



Dynamics of Changes in the Parameters of Total Blood Serum Protein in Pheasant (*Phasianus Versicolor*) in Postembryogenesis

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Abstract

The studies were carried out in 2021 on endemic subspecies of the domestic fauna - emerald and Caucasian pheasants. All pheasants were bred in the (incubator) vivarium of the Institute of Zoology of ANAS. The aim of the research was to study the dynamics of the total protein in the blood serum in connection with the change in the mass of pheasants. In the experiment, a commercial feed was used, which was enriched with protein and vitamin supplements to bring the nutritional level of 100 g of dry feed to: vitamins A - 20,000 IU (0.2 ml) 15,000 IU, D3 - 1400 IU 1250 IU (2 drops), E - 50 mg. As a result of the data obtained, the dynamics of changes in the parameters of the total protein of the blood serum of pheasant was revealed during 2 months of postembryogenesis. As shown by experimental data, with age, there is a change in the total protein of blood serum inversely proportional to the increase in live weight of pheasant calves. It was revealed that the change in the total protein content of the blood serum of pheasant calves is closely related to their growth. A higher intensity of development and weight growth of pheasant calves (21.93, 25.62, 41.93, 86.60, 153.15, 378.60 g) corresponded to a lower content of total protein (2.66, 2.37, 2.60, 2.92, 3.16, 3.84%) of blood serum and vice versa. Thus, with a decrease in the intensity of growth, an increase in the total protein of the blood serum of pheasant calves was noted. In all likelihood, this is due to the high consumption of protein during this period of development of pheasants, during the period when the construction of body tissues is observed.

Keywords: Pheasant; Blood; Protein; Postembryogenesis; Vitamin; *Phasianus versicolor*

Introduction

Biochemical blood parameters are important in determining the physiological status and health status of farm animals and poultry. It is known that the biochemical parameters of blood in birds change with age [1,2]. Due to the transport and regulatory function of blood, a multilateral connection is provided between the digestive system and metabolism. This connection is expressed both in the coordination of digestive activity and metabolism, due to nervous and hormonal regulation, and in the presence of special functions of the gastrointestinal tract, contributing to the

implementation of chemical processes [3]. The problem of studying the growth of pheasants is of theoretical and practical interest for the development of criteria for choosing feeding regimes and keeping young stock. For different age periods, a certain protein composition is characteristic, fluctuations in its level in the blood, which in turn reflects changes in protein metabolism of the whole organism [4,5]. The method of cage keeping of pheasants in vivarium conditions is increasingly being used. In addition, the cage keeping method is widely used in the breeding of various types

of game. The need for its use was caused, first of all, by the desire to provide the best zoohygienic conditions for birds, since with aviary keeping and constant contact with the soil, birds, especially young animals, are susceptible to diseases, the main of which are: syngamosis, histomonosis, coccidiosis. Along with a number of undoubted advantages, the cellular content method is not devoid of certain disadvantages. These include the possibility of bird diseases associated with injuries and constant presence on a metal mesh [6]. Keeping chickens in small cages for a year can lead to atrophy of the heart, liver, and gizzard [7,8]. In this regard, young pheasants are usually grown in cages only in the first 10-25 days of life, and then transferred to the floor keeping [9,10]. In the literature there are recommendations for the further cultivation of pheasants in acclimatizing cages. However, growing pheasants in cages after 2 weeks of age has not found wide application in the practice of pheasant breeding [11,12]. Based on the foregoing, the purpose of our research was to study the dynamics of total protein in the blood serum in connection with a change in the mass of pheasants on the same feeding and maintenance regime, the development of pheasants in a vivarium, to identify the optimal terms and conditions for growing young pheasants in cages in a vivarium and in enclosures as endemic subspecies of the domestic fauna - emerald and Caucasian pheasants.

