

PROMISING METHOD OF PRELIMINARY TREATMENT OF MEAT RAW MATERIALS DESIGNED FOR DIETETIC NUTRITION PRODUCTS

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At the present time physical, chemical and biotechnological methods of meat raw materials treatment are widely used in the manufacture of meat products. Fermentation allowing to increase efficiency of utilization of collagen-containing raw materials is a mostly spread biotechnological method of biological raw materials treatment.

Biotechnological methods are used for hair removal and hides treatment, flesh removal after deboning, blood clarification, acceleration of meat ageing, creation of bacterial starters. Microbial fermentation and enzyme transformation are generally used in the manufacture of meat products. This is the case with the processing of meat by-products having high contents of connective tissue proteins. The effect of proteolytic enzymes on collagen of pigskin connective tissue results in destruction of disulphide and hydrogen bonds of collagen molecule triple helix. As a result, an essential softening of the skin and a decrease of hydrothermal stability of protein occur, leading to new properties of the skin.

It was established that under the influence of pepsin a pronounced tenderization of meat occurs (change in muscular, collagenous and elastin fibers). This in turn increases the velocity of filtration-diffusion penetration of curing substances and contributes to a more uniform distribution of them over the volume of meat during curing. The incorporation of enzyme preparations in raw materials is followed by destructive changes of muscular fibers, connective layers and thus facilitates the functions of enzymic system of gastrointestinal tract of human being.

By this time a large variety of different enzymes and enzymic preparations are known, their properties have been studied, and methods of their application in different industries are developed. However, only limited studies have been made up to the present, aimed at the development of purposeful methods of enzymatic action on meat raw materials (containing collagen and elastin) and vegetable ones (containing carbohydrates) during their preparation for the manufacture of different meat products.

The purpose of this work was to study a specific biological method of meat raw materials treatment with the view of improvement of their functional and technological properties, increasing biological value of protein components and organoleptical properties of ready produce. In the course of work a computer modelling of chemical composition of multi-component food products and methods of modelling "in vitro" of protein digestibility in gastrointestinal tract of a human being were carried out.

The objects of investigations were pigskin, meat trimmings and beef tripe.

Curing ingredients and the enzyme preparation - pepsin of food quality (pork or beef) - were added to the comminuted meat raw materials. Simultaneously with the solution of curing ingredient a fatty component with high content of polyunsaturated fatty acids, relating to

group W , was incorporated.

After mixing the components in the agitator, the mix was maintained at 5-6 C during 18-24 hours. The treated meat raw materials were used for the manufacture of meat dietetic products. Experimental data have shown that as a result of such processing the food value and dietetic properties of prepared products significantly increased, the length of fermentation was decreased due to provision of definite ratio of indispensable amino acids and fatty acids.

To provide a prophylactic profile of the products, an essential attention was given to ratio of fatty acids in the foods. A normalizing influence of polyunsaturated fatty acids (PUFA) that are essentially in vegetable oils, on lipids exchange is well known. The most characteristic manifestation of their influence is hypocholesterolemic effect associated with quick removing of cholesterol from the organism.

The polyunsaturated fatty acids are important for synthesis of phospholipids of biomembranes. Long deficiency of PUFA in the food results in their partial substitution in phospholipids of membranes for saturated fatty acids and cholesterol.

Besides, one of PUFA of biomembranes - the arachidonic acid - is a precursor of so called cell hormones. Arachidonic acid in food fats has a very low content. In the organism it is synthesized from linoleic acid. Linoleic acid presents in all the vegetable fats.

Linolenic acid, relating by its chemical composition to the family of fatty acids, designated as W , has a special role in regulation of cholesterol exchange.

With the view of increasing the digestibility of protein compounds of dietetic products, it is useful to use vegetable oils with high content of PUFA of group W , particularly soybean oil. The specific action of PUFA considerably increases the efficiency of proteolysis of proteins with enzymes of gastrointestinal tract of a human being, the digestibility of meat products being increased by 10-25 %.

The results obtained allow to make a conclusion about good prospects for the work on development of meat products for dietetic nutrition; the raw materials for their manufacture will be subjected along with curing to proteolysis by pepsin in the presence of fatty acids with high content of PUFA. Usage in formulations of meat dietetic products of vegetable oils with high content of PUFA, relating to group W , is an important trend in increasing food value of these products.