Journal of Central European Agriculture, 2012, 13(4), p.681-694 DOI: 10.5513/JCEA01/13.4.1112

The analysis of the performance test results including correlation between the traits of this evaluation in crossbred gilts

Analiza wyników oceny przyżyciowej z uwzględnieniem korelacji między cechami tej oceny u loszek mieszańców

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ABSTRACT

The aim of the paper was the analysis of the performance test results including correlation between the traits of this evaluation in crossbred gilts of Polish Large White (PLW) and Polish Landrace (PL), conducted in years 2004-2008 in Poland in The Bydgoszcz Breeding Region. The subject of research was 51.802 crossbred gilts came from two crossing variants (where the sows' breed was given in first position): PLW x PL and PL x PLW. The PLW x PL crossbred gilts in years 2004-2007 and in a total results summary from years 2004-2008 obtained higher performance test selection index value, thus had higher the breeding value regarding to the growth and slaughter traits as compared to the animals came from PL x PLW crossing variant. Within the space of 5 analysed years (2004-2008) the performance test selection index increased in the PLW x PL and PL x PLW crossbred gilts by 3.6 and 5.8 points, respectively. Thus the improvement of the breeding value of evaluated animals has been done. In all analysed years in the tested groups of crossbred gilts negative and statistically high significant correlations have been observed between the growth rate and the standardised body meat content of animals, which may show the unfavourable impact of the high growth rate on the meat content of pigs.

Key words: crossbred gilts, performance test, correlations

ABSTRAKT

Celem pracy była analiza wyników oceny przyżyciowej z uwzględnieniem korelacji zachodzących pomiędzy cechami tej oceny u loszek mieszańców ras wielkiej białej polskiej (wbp) i polskiej białej zwisłouchej (pbz), przeprowadzonej w latach 2004-2008 w Polsce w bydgoskim okręgu hodowlanym. Przedmiotem badań było 51.802 loszek mieszańców pochodzących z dwóch wariantów krzyżowania (w których rasę lochy podano w pierwszej pozycji): wbp x pbz i pbz x wbp. Loszki mieszańce wbp x pbz w latach 2004-2007 i w łącznym zestawieniu wyników z lat 2004-2008 osiągnęły wyższą wartość indeksu selekcyjnego oceny przyżyciowej, a więc odznaczały się lepszą wartością hodowlaną pod względem cech tucznych i rzeźnych w porównaniu

ze zwierzętami pochodzącymi z wariantu krzyżowania pbz x wbp. Na przestrzeni 5 analizowanych lat (2004-2008) indeks selekcyjny oceny przyżyciowej zwiększył się u loszek mieszańców wbp x pbz i pbz x wbp odpowiednio o 3,6 pkt. i 5,8 pkt., a więc nastąpiła poprawa wartości hodowlanej ocenianych zwierząt. We wszystkich analizowanych latach u badanych grup loszek mieszańców stwierdzono ujemne i statystycznie wysoko istotne zależności między tempem wzrostu a standaryzowaną zawartością mięsa w ciele zwierząt, które mogą świadczyć o niekorzystnym wpływie wysokiego tempa wzrostu na mięsność świń.

