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Enzyme Preparations And Qualitative Indicators Of Eggs.

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ABSTRACT

The effectiveness of the use of feed and biologically active drugs in animal and poultry feeding is determined not only by quantitative productive indicators, but also by the quality of the livestock products produced. The paper shows the results of scientific and business experience on laying hens on the impact on the quality indicators of eggs when using Sanzaym and Sunfice 5000 enzyme preparations in their feeding. The studies were carried out in the SUE of the Chechen Republic poultry farm since the start of laying eggs in 18 weeks of age for 47 weeks and completed at 65 weeks of age. The scientific and business experience was divided into two phases: the first 27 weeks and the final 20 weeks of cultivation. The ration used for fattening met the required nutritional values for all periods of broiler chickens. The studies were conducted on 4 groups of chickens, brown hawk breed, formed according to the principle of analogues, 100 animals each: one control and three experimental ones. Chickens from the control group received a diet balanced for all nutrients. A population of 1 and 2 experimental groups ration supplemented, respectively, with enzyme preparation Sunzaym (100 g / t) and Sanfayz 5000 (80 g / t). Bird of the 3- d experimental group received both enzyme preparations at the same time, in the same doses. In the course of the conducted research, the positive effect of the claimed enzyme preparations on the morphological indices of eggs, their chemical composition and incubation qualities was established. Due to the better use of nutrients in the ration by the population of the experimental groups, as a result of the use of the enzyme preparations tested, both individually and together, the dry matter content in eggs increased from 11.8 to 12.8%, due to theprotein increase in1,3 %. This made it possible to increase the hatchability of chickens from 80.6 to 83.0% and to increase the average weight of chickens from hatching from 39.7 to 40.9 g.

Keywords: enzyme preparations, Sanzaym, Sunfise 5000, laying hens, morphological indicators of eggs, chemical composition of eggs, incubation qualities.

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INTRODUCTION

In recent years, domestic scientists and practitioners have been actively conducting research on more intensive use of local cereals (maize, barley, wheat, rye) with a high content of cellulose, hemicellulose, lignin, pentosans and beta-glucans, thanks to the use of various enzyme preparations. The inclusion of complex enzyme preparations in the ration consisting of a significant amount of grain components with a high content of non-starch polysaccharides helps to improve digestibility and increase the absorption of nutrients of feed mixtures.

In order to intensify the production of poultry products, it is necessary to search for ways and methods that increase digestibility and nutrient utilization by the poultry organism, which reduce the negative factors of local feed. Domestic and foreign biotechnology industry produces enzyme preparations and multienzyme compositions (**IEC**), the use of which in poultry feeding at the optimal dose of their introduction, increases digestibility and nutrient utilization of the diet, feed conversion into products, improves metabolism in the body, increases bird productivity.

MATERIAL AND RESEARCH METHODS

In the scientific and business experience conducted by the SUE of the Urus-Martanovskaya poultry farm of the Chechen Republic, qualitative indicators of laying hens eggs fed with a ration based on locally grown cereals (corn, wheat and barley, with the addition of sunflower meal), enzyme preparations Sanzaym (100 g / t) and Sanfayz 5000 (80 g / t), both individually and together.

The experiment lasted from 18 to 65 weeks ageof laying hens and was divided into two phases of egg-laying: the first from 18 to 45 weeks of age, characterized by high egg production; the second from 46 to 65 weeks of age, characterized by a gradual decrease in egg production.

4 groups of laying hens participated in the scientific and business experience: one control and three experienced ones. The bird of the control group received a general ration consisting of mixed feed, which was based on locally produced cereals: corn, wheat and barley, with the addition of sunflower meal.

In the dietof the population of 1 and 2 experimental groups were included the most optimal declared doses of enzyme preparations Sunzime and Sanfise 5000 separately, and in bird 3 of the experimental group - both enzyme preparations together, in the same doses.

Compound feeds were prepared in the feed mill of the State Unitary Enterprise of the Urus - Martanovskaya poultry farm of the Chechen Republic.

In the course of scientific and business experience according to the method of Yu.N.Vladimirirova and A.D. Sergeeva (1971) determined the quality of eggs from the results of studying their morphological and physicochemical properties.

The incubation quality of eggs was studied by the method of P.P. Tsarenko (1988) with the preliminary establishment of their fertilization as a result of ovoscoping.

RESULTS AND THEIR DISCUSSION

The quality of eggs is determined by their morphological indicators, which are subject to more significant variability under the influence of external factors, including fodder, as well as physico-chemical indicators, which are less susceptible to variability, but some influence on them is also possible. In addition, it should be considered that it is the physicochemical qualities of the eggs that directly affect the hatchability rate during incubation.

