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# THE INFLUENCE OF NEUROTROPIC - METABOLIC MEDICINES ON GLUCOSE LEVEL IN THE BLOOD OF SOWS AT THE DIFFERENT PERIODS OF PHYSIOLOGICAL STATE

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*It was found that the feeding of "Hlyutam 1M" to sows immediately after the weaning leads to a tendency to reduce the content of glucose just on the day after the feeding, but continues to influence it till the final stages of the sexual inclination. The glucose level - compared to the first day - increased by 9.3% on day 13 and decreased by 11.3% on day 28. The weaned period reduces by 1.6 days, so fertility and prolificacy indicators increase by 20%, 1.9 p., 16.8%. And also the number of stillborn piglets reduces by 0.8 p.*

***Glucose, sow, fertility, pigs, multiple pregnancy, Glutam 1M***

It was developed a number of biotechnological methods of sows reproductive ability stimulating to ensure a cyclical pork production (hormones, amino acids, vitamins and other biologically active substances) that affect not only the reproductive function and performance of females, but also the metabolic processes in their body [5, 7 11]. Thus, it was found that the use of hormones in combination with biologically active substances in 2 days after weaning helps to reduce the weaning period, and to increase female's fertility and multi-fertility as well. The biochemical composition of blood is changing, including the concentration of glucose [1, 2, 9].

A glucose content (as a marker of carbohydrate metabolism) in conditions of biologically active substances injections (feeding) and determination of its concentration on different days of the sexual cycle – especially after weaning – should be investigated.

The studies were performed in sows of large white breed at the Ltd. "Elita" farming.

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**Results of the study.** It should be noted that all the indicators of glucose in sows blood obtained are within the physiological norm.

The analysis of changes of glucose content in the blood of control group of animals indicates the possible decline of its content, including up to 1 day of sexual cycle. On the 13th day a glucose content increased by 13.8% ($P \leq 0,05$) if to compare with the 1st day of a sexual cycle, but it was not greater than after weaning (Fig. 1).

The content of glucose in blood of the control animals on the 28th day after the insemination has significantly decreased by 30.2% compared to the 13th day of a sexual cycle.

The glucose level in the blood of experimental animals from the day of medicines feeding completion to the first day of a sexual cycle was virtually the same. Further the changes of glucose level in the blood of experimental animals were similar with control one, but they gave false. On the 13th day a glucose level increased by 9.3% compared to the first day, and decreased by 11.3% on day 28.

Dynamics of glucose content changes in the blood of control females is associated to some extent with morphofunctional changes in their reproductive system. Three days after the lactation period glucose content remains high.

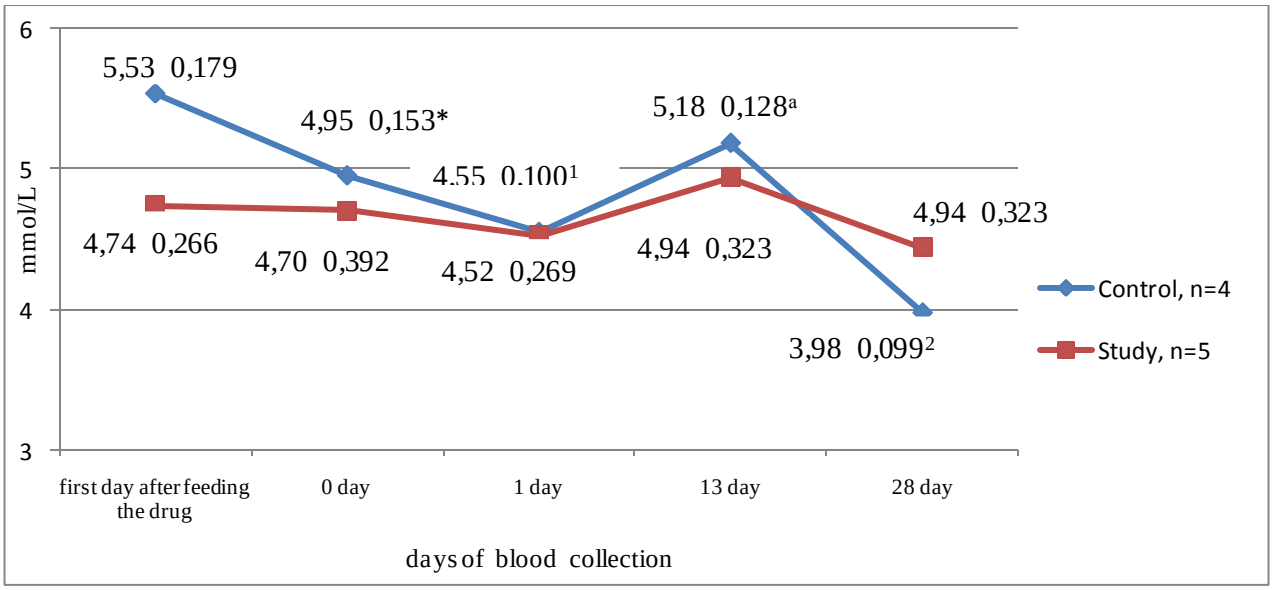


Fig. 1. The concentration of glucose in the blood sows on different days of the sexual cycle, after the introduction Hlutamu 1M, mmol / L

