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PREBIOTIC PREPARATION "MIKOLAD" IN THE DIETS OF THE WEANED YOUNG PIGS

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It was found that the introduction of the diet of weaned piglets prebiotic preparation "MikoLad" in the amount of 0,4, 0,5 and 0,6 kg / t of feed increases the average daily gain during the main period of 4,2, 12,5 and 12,7%. Aftereffect feeding preparation of young pigs results in increased daily weight while reducing the consumption of feed.

Introduction. One of the most significant scientific achievements in biological science over the past decade is the discovery of pro- and prebiotics, which are applied in farm animal feeding to promote growth and development of the organism [9]. Deliberate colonization of the gastrointestinal tract of pigs with beneficial microflora is a condition for increasing natural resistance and productive qualities of pigs [11].

Prebiotics are indigestible food ingredients that selectively stimulate the growth and activity of protective intestinal microflora of animals and thereby improve their health. Prebiotics mainly include a variety of dietary fiber, which is not broken up in the upper gastrointestinal tract due to the lack of specific enzymes in it [3].

The term “probiotics” was first introduced by R.Gibson, and nowadays it is used to identify substances that are not hydrolyzed or absorbed in the small intestine of pigs. They are a selective substrate of one or more species of bifidobacteria and lactobacilli to stimulate their growth and metabolic activity, thus improving microflora composition in the large intestine [1].

Among the most well-known prebiotics are poly- and oligofruitans, soybean oligosucrose, galactooligosucrose isolated from natural sources or obtained by biotechnological or synthetic methods. Most prebiotics are of carbohydrate nature, they are fruitooligosucrose, izomaltooligosurcose, lactulose, galactooligosurcose, dietary fiber, resistant starch types [6, 8].

Prebiotics are substances that have to meet the following requirements: they should not hydrolyze or be absorbed in the upper part of the gastrointestinal tract; they should be a selective substrate for beneficial bacteria that live in the large intestine, i.e. stimulate their growth or biochemical activity; they should alter a balance of the intestinal microflora towards more favorable composition for the body of the host-animal; they should induce beneficial effects both on the level of the gastrointestinal tract and the body as a whole, i.e. to ensure systemic effects [7,10].

Therefore, the aim of this paper is to study the effectiveness of different doses of MikoLad in the diets of the weaned young pig. This prebiotic preparation is manufactured by the labour of the plant specializing in production of bio- and enzyme preparation “Enzyme” (Ladyzhyn, Vinnytsia region) [2]. Efficiency of MikoLad in pig production has not been studied yet.

Methods of research. The experiment was conducted in four similar groups of pigs of large white breed [4] weaned from the sows at 45-day age according to the scheme given below (Table 1).

The first group was a control one. Each group had 15 animals with the initial live weight of 12.0 kg in the comparative period. After 15-day period of comparing, pigs of the second group, in addition to the basic diet, were fed MikoLad at the rate of 0.4 kg/t of mixed fodder, the third one - 0.5 kg/t of mixed fodder and the fourth one - 0.6 kg/t of mixed fodder. The preparation was fed for 90 days of the basic period.

Table 1. Scheme of the experiment

Groups	Number of animals, pigs	Feeding characteristics by the periods		
		comparative, 15 days	basic, 90 days	final, until live weight is 110-120 kg
1 (control)	15	BD*	BD	BD
2	15	BD	OP + MikoLad 0,4 kg/t of mixed fodder	BD
3	15	BD	OP + MikoLad 0,5 kg/t of mixed fodder	BD
4	15	BD	OP + MikoLad 0,6 kg/t of mixed fodder	BD

**BD – basic diet*

Table 2. Indices of performance of young pigs, M±m, n=15

Index	1 group (control)	2 group	3 group	4 group
Comparative period				
Live weight per pig:				
at the beginning of the period, kg	12,3±0,21	11,5±0,19	12,6±0,35	11,8±0,22
at the end of the period, kg	15,8±0,45	14,9±0,35	16,1±0,51	15,3±0,38
Duration of the period, days	15	15	15	15
Average daily gain, g	235±7	227±5	233±9	233±5
Basic period				
Live weight per pig:				
at the beginning of the period, kg	15,8±0,45	14,9±0,35	16,1±0,51	15,3±0,38
at the end of the period, kg	56,8±1,95	57,6±1,50	62,2±1,85	61,5±1,75
Duration of the period, days	90	90	90	90
Live weight gain:				
total, kg	41,0±1,2	42,7±1,1	46,1±1,3*	46,2±1,0*
average daily, g	455±9	474±11	512±8**	513±10**
± before control, g	-	+19	+57	+58
– " – %	-	+4,2	+12,5	+12,7
Feed consumption per kg of gain, feed units	4,18	4,00	3,71	3,70
± before control, feed units	-	-0,18	-0,47	-0,48
– " – %	-	-4,3	-11,2	-11,5

**P<0,05, **P<0,01, ***P<0,001*

Then post-effect of feeding this supplement was studied. After the experiment that lasted for 200 days, when body weight of a majority of animal was 110 - 120 kg, gross and average gains were measured as well as feed consumption per 1 kg of gain.

Pigs were weighted every month, feeds consumed were registered every day. Pigs were kept in groups in a pigsty typical for replacement young pigs. Biometric assessment of the digital material was carried out by the method offered by M.O. Plokhinsky [5].

