

Impact

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Exploring the science of food production

Elementary school students discover the science behind growing food through a successful Eastern Colorado agricultural education program.

Issue

Colorado's top five food producing counties, all located in Northeast Colorado, annually generate nearly \$3 billion in agricultural revenue—almost half of the state's \$6 billion total. Ironically, many young people living in these agricultural-rich areas often think food comes from the store rather than a farm, much like their counterparts in more urban areas. Schools provide a perfect forum for teaching about agriculture and the science behind food production. However, science lessons rarely focus on agriculture, and teachers don't always have the time, resources or knowledge to help engage students in hands-on, agricultural science-based learning.

Extension's Response

In 2010, Colorado State University Extension agents and specialists from across Eastern Colorado created *AgFest*, an annual, one-day traveling agricultural science education event. *AgFest* helps fifth and sixth grade students explore science, technology, engineering and math (STEM) through hands-on educational workshops that supplement their school curriculum.¹ The event currently takes place in communities across Eastern Colorado.

In spring 2011, approximately 1,200 students from over 20 schools attended one of five *AgFest* events held at fairgrounds and community centers. During this year's *AgFest*—in Brush, Lamar, Siebert and Sterling—students spent the day rotating through 10 activity stations, in groups of 20 to 30. Stations focus on a different science-based learning objective related to agriculture:

- Microbes and bacteria
- Embryology
- Bee keeping and pollination
- Biotechnology and plant science
- Ruminant digestion
- Renewable energy and conservation
- Farm and tractor physics
- Rangeland ecology
- Groundwater conservation
- Colorado agricultural diversity

Stations also featured hands-on learning activities that made challenging science concepts easier to grasp. Extension agents and specialists, along with a Colorado Department of Agriculture representative, led students through activities and lessons designed to supplement classroom curriculum. For example, at the 'farm and tractor physics' station, students experimented with pulleys and levers to learn about lifting loads and multiplying force. Students were also introduced to a cow's four-chambered stomach, good versus bad bacteria, baby chick embryos, how a press can turn oil seed into fuel, plant science, and a variety of food products grown in Colorado.



The Bottom Line

- *AgFest* enhances science education through standards-based activities that raise student awareness about food production and agriculture.
- *AgFest* complements classroom learning and provides teachers an opportunity to increase their students' understanding of science concepts.

Agricultural Literacy

AgFest is one of several Colorado programs designed to raise student awareness about the link between people, crops and livestock. Colorado State University's College of Agricultural Sciences developed Ag Adventure to explain the source of their food and fiber through hands-on exhibits. Learn more at www.agsci.colostate.edu/news/agfam_spring11/agfamily_spring2011_www.pdf. Increasing agricultural literacy is the mission of The Colorado Foundation for Agriculture. Learn more at www.growingyourfuture.com.

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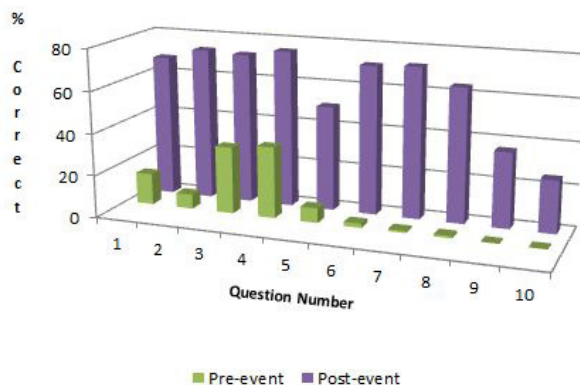
In its second year, *AgFest* continues to develop a scientific understanding of food production among the students who attend the one-day event. Pre- and post-survey results show that students greatly increased their understanding of scientific and agricultural concepts. The greatest knowledge gains were related to entomology, microbes, rangeland and plants.

AgFest surveys also provided space for students to write down and sketch the most interesting thing they learned. Overwhelmingly, students provided detailed descriptions of the parts of an embryo, levers and pulleys, 'gross' germs, and the 'amazing' four-chambered cow stomach. Most students were enthusiastic about *AgFest* and expressed a desire to return because the learning was so much fun.

Backed by 4-H STEM curriculum, Extension agents and specialists provide the resources and expertise of agricultural science-based activities that many teachers cannot offer in their classrooms. As *AgFest* evolves, event organizers hope to further develop station activities to give students even more engaging hands-on learning opportunities that develop their understanding of the agricultural, natural, physical, and life sciences while increasing their awareness of food production.

From the inaugural *AgFest* event in 2010 to its second year in 2011, student participation increased by 400 percent.

| Student knowledge | Pre-event | Post-event |
|------------------------|-----------|------------|
| 1 Embryology | 15 | 68 |
| 2 Rangeland | 7 | 73 |
| 3 Power and tools | 32 | 72 |
| 4 Digestion | 34 | 75 |
| 5 Energy | 7 | 50 |
| 6 Microbes | 2 | 71 |
| 7 Entomology - bees | 1 | 72 |
| 8 Plants | 1 | 64 |
| 9 Colorado agriculture | 0 | 36 |
| 10 Water | 0 | 25 |



¹ *Science, Technology, Math & Engineering (STEM) combines the strengths of 4-H programming, non-formal experiential-based delivery modes with strong youth/adult partnerships to address content as defined by the National Education Science Standards and practice STEM abilities in order to prepare our youth to compete in the 21st century workplace.*

“Thank you for teaching us about everyday things. The embryology, honey bee, and simple machines were my favorite stations. I hope that you keep this going so other kids can learn and have fun.”

– 5th grade student from Holly, Colorado

Learn More

<http://goldenplains.colostate.edu/AgFest>

AgFest Contributors

The event was made possible by contributions from Koberstein Farms, Monsanto, Pioneer Hybrids, Colorado Wheat Administrative Council, Colorado Corn, Western Dairy Association and High Plains Bank.

County Partners

AgFest was organized and delivered by Extension agents, specialists and program associates from the following counties:

| | |
|-------------------|-------------------|
| Bent County | Morgan County |
| Cheyenne County | Otero County |
| Crowley County | Phillips County |
| Kiowa County | Prowers County |
| Kit Carson County | Sedgwick County |
| Lincoln County | Washington County |
| Logan County | Yuma County |

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