Influence of growth rate, backfat thickness and meatiness on reproduction efficiency in Landrace gilts

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ABSTRACT: In the nucleus herd and subsequent multiplication herd of the Landrace (L) breed in 262 gilts farrowed after the first insemination we analysed the influence of various levels of average daily weight gain from birth in the performance test in the field (ADG1) and till mating (ADG2), average backfat thickness (mm) in the performance test (BF1) and at mating (BF2) or lean meat percentage (LM1 and LM2) on the age and weight at mating and at farrowing, on the number of piglets born, piglets born alive and weaned ones and litter weight at 21 days. Based on the studied traits the gilts were divided into intervals for the evaluation according to the average and standard deviation ($\leq x - s$; $x - s$; $x + s$; $\geq x + s$). A significant influence of ADG1 and ADG2 on the weight at the first insemination was observed ($P < 0.01$, $P < 0.001$). The age and weight after farrowing were affected by ADG1 to a greater extent ($P < 0.001$). With increasing values of weight gain a higher number of piglets per litter was observed. ADG1 affected the number of piglets born and also of piglets born alive ($P < 0.001$), the litter weight at 21 days (sows' milk production) and the number of weaned piglets ($P < 0.05$). ADG2, however, affected only the number of piglets born and of piglets born alive per litter ($P < 0.05$, $P < 0.001$). BF1 affected only the age at the first insemination or at farrowing ($P < 0.05$) and the number of piglets at the age of 21 days ($P < 0.05$). BF2 affected the number of piglets born, those born alive and the weaned ones ($P < 0.05$, $P < 0.01$), the litter weight at 21 days ($P < 0.001$) and the number of piglets at 21 days ($P < 0.05$, $P < 0.01$). The lean meat percentage ascertained in the performance test (LM1) did not significantly affect any studied reproduction trait. A significant influence of LM2 on the age at the first insemination or at farrowing was proved ($P < 0.05$, $P < 0.01$) as well as on the weight at the first fertile insemination ($P < 0.001$). An increased percentage of lean meat had a negative impact on the number of piglets born and piglets born alive ($P < 0.05$), on litter weight at 21 days ($P < 0.01$), number of piglets at the age of 21 days ($P < 0.001$) and on the number of weaned piglets ($P < 0.05$, $P < 0.01$). A more significant influence of the higher growth ability of gilts on the reproductive traits was detected in the performance test. On the contrary, at the period of mating the reproductive traits were affected by backfat thickness and meatiness to a greater extent.

Keywords: gilt; weight gain; backfat thickness; meatiness; reproduction

The manifestation of sow fertility is a result of a multifactor interaction of internal and external conditions of the organism; a complex of measures leading to its optimisation can therefore affect it efficiently. Reproductive traits are of major importance especially in dam breeds of pigs because the reproductive performance of sows is one of the major factors of the breed effectiveness in pig breeding. The lifetime reproduction productivity of sows is affected to a great extent by the effectiveness of gilts. The aim of the work is to analyse the influence of production traits on the reproduction ability of gilts.

The placement of gilts into the breeding herd of sows is put in connection with problems of early mating and with a lower number of piglets born in the first parity (Čeřovský, 2001). The level of protein deposition is considered to be the regulator of reproduction functions in gilts. Gaughan et al. (1997) reported that the level of fat and protein

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deposition was bound to the physiology of sexual maturity and it was considered to be a more important determinant for achieving puberty than age and weight. Čeřovský (2001), Bečková and Daněk (2002), Čechová and Tvrdoň (2002) found out a positive influence of gain on reproduction ability. Čeřovský (1996) stated that the stagnation of average daily gain after finishing the performance test had a significant influence on an increase in the age at the first insemination and a negative influence on the placement of gilts into the sow herd. Čechová (2002), Bečková et al. (2004) detected a positive impact of higher growth ability on the age at the first insemination. According to Newton and Mahan (1993) age is the factor number one that conditions the beginning of puberty rather than body weight, gain and backfat thickness. Clark and Leman(1986), Schukken et al. (1994) and Le Cozler et al. (1998) demonstrated a significant impact of the age and weight at the first insemination on litter size.

In their paper Löbke et al. (1986) reported a partial decrease in reproductive performance caused by one-sided selection to a high level of meatiness. The authors stated that an increase in meat performance led to a decrease in reproduction ability. Kerr et al. (1996), Čechová and Buchta (1995) described a genetic antagonism between the traits of reproduction and meatiness. Young et al. (1991) also concluded that selection aimed at production traits, especially at an increase in lean meat content, resulted in reproduction problems – in a decrease in the number of piglets per litter and delayed puberty onset. Čeřovský (2001) considered the absolute content of lean meat to be a critical parameter for the normal course of reproduction functions in gilts and sows rather than a decrease of the content of the so-called reserve fat. Čeřovský (2002) also mentioned a decisive importance of the body condition of gilts, appropriate age and oestrus onset for the reproduction efficiency.

