TORS AFFECTING PROTEIN AND LIPID EXTRACTABILITY IN MEAT PRODUCTS

ARCIA, J.J. CORDOBA, M.A ASENSIO, L. MARTIN, A. FALLOLA* and T. ANTEQUERA
ene y Tecnología de los Alimentos. Facultad de Veterinaria. 10071 Cáceres. Spain.
ficio de Investigación Agraria. Badajoz. Spain.

MARY

study of the evolution of different components of dry cured hams during ripening an unexpected reduction of the extractability of in and lipids was observed. The main factors related with this are the presence of salt (NaCl) and the time of processing. To evaluate ossible influence of these factors, 75 *Longissimus dorsi* from Iberian pigs were processed simulating the first stages (salting and alting) of dry cured ham processing. Moisture, NaCl, lipid and Non Protein Nitrogen (NPN) content, and the amount of protein le in 0.6M phosphate + 1.1M IK buffer were determined. The pellet obtained in the extraction of soluble proteins was stained with toxilin-eosin and observed by light microscopy. The decrease in the extractability of both proteins and lipids along salting was rmed. However, the amount of fat extracted after 60 days at refrigeration temperatures reached the initial levels. No correlation een salt content and reduction of extractability was found. On the other hand, the time of processing and the amount of protein cted are negatively correlated (-0.91).

ODUCTION

result of different studies on the evolution of the components of dry cured hams during ripening, significant reductions in the tability of protein and lipids were observed. The high polarity of the salt and the protein-lipid interactions may interfere with the extraction.

e other hand, there seems to be a positive effect of low salt concentrations on protein solubility (KENNEY and HUNT, 1990) and eversible denaturation of myosin at high salt concentrations (KNIGHT and PARSONS, 1988). In addition, as it has been reviewed ARRANT (1982), there are some other functional properties of myofibrillar proteins that could be related with solubility and tability of proteins.

im of the present work was to define the extension of the decrease of lipid and protein extractability during the stabilization stages y cured meat products, and the role of salt and temperature on this phenomenon.

TERIAL AND METHODS

cessing of the samples

nty five *Longissimus dorsi* muscles obtained from Iberian pigs were processed simulating the conditions of the first stages (salting postsalting) of dry cured ham processing.

experimental batches were as follows: Sixty seven pieces were maintained in piles of salt for 6 days (**batch S**). Then, the muscles e washed and kept at 5°C and 99% relative humidity. To evaluate the effect of the increase of temperature, 6 samples (**batch HPS**) e subjected to a gradual increase of temperature until reaching 20°C for 10 days and relative humidity of 99%. A group of 16 samples ch CPS) were kept at 5°C and relative humidity of 99% for 50 days. **Control** group: 8 pieces with no salting kept at 5 °C and relative idity of 99% for 10 days. Sampling was carried out at different time intervals (Fig 1).

lytical determinations

sture was determined following AOAC recommended method (AOAC-24002, 1984).

stimate the salt content, chlorides were extracted with water/ethanol (60/40, v/v) (AOAC-24010, 1984) and quantified by the AOAC od (AOAC-24010, 1984).

d content was determined according to the method of FOLCH et al. (1957) after homogenization with a Sorvall Omnimixer for 60s aximum speed.

soluble protein analysis, 2g samples were consecutively homogenized in a Sorvall Omnimixer for 30s at maximum speed with 40ml .1M IK + 0.1M phosphate buffer. Protein content was determined according to the method of BRADFORD (1976).

n content was estimated following the method of JOHNSON (1941).

Results and Discussion

Results obtained from batches S and CPS confirm the decrease in the extractability of proteins during salting that could not be explai with the increase of NPN (Fig. 2). This fact has been also observed by several authors in different meat products (ASTIASARAN et a 1990, CORDOBA et al. 1990). KLEMENT et al. (1975) have related this phenomenon to the increase in salt concentration. Howeve the correlation between salt concentration and loss of protein extractability is very low. Furthermore, a decrease in the amount of extract proteins was also observed in the batch with no salt added. This seems to confirm that salt concentration is not a relevant factor in lo of protein extractability.

Time of processing was highly correlated (-0.91) with the amount of protein extracted. The loss of extractability of both protein and lipi could be due to the formation of a resistant structure by interaction between denaturalized proteins. Furthermore, the changes that a produced in the connective tissue could contribute to increasing the resistant of this structure (CÓRDOBA et al. 1990). In this sens BAILEY and ROBINS (1976) indicate that the collagen fibres become less soluble and more resistant to chemical attack with age in process recognized as normal maturation were reducible crosslinks were found to decrease.