Słowa kluczowe: loszki mieszańce, ocena przyżyciowa, korelacje

DETAILED ABSTRACT

Przedmiotem badań było 51.802 loszek mieszańców pochodzących z krzyżowania ras wielkiej białej polskiej (wbp) i polskiej białej zwisłouchej (pbz). Zwierzęta zostały wyprodukowane w Polsce w bydgoskim okręgu hodowlanym obejmującym woj. kujawsko-pomorskie i ocenione przyżyciowo w latach 2004-2008. Celem pracy była analiza wyników oceny przyżyciowej z uwzględnieniem korelacji między cechami tej oceny u loszek mieszańców pochodzących z dwóch wariantów krzyżowania (w których rasę lochy podano w pierwszej pozycji): wbp x pbz i pbz x wbp. Obliczeń statystycznych dokonano korzystając ze wzorów podanych przez Ruszczyca (1981) oraz programu komputerowego Statistica 8.0 PL (2008). Zastosowano dwuczynnikową analizę wariancji uwzględniającą wariant krzyżowania oraz lata (2004-2008) przyjęte jako grupy 1-5, w których przeprowadzono ocenę przyżyciową. Zależności zachodzące między najważniejszymi wynikami oceny przyżyciowej, czyli przyrostem dobowym masy ciała standaryzowanym na 180. dzień życia, standaryzowaną zawartością mięsa w ciele oraz indeksem selekcyjnym a pozostałymi następującymi cechami oceny przyżyciowej wyrażono w postaci obliczonych współczynników korelacji: wiekiem i masą ciała w dniu oceny, standaryzowaną grubością słoniny w punktach P_2 i P_4, standaryzowaną wysokością oka polędwicy w punkcie P_4. Wyliczono ponadto współczynniki korelacji pomiędzy trzema najważniejszymi cechami oceny przyżyciowej: przyrostem dobowym masy ciała standaryzowanym na 180. dzień życia, procentową zawartością mięsa w ciele standaryzowaną na 180. dzień życia, indeksem selekcyjnym oceny przyżyciowej. Loszki mieszańce wbp x pbz w latach 2004-2007 i w łącznym zestawieniu wyników z lat 2004-2008 osiągnęły wyższą wartość indeksu selekcyjnego oceny przyżyciowej (o 1,7 pkt. w 2004 r.; 0,8 pkt. 2005 r.; 1,3 pkt. w 2006 r.; 2,1 pkt. w 2007 r. i 1,2 pkt. średnio w latach 2004-2008), a więc odznaczały się lepszą wartością hodowlaną pod względem cech tucznych i rzeźnych w porównaniu ze zwierzętami pochodzącymi z wariantu krzyżowania pbz x wbp ($P \leq 0,01$). Jednak w 2008 r. loszki mieszańce pochodzące z wariantu krzyżowania pbz x wbp uzyskały korzystniejszy wynik w tym zakresie ($P \leq 0,01$) od zwierząt wbp x pbz. Na przestrzeni 5 analizowanych lat (2004-2008) indeks selekcyjny oceny przyżyciowej zwiększył się u loszek mieszańców wbp x pbz o 3,6 pkt. z 98,5 pkt. w 2004 r. do 102,1 pkt w 2008 r. a u loszek mieszańców pbz x wbp nastąpił jeszcze większy wzrost, bo wynoszący 5,8 pkt., z 96,8 pkt. w 2004 r. do 102,6 pkt. w 2008 r. We wszystkich analizowanych latach u badanych grup loszek mieszańców stwierdzono ujemne i statystycznie wysoko istotne zależności między tempem wzrostu a standaryzowaną zawartością mięsa w ciele zwierząt, które mogą świadczyć o niekorzystnym wpływie wysokiego tempa wzrostu na mięsność świń. Biorąc pod uwagę łączne wyniki (2004-2008) badanych loszek

mieszańców można zauważyć, że indeks selekcyjny oceny przyżyciowej był w nieco większym stopniu skorelowany z przyrostem dobowym masy ciała standaryzowanym na 180. dzień życia, aniżeli z zawartością mięsa w ciele zwierząt.

INTRODUCTION

The Bydgoszcz Breeding Region is located in Poland in Kujawy-Pomorze Province, it has the top position in pig production in Poland. The young boars and gilts produced on its area impact on the level of utility of pigs in Poland. It should be noted that for years the highest number of sows covered by the reproductive performance in the country is located in Kujawy-Pomorze Province, i.e. in 2009 they accounted for 26% (Blicharski, 2010). The production efficiency of breeding and mass herd of pigs depends on i.e. paternal and maternal components breeding value used in reproduction. In the domestic pig breeding programs, it is assumed that maternal components are the breeds: Polish Large White, Polish Landrace, Puławska, Złotnicka White, Złotnicka Spotted and two-breed crossbreds came from the reciprocal crossing of PLW and PL breeds (Buczyński et al., 1999; Eckert and Żak, 2009; Michalska, 1996; Michalska et al., 2006a, b; Nowachowicz et al., 2003; Różycki, 1995, 1998). The gilts of above mentioned breeds are performance tested, which defines the breeding value regarding to growth and slaughter performance (Różycki, 1999, 2003, 2004). Its results are one of the main criteria in selection works when animals are chosen to breeding and producing herds (Buczyński et al., 1999; Różycki, 1998, 1999, 2003). The results of performance test of gilts of particular breeds are varied and change in time (Buczyński et al., 2001; Eckert and Żak, 2009; Michalska and Nowachowicz, 2002; Michalska et al., 2006 a; Nowachowicz et al., 2003). The performance traits, including these connected with the performance test are correlated. Genetical and phenotipical correlation coefficients inform about them (Buczyński et al., 1998, 2001; Nowicki et al., 1994). Their size in pigs of defined breeds and crossbreds is on different level (Buczyński et al., 1998, 2001; Michalska and Nowachowicz, 2002; Michalska et al., 2005, 2008). The analysis of performance test results of pigs including correlations between the particular traits within specified breeds and crossbreds came from different crossing variants which is done within the space of years gives the oportunity to determine the changes in these populations. The aim of the paper was the analysis of the performance test results including correlation between the traits of this evaluation in crossbred gilts of Polish Large White (PLW) and Polish Landrace (PL), conducted in years 2004-2008 in Poland in The Bydgoszcz Breeding Region.

