American Journal Of Agriculture And Horticulture Innovations
(ISSN – 2771-2559)
VOLUME 03 ISSUE 05 Pages: 04-12
SJIF IMPACT FACTOR (2021: 5. 705) (2022: 5. 705) (2023: 7. 471)
OCLC – 1290679216
Publisher: Oscar Publishing Services

Journal Website: https://theusajournals.com/index.php/ajahi

Research Article

DIAGNOSIS OF PROTEIN METABOLISM DISORDERS IN FISH

Submission Date: May 06, 2023, Accepted Date: May 11, 2023,
Published Date: May 16, 2023
Crossref doi: https://doi.org/10.37547/ajahi/Volume03Issue05-02

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ABSTRACT

This article describes the most important diagnostic tests in determining protein metabolism disorders of Fish and their importance. When diagnosing disorders of protein metabolism in fish, it is necessary to carry out an analysis of feeding them according to age (nutritional norms), characteristic clinical signs (loss of appetite, development of coxexia, lag behind growth and development), pathologoanatomic changes (accumulation of fat around internal azos, darkening of body color, coxexia, blood clots in the intestines), morphobiochemical changes in the blood (hemoglobin, erythrocyte count, average of hematocrit, leukocyte count, neutrophil with Rod nucleus, basophils, monocytes, lymphocytes, analysis of the average total protein, total calcium, inorganic phosphorus and retinol) is considered important.

KEYWORDS

Fish, intensive, coxexy, hemoglabin, common protein, retinol, perten DA7250, ETS.

INTRODUCTION

Relevance of the topic. Currently, effective work is being carried out to ensure stable supply of the population with livestock products and to expand production opportunities in livestock and its industries, to ensure food safety in this area.

Also, strengthening of quality control in the livestock sector, increasing the volume of production of competitive export-oriented products, development of a favorable business environment, which provides for the production of products with added value chain, is widely underway.

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Improvement of the system of science, education, information and consulting services, introduction of modern information technologies in this field due to the introduction of effective forms of integrated knowledge and information dissemination with the expansion of research, education and consulting services in livestock and its branches such important works are being implemented step by step.

In order to provide the population with high-quality and cheap livestock and fish products, the development of the livestock sector is being paid great attention to the sector at the level of the Republic. Therefore, the fishing industry, which is considered a branch of animal husbandry, is not an exception. In the development of the intensive fishing industry, measures such as prevention and treatment of infectious and non-infectious diseases in fish are required.

Diseases of protein metabolism disorders are widespread among fish, and this disease brings great economic damage to fisheries. Eliminating the factors that cause protein metabolism disorders shows the need to perform tasks such as early detection and prevention of diseases.

Disruption of protein metabolism in fish occurs in two ways:

- increased content of protein substances in the fish organism.

- deficiency of protein substances in the fish organism.

In the first case, nutrition of the super-protein type occurs as a result of the over-normal release of protein substances in the body of fish. This patalogy is characterized by the fact that it is practically not found in intensive farms [1].

In the latter case, it has been experimentally determined that the nutrient is lacking in protein substances, that the metabolizing process in the fish organism is derailed, and that it is caused by infectious and parasitic diseases [5,7].

When diganosticizing protein metabolism disorders found among fish, diagnosis is made based on the results of fish feeding conditions, feed quality, biochemical indicators of feed, fish storage conditions, clinical and pathomorphological examinations [2,7].

When fish with a violation of protein metabolism are cracked, thickening of the stomach wall in them necrosis flies can be seen in the stomach, due to the lack of certain amino acids, pathologies such as impaired fat metabolism and fat accumulation in the liver arise.

In many cases, the intestine becomes inflamed in the disruption of protein metabolism in the organism of Fish, and hyperemic conditions are prominent in the posterior sections of the intestine [3,6].

