DEVELOPMENT OF SAUSAGE TECHNOLOGY FOR THE ELDERLY USING COLLAGEN HYDROLYSATE FROM LAMB, HORSE AND BEEF LEGS

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I. INTRODUCTION

Currently, there is a progressive aging of the population all over the world. In 2000, there were about 600 million people over the age of 60 in the world, according to WHO forecasts, in 2025 the number of elderly people will increase to 1.2 billion people, in 2050 the expected number is 2 billion people [1]. In the Republic of Kazakhstan, there is an increase in the share of elderly people in the age structure of the country's population and at the beginning of 2019, people over the age of 60 accounted for 11.6%, over the age of 65 7.5% of the total population of the country [2]. According to the UN classification, a society in which the proportion of people over 65 years of age from the entire population of the country is 7% or more refers to aging. In this regard, it can be argued that Kazakhstan is at the initial stage of demographic aging. The aim of the study is to develop the technology of meat products for the elderly, enriched with biologically active ingredients from secondary meat raw materials will contribute to achieving the goal of waste-free/low-waste production, through the use of currently not widely used secondary meat raw materials (horse, lamb, beef legs), improving health-saving technologies, expanding the range of functional products from meat raw materials.

II. MATERIALS AND METHODS

The object of the study is boiled beef sausage with the use of protein hydrolysate from legs with a put joint (beef, lamb, horse meat), and the vegetable component purslane. The mass fraction of proteins was determined according to GOST 25011-2017. The method is based on the mineralization of the Kjeldahl sample, distillation of ammonia into a solution of sulfuric acid, followed by titration of the test sample. The determination of the mass fraction of fat was carried out according to GOST 23042-2015. Methods for determining the mass fraction of fat using the Soxlet extraction apparatus and the accelerated method using a filtering dividing funnel. The data were analyzed using Statistica 12.0 (STATISTICA, 2014; StatSoft Inc., Tulsa, OK, USA). The values are presented as the mean ± SEM. The differences were considered to be statistically significant at $p \leq 0.05$. The data were analyzed by One-way ANOVA using free web-based software.

III. RESULTS AND DISCUSSION

The results of the study of the chemical composition of control and experimental samples are presented in Table 1.

Table 1 Physico-chemical parameters of the control and experimental samples

Name of samples	Mass fraction, %			
	protein	fat	carbohydrates	moisture
Control sample	18.9±0.1	14.9±0.2	3.1±0.2	56.8±0.4
A prototype with the addition of 3% protein hydrolysate, 1% purslane powder	19.0±0.1	9.8±0.2	2.8±0.2	51.3±0.4
A prototype with the addition of 5% protein hydrolysate, 1% purslane powder	19.2±0.1	8.2±0.2	2.1±0.2	51.1±0.6

In conditions of insufficient protein content in the body, the proteins contained in the tissues begin to hydrolyze. For this reason, it is very important to follow the recommended protein intake standards [3]. According to the WHO FAO recommendations, the protein intake rate is 65-100 g per day or 10-15% of the amount of protein consumed in food [1]. Taking into account the formalized requirements for the composition of herodietic products, the mass fraction of protein of a specialized product should be at least 10%. Protein hydrolysates of animal origin, in comparison with popular soy protein isolates, are characterized by an increased (two to three times) moisture-retaining ability, comparable fat-retaining ability and significantly greater (4-8 times) strength of water-fat emulsion and can be used in sausage recipes instead of soy proteins.

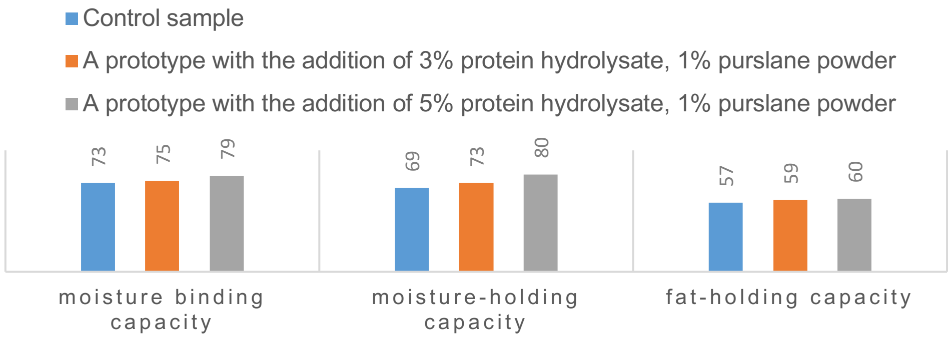

Figure 1. Functional and technological properties of the studied samples

The addition of protein hydrolysate leads to an increase in the water-binding capacity in the test samples and thereby provides a high yield of products. The presented data indicate that in experimental samples with the addition of protein hydrolysate in an amount of 5%, the yield increases. This is explained by the fact that protein hydrolysate binds a large proportion of moisture, having such important properties of natural meat additives as solubility, emulsifying and gelling abilities, and provides an increased yield of finished products.

IV. CONCLUSION

Thus, the moisture binding capacity in the experimental sample with the addition of protein hydrolysate is 3% and 5% higher than the control by 3.4% and 8.2%, respectively. The moisture-retaining capacity in the experimental sample with the addition of protein hydrolysate of 3% and 5% compared to the control is higher by 6.2% and 15.7%, respectively. The fat-holding capacity in the experimental sample with the addition of protein hydrolysate is 3% and 5% higher than the control by 3.5% and 5%, respectively. With an increase in the percentage of protein hydrolysate and the addition of purslane, the content of minerals and protein in finished products increases in the composition of finished meat products.

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