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PRODUCTIVITY OF MEAT QUAILS UNDER THE ACTION OF ENZYME PREPARATIONS

Abstract.
The research data on meat quails of the Pharaoh breed are presented in the paper. The enzyme alphalad application enhances anabolic processes causing an increase in average daily gain by 6.9% during the growing period from 7 to 14 days of age. The tendency to increase the average daily gain of the experimental group was observed throughout the growing period. The live weight of 56-day quails of the experimental group prevailed by 8.0% of females and 5.5% of males. Slaughter rates are characterized by an increase of 8.0% in the weight of the gutted carcass, including the greater weight of the pectoral muscles by 22.5%. The main researched hematological parameters were within the physiological norm.

Keywords*: quails, enzymes, feeding, growths, hematological parameters.*

Introduction. Enzymes have a different mechanism of action on the body of animals than hormones and biostimulants. They are not accumulated in the animal body and livestock products as a part of the final products. Animals and poultry produce their own enzymes in the digestive tract they are the hydrolysis of feed nutrients. Adult animals can digest up to 60-70% of feed nutrients, although the digestive glands produce sufficient amounts of pepsin, trypsin, amylase, lipase and other digestive enzymes. It is known that young animals are born with an underdeveloped digestive enzyme system [1].

The main concentrated poultry feeds are corn, barley, oats, rye, non-food wheat and products of their processing. Their potential is not fully used by the body due to the high fiber content, oats and barley contain it, respectively, 9-12 and 4-7%, if you peel the grain, the fiber content is reduced to 2.5-3.5 % in barley and up to 4-4.5% in oats, while the digestibility of the substances of these feeds, are although increasing [2].

The low digestibility of cereals is caused by significant amounts of other non-starch polysaccharides they contain, in particular beta-glucans and pentosans. They are contained in the cell walls of the grain endosperm and remain after oeeling. According to generalized data, the main anti-nutrients of wheat, rye and triticale are pentosans, most of which are arabinoxylans [3].

Materials and methods of research

The object of research was the growth, safety, metabolism and productivity of quails fed by the enzyme preparation.

Forty 7-day quails of the Pharaoh breed were selected for the experiment. Two groups were formed by the principle of analogues; each group included 20 heads. The duration of the experiment is up to 56 days. The group I was a control, the group II was experimental. Live weight and age of quails were taken into account selecting groups. The quails of group I have received a basic diet, balanced by feeding norms, and the quails of group II were additionally fed by an enzyme preparation. The living conditions corresponded to the scientific zoohygienic standards for this species. The feeding patterns are presented in Table 1.

According to the general scheme of researches, the influence of enzyme preparation on fattening and meat qualities of quails at the age from 7 to 56 days was researched.

Table 1

Feeding patterns

Group	Duration, days	Quails number, heads	Feeding characteristics
I - control	56	20	BD (complete feed)
II - experimental	56	20	BD + Alphalad (0.15 kg per 1 ton)

Taking into account research data, it should be noted the positive effect of the drug Alphalad on the fattening and meat qualities of quails (Table 2).

Table 2

Live weight of quails, g

Age, days		Group	
		I - control	II - experimental
7		38.7 ±0.40	38.9 ±0.51
14		83.2 ±1.20	86.5 ±1.43
21		138 ±2.80	144 ±2.89
28		179 ±4.7	190.4 ±4.1
35	females	259.6 ±3.6	275.4 ±2.8
	males	248.3 ±4.9	250.8 ±4.5
42	females	299.3 ±5.4	324 ±4.7
	males	268.3 ±4.3	273.9 ±4.0
49	females	326.5 ±5.1	337.6 ±2.9
	males	292.6 ±4.3	303.9 ±2.1
56	females	347.6 ±5.6	375.6 ±6.2
	males	299.5 ±3.1	316 ±4.2

The live weight of 7-day quails of both groups did not differ significantly, it proves the correct selection of poultry for the experiment.

The live weight of 14-day experimental quails was by 3.9% more than the live weight of the control group quails.