MATERIALS AND METHODS

The research covered 51.802 two-breed crossbred gilts performance tested in years 2004-2008 according to the obligatory methodology (Eckert and Żak, 2009). The animals were produced in Poland in Kujawy-Pomorze Region covered Kujawy-Pomorze Province. They came from two crossing variants of breeds: Polish Large White (PLW) and Polish Landrace (PL): PLW x PL and PL x PLW, where sows' breed was given in first position.
The performance test selection index showing the breeding value regarding to the growth and slaughter traits was estimated on the base of following formula (Eckert and Żak, 2009):

$I = 0.1556X_1 + 3.1023X_2 – 167.8359$

where:

X_1 – daily gain of body weight standardised on 180th day of life,
X_2 – percentage body meat content standardised on 180th day of life.

Two-way variance analysis has been applied regarding to the crossing variant and years (2004-2008) assumed as 1-5 groups, where the performance test has been done.
The correlations between the most important results of performance test, thus the daily gain of body weight standardised on 180th day of life, standardised body meat content and the selection index and the remaining performance test traits were expressed as calculated correlation coefficients:

- age on the test day,
- body weight on the test day,
- standardised backfat thickness in P_2 point measured by Piglog 105 apparatus,
- standardised backfat thickness in P_4 point measured by Piglog 105 apparatus,
- standardised height of loin eye in P_4 point measured by Piglog 105 apparatus.

The calculations has been made using the formulas given by Ruszczyc (1981) and the statistical program Statistica 8.0 PL (2008). The number of tested crossbred gilts in a particular years and in a total years summary 2004-2008 was presented below:

Year / Crossing variant	2004	2005	2006	2007	2008	Total
PLW x PL	1989	8286	7338	7023	7833	32469
PL x PLW	1307	5750	5003	3090	4183	19333
Total	3296	14036	12341	10113	12016	51802

RESULTS

Table 1 gives the age of gilts and Table 2 gives their body weight on the performance test day. In a total results summary from years 2004-2008 crossbred gilts came from PLW x PL crossing variant were younger by ca. 2 days and had lower body weight by 0.6 kg on the performance test day (P≤0.01) towards PL x PLW animals. The tested groups of crossbred gilts had statistically high significant or significant differences regarding to the age and body weight between particular years when performance test has been made. Table 3 gives the results of daily gain of body weight standardised on 180th day of life of tested crossbred gilts. In years 2004-2007 and in a total results summary from years 2004-2008 crossbred gilts PLW x PL had higher growth rate (by 12 g in 2004, 11 g in 2005, 4 g in 2006, 7 g in 2007 and 6 g in years 2004-2008 averagely) from animals representing PL x PLW crossing variant and the differences in this range were statistically high significant. In 2008 different results were obtained, because PL x PLW had significantly higher (P≤0.01) growth rate (by 4 g) from the animals PLW x PL. In a tested groups of crossbred gilts a significant

differentiation (P≤0.01; P≤0.05) was observed in range of the discussed trait between particular years when performance test has been made. The results of fat content characterised on the base of standardised backfat thickness in P_2 and P_4 points and the traits connected with meat content i.e. standardised height of loin eye in P_4 point and standardised body meat content of crossbred gilts were published in other paper (Nowachowicz et al. 2010). In a total results summary from years 2004-2008 crossbred gilts came from PLW x PL crossing variant had thicker backfat in P_2 and P_4 points, more favourable result of the height of loin eye in P_4 point and higher body meat content than PL x PLW animals (P≤0.01).

