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Research Article

**QUALITY AND SAFETY CONTROL THE FISH PRODUCTS**Nina Konik<sup>1</sup>, Oksana Gurkina<sup>1</sup>, Natalia Kolotova<sup>1</sup>, Oksana Turenko<sup>1</sup>, Dmitriy Ivanov<sup>2</sup><sup>1</sup>Saratov State Agrarian University named after N.I. Vavilov, Saratov, Russia., <sup>2</sup>Stavropol State Agrarian University, Stavropol, Russia.

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**Abstract:**

*Rational and healthy nutrition - is the key to good health and overall health. A person eats products of animal, vegetable, and mineral origin, which have different usefulness to the body. The usefulness of products is determined primarily by their ability to meet human nutritional needs. It depends on the chemical composition and characteristics of the transformations of various substances of these products in the human body and is characterized by such basic consumer properties as food, energy, biological, physiological and organoleptic values, as well as biological efficiency, digestibility and safety. Fish is an indispensable food product, especially for people with diseases of the cardiovascular, digestive systems. It is used for baby and diet food. The usefulness of fish and its products has been proven by scientists from many countries of the world. The chemical composition of fish is not constant and depends on its type, time and place of catch, age, sex, physiological state. Freshwater fish, an average of 100g contains: protein - 15-21g, fat - 5-22g, vitamin D - 0.001, vitamin A - 0.01, thiamine - 0.11, pyridoxine - 0.11, phosphorus - 125-315mg, magnesium - 20-170 mg, iodine - 0.1-113 µg, iron - 0.4-4.2 mg, cobalt - 3.9-14.4 µg. Freshwater fish is practically no iodine, manganese, copper, zinc, fluorine, contains little vitamin D. Few in it and polyunsaturated omega-3 fatty acids. But iron, according to nutritionists, is absorbed by the human body better than the iron of marine fish. Conducted research on the quality of rainbow trout. Based on the study of organoleptic, physico-chemical parameters and the safety of fish products.*

**Key words:** *quality, safety, fish products, quality control methods.***Corresponding author:****Nina Konik,**

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**INTRODUCTION:**

In terms of nutritional value, fish products are not inferior to meat products, and surpass them in many factors. Fish contains essential amino acids, fatty acids, fat-soluble vitamins, micro- and macronutrients in favorable ratios for the human body. Fish is a valuable protein product. By the speed of assimilation, fish and dairy products are identical and occupy the first place [1].

The level of quality and safety of products from fish raw materials has significantly decreased in recent years for several reasons: the use of outdated technological equipment; contamination of raw materials and auxiliary materials used in the release of food, toxic substances; reducing the quality of drinking water used in food production processes; unsatisfactory sanitary and hygienic state of fish processing enterprises; transportation and storage conditions for fish products do not meet sanitary standards; non-compliance with safety standards, including organoleptic indicators - smell, color and taste; imperfection and inadequacy of quality control measures for food products produced, etc. [2].

The aim of the work is to assess the quality of rainbow trout. The objects of study were samples of chilled rainbow trout, purchased in the store

"Lenta". All studies in the framework of the experiment were carried out in accordance with the approved methods in the scientific testing laboratory to determine the quality of food and agricultural products. products of SSAU named after N.I. Vavilova.

To achieve this goal, the following tasks were solved:

- conducting organoleptic quality assessment of rainbow trout;
- conducting research on the physicochemical parameters;
- analysis of research results.

**MATERIAL AND METHODS:**

The quality of fish was assessed in accordance with the requirements of normative-technical documentation according to approved methods. Rainbow trout studies were conducted on organoleptic, physic – chemical and safety indicators.

**RESULTS AND DISCUSSION:**

Separately for each fish specimen, the length and weight were determined. These indicators are reflected in table 1.

Table 1: The length and weight of the studied trout samples

| Sample number | Weight, g | Length, cm |
|---------------|-----------|------------|
| 1             | 310,0     | 31,5       |
| 2             | 405,0     | 32,0       |
| 3             | 275,0     | 29,7       |

In accordance with clause 6.3 and clause 7.1 of GOST 1368-2003 "Fish. Length and weight of the investigated trout is large.

The mass composition of the studied samples of trout are shown in Table 2.

