EduVision: Journal of Innovations in Pedagogy and Educational Advancements
Volume 01, Issue 06, June, 2025
brightmindpublishing.com
ISSN (E): 3061-6972

HEMOGLOBIN INDICATORS OF CARP FISH

Khurramova S.G.
Talented Student

Kupalova S. B.
Talented Student

Kurbanov F. E.
Scientific Supervisor, PhD.

Samarkand State University of Veterinary Medicine,
Livestock and Biotechnologies

Abstract
During the experiments, it was noticed that the hematological parameters of one-year-old carp (fingerlings) raised on a fish farm have different indicators depending on the type of pond contained.Keyword. The difference in the average size of erythrocytes in fish raised under intensive technology, pool conditions, is 19.2; 47.35 microns less than in the experiments, and this indicator was found in extensive technology and conditions of an artificial pond, and 34.6 - in the corresponding cultivation; It was found that the average size of erythrocytes is 57.3 microns.

Keywords: Erythrocyte, 1012/l, Hemocrit, Amount of hemoglobin in an erythrocyte, pg, Average size of an erythrocyte, µm, Leukocyte x1012/l, Extensive technology, Intensive technology, Artificial pool, Hemoglobin in pool conditions, Confined water pool.

Introduction

Relevance of the Topic

Along with other branches of animal husbandry, the further development of fisheries and the increasing demand of our people for fish and fish products are increasing. This, in turn, is leading to the rapid development of fisheries based on

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new innovative technologies and the widespread implementation of innovative methods of fish farming based on intensive technologies in the sector. As an example, a number of resolutions and orders of our Honorable President are being implemented in practice. In particular, in accordance with the Resolution of the President of the Republic of Uzbekistan No. PP-4816 dated August 29, 2020 "On measures to support the fisheries sector and increase its efficiency", in order to support the fisheries sector in the Republic, increase the efficiency of fisheries and fishing farms, ensure rational and efficient use of land and water resources in this area, and the widespread introduction of intensive technologies:

Starting in 2020, a tax for the use of water resources for fisheries that breed fish in artificial reservoirs will be calculated at the rates established for irrigation of agricultural land, based on the difference between the volume of water withdrawn from water bodies and returned.

The Ministry of Water Resources, together with the Ministry of Agriculture and the Uzbekbaliqsanoat Association:

In 2021-2022, in conditions of water shortage, new resource-saving intensive technologies and widespread use of secondary water sources were introduced in artificial water basins by fisheries that draw water from rivers and canals.

According to the resolution, it is determined to rapidly develop the fisheries sector in our Republic in an intensive manner based on a scientific approach, increase efficiency by introducing modern and innovative methods of fish product production into the sector.

The level of study of the problem. For the research, blood was taken from the tail artery of white Amur carp fish from the Amur fishery using a syringe. In carp seals, instead of an injection, blood is taken from the junction of the lateral line by drawing a line perpendicular to the anal opening. Blood should be taken from a hungry fish. Freshly caught fish should be kept in oxygenated water for 5-10 minutes before blood collection.

Fish should be removed from the water and wrapped in gauze. Only the base of the tail should remain outside. The puncture site is cleaned of body fluid with a cotton swab with a 70% alcohol solution. A sterilized needle and syringe are used to collect blood. Instruments are treated with sodium citrate and heparin solutions. A forceful puncture is made along the spine at a 450 angle above the anal opening. The blood collection site cannot be squeezed. This is to prevent the released fluid

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from entering. It is not recommended to collect blood again from the blood collection site.

Results and their analysis. Our research was conducted to determine the hematological parameters of one-year-old (segoletka) carp fish grown under various technological conditions in the White Amur fishery, divided into five groups: Extensive technology, Intensive technology, Artificial pond, Pool and Closed water reservoir.

When examining the hematological parameters of carp fish (pond), the arithmetic mean hemoglobin value of fish raised using Extensive technology was 85.6 grams per liter, with a standard deviation of 3.4.

It was found that carp fish raised using Intensive technology were slightly lower than the hemoglobin value of fish raised using Extensive technology by 7.02 (77.48±3.5) grams per liter, with a standard deviation of 0.481.