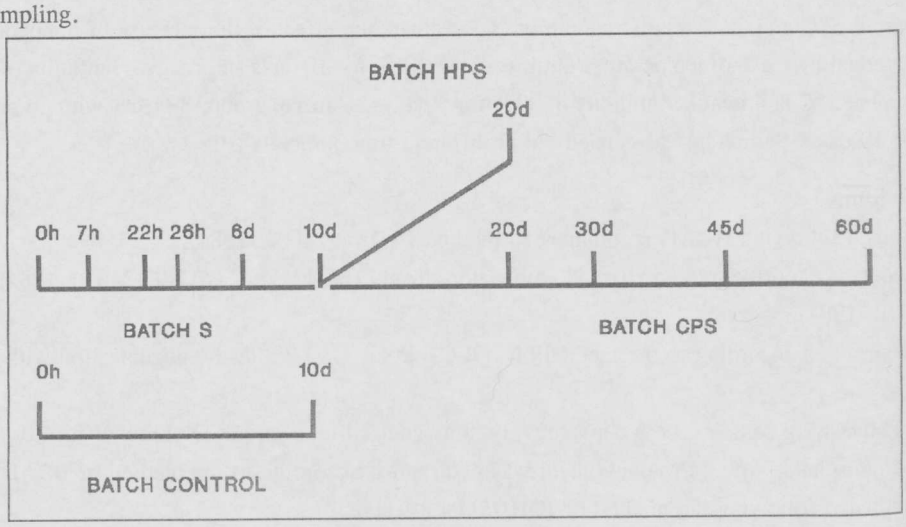
No significative difference was observed in the amount of protein extracted from the pieces kept at 5°C and those subjected to a gradu increase of temperature up to 20°C (Fig. 2).

In the first days of processing, a decrease was also observed in the amount of lipids extracted from salted muscles. However, in the la sampling time the lipids extracted reached the initial values (Fig. 3).

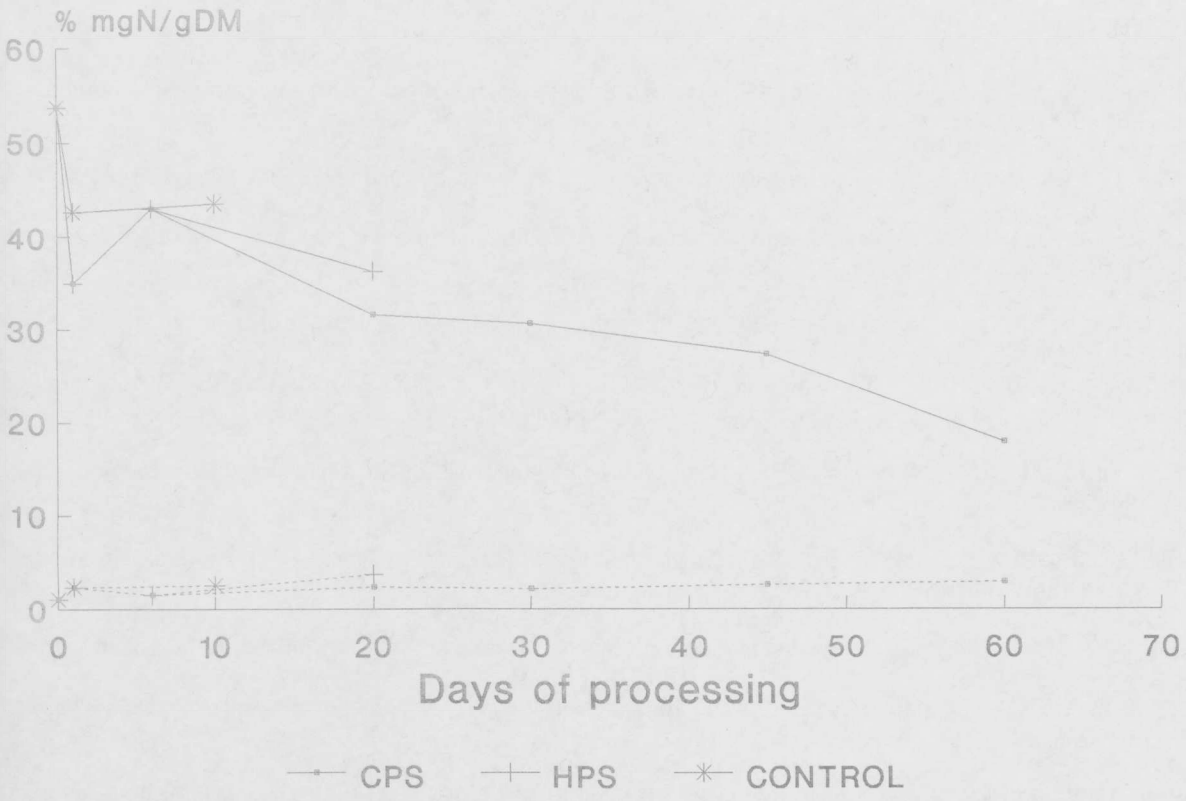
No relevant changes were observed in the extractability of lipids in the control samples. Although no correlation between salt concentratio and loss of extractability was found, the presence of salt could have some influence on the extractability of lipids. It is possible that th proteins solubilized by effect of the salt interact with lipids making the extraction more difficult. Several workers have described th presence of a protein film around fat globules (CARROL and LEE, 1981; SWASDEE et al. 1982). Hence, it appears that once the interfacial protein film has been formed, fat is immobilized by being bound to the protein matrix as well as physically restricted by th protein "sheath" (GORDON et al. 1990).

