Assessment of organoleptic and physico-chemical parameters of a semi-finished minced meat-containing product

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Abstract. The demand for semi-finished meat products has a steady upward trend, and therefore the development of new types of semi-finished products is relevant. The purpose of the research is to assess the organoleptic and physico-chemical parameters of a semi-finished product made of poultry meat and plant raw materials. The results of the organoleptic analysis showed that the samples were highly appreciated by the tasters. Physico-chemical indicators of semi-finished products meet the requirements of GOST 32951-2014 Semi-finished meat and meat-containing products. Thus, the conducted studies of organoleptic and physico-chemical indicators of semi-finished products showed the possibility of their implementation.

1. Introduction

The global and domestic market for meat products is one of the largest and fastest growing segments of the food market at the level of grain and dairy. A steady trend towards an increase in production volumes, the presence of constant high demand and consumption of meat products is associated with the important place of meat products as a source of animal protein in balanced diets of the population [1–5]. Production of semi-finished meat products occupies a leading position in the meat industry. Meat semi-finished products are meat products prepared for culinary processing. At the present day, semi-finished meat products have earned consumer recognition, and every year they occupy a strong place in the diet of the population, the demand for semi-finished products, which do not require a long time for cooking at home and at public catering establishments, has increased [6–8].

Since 2017, the market of meat products, including semi-finished meat products in Russia, has been growing steadily and showing good growth rates. In 2018, the market volume grew by 11%, in 2019 – by another 14%. The increase in demand leads to the fact that manufacturers expand the range of products offered and improve their quality, also change the production technology and purchase modern equipment [9–14].

The purpose of the work is to study the qualitative indicators of meat-containing semi-finished products made on the basis of meat and vegetable raw materials.

2. Material and methods
The object of the research is a semi-finished meat-containing minced product made of poultry and potatoes. Also, hydrated rye (wheat) flakes, protein-fat emulsion based on rice flour and vegetable oil, fresh onions, whey concentrate, and drinking water were used as the main raw materials. Talkan was used for breading, and table salt and spices (ground black pepper, dried dill, dried basil) were used to impart taste and aromatic properties. The production technology is presented in patent No. 2014127628/13 dated 2014.07.07 [15].

Organoleptic characteristics were evaluated on a five-point scale.

To study the physico-chemical characteristics of the meat and vegetable minced semi-finished product, the following indicators were determined:

- mass fraction of moisture (GOST R 51479);
- mass fraction of protein (GOST 25011);
- mass fraction of fat (GOST 23042).

3. Results and discussion

For the organoleptic characteristics of the studied semi-finished product, two different samples were prepared. In the case of the first sample hydrated rye flakes were added in the product, in the case of the second one hydrated wheat flakes were added. When carrying out the organoleptic analysis, descriptive and scoring methods were used. At the same time, the main organoleptic characteristics were established: taste, flavor, texture, color, appearance. The results of the study by the descriptive method are presented in tables 1, 2. The obtained score data are presented in the form of a profilogram (figures 1, 2).

Table 1. Organoleptic characteristics of meat and vegetable minced semi-finished product with addition of hydrated rye flakes.

| Indicator | Product Features                                                        | Score (1–5) |
|-----------|----------------------------------------------------------------------|-------------|
| Taste     | Clean, characteristic for semi-finished minced meat products.         | 4           |
| Flavor    | Good compatibility of taste and aroma of spices                       | 4.7         |
| Color     | Brown with a golden crust                                             | 4           |
| Texture   | Homogeneous, fibrous, elastic                                         | 4.2         |
| Appearance| The product has an appropriate shape, is not deformed, has a uniformly coated surface | 4.7         |

Figure 1. Profilogram of minced meat and vegetable minced product with addition of hydrated rye flakes.
Table 2. Organoleptic characteristics of meat and vegetable minced semi-finished product with addition of hydrated wheat flakes.

| Indicator  | Product Features                                                                 | Score (1–5) |
|------------|----------------------------------------------------------------------------------|-------------|
| Taste      | Clean, characteristic for semi-finished minced meat products.                   | 4.2         |
| Flavor     | Good compatibility of taste and aroma of spices                                 | 4           |
| Color      | Brown with a golden crust                                                        | 3.9         |
| Texture    | Homogeneous, fibrous, elastic                                                    | 4.1         |
| Appearance | The product has an appropriate shape, is not deformed, has a uniformly coated surface | 4.8         |

As can be seen from the profiles, the samples have almost identical organoleptic characteristics. The exception is the flavor, for sample number 2 it is slightly better.

From the data obtained, it can be seen that the samples have high marks, which indicates the tasters' satisfaction with this product. And accordingly, one can assume that this product will be in demand on the market.

When carrying out the physico-chemical analysis of semi-finished products, each indicator was determined in two parallel experiments taken from one average sample. When analyzing the data obtained, we were guided by deviations in the value of the results of parallel determinations, which did not exceed the permissible limits in accordance with the regulatory documents.

Table 3. Physico-chemical characteristics of meat and vegetable minced semi-finished product.

| Indicators | GOST 32951-2014 | Product  |
|------------|-----------------|----------|
| moisture   | not standardized | 59.5%    |
| protein    | no less than 9%  | 19.4%    |
| fat        | no more than 35% | 7.5%     |

From the data in the table it can be seen that the meat-containing minced semi-finished product satisfies all physico-chemical indicators. The product is safe and can be permitted for sale.
4. Conclusion

Organoleptic assessment of meat and vegetable minced semi-finished products was carried out: a) organoleptic indicators of meat and vegetable minced semi-finished product with addition of hydrated rye flakes: taste – 4; flavor – 4.7; color – 4; texture – 4.2; appearance – 4.7; b) organoleptic indicators of meat and vegetable minced semi-finished product with addition of hydrated wheat flakes: taste – 4.2; flavor – 4; color – 3.9; texture – 4.1; appearance – 4. Samples have high marks, which indicates the tasters' satisfaction with this product.

Physico-chemical indicators were also assessed: a) meat-containing minced semi-finished product made of poultry meat has the following values: mass fraction of moisture – 59.5%; mass fraction of protein – 19.4%; mass fraction of fat – 7.5%, which meets the standards of technical documentation.

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