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THE EFFECT OF BACKFAT THICKNESS IN GILTS ON DAY OF MATING ON THEIR REPRODUCTION PERFORMANCE

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ABSTRACT

The present study aimed at determination of the effect of backfat thickness in different measuring points on the body at first mating in pure-bred Polish Large White (PLW) gilts and Polish Large White x Polish Landrace (PLW x PL) hybrid gilts on their reproduction performance. Also an attempt was made to estimate an optimum backfat thickness at which the gilt breeding should be initiated.

Backfat thickness measurements were made using a PIGLOG 105 ultrasonic apparatus on the right-hand side of animal body in 6 points. Litter production traits were analysed, expressed by the number and the weight of piglets on day 1 and 21 of life as well as the number of piglets on day of weaning from sow and weaning to first service interval. In order to perform statistical analysis, the gilts examined were divided into groups, taking into account different backfat thickness at mating measured over the shoulder in points P1a and P1b, on the mid-back in points P2a and P2b and on the low back in points P3a and P3b.

Measurements of backfat thickness over the shoulder (points P1a and P1b) as well as those on the mid-back in point P2a are particularly important on day of mating in pure-bred PLW gilts. In case when the backfat thickness over the shoulder on day of mating was above 23 mm and on the mid-back was above 15 mm, the sows gave birth and reared significantly more piglets in the first litter ($P \leq 0.05$; $P \leq 0.01$). It was showed that measurement of backfat thickness in hybrid sows at mating in points P1b and P2a has a significant effect ($P \leq 0.05$) on the litter size and the weight of born piglets (point P2a). In the second reproduction cycle, PLW sows showed significant differences ($P \leq 0.01$) with respect to the litter weight on day 21 of life (points P1b and P3a), and in point P2a ($P \leq 0.05$). When analysing the reproduction performance traits in hybrid gilts according to thinner or thicker backfat on day of mating, it was observed that the number of piglets born in total was significantly larger ($P \leq 0.05$) in the group of primiparous sows with thicker backfat over the shoulder in point P1b at mating and with thicker backfat at point P2a. In the second reproduction cycle, sows PLW with thicker backfat at mating reared litters with a larger weight.

Key words: gilts, optimal fatness, reproduction

INTRODUCTION

The results of reproduction performance determine mainly the efficiency of pig rearing and therefore numerous researches have been taken up as well as practical measures have been applied aiming at maximisation of using the physiological potential of fertility. The breeding work being carried out at present is mainly focused on the evaluation and the improvement of traits connected with pig meatiness, contributing this way to a considerable development of these traits and at the same time to reduction of their fatness. As a result of progress in slaughter traits, the percentage of body fat in pigs has been reduced from 27–35% to 15–25%, increasing the same the percentage of muscle tissue from about 45% to 55–60% [9]. As far as this is a favourable situation in growing

animals intended for fattening and slaughter, the reduction of fat content in the body of females used in reproduction leads to an excessive loss of animal condition and affects the worsening of reproductive results. It is believed that breeding achievements with respect to pig meatiness lead to a delay in sexual maturity. They also induce the worsening of reproduction results both in sows and boars.

Pig selection towards increasing their growth rate and decreasing their fatness exerts considerable influence on reproductive functions, in particular in primiparous sows. Many data point to high culling rate between them after first litter rearing [8,10,24]. As Vangen [27] reports, thinner backfat may be positively related to increased fertility under certain conditions but this is possible when selection towards backfat thickness reduction goes together with that towards fertility increase with the use of optimum feeding.

In this connection, it is believed that young females intended for breeding should reach not only a certain minimum threshold of body weight at a specific age but also that of fatness, being expressed by backfat thickness before mating [19,22]. However, opinions on optimum backfat thickness at the beginning of reproduction are still ambiguous. There is a large difference in determining optimum backfat thickness at the first mating, ranging 14 to 25 mm. On the other hand, both too thick and too thin backfat affects unfavourably the efficiency of sow reproduction. Excessively thin backfat induces a general subtilisation of sows, which is followed by the fact that such animals have larger environmental requirements [18]. The mating of gilts with reduced fat reserve leads to a quick depletion of own energy reserves and to the lack of possibility to restore them during further use, even with good qualitative and quantitative feeding as stated by Rekiel & Więcek [21]. On the other hand, problems with normal functioning of reproduction in excessively fat animals consist mainly in less clear oestrus symptoms and thereby in prolongation of intervals between successive parturitions, reduction of the number of born piglets and their poorer rearing [1].

