

THE INFLUENCE OF MYCOFIX⁺ ON GROWTH AND FEED CONSUMPTION INDICES OF PIGLETS

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Abstract

The studies were performed using breeding young pigs in the conditions of the enterprise "Molsuinghibrid" specialized in pig selection and hybridization. To carry out the scientific and economic trial on the principle of analogy, taking into account the breed, age, sex, body weight, and growth energy, 40 breeding pigs were selected, which were then divided into four groups (LC-control and LE1, LE2, LE3-experimental groups). The aim of the trial was to study the effectiveness of the introduction into the main piglets feed of additives with different levels of the Mycofix+ preparate (1.0, 1.5, 2.0 kg/t). It was found out that the addition of the Micofix+ to the mixed fodder for growing pigs had, in general, a positive effect on the dynamics of the live weight of the piglets. Nevertheless the more effective was the level of introduction of 1.5 kg/t. It was also revealed, that under the influence of Micofix+ the cost of the feed intake on live weight gain of piglets decreased.

Key words: breeding sows, mixed fodder, mycotoxins

INTRODUCTION

Mycotoxins reduce fodder intake by animals and can cause gastro-intestinal cell damage, which usually leads to diarrhea and enteritis. They can easily be absorbed by blood. Then through the system of blood vessels they can spread throughout the body and affect internal organs such as the brain, reproductive system, liver and kidneys. Therefore, the animals' health is deteriorated, the rates of reproduction and growth is reduced, the level of fat-soluble vitamins in fodder may decrease and the animals can get diseases with different clinical manifestations depending on the nature of the toxin, its amount, duration of exposure, type of microorganism, its age and diet [1,2].

At present, the toxicological study of fodder, as a rule, determines the level of those mycotoxins that are considered to be most significant in terms of impact on health and productivity of animals and birds. Of the toxins synthesized by the most widespread in nature fungi *Fusarium*, in practice usually the content of deoxynivalenol (DON), zearalenone, T-2 toxin and fumonisins B₁ and B₂ are assessed; of the 30 mycotoxins

synthesized by *Aspergillus* the content of aflatoxins B₁ and B₂ are determined; and of 40 toxic metabolites synthesized by the fungi *Penicillium* the content of patulin and ochratoxin are determined.

The problem of mycotoxicosis is particularly acute for pig farms. The main danger lies in the fact that poisoning can occur in a latent form and manifest itself in the form of reduced productivity and increased levels of morbidity. Of all farm animals pigs are the most sensitive to mycotoxins. DON causes loss of appetite and vomiting, even small concentrations of it can affect the immune system, and lead to poor fodder conversion. It is known that very small concentrations of mycotoxins violate hormonal balance in sows' body and lead to reduced reproduction [3,4].

Currently, in order to improve the protection of animals against mycotoxins the newest adsorbents are offered which contains yeast culture, Beta-glucans and probiotics that detoxify fodders. Fodder detoxification is difficult, since most of mycotoxins are stable chemical compounds and their neutralization requires the use of radical and

hard methods and techniques; besides fodders are usually contaminated by more than one mycotoxin. The optimal concentrations of drugs, that can detoxify fodder has not yet been determined. The possibility of neutralization of aflatoxin and ochratoxin has not been studied either [5].

To protect against mycotoxins a special drug Mikofiks Plus is proposed. It contains an enzyme group that breaks down the structure of zearalenone, and because of this it has an advantage over other drugs that act solely as adsorbents.

Mycotoxicosis continues to be one of the most pressing problems of industrial animal husbandry. The presence in fodder of toxic metabolic products of fungi is not only a reason for the decline of zootechnical and economic parameters of the industry, but also

carries the potential risk to humans on account of their transfer to food products.

MATERIALS AND METHODS

Studies of the effectiveness of the drug Micofix⁺ utilisation in the fodder for growing pigs were carried out on the enterprise "Moldsuvingibrid" which specialises in pig selection and hybridization, in the period from 09.07 to 09.10.2010.

To carry out the scientific and economic expertise on the principle of analogy taking into account the breed, age, sex, body weight and energy growth [6] forty breeding pigs were selected, which afterwards were divided into four groups according to the scheme of studies (tab. 1).