Note: *$p \leq 0,05$-compared to the first selection of blood; [1]$p \leq 0,05$- compared to 0-day sexual cycle; [a]$p \leq 0,01$-compared to the first day of the sexual cycle; [2]$p \leq 0,001$-compared to 13 days.

During the sexual inclination period a glucose content decreases and at the period of anestrus first day (when levels of sex hormones and gonadotropins decrease sharply as a result of ovulation completion) reaches a minimum.

The embryo implantation in the endometrial uterine [10] is very energy intensive process, which leads to an increase of glucose content in the blood on day 13 after the insemination. In the period when the fetus is almost formed in the female reproductive system [4] energy costs in its body reduce, and it leads to the decrease of glucose content in the blood.

Blood sampling was performed at different physiological states of the sow's organism: during the sexual inclination recovery phase and the insemination of females, and during the engraftment and fetus formation. Therefore the data of glucose content were united under these periods: I period - first three samplings; and II - the last two.

At the first period the level of glucose in experimental sows blood was lower by 7.4% compared with the control group of sows. At the second period in the experimental animals blood the concentration of carbohydrate was almost at the same level with control ones, as the difference was within the error (Table 1).

1.Kontsentration blood glucose sows on different days of the sexual cycle, mmol/L

| Periods | Group | | | | n | control sow that is not pregnant |
|---|---|---|---|---|---|---|
| | n | control | n | study | | |
| I | 12 | 5,02±0,276 | 15 | 4,65±0,297 | 3 | 5,13±0,145 |
| II | 8 | 4,58±0,385 | 10 | 4,69±0,308 | 2 | 5,20 |

But the group of experimental sows showed an increase of glucose content in their blood by 11.6% during the fetus formation. (Fig. 1).

A comparative analysis of reproductive ability of the animals shows that the experimental female fertility was higher by 20% compared with the control one, and a period of weaning was shorter by 1.6 days.

Total number of newborn piglets of experimental sows that were fed with "Hlyutam 1M" was higher by 39% compared with the control group of sows. Prolificacy was higher in the experimental group by 1.9 p. compared with control one.

The use of medicines helped to reduce the number of stillborn piglets by 0.8p. The weight of newborn piglets in the experimental group of sows was higher by 16.8% and 53.1% compared to control one. Survival of piglets weaned per day was also better in the experimental group of sows compared with control one - the number of weaned piglets is larger at 0.7 p. and the weight of newborn piglets increased by 9.6 kg, but within error (Table 2).

2. Description of the reproductive ability of experimental sows

| Index | Group | |
|---|---|---|
| | control | study |
| Lactation period, days. | 26,0±1,15 | 25,80±0,75 |
| Off-cycle period, days. | 6,4±0,66 | 4,8±0,48 |
| Conception, % | 80 | 100 |
| All born piglets, ch | 41 | 57 |
| Number of piglets in the nest, ch .: | 10,3±2,60 | 11,4±2,26 |
| of these, ch: alive | 9,3±2,64 | 11,2±2,21 |
| deadborn | 1,0±0,82 | 0,2±0,26 |
| The live weight of neonatal piglets kg. | 1,3±0,08 | 1,5±0,15 |
| Mass nests of newborn piglets kg. | 11,3±2,88 | 17,3±1,42 |
| Number of piglets at weaning, ch. | 9,6±0,88 | 10,3±1,85 |
| Mass nests at weaning, kg. | 62,3±6,60 | 71,9±13,21 |

To determine the connection between the dynamics of glucose content changes in the blood of sows at the different periods of physiological state and their prolificacy some correlation coefficients were calculated. It was found that the next day after the last sows feeding with neurotropic-metabolic medicines a correlation coefficient between glucose levels and the number of live pigs was a possible negative of a high degree connection r = -0,836; while in the group of control animals it was negative of a low degree – r=-0,170.

