

SUMMARY

Dry-cured ham is the most outstanding meat product in Spain nowadays. Drying is the most time consuming stage of its production. Therefore, the knowledge of water transfer in this product is necessary in order to optimise the drying technology used. The aim of this thesis is to have a better understanding of the effect of different parameters, concerning the drying process and the product on two properties that control the water transport: water activity (a_w) and effective water diffusivity (D_e). The meat sorption isotherms from *Gluteus medius* muscle at different temperatures and NaCl contents were determined using the gravimetric method, and were fitted into the predictive Ross's equation and into different empirical equations. The D_e values, considering the effect of temperature, NaCl content, meat fiber direction, muscle type and high pH meat, were determined using the drying method. The results show that salted meat exhibits sorption isotherms typical for solids containing soluble components. A drop of moisture content around a_w 0.75 is observed. At a_w lower than 0.70, temperature has only a slight effect on water content equilibrium. At a_w above 0.75 water content equilibrium raises with the increase in NaCl content and the decrease in temperature. The predictive Ross's method yielded satisfactory results. Among the empirical equations studied, a modified GAB model for $a_w < 0.75$ and a modified Mujica model for a_w of 0.75 gave the best accuracy. Different mathematical models were applied to obtain D_e , which may consider different types of boundary conditions, water content dependence and shrinkage. As temperature increased the D_e also increased. At low temperatures, the D_e was less dependent on NaCl contents than at higher ones (as NaCl content increased the D_e decreased). An equation to determine D_e in meat considering the effect of temperature and NaCl content was obtained. No significative effect of meat fiber direction and muscle on D_e has been found. Therefore, the meat behaves as an isotropic product. There was a significative effect of meat pH on D_e . High pH meat has lower D_e than normal meat. Therefore, it will be necessary to use pH as a ham classification parameter in order to obtain a more homogeneous drying process. The effect of temperature, NaCl content and pH

should be considered to modelling meat drying processes, which will allow us to avoid problems like crust formation and meat structure softening.