Results of the research. Average daily gains in the comparison period, as it is shown in Table 2, ranged from 227 to 235 g, which resulted in live weight at the beginning of the basic fixed at the level of 15,5 ± 0,42 kg.

Introduction in the diet of young growing pigs of the studied prebiotic feed supplement MikoLad at the dose of 0.4 kg/t of mixed fodder had no probable effect on fattening indices. There was only improbable growth of average daily and absolute gains by 4.2% and 4.1% respectively. Increase of the dose of the preparation up to 0.5 and 0.6 kg/t of mixed fodder resulted in average daily gains by 57 and 58 g, or 12.5 and 12,7% (P <0,01). Accordingly, final live weight in the third group exceeded the value of the first group by 5.4 kg or 9.5 %, in the fourth group - by 4.7 kg or 8.3%.

Table 3. Fattening indices of the experimental animals, M±m, n=15

Index	1 group (control)	2 group	3 group	4 group
final period				
Live weight per pig:				
at the beginning of the period, kg	56,8±1,95	57,6±1,50	62,2±1,85	61,5±1,75
at the end of the period, kg	114,6±1,8	119,2±1,6	128,5±1,1***	129,0±1,4***
Live weight gain, kg	57,8±1,4	61,6±1,8	66,3±1,3**	67,5±1,9**
Duration of the period, days	110	110	110	110
Average daily gain, g	525±15	560±11	602±18*	613±14**
± before control, g	-	+35	+77	+88
– " – " – " – , %	-	+6,7	+14,7	+16,8
Feed consumption per kg of gain,				
feed units	4,95	4,64	4,32	4,24
± before control, feed units	-	-0,31	-0,63	-0,71
– " – , %	-	-6,3	-12,7	-14,3
over the period of breeding				
Live weight per pig:				
at the beginning of the period, kg	15,8±0,45	14,9±0,35	16,1±0,51	15,3±0,38
at the end of the period, kg	114,6±1,8	119,1±1,6	128,5±1,1***	129,1±1,4***
Live weight gain, kg	98,8±1,8	104,2±1,7	112,4±1,9***	113,8±1,6***
Duration of the period, days	200	200	200	200
Average daily gain, g	494±8	521±10	562±7***	569±9***
± before control, g	-	+29	+68	+74
– " – , %	-	+6,0	+14,2	+15,4

Feed consumption per kilogram of gain in all experimental groups decreased, namely in the second group by 4.3% , and the third and fourth groups by 11.2% and 11.5 % respectively.

According to the data, prebiotic is a substrate of normal flora of a macroorganism, and it is characterized by selective stimulation of beneficial microflora [12]. Therefore, research of MikoLad efficacy in feeding pigs is not limited by its introduction into the diet. Special attention should be paid to the final period. As it is shown in tables, a minimum dose of the preparation during the period of post-effect caused a tendency towards the increase of average daily gains comparing to the control group by 35 g or 6.7% (Table 3).

Both in the basic and final periods increasing of the doses of the preparation was accompanied by average daily gains by 77 g or 14,7% (P<0,05) in the third group and 88 g or 16,8% (P<0,01) in the fourth group that was accompanied by the reduction of feed consumption 12.7 and 14.3%.

Absolute gain over the entire breeding period, which lasted for 200 days, increased by 13.6 kg or 13.8%, and 15.0 kg or 15,2% (P<0,001) in the third and fourth groups. This gives grounds to recommend prebiotic MikoLad at doses of 0.5 and 0.6 kg/t for young pig breeding.

Conclusions

1. Introduction in the diet of the weaned young pigs of prebiotic preparation MikoLad in the amount of 0.4, 0.5 and 0.6 kg/ton of mixed fodder increases average daily gains in the basic period by 19 g or 4.2%, 57 g or 12.5% and 58 g 12.7 %. Feed consumption per kg of gain is reduced by 4,3%, 11,2% and 11,5% in comparison with the control group.
2. Post-effect of Mikolad feeding to young pigs results in average daily gains in comparison with the first group by 6.7%, 14.7% and 16.8%, while reducing feed costs by 6.3%, 12.7% and 14.3%.
3. MikoLad at the rate of 0.5 and 0.6 kg/ton of mixed fodder can be recommended for pig breeding for meat.

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АНОТАЦІЯ

Іщенко А.М., Кучерявий В.П. *Пребіотичний препарат «МікоЛад» у раціонах відлученого молодняку свиней // Биоресурсы и природопользование. – 2014. – **6**, №5–6. – С. 100 –104.*

Встановлено, що введення до складу раціону відлученого молодняку свиней пребіотичного препарату «МікоЛад» у кількості 0,4, 0,5 та 0,6 кг/т комбікорму збільшує середньодобові прирости в основний період на 4,2, 12,5 та 12,7%. Післядія згодовування препарату виявляється в зростанні середньодобових приростів при зниженні витрат корму.

АННОТАЦИЯ

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Установлено, что введение в состав рациона отнятого молодняка свиней пребиотического препарата «МикоЛад» в количестве 0,4, 0,5 и 0,6 кг/т комбикорма увеличивает среднесуточные привесы в основной период на 4,2, 12,5 и 12,7%. Последействие скармливания препарата молодняку свиней проявляется в увеличении среднесуточных привесов при снижении расхода кормов.