Table 4 gives the results of the most important trait of performance test, namely the selection index, which depends on the daily gain of body weight standardised on 180^{th} day of life and the standardised body meat content. In years 2004-2007 and in a total results summary from years 2004-2008 young crossbred gilts PLW x PL obtained higher performance test selection index value (by 1.7 point in 2004; 0.8 point in 2005; 1.3 point in 2006; 2.1 point in 2007 and 1.2 point in years 2004-2008, averagely) as compared with animals came from PL x PLW crossing variant (P≤0.01). It should be noticed that in 2008 crossbred gilts came from PL x PLW crossing variant had a highly statistically significantly higher performance test selection index from PLW x PL animals. Within the space of 5 analysed years (2004-2008) the performance test selection index increased in crossbred gilts PLW x PL by 3.6 points from 98.5 points in 2004 up to 102.1 points in 2008 and in crossbred gilts PL x PLW was an even higher increase amounted 5.8 points, from 96.8 points in 2004 up to 102.6 points in 2008. In case of two groups of crossbred gilts taken into consideration, significant differences (P≤0.01 and P≤0.05) were observed in the selection index between particular years when performance test has been made.

Table 5 gives the correlation coefficients between the daily gain of body weight standardised on 180^{th} day of life and the remaining traits of performance test of tested crossbred gilts. In all analyzed years negative and statistically high significant correlations were observed between daily gain of body weight and the age on performance test day and in a total results summary from 5 years (2004-2008) in tested crossbred gilts they shaped at the level r=-0.674** (PLW x PL) and r=-0.589** (PL x PLW). The correlation coefficients between the growth rate and the body meat content on the performance test day in particular years were low and in a total results summary from years 2004-2008 amounted negative values r=-0.052** in PLW x PL crossbred gilts and positive values r=0.041** in PL x PLW animals. The correlations between the daily gain of body weight and a standardised backfat thickness in P_2 and P_4 points in particular years were also low and varied (from negative to positive). In a total results summary from 5 years (2004-2008) in case of P_2 measurement point were negative, because r=-0.102** (PLW x PL) and r=-0.046** (PLx PLW) and regarding to P_4 point were positive, because r=0.016** (PLW x PL) and r=0.011 (PL x PLW). Positive and highly significant correlation coefficients were observed between the growth rate and the standardised height of loin eye in P_4 point, which in years 2004-2008 amounted 0.241** in PLW x PL and 0.141** in PL x PLW gilts, respectively. In all analyzed years in tested groups of crossbred gilts negative and statistically high significant correlations were observed between the growth rate and a standardised body meat content of animals. In a total results summary from years 2004-2008 correlation coefficients were: -0.176** (PLW x PL) and –0.206** (PL x PLW), respectively. High, positive and statistically highly significant correlations were observed between the daily gain of body weight and a performance test selection index, which in a total results summary from 5 tested years (2004-2008) shaped at

the level r=0.707** in PLW x PL and r=0.655** in PL x PLW. Table 6 gives the correlation coefficients between the standardised body meat content of tested crossbred gilts and the remaining parameters of their performance test. Positive and highly significant correlations between the meat content and the age and body weight on the performance test day, which in a total results summary from 5 analysed years 2004-2008 assumed the values r=0.475** and r=0.479** in PLW x PL crossbred gilts and r=0.544** and r=0.512** in PL x PLW. In all analysed years the standardised body meat content of tested crossbred gilts was negative and highly significant correlated with their fat content expressed by the standardised backfat thickness in P_2 and P_4 points and the correlation coefficients of the results summary from years 2004-2008 were –0.535** and –0.403**, respectively in PLW x PL animals and –0.539** and –0.468** in PL x PLW crossbred gilts. Positive and highly significant correlations between the meat content and the standardised height of loin eye in P_4 point, which in tested crossbred gilts (2004-2008) assumed the values r=0.495** (PLW x PL) and r=0.453** (PL x PLW). Positive and statistically high significant correlations between the standardised body meat content of tested crossbred gilts and the performance test selection index. Regarding to the total results from 5 tested years the correlation coefficients between the meat content and the selection index shaped at the level 0.571** in PLW x PL crossbred gilts and 0.603** in PL x PLW animals.

