

## QUALITY INDICATORS OF SEMI-PRODUCTS FROM MEAT WITH VEGETABLE COMPONENTS

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**Summary:** This paper includes the results of the study of replacing mutton and poultry meat with oilseeds groats of walnuts, pumpkin, sesame and wheat fiber, for the production of semi-products of meat preserved by cold. They were determined quality indicators: organoleptic and physico-chemical experimental evidence. It has been found that replacing meat with vegetable component – oilseeds groats and wheat fiber enrich the semi-products with nutrients due to high content of protein and fat, which increases the nutritional value of the finished product; reduces the moisture content and water-binding capacity. Quality indicators during preservation does not change. Organoleptic indicators improve by combining the taste and smell of the semi-products.

**Key-words:** semi-products of meat, vegetable ingredients, oilseeds groats, organoleptic indicators, physico-chemical indicators.

### Introduction

Human diet characterized by protein insufficients, vitamins, macro- and microelements. To maintain efficiency in this conditions is important to pay attention to the contribution of different nutritional substances in everyday nutrition [1]. It is important to develop new recipes and food technologies.

Growing production of combined products in many countries is not only linked with raw materials of animal origin, but also rational use of proteins from vegetable raw materials. At present, a new idea in use of proteins is the production of meat products based on raw materials combined for meat and vegetable protein, received from various sources, provided that their mutual enrichment compositions, a combination of functional and technological properties, increase the biological improve organoleptic parameters of the finished products, reducing the cost of production [2].

Scientific and patent literature studied was found in recent years in many countries has increased the demand for sheep meat. Mutton is produced in large quantities in the following countries: Australia, New Zealand, Turkey, USA, Argentina, France, CIS [3, 4, 5, 6, 7].

Manufacture of mutton on an industrial scale is not yet adequately developed. One reason for this is the limited range of products of sheep. While in Moldova there is every reason and can expect a sharp rise in production assortment of meat products from sheep and lambs [7].

In this respect, technological development and recipes for new types of meat products from sheep becomes current.

The purpose of this study is to examine the quality indicators of a range of semi-finished products from minced meat sheep and poultry of „mici” with vegetable components namely oilseeds from different seeds.

### Materials and methods

The research has been used domestic raw materials of animal origin meat mutton (yearling) - and poultry meat (chicken breast).

As vegetable components were used: oilseeds groats from walnuts (FTA UTM), pumpkin and sesame (SRL Rozavena.Doctor Oil) and wheat fibers Unicell®WF 200 (Ingredient Ltd.).

Based on the previous research conducted in 2015, have been developed recipes minced meat- sheep and poultry type sausage' "with the addition of nut seeds in the amount of 7% and 2% dietary fiber from wheat Unicell®WF 200 [8]. The ratio of mutton and poultry meat, the amount of added oilseeds groats has been determined in our previous research [8, 9].

In the paper, the manufacturing recipes were proposed of „mici” from mutton meat (70%) and poultry meat (30%) with added 7% oilseeds walnuts and 2% wheat fibers Unicell®WF 200. According to these recipes experimental samples of „mici” from mutton and poultry meat were prepared.

Therefore, the experimental batch of „mici” from mutton and poultry meat has been prepared containing: Control sample („mici” from mutton and poultry meat) without oilseeds groats and wheat fibers and three variants containing 7% with oilseeds groats of walnuts, pumpkin, sesame and 2% wheat fiber Unicell®WF 200.

The prepared samples packed in polystyrene casserole and foil sealed with stretch were put in the refrigerator for storage of food biotechnology laboratory (Public Institution Scientific-Practical Institute of Horticulture and Food Technologies) to the next regime: refrigerated temperature 0 ... + 4 ° C, Waer = 75 ... 78%, for 5 days.

The sensory analysis of "small sheep and poultry" samples with the addition of oilseeds groats from walnuts, pumpkin and sesame followed by maturation for 24 hours at 0 ... + 4 °C. Then the samples were subjected to heat treatment by roasting in an electric oven and popped for sensory analysis.

Based on elaborated recipes, 4 variants of samples of mutton meat (70%) and poultry meat (30%) with 7% oilseeds groats and 2% wheat fibers were prepared.

In the semi-products with vegetable components were determined according to standard methods the following indicators: organoleptic indicators: the exterior aspect, the aspect in section, smell and taste, consistency and succulence (table 1 and 2, figure 1); physico-chemical indicators: the content of protein by the Kjeldahl method (GOST 25011), the content of fat by the Soxhlet method (SM SR ISO 1444), the content of salt by Mohr's method (GOST 9957), the moisture content by drying in the oven (SM SR ISO 1442), the ability of binding water by pressing [10] (tab. 3, fig. 2).

### Results and discussions

Indices organoleptic in the experimental samples were evaluated by the method described in quality (tab. 1), by the method of assessment points, applying the scale of 5 (tab. 2) and by means of the profile in the form of profilogramme (fig. 1).

As a result of sensorial evaluation of the obtained experimental samples (tab. 1), it can be concluded that the samples with different grits of the blank. Samples with a meal taste and odor, pleasant. Also, nut seeds experimental sample has a fine consistency, oily, smell and taste noble, particularly other samples.

