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THE INFLUENCE OF PRIMIX-ALPHASORB ON GROWTH AND CONSUMPTION INDICES OF WEANING PIGLETS

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Abstract. The studies were conducted in the period from 06.02.2011 to 06.07.2011 in the conditions of the State Enterprise Moldsuinhibrid for pig breeding and hybridization, using Landrace breed pigs, selected on the basis of analogues (Ovsyannikov, A.I., 1976). Four groups of pigs of ten heads each were formed. The piglets in the control group were fed the basic feed, and the ration for the experimental groups EG1, EG2 and EG3, was supplemented with the adsorbent Primix-Alphasorb at the level of 0.2, 0.4 and 0.6 kg/t respectively. It was established that the addition of the adsorbent Primix-Alphasorb into the mixed fodder for breeding pigs contributed to the increase of live weight gain during the periods of breeding; after the experiment the body weight was greater in groups EG1, EG2 and EG3 by 8.72, 5.83 and 7.93% compared with the control group. The use of the adsorbent Primix-Alphasorb resulted in the improved fodder conversion; the fodder consumption to increase the body weight decreased in the experimental groups by 6.25 - 9.69% in comparison with the control group. The optimal level of the adsorbent Primix-Alphasorb in the mixed fodder for breeding pigs was 0.2 kg/t.

Key words: Mycotoxins, pigs, sorbents, mixed fodder.

INTRODUCTION. Mycotoxins continue to be priority natural contaminants of feedstuffs and food in modern animal husbandry. The reason of mycotoxicosis may be a variety of mushrooms, contaminating fodder plants and fodder during the violation of cultivation and storage technology. During mycotoxicosis cardiovascular and immune systems suffer particularly strongly. When the immune system is out of order the possibility of transmission of viral and bacterial infections to animals increases, and the effectiveness of specific prevention is sharply reduced (Antipov, V.A. et al., 2007; Connolly, E., D. O'Sullivan, 2005; Gabruk, N.G. et al., 2009). Currently, most researchers recognize the concept of

synergy in the action of mycotoxins on the body, and therefore believe that safe levels of mycotoxins do not exist (Chulkov, A.K. et al., 2007; Kononenko, G.P. et al., 2005; O'Sullivan, D., 2005). Symptoms of typical mycotoxicosis in pigs are often observed, even when tests show only a slight presence of mycotoxins in animal fodders. (Trenholm, H.L. et al., 1983).

The variety of ingredients in mixed fodders increases the possibility of multiple mycotoxins contamination while reducing the risk of high concentrations of mycotoxins, because the content of any of the fodder components in the composition of the diet is low. However, the presence of several mycotoxins in the fodder can lead to toxicological synergy that would increase the severity of mycotoxicosis (Speijers and Speijers, 2004).

The variety of epizootiology, the clinical presentation and severity of mycotoxicosis depend on the number of toxins which have got into the body, the duration of its receipt, the biological and chemical activity of the toxins, the age, species and individual differences, the state of the body strength, and the environmental conditions. Therefore, in different places and at different times mycotoxicosis manifestation can differ significantly (<http://biosafety-center.dp.ua>).

The absorption of toxins from the digestive tract is prevented by the enterosorbents. One of these is the highly dispersed adsorbent Primix-Alphasorb. The preparation is harmless, has a high adsorption capacity, and does not contain impurities.

MATERIALS AND METHODS. The studies were conducted in the period from 06.02.2011 to 06.07.2011 at the State Enterprise "Moldsuinhibrid" for pig breeding and hybridization.

The object of the study was pure-bred two-months-old pigs of Landrace breed. By the principle of analogues (Ovsyannikov, A.I., 1976), four groups of pigs of ten heads each were formed (Tab. 1).

Table 1. The scheme of the scientific experiment

Groups	Number of animals per group, head	Feeding features
CG	10	Basic mixed forage (BMF)
EG ₁	10	BMF + 0.2 kg/t Primix - Alphasorb
EG ₂	10	BMF + 0.4 kg/t Primix - Alphasorb
EG ₃	10	BMF + 0.6 kg/t Primix - Alphasorb

During the experiment, the animals were kept in groups. The feeding was carried out using mixed fodders which were manufactured at the factory of the company. The piglets of the control group were fed the basic mixed fodder, and the features and differences in the feeding of pigs in the experimental groups was that their main mixed fodder was supplemented with the adsorbent Primix-Alphasorb at different levels.

To characterize the pigs growth and development in different groups the live weight, the daily gain in body weight, and the absolute and relative growth rate were determined by weighing them at birth, at the weaning at

35 days, in 2 months and then by periods of growth.

The data obtained in the experiment were processed using the method of variation statistics in EXCEL (Cucu, I., V. Maciuc et al., 2004; Plohinsky, N. P., 1969).

