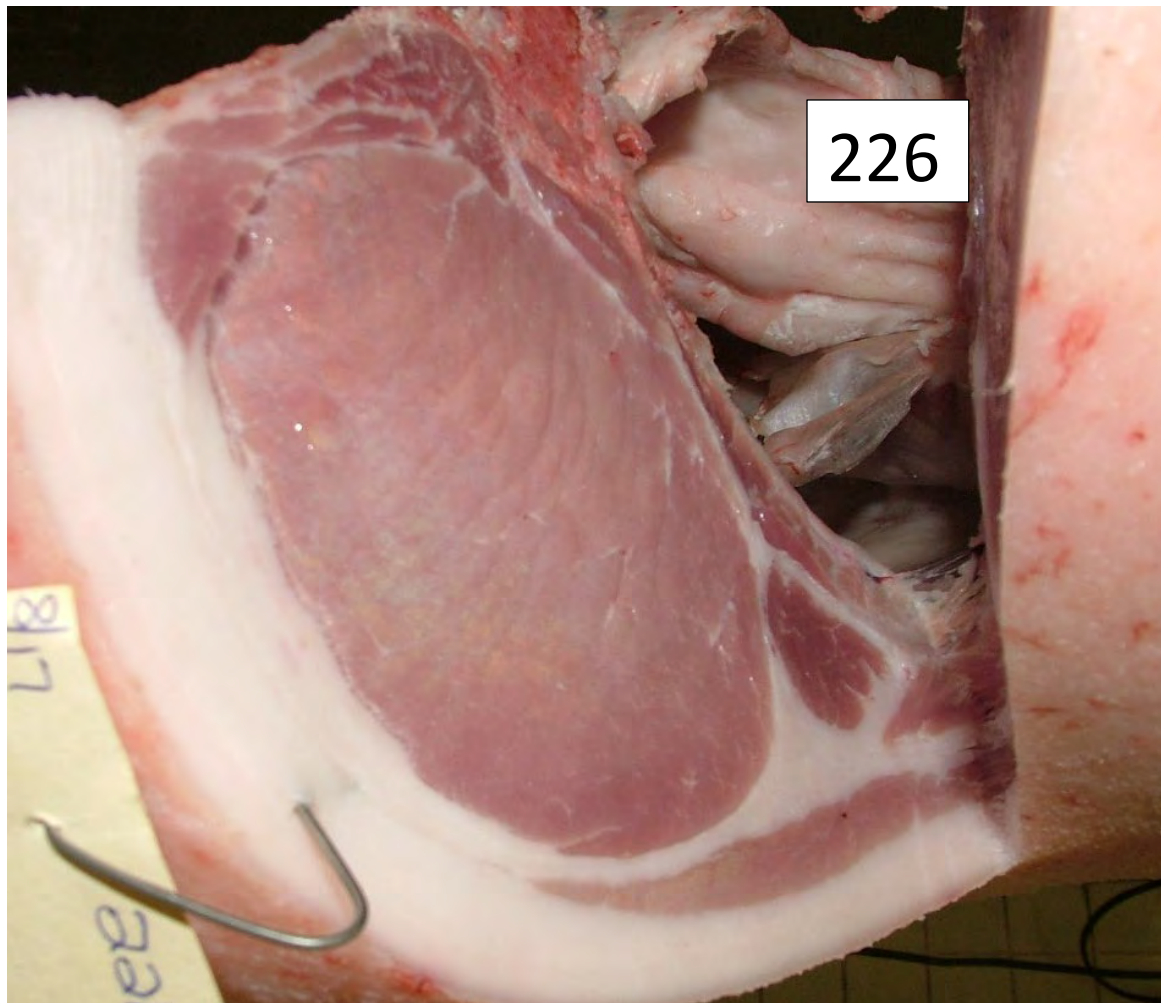






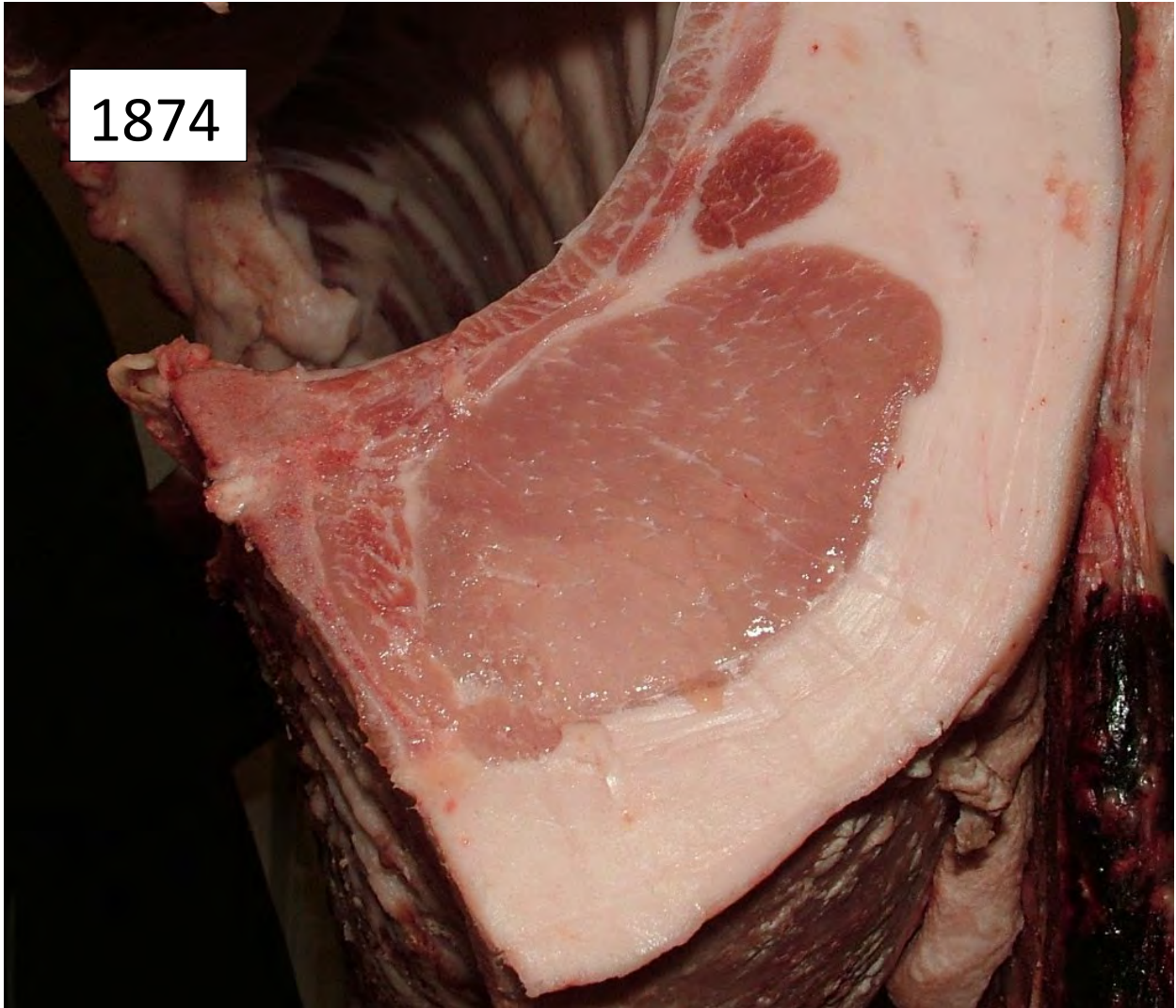
**QUALITY ASSURANCE: IDEAL MARKET ANIMAL – SWINE LOIN EYE PHOTOS**

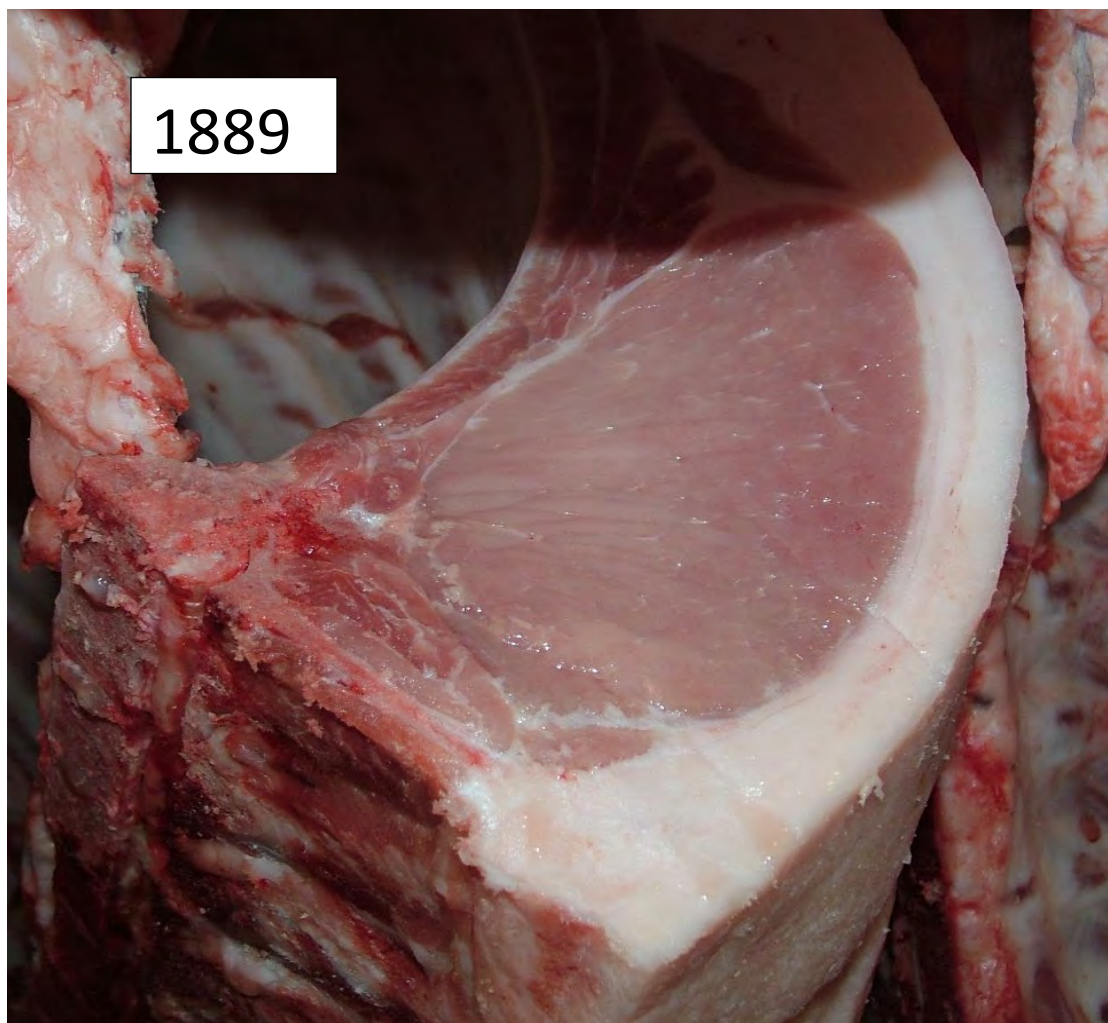
Photo Credit: Cindy A. Kinder





1874





1427



## Quality and Yield Grade Lesson Answer Key

### Marbling Score Photo Key

- 1 – Moderate = Choice + (High Choice)
- 2 – Moderately Abundant = Prime 0 (Average Prime)
- 3 – Modest = Choice 0 (Average Choice)
- 4 – Slight = Select + (High Select)
- 5 – Slightly Abundant = Prime – (Low Prime)
- 6 – Small = Choice – (Low Choice)
- 7 – Traces = Standard

### Marbling Score Photo Rank (Highest to Lowest)

- 2 – Moderately Abundant
- 5 – Slightly Abundant
- 1 – Moderate
- 3 – Modest
- 6 – Small
- 4 – Slight
- 7 – Traces

### Beef Potential Yield grade ranking

- 1<sup>st</sup> – Picture #132 had a live weight of 1305 pounds. Has the most ribeye area (13.4) compared to live weight with an acceptable fat thickness (.35).
- 2<sup>nd</sup> – Picture #68 had a live weight of 1100 pounds. He has a little less ribeye (10.5) than he should but he has the least amount of fat (.20) compared to the other two steers.
