TRAITS OF CARCASS VALUE IN TESTED HYBRID COMBINATIONS OF CARCASS PIGS (CLW X CL) X D AND (CLW X CL) X (D X BL)

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Abstract

The aim of this experiment was to evaluate chosen traits of carcass value in tested hybrid combination of carcass pigs (CLW x CL) x D and (CLW x CL) x (D x BL). Statistical conclusive ($P \leq 0.001$) higher slaughter weight (114.13 kg) it was found in hybrid combination (CLW x CL) x D in comparison with hybrid combination (CLW x CL) x (D x BL) with 108.95 kg. Lean meat portion was statistically conclusive ($P \leq 0.001$) higher in hybrid combination with Duroc boars – 57.93 % in comparison with hybrid combination with boars D x BL with 57.07 %. Regressive equations for each combination were calculated to find lean meat portion in carcass bodies with the uniform slaughter weights. In all uniform slaughter weights from 100 kg to 130 kg the lean meat portion was higher for approx. 1 % in hybrid combination (CLW x CL) x D in comparison with hybrid combination (CLW x CL) x (D x BL). The highest lean meat portion (58.78 %, 57.71 %) in studied combinations it was calculated in slaughter weight 100 kg and the lowest (56.97 %, 55.58 %) was found in slaughter weight 130 kg. The back fat thickness (12.30 mm) was a little bit lower in hybrid combination (CLW x CL) x D in comparison with hybrid combination (CLW x CL) x (D x BL) with 12.76 mm.

Key Words: carcass value, slaughter weight, lean meat portion

Carcass value is a file of traits which evaluate carcass modified body and meat from a point of view of quantitative and qualitative traits of meat production. It includes criteria of producer, processing industry and consumer. Carcass value is determined by these traits: carcass efficiency, portion of meat, fat and second-rate parts and quality of individual parts (HOVORKA et al., 1987). HOUŠKA et al. (1988) defines carcass value as quantity and quality of carcass products, respective requirement for enough meaty animals with favourable portion of meat, fat and bones, respective with favourable portion of valuable mostly meaty parts to second-rate parts of carcass body.

According to PULKRÁBEK (2005) carcass value is assessed from qualitative and quantitative point of view. For example a lean meat percentage and back fat thickness are quantitative traits. Lean meat percentage in carcass body is the main trait of carcass value in SEUROP system. Quality of pure breeds used for hybridization is one of the basic prerequisite for reaching of demanded meatness of final hybrids because reached lean meat percentage is the result of intermediary heredity – mother participates on reached level from one half and father from the second half. Sows of F1 generation (Large White x Landrace) are used as mothers of final carcass hybrids in the Czech Republic and in most of developed countries. Assumption of lean meat percentage in final carcass hybrids can be done according to breed used in sire position.

Material and Methods

The aim of this experiment was to evaluate chosen traits of carcass value in tested hybrid combination of carcass pigs (CLW x CL) x D and (CLW x CL) x (D x BL).

An operating test was done in chosen commercial breeding under the same condition to reach the goals of experiment. Hybrids of F1 generation (CLW x CL) were used in mother position. They were inseminated with portions from boar station in Velké Meziříčí – boars of Duroc breed and hybrid boars D x BL. After birth tested piglets were individually marked with identify number and sex of animal was noted into database. Fattening of pigs was done separately according to sex in one fattening hall. Commercial feeding mixtures were used during fattening.

In the end of fattening tested pigs were slaughtered in slaughter house at Kostelec u Jihlavy. Weight of carcass modified body and slaughter weight (counted with coefficient 1.285) were determined. Lean meat percentage was determined with apparatus.

These basic statistical characterizations were determined from measured values: average and standard deviation. Regressive equations for each combination were calculated to find lean meat portion in the same slaughter weight.

Calculated regressive equations in each breed combination:

1. combination (CLW x CL) x D
   y (lean meat portion) = 64.8233 – 0.0604 * x (slaughter weight)
2. combination (CLW x CL) x (D x BL)
   y (lean meat portion) = 64.8317 – 0.0712 * x (slaughter weight)

A method of multiple comparison of variance analyse – Student-Newman-Keuls test was used for test of conclusive differences among individual traits. Statistical program UNISTAT 5.1 was used for these reasons.

