

Introducing Gene Editing Technology in Livestock

Key Takeaways:

- Porcine reproductive and respiratory syndrome (PRRS) was first reported in the U.S. in 1987. Since then, outbreaks of PRRS have been confirmed throughout North America, Asia, South America, Africa, and Europe. There are currently no effective treatments, although modified-live vaccines provide partial protection against infection.
- In April 2025, Genus Pig Improvement Company (Genus PIC), a Tennessee based company who specializes in pork genetics and technology, received Food and Drug Administration (FDA) approval for gene editing technology used in its PRRS-resistant pig, determining the technology is safe and effective based on FDA standards. *FDA approval does not automatically trigger commercialization in the U.S.*
- Critics of gene editing raise concerns about overpopulation of a species as well as question the approval process and safety and effectiveness of the product. However, proponents of utilizing the technology boast improved animal welfare, reduced need for antibiotics, and minimized environmental impacts as driving forces behind implementing gene editing.

Questions:

1. If gene edited livestock were available to you, would you incorporate such technology in your operation?
2. How does gene editing technology impact consumer confidence in the food system?
3. When marketed, should products which utilize gene editing technology be regulated differently?

Background

Managing and preventing disease in livestock is a continuous process. There are currently over 140 diseases listed on the United States Department of Agriculture’s list of nationally reportable diseases.

What if producers were able to attain genetics which carry disease resistant technology? Tennessee based company, Genus PIC, comes to the market with what they claim is a “breakthrough for a devastating problem.” In April 2025, Genus PIC received FDA approval for gene editing technology used in its PRRS-resistant pig, determining the technology is safe and effective based on FDA standards.

PRRS, or porcine reproductive and respiratory syndrome, has proven to be devastating to the U.S. pork population. A study from Iowa State University in 2024 shows growing losses from

PRRS cost pork producers \$1.2 billion per year in the U.S., an estimate up from the previous \$664 million from 2006-2010.

Gene editing technology in livestock has been in the research phase for over a decade. In cattle, gene editing has been centered around traits such as disease resistance, presence of horns, heat tolerance, and muscle development. In specialty crops, gene editing has been used to grow seedless blackberries and rice which is more resistant to hot, dry climates. Outside of production agriculture, even wildlife geneticists are working to “de-extinct” the dire wolf population by using gene editing technology.

These advances in technology have not come without skepticism from consumers. Critics of gene editing raise concerns about overpopulation of a species as well as question the approval process and safety and effectiveness of the product.

However, proponents of utilizing the technology boast improved animal welfare, reduced need for antibiotics, and minimized environmental impacts as driving forces behind implementing gene editing. At a hearing in Washington D.C. focused on gene editing, a Nebraska farmer claimed gene editing can help farmers address consumer demands while dealing with changing weather patterns and disease mitigation. “We have to make sure we’re building that trust with consumers and educating them not only on the benefits gene editing will have on agriculture and how that will help us accomplish producing more with less, but we also need to make sure we’re answering consumer’s questions,” he stated.

So, how does it work? Clustered Regularly Interspaced Short Palindromic Repeats, or CRISPR, technology allows for precise changes in the DNA of a genome and can be as targeted down to the singular molecular level. What’s the difference between gene editing and genetically modified organisms such as those utilized in the row crop industries? Gene editing deletes a specific portion of a gene from an organism’s own DNA and does not insert any foreign DNA – in other words a form of selective breeding. Genetically modified organisms introduce DNA from another organism to modify the genetic code of an organism. While similar, the two phrases should not be considered interchangeably.

As for the PRRS-resistant pig, the FDA approval does not automatically trigger commercialization in the U.S. Subject to