Material and Research Methods

Research was carried out in 2021 on endemic subspecies of the domestic fauna - emerald and Phasianus versicolor. All pheasants participating in the experiments were bred in the (incubator) vivarium of the Institute of Zoology of ANAS. During the period of the experiments, the chickens were kept in the vivarium of the Institute of Zoology of ANAS (20 heads per group). All pheasants were placed in cages in the vivarium, where they were kept until 2 weeks of age. For the experiments, 5 chickens were taken from each group. The studies were carried out in 2 replicates. Blood was taken

from the jugular vein during decapitation slaughter. Sodium citrate solution was added to each tube, then the blood was centrifuged for 15 minutes at 1500 rpm, serum was separated, followed by determination of total protein by the Lowry method [13]. Statistical processing of the results obtained and the significance of differences were assessed by Student's t-test [14]. Differences were considered statistically significant at $P < 0.05$.

Research Results and Discussion

When carrying out comparative experiments on the cellular content of pheasants, the young animals were labeled with a dye. Emerald and Caucasian pheasants were housed separately. We observed equal feeding regimes and keeping conditions (control). The experimental groups of pheasants were divided into two groups: the first group of pheasants was kept only in vivarium conditions, and the second group of pheasants was placed in aviaries after 3 weeks of development. The development of young animals raised in different conditions was studied by measuring individual parts of the body, monitoring the total weight of birds, health and vitality. Immediately after hatching, young animals of two subspecies of pheasants, 5 heads per group, were placed in cages (1st and 2nd groups). The floor of the cages was covered with burlap covered with sawdust, water was put in and food was given. The cells were heated with electric 100-watt lamps. Blood was taken according to the generally accepted technique by opening the jugular vein on days 1, 5, 10, 15, 20, 30, 60, 120. The blood was collected in test tubes, then the blood was placed in a thermostat for 3 hours at a temperature of 37°C, then placed in a refrigerator for 12 hours at a temperature of 0°C. Subsequently, the serum was separated and, to remove the remaining erythrocytes, it was centrifuged at 1500 rpm. Within 15-20 minutes. The total protein content was determined refractometric. These changes in body weight and total blood protein of pheasants are shown in (Table 1).

Table 1: The given amount of total protein in the blood serum of pheasants due to changes in body weight.

Age in Days	Weight in Grams	Total Protein in%
1	21.93	2.66
5	25.62	2.37
10	41.93	2.6
20	86.6	2.92
30	153.15	3.16
60	378.6	3.84

After 14-31 days, some of the pheasant calves, 5 heads each, were placed in aviaries (groups 3 and 4), and some of the pheasant calves were left in cages in a vivarium. Feeders and drinkers were placed inside the cages and inside the enclosure. Heating of the cells turned out to be insufficient, many chicks fell ill with pneumonia, therefore, infrared and ultraviolet devices were used simultaneously. The pheasants were fed with a different diet,

heating the cells of the vivarium and simultaneously exposing the room to ultraviolet irradiation. It should be noted that all pheasant chicks received an identical diet under the selected conditions in the enclosures. Pheasant calves' feed contained proteins containing amino acids and vitamins A, E, D3. When growing pheasants from 1 to 120 days, three types of rations were used depending on age in the following sequence: 1-4 days - pre-start, 5-30 days - starting and 30-

120 days - growth. The first feed consisted of hard-boiled crushed eggs (80%) and compound feed (20%). Gradually, the number of eggs was reduced and five-day-old pheasant chicks received a dry feed mixture, the egg was already completely excluded from the diet. Industrial compound feed was used, which was enriched with protein and vitamin supplements to bring the nutritional level of 100 g of dry feed to: vitamins A - 20,000 IU (0.2 ml) 15,000 IE, D3 - 1400 IE 1250 IU (2 drops), E - 50 mg. Dairy products and crushed fish products were used for feeding. In the first 30 days after the transfer of pheasants to the aviaries, the average daily weight gain in emerald and Caucasian pheasants, both caged and

aviary, was almost the same. From 31 to 41 days, the intensity of weight gain for pheasants kept in the vivarium in cages was 0.1-0.3 g lower than those in the enclosures. All pheasants from 31 to 41 days had the same rate of weight gain, however, from 31 to 41 days, the rate of weight gain in pheasants in the vivarium increased in comparison with the weight gain in aviary birds. This phenomenon can be explained by the low mobility of birds in the vivarium and with optimal conditions of keeping in cages in the conditions of the vivarium. It should be noted about changes in the total blood protein in pheasants in connection with their development and growth (Figure 1).