Results and Discussion

From table 1 it is evident that statistically conclusive (P≤0.001) higher slaughter weight (114.13 kg) was found in hybrid combination (CLW x CL) x D in comparison with hybrid combination (CLW x CL) x (D x BL) – 108.95 kg. Combination with Duroc boars in sire position had better growth ability than combination with hybrid boars D x BL. Hogs had better growth ability in comparison with gilts in both combinations. In hybrid combination (CLW x CL) x (D x BL) there was found statistically conclusive (P≤0.001) difference among sex approx. 6 kg. On the base of reached results it is possible to recommend separated fattening of carcass pigs according to sex. PULKRÁBEK et al. (2000) confirm that in the same age gilts have lower weights in comparison with hogs because of lower growth ability. Lean meat portion was determined statistically conclusive (P≤0.001) higher in hybrid combination with Duroc boars (57.93 %) contrary to hybrid combination D x BL (57.07) %. ŠIMEK et al. (2004) monitored chosen hybrid combinations which reached following results: the highest lean meat portion was reached in hybrid combination (LW x L) x (H x Pn) – 58.9 %, the lowest lean meat portion was reached in combination (LW x L) x (D x Pn) – 54.9 %, similar levels were measured in combinations (LW x L) x (BO x BL) respective (LW x L) x CMP – 55.8 %, respective 55.5 %.

Regressive equations were calculated for individual combination to find lean meat portion in carcass bodies in the uniform slaughter weight. Calculated values are shown in table 2. It is evident that in all uniform slaughter weights from 100 to 130 kg hybrid combination (CLW x CL) x D reached higher lean meat portion for 1% in comparison with combination (CLW x CL) x (D x BL). The highest lean meat portion (58.78 %, 57.71 %) in studied combinations was calculated at 100 kg of slaughter weight and the lowest (56.97 %, 55.58 %) at 130kg of slaughter weight. An interesting result was found in combination with Duroc in sire position – in the slaughter weight of 130 kg the lean meat portion was very favourable - 56.97%. NEUŽIL and ČERVENKA (2002) during recalculation on uniform weight in hybrid combination (LW x L) x LW-sire line they found lower lean meat portion than in our experiment. In their study they mention lean meat portion 55.12% in recalculated slaughter weight 100 kg, 53.74% in weight 110kg and lean meat portion 52.37% in slaughter weight 120kg. It is evident that with higher slaughter weight the value of lean meat portion decreases. In final hybrids lean meat portion depends on their slaughter weight. Mentioned dependence corresponds with finding of PULKRÁBEK (2000) – he proved that with reduction of slaughter weight for 10 kg it is possible to expect growth of lean meat portion in carcass pig body for 1.5% and contrarily. According to JIANG et al. (1990) it represents 1.24 % LM.

Table 1. Basic statistical characterizations for carcass value traits in studied combinations

Hybrid combinations	Sex	n	Slaughter weight (kg)		Back fat thickness (mm)		Lean meat portion (%)	
			X	S_x	X	S_x	X	S_x
(CLW x CL) x D	Hogs	184	115.22	11.21	12.37	2.94	57.71 [a]	2.58
	Gilts	149	112.79	11.48	12.21	2.73	58.20 [a]	2.17
	Total	333	114.13 [a]	11.38	12.30	2.85	57.93 [b]	2.41
(CLW x CL) x (D x BL)	Hogs	159	111.86 [b]	14.38	13.66 [a]	3.57	56.09 [c]	3.00
	Gilts	118	105.04 [b]	13.04	11.54 [a]	2.30	58.40 [c]	2.03
	Total	277	108.95 [a]	14.31	12.76	3.49	57.07 [b]	2.87

a,b:P≤0,001 a:P≤0,001 a:P≤0,05 b,c:P≤0,001

Table 2. Evaluation of progress of lean meat portion production in carcass bodies after recalculation on the uniform weight

