

EVALUATION OF THE EFFECTIVENESS OF DIFFERENT METHODS OF PIG BREEDING

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Наведені результати досліджень відтворювальної здатності свиноматок великої білої породи за умови використання чистопородного розведення і промислового схрещування з кнурами породи ландрас та генотипу «Оптімус».

Встановлено, що використання кнурів-плідників породи ландрас позитивно впливає на підвищення багатоплідності свиноматок великої білої породи (на 0,4 поросяти) та маси гнізда на час відлучення (на 5,1 кг). Високовірогідний кореляційний зв'язок існує між індексом Лаша у модифікації М. Д. Березовського, багатоплідністю свиноматок ($r = +0,745 - +0,929$) і масою гнізда на час відлучення ($r = +0,855 - +0,941$).

Максимальну прибавку продукції одержано від поєднання свиноматок великої білої породи та кнурів-плідників породи ландрас і генотипу «Оптімус» – 6,53–11,52 %, що в розрахунку на 1 голову становить 137,70 та 256,50 грн відповідно.

***Ключові слова:** свиноматка, кнур-плідник, генотип, метод розведення, відтворювальна здатність, оціночний індекс, мінливість, кореляція.*

Providing the population with meat is one of the most important issues of our time. In general balance sheet significant specific share of pork. In developed countries it reaches more than 40,0 % [2, 5]. The increase in meat production requires improving the reproductive and productive qualities of pigs, improvement of fattening and slaughter indicators of livestock.

To resolve these issues is impossible without application of modern breeding techniques [1, 3, 4]. Moreover, the assessment of pigs parental forms, subject to the introduction of innovative methods and various schemes of wiring there's not enough. Thus specified determines the relevance and direction of our research.

The aim of this work is to investigate the effectiveness of the use of boars of landrace genotype "Optimus" in conjunction with the sows of large white breed and to determine the level of correlation between absolute and integrated indicators of reproductive ability.

The experimental part of the research carried out for conditions ООО "Expert-Agrotrade" (Dnipropetrovsk region) according to the following scheme (table. 1).

1. Scheme of studies

Group	Appointment group	Genotyp		Number of animals	
		sows	boars	sows	boars
I	control	LW*	LW	20	5
II	research	LW	L**	20	5
III	research	$\frac{1}{2}$ LW \times $\frac{1}{2}$ L	T***	20	5

LW – large white breed. ** L – breed landrace. * T – terminal boars of the genotype "Optimus".*

Assessment of sows in absolute and integrated indicators are led with accounting of the following criteria: polyfertility, largefertility, weight of the nest at the time of weaning, live weight 1 pig at time of weaning, average daily live weight gain of piglets until weaning, number of piglets at the time of weaning.

Index of Lash modification M. D. Berezovsky (1) and the complex index of reproductive ability of the sow (2) was calculated by the following indices:

$$I = n_0 + 2n_{60} + 35G, \quad (1)$$

where: I – index of reproductive qualities of sows; n_0 – number of piglets at birth, heads; n_{60} – number of piglets to the weaning date, heads G – average daily gain of piglets until weaning, kg [2];

$$P = n_0 + UN + 2n_{60} + 10m_0 + m_{60} + \frac{Z}{5} + \frac{W_{60}}{10}, \quad (2)$$

where: P – integrated index of reproductive ability; UN – uniformity of the nests of sows; m_0, m_{60} – the average live weight of pigs at birth and weaning, kg; Z – safety of piglets in the suckling period; W_{60} – weight of the nest at weaning, kg [4].

Biometric treatment of the results of research carried out by the method of N. A. Plohysky [7].

Found that the best indicators of reproductive ability is characterized by sows of large white breed in combination with boars of landrace (II experimental group) (tabl. 2). They exceeded peers in the control group at polyfertility, of 0.4 pigs ($td = 0,49$; $P < 0,95$), largefertility – 0,07 g ($td = 1,09$; $P < 0,95$), the weight of the nest at the time of weaning – 5,1 kg ($td = 1,5$; $P < 0,95$), live weight 1 pig – 0,9 kg ($td = 4,28$; $P > 0,999$), average daily gain in live weight of piglets to weaning – 0,027 kg ($td = 3,69$; $P > 0,999$).