Table 1 The experimental setup

Lot	Number of pigs in lot, head	Features of feeding
LM	10	MF – the main fodder
LE ₁	10	MF + Micofix ⁺ (1.0 kg/t)
LE ₂	10	MF + Micofix ⁺ (1.5 kg/t)
LE ₃	10	MF + Micofix ⁺ (2.0 kg/t)

The animals were fed similarly using mixed fodder; the only difference was that to the main mixed fodder for the pigs in LE₁, LE₂ and LE₃ (experimental groups) the drug Micofix⁺ of different levels was introduced.

Throughout the experiment the record of fodder consumption was kept, by weighing fodder before its distribution and one hour after its consumption by the pigs.

At the beginning of the preparatory and accounting periods, and at the end of each

trial period the piglets were weighted individually.

The data obtained as a result of scientific and economic experience were statistically processed [7] using a computer program.

RESULTS AND DISCUSSION

The scientific and economic trial was conducted using breeding piglets at the enterprise "Moldsuvingibrid".

Table 2 Composition of mixed fodder in the trial

Ingredients	Periods (% by mass)	
	I	II
Corn	30.25	21.0
Wheat	17.0	-
Barley grain	26.0	48.8
Soybean meal	18.1	16.0
Sunflower grouts	-	4.7
Fishmeal	3.5	2.5
Powdered milk	1.0	-
Premix 2231	2.5	2.0
Soybean Oil	-	3.0
Salt	0.35	0.30
Chalk	1.3	1.7

The feeding of the tested animals was carried out using mixed fodder, which was prepared at the feed mill of the enterprise taking into account the age features and the changes of the pigs' live weight (A.P.

Kalashnikov, et al, 2003). The composition of the fodder used in the trial is presented in table 2. The concentration of nutrients in the mixed fodder corresponded to the feeding requirements (tab. 3).

Table 3 The concentration of nutrients in the mixed fodder

Issue	Periods (quantity)	
	I	II
Feed unit	1.20	1.13
Metabolisable energy, MJ	11.39	12.74
Crude protein, g	185.39	180.74
Digestible protein, g	155.10	149.29
Crude fiber, g	38.48	48.06
Lysine, g	9.02	8.66
Methionine + cystine, g	5.64	5.69
Salt, g	0.35	0.30
Calcium, g	7.05	8.59
Phosphorus, g	5.14	5.13
Iron, mg	154.30	135.21
Copper, mg	6.31	6.31
Zinc, mg	33.50	34.44
Manganese, mg	19.65	15.47
Cobalt, mg	0.14	0.17
Iodine, mg	0.19	0.23
Vitamin A, thousand IU	2.42	2.40
Vitamin D, thousand IU	0.67	0.46
Vitamin E, thousand IU	0.81	0.97
B ₁ (thiamin), mg	22.49	30.15
B ₂ (riboflavin), mg	3.93	3.72
B ₃ (pantothenic acid), mg	1.72	1.55
B ₄ (choline), mg	9.35	9.22
B ₅ (nicotinic acid), mg	1052.93	1146.90
B ₁₂ (cyanocobalamin), mg	42.61	53.60

The animals were weighed individually on a monthly basis throughout the trial, in the morning on an empty stomach in order to establish the dynamics of live weight of the pigs under the influence of the additives of the studied drug.

The data obtained as a result of the weighing of the pigs showed (tab. 4, fig.1) that at almost the same live weight of animals at the beginning of the trial at the end of the first period the pigs' weight in the LE₂

increased by 1.74 kg as compared with LM, i.e. by 7.10 %, with a slight change of weight in other experimental groups. At the end of the second growth period the same trend as in the first period was observed; in the LE₂ that received an addition of the preparation Micofix⁺ to the main fodder at the level of 1.5 kg/t the live weight of the piglets was higher by 9.74%, in LE₁ by 0.57% and in LE₃ by 3.27%, in comparison with the control group.

