USE OF FOOD ACIDS AND THEIR SALTS FOR PRODUCTION OF PROTEIN-CARBOHYDRATE COMPOSITION FROM MODIFIED CONNECTIVE TISSUE

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One of the most perspective trends in the development of effective technologies for the processing of raw material with a high content of connective tissue is the use of edible acids and their salts which considerably improve its functional & technological properties.

Studies carried out were aimed at the development of a new technological process for the production of a protein-carbohydrate composition from modified connective tissue.

For softening of connective tissue, salts (potassium citrate, salts of tartaric acid, sodium lactate and sodium chloride), acids (acetic and citric acids) as well as mixtures based on alkaline and acid phosphates were selected.

As raw materials a connective tissue fraction (CTF) to be obtained by beef mechanical trimming was used. The effect of substances above mentioned on this fraction was evaluated by studying a complex of physico-chemical and microstructure characteristics. When determining the most effective parameters of the treatment (concentrations and time of the treatment), we proceeded from a pre-condition that swelling degree (SD) and water-binding capacity (WBC) had to be maximum during the treatment.

Histological studies carried out showed that the microstructure of control samples (treated with sodium chloride) was characterized by insignificant changes in CTF which had been expressed mainly in a homogenization of nuclear structures and in swelling of a fibrous component (Fig.1). CTF-structure of samples under study (treated with potassium citrate or a mixture based on acid phosphates) was characterized by intensive destructive changes of nuclei and collagen fibres (Fig.2,3).

Microstructural studies were agreed with results of physico-chemical studies. Thus, SD- and WBC-values of samples under study were higher than those of control ones by 11,5 - 8,2 % and by 4,2 - 3,9 % respectively.

A protein-carbohydrate composition (PCC) from modified connective tissue was developed which contains swelling starch, water and fat and which improves the stability and structural strength of products.

This is confirmed by results of comparative studies on the microstructure of model comminuted meats with added PCC (experiment) and without it (control) after the heat treatment (Fig.4,5).

The experimental samples of the model finished products were not inferior to control ones in their organoleptic parameters; their moisture content and yield were higher by 1,2 - 1,8 % and 1,0 - 1,5 % respectively as compared with control samples.

The composition developed has a long shelf-life under low temperatures without dividing into layers.

Results obtained confirmed that it was possible and advisable to use the new protein-carbohydrate composition from modified connective tissue in meat products.

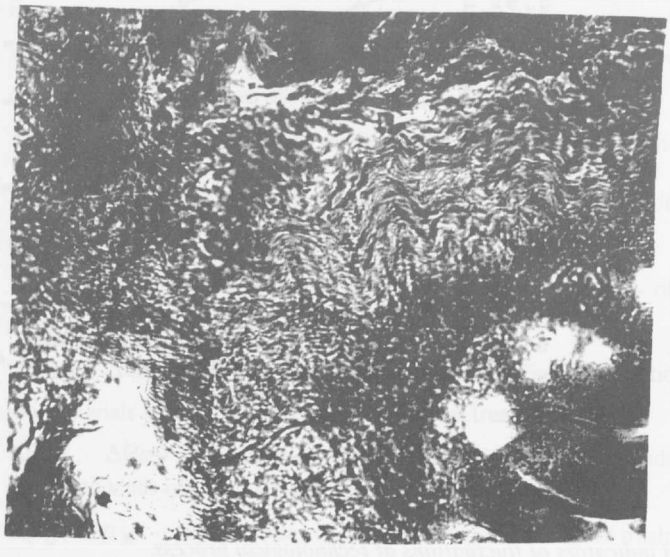

Fig.1. The microstructure of connective tissue treated with sodium chloride (control)

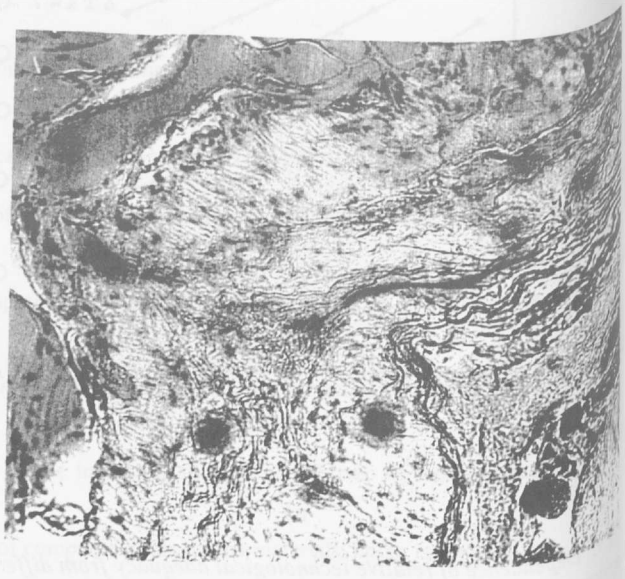

Fig.2. The microstructure of connective tissue treated with potassium citrate (experiment)