- 3<sup>rd</sup> – Picture #1509 had a live weight of 1200 pounds. He has enough ribeye (12.6) and does have more fat than needed (.55) but has less fat and more muscle than the last steer.
- 4<sup>th</sup> – Picture #122 had a live weight of 1400 pounds. He has less ribeye than he needs (11.0) and the most fat at .60.

### Lamb Potential Yield grade ranking

- 1<sup>st</sup> – Picture #2727 had a live weight of 137 pounds. Has the most ribeye (3.80) with an adequate amount of fat thickness (.20).
- 2<sup>nd</sup> – Picture #82 had a live weight of 127 pounds. Has a little less ribeye (3.00) than #132 with less fat at .15 inches of fat thickness. Ideally this lamb could have more fat but compared to the other two sheep it will have a better yield grade.
- 3<sup>rd</sup> – Picture #132 had a live weight of 126 pounds. Ranks second in the amount of ribeye (3.20) and has the most fat thickness (.25).
- 4<sup>th</sup> – Picture #90 had a live weight of 128 pounds. Ranks last in the amount of ribeye (2.80) and is not enough for the live weight and still has as much fat as other sheep (.25).



**Swine Potential USDA Grade ranking**

**1<sup>st</sup>** – Picture 1427 had a live weight of 290 pounds. Has the most loin eye area (10.80) with the least fat thickness (.50) but the amount is adequate for the weight.

**2<sup>nd</sup>** – Picture #226 had a live weight of 275. Has the second most loin eye area (8.40) with a 1.15 fat thickness which is not too much for the weight and amount of muscle.

**3<sup>rd</sup>** – Picture #1889 had a live weight of 265. Has the third most loin eye (6.0) with a .55 fat thickness. The fat thickness is lower than #226 but the amount of muscle compared to weight is not adequate.

**4<sup>th</sup>** – Picture #1874 had a live weight of 265. Has more loin eye (6.2) than #1889 and has the second most fat thickness (1.10) inches. That is too much when compared to the weight and measurements of #1889.



# Using grids to determine carcass measurements

Scott Nash, Regional Youth Development Educator

## Goal (Learning Objective):

To learn how to measure ribeye/loin eye area and fat thickness on cattle, lambs and hogs.

