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Correction of Condition Hypoxia of Pregnant Sows and Postnatal Adaptation of Piglets.

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ABSTRACT

The analysis of the relationship of the hypoxic condition in pregnant sows with the emergence of the immunobiological status of their offspring in the neonatal period of development. We took into account the individual characteristics of the system "mother - fetus - newborn baby." We used an integrated approach to the study of the influence of the conditions of hypoxia during pregnancy on the performance of the immunobiological status of piglets in the neonatal period. To normalize the detection of pathological defect studied the use of oxygen feed mixture for pregnant sows. After feeding the said mixture revealed differences in the formation of the immunobiological status in neonatal piglets from mothers treated with an oxygen feed mixture, as compared with the offspring of sows that do not apply named feed mixture. It is proved that the level of immunobiological protection of the organism and adaptive potential to the conditions of the environment are interdependent and mutually. Therefore, the study of mechanisms of formation of the immunobiological status of neonatal hypoxic condition when transferred to the fetal period of development is the ultimate objective justification intensity protect the body in the early to the later periods of postnatal development.

Keywords: hypoxia, oxygen mixture, pregnant sows, piglets.

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INTRODUCTION

Successful reproduction of the herd and increase the productivity of livestock is largely prevent hypoxic changes in the body of the fetus, leading to severe diseases in the early neonatal period, [1, 2, 5, 10, 13]. Hypoxia - typical pathological process characterized by the development of oxygen starvation because of insufficient supply of oxygen to tissues, or violation of its use tissues [7, 8, 9, 12, 15]. None animal disease does not occur without a primary or secondary hypoxia and oxygen deficiency during pregnancy is a direct cause of disorders of vital activity in a biological system "mother - fetus - newborn baby" [1, 3, 4, 6 ,11].

It was found that the fetus in physiological pregnancy is in conditions of reduced oxygen supply [2, 3, 6, 12]. It is well known that hypoxia is the trigger of a number of pathological conditions of the fetus and newborn [1, 5, 6, 17, 18]. In view of the above is very clear urgent need for an early correction of hypoxic condition during pregnancy.

The object of study: sows during pregnancy and their offspring.

The subject of research are the offspring perinatal characteristics depending on the hypoxic condition of sows in the last period of pregnancy.

Objective: to study the correction of hypoxic state of pregnant sows and perinatal adaptation of piglets by feeding oxygen feed mixture in the second half of pregnancy.

Objectives of the study:

- Determine the effect of oxygen feed mixture on the physiological state of the body of pregnant sows;
- To assess the level of perinatal adaptation of piglets in the neonatal period.

MATERIALS AND METHODS

The studies were conducting based on agricultural cooperatives and peasant farms of Stavropol Territory. It was formed 2 groups of sows (15 goals each) and their piglets in the neonatal period (150 goals). Separation was carrying out on sows experimental and control groups in sensitivity to hypoxia during pregnancy. To confirm the hypoxic condition in sows in blood serum: calcium and phosphorus inorganic, total protein, alkalinity backup, the number of red blood cells and hemoglobin concentration [14, 16].

According to figures obtained by the experimental group sows 60 days before the expected farrowing, in addition to the basic diet once a day before the morning feeding fed oxygen feed mixture (CCS) in the amount of 300 g / head. The second group served as controls and received a basic diet without (CCS). A method for preparing this mixture comprises applying components and perform the following operations:

1) Mixing wholemeal oats (150 g) of the hips syrup (80 g);
2) As the foaming agent solution, gelatin solution (8%) 70 ml, previously dissolved in water at 70 ° C. Prior oxygenation mixture was incubated for 10 min .;
3) The mixture saturated with oxygen, whisking it under the tap oxygen with pressure of 0.5-0.7 MPa for 2 minutes to obtain a stable foam. Penawasmaintainingfor 25 minutes.