On the 0 and the 1$^{st}$ day of a sexual cycle (when sows were in a state of the sexual inclination) a coefficient of correlation between the level of glucose and a prolificacy in these two days was similar in the strength of connection to the first day of blood sampling and was r=-0,903 (P≤0,01), r=-0,860 (P≤0,05). Whereas, in control group of sows this connection was direct of a medium degree – r=0,426; and of a high one r=0,862 (P≤0,05), respectively.

On the 13th day of a sexual cycle a glucose level in the blood of the experimental sows increases, but the correlation coefficient between the carbohydrate

and prolificacy is almost unchanged (r=-0,857, P≤0,05). The group of control females showed a negative connection of an average degree r=-0,386.

As the level of glucose in animals blood on the 28th day of the sexual cycle in both groups decreases (but still a glucose level in the blood of the experimental animals was higher compared with the control group of animals), then the coefficient of correlation between the studied parameters changes : the coefficient of correlation in the group of experimental sows was plausible inverse of a moderate degree r=-0,778; in the group of control females a correlation coefficient was direct of a moderate degree of connection r = 0,480.

**A general conclusion**

1. Indicators of prolificacy in the group of experimental sows were higher by 1.9 p. and by 16.8% respectively.

2. In the group of control sows a glucose content in the blood is connected with a morphofunctional state of the reproductive system of sows. Feeding of "Hlyutam 1M" to sows within 1-3 days immediately after weaning causes a tendency to reduce the content of glucose in the blood in the period of a sexual inclination and during the early engraftment of embryos; and causes a tendency to increase it during the completion of the fetus formation.

3. In the group of experimental sow between a glucose content in the blood and a prolificacy a coefficient of correlation was plausible inverse of a high degree connection within r=-0,778 – r=-0,903; in control group of animals it ranged from r= -0,170 to r=0,862 (P≤0,05).

**List of Literature**

1. Andrushko O.B. Influence of biologically active substances boar sperm plasma on reproductive function of sows / O.B Andrushko // Scientific and Engineering. Bul. Inst of Animal Biology and State. H.-D. control. Inst of Veterinary Preparations and food. additives. - 2010 - Vol. 11, N 1. - P. 269-275.

2. Andrushko O.B. Features comprehensive action of hormones on the reproductive function of sows after ablactation / O.B Andrushko, M. Sharan // Animal biology. - 2010 - 12, № 1. - P. 322-328.

3. Bezverkha L. M./ Metabolic processes in sows by using neurotropic preparation metabolic action / L.M Bezverhaya, V.I Sheremeta // Collected Scientific Papers BNAU. Issue 1. 2014. - P. 83-86.

4. Veterinary obstetrics and gynecology. / V.A Akatov, G.A Kononov, A.I Pospelov, I. Smirnov. - L. Kolos, 1977. - 656 p.

5. Gidranovich V.I Effect of ascorbic acid and selenium on carbohydrate metabolism in pigs and piglets growth / V.I Gidranovich, M.E Ahtanina // Proceedings of the Academy of Agrarian Sciences of the Republic of Belarus № 4, 2001, pp 80-84.

6. Eremin A.P. Vitamin A deficiency and E of endogenous origin in pigs and the use of diprovita for their prophylaxis and therapy: dis. cand. vet. Sciences: 16.00.01 / Eremin Anatoly Petrovich. Voronezh., 2001. - 126 p. and E Vitamin A deficiency of endogenous origin in pigs and the use of diprovita for their prophylaxis and therapy: dis. cand. vet. Sciences: 16.00.01 / Eremin Anatoly Petrovich. Voronezh., 2001. - 126 p.

7. Kendysh I. Regulation of carbohydrate metabolism. - M .: Medicine, 1985. -271 p.

8. Kovalenko V.F. Age dynamics of cortisol and glucose in the blood serum of pigs of different gender / V.F Kovalenko, S. Usenko // Ukrainian Biochemical Journal. - T.74, № 4b. - Part 2. - 2002.- S.- 92-93.

9. Platanovska I.V Influence of complex hormones and blood irradiated UV rays on the reproductive function of sows: Author. Dissertation. for obtaining sciences. degree candidate. veterinary sciences on specials. 16.00.07 "Veterinary Obstetrics" / I.V Platanovska. - Lviv, 2007 - 20, [1] p.

10. R. H. F. Hunter. Physiology and technology of reproduction of domestic animals / [trans. ang. V.V Lavrovskogo, O.V Mischihi, A.I Philonenko]. - Moscow: "Kolos", 1984. - 320C.

11. Sheremeta V.I reproductive ability of sows for use after weaning biologically active drug / VI Sheremeta, O.S Menchinskay // Collected Scientific Papers BNAU. Issue 1. 2014. - P. 79-82.

12.http://www.rusagroug.ru