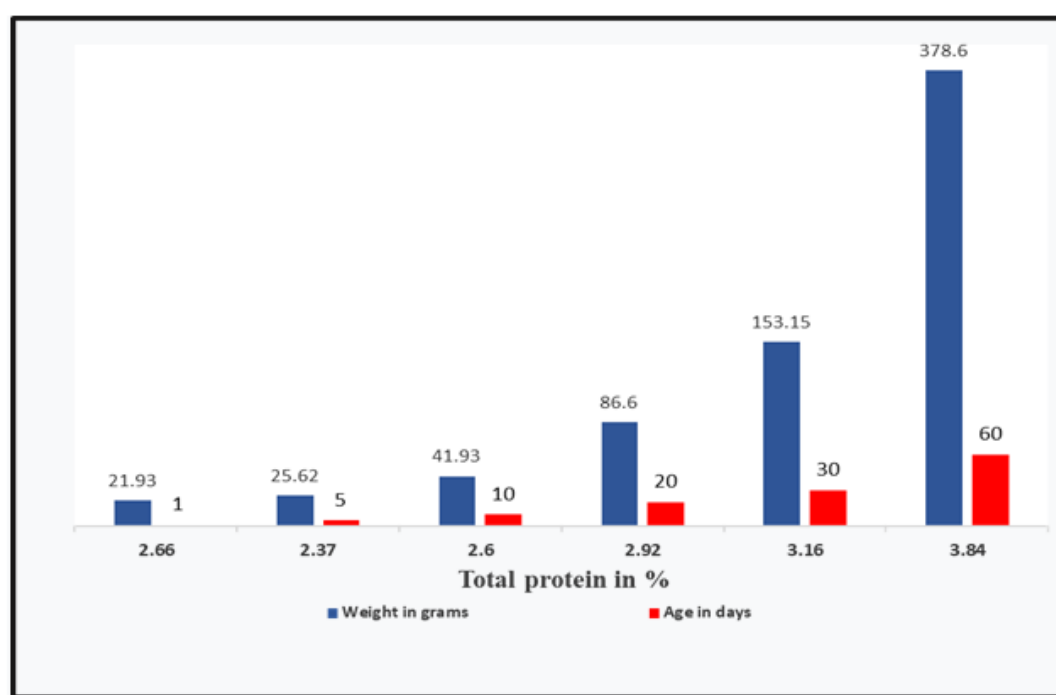


Figure 1: Diagram of the total protein of the blood serum of pheasants depending on the intensity of development and growth of the mass of pheasants.

Figure 1 shows the data on the total protein content in the blood serum of pheasant calves, depending on the intensity of development and growth of the bird mass. As a result of the data obtained, the dynamics of changes in the parameters of the total protein of the blood serum of pheasant calves was revealed during 4 months of postembryogenesis. As shown by experimental data, with age, there is a change in the total protein of blood serum inversely proportional to the increase in live weight of pheasant calves. With a decrease in the intensity of growth, an increase in the total protein of the blood serum of pheasant calves was noted. At the highest growth rate of pheasant calves, which was observed in the period from 5-10 days, respectively, the least amount of total protein in the blood serum of pheasant calves was determined. In all likelihood, this is due to the high consumption of protein during this period of development of pheasants, during the period when the construction of body tissues is observed.

Conclusion

- Revealed a change in the mass of young pheasants of endemic subspecies of the domestic fauna - emerald and Caucasian from the moment of hatching and up to 4 months of age, occurring unevenly, which increased 17 times.
- The total protein content of the blood serum of pheasants is closely related to their growth.
- A higher intensity of development and growth of pheasant calves' mass corresponded to a lower content of total blood serum protein and vice versa.

Acknowledgement

None.

Conflict of Interest

No Conflict of Interest.

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