

Секція: Технічні науки

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INFLUENCE OF THE DESIGN PARAMETERS OF THE MINCER ON THE RHEOLOGICAL PROPERTIES OF MINCED MEAT

In recent years, the consumer basket of the majority of the population of our country is more dominated by chicken compared to pork and cattle due to the low cost and taste of chicken.

Chicken meat is a source of high-quality, easily digestible proteins, vitamins, amino acids, minerals, an indispensable material for the growth and functioning of any organism, the basis for the prevention of a number of diseases - this is not a complete list of functions of chicken meat in the diet. In addition, given that according to recent research, poultry provides a full balance of protein in the body among the majority of the population of Eastern European countries, the need for regular consumption of chicken meat becomes even more obvious [1-2].

Chicken meat is also tasty, nutritious and at the same time low-calorie product that is easily digested by the human body. In terms of protein, chicken meat is superior to beef and lean pork. It contains vitamins A, B1, B2, nicotinic acid and many minerals [3]. It is also an indispensable material for the healthy functioning and growth of the body, it is easily absorbed and charges the body with energy necessary for life. Therefore, it can be considered a valuable high-calorie dietary product with low fat and high protein content.

In the food industry in the processing of poultry, and especially in the manufacture of minced meat, widely used cutting operations. This process significantly affects the structural and mechanical properties of minced meat, which affect the quality of the semi-finished and finished product.

The process of grinding and obtaining high-quality minced meat with the specified structural and mechanical properties is influenced by the relationship of the design parameters of the mincer.

Analyzing the scientific and technical literature, it was found that in most cases the process of grinding raw meat is carried out under the following conditions: The diameter of the lattice holes, $m \cdot 10^{-3}$ than with the angle of the knife edge 60 degrees and the speed of the drive shaft 110 rpm.

Interest was expressed in expanding the range of use of design parameters and studying their impact on the structural and mechanical properties of minced chicken meat and technological parameters of the grinding process.

Chicken meat was used as a raw material, which was divided into types: fillet, chicken drumstick and a mixture of fillet + chicken drumstick in a ratio of 1:1.

The study of the dispersed medium of minced meat, namely the coefficient of inhomogeneity was carried out by varying the diameters of the openings of the grills and the angle of the knife edge.

The coefficient of inhomogeneity in the composition of the particles of minced meat - a calculated value by which you can characterize the quality of grinding. The calculated values of the coefficient of heterogeneity of minced meat from different types of chicken meat depending on the angle of the knife edge are shown in Figure 1.

When analyzing the graphical dependence of the coefficient of heterogeneity (Fig. 1), it can be argued that when using a knife edge angle of 30 degrees, minced

meat from different types of chicken meat is the most homogeneous in structure and has almost the same size of meat particles. The uniformity of minced meat is also improved when chopping meat from chicken using rectilinear knives, the angle of inclination of the edge of the knife is 90 degrees, this is exactly what is observed in minced meat with fillets.

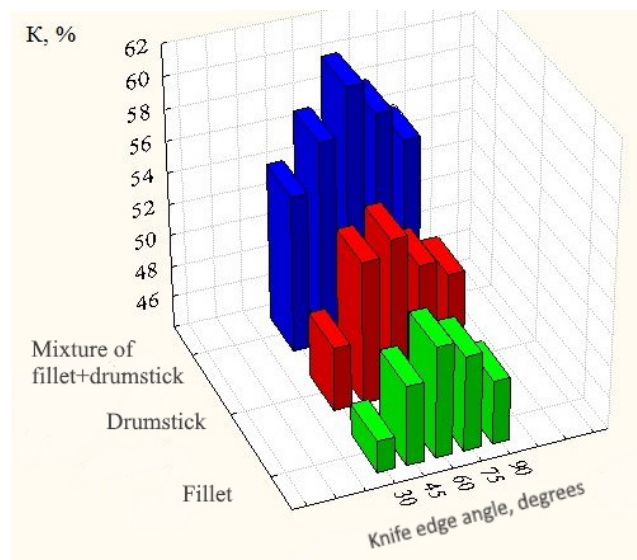


Fig. 1. The value of the coefficient of heterogeneity of the minced meat depending on the angle of the knife

The use of knives with an angle of inclination of the knife edge of 60 and 75 degrees leads to obtaining particles of minced meat of unequal size. There are meat lobes of both large and small size, ragged shape. This is due to the cutting force of these knives. Although there is a sliding cutting of meat, it is small, and at the periphery it also decreases (the sliding cutting force at the periphery of the knife is less than at the beginning of the edge of the knife). The efficiency of cutting these knives is low, which induces the accumulation of uncrushed raw materials at the ends of the edge of the knife, which shrinks, frays, breaks, which leads to an increase in protein denaturation, a significant loss of osmotic-bound moisture and inhomogeneity of minced meat.

The value of the coefficient of heterogeneity of minced meat from different types of chicken meat depending on the diameters of the lattice hole is shown in Figure 2.

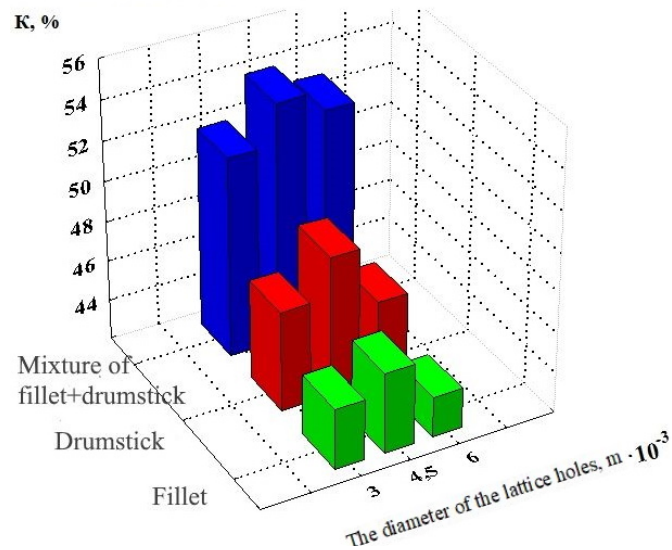


Fig. 2. Coefficient of heterogeneity of minced meat from the diameter of the lattice holes

Analyzing Figure 2, it can be stated that when mincing chicken meat with a diameter of the lattice holes of $6 \text{ m} \cdot 10^{-3}$, the obtained minced meat is more homogeneous in its structure. The size of its meat particles is almost the same throughout its volume.

The greatest heterogeneity of all types of minced chicken meat is observed when grinding with the openings of the lattice with a diameter of $4.5 \text{ m} \cdot 10^{-3}$.

The analysis of the obtained results shows that the type of raw meat of chicken meat and the conditions of the grinding process affect the structural and mechanical quality indicators of the obtained minced meat.

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