Piglets after birth (3, 5, 10 days) obtained from the experimental and control group of sows was measured leukocyte formula - for quantitative analysis in the chamber Goryaeva and quality counted in stained by Romanovsky-Giemsa smear. The content of hematological parameters - the instrument Automated Veterinary Hematology Analyzer PCE-90 VET. The concentration of immunoglobulins (A, G, M) - an automatic biochemical analyzer and ELISA ChemwellCombi V 1.03 (USA). The percentage of phagocytic activity of neutrophils (FAN%), phagocytic number (FCH), the phagocytic index (PI), the phagocytic capacity of blood (Feck) - for Kazanovsky SA, TA Anfinogenova (1987). Serum bactericidal activity - by O. SmirnovaBoyarskiif Kuzmina TA (1966). Lysozyme activity of blood serum - for VT Dorofeychuku (1998). The digital data processed by the methods of biometric Plohinskomu NA (1987), with the help of computer applications Microsoft Excel and BioStat.

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RESULTS AND DISCUSSION

In the study of pregnant sows at 60 days of pregnancy in both groups, there was a change of biochemical parameters. Reducing reserve alkalinity to 27,52 ± 1,12 vol.% CO2, calcium phosphorus ratio (calcium - 1,843 ± 0.18 mmol / l and phosphorus - 2,275 ± 0.16 mmol / l), increased total protein - 92,13 ± 2,4 g / l and a decrease in the concentration of ketone bodies - 3,24 ± 0,03 g% of the reference values. Simultaneously, there was a reduced content of erythrocytes to 4.93 ± 0.9 × 1012 / L, and the concentration of hemoglobin to 55.9 ± 0.6 g / l. These figures showed a shift of the acid-base balance toward acidosis. The data obtained can be say on the hypoxic conditions the mother's body on the 60th day of pregnancy, and because of the imminent appearance hypoxia in fetuses in the second half of pregnancy.

It was establishing that on the 60th day of pregnancy in both groups there was a change of biochemical parameters. Reduction of reserve alkalinity to about 27,52 ± 1,12. % CO2, calcium phosphorus ratio (calcium - 1,843 ± 0.18 mmol / l and phosphorus - 2,275 ± 0.16 mmol / l), increased total protein - 92,13 ± 2,4 g / l and a reduction in the concentration of ketone bodies - 3,24 ± 0,03 g% of the reference values. Simultaneously, there was a reduced content of erythrocytes to 4.93 ± 0.9 × 1012 / L, and the concentration of hemoglobin to 55.9 ± 0.6 g / l. These figures showed a shift of the acid-base balance toward acidosis. The data obtained can be argue on the hypoxic conditions the mother's body on the 60th day of pregnancy and the occurrence of hypoxia in fetuses in the second half of pregnancy.

When administered in the diet experienced sows (CCS), it has significantly improved appetite and increased the studied parameters, eliminating the hypoxic-acidotic effect. Thus on the 90th day of pregnancy (Fig. 1) in the test group were stabilized performance reserve alkalinity to 44,83 ± 2,01 vol% CO2, calcium - 2.38 ± 0.14 mmol / l, phosphorus - 1.71 ± 0.11 mmol / l, ketones - 2,02 ± 0,09 mg% total protein - 68,9 ± 1,17 g / l. Indicators of the hematopoietic called stabilized period to normative values. The number of erythrocytes was 6.51 ± 0.22 × 1012 / L and hemoglobin - 84.4 ± 0.31 g / l. However, the control group of individuals the second half of pregnancy showed no change in the hypoxic state, which was observed on the 60th day of studies.

On the positive trends in the research results there are grounds to assert that eats the mixture reduces the pathogenic effects of hypoxia and positive effect on the physiological state of the body of pregnant sows.

However, the main and most important effects is the action (CCF) to the level of perinatal adaptation of piglets from sows of the experimental group relative to the control. This confirmed in the distinction immunobiological status in the resulting progeny in the third, 5th and 10th day after birth (Fig. 2, 3, 4).

