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**RESULTS OF ASSESSMENT OF BREEDING VALUE  
SOWS ACCORDING TO THE BLUP INDEX (MATERNAL LINE)  
AND THEIR PRODUCTIVITY**

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В роботі наведено результати дослідження відтворювальних якостей свиноматок великої білої породи різної племінної цінності. На основі одержаних даних розраховано коефіцієнти дискретності основних кількісних ознак тварин піддослідних груп.

Установлено, що ремонтні свинки великої білої породи за ознаками власної продуктивності (вік досягнення живої маси 100 кг, діб; товщини шпику на рівні 6–7 грудних хребців, мм) належать до класу еліта. Максимальними показниками багатоплідності ( $12,8 \pm 0,21$  гол), молочності ( $62,8 \pm 1,46$  кг), кількості поросят на час відлучення ( $10,9 \pm 0,20$  гол) та маси гнізда на час відлучення у віці 28 діб ( $85,6 \pm 1,54$  кг) характеризуються свиноматки I піддослідної групи (індекс BLUP = 109,78-123,14). Критерієм відбору високопродуктивних тварин підконтрольних популяцій є значення індексу BLUP на рівні 109,78-123,14 балів.

**Ключові слова:** свиноматка, порода, індекс BLUP (материнська лінія), відтворювальні якості, індекс, мінливість, кореляція

**Khalak V.I., Bordun O. M., Gorchanok A. V., Chegorka P. T.,  
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**RESULTS OF ASSESSMENT OF BREEDING VALUE SOWS  
ACCORDING TO THE BLUP INDEX (MATERNAL LINE) AND THEIR  
PRODUCTIVITY**

*The paper presents the results of the study of the reproductive qualities of sows of the large white breed of different breeding value. Based on the obtained data, the coefficients of discreteness of the main quantitative characteristics of the animals of the experimental groups were calculated.*

*It was established that repair pigs of large white breed according to their own productivity (age of reaching live weight of 100 kg, days; lard thickness at the level of 6-7 thoracic vertebrae, mm) belong to the elite class. The maximum indicators of multifertility ( $12.8 \pm 0.21$  heads), milk yield ( $62.8 \pm 1.46$  kg), the number of piglets at the time of weaning ( $10.9 \pm 0.20$  heads) and litter weight at the time of weaning at the age of 28 days ( $85.6 \pm 1.54$  kg) are characterized by sows I experimental group (BLUP index = 109.78-123.14). The criterion for selecting highly productive animals of controlled populations is the value of the BLUP index at the level of 109.78-123.14 points.*

*Key words: sow, breed, BLUP index (maternal line), reproductive qualities, index, variability, correlation*

The theoretical basis for the research is the scientific works of native and foreign scientists [1-6].

The purpose of the work is to investigate the reproductive qualities of sows of the large white breed of different breeding value. Based on the obtained data, calculate the coefficients of discreteness of the main quantitative characteristics of the animals of the experimental groups.

Research materials and methods. The research was conducted in the agricultural formations of the Dnipropetrovsk and Sumy regions (2021-2022), the laboratory of animal husbandry of the State Institution "Institute of Grain Crops of the NAAS" and the laboratory of animal husbandry and fodder production of the Institute of Agriculture of the NAAS. The object of the study were repair pigs and sows of the large white breed. The BLUP (Best Linear Unbiased Prediction) index was calculated on the basis of the main institution (Institute of Pig Breeding and AIP of the NAAS) according to the general model of a single animal [7].

Evaluation of young pigs according to their own productivity indicators, sows – according to reproductive qualities, was carried out taking into account the following characteristics: age of reaching live weight of 100 kg, days; fat thickness at the level of the 6th–7th thoracic vertebra, mm; the thickness of the fat in the middle point of the back between the withers and the sacrum, mm; thickness of lard on sacrum, mm; body length, cm; multifertility, heads; milk yield, kg, nest

weight at the time of weaning at the age of 28 days, kg, survival of piglets before weaning, %.

An ultrasonic device RENKO LEAN MEATER DIGITAL BACKFAT IDIC, S/N 46080, (USA) was used to measure the thickness of lard.

Biometric processing of the received data was processed by the method of variational statistics according to the methods of V. P. Kovalenko and others. [8] using the programmable module "Data Analysis" in Microsoft Excel.

Research results and their discussion. The results of our research indicate that the age at which repair gilts reach a live weight of 100 kg is  $175.6 \pm 0.85$  days ( $Cv=5.70$  %), the fat thickness at the level of the 6th–7th thoracic vertebra is  $23.0 \pm 0.13$  mm ( $Cv=6.84$  %), the fat thickness in the middle point of the back between the withers and the sacrum –  $17.2 \pm 0.13$  mm ( $Cv=8.82$  %), the fat thickness on the sacrum –  $20.3 \pm 0.10$  mm ( $Cv=6.27$  %), body length –  $116.7 \pm 0.16$  cm ( $Cv=6.84$  %). The age of the first fertile insemination is  $245.3 \pm 1.08$  days ( $Cv=5.14$  %), multifertility of tested sows –  $11.1 \pm 0.14$  heads ( $Cv=15.76$  %), high fertility –  $1.41 \pm 0.009$  kg ( $Cv=7.88$  %), milk yield –  $51.8 \pm 0.082$  kg ( $Cv=18.52$  %), the weight of the nest at the time of weaning at the age of 28 days is  $74.3 \pm 0.85$  kg ( $Cv=13.48$  %). The BLUP index (maternal line) in sows of the controlled population is equal to  $99.59 \pm 1.253$  points ( $Cv=14.68$  %), the indicator "preservation of piglets until weaning at the age of 28 days, %" ranges from 63 to 100 %.

