

A new line of defense: Researchers find cattle vaccine works to reduce E. coli O157:H7 in a large-scale feedlot setting

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(Phys.org) -- A commercial vaccine for cattle can effectively reduce levels of E. coli by more than 50 percent, a Kansas State University study has found. The vaccine is also effective using two doses instead of the recommended three doses, which can help cut costs for the beef industry.

David Renter, associate professor of [epidemiology](#), is the principal investigator on a project that researched the effectiveness of products used to prevent the shedding of E. coli O157:H7 in [cattle](#). The research appears in a recent online version of the journal *Vaccine* and helps improve current preventative methods for addressing food safety concerns.

While E. coli O157:H7 does not affect cattle, it causes foodborne disease in humans. Vaccines and other products may be given to cattle to help prevent the spread of the bacteria.

"We wanted to test how well these products work to control E. coli O157:H7 in a commercial feedlot with a large population of cattle that were fed in the summer and may be expected to have a high level of E. coli O157:H7," Renter said.

Other Kansas State University researchers involved include T.G. Nagaraja, university distinguished professor of microbiology; Nora

Bello, assistant professor of statistics; Charley Cull, [doctoral student](#) in pathobiology, Oakland, Neb.; and Zachary Paddock, doctoral student in [pathobiology](#), Manhattan. Abram Babcock, an August 2010 Kansas State University doctoral graduate, also was involved in the research.

Using a commercial feedlot setting, the researchers studied more than 17,000 cattle during an 85-day period. They studied two products: a vaccine and a low-dose direct-fed microbial.

"What's unique about this study is the number of animals we used, the research setting and that we used commercial products in the way that any cattle producer could use them," Renter said. "We didn't want it to be any different than the way somebody would use the products in a commercial feedlot."

The researchers found that the vaccine reduced the number of cattle that were shedding *E. coli* O157:H7 in feces by more than 50 percent. *E. coli* shedding was reduced by more than 75 percent among cattle that were high shedders of *E. coli*. While the vaccine label suggests that it is given in three doses, the researchers found that two doses of the vaccine significantly reduced *E. coli*.

"Showing that level of efficacy with two doses is really important because a shift to two doses from three could significantly cut costs for the [beef industry](#)," Renter said. "In terms of logistics, it can be difficult for commercial feedlot production systems to vaccinate animals three times. Both of these benefits help when considering how the vaccine can be adopted and implemented in the industry."

The researchers also discovered that the low-dose direct-fed microbial product did not work as well as the vaccine. Renter said while the study used a lower dose of the direct-fed microbial and could find no evidence that it reduced *E. coli* shedding, it is possible that the direct-fed

microbial product is more effective at a higher dose.

"This vaccine is an option for reducing E. coli," Renter said. "We have shown that this [vaccine](#) works and that it is a tool that could be adopted in the industry."

Provided by Kansas State University

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