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Research Article

Zootechnical and Economic Efficiency of Feed Additive "Hydrolactive" in the Diets of Pigs

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ABSTRACT.

It was found that feeding piglets with feed additive "HydroLaktive" for 30 days from 1 to 2 months in the amount of 1.0; 1.5; 2.0% in addition to the main diet allows increasing the live weight of piglets: in two months, respectively, 2.4; 7.2; 8.4%, in three months – 2.3; 5.9; 7.2%, and in six months – 3.4; 4.4; 4.6% compared with the control group.Feeding piglets with feed additive "HydroLactive" in the cultivation period from 1 to 3 months in the amount of 1.0; 1.5; 2.0% in addition to the daily diet contributes to an increase of live weight of pigs: in two months, respectively 4.1; 5.3; 5.9%, in three months – 6.3; 11.2; 11.6%, and in six months – 5.4; 6.8; 7.0% compared to the control group. The use of feed additive "HydroLactive" in the diets of pigs when grown from 1 to 3 months contributes not only to increase their growth, but also to reduce feed costs per 1 kilogram of live weight gain in comparison with the control group, respectively, by 3.2; 4.2; 4.2%.

On the basis of the conducted studies it was found that the highest efficiency of pork production was achieved by feeding piglets with feed additive "HydroLactive" in an amount of 1.5% in addition to the daily diet for 60 days.

Keywords: pigs, diet, live weight, growth, feed additive "HydroLactive", feed costs, pigs growing.

INTRODUCTION:

Modern pig farming is based mainly on pig breeding, and animal diets are based on the use of balanced full-fledged feed [1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11].

It is well known that the imbalance of feeding rations reduces the profitability of animal husbandry and is the main reason for its loss, because farms in practice can not afford to create full-fledged rations for a number of objective reasons. The analysis of the components of diets is complex (indicators for rationing more than 30) and difficult, especially in the field, in the farm. Often, specialists make rations on the principle of what is, also based on limited financial resources.The science of ani-

mal feeding is more than a hundred years and today in the arsenal of specialists, it would seem, there is a wide range of tools and methods to improve the efficiency of feeding. The classical principle of the preparation of balanced rations is to complement the missing elements at the expense of premixes, vitamin-mineral complexes and other feed additives, which are based on artificially-synthesized vitamins, inorganic salts, chemical elements, etc. However, to create them without the green mass of fodder crops is almost impossible. However, the proposed synthetic compounds created by man based on the possibilities of chemistry will always remain only a similarity of what is created by nature itself.Introducing into the body of the animal synthetic drugs, we roughly interfere in its natural structure, sometimes irreversibly changing the vital functions of the digestive, respiratory, hematopoietic, excretion. Low results of the use of such additives are only an extra confirmation of their poor digestibility by the body of the animal [1,5, 12, 13, 14, 15, 16, 18].

In practice, the ideal solution to the most important problem of creating complete diets would be to supplement constantly them with a complex of natural organic compounds in an easily digestible form. Complex, the composition of which is represented by all necessary for the animal body groups of biologically active substances. Complex, the addition of which in the feed would guarantee to specialists the solution of the maximum range of zootechnical and veterinary problems in farms and obtaining, ultimately, the maximum possible results in animal husbandry [20, 21, 22, 23, 24, 25].

Such complexes of biologically active substances may be obtained only on the basis of natural animal or plant material, that is, the growing or cultivation of organisms or plants [3, 17, 19, 20].

According to R.M. Lind (1997, 1999, 2004) one of the directions of increasing the value of feeding rations of farm animals can be the use of products of microbiological processing of milk serums. Russian scientists in our country (R. M. Lind et al., 2004) developed a new technology of production and use of milk serums, hydrolyzed and enriched with lactates (SHEL). According to V.G. Samokhin, SHEL has a wide range of actions. It can be effectively used as a complete feed additive, especially for young growing animals and uterine herd [8, 12, 26, 22, 27, 28].

Currently, feed additive SHEL got a new name “HydroLactive”. This product is 100% natural and environmentally friendly. In connection with the above, the problem of the use of the drug “HydroLactive” in the diets of farm animals is relevant and has a scientific and practical value [3, 8, 9, 13].

The purpose and objectives of the study.

The purpose of our research is to study the reserves of increasing the productivity of pigs by optimizing the use of feed additives “HydroLactive” in their diets during the growing period.

To achieve this goal, the following tasks were set:

1. To study the effect of feeding pigs with feed additive “HydroLactive” during breeding on their growth and development.
2. To determine the optimal dose of feeding pigs with feed additive “HydroLactive” at their growing from 1 to 3 months.