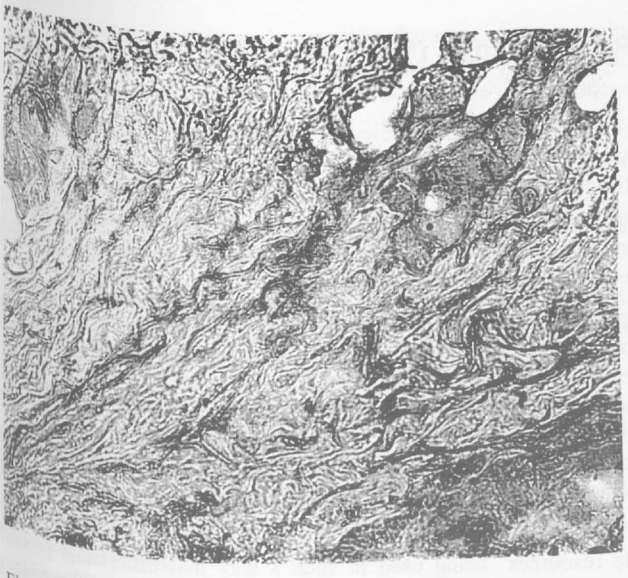

Fig.3. The microstructure of connective tissue treated with a mixture on the basis of acid phosphates (experiment)

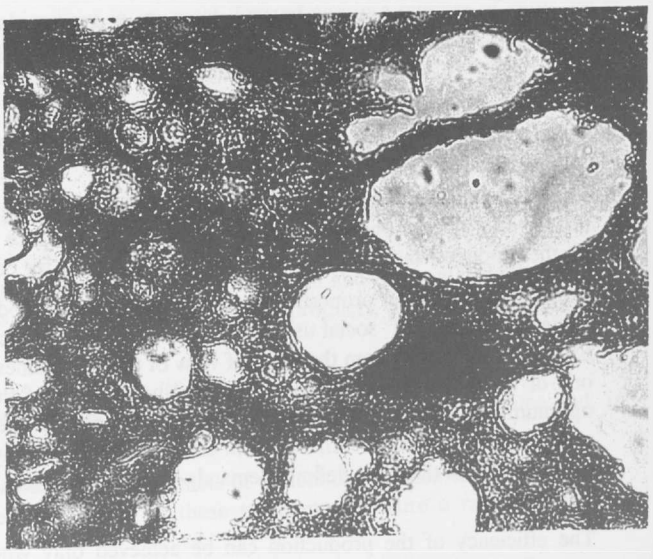

Fig.4. The microstructure of a model product without addition of the protein-carbohydrate composition

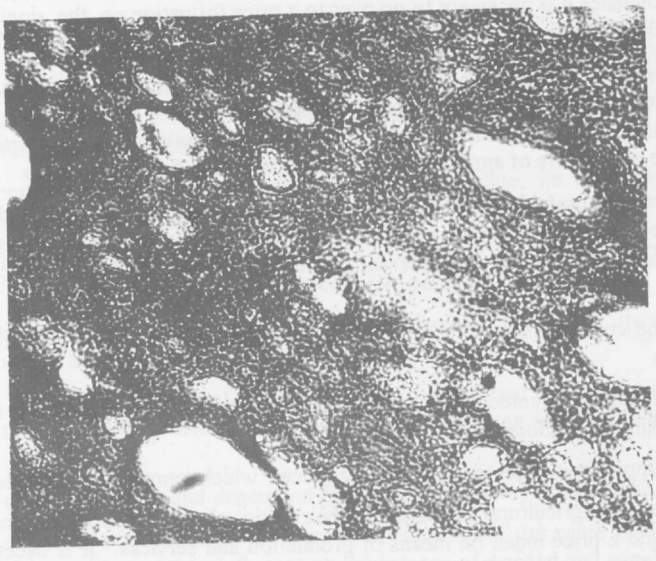

Fig.5. The microstructure of a model product with addition of the protein-carbohydrate composition