The aim of this study was to determine the effect of growth rate, backfat thickness and meatiness in Landrace gilts on reproduction efficiency in the performance test and in the mating period.

MATERIAL AND METHODS

In the nucleus herd and subsequent multiplication herd of the dam breed Landrace (L) we examined production traits in 262 gilts and their influence on selected reproductive traits. The data on particular animals were taken from the breed recording and from the results of performance test (the method of the field test ČSN 466164). The test started at the gilt's age of 12 weeks ± 4 days (the weight about 30 kg). The test lasted 8 weeks ± 7 days for Landrace and Large White gilts. All animals were weighed at the beginning and end of the test and average daily weight gain from birth and average daily weight gain in the test were calculated. After weighing at the end of the test lean meat percentage and backfat thickness were measured with Hungarian-made ultrasonic instrument SONOMARK (SM-100) on the basis of current methodology for determination of breeding pig performance *in vivo*. The points of measurements are located 70 mm laterally from the central line – backfat thickness (t_1), backfat thickness (t_2), and the depth of the muscle m.l.l.t. (sv) was measured at the same point. The regression equation supplied by the Hungarian manufacturer for SM-100 instrument is: $y = 63.87 - 0.447t_1 - 0.51t_2 + 0.128sv$. The ultrasonic measurements using the SONOMARK 100 instrument were performed in the gilts also in the period of mating or at the first insemination. Only the gilts that farrowed after the first insemination and that were intended for further breeding were placed into the evaluated group. These gilts were monitored from birth to the weaning of their piglets after the first farrowing. The gilts were fed identical diets intended for the respective categories for the whole time of the experiment. The same persons always performed the tending, detection of oestrus, insemination, weighing and ultrasonic measurements.

Among the production traits we examined the weight gain (g) from birth to the end of performance test (ADG1), gain (g) from birth to the first mating (ADG2), average backfat thickness (mm) in the performance test (BF1), average backfat thickness (mm) at the first insemination (BF2), percentage of lean meat (%) in the performance test (LM1), percentage of lean meat (%) at the first insemination (LM2), body weight at the end of the performance test (kg) and body weight at the first insemination.

The following reproductive traits were examined and consequently analysed: age at mating (days), age at farrowing (days), number of piglets born, number of piglets born alive, litter weight at 21 days (sow's milk production), number of piglets at the age of 21 days (kg, number) and number of weaned piglets.

Based on gain, average backfat thickness and lean meat percentage the gilts were divided into intervals according to the ascertained average values: $\leq x - s$; $x - s$; $x + s$; $\geq x + s$. The statistical evaluation was performed using the computer program QCExpert. Differences between means were considered significant at $P < 0.05$ (*), $P < 0.01$ (**) and $P < 0.001$ (***).

RESULTS AND DISCUSSION

The basic statistical characteristics of the studied group of gilts are given in Table 1. A development of the values of production traits in both studied periods is evident from the given results. The gilts were inseminated at the age of $x = 228.9$ days at the weight of 142.4 kg. The age at farrowing traced the mating age increased by the pregnancy period. For the evaluated group of gilts $x = 10.6$ of all piglets born, $x = 9.7$ of piglets born alive and $x = 8.9$ of weaned piglets. The average litter weight at 21 days was $x = 45.9$ kg and the number of piglets at 21 days $x = 9.0$.

The influence of the average daily weight gain from birth to the end of performance test (ADG1) or till mating (ADG2) is given in Tables 2 and 3. In the evaluated group of L gilts the influence of different levels of weight gains on age at the first insemination was not proved. Even if the results indicate a tendency towards an age decrease with the increased gain, the differences are not statistically significant ($P > 0.05$). Čechová and Tvrdoň (2002) reported a positive impact of higher ADG1 on age at the first insemination in LW and L gilts. Bečková and Daněk (2002) also discovered that in L gilts of Norwegian provenience the age at the first insemination significantly decreased ($P < 0.001$) with increasing ADG1. Vidovic (1997) considered 220–250 days ($x = 235$ days) to be an optimal age for the insemination of gilts of the L breed, which corresponds with the results of the group of the gilts we had monitored (Table 1). The lowest age at the first insemination 224.3 or 221.0 days was achieved in the gilts with ADG1 ≥ 675.6 g or ADG2 ≥ 666.0 g. A significant influence of both gains on weight at the first insemination, ADG1 ($P < 0.001$) and ADG2 ($P < 0.05$, $P < 0.001$) was observed. The age at farrowing was affected only by ADG1 on a lower up to a medium level of significance ($P < 0.05$, $P < 0.01$). The weight before farrowing was also affected by ADG1 to a greater extent ($P < 0.001$). With higher values of average daily weight gain the number of piglets per litter increased. In the group with the lowest ADG1 (553.1 g and less) the lowest number of piglets born was found (9.8) in comparison with the group with the highest gain (675.6 g and more) where there were 12.2 piglets born alive ($P < 0.001$).