It was established that repair pigs of different intrabreed differentiation according to the BLUP index (maternal line) belong to the elite class in terms of their own productivity. The minimum value of the indicator "age of reaching a live weight of 100 kg, days" was found in the animals of the II experimental group. Compared with female subjects of the I and III experimental groups, the difference in this indicator is 4.2 ( $td=1.75$ ,  $P>0.05$ ) and 3.4 days ( $td=2.08$ ,  $P<0.05$ ).

There was no significant difference in the thickness of the fat at the level of the 6th-7th thoracic vertebra, in the middle point of the back between the withers and the sacrum and on the sacrum, as well as the length of the trunk between the test animals. The coefficient of variation of own productivity indicators varies from 1.55 to 9.13 %. The analysis of data on the reproductive qualities of sows of

the experimental groups shows that the difference between the animals of the I and III groups in terms of multifertility is equal to 3.4 piglets per farrowing ( $t_d=10.00$ ,  $P<0.001$ ), with a milk yield of 17.5 kg ( $t_d=10.73$ ,  $P<0.001$ ), the number of piglets at the time of weaning – 2.9 heads ( $t_d=11.15$ ,  $P<0.001$ ), litter weight at the time of weaning in at the age of 28 days – 18.2 kg ( $t_d=10.45$ ,  $P<0.001$ ), M.D. Berezovsky's index – 8.57 points ( $t_d=11.12$ ,  $P<0.001$ ) (table.).

**Table. Reproductive qualities of sows of the large white breed of different breeding value, evaluated by the BLUP index (maternal line)**

Indicators, units of measurement	Biometric indicators	Gradations of the BLUP index (maternal line)		
		109,78-28,75	89,85-109,28	53,61-89,59
		<i>group</i>		
		I	II	III
Multifertility, head	n	30	73	33
	$\bar{X}\pm S_x$	12,8±0,21	11,0±0,13	9,4±0,28
	$C_v\pm S_{C_v}$	9,29±1,200	10,63±0,879	17,23±2,133
Fertility kg	$\bar{X}\pm S_x$	1,39±0,021	1,40±0,013	1,46±0,013
	$C_v\pm S_{C_v}$	7,91±1,021	7,85±0,649	4,79±0,589
Milk content, kg	$\bar{X}\pm S_x$	62,8±1,46	50,5±0,95	45,3±0,73
	$C_v\pm S_{C_v}$	12,78±1,651	16,15±1,336	9,29±1,144
Weight of the nest at the time of weaning, at the age of 28 days, kg	$\bar{X}\pm S_x$	85,6±1,54	72,8±0,99	67,4±0,83
	$C_v\pm S_{C_v}$	9,88±1,276	11,67±0,966	7,12±0,876
Preservation of piglets until weaning, %	$\bar{X}\pm S_x$	85,30±0,935	84,30±0,668	86,25±1,133

In terms of high fertility, the difference between sows is 0.07 kg ( $td=2.91$ ,  $P<0.01$ ) in favor of animals of the III group. The maximum rate of survival of piglets before weaning (86.25 %) was also found in animals of the III sub-experimental group. The coefficient of variation of the reproductive qualities of sows of the large white breed of different breeding value, evaluated according to the BLUP index (maternal line), ranges from 4.79 to 18.59 %.

The pairwise correlation coefficient between traits of own productivity, reproductive qualities and the BLUP index (maternal line) ranges from  $-0.066\pm 0.0854$  (BLUP index  $\times$  survival of piglets to weaning) to  $+0.704\pm 0.0433$  (BLUP index  $\times$  fertility).

### **Conclusions:**

1. It was established that repair pigs of large white breed according to their own productivity (age of reaching live weight of 100 kg, days; lard thickness at the level of 6-7 thoracic vertebrae, mm) belong to the elite class.

2. The maximum indicators of multifertility ( $12.8\pm 0.21$  heads), milk yield ( $62.8\pm 1.46$  kg), number of piglets at the time of weaning ( $10.9\pm 0.20$  heads) and nest weight at the time of weaning in aged 28 days ( $85.6\pm 1.54$  kg) are characterized by sows of the I experimental group (BLUP index = 109.78-123.14).

3. Pairwise correlation coefficients between traits of own productivity, reproductive qualities and the BLUP index (maternal line) ranges from  $-0.066\pm 0.0854$  (BLUP index  $\times$  survival of piglets to weaning) to  $+0.704\pm 0.0433$  (BLUP index  $\times$  fertility).

4. The BLUP index value at the level of 109.78-123.14 points is the criterion for selecting highly productive animals of controlled populations.

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