Kansas State University Researchers Aim to Heighten Feed Mill Biosecurity

They've come a long way already, but Kansas State University researchers studying the safety of animal food produced in feed mills say they've got plenty more to learn as they work to maintain safe food for animals and humans.

The researchers are trying to protect food from dozens of risks to raw agricultural products entering and leaving the nearly 6,000 feed mills in the United States.

"For many decades, we were manufacturing feed but we really never thought of feed as one of those things that could be bringing some of these diseases into our animals," said <u>Cassie Jones</u>, assistant professor of animal sciences and industry. "Just like food can make humans sick, some contaminated animal food can — rarely, but can — make animals sick."

According to the American Feed Industry Association, nearly 300 million tons of agricultural commodities are processed annually in American feed mills, providing feed for 9.6 billion food-producing animals as well as 70 million dogs and 74 million cats.

Jones and several of her colleagues have focused their research on swine feed, and have been conducting trials in the Cargill Feed Safety Research Center, part of the university's O.H. Kruse Feed Technology Innovation Center.

Kansas State University's mill is considered the only biosafety level-2 facility in the world that can conduct this type of research, using feed processing equipment that is similar to that used in commercial mills.

"A lot of these concepts started with the work we've done previously on porcine epidemic diarrhea virus, or PEDv," said <u>Jason Woodworth</u>, research associate professor of animal sciences and industry.

In 2015, Woodworth and a team of Kansas State University researchers discovered that feed could be a <u>vector for PEDv</u>, a destructive disease that caused an estimated 8 million pig deaths in 2014.

"That whole concept that a virus can be carried in the animal food and infect pigs was something that people thought was a possibility but maybe didn't believe until our research helped prove it," he said.

While their findings on PEDv were a major breakthrough, Kansas State University researchers are also on the lookout for safeguards against other diseases, such as salmonella. One research team hopes to provide solutions against feed contamination from classical swine fever and African swine fever, two diseases present in other countries but not currently in the United States.

Some of the biosecurity measures being implemented in feed mills are familiar to the industry: knowing where trucks have traveled from, washing hands, showering between barns, cleaning boots and controlling foot traffic in and out of the facility, among others.

Newer research includes finding the best ways to clean concrete floors, rubber boots and stainless

steel equipment; reducing grain dust, which may carry viruses or toxins; and adding nutrients to feed such as medium chain fatty acids or coconut oil that can provide added protection against target pathogens.

The university's work includes animal scientists, nutritionists, veterinarians, feed scientists and an army of graduate and undergraduate students. Iowa State University and other industry partners have provided help in areas that couldn't be addressed at Kansas State University.

"We're collecting information and doing the research that is going to help the industry define ways that we can do a better job of providing food for the pigs," said Woodworth, who noted that the group's findings should also be transferrable to cattle, chickens, domestic pets and other animal species.

Ultimately, the research will lead to safer food for American consumers.

"The U.S. food supply is the safest food supply in the world," Jones said. "There is not an inherent problem with the food supply currently or with pork or the feed we're manufacturing for swine. By doing this research, we are raising the bar to make us even safer.

"We are trying to understand the lingering issues that could impact animal food safety, as well as understanding some of the things we can do from the feed mill perspective to ensure that the feed and the products that the animals are consuming are not only manufactured in a way that meets all of their nutritional requirements, but are safe at all times."

Jones noted that implementing biosecurity measures on farms many years ago led to animals that were healthier and grew faster with less incidence of disease. She foresees similar benefits by improving feed mill biosecurity.

"Considering the lessons we've learned along the way, we're just at the infancy of applying those across the industry," she said.

The National Pork Board and the U.S. Department of Agriculture have provided most of the funding for the university's work.