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## Meat and Muscle Biology™



## Pathogen Reductions during Traditional Fermentation and Drying of Pork Salamis

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## Objectives

Traditionally-processed meat products produced without thermal processing are common in European countries and are increasing in popularity in the United States. Processors are met with the challenge of creating these high-quality products while ensuring food safety. The purpose of this study was to validate the safety of a process to produce a traditional fermented and dried salami. This experiment investigated the impact of casing type and an antimicrobial intervention on the survival of foodborne pathogens in a salami product made with minimal ingredients.

## Materials and Methods

Pork butts were cubed and experimentally-inoculated with  $\sim 8 \log_{10}$  CFU/ml of 3 strains each of *E. coli* O157:H7 (EC), *Salmonella* spp. (S), and *L. monocytogenes* (LM). The cubes were either sprayed with water (CTRL) or a 2.5% antimicrobial solution (TRT) prior to grinding through a 6-mm plate. Dry ingredients and starter culture were thoroughly mixed into the ground pork before being stuffed into  $\sim 50$  mm natural, collagen, and fibrous casings ( $N = 192$ ). The salamis were subjected to fermentation (72 h), drying (28 d), and packaging (28 d). Salami samples were collected every 24 h until the end of fermentation. During drying and packaging, salami samples were collected weekly.

## Results

There was no significant difference between the CTRL and TRT sausages for bacteria populations for EC ( $p = 0.1645$ ), S ( $p = 0.3746$ ), or LM ( $p = 0.1762$ ) for the 60 d sampling period. There was also no significant difference in bacteria reductions between casings types within each treatment ( $p > 0.05$ ). Initial levels of pathogens were 8.36, 8.40, and 8.72  $\log_{10}$  CFU/g for EC, S, and LM, respectively. Following the treatments, bacteria populations in CTRL sausages decreased by 3.20, 0.38, and 0.12  $\log_{10}$  CFU/g for EC, S, and LM, respectively. Bacteria populations decreased in TRT sausages decreased by 2.40, 0.34, and 0.19  $\log_{10}$  CFU/g for EC, S, and LM. Following fermentation and drying, EC populations decreased 1.50 to 3.19  $\log_{10}$  CFU/g; S populations decreased 3.03 to 3.45  $\log_{10}$  CFU/g; and LM populations decreased 2.69 to 4.56  $\log_{10}$  CFU/g in both CTRL and TRT sausages. A 5  $\log_{10}$  reduction was achieved for S and LM by the end of packaging, but a combination of treatment and casing type did not achieve a 5  $\log_{10}$  reduction of EC by the end of packaging.

## Conclusion

This study validated the safety of a fermented pork salami manufactured without a heat treatment or additional lethality steps following fermentation and drying for salamis produced in collagen and fibrous casings.