Correction of hypoxic state had a stimulating effect on hematopoiesis newborn piglets (Fig. 2). Therefore, the number of red blood cells and hemoglobin concentration piglets from the experimental group had higher values on the third day at 21.4%, in the fifth by 6.8% and in the 10th by 25.6%, and the concentration of hemoglobin, respectively - 14.5%, 4.9%, 34.2%. Also observed differences in humoral and cellular immunity. This was reflected in elevated levels of T-lymphocytes 35,64 ± 2,11% to 48,45 ± 3,19%, and B-lymphocytes from 12,11 ± 0,41% to 16,31% ± 0.52

This phagocytic activity of neutrophils was higher in piglets from sows experienced (17.8%, 24.3%, 18.2%), serum bactericidal activity to (17.9%, 18.7%, 18.3%), and lysozyme activity in the blood serum (21.4%, 13.6%, 20.8%) for the periods analyzed (Fig. 3).

The level of immunoglobulins (Ig A, Ig G, Ig M) over the study period in the offspring of sows gained control of scarce magnitude in relation to the experimental group (Fig. 4). Namely, Ig A was lowered to 3, and the 10th day of 35.3%, 38.1% and not exceed the value of 0,26 ± 0,04 g / l. Also Ig G was decreased and reached higher than 3.75 ± 0,09 g / l (20.8%, 16.3%), and was inferior in Ig M - (24.6%, 17.6%) and was only 0.49 ± 0.04 g / l.

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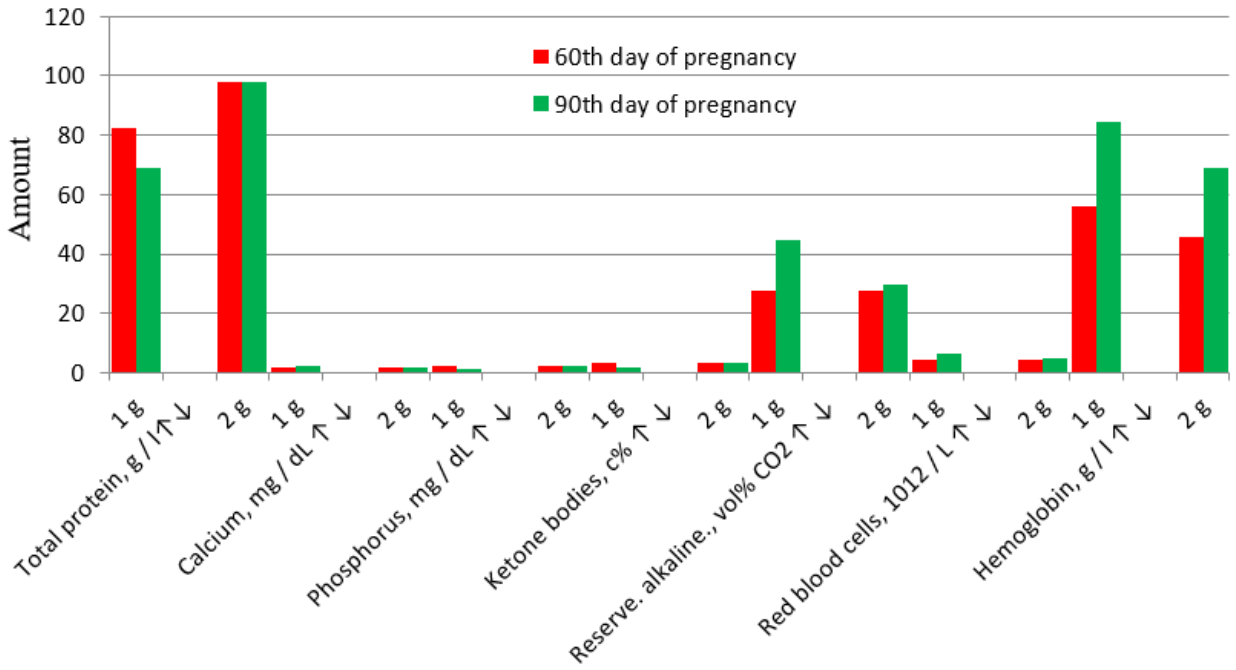

Figure 1: Biochemical indicators of pregnant sows.

