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Organoleptic and pathological-morphological examination of fish grown in ponds of a fish farm

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Abstract. The article evaluates the grown fish on the basis of external examination, organoleptic and pathological-morphological studies of fish and internal organs. The results of studies of mirror carp and trout grown in a fish farm are analyzed, conclusions are drawn that the meat of the fish grown according to the conducted examination meets the requirements of GOST and the rules of the fish grown in a pond farm. The raised fish (carp and trout) in the pond farm met the requirements of the Technical Regulations of the Eurasian Economic Union.

Keywords: fish breeding, helminths, organoleptic, pathological-morphological method, runway, consistency.

Introduction. Humanity receives about 20% of protein food of animal origin from aquatic organisms, mainly from fish, which contains about the same amount of protein substances as beef and pork, but they are much better absorbed by the human body. It is no coincidence that this is why fish and products from it occupy an essential place in the diet of people, and are considered dietary food. Over the past decade, the production of live fish has significantly increased in our country.

The ichthyofauna of the Russian Federation numbers 269 freshwater semi-anadromous and anadromous species, and at least 400 species are found in coastal sea waters. In total, this represents about 2% of the world's diversity of the fish class. Most of the fish products (about 100 million tons), mankind receives from the World Ocean. In recent decades, aquaculture has

played an increasing role in supplying the population with fish products. The annual increase in fish production from aquaculture is 1 million tons. In 2018, the volume of aquaculture production amounted to 111 946 623 tons [3].

In modern conditions, the founders of pond fish farming (A.N. Eleonsky, F.G. Martyshev, F.M.Sukhoverkhov and many others) rank fish farming as one of the areas of beef farming, since it is based on rational animal husbandry principles, and provides a system of targeted measures maximum receipt of fish from the water area of reservoirs in the desired assortment of the best quality. This involvement in agriculture has arisen since the time when people moved from hunting to fish farming in ponds and other reservoirs for agricultural and other purposes [7].

Purpose of the study. Evaluate the quality of fish grown in ponds of a fish farm.

Tasks:

a) to conduct an organoleptic examination of fish grown in a pood farm;

b) conduct pathological and morphological studies of the meat of the grown carp

c) assessment of the compliance of the farmed fish with sanitary and epidemiological rules and regulations.

Material and research methods. The veterinary and sanitary examination of fish was carried out in accordance with the Rules for the veterinary and sanitary examination of freshwater fish and crayfish. M.: Agropromizdat, 1989, and the reference book "Veterinary and sanitary examination of freshwater fish". M.: Agropromizdat, 1989. [1,6].

Physicochemical studies of fish were carried out in accordance with GOST 7631-2008 - Fish, non-fish objects and products from ...docs/entd/ru document 1200066618 Internet source [2];

Evaluation of fish and fish products izron>aricles…nauk…. usloviyakh…i…06-04-01… Internet source [5].

Organoleptic and bacterioscopic method for assessing the quality of live fish during veterinary and sanitary examination. Subbotina Yu.M. Educational workshop for bachelors in the discipline "Sanitation and environmental safety": teaching aid. – M.: Publishing house MSUFP, 2021. – 106 P. [8].

Research results.

Two and three-year-old specimens of carp and crucian carp, as well as three-year-old trout raised in the ponds of the "Biserovskiy Rybokombinat" were examined.

A study of the organoleptic properties of carp has been carried out. The scales of the fish adhere tightly to the skin, the fins are intact and not deformed, the abdomens are within normal limits, the eyes are somewhat sunken. The color of the skin, scales and meat on the cut is normal,

the gills are red. The consistency of the muscle tissue is dense. The smell matches the smell of raw pond fish. There are bruises under the scales of two-year-old carps (fig. 1).

The abdomen has a characteristic shape for this fish species, not swollen. The anal opening is tightly closed, not protruding, without the flow of mucus. In the section, the muscle tissue is elastic, tightly attached to the bones; in the cross section, the dorsal muscles have a characteristic color for the carp species of fish. The internal organs are well expressed, of natural color and structure, without the presence of tumors, the intestines are not swollen, without a putrid odor.

The study carp was boiled and 100 g of fish without internal organs, cleaned of scales, was taken, filled with a double volume of pure water and boiled for 5 minutes.

Figure 1 – The appearance of the studied carp

The broth of benign live fish is transparent, on the surface there are large glitters of fat and brown flakes of coagulated blood, the smell is specific, the meat is well divided into muscle bundles. The taste of broth and fish is pleasant, without bitterness and mustiness [8].

Trout was also examined organoleptically. Fish without mechanical damage, signs of disease and external parasites were not found. The gills are red, the eyes are transparent without damage, the smell is typical of live fish. In fresh fish, stiffness of the muscles is well pronounced (when pressed with a finger, the fossa in the region of the dorsal muscles quickly disappears). The scales, slightly pale with a pearlescent tint, fit tightly to the body; the mucus is transparent, without blood impurities and foreign smell. There are no tumors on the body. The skin is elastic, without extraneous spots, has a natural color, fits snugly to the carcass (fig. 2).