Figure 1 shows the primary basic morphological parameters, determined in the study of egg quality. It was found that the use of the enzyme preparation Sunzime in feeding of laying hens, as well as its use with the enzyme preparation Sanfise 5000, contributes to a significant increase in the average egg weight. In the first case, the increase was 1.5 g (-P≥0.95), and in the second - 1.9 g (-P≥0.99), compared with the control group.

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Studies have shown that this increase is directly related mainly to the greater mass of protein, both in absolute and relative indicators. It was found that the mass of protein in the egg increased from 38.3 g in the control group to 39.6 g in 1 experimental (-P≥0.95) and to 39.9 g in 3 experimental (-P≥0.99) groups.

It was also determined that when Sunzaym and Sunfine5000 are used together, a significant increase in the proportion of protein triggers a decrease in the proportion of yolk in the egg. In particular, the relative protein content in the egg significantly (-P≥0.99) increased by 0.65%, and the relative content of yolk, on the contrary, decreased by 0.52% (-P≥0.95), although in absolute indicatorsthe content the yolk in the egg in 3 experimental group increased by 0.2 g compared with the control.

In general, it should be recognized that, apart from these indicators, there were no other significant differences in the morphological indicators of the eggs of the control and experimental groups, although there were still positive trends towards improved indicators in the experimental groups. For example, as a result of the joint use of enzyme preparations, the ratio of the mass of protein to the mass of yolk increased from 2.24 to 2.31 units, the thickness of the shell increased by 6.7 microns, the form index increased from 76.4 to 77.4%, elastic deformation increased from 17.4 to 18.0 microns**,** the indicator of the unit Howe - from 85.7 to 87.3.

Further, the chemical composition of the constituent parts of eggs obtained from laying hens of all experimental groups was determined (Table 1).

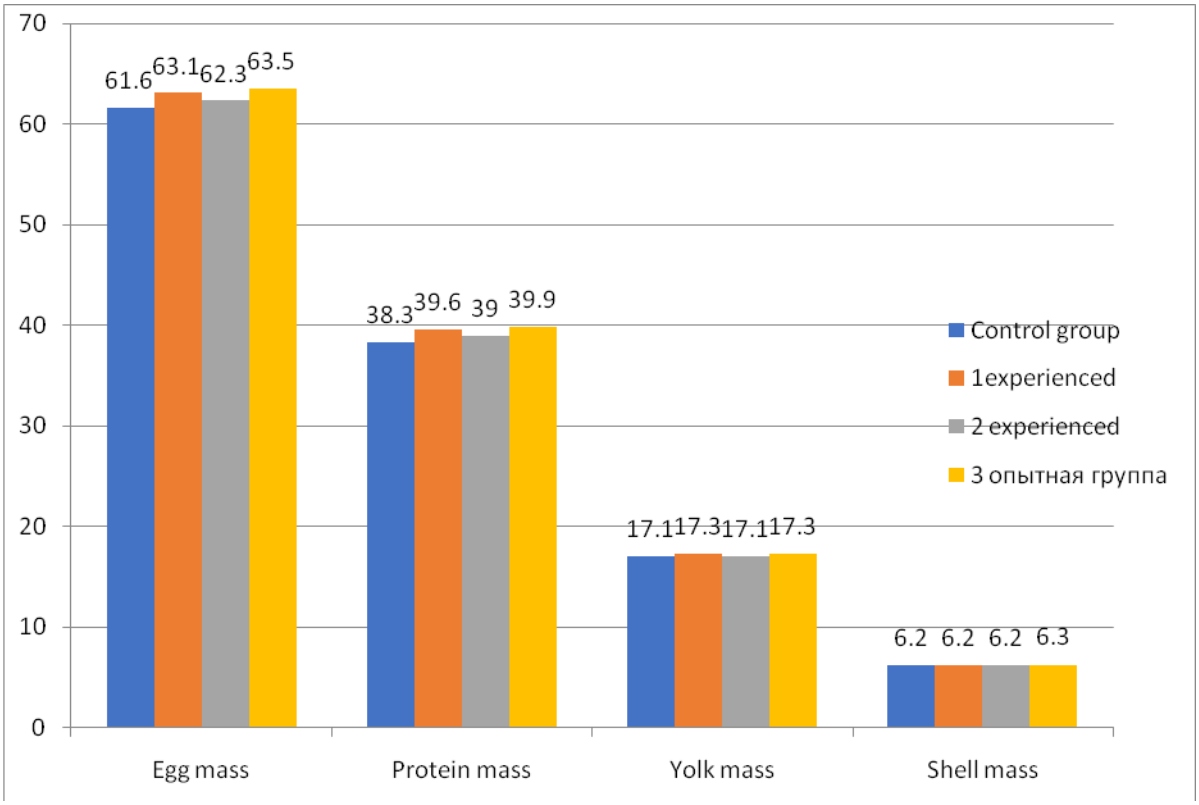

Figure 1: Morphological parameters of eggs

Table 1: The chemical composition of eggs of laying hens in the average group,% p = 5

