# On the issue of the effectiveness of feed additives

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**Abstract.** The article presents the results of scientific and production experiment in feeding the feed additive "Fayberton" to broiler chickens of the Ross-308 cross. The conducted scientific and production experiment has shown positive results on the weight indicators of broiler chickens of the Ross-308 cross, while in both the experimental and control groups, the veterinary and sanitary examination of carcasses and internal organs did not reveal significant morphological changes. The average live weight of broilers in the experimental group is significantly higher than in the control group, which indicates an acceleration of metabolic processes, an increase in meat productivity of chickens. The feed additive "Fayberton" has proven itself in scientific and production experiment as a safe, effective, cost-effective product that helps to increase the meat productivity of meat-producing chickens.

## 1 Introduction

An urgent problem of animal husbandry is to increase the efficiency of the use of nutrients in animal body. Feed additives are used to optimize the digestive processes and increase the productivity of farm animals and poultry, which is a promising direction in broiler poultry farming [1-6]. The list of feed and feed additives approved for supply to the Russian Federation by the Rosselkhoznadzor includes 193 feed additives from a German manufacturer, including Fayberton (JELU-WERK Josef Ehrler GmbH + Co.KG).

In the Russian Federation, the most popular broilers of highly productive poultry crosses of domestic and foreign breeding, such as Ross-308, Cobb-500, etc., are characterized by high growth intensity and early readiness for slaughter [7, 8].

Ross-308 is a fast-growing broiler with high meat performance, thanks to the implementation of effective feed conversion.

The purpose of the study was to evaluate the effectiveness of the Fayberton feed additive on Ross-308 cross broiler chickens using a complex of morphological and hematological research methods.

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## 2 Material and methods of research

Chickens of the Ross-308 cross were kept in the vivarium of the FSBEI HE Primorsky Agrarian and Technological University from the age of 11 days to slaughter (45 days) in conditions that meet the basic zoohygienic requirements. The birds were kept in cages with a mesh bottom of 10 individuals each. Wood shavings were used as bedding. The scientific and production experiment was carried out on 50 broiler chickens of the Ross-308 cross. According to the method of pairs of analogues, two groups were formed – a control and an experimental one. The feed additive "Fayberton" was introduced into the feed of the latter throughout the entire growing period in a dosage of 0.5 kg per 100 kg of feed according to the instructions for use of this additive. The poultry of the control group received only a basic diet balanced in nutrients (Table 1).

**Table 1.** Scheme of scientific and production experiment**.**

| Group of broiler chickens (n=50) | Feeding and feed additive | Dose per injection, ml | Method of administration |
|---|---|---|---|
| Control group | Feed ration<br>Water | daily | orally |
| Experiment group | Feed ration<br>Water<br>Feed additive "Fayberton" | daily<br><br>500g per 100 kg of feed | orally |

**Fig. 1.** Weighing of broiler chickens of cross Ross-308.

Temperature, light, and humidity conditions, the front of watering and feeding, nutritional value of the diet, the feeding program corresponded to the "Ross-308 cross growing manual" and the methodological recommendations of All-Russian Research and Technological Institute of Poultry Farming "Broiler meat production technology" [9, 10]. The live weight of the bird was measured weekly by individual weighing (Figure 1).

The objects for the study of morphological and biochemical parameters of blood were broiler chickens of the Ross 308 cross at the age of 18 and 45 days. The broiler chickens were fed with dry balanced compound feeds with nutritional parameters corresponding to the

recommended feeding standards. The birds had free access to food and water. Blood collection from birds was carried out from the axillary (underwing) vein. Biochemical studies were carried out on an automatic biochemical express analyzer Fuji Dri-Chem NX 500. A general blood test was performed using a Mindray BC-2800 Vet veterinary hematology analyzer. Veterinary and sanitary examination of carcasses and internal organs was carried out after slaughter on the 45th day.

The digital material obtained during the experiment was processed biometrically with the determination of the arithmetic mean, the arithmetic mean error, and the reliability criterion between the averages.

## 3 Results and Discussions

At the beginning of the experiment, before the inclusion of a feed additive, blood samples were taken from chickens for clinical analysis of whole blood and biochemical analysis of blood serum.

