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Productive and interior features of piglets when using biogenic stimulators Sitr and ST.

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ABSTRACT

The use of biogenic stimulators of ST and Sitr during the growth of piglets promotes the activation of their growth and an increase in the level of oxidation-reduction processes associated with enhanced protein metabolism. The most effective is injections of stimulant Sitr in a dose of 0.1ml per 1 kg of live weight.

Keywords: biogenic stimulants, piglets, growth, resistance, interior.

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INTRODUCTION

Growing wean piglets is one of the most difficult and critical moments in the technological chain of pork production. Many problems of growing young farm animals and poultry remain relevant [1, 2].

The negative influence of technological factors of modern industrial systems of growing in pigs can be leveled by the use of biogenic stimulators to enhance physiological processes that activate the functional reserves potentially available in the body [3, 4].

Biogenic stimulators are drugs whose biological activity is due to the type of tissue used to produce it.

In the experiment, biological stimulants (SITR) - a bee created on the basis of the beetle brood and (ST) - from adult drone bees were used.

The purpose of our research was to study the actions of new biogenic stimulants on the growth, development, safety and hematological parameters of piglets on growth.

MATERIAL AND METHODS

The scientific and production experience was carried out at the "Polyus" pig-breeding complex of OJSC "Kavkaz-Myaso". After weaning, 60 pigs of the CM-1 breed of the Krasnodar type were selected from the sows, which were divided into 3 groups of 20 heads each, the groups were formed according to the principle of analogues, keeping the nesting accessory.

The animals of the experimental groups were injected subcutaneously according to the scheme presented in Table 1.

Table 1: Scheme of production experience

Groups	Number of animals heads	Name of the preparation	Dose of injection of the drug per 1 kg of live weight, ml	Multiplicity of drug administration
I experienced	20	ST	0,1	Three times after 7 days
II experienced	20	SITR	0,1	Three times after 7 days
III control	20	Saline	0,1	Three times after 7 days

At the age of 2 and 3 months, 5 blood samples from each experimental group were collected for hematological and biochemical studies. Blood tests were carried out in the laboratory of the North Caucasus Area Scientific Research Veterinary Institute according to generally accepted methods.

RESULTS AND DISCUSSION

The results of our studies showed that the pigs of the experimental groups had different growth rates (Table 2). At the age of two months, the piglets of group II, stimulated with SITR, had the greatest live weight of 23.00 kg and were highly superior to the piglets of the 3rd control group by 2.89 kg ($B > 0.999$). The piglets of the 1st experimental group, where the stimulant ST was used, also significantly exceeded their analogues of group III by living weight by 2.23 kg ($B > 0.999$). The same pattern was maintained until the end of the period of growing. Thus, at the age of 3 months the superiority of the pigs of the 2nd test group over the control group was 4.32 kg ($B > 0.999$), while the animals of the I experimental group, respectively, 3.23 kg ($B > 0.999$). Preservation of pigs on the growth in all experimental groups was 100%.

An analysis of the weighting method for calculating the growth of animals revealed some features of the dynamics of the absolute, average daily and relative increase in live weight. Our research has established that the pigs of Groups I and II stimulated by ST and SITR were superior to piglets - the analogues of the third

control group at the age of two months in absolute increments of 2.21 and 2.85 kg ($B > 0.999$), in three months at 1.00 and 1, 43 kg ($B > 0.99 - 0.999$), and for the entire period of cultivation by 3.21 and 4.28 kg ($B > 0.999$), respectively (Fig. 1).

Table 2: Dynamics of live weight and piglets' safety during the period of growing

Groups	Age of days				Preservation of piglets during the period of growing, %
	28		60	90	
	Number of piglets	M±m	M±m	M±m	
I experienced	20	7,48±0,08	22,34±0,11	37,58±0,20	100
II experienced	20	7,50±0,09	23,00±0,15	38,67±0,27	100
III control	20	7,46±0,08	20,11±0,12	34,35±0,23	100

The average daily gain of live weight was also the highest in pigs, which were administered biogenic stimulators ST and Sitr (Fig. 2). Thus, the pigs of groups I and II exceeded III control group by the average daily gain of live weight at the two-month age by 69.4 and 89.4 g ($B > 0.999$), at the age of three months by 33.3 and 47.6 g ($B > 0.999$) and for the entire period of growing by 51.8 and 69.0 g ($B > 0.999$), respectively.