The live weight of 21-day experimental quails fed by enzyme preparation was by 4.3% more than the live weight of the control group quails.

The poultry live weight increase in of is observed throughout the growing period in the experimental group. The enzymes inclusion causes an increase in the transformation of feed nutrients in the product and an increase in poultry body weight by 5.5-8% compared to the control.

The indicators of absolute live weight gain have also changed (Table 3).

Table 3

Absolute live weight gain, g

Age, days		Group	
		I - control	II - experimental
7-14		44.5 ±1.34	47.6 ±1.42
15-21		54.8 ± 2.7	57.5 ±3.2
22-28		41 ±2.79	46.4 ±2.9
29-35		74 ±2.45	72.7 ±2.53
36-42	females	39.7 ±2.17	48.6 ±2.45
	males	20 ±1.78	23.1 ±2.14
43-49	females	27.2 ±2.4	28.9 ±2.5
	males	24 ±1.96	30 ±2.13
50-56	females	21.1 ±2.17	38 ±2.35
	males	6.9 ±2.39	12.1 ±2.56

The poultry additionally fed by enzyme had higher absolute gains by 6.9% during the rearing period from 7 to 14 days of age.

The rate of live weight increase can also be estimated from the average daily gains of the whole body during the growing period (Table 4). The tendency to increase the average daily gain of the experimental group was observed throughout the growing period.

Thus, considering quail growth, it can be noted that the poultry fed additionally by enzyme preparation to the compound feed, exceeded the analogues of the experimental group by live weight, absolute and average daily gain.

Table 4

Average daily live weight gain

Age, days		Group	
		I - control	II - experimental
7-14		6.35	6.8
15-21		7.8	8.2
22-28		5.8	6.6
29-35		10.6	10.4
36-42	females	5.7	6.9
	males	2.8	3.3
43-49	females	3.9	4.1
	males	3.4	4.3
50-56	females	3.0	5.4
	males	1.0	1.7

The research data on the indicators of slaughter of quails indicate a positive effect of the added enzyme preparation on their meat productivity (Table 5).

Table 5

Indicators of quail's slaughter, g

Indicator	Group	
	I - control	II - experimental
Pre-slaughter live weight	298.4 ±28.3	316.5 ±30.4
Ungutted carcass weight	280.5 ±25.1	303 ±26.1
Semi-gutted carcass weight	255 ±25.0	275.9 ±26
Gutted carcass weight	211.9 ±21.3	228.9 ±22.4
Weight of edible parts:		
pectoral muscles	48.7 ±7	59.7 ±7.5
pelvic limb muscles	29.7 ±6.3	36.5 ±6.2
skin	16.9 ±3.2	18.3 ±3.0
internal fat	12.7 ±1.2	17 ±1.4
gizzard	2.2 ±0.3	3.4 ±0.5
Weight of non-edible parts:		
head	12.7 ±0.8	12.9 ±0.3
limbs	5.1 ±0.2	5.5 ±0.5

The pre-slaughter weight of quails of the experimental group was by 6% higher than the live weight of the control group.

According to the pre-slaughter weight changes, the weight of un-gutted, semi-gutted and gutted carcasses have also changed.

The nutritional value of meat is determined by its chemical composition reflecting feeding poultry peculiarities. The chemical composition of the pectoral muscles of the experimental quails is given in Table 6.

Table 6

Chemical composition of the pectoral muscles, %

Indicator	Group	
	I - control	II - experimental
Water	71.8 ±0.17	71.3 ±0.31
Dry matter	28.2 ±0.17	28.7 ± 0.31
Ash	1.6 ±0.12	1.4 ±0.1
Organic matter	25.6 ±0.1	27.5 ±0.21
Protein	21.7 ±0.07	23.3 ±0.13
Fat	3.5 ± 0.2	3.7 ±0.18
NFE	0.4 ± 0.1	0.5 ±0.14

According to the table, the chemical composition of quail meat has not changed significantly. However, if we pay attention to the content of the main indicators characterizing the quality and nutritional value of meat, i.e. the content of dry matter, protein and fat, there is a tendency to dominate in the experimental group.