The taken up study aimed at determination of the effect of backfat thickness in different measuring points on the body at first mating in pure-bred and hybrid gilts on their reproduction performance. Also an attempt was made to estimate an optimum backfat thickness at which the gilt breeding should be initiated.

MATERIAL AND METHODS

The study was carried out at a pig industrial fattening farm situated in the Western Pomeranian Province (Poland). The observations covered 89 primiparous gilts in total, including 42 Polish Large White (PLW) ones and 47 hybrid gilts of Polish Large White and Polish Landrace breeds (PLW x PL).

The experiment started on the day of the first mating of gilts, i.e. on average on day 278 of life, in the third successive oestrus and completed after the rearing of second litter piglets. From day 150 of life, the gilts were provided with a controlled contact with boar for about 15 minutes a day in order to accelerate their sexual maturation and intensify oestrus symptoms. Before mating, the gilts were kept in group pens, with a possibility of using yards runs.

In the farrowing period until day 107 of pregnancy, the sows were kept in group pens, 4–5 animals each, and fed with complete feed mixture according to the current pig feeding programme of the Provimi Poland Co. Ltd used on the farm (2002). Until day 7 to farrowing, the pregnant sows were given a feed with the following nutritive value: 12.18 MJ ME, 12.5% total protein, 0.60% lysine and 0.40% methionine with cystine. In the last stage of pregnancy as well as during lactation, the sows were given complete feed mixture containing 12.94 MJ ME, 15.5% total protein, 0.82% lysine and 0.51% methionine with cystine. The sows were fed twice a day with a friable feed with addition of water and had a possibility of using automatic drinkers. Moreover, from May to September, the sows were additionally fed with alfalfa green fodder (1.5 kg/day). About 5–7 days before the expected parturition time, the sows were moved to triple farrowing pens, where they remained until the end of lactation. Piglets remained with their mothers for 30 (±3) days on the average. From day 5-6 of life, the suckling piglets were additionally fed with a granulated feed mixture of the prestarter type.

In the next reproduction cycle, the number of sows decreased due to culling. In the second cycle, 35 PLW sows and 37 PLW x PL hybrid ones were evaluated.

During the experiment, the body weight and the fatness were controlled in all sows on day of first and second mating. Litter production traits expressed by the number and the weight of piglets on day 1 and 21 of life were analysed, as well as the number of piglets on the day of weaning from sow and the weaning to first service interval

Backfat thickness measurements were made using a PIGLOG 105 ultrasonic apparatus on the right-hand side of animal body in 6 following points: over the shoulder – two backfat thickness measurement in the vertical line going down tangentially to the elbow joint (in the region of 6–7 thoracic vertebra) 3 cm from the middle line of the back (point P1a) and 8 cm from the middle line of the back (point P1b); on the mid-back – two backfat thickness measurements behind the last rib (on the border between thoracic and lumbar vertebrae) 3 cm from the middle line of the back (point P2a) and 8 cm from the middle line of the back (point P2b); on the low back– two backfat thickness measurements in the vertical line going down tangentially to the knee joint (between the 2nd and the 3rd sacral vertebra) 3 and 8 cm from the middle line of the back (points P3a and P3b, respectively).

Based on the obtained results, statistical calculations were made using a double-factor analysis of variation. A multivariate analysis of variance according to the Statistica 8.0 Pl computer software was applied in statistical calculations using the following model:

$$Yij = \mu + a_i + eij$$

Yij – observed value,
μ – overall mean,
a_i – effect of i-th group (where i = respectively backfat thickness measuring points: P1a, P1b, P2a, P2b, P3a, and P3b),
eij – error for *ij*-th effects.