Table 7 gives the correlation coefficients between the selection index of the tested crossbred gilts and their remaining traits of performance test. Generally negative and statistically high significant correlations between the selection index and the age on performance test day. Positive and highly significant correlations between the selection index and the body weight on the performance test day, which in case of a total results summary from 5 tested years (2004-2008) were r=0.301** (PLW x PL) and 0.428** (PL x PLW), respectively. The correlation coefficients between the performance test selection index and the standrdised backfat thickness measured in P_2 and P_4 points in particular years were negative and statistically high significant and in a total results summary from 5 tested years shaped at the level –0.469** and –0.276** in PLW x PL animals and –0.454** and –0.353** in PL x PLW crossbred gilts. It should be noticed that in each of tested years the negative correlation was higher in case of the standardised backfat thickness in P_2 point as compared to P_4 point. In all analyzed years the performance test selection index was positive and highly significant correlated with the standardised height of loin eye in P_4 point and the standardised body meat content in tested crossbred gilts. The correlation coefficients of the total results summary from 5 analysed years (2004-2008) in this range were 0.556** and 0.571** (PLW x PL) and 0.464** and 0.603** (PL x PLW), respectively. Analysing the total results (2004-2008) of the tested crossbred gilts it may be noticed, that the performance test selection index was more correlated with the daily gain of body weight standardised on 180^{th} day of life (r=0.707** in PLW x PL and r=0.655** in PL x PLW) than with the standardised body meat content of animals (r=0.571** in PLW x PL and r=0.603** in PL x PLW).

DISCUSSION

In a presented paper tested crossbred gilts were performance tested according to the obligatory methodology introduced on the 1st of October 2004. The modification of this methodology regarding to previously used one aimed to an increase of the accuracy of the assessment and take into account the current value of genetic population of pigs in the country (Eckert and Żak, 2009). The breeding progress realised in the breeding herds should be passed to the mass breeding by boars (used for a natural mating and an artificial insemination) and gilts. The breeding works conducted on the base of the results of performance test caused a significant progress regarding to the growth and slaughter traits (Różycki, 2003, 2004). The obtained performance test results should be monitored and analysed all the time because an excessive increase of animals performance may cause abnormalities in the genetic homeostasis of relationships between the complexes of traits (Falkenberg et al., 1989). Analyzing the performance test selection index results of tested crossbred gilts in 2008 it should be stated that they obtained worse result (102.1 points PLW x PL and 102.6 points PL x PLW) from the national average (108 points) for the crossbreds (Eckert and Żak, 2009). In all analyzed years in the tested groups of crossbred gilts negative and statistically high significant correlations between the growth rate and standardized body meat content of animals. They may show the unfavourable impact of the high growth rate on pigs meat content, what is also indicated in the research of other authors (Buczyński et al., 2001; Cameron and Curran, 1995 a, b; Kanis, 1998; Kapelański et al., 2002; Koczanowski et al. 2001, Milewska and Falkowski 2001) and also in the previous own research (Michalska and Nowachowicz, 2002; Michalska et al.; 2005, 2008). In a presented paper regarding to the total results summary (2004-2008) of tested crossbred gilts it may be seen, that the performance test selection index was more correlated with the daily gain of body weight standardized on the 180th day of life (r=0.707** in PLW x PL and r=0.655** in PL x PLW) than with the standardized body meat content of animals (r=0.571** in PLW x PL and r=0.603** in PL x PLW). In the previous own research (Michalska and Nowachowicz, 2002; Michalska et al., 2005) regarding to the performance test of pigs according to the previous methodology it was observed that the selection index was more correlated with the growth rate than with body meat content of animals. Similarly, Milewska and Grudniewska (1999) observed that in young boars of PL, Duroc and Pietrain, correlation coefficients between the performance test selection index and growth rate were higher (0.631**; 0.787** and 0.818**, respectively) than between the selection index and meat content (0.295*; 0.433 and 0.410*).