Material and methods of research.

Experiments were carried out in the collective farm named after Gorin, Belgorod district, Belgorod region. Cross-bred pigs (large white ×Landras×Duroc) were used in the experiments. At all stages of research pigs were kept in groups in a typical room with sufficient lighting and ventilation. All experimental animals were fed according to the norms of the UIAH with full-fledged mixed fodders.

The experiments studied: the dynamics of growth of experimental pigs from 1 month to 6 months, the average daily and relative growth, meat quality of pigs (the ratio of tissue in carcasses after slaughter: meat, fat, bone), the thickness of fat on 6-7 thoracic vertebrae, the development of internal organs (heart weight, lung weight, liver weight, kidney weight), feed costs per 1 kilogram of live weight gain and the economic efficiency of feeding piglets with feed additive “HydroLactive” during their cultivation.

Economic efficiency of feed additive “HydroLactive” was determined on the basis of the results obtained in the experiments and the cost of feeding and maintenance of pigs during the growing period, as well as the cost of acquiring the fodder additive “HydroLactive”.

The resulting digital material was processed by conventional methods of variational analysis in the description of N.A. Plokhinsky (1978).

Research results.Effect of feeding pigs with feed additive "HydroLactive" on their growth, development and meat quality.

The results of our research in the first and second experiments showed that all options for feeding pigs with feed additive "HydroLactive" in the period of cultivation from 1 to 4 months were found to be positive. However, the greatest efficiency of pork production in these studies was achieved by feeding piglets with this supplement in the amount of 15 grams in addition to the daily diet.

To determine the optimal dose and period of feeding pigs with feed additive "HydroLactive" in the period of cultivation, we had two additional experiences.

In the third experience the four groups of piglets at the age of 1 month, 20 animals per group were selected for the research on the principle of analogues.

Piglets of the first control group were fed with feed in the period from 1 to 2 months used in the farm, according to the norms of the UIAH. Piglets from second, third, fourth groups in addition to the basic ration was further fed with feed additive "HydroLactive" in the amount of 1.0; 1.5; 2.0%.

Further, from 2 to 6 months pigs of all experimental groups were fed the same, according to the norms of UIAH. The results of these studies are presented in tables 1-2.

Table 1 - The growth of piglets depending on the feeding with feed additive "HydroLactive"

Groups	Feeding conditions for piglets from 1 to 2 months	Grownpigs, heads	Live weight of piglets, kg			
			in the beginning of experiment	in 2 months	in 3 months	in 6 months
1	Basicdiet(BD)	20	7,1 ±0,2	16,6±0,3	30,3±0,4	102,0±1,2
2	BD+1.0% of feed additive"HydroLactive"	20	7,0±0,2	17,0±0,4	31,0±0,5	105,5±1,5
3	BD+1.5% of feed additive "HydroLactive"	20	7,1±0,1	17,8±0,3*	32,1±0,4**	106,5±1,3*
4	BD+2.0% of feed additive "HydroLactive"	20	7,2±0,2	18,0±0,4*	32,5±0,6**	106,7±1,5*

The data of table 1 show that feeding piglets with feed additive "HydroLactive" for 30 days from 1 to 2 months in the amount of 1.0; 1.5; 2.0% in addition to the main diet can increase the live weight of piglets: in two months, respectively, by 2.4; 7.2; 8.4%, in three months - by 2.3; 5.9; 7.2%, and in six months - by 3.4; 4.4; 4.6% compared with the control group.

In this experiment, in addition to growth of piglets depending on the feeding with feed additive "HydroLactive" meat quality and development of internal organs were studied. It was found that the experimental animals of all groups did not differ significantly in the output of muscle, fat and bone tissue, as well as in the thickness of the spieg over 6-7 thoracic vertebrae.

Indicators of development of internal organs in experimental animals are presented in table 2.

Table 2 - Development of internal organs in piglets depending on the feeding with feed additive "HydroLactive"

Groups	Feeding conditions for piglets from 1 to 2 months	Pigs in a group, heads	Weight, g			
			heart	lungs	liver	kidneys
1 (control)	Basicdiet (BD)	6	260,0 ±8,0	665,0 ±6,0	1580,0 ±9,0	202,0 ±7,0
2	BD+1.0% of feed additive "HydroLactive"	6	282,0 ±6,0*	692,0 ±8,0*	1660,0 ±11,0***	210,0 ±6,0
3	BD+1.5% of feed additive "HydroLactive"	6	284,0 ±8,0*	695,0 ±5,0***	1680,0 ±8,0***	210,0 ±8,0
4	BD+2.0% of feed additive "HydroLactive"	6	286,0 ±12,0	698,0 ±10,0**	1685,0 ±12,0***	212,0 ±6,2

Note: *P>0,95; **P>0,99; **P>0,999

The data of table 2 show that piglets of experimental groups (2-4 groups) in 6 months exceeded their peers from the first control group by heart weight, respectively, by 8.4; 9.2; 10.0%, by lung weight - by 4.0; 4.5;

4.9%, by liver weight - by 5.0; 6.3; 6.6%, by kidney weight - by 3.9; 3.9; 4.9%.