The relative increase in live weight, showing the energy of growth of animals was the highest in pigs stimulated by drugs ST and Sitr (Fig. 3). During the whole period of growing, the youngsters of group I and II outperformed the analogues of the third control group for this indicator by 41.95 and 55.14%.

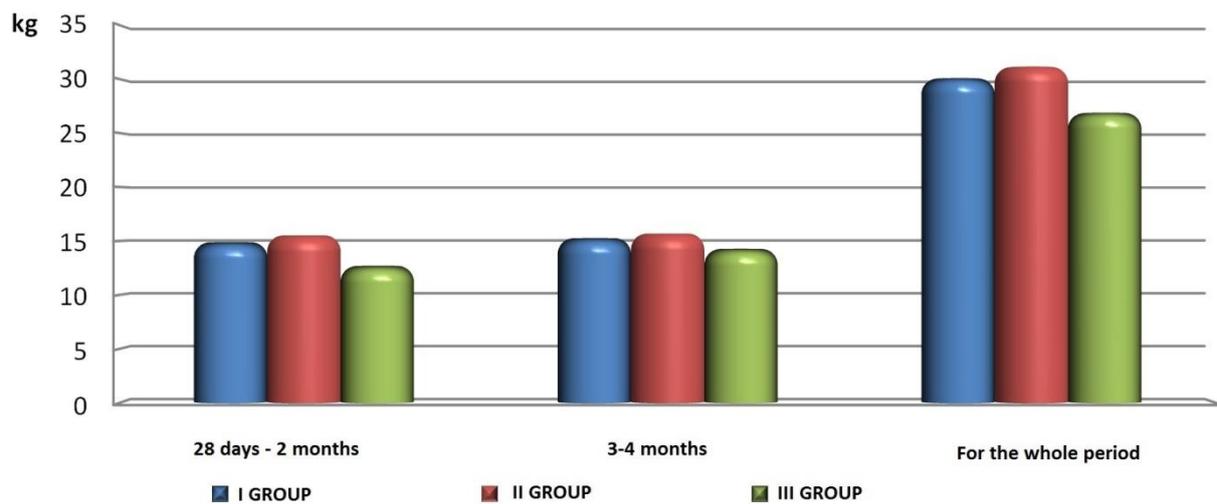


Figure 1: Absolute growth of live weight of piglets during the period of growing

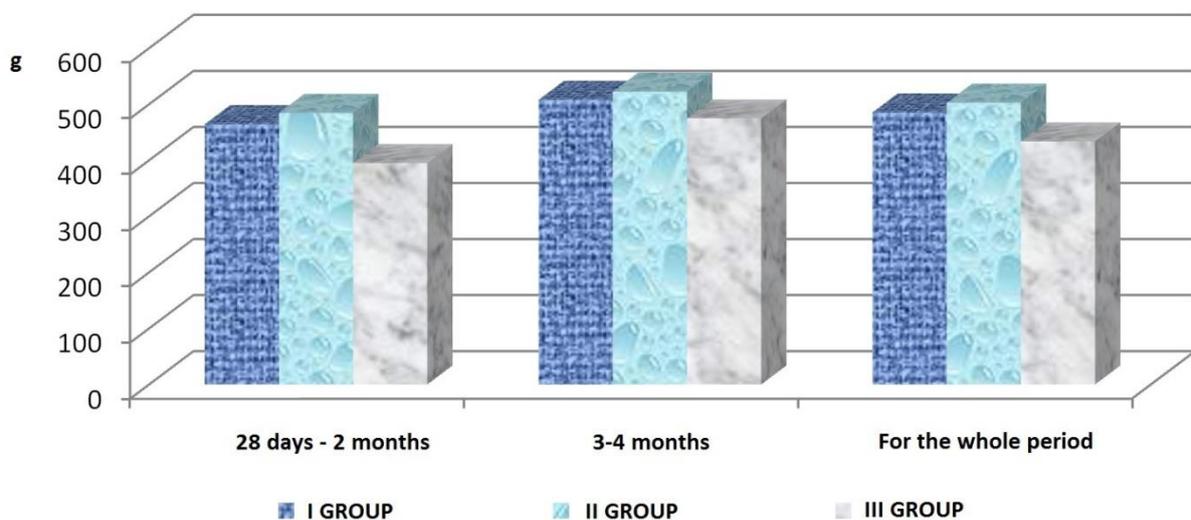


Figure 2: Average daily gain in live weight of piglets on growing

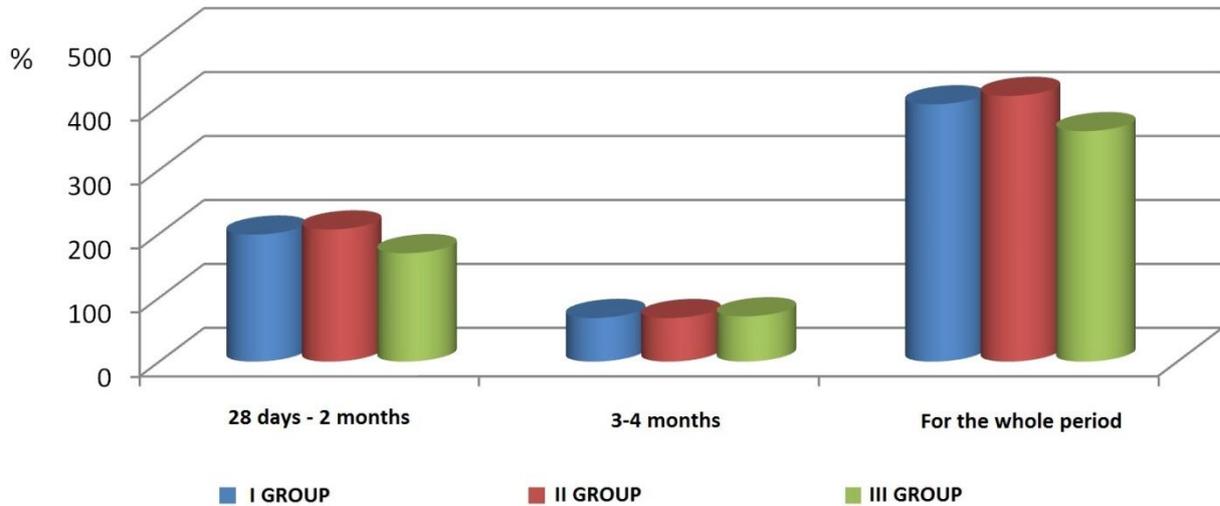


Figure 3: Relative growth of live weight of piglets during the period of growing

The use of biogenic stimulants reflected on the morphological and biochemical composition of the blood of piglets of weaners.

When studying the effect of nutrient stimulants on the animal organism, interior values are of great importance. One of the main interior indicators of the body is blood. Blood is a convenient object of study, which indicates the presence or absence of changes occurring in the body under the influence of certain factors.

Our investigations showed that the greatest amount of hemoglobin at the age of two months was in the blood of piglets of I and II experimental groups, which were stimulated with biogenic preparations of ST and SITR (Table 3). They exceeded the analogues of the third control group by 6.42 and 8.14%, this indicates that the organism of the piglets has a positive reaction to the injection of biogenic stimulants.

Formed blood elements are represented mainly by red blood cells, which constitute about 95% of the total number of blood cells.