Table1. Basic statistical characteristics of the studied group of gilts

Trait ($n = 262$)	Mean	SD	v
Average daily gain from birth to end of performance test (g)	614.3	61.2	9.9
Average backfat thickness in performance test (mm)	9.9	1.7	17.5
Lean meat in performance test (%)	60.8	1.7	2.8
Average daily gain from birth to mating (g)	591.7	74.1	12.5
Average backfat thickness before mating (mm)	14.9	3.7	25.1
Lean meat before mating (%)	56.4	3.1	5.5
Age at mating (days)	228.9	31.6	13.8
Body weight at mating (kg)	142.4	19.4	13.6
Age at farrowing (days)	348.9	31.8	9.1
Body weight before farrowing (kg)	201.2	25.8	12.8
Total number born	10.6	2.9	27.4
Number born alive/litter	9.7	2.8	28.9
Litter weight on day 21 (kg)	45.9	11.2	24.4
Number of piglets/litter on day 21	9.0	2.1	23.3
Number of piglets weaned/litter	8.9	2.2	24.7

Table 2. Influence of average daily gain from birth to the end of performance test on some reproductive traits

Trait	Class 1 (≤ 553.1) n = 36		Class 2 (553.2–614.3) n = 85		Class 3 (614.4–675.5) n = 101		Class 4 (≥ 675.6) n = 40		Significance of differences between classes					
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	1:2	1:3	1:4	2:3	2:4	3:4
Age at mating (days)	229.6	32.5	234.9	35.9	225.3	29.9	224.3	22.9	ns	ns	ns	ns	ns	ns
Body weight at mating (kg)	124.6	12.6	137.0	16.8	146.2	16.7	159.9	18.8	***	***	***	***	***	***
Age at farrowing (days)	346.5	30.8	356.3	35.5	346.6	30.8	341.1	24.8	ns	ns	ns	*	**	ns
Body weight before farrowing (kg)	189.9	24.6	199.7	24.2	201.9	27.1	212.6	23.2	*	*	***	ns	**	*
Total number born/litter	9.8	2.9	9.9	2.8	10.8	2.9	12.2	2.3	ns	ns	***	*	***	*
Number born alive/litter	9.3	3.0	9.2	2.8	9.9	2.9	10.8	2.2	ns	ns	**	ns	***	ns
Litter weight on day 21 (kg)	44.6	10.1	44.9	11.6	45.7	11.1	49.5	11.7	ns	ns	ns	ns	*	ns
Number of piglets/litter on day 21	8.9	1.8	8.6	2.3	9.3	2.0	9.5	2.2	ns	ns	ns	*	*	ns
Number of piglets weaned/litter	8.9	1.8	8.3	2.5	9.2	2.1	9.3	1.9	ns	ns	ns	*	*	ns

***$P < 0.001$; **$P < 0.01$; *$P < 0.05$; $P > 0.05$

Table 3. Influence of average daily gain from birth to mating on some reproductive traits

Trait	Class 1 (≤ 517.5) n = 45		Class 2 (517.6–591.7) n = 82		Class 3 (591.8–665.9) n = 95		Class 4 (≥ 666.0) n = 40		Significance of differences between classes					
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	1:2	1:3	1:4	2:3	2:4	3:4
Age at mating (days)	229.9	27.5	233.8	33.3	227.2	31.7	221.0	31.7	ns	ns	ns	ns	ns	ns
Body weight at mating (kg)	130.9	17.1	140.2	18.5	145.8	18.9	151.4	18.8	**	***	***	*	**	ns
Age at farrowing (days)	351.2	27.2	351.5	32.5	346.6	31.8	346.4	36.3	ns	ns	ns	ns	ns	ns
Body weight before farrowing (kg)	192.9	22.9	199.3	23.3	205.9	26.9	203.8	28.7	ns	**	ns	ns	ns	ns
Total number born/litter	9.5	2.9	10.4	2.8	11.2	2.8	10.8	3.2	ns	***	*	*	ns	ns
Number born alive/litter	9.2	2.7	9.5	2.9	10.4	2.6	9.6	2.9	ns	*	ns	*	ns	ns
Litter weight on day 21 (kg)	43.8	11.7	45.6	9.2	46.7	12.5	47.1	11.2	ns	ns	ns	ns	ns	ns
Number of piglets/litter on day 21	8.5	2.5	9.1	1.5	9.2	2.4	9.3	1.9	ns	ns	ns	ns	ns	ns
Number of piglets weaned/litter	8.4	2.5	8.9	1.9	9.1	2.4	9.0	2.0	ns	ns	ns	ns	ns	ns

