

способность и третье – объем эякулят, использование которых в уравнениях линейной регрессии с высокой статистической достоверностью ($P \leq 0,001-0,0001$) позволяет прогнозировать отдельные показатели воспроизводства.

Ключевые слова: хряки, белорусская мясная порода, показатели воспроизводства, коэффициенты корреляции, уравнения регрессии, прогнозирование.

Summary

Forecasting of reproductive qualities of male pigs of the byelorussian meat breed.

Shatskij M.A.

Reproductive qualities of male pigs of the Byelorussian meat breed are investigated. statistically authentic positive factors of correlations concentration of sperm with forecasting sperms ($P < 0,05$), with impregnating ability ($P < 0,001$) and with fruitfulness sheeps ($P < 0,05$) are established. On a degree of influence of each attribute on the others the first place concentration of sperm borrows (occupies), the second – its(her) impregnating ability and the third – volume ejaculjt which use in the equations of linear regress with high statistical reliability ($P < 0,001-0,0001$) allows прогнозировать separate parameters of reproduction.

Key words: male pigs, the Byelorussian meat breed, parameters of reproduction, factors of correlation, the equation of regress, forecasting.

THE INFLUENCE OF DRYING TECHNIQUES OF SOWS AND LENGTH OF LACTATION ON SELECTED HEMATOLOGICAL AND BIOCHEMICAL INDICATORS OF BLOOD

Rekiel A.

Warsaw Agricultural University, Faculty of Animal Science,
Division of Pigs Breeding and Production, Poland

Introduction

The level and quality of nutrition in different periods of reproduction cycle and their effect on reproductive performance, protein and fat reserves, were the aim of the various studies (10, 11, 18).

The diagnostics based on properly selected parameters and realise systematically can be permitted the monitoring of the health status of animals in experiment.

The diagnostics realise the composition of nutrient and prophylactic programmes and estimate of health status. It is useful to select those animals,

which have worse than standard parameters, because of permanent structural trouble, wrong health status and decreasing of production.

The aim of this study was the examination of selected haematological and biochemical indicators in blood of sows dried off two different techniques: traditional and modified, after 42 or 28 days of lactation.

Material and methods

The experiment was carried out on crossbred sows Polish Landrace x Polish Large White (PL x PLW) in following reproductive cycles, from first to sixth, and rearing piglets after 6 or 4 weeks of lactation.

The level of feeding during pre- and post weaning period was the basic difference between two techniques: traditional (restricted feeding – C group) and modified (intensity feeding – E group). During reproductive cycles all sows were fed individually, respectively mixture LP and LK (table 1). The level of feeding during gestation was the same in the both groups. The lactating sows were fed according to litter size (8).

There were differences (between C and E groups) in feeding sows before, during and after weaning. In the control group, the feeding was restricted before weaning. At two days before weaning sows had received $\frac{1}{2}$ portion of lactating diet, at last day of lactation only $\frac{1}{2}$ portion from day before. At the weaning day, sows were fasting. After weaning, it means at 1st, 2nd, 3rd day sows were fed 1.0 kg, 2.0 kg, 3.0 kg of mixture, respectively. At the following days they fed 3.0 kg per day up to oestrus.

In E group of sows, before weaning, they were fed as during lactation, according to the litter size (8). The high level of feeding was during weaning, oestrus but no longer than 10 days after rearing piglets. In case of deficiency of oestrus from 11th day after weaning, the level of feeding was decreased to 3 kg daily. After oestrus and mating, the feed mixture was changed (from LK on LP) and daily dose was decreased to 2.3 kg. The content of feed mixtures and selected amino acids were estimated (table 1 and 2).

At the weaning piglets from following litters, the samples of blood were collected from ear-vein. The haemoglobin (Hb), erythrocytes (RBC) and leucocytes (WBC) in blood were estimated as well as transaminase: AspAT and ALAT in serum (1, 4, 9).

All data were statistically analysed by analysis of variance with least squares' method (14).

Results and discussion

The results of present study show, that haematological and biochemical indicators of blood from sows dried off different techniques were in standard limits for swine (figure 1, 2, 3) (7, 12, 16). The number of erythrocytes (RBC) and haemoglobin concentration (Hb) were a little higher, but the number of leukocytes (WBC) was distinctly higher in blood of sows with longer lactation than other sows.

Table 1.

