

Efficiency of Growing Pigs with Introduction of the Feed Additive "Elevit" into their Ration

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Abstract—The aim of this study was to study the reserves of increasing the productivity of pigs by introducing the feed additive "Elevit" into their ration during the growing period from 1 to 3 months. The studies were conducted on the Collective Farm named after Gorin of the Belgorod district of the Belgorod region to examine the effect of the feed additive "Elevit" on their growth during the growing period from 1 to 3 months. Five groups of piglets at the age of one month, 20 animals each, were selected for the experiment based on analogues. As a result of the research, it was found that the introduction of the feed additive "Elevit" into the ration of piglets in the amount of 5; 10; 15; 20 grams in replacement of compound feed (SPK-4) during the growing period from 1 to 3 months contributes to increasing the growth of piglets, respectively, by 10.6; 15.3; 16.0; 15.6 % compared with the control group. It should be noted that the best results in animal productivity and economic efficiency were obtained by feeding piglets with the feed additive "Elevit" in the amount of 10 grams per 1 animal unit per day for 60 days from 1 to 3 months.

Keywords—piglets, growth, daily average gain, gross gain, feed additive "Elevit", ration, prime cost of 1 metric centner of live weight gain

I. INTRODUCTION

Currently, the main condition for increasing the production of livestock products is the realization of the genetic potential of animal productivity, the immanent characteristics of which should be not only an increase in average daily growths, but also an increase in the general resistance of the organism, given the high level of feed conversion and the product quality [1-13].

However, under the conditions of industrial technology, a significant part of animals, including pigs, does not fully show their potential capabilities. This is due to the fact that in industrial complexes animals experience hypodynamia, the lack of fresh air, insolation and full-fledged balanced diets. In the authors' opinion, the use of certain biologically active feed additives with an immunostimulating effect may become one of the promising directions for increasing pig productivity under the conditions of industrial technology.

It is known that the main components of Russian compound feeds for pigs are grain fodder (barley, wheat, corn, oats), grain legumes (peas, soy, vetch, chickpeas), and other feed products (bran, cake, meal, yeast, fish and meat and bone meal). Compared to other feeds in the production of feed for pigs, the most commonly used grain component is barley, not wheat; grain legumes are much more used. The use of high-quality compound feed leads to an increase in live weight gain and improves meat productivity. The use of compound feeds balanced by protein and amino acids, allows to reduce costs per 1 kg of live weight gain [13-24]. Compound feed recipes also need to be balanced in accordance with a number of vitamins and minerals, thus the feed base of a modern pig-breeding enterprise necessarily includes various balancing feed additives and vitamin preparations, which enable to provide full-fledged animal feeding [2, 3, 5-9].

The increase in productivity and the intensification of the cultivation and feeding of young pigs impose strict requirements on optimizing feeding rations, therefore, for every breeder, not only the unconditional quality of the feed additive is important, but also its cost. The second-generation organic feed additive "Elevit" based on wheat germ flour has the above-mentioned advantages – unconditional quality and low price.

Proteins of wheat germ flour "Elevit" in chemical composition and energy value are similar to proteins obtained from the processing of animal products – milk or chicken eggs. They have almost the same properties, the only difference is the lack of a shell [24, 25].

When manufacturing "Elevit", a special technology is applied, as a result of which, due to high pressure, the wheat germ is deformed and the protective coating is destroyed. Thus, when ingested, the absorption of nutrients immediately begins. The process is much faster than with ordinary proteins, since it does not take time for the decay of the protective shell. In addition, wheat germ in its composition contains at least 12 essential vitamins, more than 18 amino acids, about 21 micro and macro elements, as well as a spectrum of vitamins of the group B. It is by 2-5 times more

in comparison with the mature grain. They contain polyunsaturated fatty acids of the omega-6 and omega-3 classes, which have an antioxidant effect, as well as the most important source of coenzyme Q10.

It should also be noted that this product surpasses similar cereals by its calcium content by more than 2-3 times, and by potassium content – by 3-6 times.

II. MATERIAL AND RESEARCH METHODS

The purpose of the research is to study the reserves for increasing the productivity of pigs by introducing the feed additive "Elevit" into their ration during the growing period from 1 to 3 months.

To achieve this goal, the following tasks were set:

1. To study the effect of feeding piglets with the feed additive "Elevit" during the growing period on their growth and preservation from 1 to 3 months.

2. Determine the optimal dose of feeding piglets with the feed additive "Elevit" during their growing period from 1 to 3 months.

The experiments were conducted in the agricultural production cooperative "Collective Farm named after Gorin" of the Belgorod district of the Belgorod region. In the experiments, the authors used crossbred piglets (large white x landrace x duroc).

For the experiment, 5 groups of piglets at the age of one month of 20 animals each were selected based on analogues. The first control group of piglets received a diet according to the approved scheme for feeding animals at this enterprise.

Piglets of the second, third, fourth, fifth groups were fed with the feed additive "Elevit" in an amount of 5, 10, 15, 20 grams instead of the compound feed (SPK-4) during the period of their growth from 1 to 3 months. The following was studied during experiments: the growth and preservation of piglets from 1 to 3 months, the average daily growth of piglets, the cost of feed and the economic efficiency of feeding piglets with the feed additive "Elevit" during the growing period from 1 to 3 months. The resulting digital

material was processed by conventional variational analysis methods.