RESULTS AND DISCUSSION. The scientific and economic trial was divided into the preparatory period of 10 days and the reference period, which in its turn was divided into three periods of breeding.

The feeding in the scientific and economic experiment was carried out in accordance with the norms of pig feeding (Kalashnikov, A. P. et al., 2003) taking into account the body weight and age (Tab. 2 and Tab. 3).

Table 2. The composition of the mixed fodder used in the trial, %

Fodder components	Period of trial		
	Up to 90 days	91-120 days	121-finis
Corn	16.0	24.0	26.0
Barley	16.7	38.8	37.5
Wheat	9.6	21.0	20.0
Corn extrusion	10.0	-	-
Barley extrusion	13.7	-	-
Wheat extrusion	10.0	-	-
Soybean meal	12.0	11.3	10.0
Wheat bran	6.6	-	-
Fish meal	3.0	2.5	4.0
Praymiks	2.0	2.0	2.0
Salt	0.4	0.4	0.5

Table 3. The concentration of nutrients in 1 kg of fodder

Indicators	Periods of trial		
	Up to 90 days	91-120 days	121-finis
Feed units	1.27	1.30	1.28
Metabolizable energy, MJ	14.12	14.27	13.93
Crude protein, g	146.32	143.57	136.96
Digestible protein, g	120.21	118.20	112.28
Lysine, g	7.58	7.87	7.42
Methionine + cystine, g	5.76	4.95	5.16
Crude fiber, g	47.81	52.11	49.89
Calcium, g	9.16	8.81	7.56
Phosphorus, g	3.77	5.16	5.62
Iron, mg	142.41	127.54	131.46
Copper, mg	6.54	5.96	5.91
Zinc, mg	36.46	32.87	33.70
Manganese, mg	27.10	20.65	19.94
Cobalt, mg	0.23	0.15	0.14
Iodine, mg	0.36	0.25	0.28

determination of the pigs live weight via individual weighing according to the trial periods indicated (Tab. 4, Fig. 1) that under the influence of the addition of the sorbent Primix-Alphasorb by the end of the first period of breeding their weight increased in EG1, EG2, EG3 compared to CG respectively by 14.77%, 4.61% and 13.26%, i.e. the weight was the most higher in EG1 in which the pigs received an addition of the preparation at the level of 0.2 kg/ t.

The total weight gain of the animals at the end of the second period of breeding in the control group was 12.24 kg, whereas in the experimental groups (EG1, EG2,

and EG3) the increase in the body weight was higher respectively by 15.5 kg, 13.07 kg and 15.29 kg.

During the whole trial the live weight of the breeding piglets in groups EG1 and EG3 was 102.24 and 101.50 kg, and it was greater in comparison with the CG by 8.72 and 7.93% respectively. The highest average daily gain, in correspondence with the periods of breeding and during the whole trial, was observed in the group treated with the addition of the sorbent Primix-Alphasorb at the level of 0.2 kg/ t, and conformably to the breeding periods it amounted to 0.517, 0.519 and 0.646 g, and at the end of the trial to 0.595 g.

Table 4. The effect of Primix-Alphasorb supplementation on the live weight change

Groups	Specification	The pigs live weight in the scientific experiment, kg			
		at the beginning of the accounting period of the experiment	at the end of the first breeding period	at the end of the second breeding period	at the end of the experiment
CG	$\bar{X} \pm S_x$	11.60±0.145	23.84±1.024	38.34±1.708	94.09±3.179
	$S \pm S_s$	0.459±0.103	4.575±1.024	5.399±1.208	10.045±2.247
	$V, \% \pm S_v, \%$	116.00±0.886	238.40±4.291	383.40±3.149	940.90±2.387
EG ₁	$\bar{X} \pm S_x$	11,86±0.031	27.36±1.542	43.45±2.280	102.24±4.502
	$S \pm S_s$	0.310±0.069	4.874±1.090	7.205±1.612	14.226±3.183
	$V, \% \pm S_v, \%$	118.55±0.584	273.60±3.983	434.50±3.708	1022.40±3.111
EG ₂	$\bar{X} \pm S_x$	11.87±0.106	24.94±1.415	39.90±1.338	99.52±4.543
	$S \pm S_s$	0.333±0.075	4.470±1.000	4.228±0.946	14.357±3.212
	$V, \% \pm S_v, \%$	118.70±0.628	249.400±4.008	399.000±2.370	995.200±3.226
EG ₃	$\bar{X} \pm S_x$	11.71±0.157	27.00±1.384	42.90±2.732	101.50±4.809
	$S \pm S_s$	0.495±0.111	4.374±0.978	8.634±1.932	15.197±3.400
	$V, \% \pm S_v, \%$	117.10±0.946	270.00±3.622	429.00±4.500	1015.00±3.348