***$P < 0.001$; **$P < 0.01$; *$P < 0.05$; $P > 0.05$

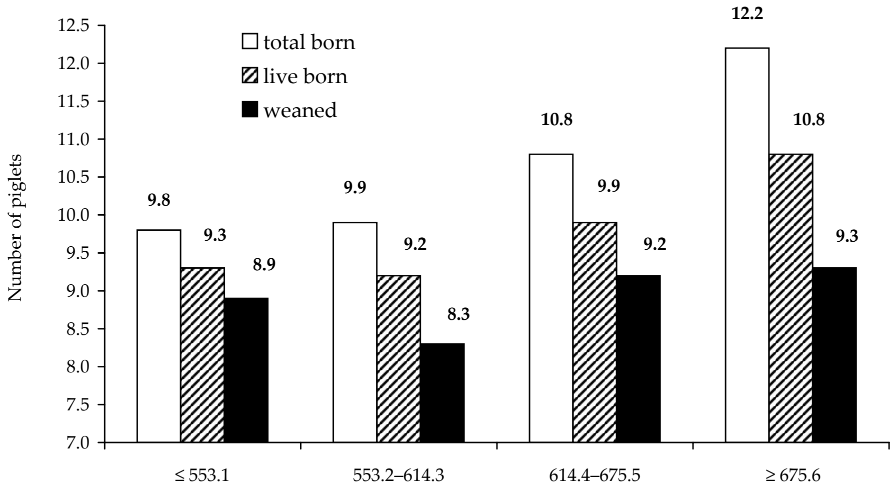

Figure 1. Daily gain from birth to the end of performance test (g)

A tendency in the number of piglets born alive was similar. ADG1 also affected litter weight at the age of 21 days and the number of weaned piglets on a lower level of significance ($P < 0.05$). Čechová and Tvrdoň (2002) found a highly significant level ($P < 0.001$) for the correlation between ADG1 and the number of piglets born and piglets born alive in the L breed. In the group of gilts with the lowest ADG2 (517.5 g and less) there was a lower number of piglets born (9.5) compared to the group with the highest gain (666.0 g and more), where there were 10.8 piglets born ($P < 0.05$). The highest number of piglets born 11.2 ($P < 0.001$) was however found in the gilts with ADG2 in the interval of 591.8 to 665.9 g. A similar tendency could be observed in the number of piglets born alive. The different level of the values of ADG2 did not however affect the litter weight at 21 days and the number of weaned piglets. Yazdi et al. (2000) reported that the gilts with higher growth ability had a higher number of piglets per litter ($P < 0.05$) and a shorter interval weaning – oestrus onset. The influence of both gains on the litter size is lucidly documented in Figures 1 and 2.

The evaluation of the influence of average back-fat thickness discovered in the performance test (BF1) and at the first insemination (BF2) is given in Tables 4 and 5. On a low level of significance BF1 affected only the age at the first insemination or at farrowing ($P < 0.05$) and the number of piglets at 21 days ($P < 0.05$). The values of BF2 had a more important impact on the evaluated reproductive traits. BF2 affected the number of piglets born, those born alive and weaned piglets (Figures 3 and 4) on a low up to a medium level of significance ($P < 0.05$, $P < 0.01$). Even if the highest number of