Indicators	Group			
	control	1 experienced	2experienced	3experienced
Protein				
Drymatter	11,8±0,19	12,6±0,17*	12,1±0,21	12,8±0,18*

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Crudeprotein	10,1±0,21	11,2±0,18*	10,2±0,18	11,4±0,14**
Rawash	0,64±0,02	0,71±0,03	0,67±0,02	0,72±0,03
Yolk				
Drymatter	50,9±0,62	52,0±0,73	51,4±0,61	52,3±0,63
Crudeprotein	16,6±0,34	17,4±0,38	16,7±0,30	17,6±0,28
Crudefat	31,6±0,27	31,9±0,33	32,0±0,39	32,0±0,39
Rawash	1,9±0,04	1,7±0,04	1,8±0,04	1,7±0,05
Carotenoids, mcg%	15,0±0,24	16,4±0,28*	15,6±0,32	16,6±0,31*
Vitamin A, mcg%	5,7±0,15	6,6±0,18*	6,1±0,11	6,9±0,18*
Vitamin B3, mcg / g	4,1±0,14	4,8±0,18*	4,6±0,17	4,9±0,16*
Shell				
Rawash	92,8±0,82	93,0±0,74	92,9±0,81	93,1±0,64
Calcium	26,4±0,31	27,0±0,28	26,8±0,35	27,1±0,24
Phosphorus	0,08±0,004	0,08±0,003	0,08±0,003	0,08±0,003

Note:*-P≥0,95; **-P≥0,99

When studying the chemical composition of the protein, it was found that eggs of laying hens of the 1 and 3 experimental groups contained significantly more dry matter than eggs of the control group of hens. This superiority was achieved due to a significant increase in the protein content of crude protein by 1.1-1.3%. Due to this, the dry matter content in eggs of hens from the experimental groups increased by 0.3, 0.8 and 1.0%, as compared with the control.

The chemical composition of the main components of the yolk no significant differences between the groups were found. Although there was a slight increase in the amount of dry matter in the yolk, and protein and fatin it, and at the same time, some decrease in of raw ash content.

In the composition of the yolk, we also determined the content of carotenoidsand vitamins A and B3, since such as they play a significant role in the metabolism of the developing embryo, ensuring the success of incubation. It was established that a significant increase of these indicators, compared with the control, occurred in 1 and 3 experimental groups. For example, the content of carotenoids increased from 15.0 to 16.6 µg /%, and vitamin A from 5.7 to 6.9 µg /%, and vitamin B3 from 4.1 to 4.9 µg / g.

The chemical composition of the shell was studiedfurther. In particular, although some differences between the groups were observed, an increase in the content of raw ash and calcium in its composition was observed, statistically they were unreliable.

Of course,morphological and physico-chemical indicators are important indicators of the quality of the eggs produced, but the final conclusion about the quality indicators can only be made from the results of the incubation and the determination of their incubation qualities.

According to the approved research methodology, in the 8-month-old laying hens, the incubation qualities of eggs were determined, for which a two-day egg collection was selected in each experimental group, which amounted to 189-194 pieces.

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In order to conduct a more objective assessment of eggsquality, all the collected quantity was sorted for suitability for incubation.

It is known that the final result of incubation depends on the degree of manifestation of various egg shell defects. All small eggs (unsuitable for incubation by weight (less than 52g.)), as well as very large ones, 2 yolk eggs with notches, rough shells that are inappropriate in shape (round or too elongated), polluted, etc. were selected. Of the 189 eggs harvested, there were 19 of these in the control group, in the 1 experimental group of 192-17, in 2 theexperimental group of 190-18, and in the3 experimental group-of 194-17.

Thus, 170, 175, 172 and 177 eggs were recognized suitable for incubation, respectively, which were laid for incubation, the results of which are presented in Table 2.