The arithmetic mean hemoglobin value in carp fish raised in artificial pond conditions was 89.88 grams per liter, and the standard deviation was 4.035, which was 3.28 and 12.42 grams per liter higher than those raised in Extensive technology and Intensive technology, respectively.

The arithmetic mean hemoglobin value in carp fish raised in pool conditions was 76.52 grams per liter, and the standard deviation was 2.98, which was 9.08; 0.96; 13.35 grams per liter lower than those raised in Extensive technology and Intensive technology and Artificial pond conditions, respectively.

In carp fish raised in closed water bodies, the arithmetic mean hemoglobin value was 60.56 grams per liter, and the standard deviation was 4.32. The experiments revealed that the difference in hemoglobin from fish raised in Extensive technology, Intensive technology, Artificial pond, and Pool conditions was 25.02; 17.08; 29.24; 15.96 grams per liter less, respectively, making this indicator the lowest among all fish raising conditions.

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Hemoglobin values of one-year-old carp (segoletka) grown in the White Amur fishery

Experience days	Statistik ko‘rsatkichlar	Pool		Artificial pool	Swimming pool	Indoor pool
		Extensive technology	Intensive technology			
120 day	**M**±m g/l	87,5	79,1	92,2	78,6	62,9
150 day	**M**±m g/l	86,8	78,5	91,6	77,1	61,1
180 day	**M**±m g/l	85,1	77,9	89,1	76,5	60,4
210 day	**M**±m g/l	84,5	76,3	88,6	75,9	59,9
230 day	**M**±m g/l	84,1	75,6	87,9	74,5	58,5
Hemoglobin, g/l		85,6±3,4	77,48±3,5	89,88±4,035	76,52±2,98	60,56±4,32

When examining the erythrocyte indicators of carp (pond), the arithmetic mean value of erythrocytes in fish raised using extensive technology was 1.5 1012/l, and the standard deviation was 0.04.

It was found that carp raised using intensive technology was 0.18 (1.32±0.4) 1012/l lower than the erythrocytes in fish raised using extensive technology, and the standard deviation was 0.4.

In carp raised in artificial pond conditions, the arithmetic mean value of erythrocytes was 1.1 1012/l, and the standard deviation was 0.41, and it was found that they were 0.4 and 0.22 1012/l lower than the erythrocytes in fish raised using extensive technology and intensive technology, respectively.

In carp fish raised in pool conditions, the arithmetic mean value of erythrocytes was 1.3 1012/liter, and the standard deviation was 0.25, which was 0.2; 0.02 1012/l lower than in carp fish raised in extensive technology, and 0.2 1012/l higher than in fish raised in artificial pond conditions. In carp fish raised in closed water bodies, the arithmetic mean value of erythrocytes was 1.0 1012/liter, and the standard deviation was 0.056, which was 0.5; 0.32; 0.1; It was found in experiments that it was less than 0.3 1012/liter, and this indicator, like the statistics of hemoglobin, had the lowest indicator in relation to all fish farming conditions.

Our experiments showed that when the hematocrit indicators of carp fish (pond) were checked, the arithmetic mean value of the hematocrit of fish raised based on extensive technology was 39.7%, and the standard deviation was 2.12.

It was found that carp fish raised in intensive technology had a slightly lower Hematocrit of 3.4 (36.3±1.3) % compared to fish raised in extensive technology, with a standard deviation of 1.3.

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The arithmetic mean value of Hematocrit in carp fish raised in artificial pond conditions was 35.5 %, with a standard deviation of 2.3, which was 3.4 and 4.2 % lower than those raised in extensive technology and intensive technology, respectively.

The arithmetic mean value of Hematocrit in carp fish raised in pool conditions was 34.2 %, with a standard deviation of 1.48, which was 5.5; 2.1; 1.3 % lower than those raised in extensive technology and intensive technology and artificial pond conditions, respectively.

In carp fish raised in closed water basin conditions, the arithmetic mean value of Hematocrit was 30.7%, and the standard deviation was 2.17, and the difference in Hematocrit from fish raised in Extensive technology, Intensive technology, Artificial pond, and Pool conditions was 9.0; 5.6; 4.8; 3.5% less, respectively. It was found in the experiments that this indicator had the lowest indicator compared to all fish raising conditions. It was found that this indicator had the lowest indicator compared to all fish raising conditions, such as hemoglobin and erythrocyte statistics.