Table 2: Mass composition of the studied trout samples (average), %

| Weight, g | Flesh | Internal organs | Head | Fins | Bones | Squama |
|-----------|-------|-----------------|------|------|-------|--------|
| 310,00 г  | 70,6  | 7,4             | 14,2 | 2,1  | 4,5   | 1,2    |

In the study of the quality of fish, organoleptic indicators were evaluated: the color of the product, its appearance and the condition of the skin; consistency of fish; the smell of fish.

Selected samples had a clean surface without external damage, natural color. Gills of dark red color. Folds of scales and skin damage in the samples were not identified. The consistency of the fish is dense. The smell characteristic of fresh trout, with no extraneous signs. The average fat content of the studied trout samples was 16.3%, respectively, the studied rainbow trout refers to fatty fish.

Fish and other hydrobionts are able to accumulate and sorb toxic elements and substances contained in water, and therefore pose a danger to human life and health. A violation of the technological

discipline of mining and processing, sanitary and hygienic requirements, personal hygiene of the staff, as well as storage and transportation conditions can lead to serious consequences. The priority contaminants of fish and fish products are: toxic elements (lead, arsenic, cadmium, mercury, copper, zinc), histamine, benzopyrene, nitrosamines, pesticides, mycotoxins, radionuclides.

To assess the freshness of fish raw materials and their quality, the use of multisensor systems, which provide information both on the composition and on the concentration of individual substances, seems to be quite promising. The content of toxic elements, pesticides, histamine in the samples we studied did not exceed permissible levels (Table 3).

Table 3: Grading quality of rainbow trout samples by safety indicators

| Index names   | Hygienic standard (SanPiN, MDU, MPC) | Sample № 1 | Sample № 2 | Sample № 3 |
|---|--------------------------------------|------------|------------|------------|
| Lead  | no more than 1.0                     | 0,98       | 1,0        | 0,92       |
| Arsenic   | no more than 1.0                     | 0,95       | 0,96       | 0,99       |
| Cadmium   | no more than 0.2                     | 0,2        | 0,2        | 0,2        |
| Mercury   | no more than 0.3                     | 0,3        | 0,3        | 0,3        |
| Cesium - 137  | no more than 130                     | 130        | 130        | 130        |
| Strontium - 90  | no more than 100                     | 100        | 100        | 100        |
| Hexachlorocyclohexane mg / kg                         | no more than 0.03                    | 0,03       | 0,03       | 0,03       |
| DDT and its metabolites, mg / kg                      | no more than 0.3                     | 0,3        | 0,3        | 0,3        |
| Nitrosamines  | no more than 0,003                   | 0,003      | 0,003      | 0,003      |
| Polychlorinated biphenyls, mg / kg                    | no more than 2.0                     | 2,0        | 2,0        | 2,0        |
| QMAFAnM, CFU / g                                      | no more than 100,000                 | 100000     | 100000     | 100000     |
| BKGP in 0,001 g                                       | not allowed                          | not        | not        | not        |
| Staphylococcus aureus 0.01 g                          | not allowed                          | not        | not        | not        |
| Pathogenic microorganisms, incl. salmonella in 25.0 g | not allowed                          | not        | not        | not        |
| L. monocytogenes 25.0                                 | not allowed                          | not        | not        | not        |
| Histamine   | no more than 100                     | 100        | 100        | 100        |

**CONCLUSION:**

In terms of organoleptic quality indicators, trout samples meet the requirements of GOST 814-96 "Chilled fish. Technical conditions" and are subject to implementation without restrictions; in accordance with GOST 1368-2003 "Fish. Length and weight of the investigated trout is large; during the assessment of trout on the basis of physico-chemical parameters, it was established that according to the fat content (16.3%), the studied samples belong to oily fish; studies on the luminoscope showed that the fish is fresh. According to the results of the quality assessment by safety indicators, the content of toxic elements, pesticides, histamine in the samples does not exceed permissible levels.

In the process of developing and introducing technical regulations, the main objectives for fish and fish products are to protect the health of citizens, to protect consumers from poor quality and counterfeit products. Manufacturers of fish products should not forget that product quality plays an important role in shaping the demand for it. Compliance with all requirements of regulatory documents and the introduction of new methods of quality control are the main success factors of any enterprise.

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