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Table 1. Age on test day (days)
Tabela 1. Wiek w dniu oceny przyżyciowej (dni)

Year (Group)	Crossing variant			Significance of differences between tested years assumed as 1-5 groups			
				PLW x PL		PL x PLW	
	PLW x PL	PL x PLW	Average	P≤0.05	P≤0.01	P≤0.05	P≤0.01
2004 (1)	173.0^{a}±12.5	172.1^{b}±11.9	172.6±12.3	-	5	-	2,3,4,5
2005 (2)	172.5^{A}±14.0	174.2^{B}±14.2	173.2±14.1	-	5	-	1,3,4,5
2006 (3)	173.2^{A}±14.4	175.2^{B}±14.0	174.0±14.3	-	5	-	1,2,4
2007 (4)	172.8^{A}±15.1	177.0^{B}±15.4	174.1±15.3	-	5	-	1,2,3,5
2008 (5)	175.2±15.3	175.8±14.9	175.4±15.2	-	1,2,3,4	-	1,2,4
Average 2004-2008	173.4^{A}±14.6	175.1^{B}±14.4	174.0±14.6	-	5-1,2,3,4	-	1-2,3,4,5; 2-3,4,5 4-3,5

Averages in rows marked by different letters differ significantly each other; capital letters - P≤0.01, small letters - P≤0.05

Table 2. Body weight on test day (kg)
Tabela 2. Masa ciała w dniu oceny przyżyciowej (kg)

Year (Group)	Crossing variant			Significance of differences between tested years assumed as 1-5 groups			
				PLW x PL		PL x PLW	
	PLW x PL	PL x PLW	Average	P≤0.05	P≤0.01	P≤0.05	P≤0.01
2004 (1)	101.3^{A}±8.5	98.5^{B}±8.3	100.2±8.5	-	2,3,4,5	-	3,4,5
2005 (2)	99.3^{a}±8.9	98.9^{b}±9.4	99.1±9.2	-	1,3,4,5	-	4,5
2006 (3)	98.1^{A}±9.0	99.4^{B}±10.0	98.6±9.4	-	1,2,4,5	-	1,4,5
2007 (4)	100.5^{A}±8.9	103.0^{B}±9.6	101.3±9.2	-	1,2,3,5	5	1,2,3
2008 (5)	102.1^{A}±10.0	103.5^{B}±10.7	102.6±10.3	-	1,2,3,4	4	1,2,3
Average 2004-2008	100.1^{A}±9.3	100.7^{B}±10.0	100.3±9.6	-	1-2,3,4,5; 2-3,4,5 3-4,5; 4-5	4-5	1-3,4,5; 2,3-4,5

Averages in rows marked by different letters differ significantly each other; capital letters - P≤0.01, small letters - P≤0.05

Table 3. Daily gain of body weight standardized on 180th day of life (g)
Tabela 3. Przyrost dobowy masy ciała standaryzowany na 180. dzień życia (g)

Year (Group)	Crossing variant			Significance of differences between tested years assumed as 1-5 groups			
				PLW x PL		PL x PLW	
	PLW x PL	PL x PLW	Average	P≤0.05	P≤0.01	P≤0.05	P≤0.01
2004 (1)	601^{A}±44	589^{B}±44	596±45	-	2,3,5	-	2,3,4,5
2005 (2)	592^{A}±47	581^{B}±43	588±45	-	1,3,4,5	3	1,4,5
2006 (3)	583^{A}±49	579^{B}±45	581±48	-	1,2,4,5	2	1,4,5
2007 (4)	600^{A}±52	593^{B}±50	597±52	-	2,3,5	-	1,2,3,5
2008 (5)	596^{A}±47	600^{B}±48	597±48	-	1,2,3,4	-	1,2,3,4
Average 2004-2008	593^{A}±49	587^{B}±47	591±48	-	1-2,3,5; 2-3,4,5 3-4,5; 4-5	2-3	1-2,3,4,5; 2,3-4,5 4-5

Averages in rows marked by different letters differ significantly each other; capital letters - P≤0.01, small letters - P≤0.05

Table 4. Performance test selection index (points)
Tabela 4. Indeks selekcyjny oceny przyżyciowej (pkt)

Year (Group)	Crossing variant			Significance of differences between tested years assumed as 1-5 groups			
				PLW x PL		PL x PLW	
	PLW x PL	PL x PLW	Average	P≤0.05	P≤0.01	P≤0.05	P≤0.01
2004 (1)	98.5^{A}±9.1	96.8^{B}±8.7	97.9±9.0	-	2,3,4,5	-	2,3,4,5
2005 (2)	97.0^{A}±8.8	96.2^{B}±8.3	96.7±8.6	-	1,4,5	3	1,4,5
2006 (3)	97.0^{A}±9.6	95.7^{B}±8.7	96.5±9.3	-	1,4,5	2	1,4,5
2007 (4)	101.2^{A}±8.9	99.1^{B}±8.1	100.6±8.7	-	1,2,3,5	-	1,2,3,5
2008 (5)	102.1^{A}±8.0	102.6^{B}±8.7	102.3±8.3	-	1,2,3,4	-	1,2,3,4
Average 2004-2008	99.2^{A}±9.1	98.0^{B}±8.9	98.8±9.1	-	1-2,3,4,5; 2,3-4,5; 4-5	2-3	1-2,3,4,5; 2,3-4,5 4-5