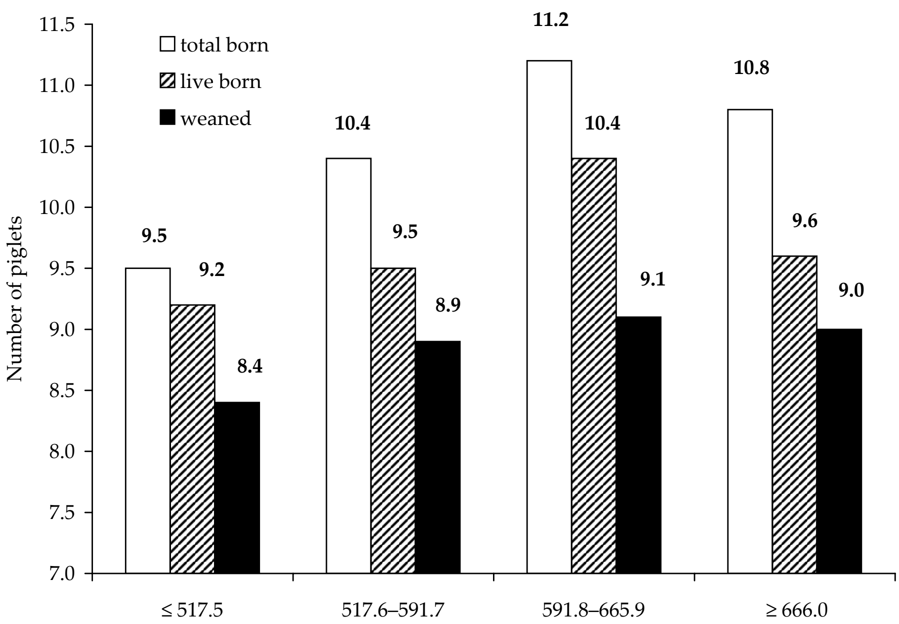

Figure 2. Daily gain from birth to mating (g)

Table 4. Influence of average backfat thickness in performance test on some reproductive traits

Trait	Class 1 (≤ 8.1) n = 48		Class 2 (8.2–9.8) n = 81		Class 3 (9.9–11.5) n = 93		Class 4 (≥ 11.6) n = 40		Significance of differences between classes					
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	1:2	1:3	1:4	2:3	2:4	3:4
Age at mating (days)	222.1	24.3	223.1	23.8	234.9	37.2	235.1	36.5	ns	*	ns	*	ns	ns
Body weight at mating (kg)	142.3	18.5	141.4	16.7	141.8	21.4	145.8	21.1	ns	ns	ns	ns	ns	ns
Age at farrowing (days)	342.6	24.3	345.6	25.9	353.2	35.4	353.2	40,4	ns	*	ns	ns	ns	ns
Body weight before farrowing (kg)	202.7	22.6	202.1	22.8	198.5	29.4	203.8	26.8	ns	ns	ns	ns	ns	ns
Total number born/litter	10.6	2.9	10.9	2.9	10.5	2.9	10.4	2.9	ns	ns	ns	ns	ns	ns
Number born alive/litter	9.8	2.8	9.9	2.8	9.6	2.9	9.8	2.8	ns	ns	ns	ns	ns	ns
Litter weight on day 21 (kg)	46.7	11.6	45.7	12.1	45.0	10.2	47.5	11.7	ns	ns	ns	ns	ns	ns
Number of piglets/litter on day 21	9.1	2.2	8.8	2.4	8.9	1.9	9.7	1.8	ns	ns	ns	ns	*	*
Number of piglets weaned/litter	8.9	2.2	8.7	2.6	8.9	2.0	9.3	1.8	ns	ns	ns	ns	ns	ns

*P < 0.05; P > 0.05

Table 5. Influence of average backfat thickness before mating on some reproductive traits

Trait	Class 1 (≤ 11.1) n = 26		Class 2 (11.2–14.9) n = 123		Class 3 (15.0–18.7) n = 81		Class 4 (≥ 18.8) n = 32		Significance of differences between classes					
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	1:2	1:3	1:4	2:3	2:4	3:4
Age at mating (days)	224.1	26.9	224.3	30.9	232.9	29.3	240.7	39.8	ns	ns	ns	*	*	ns
Body weight at mating (kg)	132.1	14.3	137.1	16.4	145.9	16.3	162.0	25.1	ns	***	***	***	***	***
Age at farrowing (days)	342.5	28.4	344.3	31.0	352.5	27.7	362.5	42.5	ns	ns	*	ns	*	ns
Body weight before farrowing (kg)	196.2	18.1	198.5	24.8	202.7	26.4	211.7	31.0	ns	ns	*	ns	*	ns
Total number born/litter	9.2	3.0	10.6	2.8	11.0	2.8	10.9	3.1	*	**	*	ns	ns	ns
Number born alive/litter	8.9	3.0	9.5	2.8	10.3	2.6	10.0	3.4	ns	*	ns	*	ns	ns
Litter weight on day 21 (kg)	44.8	11.9	43.1	11.1	48.5	10.3	50.9	11.1	ns	ns	ns	***	***	ns
Number of piglets/litter on day 21	8.3	2.4	8.7	2.2	9.4	1.9	9.9	1.7	ns	*	**	*	**	ns
Number of piglets weaned/litter	8.3	2.4	8.6	2.3	9.3	2.2	9.7	1.6	ns	ns	*	*	**	ns

