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THE USING OF EMULGATORS IN THE COMPOSITION OF COMPLEX FOOD ADDITIVES IN THE TECHNOLOGY OF MEAT PRODUCTS

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Introductions. Currently, in conditions of decreasing in the resources of raw meat materials, the using of raw materials of non-standard quality (for example, frozen meat with a long storage period, with a high content of fat and connective tissue, meat with signs of PSE, RSE and DFD), manufacturers are forced not only to constantly maintain the quality of their products, but also to ensure a reduction in its cost.

Aim. The effective using of meat raw materials in the production of sausages presupposes regular improvement and optimization of technological processes for its production, preparation and industrial processing. Particularly relevant in this regard is the problem of processing various types of fatty and fat-containing raw materials, which are mainly used in the production of cooked sausages. One of the tools for managing quality and profitability in cooked sausage production is the using of protein-fat emulsions.

Their using help to reduce the consumption of the most expensive raw material - meat, which has a certain social significance. In this regard, the researching in the creation of the optimal qualitative and quantitative composition of the components of complex and functional food additives (including emulsifiers), especially in the meat processing industry, is timely and relevant.

Materials and methods. In the production of meat products, particularly sausages and minced ham, fatty raw materials are used - pork fat, side, sausage, lard trimmings, beef fat and poultry skin. In this regard, it should be stated that many additives do not have the full range of functional properties required for modern emulsifier-stabilizers. In particular, they cannot provide the required stability of the emulsion in such a complex system as protein-fat-water and they do not have sufficient water-holding properties for such systems [1].

The preparation of protein-fat emulsions requires compliance with all parameters that ensure the stability of the fat-water emulsion at the stage of its production, as well as during further using in industrial production. The using of food additives in the meat industry is limited by technological expediency even to a greater extent than by medical and biological safety or hygienic regulations.

Results and discussion. Emulsifiers have surface-active properties, such as concentrating on the interface of immiscible phases, they can reduce the interfacial surface tension. One of the first food emulsifiers used only natural substances. Typical and oldest emulsifiers for the food industry are chicken egg protein and natural lecithin, and although they have retained their popularity, synthetic emulsifiers are increasingly used in industry today.

The most popular food emulsifiers currently are mono- and diglycerides of fatty acids (E 471), esters of glycerol, fatty and organic acids (E 472), lecithins, phosphatides (E 322), ammonium salts of phosphatidyl acid (E 442), polysorbates, tweens (E 432 ... E 436), sorbitan esters, spans (E 491-E 496), esters of polyglycerol and inter-esterified ricinolic acids (E 476), esters of sucrose and fatty acids (E 473), sodium stearoyl lactates (E 481), calcium stearoyl lactates (E 482) [2]. Emulsifiers, as well as stabilizers of various nature and complex food additives containing them, are widely used in most branches of the food industry, where the technology provides the creation of stable emulsions.

These ingredients improve the structural and mechanical properties of the finished product. The action of emulsifiers is multilateral. They are responsible for

the mutual distribution of the two immiscible phases, for the consistency of the food product, its pulpy properties, viscosity and the feeling of "fullness" in the mouth.

In the meat processing industry, individual ingredients are widely used, including emulsifiers, stabilizers, thickeners, as well as spices and herbs, which, according to traditional technology and recipes, are introduced into meat or meat-vegetable pates, liver sausages or blood sausages, brawn [3].

For example, edible caseinates, wheat flour, table salt, granulated sugar and natural spices are added to meat pates or liver sausages; in the manufacture of brawn - table salt and natural spices, and for blood sausages it is a protein stabilizer, soy protein or sodium caseinate, table salt, sodium nitrite, granulated sugar or glucose, natural spices. However, these food additives are not complex and universal at the same time for all types of the above products.

In addition, they are not sufficiently technological: they are inconvenient to use, and the preparation of each of the components takes a long time and it is not always possible to simultaneously achieve the necessary property values that provide good organoleptic characteristics of the finished product.

As it is known, as emulsifiers can be used Ionogenic (containing polar groups) and nonionic (mainly high molecular weight) compounds [2] may be used. Nonionic surfactants (surfactants) are substances which molecules are not capable of dissociation. Their amphiphilic molecules usually contain hydroxyl or ether groups as polar groups responsible for their solubility.

Molecules of food emulsifiers have a diphilicstructure , scilicet they contain hydrophilic and hydrophobic groups. Hydrophilic groups ensure the solubility of surfactants in water, hydrophobic (usually hydrocarbon) groups at a sufficiently high molecular weight , they contribute to the dissolution of surfactants in non-polar media.

The effect of emulsifiers does not end there. Due to the formation of spatial and electrostatic barriers, they additionally stabilize emulsions, scilicet they prevent re-adhesion of already formed particles of the dispersed phase and re-stratification. At present, the industry widely uses synthetic emulsifiers, or products of chemical

modification of natural substances, the industrial production of which began to develop in the 1920s. XX century. The purpose of chemical modification of natural emulsifiers is to change their hydrophilic-lipophilic balance and, accordingly, change their behavior in food systems.

When creating emulsion systems for the food industry, as a rule, nonionic high molecular weight emulsifiers are used. Such as proteins of various structures, beta-lactoglobulin, lysozyme, ovalbumin, collagens. For this, their preliminary preparation is carried out, which consists in the preparation of special solutions with a certain temperature and swelling time.

Esters of sucrose and fatty acids are one of the latest groups of emulsifiers to receive FDA approval for use as direct nutritional supplements. Mono-, di- and triesters of sucrose (esters of sucrose and fatty acids) are allowed as additives. Sucrose esters can be used in a variety of foods, including emulsions and starch or fat based products. However, their permissible daily requirement does not exceed 10 mg / kg body weight, which limits their use in food.

Sucrose esters are a non-ionic emulsifier with a wide range of hydrophilic-lipophilic balance values. There are eight hydroxyl groups in the sucrose molecule, each of which can be esterified. The degree of esterification affects the hydrophilic-lipophilic balance. The ability to emulsify animal and vegetable fats quickly in a wide temperature range (from 8 to 60 ° C) allows them to be used in the preparation of protein-fat and fat emulsions in the industrial production of meat products.

Conclusions. Carrying out studies of the interaction of emulsifiers with high molecular weight hydrocoloids is advisable for use in various types of complex food additives with a wide range of functional properties, in particular, thickening and emulsification of sausage meat, stabilization of the structure of emulsified meat products or protein-fat emulsions for their production.

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