A higher concentration of erythrocytes in the blood had piglets stimulated by biogenic preparations. The superiority of the I and II group pigs over the Group III analogs in the number of red blood cells was 10.25% and 13.35% ($B > 0.95$).

Leukocytes perform a protective function in the animal's body. Our studies established that the number of leukocytes in the blood of piglets of all experimental groups was within the physiological norm. However, it should be noted that the pigs I and II of the group stimulated by the preparations of ST and SITR were superior to the control group by the number of leukocytes by 9.19 and 12.37% ($B > 0.95$), which indicates that the biogenic stimulants activate the protective function piglets.

Table 3: Morphological and biochemical indicators of blood

Index	Group		
	I	II	III
At two months of age			
Hemoglobin, g / l	106,84±1,25	108,56±1,44	100,39±1,58
Erythrocytes, t / l	5,70±0,19	5,86±0,22	5,17±0,24
Leukocytes, g / l	13,06±0,29	13,44±0,35	11,96±0,38
Reserve alkalinity, vol.% CO ₂	48,89±1,12	49,13±1,08	41,55±1,23
At three months of age			

Hemoglobin, g / l	115,04±1,37	116,28±1,80	105,17±1,66
Erythrocytes, t / l	6,90±0,27	6,99±0,30	6,18±0,25
Leukocytes, g / l	14,58±0,48	14,65±0,50	13,21±0,52
Reserve alkalinity, vol.% CO ₂	53,20±1,28	53,26±1,37	47,03±1,40

The reserve alkalinity of the blood shows how many animals are provided with mineral substances, how they are provided with acid-base balance and buffer properties of blood. Our researches established that the blood of piglets stimulated by biogenic stimulators ST and SITR had a higher alkaline reserve. Therefore, the piglets of group I and II exceeded the analogues of the control group by 7.34 and 7.58 vol. % CO₂ (B> 0.99).

