EFFECT OF BROVAGLUKIN ON VALUES OF BLOOD AND PRODUCTIVE QUALITIES IN PREGNANT GILTS

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SUMMARY

The effect of the complex preparation brovaglukin on some biochemical indices of blood, humoral and cellular factor of the body protection has been studied. It has been stated that brovaglukin, 4 ml per 10 kg live weight, stimulates the productive qualities of piglets produced by the gilts of the experimental group, improves the durability of the litter.

Key words: brovaglukin, blood, pregnant, gilts, suckling, piglets, resistance, biochemical values

INTRODUCTION

The most important environmental factors that result in significant interior changes in the body and effect the intensity of animal growth and development are different feeding stuffs and biologically active substances [2,4]. The problem of the balanced rations for animal feeding is topical, especially from the point of view of mineral nutrition [1]. The deficiency of macro and microelements and BAS in the gilt ration leads to the lowering of resistance and productivity [5]. So, the use of complex preparations is the necessary condition to prevent animal diseases, to increase immunological status and productive potential of animals.

OBJECTIVE

The aim of the experiment was to study and to develop new ways to improve animal keeping hygiene, to promote the increase in animal resistance and productivity and to keep the piglets healthy in their critical periods of growth.

MATERIALS AND METHODS

To achieve the above objective 37 pregnant gilts of Large White breed were divided into two groups. The animals were of the same age, live weight and of the third pregnancy.

The gilts of the experimental group were kept in the conditions of microclimate and sanitary regime according to the technological design standards for pig-breeding farms. 18 gilts of the control group were fed by the ration that provided them with all essential elements of animal nutrition. 19 gilts of the experimental group received the same ration but they were administrated IM brovaglukin, 4ml per 10kg live weight, twice, on the 35 and 15 days before farrowing.

Brovaglukin is powder of light yellow colour, packed in flasks.

Before the administration of the preparation the content of the flask was diluted by isotonic solution. 1 ml of the solution for injection contains 100 mg Na sulphadimetotoxin, 100 mg Na sulphadiazin, 25 mg Ca ions, phosphorus ions – 12,5 mg, Mg ions – 5 mg and 4 mg cholinchloride.

The estimation of ammonia, carbon dioxide and hydrogen sulphide levels in the pigsty was carried out by the express-analyzer "Gas tester, type KI-28066, light intensity was measured by luxometer, type U-117, temperature –by the special device I1-611.

The health status of the gilts and their litter was determined by the blood and blood plasma indices. For that standard reagents produced by "Lachema" (Chechia) were used. The state of immune organs in the piglets was evaluated by the common methods.

The effect of brovaglukin on haematological values of blood in the pregnant gilts was studied by morphological, biochemical and immunological methods: the level of haemoglobin was determined by FEC-56 M, leukocyte content was determined in Boryaev's chamber, the concentration of circulating immune complexes (CIC) was estimated by Grinevich's method, etc [3, 6, 8], lyzocymic activity-by Perri [8], the amount of the G and M immune classes – by Manchini [9].

RESULTS

During the experiment some changes in the values of natural resistance in the pregnant gilts have been revealed (Table 1).

Table 1. Indices of humoral and cellular protection in pregnant gilts

Index	Groups		
	Control	Experimental	Referent Level
	35^{th} 15^{th} day before farrowing		
BABS, %	50,1±3,8 45,1±2,4	49,1±2,27 48,4±1,14*	40–60
LABS, %	39,6±2,14 35,1±1,17	40,7±1,31 38,4±1,36*	30–50
PAN,%	27,3±0,72 22,6±0,80	26,8±1,18 24,3±1,12	30–40
T-lymphocytes	4,61±0,03 3,81±0,02	4,55±0,04 4,27±0,02*	3,1–4,5
B– lymphocytes	1,78±0,04 1,62±0,03	1,74±0,03 2,01±0,04*	1,0–3–5

	10th day	5th day before farrowing	
BABS, %	30,4±0,62 41,2±1,10	46,7±1,04* 36,2±0,85	40–50
LABS,%	32,5±1,12 36,4±1,08	37,1±1,15* 39,1±0,10*	30–50
PAN %	20,1±0,21 27,4±0,20	24,8±0,31* 32,1±0,34*	30–40
T–lymphocytes g/l	3,48±0,03 4,43±0,04	5,04±0,04* 5,27±0,05*	3,1–4,5
B–lymphocytes g/l	1,74±0,03 2,08±0,02	2,10±0,04* 2,38±0,05*	1,0–3,5

Note: the numerator indicates the values on the 35th and 10th days; the denominator indicates the values on the 15th and 5th day, respectively.
*P < 0, 05
**P < 0, 01

The analysis of the natural resistance levels (Table 1) showed the reduction of BABS level in the gilts of the experimental group. The level of BABS on the 35th day before the farrowing was not lower than 48,4±1,14%, 15th day before farrowing the above level was 46,7±1,04%, on the 5th day before farrowing it was 36,2±0,85%.

The level of LABS was trustworthy higher [P <0, 05] as compared with that in the gilts of the control group before farrowing on the days mentioned above. The amount of lymphocytes in the blood of the gilts in the experimental group on the 35th day before farrowing was 11,2% higher than that in the control group and on the 10th day it was higher by 10,7%, the level of B-lymphocytes in the above periods of the investigation was in the range of 2,01±0,04 g/l, on the 35th day before farrowing –2,10±0,04 g/l, on the 5th day before farrowing –2,38±0,05 g/l.