Averages in rows marked by different letters differ significantly each other; capital letters - P≤0.01, small letters - P≤0.05

Table 5. Correlations between daily gain of body weight of gilts standardized on 180th day of life and remaining performance test traits
Tabela 5. Korelacje między przyrostem dobowym masy ciała loszek standaryzowanym na 180. dzień życia a pozostałymi cechami oceny przyżyciowej

Crossing variant	Correlation coefficients (r) between daily gain of body weight and:						
	Age on test day	Body weight on test day	Standardized backfat thickness in P_2 point	Standardized backfat thickness in P_4 point	Standardized height of loin eye in P_4 point	Standardized body meat content	Performance test selection index
year 2004							
PLW x PL	-0.639**	0.020	0.002	0.076**	0.261**	-0.151**	0.637**
PL x PLW	-0.600**	0.160**	-0.088**	-0.070*	0.046	-0.166**	0.668**
Total	-0.613**	0.094**	-0.032	0.040	0.181**	-0.157**	0.653**
year 2005							
PLW x PL	-0.671**	-0.054**	0.037**	0.114**	0.226**	-0.243**	0.632**
PL x PLW	-0.626**	-0.065**	0.124**	0.091**	0.116**	-0.310**	0.518**
Total	-0.654**	-0.056**	0.080**	0.126**	0.194**	-0.274**	0.590**
year 2006							
PLW x PL	-0.681**	-0.036**	-0.155**	-0.027*	0.236**	-0.119**	0.715**
PL x PLW	-0.555**	0.096**	0.007	0.035*	0.058**	-0.253**	0.593**
Total	-0.634**	0.015	-0.085**	0.007	0.178**	-0.170**	0.672**
year 2007							
PLW x PL	-0.732**	-0.115**	-0.161**	-0.022	0.230**	-0.226**	0.765**
PL x PLW	-0.699**	-0.096**	-0.206**	-0.046*	0.056**	-0.336**	0.734**
Total	-0.722**	-0.115**	-0.174**	-0.026**	0.186**	-0.252**	0.757**
year 2008							
PLW x PL	-0.660**	-0.091**	-0.203**	-0.035**	0.260**	-0.222**	0.777**
PL x PLW	-0.573**	0.028	-0.243**	-0.140**	0.174**	-0.133**	0.774**
Total	-0.628**	-0.044**	-0.219**	-0.076**	0.219**	-0.190**	0.776**
Population average 2004-2008							
PLW x PL	-0.674**	-0.052**	-0.102**	0.016**	0.241**	-0.176**	0.707**
PL x PLW	-0.589**	0.041**	-0.046**	0.011	0.141**	-0.206**	0.655**
Total	-0.645**	-0.018**	-0.079**	0.024**	0.212**	-0.185**	0.690**

* - correlation coefficients statistically significant at P≤0.05
** - correlation coefficients statistically significant at P≤0.01

Table 6. Correlations between body meat content of gilts and remaining performance test traits
Tabela 6. Korelacje między standaryzowaną zawartością mięsa w ciele loszek a pozostałymi cechami oceny przyżyciowej