## Supplies Needed:

- Plastic grid cards – to be used for measuring a beef and lamb ribeye area and swine loin eye area. (If you don't have the ability to use a plastic grid card, make a paper copy of the card, place it in a gallon Ziploc bag and trace the dots with a sharpie marker. Place the ribeye picture inside the bag and count the dots within the longissimus dorsi muscle area.)
- A copy of the Beef grid can be found on page 8-7 in the Ohio Beef Resource Handbook.
- A copy of the grid to be used for swine and lamb can be found on page 4-155 in the Ohio Swine Resource Handbook. (If you can't get a copy of a plastic grip card make a paper copy of the grid and put copy in a sheet protector (or gallon Ziploc bag.) Use a permanent marker to copy the dots onto the sheet protector, pull to grid copy out. Place the item to be traced inside or behind the sheet protector and count the dots.)
- Soda pop can(s)
- Deck of playing cards
- Color pictures of beef and lamb rib eyes. The pictures are also used in the Quality and Yield Grade Lesson.
- Color pictures of swine loin eyes. The pictures are also used in the Quality and Yield Grade Lesson.
- Print a copy of the Carcass Measurements Key. It will provide the measurements for the pictures used in this lesson.

## Pre-Lesson Preparation:

- Measure the soda pop can and deck of cards. Take time to make sure the ribeye and loin eye pictures have different muscle size and different amounts of fat thickness so the youth can

determine differences. Measure the pictures in advance so you will have the answers for the youth after they have measured each.

- Study or teach the USDA Quality Grade and Yield Grade Lesson prior to teaching this lesson
- **Lesson Directions/Outline:**
  - Background information
    - The plastic grid is used to measure the size of the longissimus dorsi muscle, ribeye area in beef and lamb and loin eye area in swine. Remember from the Quality Grade and Yield Grade lesson that ribeye area in beef and lamb are an important factor in determining yield grade. Loin eye area in swine plays a role in USDA grade. Each dot on the grid is equal to one square inch in muscle area. Count the number of dots that are inside of the muscle to determine the total area in square inches. For example: If you count 127 dots in the beef ribeye then the total area is 12.7 square inches. For sheep and swine use the grid with smaller dots (Grid found on page 4-15 in the Ohio Swine Resource Handbook.) Count the total number of dots and divide by 20. For example, if you count 132 dots, divide 132 by 20 for a 6.6 square inch area.
    - Use the ruler grid on the side of the plastic grid sheet to measure fat thickness. One line equals 1/10 of an inch. (You can also trace the ruler grid on the same Ziploc bag.)
    - Currently there are not any USDA carcass standards for meat goats. Measuring the ribeye and fat would be done the same way but it is not an industry practice for meat goats.

- **DO: Conducting the activity**



- Using the grids or Ziploc bags have the youth measure the size of the deck of cards (then the soda pop can and then put them both together) by counting the dots.
- Have youth measure pictures of rib eye areas and swine loin eye areas including the fat thickness. Have youth write down answers.
- **REFLECT: What did we learn?**
  - Did everyone get the same numbers? Why or why not? Why is the size of the muscle and the amount of fat hard for a judge to determine on the live animal? How will these measurements help determine the yield grade of the animal?
- **APPLY: Why is that important?**
  - How will knowing the amount of fat and muscle in my project help in the selection of my next animal project? What can I do to promote Quality Assurance by participating in this activity? What impact can I have on the consumer when I understand Quality Assurance?

## References

Beef Resource Handbook. (2011). Beef Carcass Evaluation. (pages 8-6 through 8-11 and Color Photo (CP) CP-18). Ohio State University Extension.

Sheep Resource Handbook for Market and Breeding Projects. 2011. pgs. 74 – 76. Ohio State University Extension.

Swine Resource Handbook for Market and Breeding Projects. 2000. pgs. 4-14 – 4-15. Ohio State University Extension.

Goat Resource Handbook. 2008. Pgs. 118-126. Ohio State University Extension.

## Additional Resources

Beef ribeye pictures can be found in the Meat Evaluation Handbook, American Meat Science Association, 2001. pgs. 29-44.