It was also found that under this option, feeding with feed additive “HydroLactive” increases not only the growth of pigs, but also reduces the cost of feed per kilogram of live weight gain in comparison with the control group, respectively, by 2.9; 3.2; 3.5%.

On the basis of the conducted researches we made the calculation of economic efficiency of feeding pigs with feed additive “HydroLactive” in the period of cultivation from 1 to 2 months. The results of these calculations indicate an increase in gross weight gain of piglets from 1 to 6 months, respectively, by 3.7; 4.7; 4.8%, which reduced the cost of 1 centner of live weight gain of piglets, respectively, by 247.40; 300.35; 295.41 rubles or 3.2; 4.0; 3.9% compared with the first control group.

In the fourth experiment, the feed additive was fed to pigs during their cultivation from 1 to 3 months in an amount of 1.0; 1.5; 2.0% in addition to the daily diet.

The growth of piglets depending on the feeding with feed additive “HydroLactive”within 60 days from 1 to 3 months are presented in table 3.

Table3 - The growth of piglets depending on the feeding with feed additive “HydroLactive” in the cultivation period from 1 to 3 months

Groups	Feeding conditions for piglets from 1 to 3 months	Pigs in a group, heads	Live weight of piglets, kg			
			age, months			
			1	2	3	6
1 (control)	Basicdiet (BD)	20	7,2±0,1	16,8±0,3	30,1±0,5	101,5±0,9
2	BD+1.0% of feed additive “HydroLactive”	20	7,1±0,2	17,5±0,3	32,0±0,4**	107,0±1,5**
3	BD+1.5% of feed additive “HydroLactive”	20	7,0±0,1	17,7±0,3*	33,5±0,5**	108,5±1,2***
4	BD+2.0% of feed additive “HydroLactive”	20	7,1 ±0,1	17,8±0,4*	33,6±0,6***	108,7±1,4***

The data of table 3 show that the live weight of piglets in two months increased by 4.1; 5.3; 5.9%, respectively, in three months - by 6.3; 11.2; 11.6%, and in six months - by 5.4; 6.8; 7.0% compared to the control group.

However, experimental animals of all groups did not differ significantly in the output of muscle, fat and bone tissue, as well as in the thickness of the spieg over 6 - 7 thoracic vertebrae.

Indicators of development of internal organs in experimental animals are presented in table 4.

The data in table 4 show that the piglets of the experimental groups (groups 2-4) were superior to their peers from the first control group on the weight of the heart, respectively, by 14.2; 14,6; 17,0%, by weight of lungs – by 6,3; 6,6; 6,9%, by weight of the liver – by 6.8; 7,6; 7,8%, by weight of the kidney – by 6, 4; 9,4; 10.4 %.

Table4 - Development of internal organs in piglets depending on the feeding with feed additive “HydroLactive”

Groups	Feeding conditions for piglets from 1 to 3 months	Pigs in a group, heads	Weight, g			
			heart	lungs	liver	kidneys
1 (control)	Basicdiet (BD)	6	252,0±5,0	660,0±4,2	1574,0±11,0	201,0±5,5
2	BD+1.0% of feed additive “HydroLactive”	6	288,0±7,0***	702,0±9,0***	1682,0±15,0***	214,0±4,5
3	BD+1.5% of feed additive “HydroLactive”	6	289,0±9,0**	704,0±6,0***	1695,0±16,0***	220,0±5,1*
4	BD+2.0% of feed additive “HydroLactive”	6	295,0±8,0***	706,0±7,2***	1698,0±12,5***	222,0±6,0*

It was also found that under this option, feeding with feed additive “HydroLactive” increases not only the growth of pigs, but also reduces the cost of feed per kilogram of live weight gain in comparison with the control group, respectively, by 3.2; 4.2; 4.2%.

On the basis of the conducted researches we made the calculation of economic efficiency of feeding pigs with feed additive “HydroLactive” in the period of cultivation from 1 to 3 months. The results

of these calculations indicate an increase in gross weight gain of piglets from 1 to 6 months, respectively, by 5.9; 7.6; 7.7%, which reduced the cost of 1 centner of live weight gain of piglets respectively by 349.46: 423.66; 392.79 rubles or 4.6; 5.5; 5.1%.