In the tables are presented the mean values and the standard errors of the means (SEM).

RESULTS

The examined sows were mated for the first time at the average body weight of 129 kg. The hybrid sows were significantly heavier (P≤0.01) when compared to pure-bred ones, both at the first mating and in the next reproduction cycle (Table 1). The animals at the first mating were characterised by the body weight consistent with recommendations.

Table 1. Body weight and backfat thickness at first and next mating Polish Large White sows and Polish Large White x Landrace hybrids sows

Trait:	1st reproduction cycles		2nd reproduction cycles		SEM	differences		interaction group x cycles
	PLW	PLWxL	PLW	PLWxL		PLW-PLWxL	1st cycles-2nd cycles	
Body weight (kg)	121.3	136.6	142.3	154.1	1.50	-13.6**	-19.6**	NS
backfat thickness 3 cm from the middle line (mm)								
– over the shoulder (P1a)	23.1	24.4	25.5	24.7	0.36	-0.25	-1.35*	NS
– on the mid-back (P2a)	15.0	16.0	17.0	18.2	0.26	-1.1*	- 2.1*	NS
– on the low back (P3a)	16.8	17.0	17.7	17.8	0.29	-0.15	-0.85	NS
Fat thickness 8 cm from the middle line (mm)								
– over the shoulder (P1b)	23.9	23.4	23.9	23.7	0.36	0.35	-0.15	NS
– on the mid-back (P2b)	14.6	15.0	15.4	17.2	0.26	-1.1*	-1.5*	NS
– on the low back (P3b)	16.7	16.7	17.3	18.3	0.31	-0.5	-1.1	NS

SEM: semi standard error, * P ≤ 0.05; ** P ≤ 0.01, NS non significant

In the presented study (Table 1), the thickest backfat on day of mating in both sow groups (PLW and PL) was observed over the shoulder (points P1a and P1b), while the thinnest one behind the last rib on the mid-back (points P2a and P2b).

Mean backfat thickness over the shoulder (points P1a and P1b) on the day of the first mating amounted respectively to 23.1 mm and 23.9 mm in pure-bred sows, while to 24.4 mm and 23.4 mm, respectively, in the hybrid ones. On the other hand, mean backfat thickness on the mid-back (points P2a and P2b) during the first mating was respectively 15.0 and 14.6 mm in pure-bred sows and 16.0 mm and 15.0 mm in the hybrid ones. The fatness of PLW sows on the day of the first mating on the back [mid-back] 3 cm from the middle line of the back (point P2a) was significantly smaller (P≤0.05) when compared to that in hybrid sows. On the other hand, the backfat thickness on the low back (points P3a and P3b) in the same time in both groups was very similar, since it amounted to 16.7 mm and 17.0 mm, respectively, and no statistical differences were found. In the second reproduction cycle (Table 1), a significant increase (P≤0.05) was observed in the backfat thickness over the shoulder (point P1a) and on the mid-back (points P2a and P2b). In other measurement points, i.e. on the low back (points P3a and P3b), an increase in the backfat thickness occurred as well but it was statistically non-significant.

In Tables 2 and 3 are presented the results of reproductive performance, taking into account the division of PLW and hybrid sows into groups with thinner and thicker backfat at mating in respective measuring points. When analysing the reproduction performance of primiparous sows according to the backfat thickness on day of mating, it was found that better reproduction performance results were obtained by the sows with thicker backfat at first mating.