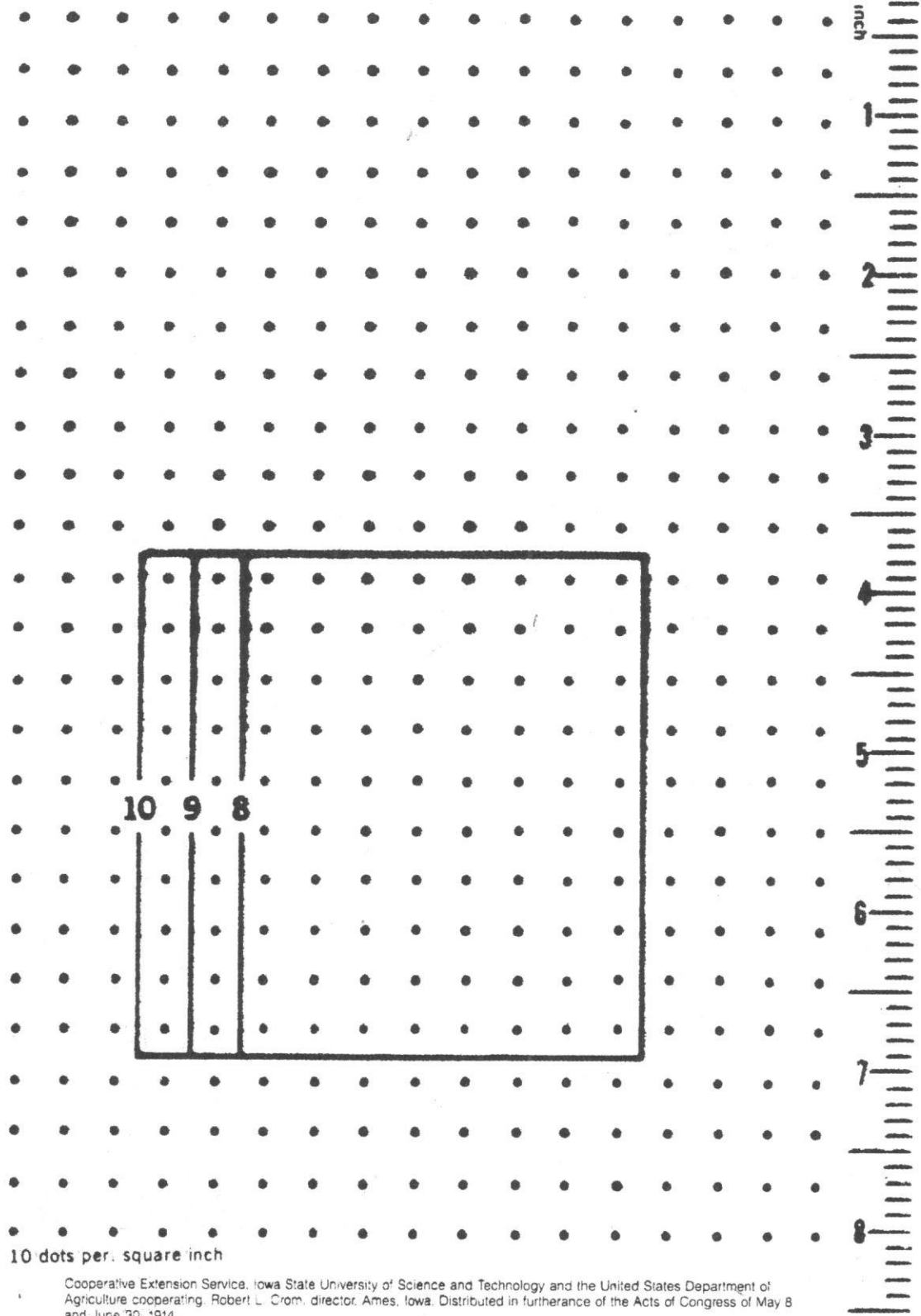
Lamb ribeye pictures can be found in the Meat Evaluation Handbook, American Meat Science Association, 2001. pgs. 124-125 and 130.

Pork loin eye pictures can be found in the Meat Evaluation Handbook, American Meat Science Association, 2001. pgs. 98-99.

Carcass Measurements Key will provide the measurements for the pictures used in this lesson.

# *Example of plastic grid card used for measurement of loin eye (beef rib eye area)*

Iowa State University of Science and Technology • Ames, Iowa  
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(Figure 8.06)

