

Support Material for mRNA Vaccine Discussions

Background:

Misinformation has been shared on social media claiming humans can become vaccinated against COVID-19 by consuming animal protein from livestock treated with mRNA vaccines.

Additionally, the topic of "messenger" RNA technology or mRNA vaccines has recently found its way into some state legislative bills, media outlets, customer conversations, and on social media.

A National Institute for Animal Agriculture (NIAA)-facilitated working group has developed material for communications support regarding the use of mRNA technology in animal agriculture. Working group leaders include:

- American Association of Swine Veterinarians
- American Farm Bureau Federation
- American Veterinary Medical Association
- Animal Agriculture Alliance
- Livestock Marketing Association
- Merck Animal Health
- Missouri Farm Bureau
- National Institute for Animal Agriculture
- National Pork Board
- National Pork Producers Council
- North American Meat Institute
- Zoetis

What is mRNA?

Messenger ribonucleic acid (mRNA) occurs in all living organisms including food.¹ mRNA breakdown (degradation) occurs in all forms of life² including digestion of food.

How are vaccines regulated in the US?

FDA's Center for Biologics Evaluation and Research (CBER) regulates biological products, which includes vaccines, for human use to ensure they are safe, effective, and available.³ USDA's Animal Plant Health Inspection Service (APHIS) in its Center for Veterinary Biologics (CVB) regulates veterinary biologics (vaccines, bacterins, antisera, diagnostic kits, and other products of biological origin) to ensure that the veterinary biologics available for the diagnosis, prevention, and treatment of animal diseases are pure, safe, potent, and effective.⁴ CVB's safety evaluation includes safety of food derived from food-producing animals (livestock) that have received a vaccine⁵ including vaccines produced with new technologies.⁶

What are mRNA vaccines and how are they used?

Messenger ribonucleic acid (mRNA) vaccines are newer vaccines; however, the technology has been researched for decades – beginning in 1961⁷. Researchers began exploring mRNA’s application to human and animal health shortly after mRNA was discovered. In 2020, mRNA was the platform used to develop some COVID-19 vaccines. Unlike conventional vaccines, which can be expensive and take months to produce by growing weakened forms of the virus, mRNA vaccines can be constructed quickly using only the pathogen's genetic code.⁸

Many vaccines use a weakened or inactivated germ to trigger an immune response; this is not the case for mRNA vaccines. Instead, mRNA vaccines use mRNA created in a laboratory to teach animal cells how to make a protein—or even just a piece of a protein—that triggers an immune response inside the body. This immune response, which produces antibodies, helps protect against illness.⁹ After the body produces an immune response, it discards all the vaccine ingredients. The genetic material delivered by mRNA vaccines cannot intermingle or change the genes of the person or animal receiving the vaccine.¹⁰

While many vaccines are manufactured in the United States, all vaccines administered to livestock in the U.S. must be approved and licensed by USDA – Center for Veterinary Biologics. The USDA-CVB has a well-defined process to review and regulate the manufacturability, safety, and potency of biological products intended for use in livestock. Vaccines do not exist for all animal diseases,¹¹ but there is ongoing research around the world developing mRNA vaccines, which could benefit the health and welfare of livestock in the future.

Vaccines for livestock [protect against diseases](#), and limiting mRNA vaccines would mean losing a new tool to protect animals from illnesses.¹²

As more animal health advancements emerge, farmers and ranchers, veterinarians, and scientific experts will continue to evaluate critical tools to preserve animal and human health. Vaccines undergo rigorous safety studies and are approved by the U.S. Department of Agriculture's Center for Veterinary Biologics. RNA technology has not been found to pose any risks to the food supply through food animals.

What exists today and is it safe?

Vaccines are crucial for safeguarding animal health and well-being, keeping the food supply safe, and protecting U.S. livestock from emerging and foreign diseases.

Numerous vaccine technologies have been developed over the years to improve animal health and welfare, and all vaccine technologies used in livestock must be licensed and regulated by the USDA. Research will continue to use every available tool in the toolbox to protect animals from disease and ensure a safe food supply.

Are livestock vaccinated for COVID-19?

There is one veterinary COVID-19 vaccine licensed in the U.S. for use in mink and it does not use mRNA technology. This vaccine utilizes a recombinant SARS-COV-2 Spike protein formulated with an adjuvant and does not utilize the mRNA technology. Additionally, no requirements exist to vaccinate livestock for any disease, including COVID-19, regardless of technology.¹²

Is a vaccine present in the meat, milk, or eggs I eat?

With all vaccinations administered to livestock, there are required withdrawal times to ensure meat, milk, and eggs are safe for human consumption. Each manufacturer determines the withdrawal period, is specific to each vaccine, and is required to get USDA approval.^{12,14} Scientists agree that mRNA vaccines cannot be passed on to consumers through ingesting meat, milk, or eggs from a vaccinated animal.^{12, 13,13} Furthermore, correct cooking procedures and digestion in the human gut destroy any potential mRNA.

New technologies can help us address future problems and we need to ensure access to these technologies to solve emerging diseases. All animal health products receive the highest level of scrutiny before entering the human food supply.