Table 2. Reproduction performance of Polish Large White (PLW) sows according to backfat thickness at first mating

Traits:	backfat thickness over the shoulder				backfat thickness on the mid-back				backfat thickness on the low back				SEM
	P1a		P1b		P2a		P2b		P3a		P3b		
	≤23.0 mm	>23.0 mm	≤23.0 mm	>23.0 mm	≤15.0 mm	>15.0 mm	≤14.0 mm	>14.0 mm	≤17.0 mm	>17.0 mm	≤16.0 mm	>16.0 mm	
	n=24 $\bar{x}$=20.2	n=18 $\bar{x}$=27.1	n=19 $\bar{x}$=19.6	n=23 $\bar{x}$=27.4	n=24 $\bar{x}$=13.5	n=18 $\bar{x}$=17.1	n=24 $\bar{x}$=12.4	n=18 $\bar{x}$=17.0	n=22 $\bar{x}$=14.0	n=20 $\bar{x}$=19.9	n=20 $\bar{x}$=14.2	n=22 $\bar{x}$=19.1	
First parity Number of piglets:													
total born	9.4^{A}	10.5^{A}	9.4	10.2	9.5^{a}	10.4^{a}	9.8	9.9	9.8	9.8	9.7	9.9	0.22
born alive	8.6^{a}	9.7^{a}	8.6^{b}	9.4^{b}	8.6^{c}	9.6^{c}	8.8	9.3	8.8	9.3	8.8	9.3	0.22
on the 21st. days	8.1	8.5	7.8^{a}	8.6^{a}	8.1	8.5	8.1	8.5	8.0	8.6	8.0	8.5	0.19
Litter weight: On day 1st (kg)	11.3	11.9	10.9	12.1	11.1	12.1	11.3	11.9	11.0	12.2	10.9	12.2	0.39
On day 21st (kg)	41.3	40.3	38.2	42.9	40.8	41.1	38.7	43.3	40.2	41.6	38.2	43.1	1.47
Piglet losses up to day 21st (%)	4.6^{a}	10.7^{a}	5.8	8.2	5.4	9.8	7.1	7.2	8.3	5.9	6.6	7.7	1.45
Non – pregnant days	11.8	10.4	10.1	11.9	12.6	9.1	10.8	11.6	9.8	12.8	12.4	10.2	1.52
Second parity Number of piglets:													
total born	10.5	10.7	10.3	10.8	10.3	11.0	10.6	10.5	10.4	10.7	10.6	10.6	0.24
born alive	9.6	10.0	9.5	10.0	9.8	9.9	9.6	10.0	9.7	9.9	9.7	9.9	0.35
Litter weight: On day 1st (kg)	12.9	12.8	12.5	13.1	12.9	12.8	12.7	13.1	12.7	13.0	12.8	13.0	0.51
On day 21st (kg)	46.5	49.3	43.7^{A}	50.5^{A}	45.3^{a}	51.4^{a}	45.8	49.9	44.1^{B}	50.9^{B}	45.6	50.3	1.33

SEM: semi standard error, means in rows with the same letters superscript differ significantly at: ^{a,b,c} $P \leq 0.05$; ^{A,B,C} $P \leq 0.01$

Tabele 3. Reproduction performance of Polish Large White x Landrace hybrid sows according to backfat thickness at first mating