III. RESULTS AND DISCUSSION

The effect of feeding piglets with the feed additive "Elevit" during the growing period from 1 to 3 months on their growth and preservation. The growth of piglets is presented in Table I.

The data in Table 1 show that feeding piglets with the feed additive "Elevit" in the amount of 5, 10, 15, 20 grams instead of the compound feed during the growing period from 1 to 3 months contributes to an increase in the growth of piglets, respectively, by 10.6, 15.3, 16.0, 15.6 % compared with the control group. According to the average daily gain in live weight, the piglets of the experimental groups (2-5 groups) exceeded their peers from the control group, respectively, by 14.5, 20.6, 21.1, 20.6 %.

Based on the studies, the authors calculated the effectiveness of feeding piglets with the feed additive "Elevit" during their growing period from 1 to 3 months. The results of these calculations are presented in Table I.

The data in Table II show that the introduction of the feed additive "Elevit" into the diet of piglets in the amount of 5, 10, 15, 20 grams per 1 animal unit per day instead of the compound feed during the period of their growth from 1 to 3 months, helps to increase the gross live weight gain of piglets from 1 to 3 months, respectively, by 14.5, 20.7, 21.1, 20.7 %, which allowed to reduce the cost of 1 metric centner of live weight gain of piglets, respectively, by 630.94, 796.99, 718.55, 603.01 rubles or by 10.9, 13.7, 12.4, 10.4 % compared with the first control group.

Thus, the results of the studies have shown that all options for feeding piglets with the feed additive "Elevit" during their growing period from 1 to 3 months gave a positive result. However, it should be noted that the greatest efficiency in the production of pork in these studies was achieved by feeding piglets with the feed additive "Elevit" in the amount of 10 grams per 1 animal unit per day instead of the compound feed for 60 days from 1 to 3 months.

TABLE I. THE EFFECT OF FEEDING PIGLETS WITH THE FEED ADDITIVE "ELEVIT" DURING THE GROWING PERIOD FROM 1 TO 3 MONTHS ON THEIR GROWTH

Groups of experiment	Feeding conditions of piglets from 1 to 3 months	Num-ber of pig-lets in the group	Live weight of piglets, kg		The average daily growth of piglets in the period from 1 to 3 months, g
			when starting the experi-ment at 1 month	when finishing the experi-ment at 3 months	
1	Main ration	20	7.3±0.1	30.0±0.5	378
2	In the main ration, 5 g of feed were replaced by the feed additive "Elevit"	20	7.2±0.2	33.2±0.4	433
3	In the main ration, 10 g of feed were replaced by the feed additive "Elevit"	20	7.2±0.2	34.6±0.3	456
4	In the main ration, 15 g of feed were replaced by the feed additive "Elevit"	20	7.3±0.1	34.8±0.5	458
5	In the main ration, 20 g of feed were replaced by the feed additive "Elevit"	20	7.3±0.2	34.7±0.6	456

TABLE II. THE EFFECTIVENESS OF FEEDING PIGLETS WITH THE FEED ADDITIVE "ELEVIT" DURING THEIR GROWING PERIOD FROM 1 TO 3 MONTHS

Groups of experiment	Feeding conditions of piglets from 1 to 3 months	Number of piglets in the group	Costs of growing piglets from 1 to 3 months, rubles.			Gross live weight gain of piglets from 1 to 3 months, metric centner	The cost of 1 kg gain in live weight of piglets from 1 to 3 months, rub.
			Costs of feed	Costs of feed ad-ditive "Elevit"	Total costs		
1	Main ration	20	18360.0	0	26228.0	4.54	5777.0
2	In the main ration, 5 g of feed were replaced by the feed additive "Elevit"	20	18252.0	480.0	26760.0	5.20	5146.1
3	In the main ration, 10 g of feed were replaced by the feed additive "Elevit"	20	18144.0	960.0	27291.0	5.48	4980.1
4	In the main ration, 15 g of feed were replaced by the feed additive "Elevit"	20	18036.0	1440.0	27822.0	5.50	5058.5
5	In the main ration, 20 g of feed were replaced by the feed additive "Elevit"	20	17928.0	1920.0	28354.0	5.48	5174.0

It should also be noted that when introducing the feed additive "Elevit" into the diet of piglets in the amount of 10; 15; 20 grams, almost the same results on the gross live weight gain were obtained, but due to the increase in the amount of the feed additives "Elevit" in the fourth and fifth experimental groups, the cost of diets increased, which eventually reduced the efficiency of pork production in these groups compared with the third experimental group.

IV. CONCLUSIONS

Based on the research and analysis of the obtained data, the following conclusions can be made:

1. Feeding piglets with the feed additive "Elevit" during the growing period contributed to an increase in their productivity and economic efficiency of pork production.

2. When feeding experimental piglets with the feed additive "Elevit" from 1 to 3 months in an amount of 5, 10, 15, 20 grams instead of the compound feed, the following was found:

- an increase in the absolute live weight gain of piglets, respectively, by 10.6, 15.3, 16.0, 15.6%;
- increase in average daily growth of piglets, respectively, by 14.5, 20.6, 21.1, 20.6 %;
- increase in gross growth of piglets, respectively, by 14.5, 20.7, 21.1, 20.7 %;
- cost reduction of 1 metric centner of live weight gain, respectively, by 10.9, 13.7, 12.4, 10.4 %.

3. The greatest zootechnical and economic effect was obtained by feeding piglets with the feed additive "Elevit" from 1 to 3 months in the amount of 10 grams per 1 animal unit per day.

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