

Diet may hold secret to limiting E. coli

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Beef recall prompts new research

By focusing on how nutrition of ruminants affects colonization and growth of E. coli O157:H7, University of Nebraska-Lincoln researchers hope to find a diet that limits the potentially deadly bacteria in feedlot cattle.

“The next step is to positively use nutrition because it’s logical that what you feed an animal affects its microbiology,” said Terry Klopfenstein, UNL animal scientist.

The Institute of Agriculture and Natural Resources team expects the study to complement UNL’s earlier, nationally recognized E. coli research. The team includes IANR Veterinary Scientists David Smith and Rod Moxley and Animal Scientists Galen Erickson and Klopfenstein.

UNL expanded its E. coli research program with support from Nebraska’s Legislature after the massive recall of E. coli-contaminated ground beef processed at Hudson Foods in Columbus in 1997.

Early research helped confirm that O157:H7 is common and widespread in feedlot cattle. Since E. coli is everywhere, eliminating it isn’t realistic. Limiting it at key times, such as before slaughter, is the goal, Smith said.

By studying what goes on in cattle’s digestive system, researchers will be able to study how what cattle are fed affects microorganisms in their gut. A goal is to soon add a rumen (gut) microbiologist to the team to study this.

Other UNL E. coli research tested several potential control methods for use in feedlots, including feeding a commercially available Lactobacillus acidophilus feed additive. UNL also worked closely with Canadian researchers on a vaccine. Feeding the Lactobacillus acidophilus feed additive reduced fecal shedding of E. coli by about 35 percent, while the vaccination reduced shedding by about 65 percent. The Canadian company Bioniche has obtained approval

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to market the vaccine in Canada. The vaccination still is awaiting approval for commercial use in the United States.

Moxley said learning more about the gut will complement this earlier research and offer one more added protection for reducing E. coli in feedlot cattle.

“It’s like wearing your seat belt, not texting while driving and obeying the speed limit,” Moxley said. “Studying the gut will be an added step in making food safer.”

Knowing when and where E. coli is being shed in manure also is key, Smith said.

Klopfenstein said E. coli is found at the end of the large intestine, attached to the intestinal wall.

The team also continues to study how feeding ethanol byproducts affects fecal shedding of E. coli. Right now researchers cannot conclude that it increases or decreases fecal shedding.

“Distillers grains are 90% digested and absorbed by the time they get to the large intestine,” Klopfenstein said.

So, it’s not the digested grains, but the fractions that are left, the 10 percent that did not digest, that gets to the large intestine. Researchers are looking at how that would affect E. coli that are attached there.

“It could be those nutrients or it could be some sort of nutrient that is lacking in a competing organism,” he said.

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