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STUDY OF THE INFLUENCE OF NUTRIENT ADDITIVES ON THE PROPERTIES OF THE MINCE SYSTEM IN THE PRODUCTION OF MEAT PRODUCTS

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Abstract. In the production of meat products, the technological and structural properties of the minced system are one of the main factors determining the quality of the finished product. Nutritional additives introduced into the minced meat have a significant effect on its physicochemical, rheological and organoleptic properties. This study investigates the effect of various functional food additives on the water retention capacity of minced meat, emulsion stability, viscosity, and mass loss during cooking. It is found that the use of protein, fiber, starch, and stabilizers strengthens the structure of minced meat and increases the mechanical stability of the product. Also, food additives ensure uniform moisture distribution in the minced meat, improving the juiciness and tenderness of the finished meat product. The results of the study allow for the efficient use of resources in the meat industry, increasing product yield, and optimizing quality indicators. This work serves to scientifically assess the technological importance of food additives.

Keywords: meat products, minced meat system, food additives, water retention capacity, emulsion stability, rheological properties, technological quality, meat industry.

Nowadays, one of the pressing issues in the meat industry is to improve product quality, improve technological processes, and create safe and healthy food products that meet consumer demand. The minced meat system, which is the main component of meat products, is considered an important technological factor that determines its structure, consistency, juiciness, and general organoleptic properties. Therefore, in-depth study of the properties of the minced meat system and the development of methods that allow them to be controlled are of great scientific and practical importance in the meat industry. The minced meat system is a complex colloidal-dispersed system, the properties of which directly depend on the type of raw materials, the degree of mechanical processing, the amount of moisture, and the technological additives used. In particular, the introduction of nutritional additives into the minced meat composition has a significant impact on the physicochemical and rheological properties of the product. Protein sources, carbohydrate stabilizers, fibrous substances, and other functional additives strengthen the minced meat structure, increase its water retention capacity, and reduce mass loss during cooking.

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In modern meat production, efficient use of resources and increasing economic efficiency are important tasks, and the rational use of food additives plays an important role in this process. The correct selection and optimal use of additives not only increases product yield, but also improves the structure, appearance and taste of the finished product. At the same time, the biological value and safety of additives should also be given special attention during the production process.

Today, with the growing demand of consumers for healthy eating, enriching the nutritional value of meat products is becoming an urgent issue. With the help of food additives, it is possible to increase the protein content, reduce the fat content and improve the functional properties of the product. This creates the basis for the formation of meat products as not only nutritious, but also healthy products.

This article analyzes the effect of various nutritional additives on the properties of the minced meat system from a scientific point of view, highlighting their technological efficiency and impact on the quality of meat products. The results of the study are of great importance in the introduction of innovative approaches in the meat industry and the production of competitive products. The minced meat system is the main semi-finished product in the production of meat products, and its structure directly affects the quality of the finished product. Minced meat is a complex dispersed system consisting of muscle fibers, connective tissue, fat particles and water. During the mechanical grinding process, meat tissues are crushed, proteins are partially opened and interact with water. As a result, a viscous-elastic environment is formed in the minced meat, which ensures the formation and stability of the product. Such properties of the minced meat system are used in the production of sausages, semi-finished meat products and other processed is important in the production of processed meats.[1]

In addition to the type of raw material, the degree of grinding, the amount of salt, the temperature and the humidity, the factors affecting the quality of minced meat also include nutritional additives. In particular, functional additives allow you to control the physical and mechanical properties of the minced meat system.[6]

Nutritional additives used in the technology of meat products are divided into several groups according to their origin and functional properties. Protein-based additives (milk proteins, vegetable proteins) act as structural binders in the minced meat system and increase the stability of the emulsion. Such additives keep water and fat in balance and prevent the product from breaking down.

Carbohydrate additives, including starch and fiber, help maintain the volume of minced meat by binding moisture. They thicken the consistency of minced meat and reduce the degree of shrinkage during cooking. In addition, stabilizers and emulsifiers ensure a uniform distribution of the oil and water phases in the minced meat system, increasing the stability of the product structure.[3]

One of the most important indicators of the minced meat system is its water retention capacity. This property determines the juiciness, softness and cooking loss of the product. Nutritional additives interact with minced meat proteins, increasing the ability to bind water molecules. As a result, the amount of free water in the minced meat decreases and the proportion of structural water increases.

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Practical studies have shown that when using fiber and protein-rich additives, the amount of juice released during cooking is significantly reduced. This increases product yield and ensures economic efficiency. At the same time, the increased water retention capacity has a positive effect on the appearance of the product and its acceptance by the consumer.

Changes in rheological and structural properties. The introduction of nutritional additives into the minced meat system changes its rheological properties, i.e. the degree of viscosity, elasticity and plasticity. These indicators determine the ease of working with the minced meat and the formation of the product. When proteins and stabilizers are used, the minced meat acquires a more uniform and elastic structure, which facilitates the molding and packaging processes of the product.[4]

Structurally, such minced meat retains its shape well during heat treatment. The protein network formed in the minced meat retains water and fat, preventing the product from breaking down. As a result, the finished product has a smooth and uniform structure when cut.

Effects on organoleptic indicators. Changes in the properties of the minced meat system directly affect the taste, aroma and texture of the finished product. When nutritional additives are used in moderation, the juiciness and softness of the product are increased, creating a pleasant texture for consumers. In particular, fiber additives can compensate for the lack of texture in products with reduced fat content.[5]

However, the excessive use of additives can reduce the natural taste of the product. Therefore, it is important to determine the optimal proportions of additives in the technological process. A scientifically based approach can produce a high-quality and balanced product.

The use of nutritional additives allows you to optimize technological processes in the production of meat products. Increased product yield, reduced cooking losses and improved storage stability ensure production efficiency. At the same time, the appearance and quality indicators of the product are improved, increasing market competitiveness.

In conclusion, an in-depth study of the effect of nutritional additives on the properties of the minced meat system is of significant scientific and practical importance for the meat industry, serving to produce high-quality, safe and economically efficient products.

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