***P < 0.001; **P < 0.01; *P < 0.05; P > 0.05

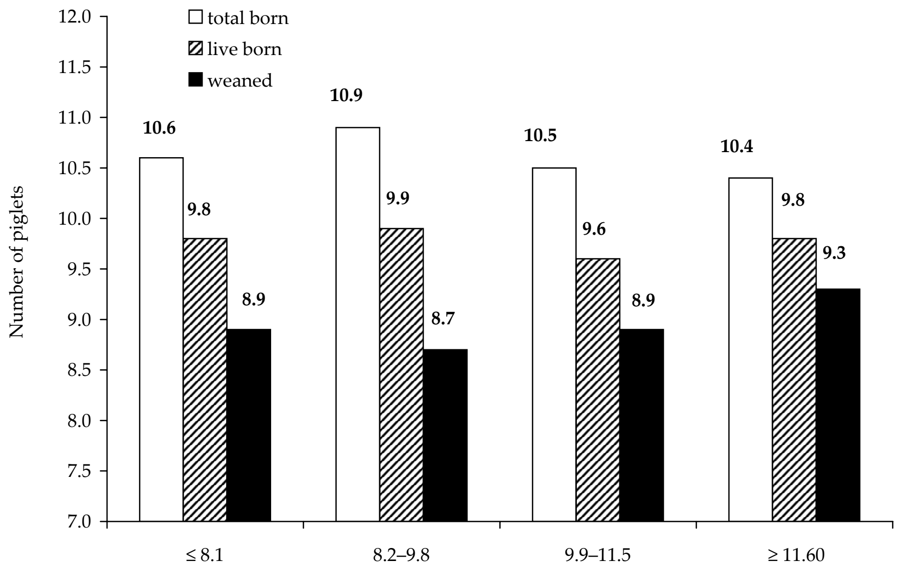

Figure 3. Backfat thickness in performance test (mm)

piglets born and those born alive (11.0 and/or 10.3, respectively) was reached in gilts with BF2 ranging from 15.0 to 18.7 mm, the number of weaned piglets (9.7) was highest in the gilts with the maximum average backfat thickness at the first insemination (at least 18.8 mm). The difference in the number of weaned piglets between the gilts with the minimum and the maximum BF2 was almost 1.5 of piglets. Higher values of BF2 positively affected the litter weight at 21 days. A statistically highly significant difference ($P < 0.001$) was detected in the litter weight, at the lower level of significance ($P < 0.05$, $P < 0.01$) for the number of piglets at 21 days. In the Leicoma and German Landrace gilts Wähner et al. (2001) ascertained the influence of growth and backfat thickness on the production and reproductive traits at the choice for breed and at mating. The development of backfat thickness in this period affected the litter size significantly positively. Based on the analysis of data from 1975 to 1995 Gaughan et al. (1995) arrived to a conclusion that the gilts with less than 14 mm of fat produce smaller litters for their whole lifetime than the fatter sows.

The percentage of lean meat discovered in the performance test (LM1) in the evaluated group of gilts did not significantly affect any of the studied reproductive traits (Table 6, Figures 5). Theories about the negative influence of lean meat percentage on the reproductive traits differ in various authors. Chen et al. (2003) discovered that the genetic correlations between meat efficiency and reproductive traits were very low. Other authors reported a negative influence of high meatiness on reproduction. Kerr and Cameron (1996) proved a

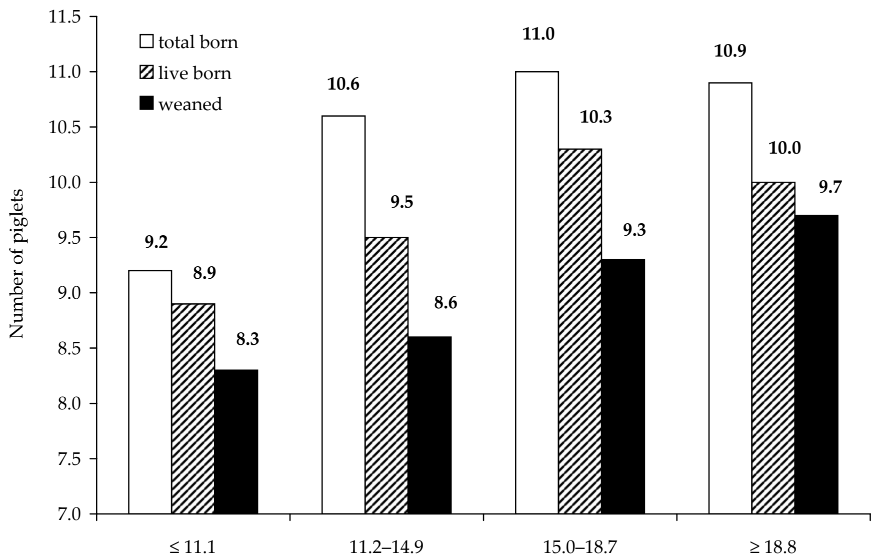

Figure 4. Backfat thickness before mating (mm)

