

# Age-related Changes in Aspartate Aminotransferase in The Blood of Pheasants With the Complex Use of Vitamins and an Antistress Drug

## Research Article

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## Abstract

In the article presented by us, the results of the use of vitamins and an anti-stress drug on biochemical indicators of blood activity are presented.

The aim of the research was to identify the dynamics of age-related changes in aspartate aminotransferase (AcAT) in the blood of pheasants with the complex use of vitamins and an antistress drug. The object of research was the blood of pheasants.

Determination of the activity of the enzyme aspartate aminotransferase in the blood of partridges was carried out on a Specol 1500 spectrophotometer (Analytik Jena) according to the method of R Rej., M Hoder, U.H Bergmeyer at a wavelength of 540 nm. On the basis of experimental data, it can be stated that after the inclusion in the diet of birds of a complex of vitamins (A-20000 IU, D<sub>3</sub> - 1250 IU, E - 50 mg) and an anti-stress drug (succinic acid) at a dose of 0.01, 0.03, 0.05 g per 1 kg of body weight per day, in all experimental groups there is a tendency to improve biochemical parameters, namely the activity of the enzyme aspartate aminotransferase, that is, a decrease in the activity of the enzyme is revealed by 2, 1.5, 1.25, 1.33, 1.26, 1.4 times compared with the indicators of the control groups of pheasants. At the same time, a decrease in the activity of the alanyl aminotransferase enzyme in the blood serum of the experimental groups of pheasants was found to be 2, 1.5, 1.25, 1.33, 1.26, 1.4 times compared with the indicators of the control groups of pheasants.

The level of alanylaminotransferase against the background of the use of a complex of vitamins (A, D<sub>3</sub>, E) and the anti-stress drug succinic acid at a dose of 0.05 g per 1 kg of body weight per day decreased in one-day-old partridges to 0.10 U/l, reaching a maximum value in 30-day-old (0.80 U/L), followed by a decrease in activity to 0.50 U/L in 60-day experimental groups of pheasants.

## Keywords

Biochemical Parameters Of Blood; Aspartateaminotransferase; Pheasant; Phasianus Colchicus; Phasianus Versicolor; Vitamins; Antistress Drug

## Introduction

The literature provides data on the role of enzyme systems in the regulation of growth and development, as well as on the formation of the productive qualities of plants. It was noted that the content of aspartate aminotransferase

and alanine aminotransferase in hepatocytes and the rate of release of aminotransferase from cells in the blood in the physiological assessment of the properties to the greatest extent on the content of enzymes in the blood of chickens and, as a detection, on the metabolic transformations of

amino acids in the chest, which is associated with its egg productivity [1].

Comparative analysis of biochemical parameters of blood serum of quails, obtained under the conditions of the experiment, allows the authors to conclude that the introduction of the additive "Yarosil" into the diet of poultry at a dose of 0.6 and 0.2 ml/kg, as well as the additive "Kurunga" in a dose of 0.1 ml/kg has a positive effect on the metabolic status of the experimental birds. This is reflected in indicators characterizing the normalization of liver function, amino acid metabolism, and carbohydrate metabolism [2].

In the article by N. Sachivkina and co-authors on the quail model, it was shown that biochemical analysis in the experimental group on the 10th and 15th days showed a significant increase in the levels of creatinine, aspartate aminotransferase, alanine aminotransferase, and alkaline phosphatase [3].

The work of A. V. Antipov and co-authors [4] presents the results of a study of the effect of a probiotic feed additive on the body and quality indicators of quail meat. According to research results, the recommended rate of introducing a bioproduct into the composition of the main diet is 2% daily, starting from the day of age for 49 days. An analysis of the biochemical parameters of quail blood found that the AST of the experimental group was lower than the control by 1.1%, and by the amount of ALT - by 2.9%.

According to literature data, in a certain period of development, a bird needs biologically active substances, the consumption of which determines its productivity. It should be noted that the rational use of dietary supplements in chickens has a positive effect on metabolic processes in the body. With the positive effect of the drugs used, productivity increases and the profitability of poultry products increases [5].

Additional introduction of biologically active substances of directed action into the feed diet of poultry is a significant factor in increasing their productivity and safety [6]. A properly formulated diet for animals is no less important than their genetic origin. Therefore, one should take into account not only the nutritional value of the ration feed, but also the presence of biologically active substances in them [7].

To date, poultry farmers have accumulated a significant amount of experimental data on the effective use of various

biologically active and non-traditional additives for poultry [8,9].

In the poultry industry, choosing the right proportion to create an ideal dietary ration is critical, and is also important for efficient production. The availability of a non-digestible food ration in different parts of the bird's intestines can significantly affect its health, growth rate, and performance. Errors in calculations, as a rule, lead to metabolic disorders and, as a result, the development of dysbacteriosis, necrotic enteritis [10].

The activity of enzymes in birds is determined not only by the influence of factors of the external and internal environment of the cell, but also by the degree of influence of biological and technological factors (age, type of feeding, reproductive periods, and other factors). However, in the literature available to us, we did not find information about the features of the influence of age on the activity of aspartate aminotransferase in the blood of pheasants.