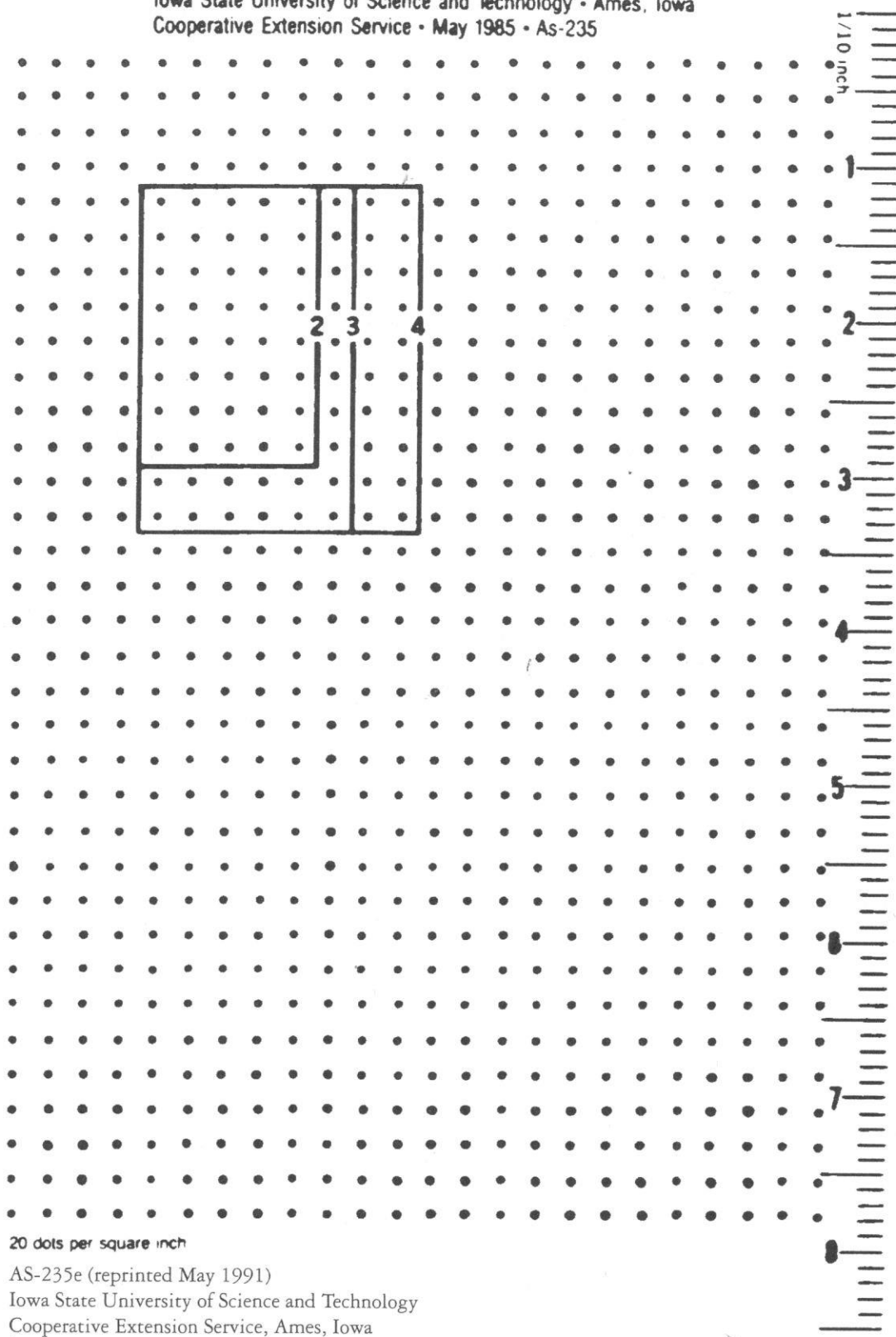


Figure 4.7  
Plastic grid for measuring loin eye

## **Carcass Measurements Lesson Key**

### **Beef Ribeye Measurements (10 dots on the beef ribeye grid = 1 square inch)**

Picture #132 – Total number of dots = 134 for a ribeye area of 13.4 square inches

Measured with .35 inches of fat thickness

Picture #68 – Total number of dots = 105 for a ribeye area of 10.5 square inches

Measured with .20 inches of fat thickness

Picture #1509 – Total number of dots = 126 for a ribeye area of 12.6 square inches

Measured with .55 inches of fat thickness

Picture #122 – Total number of dots = 110 for a ribeye area of 11.0 square inches

Measure with .60 inches of fat thickness

### **Lamb Ribeye Measurements (20 dots on the swine loin eye grid = 1 square inch)**

Picture #82 – Total number of dots = 56 for a ribeye area of 2.80 square inches

Measured with .15 inches of fat thickness

Picture #132 – Total number of dots = 53 for a ribeye area of 2.65 square inches

Measured with .25 inches of fat thickness

Picture #90 – Total number of dots = 46 for a ribeye area of 2.30 square inches

Measured with .20 inches of fat thickness

Picture #2727 – Total number of dots = 73 for a ribeye area of 3.65 square inches

Measured with .20 inches of fat thickness

### **Swine Loin eye Measurements (20 dots on the swine loin eye grid = 1 square inch)**

Picture #226 – Total number of dots = 150 for a loin eye area of 7.5 square inches

Measured with a backfat thickness of 1.00 inch

Picture #1874 – Total number of dots = 116 for a loin area of 5.8 square inches

Measured with a backfat thickness of 1.10 inches

Picture #1889 – Total number of dots = 110 for a loin eye area of 5.5 square inches

Measured with a backfat thickness of .50 inch

Picture #1427 – Total number of dots = 196 for a loin eye area of 9.8 square inches