Traits:	backfat thickness over the shoulder				backfat thickness on the mid-back				backfat thickness on the low back				SEM
	P1a		P1b		P2a		P2b		P3a		P3b		
	≤23.0 mm	>23.0 mm	≤23.0 mm	>23.0 mm	≤ 15.0 mm	> 15.0 mm	≤ 14.0 mm	> 14.0 mm	≤17.0 mm	>17.0 mm	≤16.0 mm	>16.0 mm	
	n=20 $\bar{x}$=20.4	n=27 $\bar{x}$=27.5	n=23 $\bar{x}$=20.0	n=24 $\bar{x}$=26.7	n=22 $\bar{x}$=13.3	n=25 $\bar{x}$=18.4	n=22 $\bar{x}$=12.0	n=25 $\bar{x}$=17.9	n=26 $\bar{x}$=14.7	n=21 $\bar{x}$=19.9	n=27 $\bar{x}$=14.3	n=20 $\bar{x}$=20.0	
First parity													
Number of piglets:													
total born	10.9	11.4	10.6[a]	11.7[a]	10.7	11.6	10.8	11.5	10.8	11.6	10.9	11.6	0.26
born alive	10.4	10.6	10,1	10.9	9.9[a]	11.0[a]	10.2	10.8	10.1	11.0	10.3	10.9	0.28
on the 21st. days	9.4	9.6	9.3	9.8	9.3	9.8	9.3	9.7	9.4	9.7	9.3	9.9	0.19
Litter weight: On day 1st (kg)	13.0	13.2	13.1	13.4	12.6[a]	13.8[a]	13.3	13.2	13.2	13.3	13.1	13.5	0.34
On day 21st (kg)	52.0	52.5	51.3	53.2	49.8	54.6	50.6	54.0	52.9	51.5	50.2[a]	55.2[a]	1.36
Piglet losses up to day 21st (%)	8.3	8.1	7.3	9.0	5.6	10.5	7.6	8.7	5.8[a]	11.2[a]	8.3	8.0	1.46
Non – pregnant days	11.2	8.9	9.5	10.5	8.8	11.2	9.0	10.9	10.6	9.3	10.9	8.6	1.33
Second parity													
Number of piglets:													
total born	11.6	11.5	11.3	11.7	11.6	11.4	10.9	10.8	11.3	11.8	11.5	11.5	0.21
born alive	10.9	10.8	10.7	10.9	10.9	10.7	11.5	11.5	10.7	11.1	10.9	10.6	0.27
Litter weight: On day 1st (kg)	13.8	14.0	13.9	13.9	14.1	13.8	14.0	13.8	13.9	13.9	14.0	13.7	0.27
On day 21st (kg)	54.9	55.2	55.4	54.7	55.9	54.1	55.5	54.6	54.4	56.0	55.2	54.9	1.46

SEM: semi standard error, means in rows with the same letters superscript differ significantly at: [a,b,c] $P \leq 0.05$; [A,B,C] $P \leq 0.01$

The pure-bred primiparous sows (Table 2) with thicker backfat measured over the shoulder at point P1a ($\bar{x}$=27.1mm) in general gave birth to significantly more piglets (P≤0.01) in the first litter (by 1.1 piglet) when compared to those with thinner backfat ($\bar{x}$=20.2 mm). It was also showed that the sows with thicker backfat over the shoulder at points P1a and P1b gave birth to significantly more live piglets in the litter (P≤0.05), respectively by 1.1 and 0.8 piglets, than those with thinner backfat measured in the same measuring points. In the group of sows with thicker backfat at points P1a and P1b, smaller piglet losses until day 21 of life were observed, with statistically significant differences (P≤0.05) being showed for the backfat thickness at point P1a. The sows with thicker backfat over the shoulder (at point P1b) reared also significantly more piglets (P≤0.05) until day 21 of life.

When analysing reproduction performance results in primiparous sows according to the backfat thickness on the mid-back behind the last rib, a significantly larger number of piglets (P≤0.05) born in total and alive by the sows with thicker backfat at point P2a ($\bar{x}$=17.1 mm) was found than by those with thinner backfat ($\bar{x}$=13.5 mm). No differences were observed in the results of reproduction performance in sows according to the backfat thickness measured on the low back.

In the second reproduction cycle, significant differences (P≤0.01) were observed in relation to the litter weight on day 21 of life. The sows with thicker backfat at mating over the shoulder (point P1b), on the mid-back behind the last rib (point P2a) and on the low back (point P3a) reared litters with a larger weight when compared to those with thinner backfat.

When analysing the reproduction performance traits of hybrid sows (Table 3) according to thinner or thicker backfat at mating, it was found that the number of piglets born in total was significantly larger (P≤0.05) in the group of primiparous sows with thicker backfat over the shoulder, i.e. in point P1b.

The hybrid sows with thicker backfat ($\bar{x}$=26.7 mm) gave birth to more piglets in litter, by 1.1 piglet, than those with the thinner one ($\bar{x}$=20.0 mm). It was also found that the hybrid sows with thicker backfat at point P2a ($\bar{x}$=18.4 mm) gave birth to more piglets (P≤0.05), by 1.1 piglet, when compared to those with a thinner layer of the fat tissue in this point ($\bar{x}$=13.3 mm). In this group of sows, no such differences were found when analysing the backfat thickness at first mating according to the results of breeding performance in sows in the second reproduction cycle.

