Research Project: New and Efficient Processes for Making Quality Leather

Location: Fats, Oils and Animal Coproducts Research

Title: *Evaluation of Degreasers as Brine Curing Additives*

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Technical Abstract: The length of time needed for brine curing of raw hides and skins, a minimum of 18 h, is a time-consuming and expensive process. In this paper we initially report the results of an investigation of the stratigraphic distribution of sodium chloride and water in fleshed hides cured for varying intervals of time. We demonstrated that salt enters the hide mainly from the flesh side. Water, on the other hand, is withdrawn from both sides of the hide; the epidermis acts as a semipermeable membrane. Three commercial degreasers as well as a glycolipid surfactant (sophorolipid) were tested as brine curing additives and their efficiency evaluated according to the moisture, salt, salt saturation and fat content levels in the brine cured hide. One of the commercial degreasers, when used at 0.5% w/w, significantly removed fat from the hide as well as enhanced the uptake of salt. The sophorolipid also was an effective degreasing agent, decreasing the fat content of the brine-cured hide and, if used in excess, significantly increasing the uptake of salt. The data presented here confirmed that the usage of an appropriate degreasing agent in the brine is a suitable option for reducing the turn-around times in raceways and thus creates additional curing capacity.

Interpretive Summary: Sodium chloride is the most common preserving agent for raw hides and skins. Typically, raw hides and skins removed from the animal in the slaughterhouse are immersed in a raceway containing an almost saturated brine solution for about 18 hours, after which they are believed to be properly preserved until eventual tanning into leather. An understanding of brine diffusion and the role that surfactants might play to hasten the rate of diffusion are necessary to make the process more rapid and thereby less costly. In this paper, we first studied the distribution of sodium chloride and water within the hide as the curing progressed. We found that salt entered the hide mainly from the flesh (bottom) side, whereas the epidermis acted as semipermeable membrane and thus hindered the diffusion of salt through the top or grain layer of the hide. The thermal stability of the hide increased upon curing, caused by the dehydration of the collagen molecules and subsequent aggregation. We also evaluated the effect that three different commercial degreasers and an experimental, ¿green¿ glycolipid (sophorolipid, SL) exerted on the curing process. One of the degreasers and the SL significantly removed fatty matter from the hide as well as enhanced the uptake of salt. Acceleration of the penetration of salt

into the hide should lead to a reduction in turn-around times in the raceways, thus creating additional curing capacity.

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