Protein metabolism disorders in the fish organism can also be diagnosed by detecting energy deficit syndrome (ETS). When determining (ETS), a test is carried out on physiological and biochemical indicators in fish.In this case, the fish are assessed for their resistance to stress factors, in particular to temperature rises. In this case, 20-40 L is carried out with non-moving water and in containers supplied with a constant O2 (aquarium). When starting the test, the water temperature rises from 0.5-2 C° to 27-30 c° in 1 hour, when the water temperature in sick fish exceeds 25 C°, kilinic signs are manifested (circular movements). Death is observed when the water temperature exceeds 27 C°, it takes 30 fish to pass this biosinov [3].

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When protein metabolism is disrupted, fish remain susceptible to growth and development, coxexia, infections, in a short time infected fish turn dark or black in general, sometimes water accumulates in the abdomen, covering the eyes with a white veil. Fish do not receive nutrients, movement coordination is disrupted, accumulating and dying on low-water shores [3].

When protein metabolism is disrupted, the amount of hemoglobin and the number of erythrocytes in the body of fish decreases, while the amount of many amino acids in the protein decreases and their proportions change [4].

The fish organism's need for protein is considered to be greater than that of other livestock. In fish of different breeds, the need for protein is different. For example: proteins should make up 31-38% of the feed for carpsimons, 35-40% for forel, 38-40% for osyotrsimons, 40-42% for African lacs and local river lacs, while proteins are required in young fish up to 50%. Disruption of protein metabolism in the organism of fish is also affected by a lack of vitamins, fats and minerals [1,4].

The results obtained and their analysis. Our scientific researches were carried out in fish farms in Tashkent and Samarkand regions. Scientific investigations were conducted in order to determine the level of protein metabolism disorders among 1-year-old carp fish grown in ""Autsayder Fish" " fish farm located in Tashkent region.

The investigations began with an analysis of the feed base available on the farm and the process of feeding the fish. Granular fodder containing wheat, barley and mash is widely used as feed in the farm. In this farm, fish are fed 3 times a day.

The average daily feed intake in the farm is 1.5% of the fish's body weight (the standard daily feed should be 2.5% of the fish's body weight.)

In order to determine the disorders of protein metabolism in fish, 50 1-year-old fish were randomly selected as a sample and underwent clinical and hematological examinations. As a result of clinical examinations, it was found that the growth and development of the fish was delayed, the average body weight was 0.7-0.8 kg.

At the "Aminjon Farukhbek" fishery farm located in Samarkand region, investigations were also conducted to determine the violation of protein metabolism among fish belonging to the 1-year-old carp breed.

In this farm, mash and wheat bran are used as feed, fish are fed twice a day. At the "Aminjon Farukhbek" fishery farm, the amount of food taken by fish per day is on average 1.7% of body weight.

In both farms, it was found that the body weight of 1-year-old carp fish is less than the standard indicator.

During the training, the amount of protein in the feed was checked according to the Гост13496.4-93 standard and using a modern universal infrared express analyzer Perten DA7250.

Laboratory analyzes showed that 100 grams of feed used in the "Autsayder Fish" fishery contained an average of 28.86% protein.

It was found that 100 grams of feed used by "Aminjon Farukhbek" fishery farm contains 14.94% protein.

According to the requirements of the standard, the amount of protein in the daily feed of carp fish should be 31-38% on average.

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Energy deficiency syndrome (ETS) test was used to detect protein metabolism disorders among fish. In this method, resistance of fish to stress factors, especially temperature rise, was evaluated.

This test was carried out in 40 l tanks with still water and constant O2 supply (AKVARUM). At the start of the test, the water temperature increased from 2 C° to 27-30 C° in 1 hour, and when the water temperature exceeded 25 C°, diseased fish began to show clinical signs (circling movements). When the water temperature exceeded 27 C°, death was observed in fish with clinical signs, 50 fish were used for this biotest.

As a result of the test carried out at the "Autsayder Fish" fishery (ETS), 37 out of 50 fish began to show clinical signs when the water temperature exceeded 25 °C, and during the experiment, clinical signs began to appear when the water temperature exceeded 27 °C. the death of the fish was observed.

The following results were obtained in the investigation at the "Aminjon Farukhbek" fish farm (ETS): when the water temperature rose above 25°C, clinical symptoms appeared in 43 out of 50 fish, and when the temperature reached 27°C, clinical signs appeared. death was recorded in 43 large fish with no symptoms.

