

## Sodium Lactate and Chitosans on Quality Characteristics and Microbiological Changes of Low-fat Comminuted Sausages Inoculated with Pathogens during Refrigerated Storage

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Natural ingredients containing antimicrobial effect have been developed to use in meat products. These products may extend shelf-life and function as replacements for chemical preservatives. The objectives of this study were to evaluate the effect of natural preservative, sodium lactate (SL, 60% solution) and various molecular weights (MWs) of chitosans on physico-chemical and microbiological changes of low-fat comminuted sausages (LFCS) inoculated with pathogens during refrigerated storage, and to determine the potential possibility to replace for sodium nitrite in the products. Sausages were manufactured with 3.3% SL alone and in combination with various MWs of chitosans (0.3%, low, 2 kDa, Medium, 30~50 kDa, high, 200 kDa) as compared to controls (with or without 150 ppm sodium nitrite). *E. coli* 0157:H7, *Salmonella typhimurium* and *Listeria monocytogenes* were inoculated into LFCS at the level of  $10^3$  cfu/g at the initial storage. Microbial counts for *E. coli* 0157:H7 and *Salmonella typhimurium* in LFCSs were decreased with increased storage time, regardless of the treatments, however, the growth pattern of *Listeria monocytogenes* (LM) was affected by the addition of SL and various MWs of chitosans. Sausages containing SL alone or in combination with chitosans had antimicrobial effect, resulting in delaying lag phase for treatments at least two weeks, as compared to controls. The antimicrobial effect tended to be increased with increased MWs of chitosans. LFCSs manufactured with SL and medium MW of chitosans had higher expressible moisture and textural properties ( $P < 0.05$ ) than other treatments and controls. These results indicated that the combination of SL and chitosans inhibited microbial growth for LM in LFCSs and extended the shelf-life of LFCSs. Thus, they may use for the potential replacement of sodium nitrite or other chemical preservatives in the manufacture of LFCSs.