Technological solution for turkey meat processing

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Abstract. Turkey meat is the most valuable product for human nutrition. In this research, we suggest a technological solution for food production from turkey meat, as well as assess the influence of cross on the organoleptic characteristics of the product. The technological result of this invention was a slight reduction in the time cost of producing a gourmet food from poultry meat (turkey), while maintaining a fairly high sensory characteristics of the finished product. Also, the developed product expands the range of meat delicacies that will be presented on the domestic market. An organoleptic evaluation showed that the crossbred meat of Hybrid crosses the meat of white broad-chested crosses. It was established that the best rating was given to a product made from meat of medium cross-country hybrid poultry Hybrid Grade Maker (group III). The score was 8.62 points.

1. Introduction
The Food Doctrine of the Russian Federation pays great attention to improving the competitiveness of agricultural enterprises. The solution to the issues of ensuring the quality and safety of food raw materials and products is relevant from the point of view of the food industry priority areas development [1–5]. This problem cannot be solved in isolation from the tasks of improving the existing and introducing modern innovative technologies of food production [6–10]. The main result of the poultry industry activity are human food products, which are a conductor of biologically active regulatory substances [11–14]. Improving the quality of these products allows to improve the efficiency of the entire industry as a whole, therefore, increased attention is paid to the quality characteristics of poultry products, and turkeys in particular [15–19].

Turkey meat as an important component of good nutrition has the necessary potential to improve food quality [20]. Products of meat processing, in addition to their appearance, pleasant taste and aroma, should also be fully functional in terms of nutrient content [21–23]. Food products should fully meet the needs of the human body in good nutrition. [23–26]. Today, meat delicacies are very popular. Therefore, the production of tasty and nutritious turkey meat products is relevant.
2. Material and methods
Using a new technological solution we suggest a specialty product from turkey meat (patent for the invention “Method for the production of a specialty product from turkey meat” № 2579226 RU).

To assess the effect of turkey cross on the characteristics of the specialty product, four groups of turkey (males) meat were used:

- Group I – medium cross of White broad-chest breed;
- Group II – heavy cross of White broad-chest breed;
- Group III – medium cross Hybrid Grade Maker;
- Group IV – heavy cross Hybrid Converter.

The conformity assessment of the specialty turkey meat food product was carried out in accordance with the requirements of the Technical Regulations of the Customs Union 005/2011; 034/2013 and 021/2011. Assessment of microbiological indicators was carried out according to the methods specified in national standards: GOST 21237, GOST 31468, GOST 29185, GOST 29185, GOST 31746.

3. Results and discussion
The technological results of this invention is a slight reduction in the time spent on the production of a delicacy from poultry meat (turkey), while maintaining a fairly high sensory characteristics of the finished product. It also expands the assortment of the domestic market for turkey meat delicacies.

An increase in the product shelf life is possible due to a decrease in biological risks and an increase in microbiological safety, obtained by a rather high activity of the used strains of microorganisms contained in our preparation (which is a mixed culture of bacteria Lactobacillus (casei, acidophilus, bulgaricum), Pediococcus acidilactici, in the established proportion 1 : 4 : 2 : 3), due to their ability to suppress unwanted (possibly pathogenic) microflora. The changes in microbiological parameters are represented in table 1.

| Storage day | E. coli bacteria (coliforms) | Pathogenic, Salmonella | S. aureus | Sulfite-reducing clostridia |
|-------------|------------------------------|------------------------|-----------|---------------------------|
| 1           | 0.11±0.001                   | Not detected           | Not detected | Not detected |
| 45          | 0.11±0.001                   |                        |           |               |
| 90          | 0.12±0.001                   |                        |           |               |
| 120         | 0.10±0.001                   |                        |           |               |
| 180         | 0.13±0.001                   |                        |           |               |
| 210         | 0.11±0.001                   |                        |           |               |
| 240         | 0.10±0.001                   |                        |           |               |

Microbiological studies have shown that the product from turkey meat of all the studied groups is safe. The method is carried out in several stages:

A) turkey meat, previously prepared, is cut in accordance with the established recommendations: “along the muscle fibers line”, while the established weight correspondence was observed - the net weight of a turkey piece should not exceed 30 g.

B) In accordance with the best established results, the turkey meat is salted in a dry way, the mixture prepared for salting has the following ingredient composition: food salt, paprika, ground black and white pepper. When salting turkey meat, it is necessary to introduce the above-mentioned starter cultures in the amount of 0.07% to the meat raw materials weight, having previously dissolved them in warm prepared water with fast carbohydrates at 20–23 °C and after about 10 minutes of activation. In specially prepared water, lactose and glucose are added in an amount of 2 g per 1 kg of raw meat used by in a ratio of 9:11. Turkey meat salting is carried out for 115–185 min at a temperature 16±2 °C.
C) Bacteriostatics are added to the meat raw materials: sodium acetate, sodium citrate, sodium benzoate, sodium tartrate and sodium lactate (in the ratio we set 16: 4: 6: 60), in an amount of 2 g per 1 kg of turkey meat. The next step is the thorough mixing of prepared meat raw materials.

D) After that, the meat raw materials are laid out on perforated grids and sent for heat treatment, which is carried out in two stages:
– the first heat treatment stage is carried out at 56±3 °C during 80–110 min;
– the second stage – at 71±3 °C during 8–13 min.

E) The finished product is subjected to air cooling to a temperature 3–7 °C.

F) The products are tested according to the current regulatory standards and sent for packaging and labeling.

Figure 1 shows the technological scheme for preparing the gourmet product from turkey meat.

![Figure 1. Product Flow Chart.](image)

To assess the impact of a turkey cross on the organoleptic characteristics of the specialty gourmet product, its organoleptic assessment was carried out, presented in table 2.
Table 2. Organoleptic evaluation of the specialty product from turkey meat, score.

| Indicator    | Group I | Group II | Group III | Group IV |
|--------------|---------|----------|-----------|----------|
| Appearance   | 8.55    | 8.52     | 8.61      | 8.52     |
| Flavor       | 8.60    | 8.49     | 8.63      | 8.56     |
| Taste        | 8.55    | 8.52     | 8.65      | 8.55     |
| Consistency  | 8.46    | 8.39     | 8.59      | 8.58     |
| Juiciness    | 8.54    | 8.51     | 8.61      | 8.62     |
| TOTAL        | 8.54    | 8.49     | 8.62      | 8.57     |

It was found that the best rating was given to the product made of meat from medium cross Hybrid Grade Maker (Group III). The product score was 8.62 points. The product from medium cross meat of a white broad-chest turkey (Group I) received 8.54 points. Among the heavy crosses, the Hybrid meat product (Group IV) received a higher score – 8.57 points. It differed from the deli product of medium cross turkey meat in its hardness caused by large muscle fibers. But it was superior in tasting grade to the white broad-breasted turkey meat of both crosses (Groups I and II). The product from the turkey meat of these crosses turned out to be a little dry due to the lower fat content in the muscles.

4. Conclusion

Thus, we justified the possibility of applying a new technology to make a gourmet product from turkey meat in food production technology. The manufacture of this delicious product from turkey meat is possible for mass consumption. The developed product satisfies all quality and safety requirements, expands the range of meat delicacies and shortens production time. An organoleptic evaluation showed that the crossbred meat of Hybrid crosses exceeds the meat of White broad-chested crosses. Among the studied groups, the most suitable for the gourmet product manufacturing is the medium cross Hybrid Grade Maker.

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