



## Dependence of Sows Productivity on the Duration of Their Gestation Period

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### Abstract

The research and trials at the Gorin Collective Farm in the Belgorod region showed that the period of pregnancy in sows under the conditions of the industrial technology of pork production is 115 days on average with the variation from 110 to 120 days. Thus; out of 100 farrowing sows of the Large White Breed 62% had a pregnancy period of 114 to 115 days. These groups of sows had the highest multiple births (12 piglets) and the highest fertility (1.30-1.33 kg). Out of 100 farrowing Landrace sows 51% of them had a pregnancy period of 114-115 days and on average Landrace sows had a pregnancy period of 115.7 days. It should be noted that Landrace sows have the same dependence on the period of pregnancy as Large White breeds. Moreover; the deviation of the gestation period from 114 days; both in the direction of decreasing and increasing; negatively affects the productivity of both breeds of pigs.

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## 1 Introduction

In recent years; under the conditions of industrial technology of pork production; there has been a change in such an important indicator as to the duration of the gestation period in sows. The authors note that this period has changed in a large direction. If previously it was considered that the gestation period is 114 days and it was practically unchangeable; nowadays in conditions of industrial complexes the gestation period averages 115 days with variations from 105 to 125 days [2; 3; 9; 10; 11].

According to Tkachev [1; 12; 13]; the duration of pregnancy in sows of the Large White Breed in conditions of conventional pig farms is 114 days; and with their transfer to free-range housing this period increased by 1 day and was 115 days. Savich [2] noted that about 11% of sows in an industrial unit can farrow for up to 114 days and that 20% of sows can farrow for up to 114 days after that.

Scientists who have studied the gestation period of sows at different times have concluded that the gestation period of sows depends on many factors: age; breed; feeding and housing conditions of the sows [4; 5; 6; 8]. However; the question arises; how does the duration of gestation period in sows affect their productivity?

The purpose of these studies was to find out the effect of different periods of the gestation period in Large White and Landrace sows on their productivity.

## 2 Materials and Methods

To study the influence of the gestation period in the Large White and Landrace sows on the multiple pregnancy; large fecundity; growth and the safety of their offspring up to 30 days we have conducted two scientific-industrial experience in the SPC "Kolkhoz Gorin"; the Belgorod region. For carrying out the first experiment 100 pregnant adult sows of the Large White Breed were selected from which 11 groups were formed after farrowing; depending on the duration of their gestation period. In the second experiment; 100 adult gestating sows of Landrace breed were also selected and 11 groups were formed depending on the duration of their gestation period. In these experiments; the duration of the gestation period in sows of both breeds; the number of piglets obtained at birth; growth and safety of these piglets up to 30 days were studied.

## 3 Research Results and Their Discussion

Table 1 presents the results of farrowing sows of the Large White Breed.

**Table 1:** Effect of the duration of gestation period in Large White Breed sows on their productivity

Experience groups	Duration of gestation period in sows; days	Number of sows in the group; goal	Piglets obtained; total; goal	Multiple births; goal	Average live weight of 1 piglet at birth; kg
1	110	1	10	10;00	0;85±0;04
2	111	2	19	9;50	0;92±0;05
3	112	4	39	9;75±0;3	1;06±0;03
4	113	12	124	10;33±0;1	1;15±0;05
5	114	51	613	12;01±0;2	1;33±0;01
6	115	11	132	12;00±0;2	1;30±0;01
7	116	8	89	11;12±0;3	1;25±0;01
8	117	5	53	10;60±0;2	1;20±0;01
9	118	3	30	10;00±0;3	1;18±0;03
10	119	2	19	9;50	1;16±0;06
11	120	1	9	9;00	1;10±0;05
114;40		100	1137	11;37±0;2	1;26±0;01

The data in Table 1 shows that out of 100 sows that farrowed; 62% of them had a gestation period of 114-115 days. These groups of sows had the highest multiple births (12.0 piglets) and the highest large births (1.30-1.33 kg). At the same time; sows with gestation periods of 110; 111; 112;

112; 113; 116; 117; 118; 119; 120 days were inferior to sows with gestation periods of 114 days by 16.7 20.8; 18.8; 13.9; 7.4; 11.7; 16.7; 20.8; 25.0%; for large-breeding capacity; by 36.0; 30.8; 20.3; 13.5; 6.0; 9.7; 11.2; 12.7; 17.2%; respectively.

The growth and safety of piglets obtained from Large White Breed sows with different length of gestation periods are shown in Table 2.

**Table 2:** Growth and survival of piglets depending on the duration of gestation period in their mothers of Large White breed

Experience groups	Duration of gestation period in sows; days	Piglets obtained; total (live); goal	Live weight of piglets; days		Piglet survival rate up to 30 days	
			at birth	in 30 days.	number	%
1	110	10	0;85±0;04	4;20±0;2	5	50;0
2	111	19	0;92±0;03	4;50±0;2	11	57;8
3	112	39	1;06±0;03	4;61±0;1	24	61;5
4	113	124	1;15±0;03	5;90±0;1	93	75;0
5	114	613	1;33±0;01	7;80±0;1	583	95;1
6	115	132	1;30±0;01	7;50±0;1	125	94;6
7	116	89	1;25±0;02	7;20±0;1	82	92;1
8	117	53	1;20±0;02	6;85±0;1	46	86;7
9	118	30	1;18±0;03	6;80±0;2	24	80;0
10	119	19	1;16±0;04	6;00±0;2	13	68;4
11	120	9	1;10±0;04	5;65±0;2	6	66;6
	114;40	1137	1;26±0;01	7;30±0;1	1012	89;00

