

# Researchers boost beef jerky safety

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The latest spate of meat recalls due to *E. coli* O157:H7 and *Salmonella* contamination might have consumers wondering about the safety of their meat products.

But beef jerky connoisseurs need not worry. With funding provided by the U.S. Department of Agriculture's Food Safety and Inspection Service, K-State researchers Elizabeth Boyle and Kelly Getty have validated a new way for small-scale jerky producers to keep both *E. coli* O157:H7 and *Salmonella* out of the food chain.

"The number of small plants producing jerky and other meat products has declined rapidly since the 1990s," Boyle said. "The standards became more strict and, in some cases, harder to abide by. That trend has had a definite economic impact on small towns like those in Kansas that have traditionally been home to smaller-scale meat producers."

Boyle and Getty, also worked with food science graduate student Nigel Harper, Hagerstown, Ind., and Shelly Roberts, Wichita, a December 2006 master's graduate in food science. They focused on validating a process that would effectively destroy pathogens of concern, but that wouldn't be more burdensome to small producers.

Jerky is made using a combination of heating and drying. The research team first surveyed plants in several states to find out what processes were being used to control pathogens, and what the "worst-case" processing scenario was. Researchers then evaluated the efficacy of the worst-case scenario thermal process to destroy *E. coli* O157:H7 and

Salmonella.

A commercial processor provided samples of the batter used to make chopped and formed beef jerky. The researchers then inoculated the raw batter with either E. coli O157:H7 or Salmonella and extruded it into strips measuring 2.54 long by 0.64 centimeters wide. The strips were then thermally processed in K-State's own pathogen dedicated commercial smokehouse for nearly seven hours, using varying rates of relative humidity and temperature.

Researchers determined that the worst-case scenario for a commercial jerky process does not adequately reduce the pathogens as required by the U.S. Department of Agriculture's Food Safety and Inspection Service. In order to ensure that both pathogens were destroyed, researchers found that an additional hour and a half of drying at 68 degrees Celsius was needed.

"Though the worst-case scenario for a commercial jerky process did reduce the presence of Salmonella to the required level, it didn't have the desired effect on E. coli O157:H7," Getty said. "Additional drying was needed to kill off both pathogens at the levels required by the Food Safety and Inspection Service."

The results of this research were presented by Nigel Harper at the 13th Annual K-State Research Forum, where he received first place in the poster competition for his work on the project.

"We hope that our research has provided a process for small processors that produce safe beef jerky without creating an extra burden," Getty said. "Really, the adjustments we are suggesting are minor and will enhance the safety of jerky for the consumer."

Source: Kansas State University

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