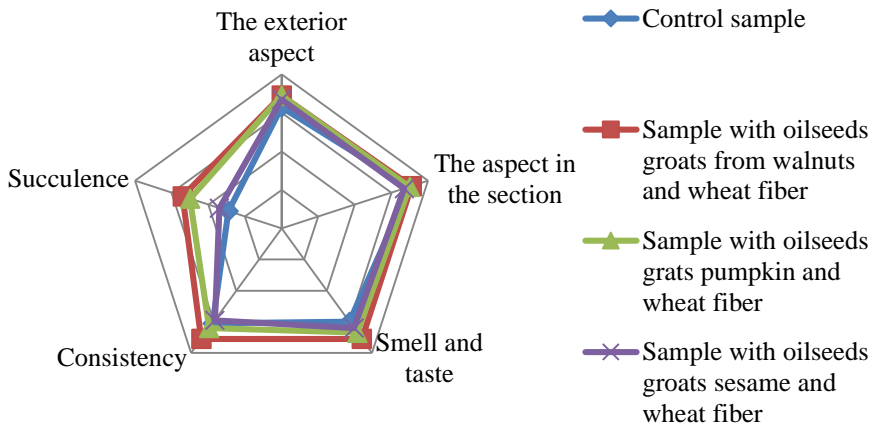
**Table 1.** Organoleptic indices of experimental samples - „mici” of mutton and poultry meat with 7% oilseeds groats and 2% wheat fiber

| Indicators            | Characteristic. Sample   |   |   |  |
|-----------------------|--|---|---|--|
|                       | Control sample   | Sample with oilseeds groats from walnuts and wheat fibers | Sample with oilseeds groats from pumpkin and wheat fibers | Sample with oilseeds groats from sesame and wheat fibers |
| The exterior aspect   | Round cylinders 8-10 cm in length with a diameter of 3 to 3,5 cm. Smooth surface without cracks and broken edges |   |   |  |
| The aspect in section | Composition kneaded thoroughly and evenly mixed  |   |   |  |
| Smell and taste       | Raw - in accordance with quality raw material used   |   |   |  |
|                       | Able roasted smell characteristic of this product,   |   |   |  |
|                       | with pleasant aroma of spices  | Fragrant specific meal nuts                               | Pumpkin grits with specific nice smell                    | There is a weak specific smell expressed                 |
| Consistency           | Raw  |   |   |  |
|                       | Elastic, dense   | Elastic   | Elastic   | Elastic  |
|                       | Able roasted   |   |   |  |
|                       | The farm   | Delicate, oily  | Thick   | Thick  |
| Succulence            | Able roasted   |   |   |  |
|                       | Reduced succulence   | Succulents  | Succulents  | Succulents   |

**Table 2.** Sensory analysis of the semi-products - „mici” of mutton and poultry meat with added 7% oilseeds groats and 2% wheat fibers

| №  | The name of the sample                                    | The exterior aspect | The aspect in the section | Smell and taste | Consistency | Succulence | Overall average note |
|----|---|---------------------|---------------------------|-----------------|-------------|------------|----------------------|
| 1. | Control sample  | 4,83                | 4,90                      | 4,80            | 4,81        | 4,49       | 4,77                 |
| 2. | Sample with oilseeds groats from walnuts and wheat fibers | 4,89                | 4,91                      | 4,91            | 4,91        | 4,74       | 4,87                 |
| 3. | Sample with oilseeds groats from pumpkin and wheat fibers | 4,89                | 4,90                      | 4,87            | 4,84        | 4,70       | 4,84                 |
| 4. | Sample with oilseeds groats from sesame and wheat fibers  | 4,87                | 4,87                      | 4,84            | 4,79        | 4,54       | 4,80                 |

The results (tab. 2) after heat treatment (roasting) finds that all the samples have good organoleptic characteristics. But the best are samples containing 7% oilseeds groats from walnuts and 2% wheat fiber, with overall average note 4,87. We note that the tasting committee appreciated the best organoleptic characteristics for the sample „mici” of mutton and poultry meat with the addition of oilseeds groats from walnuts.



**Fig. 1.** Profilogram of semi-products - „mici” of mutton and poultry meat with oilseeds groats - 7% and wheat fibers - 2% after heat treatment

From profilogram it is clearly observed that all samples with the addition of nuts and pumpkin seeds is juicier, has a more elastic texture, taste and smell more pronounced appearance more attractive.

