

# Increasing the productivity and preservation of pigs by remedies of natural origin

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**Abstract.** Research materials on the use of herbal infusions for the correction of weaning stress in piglets, as well as the complex use of natural products as stress correctors are presented in the article. Infusions of medicinal plants from the leaves of nettle, plantain, rose hips and rowan were used to normalize metabolism and increase the overall immunological resistance of the body. They are distinguished by good tolerance, very rare development of negative side reactions, even with prolonged use. It has been experimentally established that the adaptogenic effect of infusions of nettle, plantain, wild rose and rowan is manifested by an increase in the general nonspecific resistance of the animal body due to the effect on the stress-limiting systems of the body. As a result of the studies carried out, it was found that the use of medicinal plants had a positive effect on the use of feed nutrients by animals and a change in the live weight of pigs. The complex use of natural remedies contributed to an increase in the growth rate of young animals and, ultimately, to an increase in their preservation and productivity. The use of rose hip infusions 20 days before weaning of piglets from sows turned out to be the most effective in terms of preservation, growth and additional income when growing piglets.

## 1 Introduction

Intensive livestock management involves taking into account the physiological capabilities of the animal organism at all stages of their individual development. Currently, stress remains an urgent problem in animal husbandry. There are especially many different unfavorable stress factors in pig production. Stressogenic nature is associated with the impact on the animal's body of factors of early weaning, rearrangements, transport stress, physical inactivity, informational and emotional stress, therapeutic and prophylactic measures and other stress factors [1, 4, 5]. The regulatory activity of the body, when exposed to unfavorable technological factors, requires colossal energy and plastic costs under conditions of intense functioning of all organs and systems, which can lead to suppression of immunity, disruption of the gastrointestinal tract, impairment of reproductive functions and, in addition, to increasing the risk of developing various diseases and reducing the productivity of animals [6, 7, 8].

Thus, the search for new drugs for the correction of weaning stress, as well as the complex use of herbal remedies and antioxidants as stress correctors is of great scientific and practical importance.

The purpose of research was to increase the productivity and preservation of weaned piglets in a single farm conditions.

The objectives of the research were:

to study the effect of drinking infusions of various herbs on:

- growth and development of weaned pigs;
- preservation of weaned piglets;
- fattening qualities of piglets;

to calculate the economic efficiency of the research carried out.

## 2 Material and methods

In recent years, there has been a rapidly growing interest in the use of alternative methods for treating animals in the world, which is associated with the dissatisfaction of doctors and animal owners with drugs and approaches traditionally used in veterinary medicine. In addition, it is obvious that potent (biologically aggressive) agents are far from always suitable for increasing resistance and improving the productivity of animals [2, 3, 9, 10].

Scientific and economic experiments were carried out according to the corresponding scheme (table 1).

Five groups of animals that were analogous in terms of age, breed and productivity of the parents were formed.

Before the start of the experiments, the piglets were weighed, a clinical examination was carried out: the condition of the skin and individual body systems (respiratory, cardiac, digestive) was determined.

**Table 1.** Scheme of experiment at weaning at 60 days of age

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Group number	Number of animals, heads	Daily dose of infusion, ml			
		nettle	plantain	rose hip	rowan
Control	4	-	-	-	-
1	4	45	-	-	-
2	4	-	20	-	-
3	4	-	-	45	-
4	12	-	-	-	45

The suckling pigs were fed infusions of various plants 20 days before weaning at the age of 60 days.

Clinically healthy suckling piglets of different sexes, at the age of 40 days, were selected for the study. In the control group, remedies of natural origin were not used, the piglets of the first experimental group were given an infusion of nettle leaves, the pigs of the second experimental group received an infusion of plantain leaves, in the third experimental group, an infusion of rose hips was used, the fourth experimental group received an infusion of rowan fruits.

Microclimate parameters were maintained within the permissible zoohygienic standards. Thus, the negative influence of the diet and microclimate on the piglets' organism was excluded.

### 3 Results and discussion

Most herbal remedies are close to the body of animals by their chemical nature. In the course of long evolution, animals have adapted to the assimilation of various plant components, which are easily included in biochemical processes. They are distinguished by good tolerance, very rare development of negative side reactions, even with prolonged use.

Infusions of medicinal plants from the leaves of nettle, plantain and fruits of rose hip and rowan are used to normalize metabolism and increase the overall immunological resistance of the body.

As a result of the studies carried out, it was found that animals in the control and all experimental groups had the same live weight at birth (table 2).