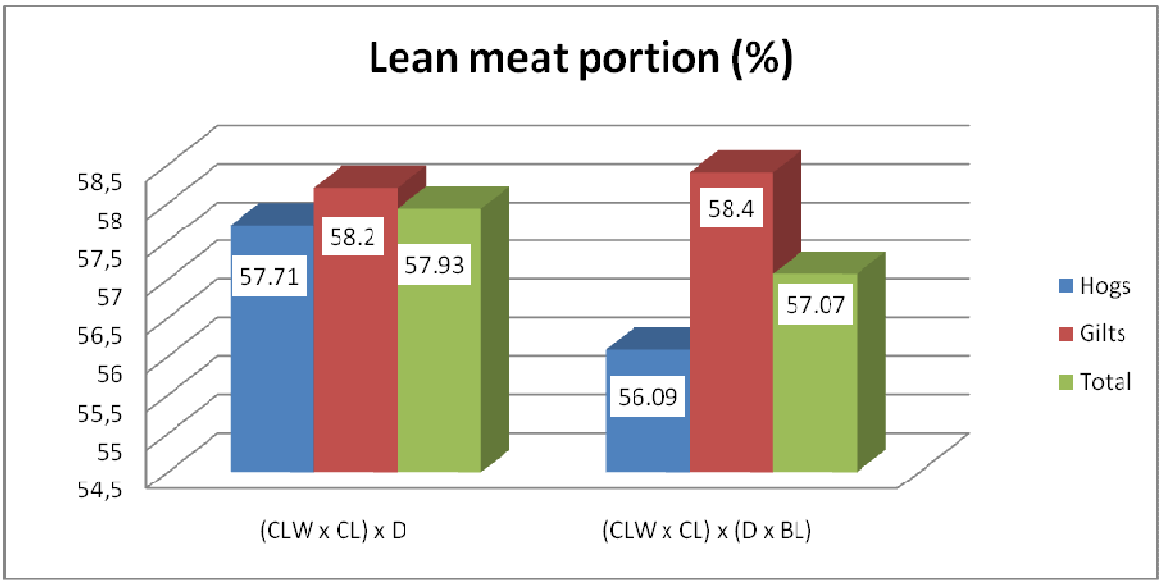
Hybrid combinations	(CLW x CL) x D	(CLW x CL) x (D x BL)
Slaughter weight (kg)	Lean meat portion (%)	Lean meat portion (%)
100	58.78	57.71
105	58.48	57.36
110	58.18	57.00
115	57.88	56.64
120	57.58	56.29
125	57.27	55.93
130	56.97	55.58

In both studied combinations gilts showed statistically conclusive higher difference in determined values of lean meat portion in comparison with hogs. It is related with higher slaughter weight of hogs which is reached during common fattening with gilts in one turn. Back fat thickness (12.30 mm) was detected a little bit lower in hybrid combination (CLW x CL) x D in comparison with combination (CLW x CL) x (D x BL) – 12.76 mm. SLÁDEK et al. (2000) measured higher values 17.5 mm, 17.5 mm and 16.7 mm during comparison of three hybrid combinations (LW x L) x LW-sire line; (LW x L) x (Pn x H) and (LW x L) x (LW-sire line x BL).

The back fat thickness was lower in gilts in comparison with hogs in both tested combinations.

BRUWE et al. (1991) determined the highest fat portion in hogs, lower in gilts and the lowest in young boars. It is related with different metabolism. For example PIAO et al. (2004) mention higher average values of back fat thickness (P≤0.01) in hogs in comparison with gilts too.

Graph 1. Lean meat portion (%) in studied hybrid combinations



Conclusion

From reached results it is evident that combination with boars of Duroc breed in sire position had better growth ability in comparison with combination D x BL. Among sex hogs showed better growth ability in comparison with gilts in both studied combinations. On the base of reached results it is possible to recommend separated fattening of carcass pigs according to sex. Lean meat portion was found higher for 0.86 % in hybrid combination with Duroc boars in comparison with hybrid combination with D x BL even that an average slaughter weight of carcass pigs after Duroc boars was for 5 kg higher. Regressive equations for individual combination were calculated to find lean meat portion in the same slaughter weight.

From calculated values it is evident that in all uniform slaughter weights from 100 to 130 kg hybrid combination (CLW x CL) x D reached higher lean meat portion for 1% in comparison with combination (CLW x CL) x (D x BL). An interesting result was found in combination with Duroc in sire position – in the slaughter weight of 130 kg the lean meat portion was very favourable - 56.97%. Hybrid combination (CLW x CL) x D reached a little bit lower level of back fat thickness in comparison with combination (CLW x CL) x (D x BL).

From evaluated figures according to sex it is possible to determine a relation among an average slaughter weight, lean meat portion and back fat thickness. Hogs reached higher average slaughter weight, lower lean meat portion and higher level of back fat thickness in comparison with gilts.

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