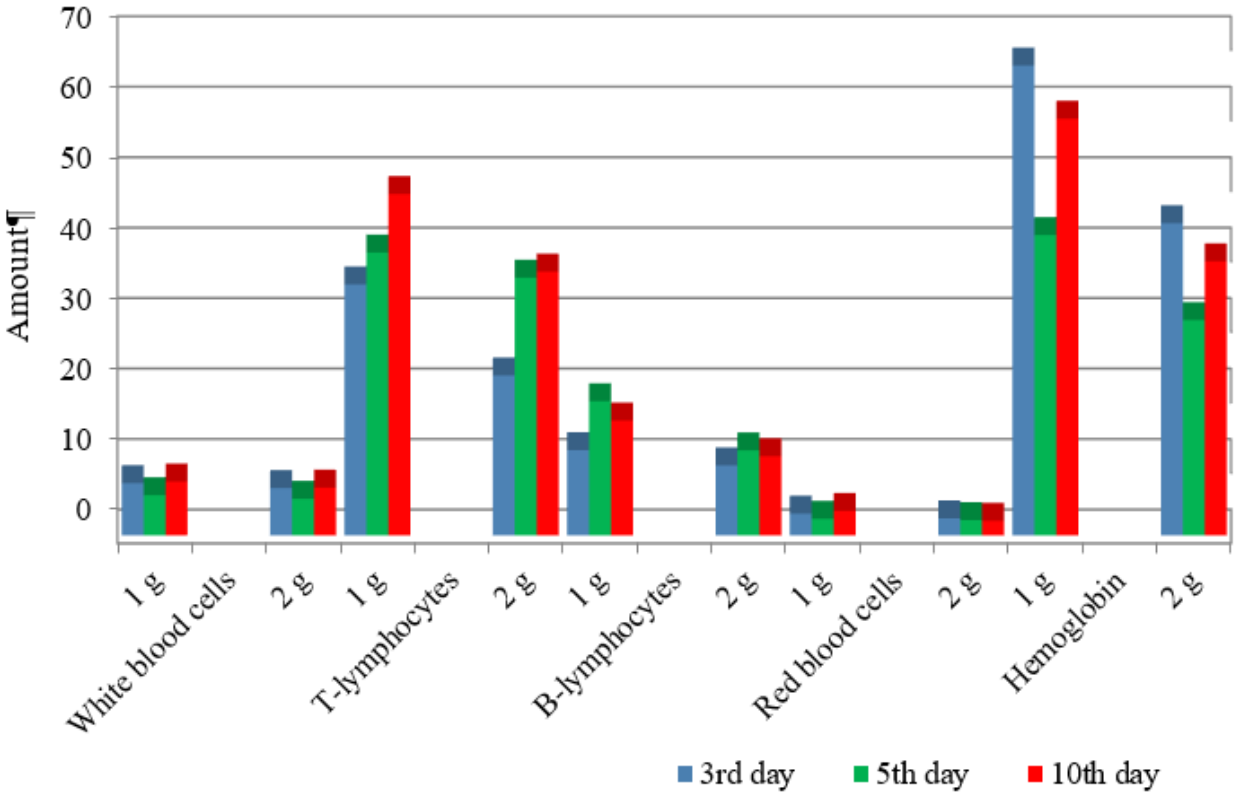

Figure 2: Hematologic parameters of newborn piglets

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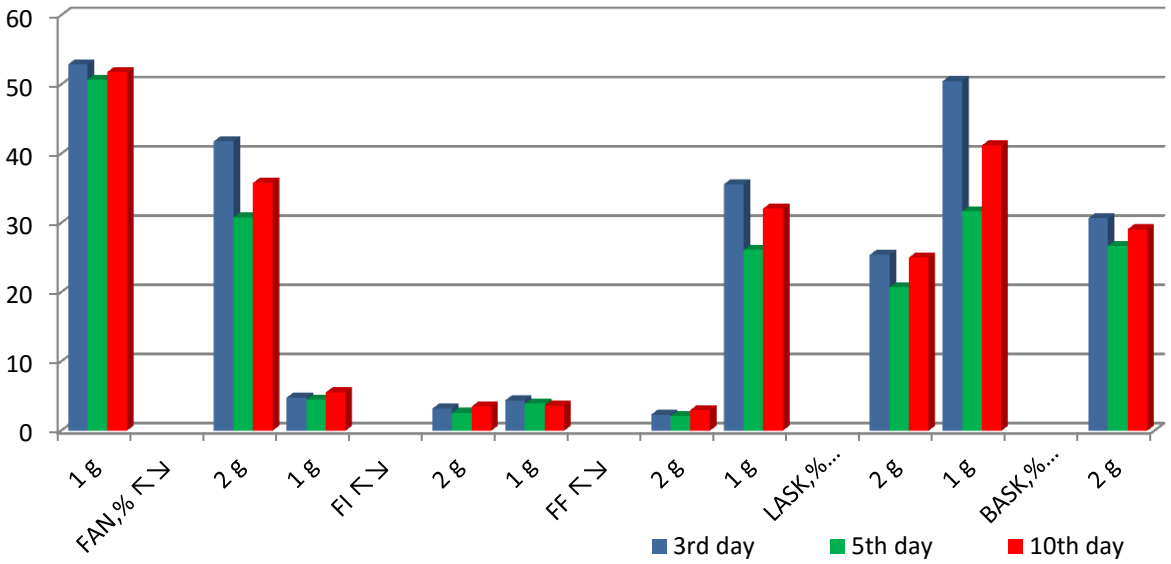

Figure 3: Factors of resistance of newborn piglets.

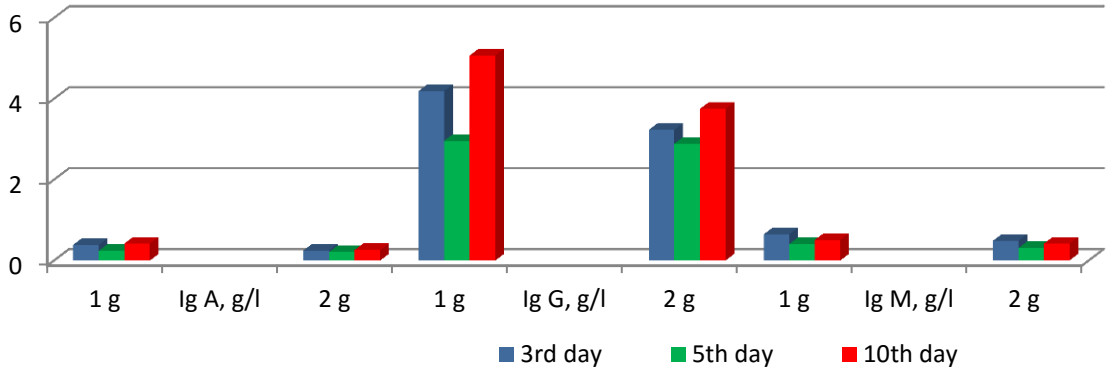

Figure 4: The concentration of immunoglobulins to piglets 3-, 5-, 10th day after birth

CONCLUSION

According to the survey found a negative impact on the formation of antenatal hypoxia immunobiological status of piglets in the neonatal period. The results obtained give grounds to conclude that the proposed feeding the feed mixture gave a positive result to eliminate the signs of hypoxia in pregnant sows and contributed to a more fulfilling perinatal adaptation of piglets in the neonatal period. Therefore, the use of the developed oxygen feed mixture can be recommended to improve the productive and reproductive potential in the pig industry.

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