Given the above, the purpose of the research was to identify the dynamics of age-related changes in aspartateaminotransferase in the blood of pheasants with the complex use of vitamins and an anti-stress drug.

### Material and Research Methods

The control and experimental groups of pheasants were selected according to the principle of analogue groups. During the experimental period, the following was taken into account: the safety of the livestock - by daily detection of dead birds with the establishment of the causes of death, the cost of feed per unit of production. All experiments were repeated and ended with a production check. Studies were carried out in the blood of 60 pheasants in the postembryonic period at the age of 1 to 60 days of age.

After taking blood from the jugular vein, blood was collected in test tubes, followed by centrifugation at 4000 rpm for 15 minutes, and serum was obtained, in which AST activity was determined. Determination of the activity of the enzyme aspartate aminotransferase in the blood of partridges was carried out on a Specol 1500 spectrophotometer (Analitik Jena) according to the method of R Rej., M Hoder, U.H Bergmeyer at a wavelength of 540 nm [11]. The experimental digital material was subjected to statistical processing. The significance of differences between the groups was assessed using the Student's t-test in accordance with the generally accepted method [11-14].

**Research Results and Discussion**

For research, 4 groups of pheasants from 1 day to 90 days of age were formed, 5 heads in each group. The birds were in the same building and received the main diet, represented by factory-made compound feed.

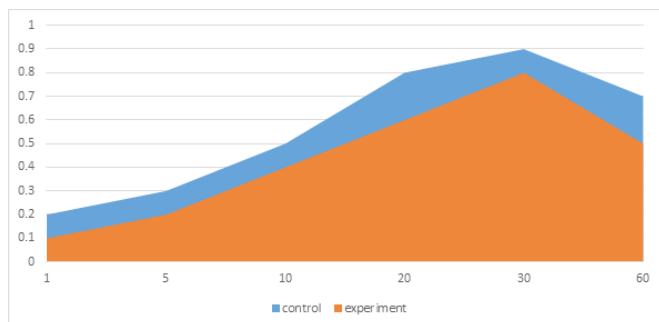
In addition to the diet of birds, a complex of vitamins (A-20000 IU, D3 - 1250 IU, E - 50 mg) and an anti-stress drug (succinic acid) at a dose of 0.01, 0.03, 0.05 g per 1 kg of body weight per day were used.

**Table.1.** Scheme of experiments on pheasants

Groups	Used drugs	Dose of antistress drug, g/kg of body weight
1 - control	Basic ration (BR)	
2 - experienced	BR+ vitamin + antistress a drug	0.01
3 - experienced	BR+ vitamin + antistress a drug	0,03
4- experienced	BR+ vitamin + antistress a drug	0,05

**Table 2.** The activity of the enzyme aspartateaminotransferase in the blood of pheasants

Age in days	Significative	
	control	experiment
1	0.20±0.05	0.10±0.11
5	0.30±0.21	0.20±0.20
10	0.50±0.20	0.40±0.21
20	0.80±0.10	0.60±0.15
30	0.90±0.15	0.80±0.30
60	0.70±0.20	0.50±0.02



**Figure 1:** The activity of the enzyme aspartate aminotransferase in the blood of pheasants

The preparations were used with food for 90 days according to the experimental scheme presented in (Table 1).

Rice. 1. The activity of the enzyme aspartate aminotransferase in the blood of pheasants

Aspartate aminotransferase is mostly found in hepatocytes and is present in small amounts in muscle tissue. The activity of this enzyme in the blood indicates the destruction of tissue cells containing them and an increased release of the enzyme into the blood. Their increase in the blood can occur long before the clinical manifestation of the pathological process. In all likelihood, the content of the enzyme in the liver and the rate of their release from cells into the blood most affect the activity of the enzyme in the blood of pheasants, which affects their productivity.

Thus, a comparative analysis of the biochemical parameters of the blood serum of pheasants obtained under the conditions of the experiment allows us to conclude that the introduction of a complex of vitamins (A-20000 IU, D3 - 1250 IU, E - 50 mg) and an anti-stress drug (succinic acid 0.05 g per 1 kg of body weight per day) has a positive effect on the metabolic status of experimental groups of pheasants.

**Findings**

1. Revealed a decrease in the activity of the enzyme alanylaminotransferase in the blood serum of the experimental groups of partridges by 2, 1.5, 1.25, 1.33, 1.26, 1.4 times compared with the indicators of the control groups of partridges.

2. The level of alanyl aminotransferase against the background of the use of a complex of vitamins (A-20000 IU, D3 - 1250 IU, E - 50 mg) and the anti-stress preparation of succinic acid at a dose of 0.05 g per 1 kg of body weight per day decreased in day-old partridges to 0.10 units /l, reaching a maximum value in 30-day-old (0.80 U/L), followed by a decrease in activity to 0.50 U/L in 60-day experimental groups of partridges.

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