In the presented study an attempt was also made to estimate an optimum backfat thickness on the day of the first mating in respective measuring points. The obtained results are presented collectively for both groups of sows (PLW and hybrid ones) on three diagrams (Fig. 1, 2 and 3).

The largest number of live piglets in litter was born by the sows with the backfat thickness over the shoulder (point P1a) at mating amounting to 28 to 30 mm, while in point P1b to 24 to 26 mm, i.e. 11.7 and 10.5 piglets, respectively. When taking into account the backfat thickness on the mid-back (Fig. 2), the largest number of live piglets in litter (11.9) was born by the sows with the backfat in point P2a having a thickness of 18.0 mm and 19.0 mm in point P2b (11 piglets). It should be stressed however that in case of measurements on the mid-back, over 10 piglets in litter were obtained from the sows with the backfat thickness from 17.0 mm to 19.0 mm in point P2a and from 18.0 mm to 20.0 mm in point P2b. The results presented in Fig. 3 show that the most suitable backfat thickness on the low back (point P3a) is 21.0 mm, while that in point P3b from 17.0 to 21.0 mm. The sows with such a backfat thickness at mating gave birth to the largest number of live piglets (11.7 and 10.0, respectively).

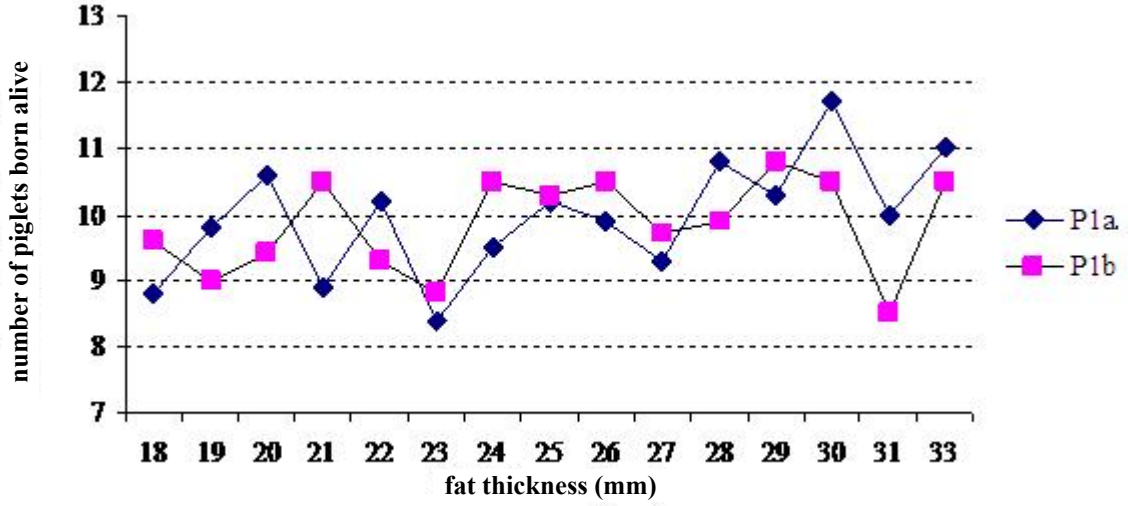

Fig. 1. Effect of the backfat thickness over the shoulder at first mating on the number of piglets born alive in the first parity