Measured with a backfat thickness of .50 inch

**QUALITY ASSURANCE: IDEAL MARKET ANIMAL – BEEF RIBEYE PHOTOS**

Photo Credit: Cindy A. Kinder





68





122



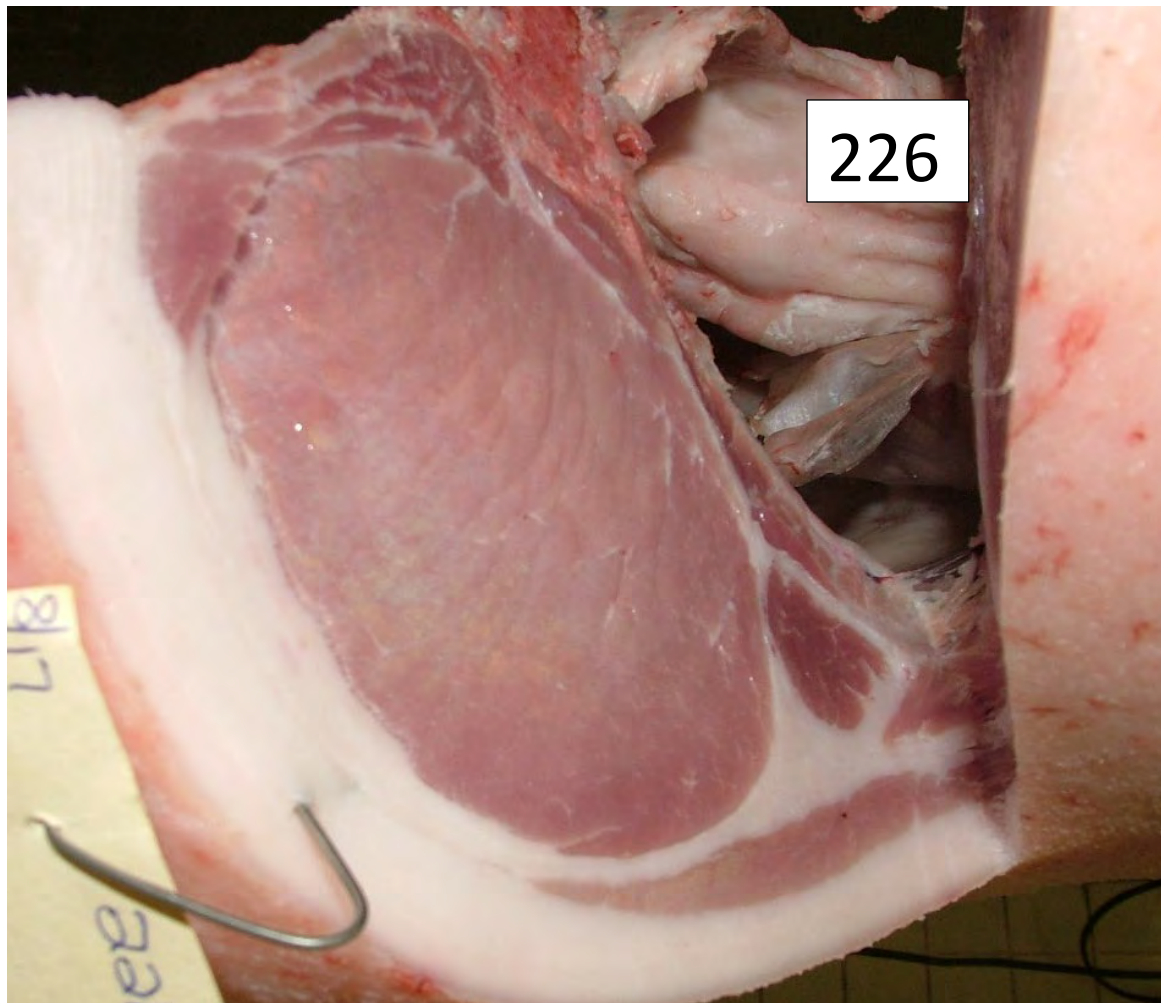


1509



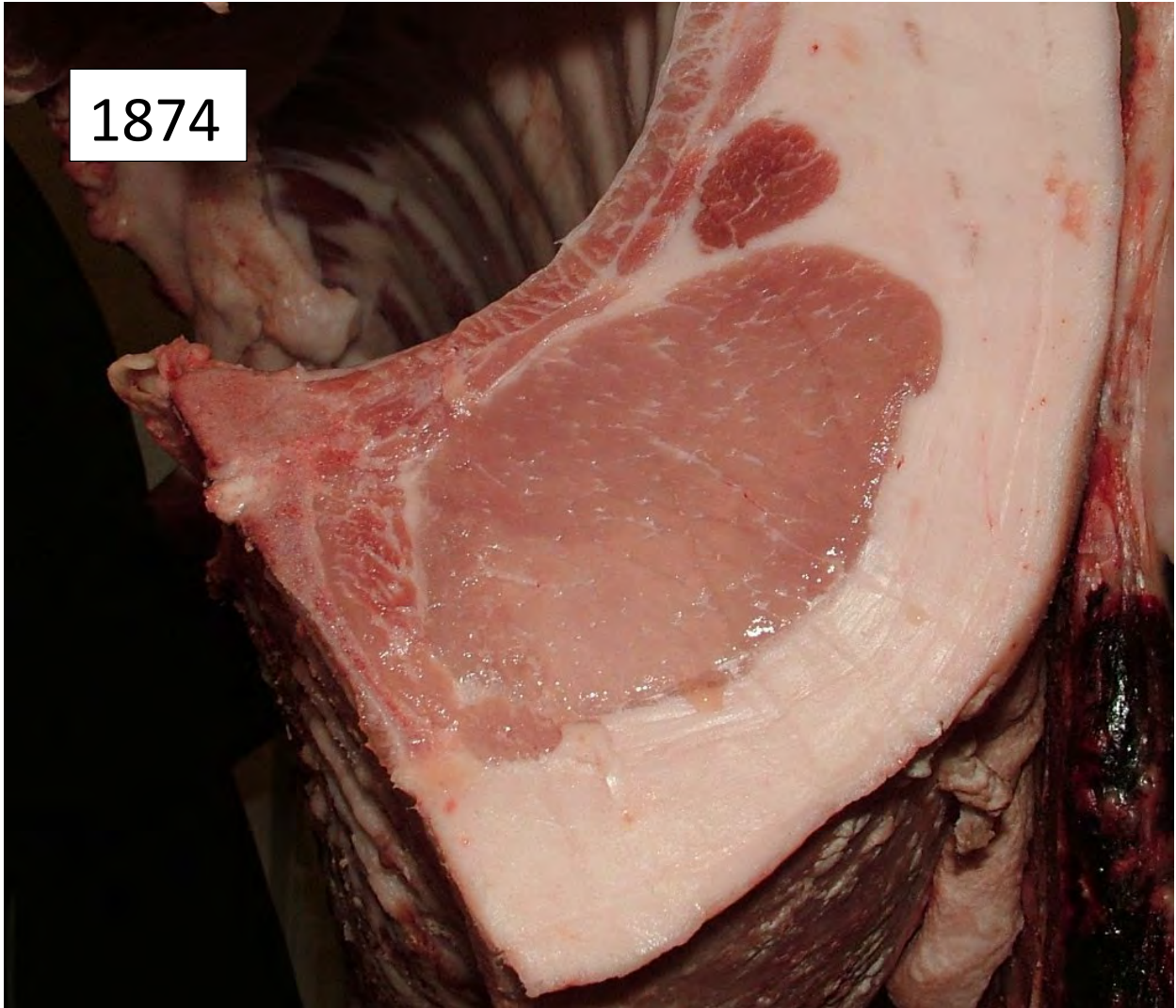