Thus, our results showed that all the variants of feeding pigs with feed additive "HydroLactive" in the period of cultivation from 1 to 3 months gave a positive result. However, it should be noted that the greatest efficiency of pork production in these studies was achieved by feeding piglets with feed additive "HydroLactive" in an amount of 1.5% in addition to the daily diet for 60 days.

To confirm the results obtained in two experiments to study the effect of feeding pigs with feed additive "HydroLactive" during breeding on growth, development and meat quality, we carried out a production test.

Data of production tests showed that the feeding pigs with feed additive "HydroLactive" within 30 and 60 days in the amount of 1.5% in addition to the daily diet helps to increase the gross weight live weight gain of pigs for the period of experiment from 1 to 6 months respectively by 7.8; 10.1%, thus reducing the cost of centner growth of live weight of pigs, respectively, in groups by 362.35; 441.88 rubles, or 4.7; 5.7% in comparison with first control group.

Thus, the production test confirmed fully the results of the previous two experiments, which gives us the right to recommend the introduction into the diet of piglets when they are grown feed additive "HydroLactive" in an amount of 1.5% in addition to the main diet for 60 days from 1 to 3 months.

CONCLUSIONS.

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

1. Feeding pigs with feed additive "HydroLactive" during the growing period increased their productivity and production efficiency of pork.
2. At feeding pigs from 1 to 2 months age with feed additive "HydroLactive" in the rate of 1.0; 1.5; 2.0% in addition to basic diet for 30 days it is found:

- increase in absolute live weight gain by 3.4; 4.4; 4.6 % respectively;
- increase in average daily growth by 3.7; 4.7; 4.9 % respectively;
- increase in growth rate respectively by 4,8; 4,8; 3,4%;
- increase in gross growth by 3.7; 4.7; 4.8%, respectively;
- reduction of feed costs per 1 kg of live weight gain by 2.9; 3.2; 3.5%, respectively;
- reduction in the cost of 1 cent of the live weight gain, respectively, by 3.2; 4.0; 3.9%.

3. In experimental piglets from 1 to 3 months of age at feeding with feed additive "HydroLactive" in the rate of 1.0; 1.5; 2.0% in addition to the basic diet during the 60 days it is found:

- increase in absolute live weight gain by 5.4; 6.8; 7.0%, respectively;
- increase in average daily growth by 6.0; 7.6; 7.8%, respectively;
- increase of growth intensity by 7.1; 10.7; 9.2%, respectively;
- increase in gross growth by 5.9; 7.6; 7.7%, respectively;
- reduction of feed costs per 1 kg of live weight gain by 3.2; 4.2; 4.2%, respectively;
- reduction of the cost of 1 cent of live weight gain by 4.6; 5.5; 5.1%, respectively.

4. At feeding pigs within 30 and within 60 days with feed additive "HydroLactive" in the rate of 1.0; 1.5; 2.0% in addition to the main diet there were no significant differences in the yield of muscular, fat and bone tissue and the thickness of fat above 6-7 chest vertebras.
5. Feeding the feed additive "HydroLactive" at the rate of 1.0; 1.5; 2.0% in addition to the main diet contributed to the better development of internal organs, which is indirect evidence of a higher level of metabolic processes in experimental piglets:

5.1. At feeding with feed additive "HydroLactive" from 1 to 2 months of age within 30 days pigs were superior to their peers from control group at 6 months, respectively: 8.4; 9.2; 10.0% by mass of the heart; 4.0; 4.5; 4.9% by weight of the lungs; 5.0; 6.3; 6.6% by mass of the liver; 3.9; 3.9; 4.9% by weight of the kidneys;

5.2. At feeding with feed additive "HydroLactive" from 1 to 3 months of age for 60 days

the experimental pigs were superior to their peers from control group at 6 months, respectively: 14.2; 14.6; 17.0% by mass of the heart; 6.3;6.6; 6.9% by mass of the lungs; 6.8; 7.6; 7.8% by mass of the liver; 6.4; 9.4; 10.4% by mass of the kidneys.

6. Most zootechnical and economic effect was obtained at feedingwith feed additive “HydroLactive” pigs from 1 to 3 months of age at the rate of 1.5% in addition to basic diet for 60 days. At the same time, there was an increase of 10.1% in gross weight gain of experimental piglets from 1 to 6 months of age, a decrease of 6.3% in feed costs per 1 kg of growth and 5.7% in the cost of 1 cent of live weight gain compared to the control group.

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