When studying the effect of gestation period in sows on growth and safety of their offspring (Table 2). It was found that the sows with gestation period of 114 days surpassed their counterparts obtained from their mothers during pregnancy period of 110; 111; 112; 113; 115; 116; 117; 118; 119; 120 days: 85.7; 73.3; 69.1; 32.2; 4.0; 8.3; 13.2; 14.7; 30.0; 38.0% in live weight at 30 days of age; respectively; 45.1; 37.3; 33.6; 20.1; 0.5; 3.0; 8.4; 15.1; 26.7; 28.5% in survival to 30 days; respectively.

In another similar experiment; the gestation period in Landrace sows was studied. For the experiment 100 adult (2.5-3 years old) gestating Landrace sows were selected; from which 11 groups were formed; depending on the period and gestation. The formation of groups of sows was carried out after their farrowing. Table 3 presents the results of farrowing of Landrace breed sows.

**Table 3:** Effect of gestation period in Landrace sows on their productivity

Experience groups	Duration of gestation period in sows; days	Number of sows in the group; goal	Piglets obtained; total; goal	Multiple births; goal	Average live weight of 1 piglet at birth; kg
1	110	1	10	10;00	0;88±0;04
2	111	1	10	10;00	0;94±0;05
3	112	2	21	10;50	1;08±0;03
4	113	3	33	11;00±0;1	1;16±0;05
5	114	26	310	11;92±0;2	1;35±0;01
6	115	25	295	11;80±0;2	1;30±0;01
7	116	19	210	11;05±0;3	1;28±0;01
8	117	12	129	10;75±0;2	1;24±0;01
9	118	6	61	10;16±0;3	1;21±0;03
10	119	3	28	9;33±0;3	1;15±0;06
11	120	2	17	8;50	1;10±0;05
	115;70	100	1124	11;24±0;2	1;27±0;01

The data in Table 3 show that out of 100 farrowing Landrace sows; 51% of them had a gestation period of 114-115 days. It should be noted that these groups of sows (groups 5-6) had the highest multiple births (11.80-11.92 piglets) and the highest fertility (1.30-1.32 kg). The Landrace sows with gestation periods of 110; 111; 112; 112; 113; 116; 117; 118; 119; 120 days were inferior to their counterparts with gestation periods of 114 days in terms of multiple births by 16.1 The birth weights of piglets were: 16.1; 11.9; 7.7; 7.2; 9.8; 14.7; 21.7; 28.6%; by 34.8; 30.3; 20.0; 14.0; 5.1; 8.1; 10.3; 14.8; 18.5%; respectively. The growth and safety of piglets up to 30 days of age from Landrace sows with different gestation periods are shown in Table 4.

**Table 4:** Growth and survival of piglets depending on the duration of gestation period of their Landrace mothers

Experience groups	Duration of gestation period in sows; days	Piglets obtained; total (live); goal	Live weight of piglets; days		Piglet survival rate up to 30 days	
			at birth	in 30 days.	number	%
1	110	10	0;88±0;04	4;50±0;2	4	40;0
2	111	10	0;94±0;05	4;61±0;2	6	60;0
3	112	21	1;08±0;03	4;85±0;2	13	61;9
4	113	33	1;16±0;02	6;10±0;3	25	75;7
5	114	310	1;35±0;01	8;00±0;1	283	91;2
6	115	295	1;30±0;01	8;10±0;1	272	92;2
7	116	210	1;28±0;01	7;60±0;1	189	90;0
8	117	129	1;24±0;03	7;10±0;1	114	88;3
9	118	61	1;21±0;03	6;90±0;2	48	78;6
10	119	28	1;15±0;04	6;50±0;2	20	71;4
11	120	17	1;10±0;04	5;80±0;2	11	64;7
	115;70	1124	1;27±0;01	7;61±0;1	985	87;6

Table 4 shows that the gestation period of Landrace sows has a significant effect on the growth and survival of their offspring up to 30 days. Thus; the Landrace sows with gestation period of 114 days surpassed their counterparts with gestation period of 110; 111; 112; 113; 113; 116; 117; 118; 119; 120 days in the growth of progeny up to 30 days by 43.7; 42.3; 39.3; 23.7; 23.7 and 25.7 days; respectively; 42.3; 39.3; 23.7; 5.0; 11.2; 13.7; 18.7; 27.4%; for safety; by 51.2; 31.2; 29.3; 15.5; 1.2; 2.9; 12.6; 19.8; 26.5%; respectively. Summarizing these data; it should be noted that Landrace sows with a duration of 114 and 115 days did not differ significantly between each other in terms of productivity.

## 4 Conclusion

Thus; the studies have shown that the duration of the gestation period in Large White and Landrace sows significantly affects the fertility; large-breeding sows; and the growth and preservation of their offspring up to 30 days of age. Moreover; it should be noted that the deviation of the gestation period; both in the direction of decreasing and increasing has a negative effect on the productivity of Large White and Landrace sows. Given the data of our studies; it is necessary to conduct further experiments to optimize the duration of the gestation period in sows under industrial technology.

## 5 Availability of Data and Material

Data can be made available by contacting the corresponding authors.

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