Highlights

- The health and well-being of animals is the top priority.
- Vaccines are critical to preserving animal health and well-being, keeping the food supply safe, and protecting U.S. livestock from emerging and foreign diseases.
- Vaccines have been shown to prevent outbreaks and reduce disease on farms.
- Farmers, ranchers, and veterinarians utilize technologies such as vaccines to help safeguard animal health and welfare to protect food security.
- Vaccines are used under the direction of a veterinarian to protect animal health and well-being.
- Food from vaccinated animals is safe to consume.
- Vaccines, antibiotics, and other medicines used to treat food animals are not present when animal proteins enter the food supply.
- Animal-derived proteins entering the food system must adhere to withdrawal requirements for USDA's licensure of the products. People cannot become vaccinated by eating meat.
- mRNA vaccines allow scientists to more efficiently research and develop specific, targeted instructions for an immune response from the vaccinated animal.
- Every mRNA vaccine undergoes the same licensing requirements as other vaccines and meets regulatory requirements and manufacturing guidelines.
- mRNA vaccines do not change or interact with the animal's DNA, nor do they interact with a person consuming meat, milk, or eggs from a vaccinated animal.
- The mRNA component of an mRNA-based vaccine breaks down quickly once administered.
- Livestock are not vaccinated against COVID-19.
- Vaccines are considered a "tool in the toolbox" that farmers, ranchers, and veterinarians use to ensure that animals are free from pain, suffering, and illness.
- Responsibly vaccinating livestock reduces the instances of illness. Prevention of illness decreases the need for other animal health products such as antibiotics and reduces the increased potential for antibiotic resistance.¹⁴
- Preventing animal diseases via vaccination also helps to keep people safe from zoonotic diseases.

Proposed Legislation

- Arizona's [HB 2762](#) - would require notification of the presence of the technology
- Idaho's [SB 1093](#) - would make administering a mRNA vaccine a misdemeanor
- Missouri's [HB 1169](#) - would require notification of the presence of the technology mandating the label include, "Gene Therapy Product."
 - [Motion failed](#)
- North Dakota's [SB 2384](#) - not livestock-focused, but would have banned mRNA technology all together.
 - [Motion failed](#)
- South Carolina's [HB 4348](#) - would charge with a misdemeanor anyone who uses the "Certified SC Grown" label for food products containing any form of mRNA
 - [Currently residing in the House](#)
- Tennessee's [S.B. 99](#) - would ban the manufacture, sale, or delivery of livestock carcass or meat food that contains mRNA vaccine material unless the product contains a "conspicuous" notification of the presence of the mRNA technology.
 - [Referred to Senate Health & Welfare Committee. Withdrawn from the House.](#)

Endnotes

¹ [Messenger RNA](#)

² [The Many Pathways of RNA Degradation](#)

³ [Center for Biologics Evaluation and Research \(CBER\)](#)

⁴ [Veterinary Biologics](#)

⁵ [Veterinary Services Memoranda](#) Is 800.51 the appropriate memo?

⁶ As for above, not sure what memos may be appropriate to cite - ? 800.205, 800.213, 800.214, 800.300 ?

⁷ [Decades in the Making: mRNA COVID-19 Vaccines | NIH COVID-19 Research](#)

⁸ "What Makes an RNA Vaccine Different From a Conventional Vaccine?", Pfizer, 7 Oct. 2022, www.pfizer.com/news/articles/what_makes_an_rna_vaccine_different_from_a_conventional_vaccine?cid=ps_corp_pfizer-com-s1_mrna+vaccine+vs+traditional+vaccine_0223&type=ps&gclid=CjwKCAjw9pGjBhB-EiwAa5jI3H4iel56m4KofxJH4c0TShc9nOS9f5flykoBvH06BdH7G6QaNx0zQxoCigQQAvD_BwE.

⁹ "Understanding How Covid-19 Vaccines Work." Centers for Disease Control and Prevention, 12 May 2023, www.cdc.gov/coronavirus/2019-ncov/vaccines/different-vaccines/how-they-work.html#:~:text=To%20trigger%20an%20immune%20response,immune%20response%20inside%20our%20body.

¹⁰ "Myths and Facts about Covid-19 Vaccines." Centers for Disease Control and Prevention, 16 Feb. 2023, www.cdc.gov/coronavirus/2019-ncov/vaccines/facts.html.

¹¹ "Foreign Animal Disease Preparedness & Response Plan - Vaccination for Contagious Diseases – Handling & Administration." USDA APHIS, Animal Health Emergency Management, 2014, https://www.aphis.usda.gov/animal_health/emergency_management/downloads/ed_materials/vac_administration_handout.pdf

¹² United States, Environmental Protection Agency, Office of Chemical Safety and Pollution Prevention, and Sharlene Matten, PhD., FIFRA Scientific Advisory Panel, Office of the Science Coordination and Policy. *Transmittal of the Meeting Minutes of the FIFRA SAP Meeting Held January 28, 2014 on the Scientific Issues Associated with the Use of "RNAi Technology as a Pesticide: Problem Formulation for Human Health and Ecological Risk Assessment,"* 1 May 2014, pp. 14, 30.

¹³ Verhoeven, David. "Vaccines Using mRNA Can Protect Farm Animals against Diseases Traditional Ones May Not – and There Are Safeguards to Ensure They Won't End up in Your Food." *The Conversation*, 17 May 2023, theconversation.com/vaccines-using-mrna-can-protect-farm-animals-against-diseases-traditional-ones-may-not-and-there-are-safeguards-to-ensure-they-wont-end-up-in-your-food-204774.

¹⁴ [Antimicrobial resistance in livestock: advances and alternatives to antibiotics - PMC \(nih.gov\)](#)