Table 6. Influence of lean meat percentage in performance test on some reproductive traits

Trait	Class 1 (≤ 59.1) n = 41		Class 2 (59.2–60.8) n = 88		Class 3 (60.9–62.5) n = 84		Class 4 (≥ 62.6) n = 49		Significance of differences between classes					
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	1:2	1:3	1:4	2:3	2:4	3:4
Age at mating (days)	229.0	35.4	233.3	37.4	226.7	25.4	224.9	27.2	ns	ns	ns	ns	ns	ns
Body weight at mating (kg)	140.8	18.9	143.1	21.6	142.4	17.9	142.4	18.6	ns	ns	ns	ns	ns	ns
Age at farrowing (days)	348.5	38.6	351.5	35.9	349.1	26.7	344.0	26.2	ns	ns	ns	ns	ns	ns
Body weight before farrowing (kg)	195.6	27.7	201.6	27.2	202.6	24.8	202.7	23.7	ns	ns	ns	ns	ns	ns
Total number born/litter	10.5	2.4	10.5	3.3	10.8	2.7	10.6	2.9	ns	ns	ns	ns	ns	ns
Number born alive/litter	10.1	2.3	9.5	3.1	9.9	2.8	9.6	2.7	ns	ns	ns	ns	ns	ns
Litter weight on day 21 (kg)	47.4	10.8	45.9	10.6	45.3	11.6	45.7	12.3	ns	ns	ns	ns	ns	ns
Number of piglets/litter on day 21	9.5	1.2	8.9	2.1	9.0	2.3	8.7	2.1	ns	ns	*	ns	ns	ns
Number of piglets weaned/litter	9.4	1.6	8.8	2.2	8.9	2.5	8.7	2.1	ns	ns	ns	ns	ns	ns

*$P < 0.05$; $P > 0.05$

Table 7. Influence of lean meat percentage before mating on some reproductive traits

Trait	Class 1 (≤ 53.2) n = 41		Class 2 (53.3–56.4) n = 71		Class 3 (56.5–59.6) n = 117		Class 4 (≥ 59.7) n = 33		Significance of differences between classes					
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	1:2	1:3	1:4	2:3	2:4	3:4
Age at mating (days)	245.9	41.8	226.8	24.2	225.5	30.9	224.3	28.3	*	**	*	ns	ns	ns
Body weight at mating (kg)	159.2	22.4	144.8	17.6	137.8	15.5	132.6	18.7	***	***	***	**	**	ns
Age at farrowing (days)	364.9	44.1	347.6	22.1	345.8	30.8	342.6	30.8	*	**	*	ns	ns	ns
Body weight before farrowing (kg)	212.2	32.3	197.1	23.6	201.4	24.1	195.5	24.6	*	ns	*	ns	ns	ns
Total number born/litter	10.8	3.0	11.1	2.9	10.5	2.8	9.5	3.0	ns	ns	ns	ns	*	ns
Number born alive/litter	10.1	3.3	10.2	2.7	9.6	2.7	8.9	2.9	ns	ns	ns	ns	*	ns
Litter weight on day 21 (kg)	50.0	9.3	47.9	11.0	43.3	11.5	45.4	11.1	ns	**	ns	**	ns	ns
Number of piglets/litter on day 21	9.9	1.6	9.2	1.9	8.7	2.2	8.5	2.3	ns	***	**	ns	ns	ns
Number of piglets weaned/litter	9.7	1.5	9.1	2.3	8.6	2.3	8.5	2.3	ns	**	*	ns	ns	ns

