

# The Case for GMOs

UC–Davis professor stresses the importance and positive aspects of genetic engineering in animal agriculture.

Story & photo by **Shelby Mettlen**, assistant editor

One of the most controversial topics in agriculture today is the use of genetically modified organisms (GMOs). The use of the technology has helped farmers and ranchers make incredible progress in many important areas of agricultural production, including dramatic increases in crop yields and animal growth.

So why are consumers so averse to adoption of the technology? Alison Van Eenennaam, Cooperative Extension specialist in animal genomics and biotechnology with the University of California–Davis, broke it down for her Cattlemen’s College® audience at the Cattle Industry Convention & NCBA Trade Show Jan. 28.

“I really hate the term ‘genetically modified organism,’” she said. “It’s really an ill-defined term. What people are actually referring to is genetic engineering.”

According to Van Eenennaam, the USDA defines genetic engineering as “using recombinant DNA technology to move a piece of DNA from one species ... into another to give it a protein expression in that species that does something we want.”

Some examples are herbicide- or insect-resistant plants and fast-growing salmon.

Globally, about 18 million farmers grow 448 million acres of genetically modified crops. We tend to think of biotechnology and use of genetically engineered crops as a First World technology, but 16.5 million farmers in developing countries grow GMO crops.

## Safe for consumption

Between 70% and 90% of the GMO crop varieties produced are consumed by livestock animals. Since genetic engineering’s introduction in 1996, Van Eenennaam said there have been no safety issues related to animal or human consumption of genetically engineered crops.

There are “literally hundreds” of studies that have been conducted and published to prove the safety of genetically engineered crop varieties for animal consumption, she shared with the audience.

Genetically modified plants are nutritionally equivalent to their non-GMO counterparts. They are safe to use in feed and food, she emphasized. “The science is



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very solid. They are not unsafe for animals to eat.”

Van Eenennaam and her colleagues conducted a meta-analysis to explore any possible implications of consuming genetically modified crops in commercial livestock populations. One hundred five billion livestock animals, including about 400 million beef cattle, consumed genetically engineered crop varieties between 2000 and 2011. What Van Eenennaam found was a positive trend — not a trend you would expect from sick or ailing animals, which is the effect some believe genetically engineered crops have on livestock.

She and her colleagues discovered overall decreases in percent mortality and condemnation, as well as increased average daily gain and feed-to-gain ratios.

“I feel very confident that there are no implications to consuming GMO crops,” she said.

Van Eenennaam explained that the milk, meat and eggs from animals consuming GMO feeds “contain no traces of recombinant DNA that has been expressed in the trans gene.” The products from animals fed genetically engineered crops are indistinguishable from their non-GMO counterparts.

## Labeling discussion

For this reason, she said, it is unnecessary

to require a product derived from an animal fed GMO crop varieties to be labeled.

“They’re fundamentally exactly the same,” she said. “There’s no way to detect one from the other.”

There is currently no mandatory labeling required to recognize animals that have been fed genetically modified crops. However, there is a voluntary system in place, which Van Eenennaam said is creating a “false or misleading” market. Companies are labeling their bananas as “non-GMO,” when in fact there are no genetically modified varieties of bananas.

“What concerns me is that when you start mandating a process on the label, what’s the end of it?” she asked. “In this case, we’re trying to mandate the process of having genetic engineering in the breeding process that produced a particular crop used to feed the animal that then produced the steak that then ends up in the market.”

“If it doesn’t change the composition or safety of the end product, the logistics, or keeping it straight, would get kind of unmanageable,” she said. “If we start labeling things other than for food safety, just based on concern for the process, where do we stop?”

Genetic engineering is just one of many breeding methods, she explained. It’s just like breeding through traditional selection of



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superior traits. The technology is used in lab animals, pharmaceuticals, aquarium fish and salmon. She also pointed out that insulin is produced in genetically modified microbes.

Van Eenennaam spoke in detail on the AquAdvantage salmon — a genetically engineered breed of salmon in which a gene from the Chinook salmon is injected into the Atlantic salmon, allowing it to reach market weight in 18 months rather than 30.

Since the initial transmittal of the gene from one breed of salmon to the other in 1989, there has been no genetic engineering done to the animal. Subsequent breeding of the fish has been conducted solely through conventional breeding.