Solid fins of natural color. The operculums tightly cover the branchial cavity. The eyes are slightly sunken, the cornea is transparent, there are occasional hemorrhages in the anterior chamber of the eyes. The abdomen is characteristic of a trout, not swollen. The anal opening is tightly closed, not protruding, without the flow of mucus. On the cut, the muscle tissue is elastic, fits tightly to the bones; on the cross section, the dorsal muscles have a characteristic color for trout. The internal organs are well expressed, of natural color and structure, without the presence of tumors, the intestines are not swollen, without a putrid odor. Trout broth is transparent, has not large glitters of fat on the surface, a specific fishy smell; meat is well cut into muscle bundles.

The studied fish comply with the sanitary and epidemiological rules and regulations [4,6].

Figure 3 - Appearance of the studied trout

Pathological and morphological studies of internal organs were carried out, the studies were carried out in the following order [8].

Liver. Determined the shape, size, color, consistency of the organ (dense, soft, flabby), hyperemia or anemia, the presence of hemorrhages. No helminths were found.

Gall bladder. Determined the degree of its filling, the nature of bile (color, transparency, consistency), the state of the wall of the swim bladder and its inner shell, noted that the walls of the bladder are hyperemic, the vessels are dilated.

Spleen. Determined the grandeur, shape, consistency (dense, soft, flabby) color, the presence of overlays, scars. After external examination, the spleen was cut and the state of the pulp, its color, the presence of necrotic areas, hemorrhages, purulent and cheesy foci were not found.

Gastrointestinal tract. The intestine was carefully removed together with the adjacent internal organs, then freed from the liver and adipose tissue, straightened in a separate cuvette and opened with scissors. At the same time, attention was paid to the width of the lumen, the amount and nature of the contents of various departments, the presence of food mass, mucus, its color, smell, and the presence of parasites.

After that, the intestines were washed in water and the mucous membrane was thoroughly examined: color, the presence of swelling, edema, thinning, hemorrhages, ulcers, scars, perforations. Was made from the intestinal mucosa for microscopic examination for the presence of small parasitic forms. No helminths were found.

Sex glands. The shape, size, color, consistency, stage of maturity, hemorrhages, and the presence of parasites were determined.

Swimming bladder. Attention was drawn to its shape, size, the ratio of the volumes of the anterior and posterior chambers, deformation, the condition of the membranes, their thickness, opaque walls, the presence of hemorrhages and overlaps, as well as pigmentation. The nature of the contents was determined: the amount, color, transparency, consistency, odor, as well as the presence of parasites visible to the naked eye.

In our case, the carp showed inflammation of the posterior chamber of the swim bladder (fig. 3, 4, 5).

Figure 3 - External view of the internal organs and inflamed swim bladder of carp

Figure 4 - Pathological and morphological studies of mirror carp

Figure 5 - Swimming bladder mouth guard with severe inflammation

The scaly skin was evaluated. The body surface of carp and trout is clean, natural coloration, covered with a thin layer of mucus. scales are shiny, with a mother-of-pearl tint, tight to the body, transparent mucus. The skin is firm, the fins are solid. The toads are bright red, the gill covers tightly close the gill cavity. The eyes are convex, the cornea is transparent, dirty gray in color. The abdomen is not swollen, the anus is not protruding. On the cut, the muscle tissue is elastic and tight.

The consistency of the fish was determined by pressing lightly with the fingers. To determine the consistency of the fish, an oblique cut was made with a scalpel in the most stable part of the fish.

The consistency is dense, if, when pressing on the edges of the cut, the meat is very springy, and the traces of deformation quickly disappear.

The consistency is weakened, if the fish meat springs weakly, the traces of deformation disappear slowly but completely.

The consistency is soft, if the meat does not spring, the resulting grooves do not completely disappear.

The consistency is smeared if, when rubbed between the fingers, the muscle tissue is easily smeared.

The muscular part is elastic, fits tightly to the bones, in the section the dorsal muscles of a characteristic color. The smell is fishy. The consistency is dense, when pressed on the edges of the cut, the meat is very springy, traces of deformation quickly disappear.

Conclusions. The nutritional value, in general, of the meat of the farmed fish corresponded to the requirements for the fish grown in the pood farm. Microbiological indicators met the requirements of SanPiN. In the pond economy, the technology and regimes of fish rearing are fully observed, including the creation of optimal temperature and gas regimes, and zoohygienic conditions for rearing fish.

The fish grown (carp and trout) in the pond farm met the requirements of the Technical Regulations of the Eurasian Economic Union "On the safety of fish and fish products" 040/2016", which confirms the safety of products for the consumer [4].

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