

Hands-on genomics course inspires Idaho teens toward agricultural biotech careers

AT A GLANCE

The genomics course for teens immerses Idaho youth in biotechnology, genetics and aquaculture through hands-on lab and field experiences that boost STEM skills and career interest.

The Situation

As Idaho's agricultural sector increasingly integrates biotechnology into animal breeding, crop improvement and sustainability practices, a shortage of skilled workers in agricultural biotechnology will limit innovation and economic growth. High school students, especially in rural regions, have limited access to advanced lab experiences that demonstrate real-world applications of genomics in food production. Without early exposure, many students are unaware of these emerging career opportunities or how they connect to Idaho's agricultural economy. Providing experiential STEM education in genomics can help build a future workforce prepared to meet these challenges while expanding awareness of modern agricultural technologies and career paths.

Our Response

University of Idaho Extension developed and hosted the Agricultural Genomics Course for Teens (AGCT) at the Hagerman Fish Culture Experiment Station, supported by a USDA–NIFA–AFRI Agricultural Technology Pathways grant. The three-day summer course provided high school students with immersive, hands-on instruction in DNA extraction, PCR amplification, gel electrophoresis, and genome analysis using real



Youth participants and instructors in the molecular genetics lab during the 2025 Agricultural Genomics Course for Teens.

agricultural case studies in aquaculture and plant science. Students toured a commercial fish farm (Riverence Farms R&D), interacted directly with university scientists, and gained experience using molecular tools in a laboratory setting. Participants received certificates of completion and were encouraged to apply what they learned toward FFA, 4-H or school research projects. The program was promoted through University of Idaho Extension networks, local schools and 4-H channels.

Program Outcomes

Course evaluations demonstrated clear learning gains and meaningful impacts for participating youth. Following the program, students showed an average post-test improvement of 18.4 percentage points, reflecting

substantial increases in understanding of DNA, molecular biology and genomics in agriculture. Every student and parent indicated that the course met learning needs, was well organized, and that instructors were knowledgeable and engaging.

Participants also reported a greater appreciation for how biotechnology contributes to animal science, crop production and food security. Several students planned to apply what they learned to FFA market beef, poultry and sugar beet projects, classroom research and future college coursework. Parents described the program as “amazing” and praised the hands-on practice and relevance to real-world agricultural careers. Instructors observed that students gained confidence using laboratory tools, interpreting genetic data and communicating scientific ideas.

- Knowledge gain: +18.4% average increase in post-test scores
- Participant satisfaction: 100% positive feedback from students and parents
- Behavioral change: Students identified specific applications of new skills in FFA and coursework
- Qualitative impact: Increased confidence, curiosity, and awareness of ag-biotech career opportunities

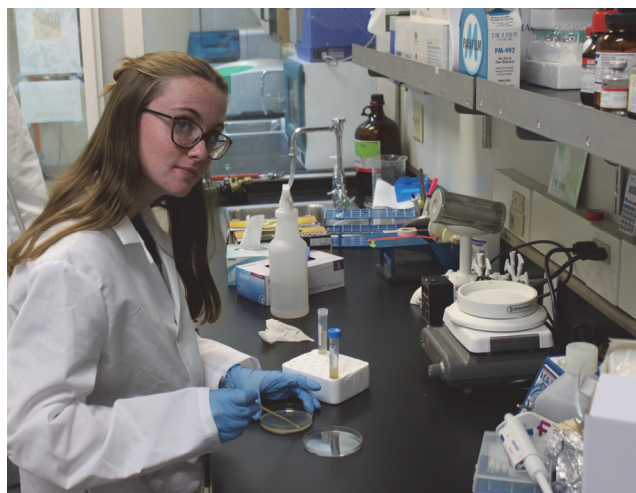
The Future

Plans for next year include extending the course duration and strengthening additional partnerships with local schools and agricultural biotechnology employers to broaden its statewide reach. These enhancements

will further connect Idaho youth with career pathways in agricultural science, supporting the 4-H STEM focus on plant and animal science education.

Cooperators and Co-Sponsors

This program was supported in part by the U.S. Department of Agriculture, National Institute of Food and Agriculture (USDA-NIFA) through the Agricultural Technology Pathways grant, administered by the University of Idaho College of Agricultural and Life Sciences. Additional support and instructional resources were provided by the University of Idaho Aquaculture Research Institute and collaborating staff at the Hagerman Fish Culture Experiment Station.



An Agricultural Genomic Course for Teens participant practices molecular biology techniques during a hands-on lab session.

FOR MORE INFORMATION

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