

Title Diffusion of sodium chloride in pork tissue
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Abstract

The objectives of the present work were: (a) to establish the effect of brine concentration on porcine tissue microstructure (scanning electron microscopy) and protein denaturation (differential scanning calorimetry), (b) to examine the influence of NaCl concentration on the changes in water content, salt uptake, and protein solubilization, using mass balances, (c) to determine the effect of brine concentration on the diffusion coefficient (D_m) of NaCl in pork tissue (*Longissimus dorsi*) at 4 °C analyzing the influence of water uptake on the results.

DSC thermograms of tissue samples showed three major peaks for untreated tissue corresponding to myosin (57.6 °C), sarcoplasmic protein and collagen (66.2 °C) and actin (80.3 °C). When the tissue was treated with increasing NaCl concentrations the number of peaks was reduced and maximum temperatures of the peaks changed. For D_m determination a transient radial diffusion system was adopted using cylinders of *Longissimus dorsi* that were immersed in brines of different concentrations. Theoretical curves of the diffusional model were fitted to experimental NaCl uptake values corrected by the tissue water content. The increase of D_m with NaCl concentration was attributed to the fact that salt penetration affects cellular structure. Results were interpreted by micrographs, protein denaturation and changes in the tissue water holding capacity.