2. Indicators of reproductive ability of sows of the experimental groups

Indicators	Biometric indicator	Groups		
		I	II	III
Polyfertility, head	n	13	16	14
	$\bar{X} \pm S\bar{x}$	10,7 ± 0,49	11,1 ± 0,65	10,2 ± 0,459
	Cv, %	16,59	23,68	16,81
Largefertility, kg	$\bar{X} \pm S\bar{x}$	1,39 ± 0,040	1,46 ± 0,051	1,64 ± 0,043***
	Cv, %	10,42	14,04	10,00
Weight of the nest at the time of weaning, kg	$\bar{X} \pm S\bar{x}$	72,9 ± 2,76	78,0 ± 2,15	82,4 ± 3,68*
	Cv, %	13,68	11,06	21,25
Live weight 1 pig, kg	$\bar{X} \pm S\bar{x}$	7,5 ± 0,17	8,4 ± 0,13***	9,7 ± 0,23***
	Cv, %	8,27	6,25	9,15
Average daily gain in live weight of piglets to weaning, kg	$\bar{X} \pm S\bar{x}$	0,222 ± 0,0059	0,249 ± 0,0044***	0,287 ± 0,0086***
	Cv, %	9,72	7,16	11,20
Number of piglets at the time of weaning, heads	$\bar{X} \pm S\bar{x}$	9,6 ± 0,33	9,2 ± 0,28	8,6 ± 0,60
	Cv, %	12,40	12,16	26,30

The greatest number of piglets before weaning were sows I control group – 9,6 pigs at one farrow. Compared to peers, II and III experimental groups this difference on this indicator was 0,4 ($td = 0,93$; $P < 0,95$) and 1 pig ($td = 1,47$; $P < 0,95$).

3. Integrated indicators of reproductive ability of sows

Indicators	Biometric indicator	Groups		
		I	II	III
Uniformity of the nest, points	$\bar{X} \pm S\bar{x}$	4,31±0,532	4,74 ± 0,432	4,85 ± 0,327
	Cv, %	44,54	36,49	25,19
Index of Lash modification M. D. Berezovsky, points	$\bar{X} \pm S\bar{x}$	37,75 ± 1,048	38,30 ± 1,111	37,57 ± 1,319
	Cv, %	10,01	11,60	13,14
Integrated indicators of reproductive ability sow, points	$\bar{X} \pm S\bar{x}$	81,19 ± 1,358	81,89 ± 0,986	83,2 ± 2,214
	Cv, %	6,03	4,82	10,07

Use two-pedigree sows in combination with the boars of the genotype "Optimus" (experimental group III) deliver high performance: largefertility, weight of the nest and live weight 1 pig at time of weaning and average daily gain in live weight of piglets to weaning. The

difference compared with animals I control group was 0.25 kg (td = 4,31; P>0,999), 9.5 kg (td = 2,11; P>0,95), 2.2 kg (td = 7,85; P>0,999) and 0.065 kg (td = 6,31; P>0,999).

The coefficient of variation of signs of reproductive ability ranged from 6,25 (II experimental group; live weight 1 pig at the time of weaning, kg) to 26,30 % (III experimental group); number of piglets at the time of weaning, animals).

The evaluation of the sows on integrated indicators of reproductive ability surrender-ness indicate a slight variation of the "uniformity of the nest", "an integrated indicator of reproductive ability of sows" and "index of Lash modification M. D. Berezovsky" (tabl. 3).

Calculation of coefficients of pair correlation between the absolute and integrated display of nicknames of reproductive ability of sows indicates the presence of links of different direction and strength. So, in the animals both from the control and experimental groups there was a reverse in direction, medium and close relationship between the twins and largefertility ($r = -0,562 - -0,900$), direct in the direction and average strength between the twins and ground nests at the time of weaning ($r = +0,489 - +0,526$) (tabl. 4).

4. Correlation between absolute and integrated indicators of reproductive ability of sows when using various methods of cultivation