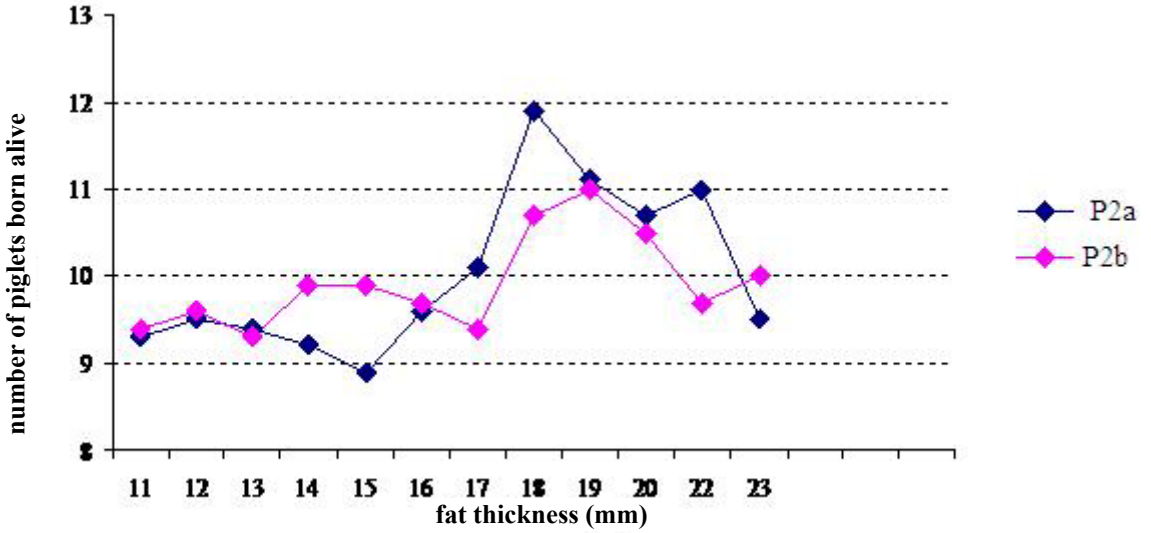

Fig. 2. Effect of the backfat thickness on the mid-back at first mating on the number of piglets born alive in the first parity

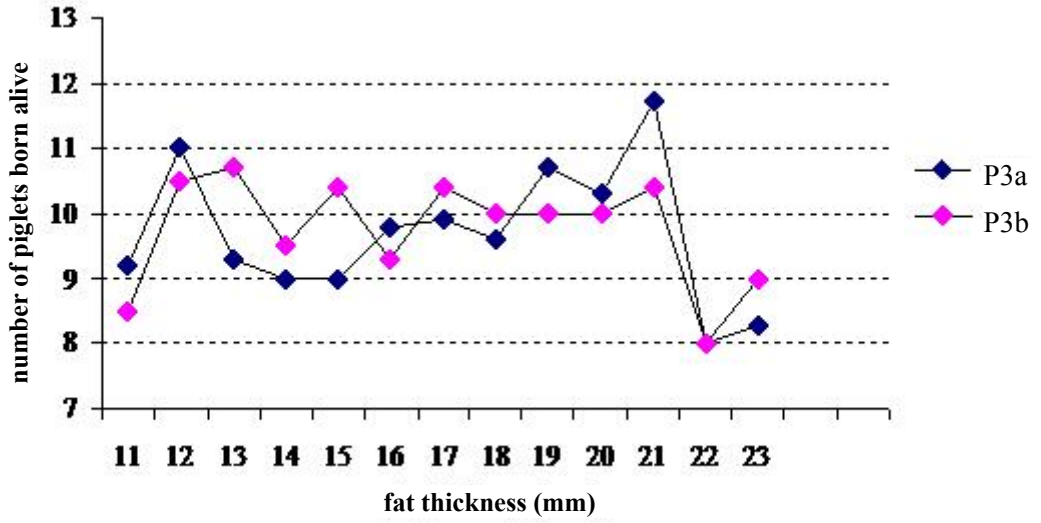

Fig. 3. Effect of the backfat thickness on the low back at first mating on the number of piglets born alive in the first parity

DISCUSSION

It is believed that a female prepared for reproduction should not weigh less than 120 kg [30]. According to other authors, it should even weigh from 130 to 150 kg [6,11,25]. This is because a systematic development of the reproductive system occurs and the number of ovulating egg cells increases with the increase of body weight in gilts [28]. The gilts being heavier and older during the first mating are stronger and tougher. They are characterised by high reproduction performance and reproductive longevity [21].