At the age of three months, a similar pattern was observed. The highest hemoglobin content in the blood is 9.38 and 10.56% (B> 0.95), the erythrocytes by 11.65 and 13.11% (B> 0.99), the leukocytes by 10.37 and 10.90% (B> 0.99) and an alkaline reserve of 14.18 and 13.25% (B> 0.99) was detected in piglets of Groups I and II, which were administered biogenic stimulators ST and SITP, in comparison with the analogues of the III control group.

An important indicator of protein metabolism in the body are proteins, their qualitative and quantitative characteristics.

Our studies found that the content of total protein and protein fractions in the blood serum of pigs I and II groups was higher (Table 4). Piglets I and II of the group receiving injections of biogenic preparations ST and SITR were superior to the control group analogues in terms of total protein content in serum at two-month age by 5.36 and 5.94% (B> 0.95), and at the age of three months by 5, 09 and 5.37% (B> 0.95).

Table 4: Content of total protein and protein fractions in blood serum of piglets, g / l

Index	Group		
	I	II	III
At two months of age			
Total protein	67,20±0,68	67,57±0,45	63,78±0,55
Albumins	27,24±0,30	27,56±0,38	26,35±0,28
Globulins:			
-alpha	11,69±0,22	11,72±0,25	10,91±0,22
-beta	13,00±0,13	12,99±0,20	12,26±0,19
-gamma	15,27±0,50	15,30±0,38	14,26±0,31
At three months of age			
Total protein	68,15±0,74	68,33±0,47	64,85±0,50
Albumins	27,86±0,25	27,90±0,31	26,70±0,37
Globulins:			
-alpha	11,70±0,22	11,72±0,18	11,06±0,16
-beta	13,01±0,15	13,10±0,14	12,40±0,20
-gamma	15,58±0,32	15,61±0,25	14,69±0,40

It is known that the main types of proteins that take part in metabolism and regulate metabolic processes are albumins. The results of our studies indicate that the dynamics of their content is similar to the change in the concentration of total protein in blood serum. The highest content of albumins was observed in the blood serum of pigs of Groups I and II. Their superiority over the analogues of the third control group was 3.38 and 4.59 at the age of two months, and at 4.34 and 4.49% at the age of three months.

Another important group of whey proteins are globulins - as a factor of humoral immunity. This fraction includes antibodies, most of which are gamma globulins.

The data obtained by us show that the content of globulins in the blood serum is related to the growth rate of piglets.

The content of alpha-globulin was also greatest in piglets of I and II experimental groups. They exceeded the analogues of group III in this parameter at the age of two months by 7.15 and 7.42% ($B > 0.95$), and at the age of three months, respectively, by 5.79 and 5.97%. A similar picture was observed for the beta-globulin fraction. Piglets of Groups I and II exceeded III at the two-month age by 6.04 and 5.22%, and in the three-month period by 4.92 and 5.65%.

The highest content of gamma globulins, which are carriers of antibodies, possessed in all age periods piglets stimulated by biogenic preparations of ST and SITR. In this indicator, the pigs of Groups I and II exceeded III at the two-month age by 7.08 and 7.29% ($B > 0.95$), and in the three-month period by 6.06 and 6.26% ($B > 0.95$).

The study of the effect of biogenic stimulants on the natural resistance of the wean-wean organism showed that their use increases the bactericidal and lysozyme activity of serum. Piglets I and II groups stimulated with drugs ST and SITR exceeded the analogues of the third control group for bactericidal activity at the age of two months by 6.58 and 7.04% ($B > 0.95$), and at the age of three months by 6.93 and 7.25 % ($B > 0.99$), and by lysozyme activity of serum, respectively, at two months of age by 4.1 and 4.18%, in the three-month period by 4.57 and 4.64% ($B > 0.95$).

CONCLUSION

Thus, the studies lead to the conclusion that injections of biogenic ST and SITP stimulants to piglets on growing in a dose of 0.1 ml per 1 kg of live weight, three times after 7 days lead to activation of growth and development of piglets and contribute to an increase in the level of redox processes, associated with a strong protein metabolism, and indicators of the protective factors of the body.

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