

# Food-borne Pathogens Remain A Concern

9:30 a.m. session, Tuesday, Dec. 6, 2005

Presenter: Terry Klopfenstein, University of Nebraska-Lincoln

RAPID CITY, S.D. (Dec. 6, 2005) — The food industry has seen significant advances in the prevention of food-borne pathogens such as *E. coli* O157:H7 during the last few years; however, the pathogen is still a concern for the food industry, said Terry Klopfenstein, ruminant nutrition professor at the University of Nebraska-Lincoln (UNL).



**UNL ruminant nutritionist Terry Klopfenstein presented findings from research projects measuring *E. coli* prevalence and intervention strategies.**

[PHOTO BY LYNN GORDON]

Klopfenstein presented findings from UNL research projects, which measured *E. coli* prevalence and intervention strategies, to participants gathered at the biennial Range Beef Cow Symposium.

“We believe we have the safest food in history, so what’s the problem?” Klopfenstein asked. According to *Meat & Poultry* magazine, he noted, *E. coli* O157:H7 cost the cattle industry approximately \$2.7 billion from 1993 to 2003. In addition, a breakout of the pathogen has the ability to bankrupt processing facilities and cause illness or, in fewer than 61 cases annually, death.

Undercooked hamburger is the primary culprit for *E. coli* contamination; however, it is also a potential threat in needle-tenderized beef, Klopfenstein said, adding that contamination occurs when the outside of an affected carcass contacts the meat.

According to UNL research conducted during a seven-year period, feedlot cattle have surfaced as the primary reservoir for *E. coli* O157:H7. A study conducted in five commercial feedlots found that 23% of cattle tested at reimplant time were shedding the pathogen, including at least one affected animal in each pen. In another study, 43% of tested pens were positive for *E. coli*.

Klopfenstein said *E. coli* prevalence was higher in muddy, wet conditions as opposed to dry, dusty lots. Conditions seem to worsen in summer months, researchers found, and Klopfenstein estimated that the worst period for contamination is spring and summer. Most recalls have been due to meat processed in the May-June time period, he said, when pen conditions allow for a lot of manure buildup. In fact, Klopfenstein said approximately 15%-20% of feedlot cattle going to harvest carry the pathogen.

On the other hand, *E. coli* prevalence in cow herds doesn’t seem to be much of a problem, Klopfenstein said, noting literature from studies conducted at the Roman L. Hruska Meat Animal Research Center (MARC) in Clay Center, Neb., which found 7.4%

of calves at weaning time tested positive, with about 83% indicating they had been exposed to *E. coli* at some time.

“Prevalence is fairly low in our cow herds. It’s probably out there, it’s just that prevalence is low,” he said. “This is primarily a feedlot problem.”

However, it’s not clear how cattle become inoculated. Therefore, no best management practices (BMP) can be recommended, Klopfenstein said, but two intervention strategies — vaccination and direct-fed microbials — show promise in reducing the shed of *E. coli*.

Feedlot steers fed direct-fed microbials were 35% less likely to shed the pathogen in feces, and similar results have been shown in other studies, he said.

Vaccination against *E. coli*, which is still in the approval process, also showed promise. Vaccinated cattle in a series of studies were much less likely to shed the bacteria, demonstrating the product is effective in reducing colonization, he explained.

As cattle are loaded for transportation to packing facilities, *E. coli* prevalence rises. Although vaccination reduced the bacteria’s prevalence on the hide by 44%, Klopfenstein said, “Contamination of the hide during transportation is an issue we’re going to have to deal with.”

“We’ve made excellent progress,” he noted, attributing most of the progress to preventive measures implemented by the packing industry. “We can make progress and then we can add another hurdle by adding cleaner cattle to the packing plant.”

— by Crystal Albers, associate editor, Angus Productions Inc.  
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