**Table 2.** Biochemical and clinical blood parameters of broiler chickens at the age of 18 days (n=20).

| Indicators | Result | |
|---|---|---|
| | control group | experimental group |
| Aspartate Aminotransferase (AST), U/l | 166±5.60 | 168±5.30 |
| Total protein (TP), g/l | 33.00±1.60 | 32.30±1.70 |
| Albumin (ALB), g/l | 11.00±0.68 | 11.1±0.66 |
| Globulin (GLOB), g/l | 22.00±1.90 | 21.8±1.80 |
| Cholesterol (CHOL), mmol/l | 2.98±0.37 | 2.90±0.28 |
| Phosphorus (PHOS, IP), mmol/l | 2.71±0.45 | 2.85±0.41 |
| Uric acid, μmol/l | 237.00±5.9 | 235.00±6.2 |
| Glucose (GLU), mmol/l | 9.10±0.44 | 9.12±0.43 |
| Calcium (Ca), mmol/l | 2.40±0.39 | 2.50±0.33 |
| White blood cells (WBC), thousand/μl | 21.00±1.35 | 21.10±1.20 |
| Red blood cells (RBC), million/μl | 2.10±0.43 | 2.10±0.39 |
| Hemoglobin (HGB), g/l | 108.00±2.88 | 107.00±3.20 |

Biochemical and general blood analysis (Table 2) revealed no abnormalities, all indicators are within the physiological norm. The differences between the indicators of the control and experimental groups are statistically insignificant.

The live weight of chickens increased more than 10 times during the growing period from 11 to 45 days (Table 3). The largest live weight was recorded in the experimental group.

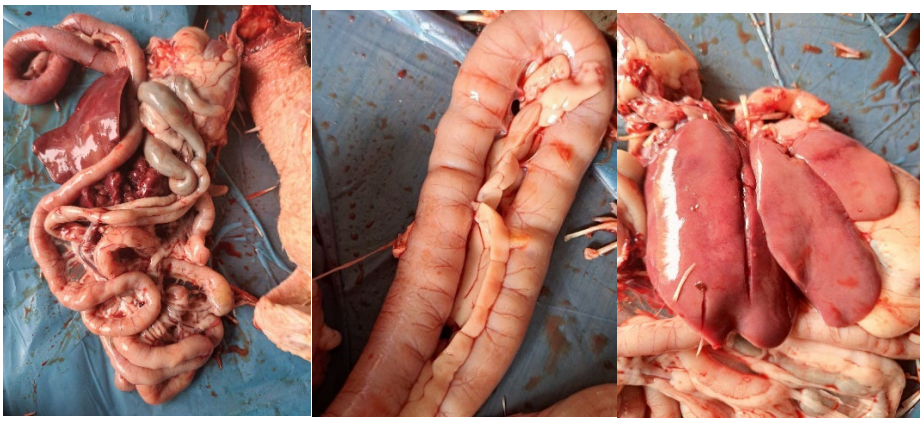
**Table 3.** Live weight of chickens during the growing period, g.

| **Days** | **Live weight of broiler chickens $M_{min} - M_{max}$** | |
|---|---|---|
| | **control group** | **experimental group** |
| 11 | 153.9-266.6 | 155.5-259.5 |
| 18 | 394.0-514.0 | 400.0-530.0 |
| 25 | 570.0-825.0 | 600.0-900.0 |
| 32 | 910.0-1368.0 | 915.0-1532.0 |
| 39 | 1590-2050.0 | 1660.0-2270.0 |
| 45 | 1830.0-2580.0 | 1950.0 -2790.0 |

The live weight of chickens in the experimental group is already 18 days higher than that in the control group. By the age of 45 days, the difference in live weight is most noticeable,

the maximum live weight values in the groups differ by more than 200 g. To calculate the reliability of differences in the 45-day-old groups, the Student's t-test was calculated (t=9.08), with P<0.01, which indicates statistically significant differences.

The bird safety during cultivation was 100%.



**A** **B** **C**

**Fig. 2.** Internal organs of broiler chickens, age 45 days. A. Complex of internal organs; B. Loop of the duodenum with the pancreas; C. Liver lobes.

During the veterinary and sanitary examination, it was noted that the carcasses and internal organs of the control and experimental groups do not have significant differences and significant morphological changes. Carcasses of both groups have elastic skeletal muscles of pale pink color, anatomically correct topography of organs, slight enlargement of the liver, pale pink kidneys of flabby consistency (Figure 2).

## 4 Conclusions

The conducted scientific and production experiment on the effect of feed additives on poultry meat productivity showed positive results on the weight indicators of broiler chickens of the Ross-308 cross, while in both the experimental and control groups, the veterinary and sanitary examination of carcasses and internal organs did not reveal significant morphological changes. The average live weight of broilers in the experimental group is significantly higher than in the control group, which indicates an acceleration of metabolic processes, an increase in meat productivity of chickens. The feed additive "Fayberton" has proven itself in scientific and production experiment as a safe, effective, cost-effective product that helps to increase the meat productivity of meat-producing chickens.

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