It means that the shorter the period before farrowing the higher the levels under investigation. The piglets produced by the gilts of the experimental group had better indices of natural resistance as compared to the piglets born by the gilts of the control group (Table 2).

Table 2. Humoral and cellular levels of natural resistance in suckling piglets

Index	Investigation after birth, days		
	10	21	60
BASS %	34,1±0,24* 26,4±0,31	38,04±0,38* 28,7±1,01	48,6±1,21* 40,1±1,12
LABS %	27,8±0,09* 24,1±0,08	36,1±1,1* 25,8±0,09	48,7±1,2* 40,1±1,08
PAN, %	64,5±0,41* 58,6±0,56	70,2±0,9 68,5±1,12	74,5±0,7** 6,57±1,10

Note: the nominator indicates the values received in the experimental group of animals; denominator indicates the results of the control group.
*P < 0, 05
**P < 0, 01

The analysis of the data given in Table 2 shows that BABS level in the 10th day-old piglets was higher by 7, 7% as compared to the piglets of the same age in the control group, the above level in the 21-day- old piglets was higher by 9, 34% and in the 60 day-old- piglets – by 8, 5% as

compared to the control ones (P<0, 05). The level of LABS in the piglets of the experimental group in the above periods ranged from 27,8±0,09 to 48,7±1,2%, PAN level was 5,9–8,8% higher in 10 and 60 days old piglets than in the control group (P<0,05–0,001)
Positive changes in the immune defence have been revealed in the piglets produced by the gilts of the experimental group.
It can be proved by the lower number of piglets having symptoms of gastric disturbances (lower by 1, 5–1, 9 times) and the better durability of the piglets born.
Brovaglukin had an influence on the morphological state of the immunocompetent organs (Table 3).

Table 3. Live weight of immunocompetent organs in piglets

Group	Thymus weight, g	Thymus index, %	Spleen weight g	Spleen index, %
Control	1,09±0,01	0,172	0,61±0,51	0,081
Experimental	1,15±0,01*	0,212**	0,75±0,20	0,096

Note: *P<0, 05 and ** P<0, 01

The data in Table 3 show that the use of brovaglukin stimulated the increase in the protective functions of the piglets. It can be proved by the increase in the weights of thymus and spleen and by the increase in the indices of the above organs.
Blood is one the mobile systems in which the state and the processes of metabolism in the body are reflected (Table 4).

Table 4. Biochemical values of blood in piglets

Group	Protein %	Calcium mg %	Phosphorus mcg %	Vitamin A, mcg %	Glucose mmol/l
Control	5,48±0,20	8,91±0,22	4,27±0,20	46,8±2,01	3,42±0,2
Experimental	6,75±0,21*	10,65±0,31	5,58±0,22*	53,2±1,96**	4,11±0,2*
Referent index	7–8,4	10–14	40–60	30,0–70,0	4,5–10,0

Note *P<0, 05; **P<0, 01 in ratio to the control.

It the can be seen from Table 4 that biochemical indices of the gilts from the control group are significantly different from the ones of the experimental animals The level of protein in the animals of the control group was lower by 8,9%, calcium – by 15,9%, phosphorus –by 23,5%, vitamin A-by 12,1%, glucose – by 16,8% than in the experimental group.
The analysis of the data received shows that the use of brovaglukin affected the productive properties of the gilts under investigation and the litter produced by the above gilts (Table 5).

Table 5. Reproductive qualities of gilts

Group	Multi foetus, number of piglets	Large size of foetus	Number of piglets born	Milking quality, kg
Control (n=18)	10,6±0,21	1,21±0,08	173	58,1±1,40
Experimental (n=19)	11,7±0,15*	1,32±0,05	220	62,8±1,34**

Note:*P<0, 05; ** P<0, 01

It can be seen from Table 5 that the gilts of the experimental group had better indices of reproductivity than the gilts of the control group.

The experimental gilts exceeded the control ones on the number of piglets born by 27, 1%, the largeness of foetus by 9, 0% and in multifoetus –by 8, 1%.

During the experiment the positive effect of brovaglukin on the growth of piglets was revealed (Table 6).

Table 6. Growth intensity, durability, and morbidity of piglets

Group	Age of piglets, days			Morbidity, %	Durability, %
	10	21	60		
Control	2,63±0,20	4,90±0,02	15,7±0,2	21	90,4±0,30
Experimental	2,95±0,18	5,11±0,03*	16,8±0,3*	12	94,8±0,34**

Note: *p<0, 05; **p<0, 01

During the suckling period the piglets produced by the gilts of the experimental group grew more intensively: on the 10^{th} day the growth intensity index was higher by 12,1%, by the 21^{st} day – by 4,2% and on the 60^{th} day of their life – by 7% as compared to the piglets born by the gilts from the control group. The average daily weight gains were 279g, it is by 6, 1% higher than the values in the control group

CONCLUSION

On the basis of the data received during the experiment it has been stated that brovaglukin provides the organs of the gilts with the essential mineral substances that intensify metabolic processes, stimulate body natural resistance and productive potential of the gilts. The combination of sulphanilamides inhibits the growth and reproduction of microorganisms. Phosphorus has general stimulating action and activates the fermentation processes, Mg promotes protein and carbohydrate metabolism, cholinchloride regulates phosphorous and lipid metabolism. The use of the preparation in the dose 4mg per 10kg of live weight has positive influence on the reproductive qualities of pregnant gilts, on the productivity and durability of the piglets produced by the gilts.

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