The content of energy and nutrients in feed mixture for pregnant (LP) and lactating (LK) sows

Item	Mixture LP	Mixture LK	Mixture LP	Mixture LK
	primiparous sows		multiparous sows	
Metabolizable energy, MJ/kg	12.16	13.04	13.34	13.98
Crude protein, %	13.18	15.86	14.56	16.50
Crude fat, %	1.83	1.52	3.26	3.57
Crude fibre, %	10.30	6.67	6.79	6.31
Crude ash, %	5.51	5.68	6.08	5.88
N-free extractives, %	57.17	57.10	57.19	57.43
Lys, g/kg	5.00	6.70	6.30	7.80
Met + cyst, g/kg	4.80	5.30	5.93	6.85
Tre, g/kg	4.50	5.10	7.00	6.39

Table 2.

Composition of mixtures and level guarantee components*

The guarantee components of mixture	Units	Mixture LP	Mixture LK
	Materials		
	Cereal ground, extracted meal, animal meals, cereal by-products, plant oil		
	Vitamins: A, D, E, K B ₂ , B ₆ , B ₁₂ , biotin, pantothenic acid, nicotinic acid, folic acid, choline		
Metionine, lysine, limestone, phosphate, NaCl, microelements – Zn, Mn, Fe, Cu, J, Se			
Ca total, min	%	0.95	0.95
P total, min	%	0.75	0.75
P assimilable, min	%	0.35	0.35
Vit. A, min	JM/kg	-	27
Vit. E, min	JM/kg	-	64
NaCl, max	%	0.60	0.60

*Financed by the State Committee for Scientific Research, project no. KBN 5P06E 052 14

Stankiewicz (15) observed the distinctly decreasing of number of erythrocytes in blood of sows during gestation and lactation. During gestation, between 1 and 6 hours after farrowing as well as between 2nd and 10th day of lactation and after 2 weeks of lactation, the number of erythrocytes was respectively: $6.4 \times 10^{12}/l$, $5.7 \times 10^{12}/l$, $4.0 \times 10^{12}/l$. The values of haematological indicators depend on sows' supping of nutrients, especially minerals – iron and copper which taken place in erythropoiesis. In present study, the level of haemoglobin was lower in blood of sows with shorter lactation (4 weeks) than with longer lactation (6 weeks) in control group (about 12.33%) as well as experimental group (about 12.13%). It shown a bigger loading of lactation these sow, which were rearing piglets shorter.

The number of leukocytes in blood of the animals under control was in standard and it evidenced good health of sows in C and E groups (7, 12, 16). In Stankiewicz (15) opinion, the little leukocytosis in drying period is a typical

occurrence. The higher value of WBC has occurred in animals after physical effort (6, 17) or at stress (15). But a little deviation of norm may suggest the beginning of disease. A slight decreasing of WBC in E group in comparison with C at 6 weeks of lactation may shown at the lower immunological reaction in the last phase of lactation. The results of study of Skorska-Wyszyńska et al. (13) showed the reduction of WBC after second farrowing in comparison with first. The compensate of haematological indicators to physiological level point out that sows in the second reproductive cycle set the reproductive maturity (5, 6). In present study, the WBC was higher of sows with 4 than 6 weeks length of lactation. During observation, sows after rearing piglets after 3, 4 5 or 6 weeks of lactation have lower number of leukocytes during longer lactation. It has shown indirectly about lower immunological engagement. It is also related with intensified metabolism of milk production. The reaction of immunity suffers weakness (3, 13). The number of WBC of swine balance in wild limits ($10 - 20 \times 10^9/l$). It is connected with a big susceptibility on stress in pigs. The lower value of WBC is observed also in weakness, in inanition condition and during recuperation (16).

The average value of biochemical indicators ALAT and AspAT in C and E groups were in references limits for specie and group of pigs (table 3) (7, 16). Gajęcki (6) received a similar value of amino transferases of sows' herd.

Table 3. The activity of AspAT and ALAT

Item	Length of lactation											
	42 days						28 days					
	groups											
	control			experimental			control			experimental		
n	x	S _e	N	X	S _e	n	x	S _e	n	x	S _e	
ALAT	39	32.6	1.21	41	30.2	1.18	38	30.0	1.22	41	32.4	1.18
AspAT	46	45.3	1.65	42	40.6	1.61	56	46.5	1.50	61	47.6	1.44

Summation

The basic haematological and biochemical indicators in blood of sows from the commercial farm were observed. Those parameters were estimated on primiparous and multiparous sows (1-6 litters) drying off two different techniques. It find that the differential level of sows' feeding before, during and after weaning in control group (traditional dry technique) and experimental (modified dry technique) had no effect on changes the selected parameters of morphology and biochemical of blood. After 42 or 28 day of lactation, the results were little differential. The values of morphological and biochemical indicators of animals were within reference limits for this species.