It should be noted that hematological parameters are a marker of productivity, metabolism and resistance of animals [4].

Blood test is one of the main stages of feeding monitoring. Morphological studies of the blood of quail meat as a relatively new object of industrial poultry will expand the understanding of the relationship between blood parameters and mechanisms of homeostasis regulation.

Table 7

Морфологічні показники крові перепелів

Indicator	Group	
	I - control	II - expetimental
Erythrocytes (T / l)	3.06 ±0.07	3.4 ±0.04
Leukocytes (G / l)	30.1 ±0.9	29.8 ±0.6
Platelets G / l	84.9 ±6.1	83.2 ±5.3
Hemoglobin (g / l)	113.1 ± 3.6	112.3 ±3.1
ESR (mm / hour)	1.6	1.5

The level of erythrocytes, hemoglobin and the rate of their clotting did not differ significantly between groups and had no significant changes.

Conclusions

1. Enzyme preparation alphalad application increases the growth rate of quails of the breed Pharaoh by 5.5% for females and 8.0% for males.

2. The slaughter indicators and edible parts weight increase under the action of the enzyme preparation. The meat quality has improved containing more protein.

3. The introduction of a new feed factor did not have a negative impact on hematological parameters.

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THE EFFECTIVENESS OF FEED WITH MANGANESE CHELATE COMPLEX APPLICATION FOR BROILER CHICKEN NUTRITION

Abstract.

According to the research results, the application of Multigain compound feed with chelate form of manganese at the rate of 0.2 kg per ton of compound feed, increases the live weight of broiler chickens by 7.9%. It was also found that the average daily gains increased by an average of 8.95% since the third week of rearing. The absolute increase also increased by 8.1%. The intensity of growth had a positive effect on slaughter rates. The weight of ungutted carcass increased by 7.6%, and gutted carcass by 3.8%.

Keywords: *broiler chickens, organic manganese, growth, live weight, slaughter rates.*

Nowadays, enzymes, probiotics, prebiotics, phytobiotics, and pollinators have become widespread among modern feed additives.

However, chelated micronutrients are attracting more and more attention in poultry farming. They are known as fundamentally new chemical compounds in which the inorganic component of the metal and the amino acid are combined. Such compounds are fundamentally different from chlorides and oxides considering their biological properties. Thus, chelates are stable in acidic and alkaline environment, have good solubility and easily digestible form.

The inorganic metal salts application was ineffective in many cases. Scientists claim that the best effect can be achieved by using complex compounds of metals with amino acids [1, 2].

Manganese is one of the most important microelements ensuring the normal functioning of the animal body. It takes an active part in redox processes and tissue respiration in animals, bone formation, affects the growth, reproduction of animals and hematopoiesis, regulates the function of endocrine organs, enhances the action of vitamins, is part of enzymes and is their activator [3, 5, 6, 7].

Manganese is obtained from food and partly from water [1-5]. However, the inorganic form of mineral compounds is relatively difficult to digest in animals, and increasing dose to achieve the optimal level of assimilation in the body causes toxicosis in animals. That's why, the search for the possibility of introducing biogenic metals into the diet of farm animals, including manganese in an easily digestible form, becomes of great practical importance [4].

The biological activity of a metal with amino acids increases hundreds of times [4]. However, the chelated forms of manganese application in animal feed requires comprehensive research.

It is known that the main functions of manganese in animals are multifaceted. The main ones are related to redox reactions, effects on growth, hematopoiesis, and endocrine function. It is also known that it normalizes nitrogen and calcium-phosphorus metabolism [1].

According to scientists, birds need more manganese than mammals. The higher level of metabolism is caused by manganese participation in the oxidative phosphorylation processes [2].

Thus, the aim of the research was to establish the organic manganese effect on productivity and basic hematological parameters.