Sign #	Biometric indicator	Groups		
		I	II	III
1-2	n	13	16	14
	r ± Sr	-0,612 ± 0,2385*	-0,900 ± 0,2564**	-0,562 ± 0,2388*
	tr	2,56	3,51	2,35
1-3	r ± Sr	0,515 ± 0,258	0,526 ± 0,2884	0,489 ± 0,2518
	tr	1,99	1,82	1,94
1-4	r ± Sr	-0,525 ± 0,2566	-0,292 ± 0,1116*	-0,140 ± 0,2858
	tr	2,04	2,61	0,49
1-5	r ± Sr	0,860 ± 0,1539***	0,929 ± 0,3015**	0,745 ± 0,1926**
	tr	5,59	3,08	3,86
1-6	r ± Sr	0,070 ± 0,3008	0,010 ± 0,2766	0,361 ± 0,2692
	tr	0,23	0,036	1,34
2-3	r ± Sr	-0,072 ± 0,3007	-0,398 ± 0,2809	-0,452 ± 0,2575
	tr	0,23	1,41	1,75
2-4	r ± Sr	0,172 ± 0,2970	0,363 ± 0,1781	0,224 ± 0,2813
	tr	0,57	2,03	0,79
2-5	r ± Sr	-0,428 ± 0,2725	-0,807 ± 0,2936*	-0,519 ± 0,2468
	tr	1,57	2,74	2,10
2-6	r ± Sr	0,252 ± 0,2918	0,227 ± 0,2809	-0,175 ± 0,2842
	tr	0,86	0,80	0,61
3-4	r ± Sr	-0,486 ± 0,2635	0,363 ± 0,1841	0,261 ± 0,2787
	tr	1,84	1,97	0,93
3-5	r ± Sr	0,855 ± 0,1564***	0,792 ± 0,2344**	0,941 ± 0,0977***
	tr	5,46	3,37	9,63
3-6	r ± Sr	0,705 ± 0,2138**	0,629 ± 0,2806*	0,931 ± 0,1054***
	tr	3,29	2,24	8,83
4-5	r ± Sr	-0,486 ± 0,2618	-0,366 ± 0,2857	-0,263 ± 0,2785

1 – polyfertility, goals; 2 – largefertility, kg; 3 – weight of the nest at the time of weaning, kg; 4 – uniformity of the nest, points; 5 – the index of Lash modification M. D. Berezovsky, points; 6 – comprehensive measure of the reproductive ability of the sow, points.

Reliable correlation found between multiple pregnancy and an index of Lash modification M. D. Berezovsky ($r = +0,745 - +0,929$). The same trend is observed for the characteristics "weight of the nest at the time of excommunication", and the index of Lash modification M. D. Berezovsky ($r = +0,855 - +0,941$). The strength of the relationship between a comprehensive measure waterwell-term ability of the sow, polyfertility and largefertility arge

sows ranged from $-0,175 \pm 0,2842$ to $0,361 \pm 0,2692$.

The indicator "weight of the nest at the time of weaning" describes the norm of reaction of genotype to the environment. Correlation between the index of Lash modification M. D. Berezovsky and comprehensive indicator of reproductive ability of sows in all groups the strength varies from medium to strong at different levels of probability.

It has been established that sows of all experimental groups have a positive level of relation between the index of Lash modification M. D. Berezovsky and comprehensive display-nickname reproductive ability of sows ($r = +0,293 - +0,855$).

On the performance of breeding work largely influenced not only by the genotype of the sows and breeding boars, which is confirmed by our calculations of economic efficiency (tabl. 5).

5. Economic efficiency of breeding boars of different genotypes

The group	Weight of the nest on the date of weaning at the age of 30–35 days, kg *	Gain of products, %	Cost of production, UAH/head
I	$72,9 \pm 2,76$	-	
II	$78,0 \pm 2,15$	+6,53	+137,70
III	$82,4 \pm 3,68$	+11,52	+256,50

* The average sale price per 1 kg of live weight of young pigs to the processing enterprises of Dnipropetrovsk region at the time of the research work made up to 27.0 UAH.

Found that the greatest increase of production obtained from animals of experimental group III and 9,5 kg. in animals of the II group it was of 5,1 kg.

The cost of the additional products obtained from animals II and III experimental groups, calculated per 1 head was above 7,0 and 13,0 %, respectively.

The conclusions

1. Found that the sows III and II experimental groups to large fertility were superior to the requirements for class "elite" respectively, 2,0–11,1 %. The weight of the nest at the time of separation were within 78,0–82,4 kg, safety 82,9 was 89,7 %.

2. Significant coefficients of correlation established between absolute and integration indicators of reproductive ability of sows when using various methods of cultivation: the Farrow \times index of Lash modification M. D. Berezovsky – $+0,745 - +0,929$; weight of the nest at the time of weaning \times index of Lash modification M. D. Berezovsky - $+0,792 - +0,941$; weight of the nest at the time of weaning \times complex index of reproduction ability of sows – $+0,629 - +0,931$.

3. The largest increase of production is obtained from a combination of sows of large white breed boars and Landrace genotype "Optimus" – 6,53–11,52 % per 1 head is respectively 137,70 and 256,50 UAH.

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