***$P < 0.001$; **$P < 0.01$; *$P < 0.05$; $P > 0.05$

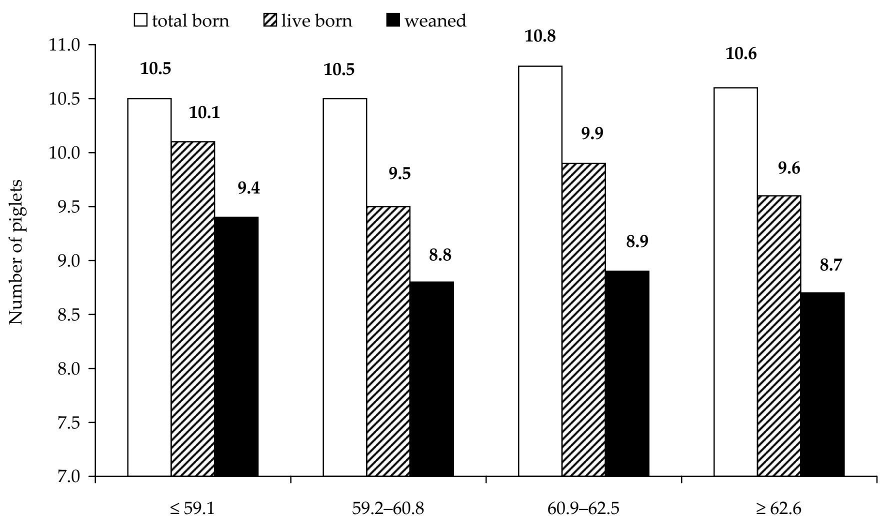

Figure 5. Lean meat percentage in performance test

decrease in reproduction efficiency in the L gilts with a high proportion of lean meat. The percentage of lean meat detected at the mating period (LM2) with its increasing values positively affected the age at the first insemination or at farrowing in the group of studied gilts (Table 7). Differences between particular intervals were statistically significant ($P < 0.05$, $P < 0.01$). A significant influence of LM2 on the age at the first insemination and subsequently at farrowing ($P < 0.05$, $P < 0.01$) was proved. Higher meatiness highly significantly decreased the weight at the first insemination ($P < 0.001$). The weight before farrowing was however affected by LM2 on a low level of significance ($P < 0.05$). An increased proportion of LM2 had a negative impact on the number of piglets born and those born alive ($P < 0.05$), Figure 6. It was however the lactic level of the studied gilts that was mostly affected by LM2. The gilts with a higher proportion of lean meat had a significantly lower litter weight at 21 days ($P < 0.01$) and a highly significantly lower number of piglets at 21 days ($P < 0.01$, $P < 0.001$). The gilts with the lowest percentage of lean meat (53.2%) had the highest number of weaned piglets (9.7), gilts with the percentage of lean meat at least 59.7% had the lowest number of weaned piglets (8.5). The differences between particular intervals were statistically significant ($P < 0.05$, $P < 0.01$).

CONCLUSION

It is evident from the results given above that the evaluated reproductive traits in the studied group of Landrace gilts were affected by weight gain and backfat thickness to a great extent, by meatiness to a lesser extent. A greater effect of higher growth ability on the reproduction efficiency compared to the mating period became evident in the performance test. On the contrary, in the period of mating the reproduction efficiency was affected rather by backfat thickness and meatiness. After the per-

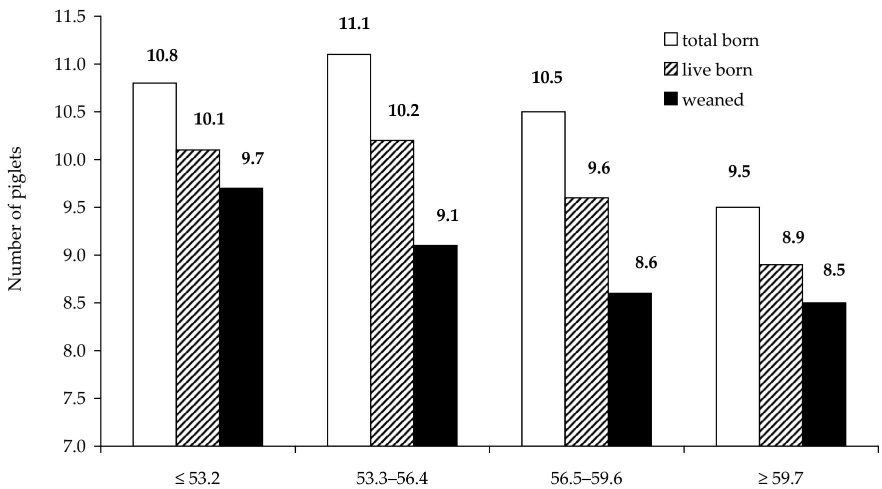

Figure 6. Lean meat percentage before mating

formance test finished, the gilts did not complete their development yet. It results from the finding that the intensive growth after finishing the performance test should not cease, but it is necessary to support it by quality nutrition with sufficient energy sources for an appropriate increase in fat deposition. It is not necessary to increase the proportion of lean meat, it is necessary to keep meatiness on the same level.

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