Recommendations referring to the backfat thickness at gilt mating, allowing for their genotype, differ. Chalinor et al. [5] obtained best reproduction performance results for sows that were mated for the first time at a body weight of 126 to 146 kg and at mean backfat thickness on the mid-back (point P_2) from 15.8 to 20.0 mm. It is desired for the sows of French breeds that their fatness on the mid-back at first mating is larger than or equal to 15.0 mm, while in multiparous sows it should be 17.0 mm [9]. According to Rekiel et al. [20], the efficient reproduction should be expected when initiating the breeding of PLW x PL hybrid sows at a body weight of 120-125 kg and a fat reserve being determined by the value P_2 of about 19-20 mm. Some authors are of the opinion that particular attention should be paid to obtaining a proper backfat thickness at mating in pure-bred gilts.

In the presented study measurements of the backfat tissue over the shoulder (points P1a and P1b) as well as that on the mid-back in point P2a on day of mating in pure-bred PWL gilts are particularly important. In the event that backfat thickness over the shoulder on day of mating was above 23 mm and that on the mid-back was above 15 mm, the sows gave birth to significantly more piglets in the first litter. It was showed in hybrid sows that backfat thickness measurement at mating in points P1b and P2a has a significant effect on the litter size and the weight of born piglets (point P2a).

It is difficult to confront the results referring to the backfat thickness over the shoulder or on the low back obtained in the presented study because in the available literature the gilt fatness was mainly examined on the mid-back. However, the evaluation of fatness in additional measuring points may substantially contribute to better determination of optimum energy stores in the reproduction period.

The results of reproduction performance in sows according to their fat reserve measured by backfat thickness obtained in other studies differ. The backfat thickness on the back [mid-back] behind the last rib for gilts at the time they start breeding can range from 14 to 25 mm [30], with the most frequently recommended one of 18–20 mm in point P2 [25,3]. In many studies, the results of sow reproduction performance and litter production performance were better in the sows with thicker backfat at mating. Gaughan et al. [13], when evaluating the lifetime reproduction performance of sows according to their backfat thickness showed that those with backfat thickness at mating of 18.5 mm gave birth to and reared the largest number of piglets. In the studies of Walkiewicz et al. [29], the primiparous sows with thicker fat tissue on the mid-back before mating (16.2 and 17.8 mm) gave birth to more numerous litters, respectively by 0.42 and 0.8 piglet, and reared them better than those with thinner backfat, being thick 13.6 mm on the average on day of mating. Moreover, the milk of sows with thicker backfat measured on day of mating was richer in fat, while the period from weaning to the occurrence of next oestrus was shorter on average by 13 days. This shows that sows with thicker backfat on day of mating were in better reproduction condition after completing the lactation period. The research of Čechova & Tvardoň [4] showed that sows with thicker backfat on the day of the first mating not only were used for a longer time but also reared heavier piglets in successive cycles. It should be stressed here that both too thick and too thin backfat affects unfavourably the efficiency of pig reproduction.

According to some authors [14,26], the fatness of gilt bodies is important not only on day of mating but also before starting the breeding. It was showed that intensive selection towards increasing the pig meatiness brought about many unfavourable consequences in pig reproduction. This is manifested by smaller litter size in sows or increased piglet losses during the rearing period [12,16,23,27]. Also a decrease in the efficiency of boar reproduction is observed [17]. The fat tissue is considered at present not only as a store of excess energy reserves. It was showed in many studies that fat cells produce biologically active substances which may have an effect on the reproduction axis [2,7].

CONCLUSION

The PLW and hybrid (PLW x PL) sows with thicker backfat on the day of the first mating evaluated in this study were characterised by better results of reproduction performance when taking into account the number of piglets born in total and alive. The best performance were obtained in case of the sows with backfat thickness on the day of the first mating amounting on average to 30.0 mm over the shoulder, 18.0 mm on the mid-back behind the last rib and 20.0 mm on the low back. This may suggest that they represent optimum values at which gilts should be mated for the first time.

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