Live weight at birth ranged from 1.04 kg in the second experimental group to 1.09 kg in the control group.

The data given in Table 2 indicate that the average weight of young stock to weaning in piglets of all groups was the same (from 15.7 kg to 16.2 kg) as well as the average live weight of suckling piglets at birth (1.04 - 1.09 kg).

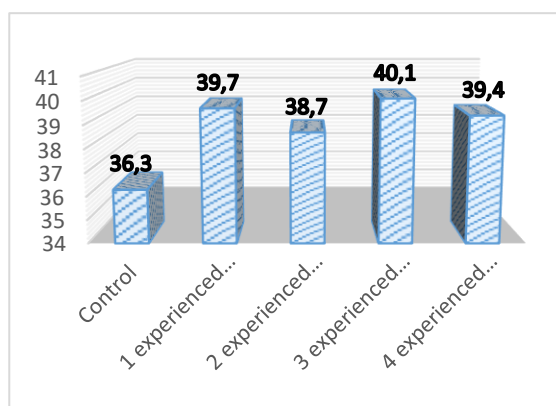
The average weight of weaned pigs by the age of 4 months in the control and experimental groups differed markedly.

**Table 2.** Live weight of piglets at different age periods.

Indicators	Control group	Drinking infusions 20 days before weaning			
		1st experimental nettle	2nd experimental plantain	3rd experimental rose hip	4th experimental rowan
Average weight of one head at birth, kg	1.09 ± 0.06	1.05 ± 0.21	1.04 ± 0.03	1.07 ± 0.08	1.06 ± 0.02
Average weight of one head at weaning, kg	15.7 ± 0.39	16.1 ± 0.41	15.7 ± 0.38	16.2 ± 0.45	15.8 ± 0.42
Average weight of one head at 4 months, kg	36.3 ± 0.67	39.7 ± 0.70***	38.7 ± 0.68*	40.1 ± 0.61***	39.4 ± 0.74**

The differences are statistically significant: \* - P < 0.05; \*\* - P < 0.01; \*\*\* - P < 0.001

In the control group the piglets weighed on average 36.3 kg, when the piglets received nettle infusion, their weight increased by 9.4% (P < 0.001), plantain infusion - by 6.6% (P < 0.05), rose hip infusion - by 10.5% (P < 0.001) and rowan infusion - by 8.5% (P < 0.01) (Figure 1).



**Fig. 1.** Average weight of one head at 4 months of age, at weaning of piglets at 60 days

Average daily gains were higher in pigs that received infusions of nettle (322.1 g) and rose hips (325.3 g) (table 3).

Piglets of the 3rd experimental group, which received rose hip infusions, had the greatest gain. Their growth was higher in comparison with piglets in the control, 1st, 2nd

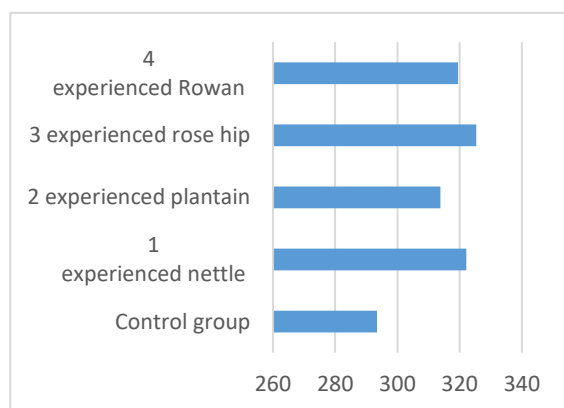
and 4th experimental groups by 31.9 g; 3.2 g; 11.5 g and 5.8 g, respectively, or on average by 7.0% - 10.8% (Figure 2).

**Table 3.** Indicators of average daily gain and preservation of piglets up to 4 months of age.

Indicators	Control group	Drinking infusions 20 days before weaning			
		1st experimental nettle	2nd experimental plantain	3rd experimental rose hip	4th experimental rowan
Average daily gain of 1 head for the entire growing period, g	293.4 ± 31.0	322.1 ± 26.0	313.8 ± 27.0	325.3 ± 24.0	319.5 ± 25.0
% of preservation from weaning up to 4 months	83.3	91.7	83.3	100.0	83.3

The differences are statistically significant: \* - P < 0.05; \*\* - P < 0.01; \*\*\* - P < 0.001

The preservation of piglets from weaning to 4 months of age was higher in the 1st (91.7%) and 3rd (100%) experimental groups, and in the 2nd and 4th experimental groups the preservation of piglets was equal to the indicator of control group – 83.3%.



