

Effect of temperature on nitrite and water diffusion in pork meat

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Abstract

Nitrites are important food additives. The nitrite movement in meat is assumed to occur by means of a diffusion process. The objective of this study was to investigate the effect of temperature on nitrite and water diffusion mechanisms in meat samples during the curing of pork meat. For this purpose, cylinders of *Semimembranosus* muscle were salted with sodium nitrite (NaNO_2) at 2 °C, 7 °C and 12 °C. Experimental curing and water loss kinetics were modelled by means of a diffusion model. As the curing time lengthened, the water content fell and the nitrite content increased. The values for the nitrite and water diffusion were estimated to be in the range of $4.58 \cdot 10^{-12}$ – $1.02 \cdot 10^{-12}$ m²/s and $5.96 \cdot 10^{-9}$ – $9.82 \cdot 10^{-9}$ m²/s respectively, and they increased as the temperature went up. The activation energy was 32.24 kJ/mol for water diffusion and 60.32 kJ/mol for nitrite diffusion.