**QUALITY ASSURANCE: IDEAL MARKET ANIMAL – SWINE LOIN EYE PHOTOS**

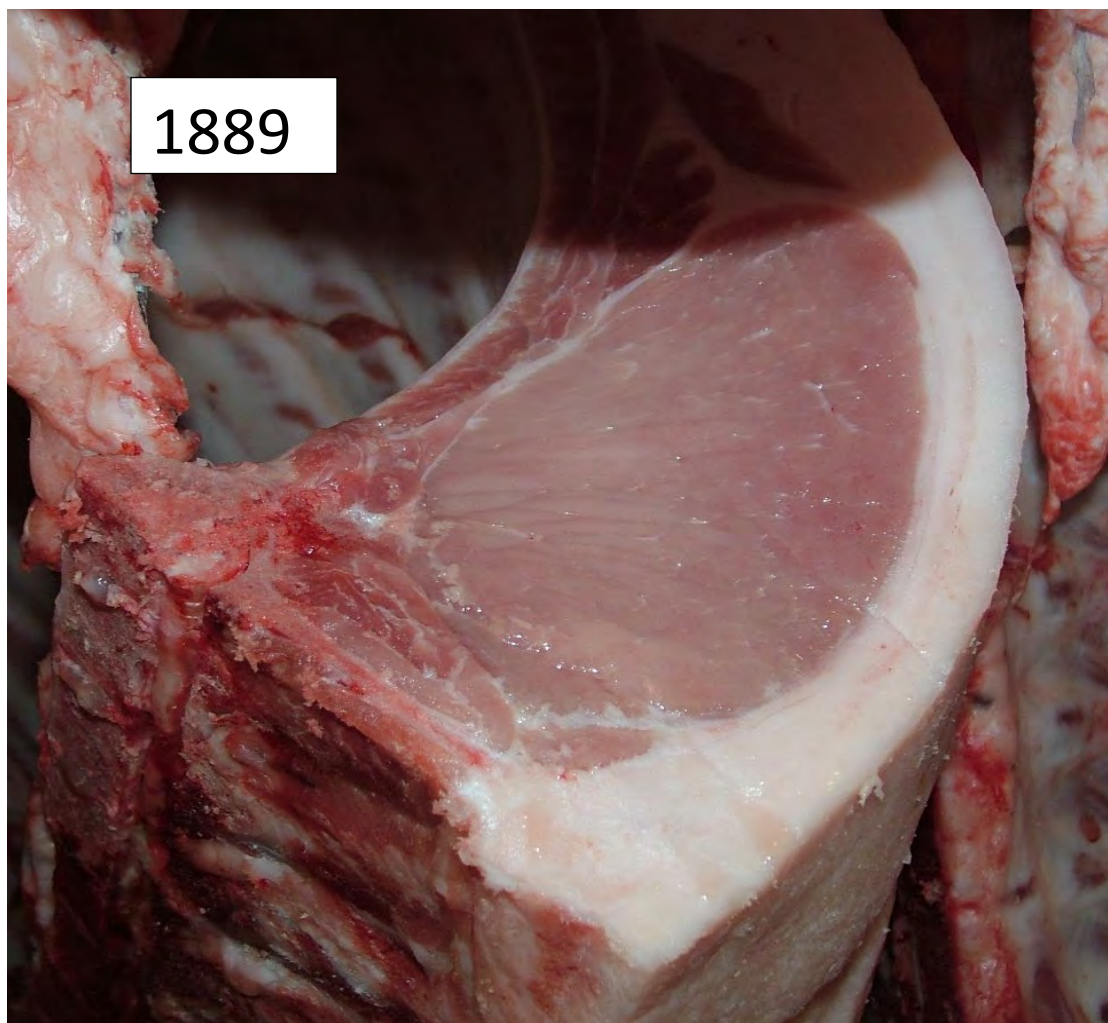
Photo Credit: Cindy A. Kinder





1874





1427





**QUALITY ASSURANCE: IDEAL MARKET ANIMAL – LAMB RIBEYE PHOTOS**

Photo Credit: Cindy A. Kinder