When the hemoglobin content in erythrocytes (Sali hemometer) of carp fish in our experiments was checked, the arithmetic mean value of hemoglobin content in erythrocytes of fish raised in Extensive technology (pond) was 56.6 pg, and the standard deviation was 2.7.

It was found that carp fish raised in intensive technology had a hemoglobin content in erythrocytes of 10.26 (46.34±1.85) pg less than fish raised in extensive technology, with a standard deviation of 1.85.

The arithmetic mean value of hemoglobin in erythrocytes in carp fish raised in artificial pond conditions was 81.5 pg, with a standard deviation of 2.25, which was 24.9 and 35.16 pg higher than those raised in extensive technology and intensive technology, respectively.

The arithmetic mean value of hemoglobin in erythrocytes in carp fish raised in pool conditions was 58.0 pg, with a standard deviation of 4.1, which was 2.6; It was found to be 12.34 pg lower, and fish raised in artificial pond conditions were found to have a hemoglobin content of 23.5 pg lower than that in erythrocytes.

In carp fish raised in closed water basin conditions, the arithmetic mean value of hemoglobin in erythrocytes was 59.5 pg, and the standard deviation was 1.5, and the difference in hemoglobin in erythrocytes was 3.1; 13.16; 1.5 pg higher than in

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fish raised in Extensive technology, Intensive technology, and Pool conditions, respectively, and it was found in experiments that this indicator was 22.0 pg lower than in fish raised in artificial pond conditions.

When examining the average erythrocyte volume indicators of carp fish in the White Amur farm (pool), the average erythrocyte volume of fish raised in Extensive technology was 267.7 µm, and the standard deviation was 9.6.

The average erythrocyte size of carp fish raised in intensive technology was 321.5 µm, and the standard deviation was 2.8.

The arithmetic mean value of the average erythrocyte size in carp fish raised in artificial pond conditions was 245 µm, and the standard deviation was 2.6, and the average erythrocyte size in carp fish raised in pool conditions was 349.65 µm, and the standard deviation was 7.5.

It was found that the average erythrocyte size in carp fish raised in closed water bodies was 302.3 µm, and the standard deviation was 2.85.

The difference in the average erythrocyte size from fish raised in intensive technology and pool conditions was 19.2; It was found in experiments that this indicator was lower by 47.35 µm, and in fish raised under Extensive technology and Artificial pond conditions, it was found that the average size of erythrocytes was lower by 34.6; 57.3 µm.

When examining the leukocyte indicators of the White Amur carp fish in the farm (pond), the arithmetic mean value of the leukocyte of the fish raised under Extensive technology was 24.8 x1012/l, and the standard deviation was 4.2.

The arithmetic mean value of the leukocyte of the carp fish raised under Intensive technology was 37 x1012/l, and the standard deviation was 5.3.

In carp fish raised in artificial pond conditions, the arithmetic mean value of leukocytes was 41.1 x1012/l, with a standard deviation of 4.6, and in carp fish raised in pool conditions, the arithmetic mean value of leukocytes was 39.5 x1012/l, with a standard deviation of 4.5.

In carp fish raised in closed water bodies, the arithmetic mean value of leukocytes was 52.9 x1012/l, with a standard deviation of 0.2.

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Hematological parameters of one-year-old carp (segoletka) grown in the White Amur fishery

Indicators	Pool		Artificial pool	Swimming pool	Indoor pool Extensive technology
	Extensive technology	Intensive technology			
Erythrocyte, 10^{12}/l	1,5±0,04	1,32±0,41	1,1±0,43	1,3±0,25	1,0±0,056
Hematocrit, %	39,7±2,12	36,3±1,3	35,5±2,3	34,2±1,48	30,7±2,17
The amount of hemoglobin in an erythrocyte, pg	56,6±2,7	46,34±1,85	81,5±2,25	58,0±4,1	59,5±1,5
Average erythrocyte size, mkm	267,7±9,6	321,5±2,8	245±2,6	349,65±7,5	302,3±2,85
Leukocyte x10^{12}/l	24,8±4,2	37±5,3	41,1±4,6	39,5±4,5	52,9±0,2

Conclusion

During the experiments, it was observed that the hematological parameters of summer carp (segoletka) grown in a fish farm showed different indicators depending on the type of pond in which they were kept.

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