**Fig. 2.** Average daily gains of weaned pigs from birth to 4 months of age, at weaning of pigs at 60 days.

The obtained results can be explained by the presence of a significant amount of vitamins and other biological active substances in rose hips fruits and nettle leaves, among which vitamins A, E and C are of paramount importance for the formation of the body's defenses in young animals, which contribute to an increase in the

viability and a decrease in the incidence of diseases in animals.

The presence of an adaptogenic effect of infusions of nettle, plantain, wild rose and rowan is manifested by an increase in the general nonspecific resistance of the animal body due to the effect on the stress-limiting systems of the body, an improvement in the growth rate of young animals and, ultimately, an increase in their preservation and productivity.

Thus, 20 days before the weaning of piglets, the use of infusions from medicinal plants as agents that increase the resistance of the animal body to the action of various stress factors is assumed.

The use of infusions from medicinal plants allows to increase the preservation and productivity of piglets after weaning.

## 4 Conclusions

1. The use of infusions of nettle, plantain, wild rose and rowan 20 days before weaning of suckling pigs allows to increase the live weight of pigs by 4 months of age by 9.4%; 6.6%; 10.5% and 8.5%, respectively.

2. Piglets of the 3rd experimental group, which received rose hip infusions, had the highest average daily gain. Their growth was higher than that of piglets in the control, 1st, 2nd and 4th experimental groups by 31.9 g; 3.2 g; 11.5 g and 5.8 g, respectively, or an average of 7.0-10.8%.

3. The preservation of piglets from weaning to 4 months of age was higher in the 1st (91.7%) and 3rd (100%) experimental groups, where the piglets received infusions of nettle and rose hips. In the 2nd and 4th experimental groups, the preservation of piglets was equal to the indicator of control group and amounted to 83.3%.

4. The use of infusions of nettle, plantain, wild rose and rowan 20 days before weaning piglets from sows, allows you to get additional income calculated for 1000 pigs, 294.00; 235.20; 323.40 and 294.00 thousand rubles, respectively.

5. The use of rose hip infusions 20 days before weaning of piglets from sows turned out to be the most effective in terms of preservation, growth and additional income when raising piglets.

## References

1. A.I. Dedkova, N.N. Sergeeva, V.N. Dedkov, Vestnik OrelSAU. **1** 48-49 (2011)
2. L.L. Thoma, R.D. Goodband, J.C. Woodworth, M.D. Tokach, J.M. Derouchey. Transl Anim Sci. 351–357 (2018)
3. J.M. Fohse, R.T. Zijlstra and B.P. Willing. Animal Frontiers. **6** 30–36 (2016).
4. H.K. Allen, U.Y. Levine, T. Looft, M. Bandrick, T.A. Casey Trends in Microbiology Treatment, promotion, commotion: Antibiotic alternatives in food-producing animals **21** (3) 114-119 (2013)

5. G. Pritchard, I. Dennis, J. Waddilove Biosecurity *Reducing disease risks to pig breeding herds In Practic* **27** (5) 230-237 (2005)
6. Y. Vatnikov, Y. Morteza, S. Engashev, P. Rudenko, V. Lutsay, E. Kulikov, A. Karamyan, T. Dremova, A. Tadzhiyeva, A. Strizhakov, V. Kuznetsov, Y. Sergey, E. Shlindova *Int. J of Pharmac. Res. Clinical and hematological parameters for selecting the optimal dose of the phytopreparation "deprim", containing an extract of the herb hypericum perforatum l., in husbandry* **12** 2731-2742 (2020)
7. A.Z.M. Salem, R. Rojo, D. Cardoso, O.D. Montañez, L.M. Camacho, *Plant-Phytochem. in Animal Nutrition Plant secondary metabolites in animal feeds* 1-31 (2011)
8. V.N. Dedkov *Modern agro-ind. compl. through the eyes of young res. Microbiological processing of spring wheat straw with the preparation Baikal EM-1* (Orel, 2012)
9. A.I. Dedkova, N.N. Sergeeva, S.N. Khimicheva *Vestnik OrelGAU* **5**(44) 36-38 (2013)
10. A.E. Kutsova, I.V. Sergienko, A.V. Alehina, I.S. Kosenko, S.V. Kutsov *In vivo experiments to determine the efficiency of the elementary status correction* *IOP Conf. Ser.: Earth and Environ. Sci.* **422** 1 012076 (10 January 2020)