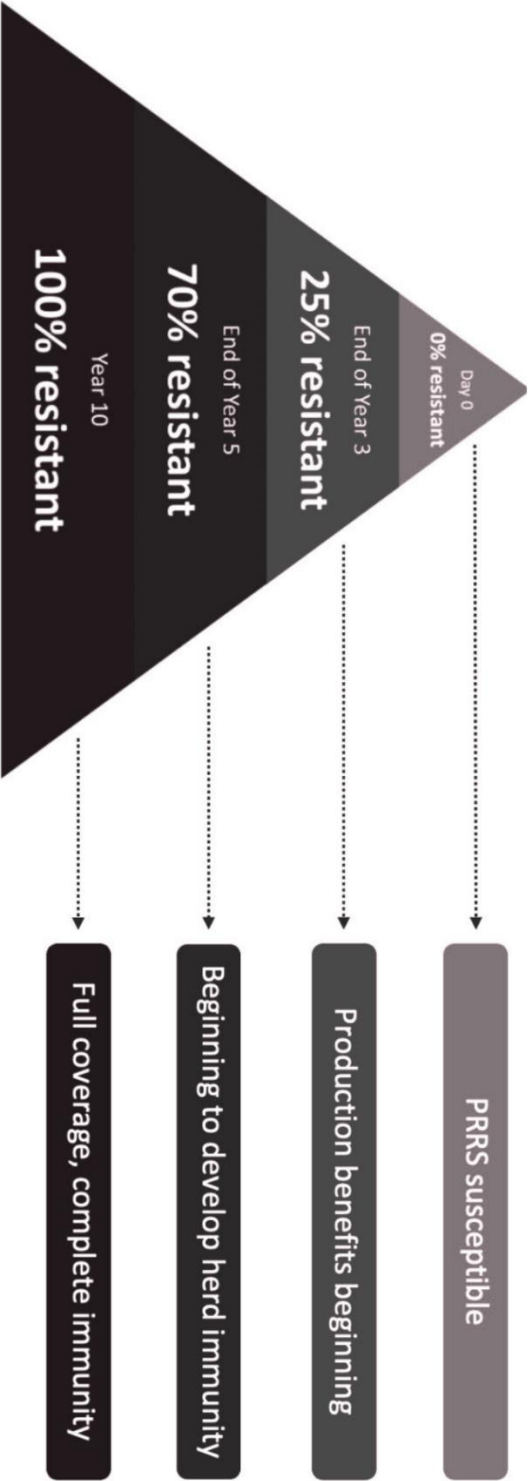
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Read more about the PRRS-resistant pig, including the stages of research and development:



receipt of FDA and other approvals in key pork markets, PIC foresees commercialization in the U.S. in 2026 at the earliest. The graph below shows PIC’s incremental timeline to allow the pork market to adjust to the introduction.

This is just one **example** of how the PRRS-Resistant Pig could be integrated into a large system. Individual producers may choose to go faster or slower, and implementation will vary.



*All claims about the safety and efficacy of PIC’s PRRS-resistant pig are currently under FDA review. The PRRS-resistant pig is not currently for sale. **FDA approval will not automatically trigger commercialization in the U.S.** Subject to the receipt of FDA and other approvals in key pork markets, PIC foresees commercialization in the U.S. in 2026 at the earliest.



Policy

Tennessee Farm Bureau Biotechnology (Partial)

Advancements in biotechnology are having tremendous positive impacts on agriculture. These developments benefit all sectors of our society, not just agriculture. Therefore, Farm Bureau should strive to inform the public of the benefits implementation of these new production practices will have on the environment and the well-being of the community.

We support increased efforts through biotechnology to increase the marketability of our products, to solve environmental concerns, to increase net farm income by decreasing input costs, and to improve product quality and acceptability.

We urge state and national political leaders to develop a positive national strategy for biotechnology research and development. Part of this strategy should include an open and frank dialogue with all interested parties. Only the continued support and encouragement of technological advancements will assure our viability in world markets. We encourage USDA to take a lead in coordinating efforts to evaluate and move approved products and technologies to the marketplace quickly. The approval of new products should be based on safety and efficacy criteria and not on socioeconomic criteria.

Patents should be broad enough to provide reasonable protection of development costs but not so broad as to grant one developer the right to a whole class of future developments. Patents should be granted only on invented devices or processes, not on discoveries of naturally occurring genes, chemicals, or other biological systems. Companies should not sell U.S. patented seeds in countries that do not provide patent protection. This gives foreign producers a competitive advantage over U.S. farmers who must pay for development costs and abide by patent laws. Farm Bureau should work to inform farmers of their rights and obligations under U.S. patent laws regarding plant varieties and other biological material.

We oppose any law or regulation requiring registration of farmers who use or sell products approved for sale by the Food and Drug Administration.

We oppose mandatory labeling of genetically modified foods. We oppose the classification of Bt corn as a chemical by EPA. We support advancements in genome editing that could increase productivity to Tennessee farms. There are several approaches to genome editing, of which the CRISPR-Cas9 method shows promise for all agriculture. The agricultural industry should work to bring a positive image for biotechnology and genome editing.

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1. We support:

- 1.1. The use of gene editing in livestock, companion animals and crops;
- 1.2. Gene editing technology being regulated by USDA, not the Food and Drug Administration;
- 1.3. The use of sound science in the regulation of genetically edited products with the timely approval for human consumption. We believe that consumers, both domestic and foreign, deserve sound-science-based education on genomic editing;
- 1.4. A voluntary and uniform labeling system for products designed with gene editing;
and
- 1.5. Continued research of genetic modification.