Crossing variant	Correlation coefficients (r) between body meat content and:						
	Age on test day	Body weight on test day	Standardized daily gain of body weight on 180th day of life	Standardized backfat thickness in P_2 point	Standardized backfat thickness in P_4 point	Standardized height of loin eye in P_4 point	Performance test selection index
year 2004							
PLW x PL	0.522**	0.542**	-0.151**	-0.699**	-0.539**	0.379**	0.665**
PL x PLW	0.449**	0.411**	-0.166**	-0.618**	-0.519**	0.396**	0.621**
Total	0.495**	0.485**	-0.157**	-0.668**	-0.525**	0.383**	0.645**
year 2005							
PLW x PL	0.559**	0.535**	-0.243**	-0.654**	-0.431**	0.457**	0.598**
PL x PLW	0.567**	0.501**	-0.310**	-0.661**	-0.547**	0.408**	0.652**
Total	0.564**	0.518**	-0.274**	-0.658**	-0.485**	0.426**	0.614**
year 2006							
PLW x PL	0.408**	0.434**	-0.119**	-0.566**	-0.343**	0.565**	0.608**
PL x PLW	0.581**	0.504**	-0.253**	-0.621**	-0.535**	0.397**	0.628**
Total	0.474**	0.460**	-0.170**	-0.591**	-0.411**	0.496**	0.615**
year 2007							
PLW x PL	0.412**	0.373**	-0.226**	-0.475**	-0.355**	0.472**	0.454**
PL x PLW	0.506**	0.409**	-0.336**	-0.278**	-0.301**	0.518**	0.392**
Total	0.426**	0.370**	-0.252**	-0.418**	-0.335**	0.489**	0.441**
year 2008							
PLW x PL	0.536**	0.533**	-0.222**	-0.429**	-0.425**	0.267**	0.441**
PL x PLW	0.568**	0.586**	-0.133**	-0.360**	-0.370**	0.425**	0.523**
Total	0.547**	0.550**	-0.190**	-0.402**	-0.398**	0.324**	0.471**
Population average 2004-2008							
PLW x PL	0.475**	0.479**	-0.176**	-0.535**	-0.403**	0.495**	0.571**
PL x PLW	0.544**	0.512**	-0.206**	-0.539**	-0.468**	0.453**	0.603**
Total	0.498**	0.491**	-0.185**	-0.536**	-0.419**	0.476**	0.583**

** - correlation coefficients statistically significant at P≤0.01

Table 7. Correlations between performance test selection index of gilts and remaining traits
Tabela 7. Korelacje między indeksem selekcyjnym oceny przyżyciowej loszek a pozostałymi cechami

Crossing variant	Correlation coefficients (r) between performance test selection index and:						
	Age on test day	Body weight on test day	Standardized daily gain of body weight on 180th day of life	Standardized backfat thickness in P_2 point	Standardized backfat thickness in P_4 point	Standardized height of loin eye in P_4 point	Standardized body meat content
year 2004							
PLW x PL	-0.075**	0.438**	0.637**	-0.543**	-0.362**	0.493**	0.665**
PL x PLW	-0.139**	0.435**	0.668**	-0.535**	-0.445**	0.335**	0.621**
Total	-0.095**	0.444**	0.653**	-0.537**	-0.371**	0.434**	0.645**
year 2005							
PLW x PL	-0.108**	0.383**	0.632**	-0.491**	-0.250**	0.457**	0.598**
PL x PLW	0.011	0.398**	0.518**	-0.494**	-0.419**	0.459**	0.652**
Total	-0.063**	0.389**	0.590**	-0.486**	-0.303**	0.516**	0.614**
year 2006							
PLW x PL	-0.257**	0.276**	0.715**	-0.522**	-0.264**	0.585**	0.608**
PL x PLW	0.037**	0.496**	0.593**	-0.511**	-0.418**	0.376**	0.628**
Total	-0.151**	0.358**	0.672**	-0.512**	-0.304**	0.514**	0.615**
year 2007							
PLW x PL	-0.396**	0.142**	0.765**	-0.461**	-0.255**	0.521**	0.454**
PL x PLW	-0.317**	0.202**	0.734**	-0.402**	-0.262**	0.426**	0.392**
Total	-0.381**	0.144**	0.757**	-0.444**	-0.250**	0.502**	0.441**
year 2008							
PLW x PL	-0.260**	0.260**	0.777**	-0.464**	-0.306**	0.411**	0.441**
PL x PLW	-0.131**	0.398**	0.774**	-0.438**	-0.356**	0.421**	0.523**
Total	-0.212**	0.314**	0.776**	-0.455**	-0.323**	0.404**	0.471**
Population average 2004-2008							
PLW x PL	-0.221**	0.301**	0.707**	-0.469**	-0.276**	0.556**	0.571**
PL x PLW	-0.060**	0.428**	0.655**	-0.454**	-0.353**	0.464**	0.603**
Total	-0.166**	0.347**	0.690**	-0.460**	-0.289**	0.525**	0.583**

** - correlation coefficients statistically significant at P≤0.01