Based on the results of the conducted (ETS) examination, the number of fish that showed clinical signs and died was 74% at the "Outsider Fish" farm, and 86% at the "Aminjon Farukhbek" farm.

During the inspections carried out at the "Autsayder Fish" fishery, 18% of the fish showed relaxation of the skeletal muscles, 10% of the fish had darkened body color, 24% of the fish had tumors in the muscles of the dorsal part of the body, and 58% of the fish had a decrease in response to external influences and poor appetite. was determined.

In the "Aminjon Farukhbek" fishing farm, 20% of the fish had loose skeletal muscles, 13% of the fish had darkened body color, 28% of the fish had tumors in the muscles of the dorsal part of the body, and 54% of the fish had a decrease in response to external influences and poor appetite.

Pathanatomical examinations at the "Autsayder Fish" fishery showed accumulation of fat around the internal organs in 26% of fish, darkening of the body color in 32% of fish, cochexia in 72% of fish, bleeding in the intestines of 13% of fish, curvature of the skull in 10% of fish, 8 In % of fish, it was found that the degree of refraction of the fin apparatus was increased, in 24% of the fish, the eyeball was cloudy, and in 18% of the fish, the presence of hemorrhages in the skin and eyelids was found.

Figure 1: Accumulation of fat around internal organs as a result of protein metabolism.

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From the pathanatomical examinations in "Aminjon Farukhbek" fishery farm, 32% of fishes have accumulation of fat around internal azoes, (Fig. 2) darkening of body color in 34% of fishes, cohexia in 76% of fishes, curvature of the skull in 14% of fishes, 16 Hemorrhages in the intestines of % fishes, increase in the degree of refraction of fin apparatus in 10% fishes, darkening of the eyeballs in 26% fishes, presence of hemorrhages in the skin and eyelids in 22% fishes was found.

Blood samples were taken from experimental fish and their hematological indicators were checked based on generally accepted methods.

Figure 2. Hemorrhage in the intestines as a result of protein metabolism disorders.

It can be seen in Table 1 that the results of the analysis of fish blood taken as a sample from the "Autsayder Fish" fishery showed that the average hemoglobin content was 69.26±3.78 g/l (the standard average was 75.25± 4.38 g/l), the average number of erythrocytes is 1.1±0.2 1012/l (norm 1.3±0.21012/l), the average indicator of hematocrit is 32.8±0 ,8% (normal 34.1±1.0%), leukocyte count on average 38.3±4.1-109/l (normal 39.4±4.3-109/l), the average number of neutrophils with rod nuclei is 2.4±0.5% (norm 2.8±0.7%), basophils 0.7±0.2% (norm 1.0±0.5%), the average amount of monocytes 2.1±0.5% (norm 2.7±0.7%), lymphocytes 88.2±1.2% (norm 90.2±1.4%) formed.

Table 1

Hematological indicators of fish from the "Autsayder Fish" fishery.

T/r	Indicator	Result	Norm (SI unit)	
1.	Hemoglobin (HB)	69,26±3,78	75,25±4,38	g/l
2.	Erythrocytes (RBC)	1,1±0,2	1,3±0,2	10^{12}/l
3.	Hematocrit (HCT)	32,8±0,8	34,1±1,0	%
4.	Leukocytes (WBC)	38,3±4,1	39,4±4,3	10^{9}/l

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5.	Neutrophil with rod nucleus	2,4±0,5	2,8±0,7	%
6.	Basophils	0,7±0,2	1,0±0,5	%
7.	Monocytes	2,1±0,5	2,7±0,7	%
8.	Lymphocytes	88,2±1,2	90,2±1,4	%
9.	Total protein	27,25±1,81	40,23±2,8	g/l
10.	Total calcium	1,9±0,12	2,05±0,15	mmol/l
11.	Inorganic phosphorus	0,99±0,06	1,04±0,08	mmol/l
12.	Retinol (vitamin A)	39,3	46-52	ng/ml

The average amount of total protein in fish blood serum is 27.25±1.81 g/l (norm 40.23±2.8 g/l), the average total calcium is 1.9±0.12 mmol/l (norm 2.05±0.15 mmol/l), inorganic phosphorus on average 0.99±0.06 mmol/l (norm 1.04±0.08 mmol/l) and retinol the average amount was 39.3 ng/ml (normal average 46-52 ng/ml).

