

USDA Investigates Role of Invasive European Starlings in the Spread of Salmonella at Cattle Feeding Operations

A recent study conducted by researchers from the U.S. Department of Agriculture's Animal and Plant Health Inspection Service (APHIS) indicates that *Salmonella enterica* (Salmonella) contamination of feed and water at cattle feeding operations is strongly related to the number of starlings present on facilities. The research findings were recently published in an article titled, "The Role of Starlings in the Spread of Salmonella within Concentrated Animal Feeding Operations," in the *Journal of Applied Ecology* (onlinelibrary.wiley.com/doi/10.1111/j.1365-2664.2010.01935.x/abstract). The findings shed light on the role European starlings play in the spread of infectious disease agents.

"Cattle feedlots contain abundant and nutritious food sources that attract European starlings and other invasive wildlife species. Unfortunately, these species are known carriers of pathogens, such as Salmonella," said James Carlson, wildlife biologist at APHIS' National Wildlife Research Center (NWRC). "Identifying and managing invasive species that contribute to the spread of diseases like Salmonella can help reduce production losses and contamination of human food products."

Salmonella was widespread at the 10 feedlots where the study was conducted. The NWRC researchers found Salmonella in 2.5 percent of starlings, 8.4 percent of cattle feed, 13.6 percent of cattle water and 6.5 percent of cattle fecal samples. Further analysis indicated that Salmonella contamination of cattle feed and water was correlated with the number of starlings present at the facilities.

Researchers hypothesize that starlings move contaminated cattle feces on their feet, legs and feathers from contaminated cattle pens to other locations in feedlots, such as feed and water troughs. Because starlings may play a role in contamination of feedlots,

reducing the number of starlings may be an effective method for reducing cattle infections that occur because of feed and water contamination. Feedlot managers can reduce starling numbers on their properties through an integrated damage management approach that includes lethal and nonlethal methods (e.g., repellents, exclusion devices, scare devices, habitat modification).

Salmonella is the second most common disease-causing foodborne pathogen in the United States. Salmonella in cattle is one source for human salmonellosis, which is responsible for an estimated 1.3 million human cases, 15,600 hospitalizations and 550 human deaths each year. Symptoms include nausea, vomiting, abdominal pain, cramps and diarrhea. Salmonella infections in cattle can contribute to increased spontaneous abortion in cows.

NWRC is the research arm of the USDA APHIS wildlife services program. The center applies scientific expertise to the development of practical methods to resolve human-wildlife conflicts and to maintain the quality of the environments shared with wildlife. To learn more about NWRC, visit its website at www.aphis.usda.gov/wildlife_damage/nwrc.

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