

## ***Escherichia coli* O157:H7**

*Escherichia coli* O157:H7 is associated with the cheeks, mouth, hide and intestinal tract of animals, particularly cattle, providing opportunity for contamination of the meat at slaughter. The pathogen is shed in the saliva and feces of infected animals, resulting in contamination on the hides of animals that come in contact with the saliva and feces. *E. coli* O157:H7 can be transferred from contaminated hides or the intestines of infected animals during the slaughter process. Although not a good competitor, *E. coli* O157:H7 can survive under refrigerated and frozen conditions. It is acid resistant, and thus it presents a potential problem by its survival in fermented meats.

Even very low numbers of *E. coli* O157:H7 are capable of causing infection, thus the microorganism must be completely destroyed during the process. Control principles for *E. coli* O157:H7 include minimizing the presence of the organism in the raw meats and proper fermentation and heating of final product. In most fermented sausages, a combination of low pH and intermediate heat treatment can effectively eliminate high numbers of *E. coli* O157:H7. For non-heated meat products, reduced water activity (combined with other factors such as salt level, time, and temperature) has been an effective means to reduce numbers of *E. coli* O157:H7.

Following an outbreak of illness from *E. coli* O157:H7 in dry fermented salami, FSIS and industry agreed that processors would validate the manufacturing process for dry and semi-dry fermented sausages to demonstrate an effective 5-log or greater reduction in *E. coli* O157:H7 and prevent recontamination. Ultimately five options were developed -

- Use a heating step in 9 CFR 318.17 or 9 CFR 318.23.
- Apply a validated heat treatment equivalent to at least a 5-log inactivation.
- Hold and test finished products using standard sampling plan protocols (e.g., ICMSF (International Commission on Microbiological Specifications for Foods) lot acceptance criteria; 15 or 30 samples tested, depending on use of product).
- Apply a validated minimum 5-log reduction or process that results in <1 *E. coli* O157:H7/100g (treatments shown to be effective in combination).
- Sample raw ingredients (mix) to demonstrate there is <1 *E. coli* O157:H7/g and apply a 2-log lethality treatment.

A Blue Ribbon Task Force of the National Cattlemen's Beef Association developed option 5 above. The task force also developed several processing procedures that achieved the 5-log reduction, which FSIS considers to be validated processes meeting option 2. These processes involve various combinations of fermentation temperature, pH at the end of fermentation, holding times and temperatures, drying, and cooking.