As shown in Table 2, the results of the analysis of the blood of the fish taken as a test from the "Aminjon Farukhbek" fishery showed that the average hemoglobin content was 65.25±3.08g/l (the standard average is 75.25±4.38g /l), the number of erythrocytes is on average 1.0±0.21012/l (norm 1.3±0.21012/l), the average indicator of hematocrit is 31.8±0.8% (me mean 34.1±1.0%), average leukocyte count 38.3±4.1-109/l (normal 39.4±4.3-109/l), rod-shaped neutrophils average amount 2.4±0.5% (norm 2.8±0.7%), basophils 0.7±0.2% (norm 1.0±0.5%), monocytes average amount 2.1±0.5% (norm 2.7±0.7%), lymphocytes 88.2±1.2% (norm 90.2±1.4%), total blood serum average amount of protein 20.25±1.01 g/l (norm 40.23±2.8 g/l), total calcium average 1.9±0.11 mmol/l (norm 2.05±0.15 mmol/l), average inorganic phosphorus 0.98±0.05 mmol/l (norm 1.04±0.08 mmol/l) and average amount of retinol 37, It was 5 ng/ml.

Table 2

Hematological indicators of fish in the "Aminjon Farukhbek" fishery

T/r	Indicator	Result	Norm (SI unit)	
1.	Hemoglobin (HB)	65,25±3,08	75,25±4,38	g/l
2.	Erythrocytes (RBC)	1,0±0,2	1,3±0,2	10^{12}/l
3.	Hematocrit (HCT)	31,8±0,8	34,1±1,0	%
4.	Leukocytes (WBC)	38,3±4,1	39,4±4,3	10^{9}/l
5.	Neutrophil with rod nucleus	2,4±0,5	2,8±0,7	%
6.	Basophils	0,7±0,2	1,0±0,5	%
7.	Monocytes	2,1±0,5	2,7±0,7	%
8.	Lymphocytes	88,2±1,2	90,2±1,4	%
9.	Total protein	20,25±1,01	40,23±2,8	g/l

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10.	Total calcium	1,9±0,11	2,05±0,15	mmol/l
11.	Inorganic phosphorus	0,98±0,05	1,04±0,08	mmol/l
12.	Retinol (vitamin A)	37,5	46-52	ng/ml

From the results obtained from both farms, it can be seen that the process of protein metabolism is going on in the body of fish, and in turn, the disorder of the metabolism of calcium, phosphorus and retinol in the body is characterized by the fact that it does not leave a negative impact on the process of protein metabolism.