Table 2: The incubation quality of eggs

Indicator		Groups			
		Control	1experienced	2experienced	3 experienced
Eggs collected in 2 days, pieces		189	192	190	194
of them are not suitable for incubation, pcs		19	17	18	17
Laid on the incubation of eggs, pcs.		170	175	172	177
Ofthem fertilized:	pcs	161	168	164	170
	%	94,7	96,0	95,3	96,0
Chickens, heads		137	144	140	147
in% ofmortgaged		80,6	82,3	81,4	83,0
in% offertilized		85,1	85,7	85,4	86,5
Live weight of chickens during hatching, g		39,7	40,6	40,2	40,9

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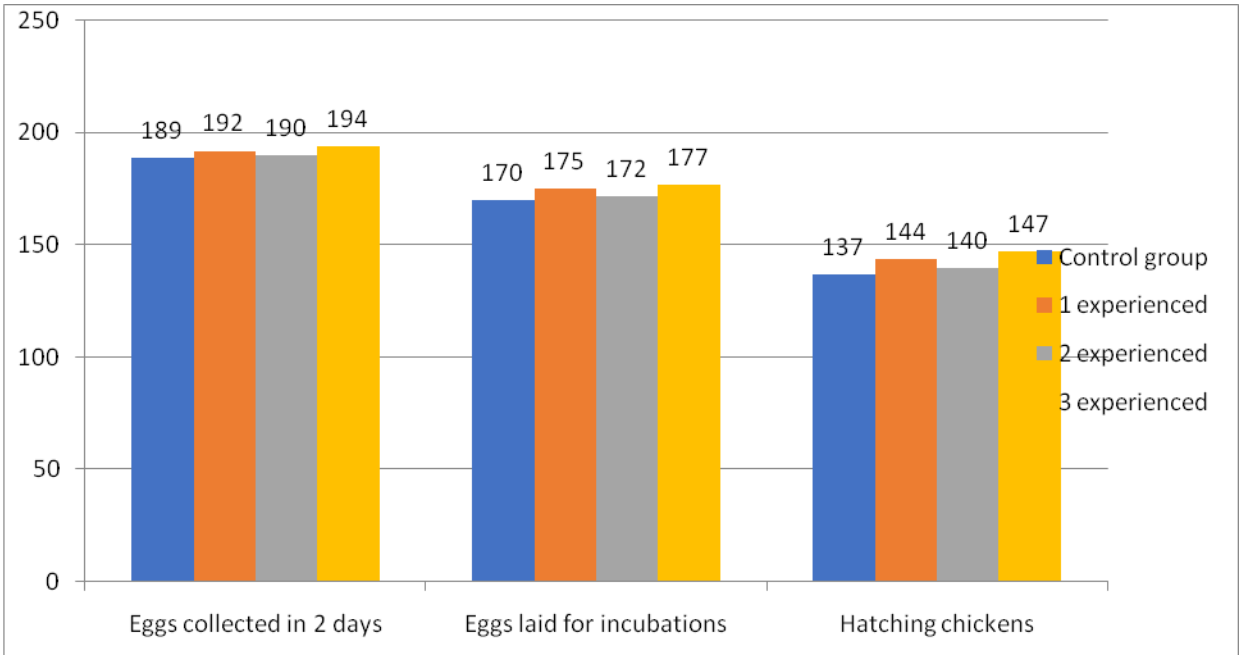

Figure 2: Hatching quality of eggs

It was revealed that in the control group of 170 eggs laid for incubation, 161 pieces, or 94.7% were fertilized. If consider,that in this group only 137 chickens were bred, the hatchability from the pledged was 80.6%, and from the fertilized 85.1%.

The indicators obtained in the 2nd experimental group (the use of the enzyme preparation Sanfayz 5000) was slightly better: the proportion of fertilized eggs from the pledged for incubation was 95.3%, the hatchability of the chickens from the pledged 81.4%, from fertilized 85.4%.

The use of the enzyme preparation Sunzime had a more significant effect. Of the 175 eggs laid for incubation, 168, or 96.0%, were fertilized. A total of 144 chickens were bred in this group, which accounted for 82.3% of the pledged and 85.7% of the fertilized.

However, the best incubation qualities are observed in eggs obtained from laying hens that received both enzyme preparations with the ration at the same time. Of the 177 eggs laid for incubation, 147 conditioned chickens were bred, which accounted for 83.0% of the laid and 86.5% of the fertilized, respectively, by 2.4 and 1.4% more than in the control group.

In the course of our experience, it was found that the eggs of laying hens of the experimental groups had a higher mass due to the inclusion of enzyme preparations in their diets. The results of incubation showed that a higher average weight of eggs led to a higher weight of chickens during hatching, and this is a good guarantee for their further growth and development.

CONCLUSION

In general we can conclude that, based on the study of the morphological and biochemical composition of eggs, thanks to the use of enzyme preparations Sunzime and Sanfise 5000 in the rations of laying hens, the quality indicators of eggs have been improved. The results indicate that the sharing use of the claimed enzyme preparations in their optimal doses (100 and 80 g / t) turned out to be the most effective. Ultimately, this circumstance was manifested in the improvement of the incubation qualities of the eggs, which was reflected in an increase in the fertility of the eggs and hatchability of the young.

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