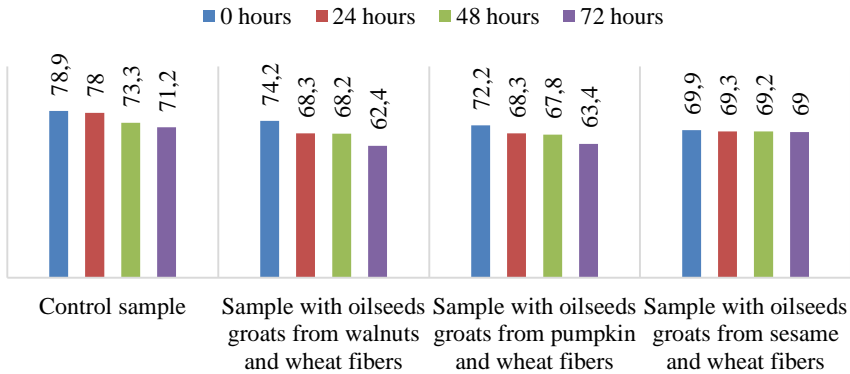
**Table 3.** Changing the physico-chemical indicators „mici” of mutton and poultry meat with 7% oilseeds groats and 2% wheat fiber

| №  | Name of sample                                       | The mass fraction of moisture, % |              |              |              | The mass fraction of salt, % | The mass fraction of protein, % | The fat mass fraction, % |
|----|--|----------------------------------|--------------|--------------|--------------|------------------------------|---------------------------------|--------------------------|
|    |  | 0 hours                          | 24 hours     | 48 hours     | 72 hours     | 0 hours                      | 0 hours                         | 0 hours                  |
| 1. | Control sample                                       | 86,6±<br>0,1                     | 84,2±<br>0,1 | 79,5±<br>0,1 | 76,9±<br>0,1 | 1,2 ±<br>0,1                 | 16,3 ±<br>0,3                   | 6,1 ±<br>0,2             |
| 2. | Sample with oilseeds groats walnuts and wheat fibers | 76,4±<br>0,1                     | 76,3±<br>0,1 | 76,2±<br>0,1 | 76,2±<br>0,1 | 1,2 ±<br>0,1                 | 17,6 ±<br>0,3                   | 7,7 ±<br>0,3             |
| 3. | Sample with oilseeds groats pumpkin and wheat fibers | 77,7±<br>0,1                     | 77,7±<br>0,1 | 77,1±<br>0,1 | 76,7±<br>0,1 | 1,1 ±<br>0,2                 | 18,4 ±<br>0,3                   | 6,5 ±<br>0,5             |
| 4. | Sample with sesame seedoil and dietary fiber         | 76.5±<br>0.1                     | 76.4±<br>0.1 | 76.3±<br>0.1 | 76.1±<br>0.1 | 1.2 ±<br>0.1                 | 18.8 ±<br>0.3                   | 6.8 ±<br>0.2             |

Analysis of experimental data in tab. 3 allow the grist finding that the addition of oilseeds groats from walnuts, pumpkin, sesame and wheat fibers in the mincemeat a „mici” reduces the mass fraction of moisture with 11,8%, 10,3% and 11,7% compared with the control sample.

Storage of semi-products of meat - „mici” of mutton and poultry meat kept to 0 ... +4°C for 72 hours resulting in a reduction of moisture in the product value of 11,2% for the control sample, the sample with the oilseeds groats from walnuts 0,3%, the sample with

the oilseeds groats from pumpkin 1,3%, the sample with oilseeds groats from sesame 0,5%, based on the initial value. Therefore, replacing the starting material of animal origin plant components reduce altering the moisture content during storage and retain quality finished product.



**Fig. 2.** Changing the water binding capacity in the „mici” of mutton and poultry meat with 7% oilseeds groats and 2% wheat fibers

Addition of oilseeds groats taken in the research of the water-binding capacity in the „mici” of mutton and poultry meat in different measures. The addition of oilseeds groats and wheat fibers to water-binding capacity decreases with 6% for the sample with oilseeds groats from walnuts, 8,5% for the sample with oilseeds groats from pumpkin and 15,2% for the sample with oilseeds groats from sesame (fig. 2).

Storing samples of („mici” and poultry meat) refrigerated for 72 hours show decrease the water binding capacity value in all samples. The level of decrease in the water binding capacity ranges from 9,8% for the witness sample, nutmeg 15,9%, 12,2% oilseeds groats from pumpkin, and 1,3% oilseeds groats from sesame, compared to the initial.

The mass fraction of salt for food does not change and remains at the level of the amount used according to the recipe of manufacturing – 1,1 ÷ 1,2%.

Oilseed proteins (albumins, globulins, gliadins, glutelins) during operations of extracting the fatty materials in the grist passes almost entirely. Because of this oilseeds groats rich minced meat semi-products with nutrients. Of the types of oilseeds groats used, the highest protein content has 15% more the samples with oilseeds groats from sesame compared to the control sample.

Samples with oilseeds groats with walnuts differ in high fat content, since laboratory-produced oilseeds groats has been used, and thus a higher amount of fat remains in comparison with industrial scale oilseeds groats.

### Conclusions

The use of oilseeds groats from walnuts, pumpkin and sesame in the composition for semi-products of mutton and poultry meat with the addition of wheat fibers enrich the sensorial characteristics of the finished product.

Sensory assessment analysis carried out by three methods found that performs with the addition of oilseeds groats from walnuts and pumpkin have an appearance, smell, taste, juiciness and better texture than the control sample.

The studied oilseeds groats contribute to reducing the moisture content and water binding capacity; increases the protein and fat content of the finished product.

Rational use of these components in the form of flour of oilseeds groats is one of the promising ways to create meat products combined with vegetable raw material with a functional orientation.

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