References

- Alpha Diagnostics: 1996. Grupa Firm.M.C.
- AOAC. Official Methods of Analysis of the Associated of Official Analytical Chemists. 15 ed. Chapter 32, Washington, DC. 1990.

15. Bakuła T., Bączek W., Przala F., Gajęcki M., Zduńczyk E., Skorska-Wyszyńska E. Włókno surowe w profilaktyce schorzeń okołoporodowych i jego wpływ na odchów prosiąt. *Medycyna Wet.* 1992. 48, 514-517.
16. Bomski H. Podstawowe laboratoryjne badania hematologiczne. PZWL Warszawa 1989.
17. Elbers A.R.W., Counnotte G.H.M., Tielen M.J.M. Hematological and clinicochemical blood profiles in slaughter pigs. *Vet. Quart.* 1992. 14, 57-62.
18. Gajęcki M. Wybrane składniki pokarmowe a zdrowotność trzody chlewnej. Materiały Seminarium „Zdrowie świń a opłacalność produkcji trzody chlewnej. Puławy 11-12.06.1996, 7176.
19. Kuleta Z. Wartości wskaźników hematologicznych i biochemicznych zwierząt domowych w stanach zdrowia i choroby. Wyd. AR-T Olsztyn 1993.
20. Normy Żywienia Świń. IFiZZ Jabłonna, Wyd. Omnitech-Press Warszawa 1993.
21. Pinkiewicz E. Podstawowe badania laboratoryjne w chorobach zwierząt. Wyd. PWRiL Warszawa 1971.
22. Rekiel A. Wpływ odmiennych technik zasuszania na poziom rezerw tłuszczowych loch. *Zesz. Nauk. Przegł. Hod.* 2003, 68, 2, 41-53.
23. Rekiel A. Wpływ odmiennych technik zasuszania na wyniki reprodukcji loch. *Zesz. Nauk. Przegł. Hod.* 2003, 68, 2, 55-67.
24. Sitariska E., Winnicka A., Kluciński W. Diagnostyka laboratoryjna. Cz. I – badanie układu czerwonekrwinkowego. *Magazyn Wet.* 2000. 9 (45), 30-32.
25. Skorska-Wyszyńska E., Gajęcki M., Bakuła T., Pirus K. Analiza wybranych wskaźników hematologicznych krwi loch w trzech cyklach rozplodowych przy różnych terminach odsadzania prosiąt. *Biul. Nauk. ART. Olsztyn* 7, 283-291, 2000.
26. SPSS. 10.0 for Windows user's guide, 2000 by SPSS Ins. USA.
27. Stankiewicz W. Hematologia weterynaryjna. Wyd. PWRiL Warszawa 1973.
28. Winnicka A. Wartości referencyjne podstawowych badań laboratoryjnych w weterynarii. Wyd. SGGW Warszawa 1997.
29. Wrońska J. Zmiany w leukogramie, poziomie białka i cholesterolu całkowitego u tuczników pod wpływem obrotu przedubojowego. *Medycyna Wet.* 1982. 38, 230-232.
30. Young M.G., Tokach M.D., Aherne X.F., Main R.G., Dritz S.S., Goodband R.D., Nelsen J.L. Comparison of free methods of feeding sows in gestation and the subsequent effects on lactation performance. *J. Anim. Sci.* 2004. 82 (10), 3058-3070.

Summary

The influence of drying techniques of sows and length of lactation on selected hematological and biochemical indicators of blood

Rekiel A.

The research included crossbred sows PL x PLW in 6 reproductive cycles. The sows were dried off two different techniques, traditional (control - C group) and modified (experimental - E group). The sows from C were fed in restricted way, but sows from E were fed intensively before, during and after weaning. After weaning, 6 or 4 weeks of lactation, the samples of blood were collected. The selected indicators of haematological (RBC, WBC, Hb) and biochemical (AspAT and ALAT) were estimated in blood. The differential level of feeding in pre – and post- weaning period had no effect on change the blood parameters. The results were similar at lactation of 42 or 28 days. The values of indicators were within reference limits characteristic for pigs.