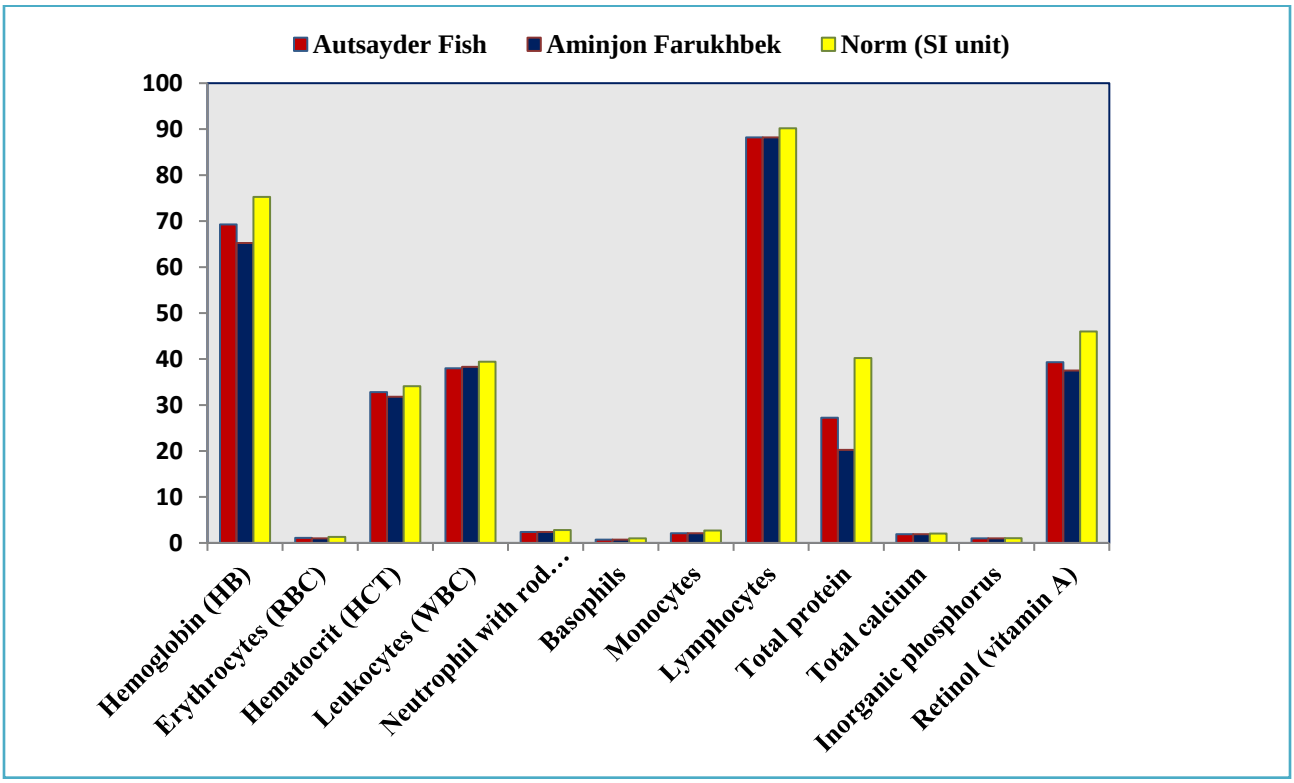

Figure 3: Blood pointer of experimental fish

In the fish farms where the experiments were conducted, the fish feeding procedure was violated, the protein content of the feed was insufficient and therefore the daily protein needs of the fish were not covered, and the presence of clinical signs characteristic of protein metabolism disorders in the fish caught and examined as an experiment, pathanatomical o It was determined during the experiments that the changes were developed and that the hematological parameters were lower than the standard parameters.

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Figure 4: Procedure for obtaining blood from the fish tail artery for hematological tests.

Based on the obtained results, it was concluded that there are protein metabolism disorders among fish grown in fisheries.

CONCLUSION

The origin of protein metabolism disorders in intensive fisheries is caused by non-compliance with fish feeding procedures, daily feed intake less than 2.5% of fish body weight, feeding in an unbalanced diet with less than 31-38% protein content. important factors such as

In the diagnosis of protein metabolism disorders in fish, the following characteristic clinical-pathological-anatomical signs are used: relaxation of the skeletal muscles, the presence of tumors in the muscles of the dorsal part of the body, decreased response to external influences, changes in appetite, accumulation of fat around the internal organs, darkening of the body color. cohexia, curvature of the skull, increased refractive index of the fin apparatus, darkening of the eyeball, the presence of hemorrhages on the skin and eyelids should be determined.

The diagnosis of protein metabolism disorders in fish is an effective method by detecting energy deficiency syndrome (ETS). When the water temperature rises above 25 °C, clinical signs begin to appear in fish with protein metabolism disorders (rotational movements).

From the hematological parameters, the amount of hemoglobin increased by 7.9% on average, the number of erythrocytes by 15.38%, the average indicator of hematocrit by 3.8%, the number of leukocytes by 2.7%, the number of neutrophils with rod nuclei by 14, by 2%, basophils by 30%, monocytes by 22%, lymphocytes by 2.2%, total protein by 32.2%, total calcium by 7.3%, inorganic phosphorus by 4.8%, and the amount of retinol by o When it decreases by 14.5% on average, it is possible to diagnose that protein metabolism disorders have developed.

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