Table 4. The pigs live weight in the experiment

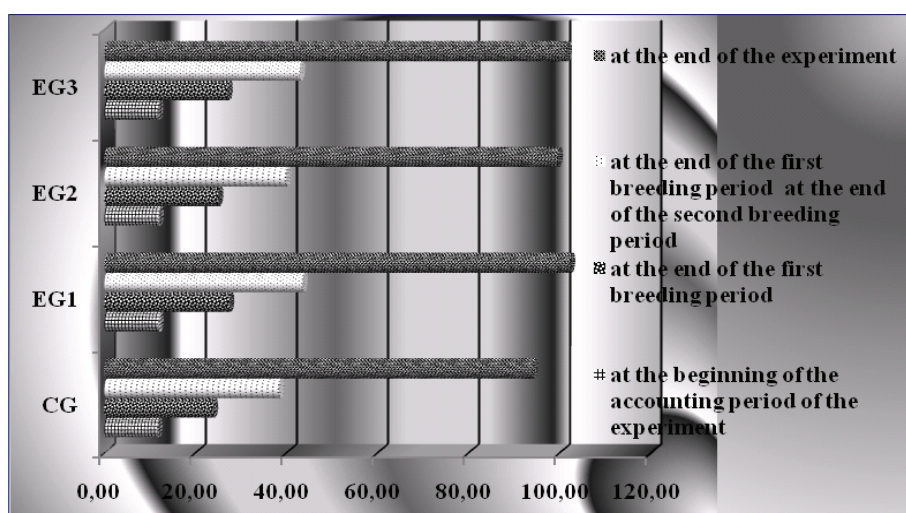


Table 5. Average daily gain, kg

Groups	Indicators	at the end of the first breeding period	at the end of the second breeding period	at the end of the third breeding period	at the end of the trial
CG	$\bar{X} \pm S_x$	0.408±0.047	0.468±0.029	0.613±0.023	0.543±0.021
	$S \pm S_s$	0.149±0.033	0.091±0.020	0.072±0.016	0.067±0.015
	$V, \% \pm S_v, \%$	4.080±8.168	4.677±4.352	6.126±2.632	5.427±2.765
EG ₁	$\bar{X} \pm S_x$	0.517±0.051	0.519±0.044	0.646±0.029	0.595±0.030
	$S \pm S_s$	0.160±0.036	0.140±0.031	0.092±0.021	0.093±0.021
	$V, \% \pm S_v, \%$	5.168±6.925	5.190±6.014	6.460±3.179	5.946±0.021
EG ₂	$\bar{X} \pm S_x$	0.422±0.045	0.483±0.017	0.655±0.040	0.577±0.030
	$S \pm S_s$	0.143±0.032	0.053±0.012	0.126±0.028	0.094±0.021
	$V, \% \pm S_v, \%$	4.216±7.599	4.826±2.473	6.552±4.295	5.766±3.641
EG ₃	$\bar{X} \pm S_x$	0.510±0.043	0.513±0.052	0.644±0.030	0.591±0.031
	$S \pm S_s$	0.135±1.932	0.163±0.036	0.095±0.021	0.098±0.022
	$V, \% \pm S_v, \%$	429.00±4.500	5.129±7.104	6.440±3.313	5.907±3.705

The data on the quantity of eaten fodder by the animals during the trial allowed to calculate the total average amount of fodder consumed in each group (Tab. 6).

On the basis of the results on the general increase in animal body weight and the data on the fodder the animals had consumed, the fodder consumption per kilogram of weight gain were calculated, which amounted to 3.20, 2.89, 3.00 and 2.96 kg respectively in groups CG, EG₁, EG₂ and EG₃, i.e. the consumption was lower in the groups which had received fodder supplemented with the adsorbent Primix-Alphasorb.

CONCLUSIONS.

- The addition of the adsorbent Primix-Alphasorb into the fodder for breeding pigs has contributed to the increase of live weight gain during the rearing periods, and during the whole experience it was greater in groups of EG₁, EG₂ and EG₃ by 8.72, 5.83 and 7.93% in comparison with the control group.

- The supplementation of the mixed fodder for piglets with the adsorbent Primix-Alphasorb causes the reduction of fodder consumption for the live weight gain on the average from 6.25% to 9.69%.

- The optimal level of the adsorbent Primix-Alphasorb in the mixed fodder for breeding piglets is 0.2 kg/t.

Table 6. Fodder consumption by the pigs in the trial

Indicators	Groups			
	CG	EG ₁	EG ₂	EG ₃
Average quantity of fodder consumed in each group:				
during the first breeding period	419.25	408.14	419.45	434.35
during the second breeding period	448.54	447.54	449.39	457.15
during the third breeding period	1770.54	1755.19	1758.26	1766.03
during the whole trial	2638.32	2610.87	2627.09	2657.18

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