The fish was approved by the Food and Drug Administration (FDA) last November. It took about \$85 million and 25 years to approve the animal for the market, even though it is bred the same way as chickens, cattle and any other livestock animal — using conventional breeding. Chickens were bred by selecting for fast-growing animals; the salmon were bred by transplanting one gene that causes the fish to grow faster. It's the same principle, Van Eenennaam said.

### Gene editing

Another technology Van Eenennaam said is exciting for the industry is gene editing.

Like you can make the word “wine” into “wing” by changing one letter, scientists can edit the genome.

“If we know what genes we want to target, we can go in and turn it off,” she said.

By tweaking one gene, scientists can design hogs that aren't susceptible to disease. They can reduce the effects of bovine respiratory virus (BRV), or shipping fever, in feedlot cattle. They can breed Holstein cattle that are polled, eliminating the need for the painful process of dehorning. They can breed single-gender chickens to eliminate the condemnation of male layers.

Why is this important? Because scientists can eliminate suffering, disease and pain by modifying single genes in livestock animals.

At present, the industry loses 20% of its animals to illness leading to death. Employing the use of biotechnology can improve the overall health of livestock animals and eliminate suffering and death in livestock populations.



**Editor's Note:** This article was written as part of Angus Media's online coverage of the Cattle Industry Convention & NCBA Trade Show. For additional coverage, visit the Newsroom at [www.4cattlemen.com](http://www.4cattlemen.com).

# Modern Ag in a Facebook Culture

## Nutritionist emphasizes need for producers to share their stories to help build understanding of the need of technology.

by Kindra Gordon, field editor

**G**ary Sides, a beef cattle nutritionist with Zoetis, shared a sad but true reality during his Cattlemen's College® presentation in San Diego, Calif., Jan. 27.

“Simple lies are more palatable than complicated truths,” Sides pointed out as he noted the public's misunderstandings of food and agriculture.



Helping consumers understand and embrace technology will be essential for addressing global food security issues, Gary Sides said. Telling stories and sharing experiences are key to building this understanding and support.

In today's Facebook- and social media-driven culture, Sides shared several examples where consumers have chosen to demonize beef and the beef industry rather than listen to scientific findings — fat, growth hormones, food safety, animal welfare and the environment.

Sides shared data indicating that during the past 40 years a high-carbohydrate, low-fat diet has contributed more to the population's obesity epidemic than fat. Yet, he said, today's generation, government nutritionists and the medical community have ignored science showing that fat does not make people fat, and have made fat a four-letter word.

“It's become the second F-word,” Sides said. He pointed out that the average American drinks 400 12-oz. cans of soda pop each year, “but yet fat is the bad guy.”

Sides shared other similar scenarios:

- ▶ Sodium is blamed for high blood pressure when there is ground-breaking research that has proven otherwise; and
- ▶ Growth hormones are blamed for high levels of estrogen when soy flour, birth control pills and white bread have millions of times more estrogen than beef produced from steers given growth promotants.

When was the last time a headline proclaimed the good news about beef, he asked. “I'm amazed people still eat our product.”

“Today's consumers have access to all of this information, but they don't know where their food comes from,” Sides pointed out. He underscored that it is the job of those in agriculture to teach people about the basis of their food.

Regarding technology, Sides shared that if the globe had only the technology available in 1950, additional land mass the size of South America would be needed to produce the same amount of food as is produced today. He noted that in 1776 a farmer could raise enough food for one extra person. Today, with technology, a farmer produces enough food to feed more than 155 additional people.

Sides emphasized that to enable future use of technology, helping consumers understand and embrace technology will be essential for addressing global food security issues. He noted that telling stories and sharing experiences are key to building this understanding and support.

Sides closed his presentation noting that he is now a grandfather of two, a job he considers the best in the world. Sharing a photo of his grandchildren and expressing his commitment to beef, he said, “Do you think I'd ever recommend anything in the food supply that might hurt these kids?”



**Editor's Note:** Kindra Gordon is a freelancer and cattlegirl from Whitewood, S.D. This article was written as part of Angus Media's online coverage of the Cattle Industry Convention & NCBA Trade Show. For additional coverage, visit the Newsroom at [www.4cattlemen.com](http://www.4cattlemen.com).