Table 4 Average weight gain of piglets, kg

Lots	Issue	at the beginning of the preparatory period	at the beginning of the experiment	at the end of the first period	at the end of the second period
LM	X ± Sx	10.80 ± 0.054	14.25 ± 0.264	24.49 ± 0.673	35.12 ± 0.693
	S ± Ss	0.17 ± 0.038	0.83 ± 0.186	2.12 ± 0.476	2.19 ± 0.490
	V,% ± Sv,%	1.57 ± 0.352	5.85 ± 1.308	8.69 ± 1.943	6.24 ± 1.396
LE ₁	X ± Sx	10.54 ± 0.138	14.48 ± 0.212	24.70 ± 0.212	35.32 ± 1.045
	S ± Ss	0.43 ± 0.098	0.67 ± 0.150	2.35 ± 0.526	3.31 ± 0.739
	V,% ± Sv,%	4.15 ± 0.928	4.63 ± 1.036	9.52 ± 2.130	9.36 ± 2.093
LE ₂	X ± Sx	10.79 ± 0.098	14.33 ± 0.208	26.23 ± 1.037	38.54 ± 1.978
	S ± Ss	0.31 ± 0.069	0.659 ± 0.147	3.28 ± 0.733	6.25 ± 1.399
	V,% ± Sv,%	2.88 ± 0.644	4.482 ± 1.028	12.50 ± 2.796	16.23 ± 3.629
LE ₃	X ± Sx	10.75 ± 0.127	14.33 ± 0.208	24.58 ± 0.550	36.27 ± 0.755
	S ± Ss	0.40 ± 0.090	0.65 ± 0.147	1.73 ± 0.389	2.39 ± 0.534
	V,% ± Sv,%	3.73 ± 0.835	3.25 ± 1.028	7.07 ± 1.581	6.58 ± 1.472

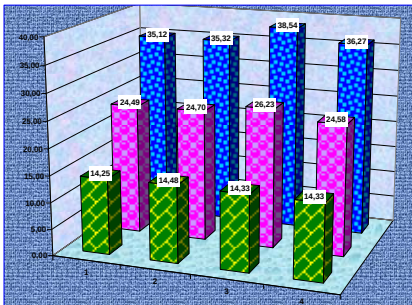


Fig.1. The live weight of pigs in the trial

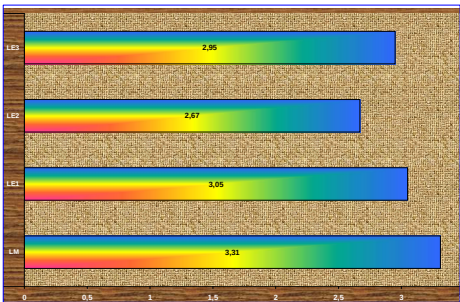


Fig.2. Average feed conversion ratio

On the basis of the accounting of the consumed fodder it was found out that in the experimental groups treated with the additive drug enterosorbent, especially in LE₁, the

fodder consumption was lower (tab. 5), the difference in comparison with the control group being of 53.38 kg.

Table 5 Feed consumption during the course of the trial

Issue	Lots			
	LM	LE ₁	LE ₂	LE ₃
Average feed intake during of the experiment: kg/lot	689.90	636.52	645.86	648.31
kg/head	68.99	63.65	64.58	64.83

The results of the changes in body weight by periods of growth and fodder intake in the trial allowed to determine the fodder consumption per unit of weight gain (tab. 6, fig. 2).

The lowest fodder intake was in LE₁, LE₂, LE₃, compared with the LM, respectively, by 7.74%, 6.38% and 6.03% at the lowest fodder consumption for the live weight gain in the same groups.

Table 6 Average feed conversion ration

Issue	Lots							
	LM		LE ₁		LE ₂		LE ₃	
	kg	feed unit	kg	feed unit	kg	feed unit	kg	feed unit
Feed conversation , kg/kg	3.31	3.86	3.05	3.55	2.67	3.11	2.95	3.44

CONCLUSIONS

- The addition of the drug Micofix⁺ to the mixed fodder for breeding piglets in general has had a positive effect on the dynamics of the live weight of pigs in the scientific and economic trial, but the more effective has been the level of 1.5 kg/t.

- The introduction of the drug Micofix⁺ in the mixed fodder during the whole trial has reduced the fodder intake by the piglets.

- When using Micofix⁺ at the levels of 1.0, 1.5 and 2.0 kg/t in mixed fodder for breeding piglets the fodder intake per kg gain is reduced, respectively, in the experimental groups by 0.31, 0.75 and 0.42.

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