In the last stages of processing the recuperation of lipids of the extraction of lipids can be attributed to decrease of the protei

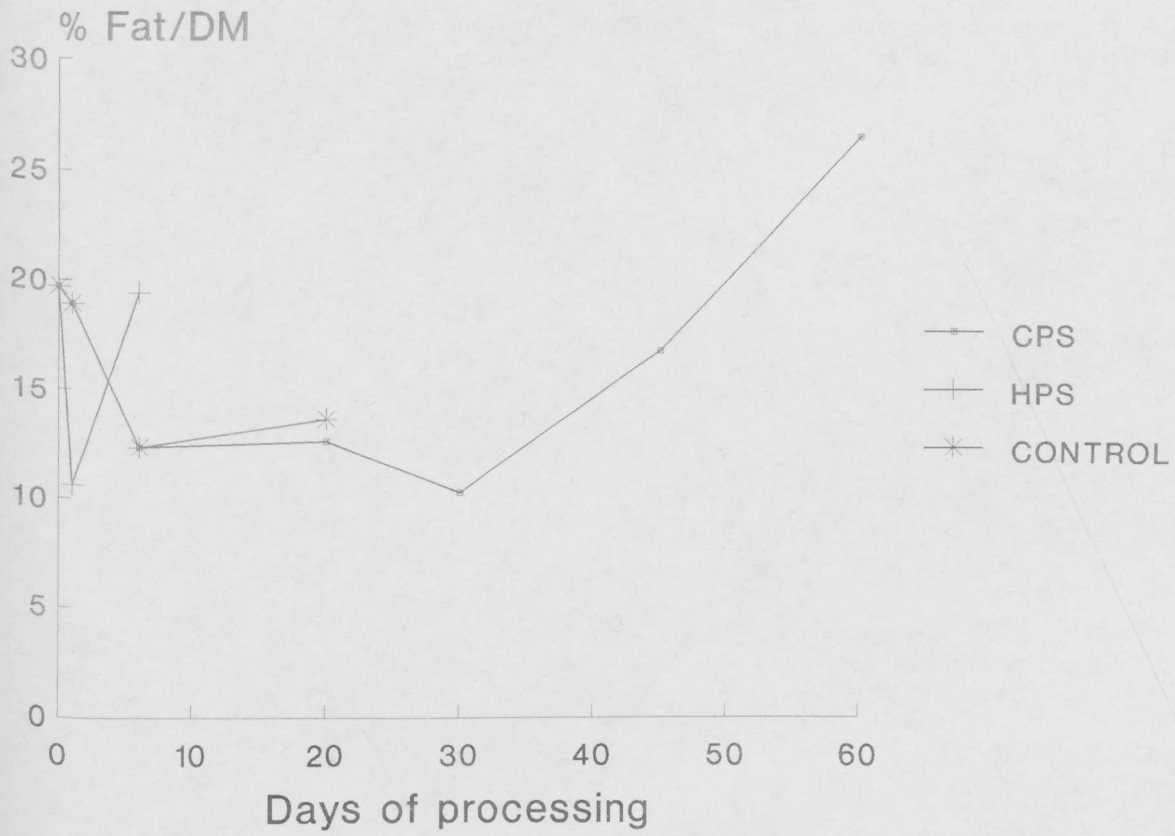
Figure 1.- Scheme of sampling.



re 2.- Evolution of Protein Nitrogen extracted with 1.1M IK + 0.1M phosphate buffer (—) and NNP (···) of differents batchs.



re 3.- Evolution of lipids extracted of *Longissimus dorsi* of differents batchs.



extractability.

Finally, there is no relevant correlation between low extractability and the temperature of processing, as shown in Fig. 3.

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