

12th
INTERNATIONAL
SYMPOSIUM

MODERN
TRENDS
IN LIVESTOCK
PRODUCTION



P R O C E E D I N G S

9 -11 October 2019, Belgrade, Serbia

Institute for Animal Husbandry

Belgrade - Zemun, SERBIA

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INFLUENCE OF SIRE BREED ON MEATINESS OF PIG CARCASS

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Abstract: The aim of this paper was to determine the influence of sire breed on meatiness of pig carcass. Trial was conducted on 480 pigs, offspring of six boars, of two genotype Large White (LW) and Swedish Landrace (SL). Average body mass of examined animals were 114.5 kg. Share of meat yield of pig carcass was estimated on the slaughter line using two methods. First method use “two point” system where first measurement is depth of *m. longissimus* measured as the shortest link/connection between front (cranial) end of *m. gluteus medius* and the top (dorsal) rim/edge of the spinal canal and second is where *m. gluteus medius* penetrates the fat tissue the most. Second method also use two measurements: X1=thickness of fat tissue (with skin) in millimeters measured on medial carcass surface between 3rd and 4th lumbal vertebrae, caudo-cranially and X2=thickness of fat tissue (with skin) in milimeters measured on medial carcass surface between 3rd and 4th rib, caudo-cranially. The meatiness of the progeny very significantly depended on boar genotype ($p<0.01$). Offspring of SL boars had better results in both methods (60.47; 56.45%), than LW offspring (60.35; 55.85%).

Key words: offspring, backfat, slaughter characteristics

Introduction

The quality of pig carcasses is major topic in pig production, which always deserves attention of science as well as in practice. Quality of pig carcasses is measured in high share of muscle tissue in major carcass side parts, especially the most important parts. Traits of the pig carcass quality vary under the influence of genetic and environmental factors (breed, sires, breeding methods, age, castration, nutrition, season, etc.). Genotype of sires affects the variability of carcass quality traits of offspring (Petrović *et al.*, 2004; Pušić and Petrović, 2004), as well as sires

within the same genotype (Kosovac et al., 1998; Petrović et al., 2002; Radović et al., 2003). Results of some studies show that there are differences between breeds in regard to the effect of sire on variability of traits of the offspring (Mijatović et al., 2005) or the sire effect is not significant in different herds (Bahelka et al., 2004). Sires within three breeds have affected the variation in the content of meat in the carcass of performance tested sons (Mijatović et al., 2005), but boars of two breeds had no effect on depth of *m. longissimus dorsi* (MLD) in their offspring. For the purpose of investigation of lean meat and quality of meat deriving from pigs of different genotypes, we analyzed all relevant indicators of lean meat using different methods of investigation. Objective of this paper was to determine the influence of sire breed on meatiness of pig carcass.

Materials and Methods

Trial was conducted on 480 pigs, offspring of six boars, of two genotype Large White (LW) and Swedish Landrace (SL). Average body mass of examined animals were 114.5 kg. On slaughter line the meat yield was evaluated in two ways:

First method use “two point” system where first measurement is depth of *m. longissimus* measured as the shortest link/connection between front (cranial) end of *m. gluteus medius* (S), and the top (dorsal) rim/edge of the spinal canal and second is where *m. gluteus medius* penetrates the fat tissue the most (M) (Regulations on the quality of pig carcasses and halves on the slaughter line, National newspapers 13/06).

$$M\% = 47,978 + (26,0429 \times S/M) + (4,5154 \times M) - (2,5018 \times \log S) - (8,4212 \times S)$$

Second method is also method of two points, where for the assessment of carcass side meat yield measures of fat tissue on two points were taken: X1= thickness of fat tissue (with skin) in milimeters measured on medial carcass surface between 3rd and 4th lumbal vertebrae, caudo-cranially, and X2 = thickness of fat tissue (with skin) in milimeters measured on medial carcass surface between 3rd and 4th rib, caudo-cranially. Linear measures X1 and X2 were taken manually using ruler and mathematical formula calculated through setting of linear multiple regression model with two independent variables, defined by Džinić et al. (2004) and meat yield of each pig carcass side was calculated.

$$Y = 67.098 - 0.505X1 - 0.14X2$$

The data obtained were processed using the software package "STATISTICA" (Stat Soft Inc, 2012). ANOVA was used while the Tukey test served to determine the statistical significance of the differences between individual means values.

Results and Discussion

The results were shown in Table 1. suggests that there are major significant differences between boars, and between methods. Boars A, B, C are genotype SL, and D, E, F are LW. Boars A, C, D, F had significantly larger carcass side mass than B and E boars. Second method shows less percentage of meatiness in carcass sides. Carcass quality of offsprings significantly depended on boar genotype. Offsprings of SL boars had better percentage of meatiness in both methods (60.47; 56.45%), than LW offspring (60.35; 55.85%). Offsprings of boar C has shown significantly better results in meatiness in both methods than the rest of the boars.

Table 1. The effect of genotype on meatiness of carcass

	Boars						SEM	p
	A	B	C	D	E	F		
MCCS, kg	48.999 ^a	47.169 ^b	47.836 ^a	48.846 ^a	46.731 ^b	47.956 ^a	0.242	p<0.01
S, mm	17.663 ^a	16.013 ^{ab}	12.413 ^c	17.250 ^a	16.188 ^{ab}	14.200 ^{bc}	0.232	p<0.01
M, mm	90.463 ^c	98.600 ^a	91.600 ^{bc}	98.288 ^a	95.925 ^a	93.713 ^b	0.384	p<0.01
I method, %	57.903 ^c	60.710 ^b	62.814 ^a	59.637 ^b	60.116 ^{bc}	61.292 ^b	0.183	p<0.01
X1, mm	23.725 ^{ac}	23.688 ^{ac}	22.450 ^{bc}	24.613 ^{abc}	26.275 ^a	24.875 ^a	0.229	p<0.01
X2, mm	17.738 ^a	13.688 ^{bcd}	12.450 ^{cd}	14.613 ^{bcd}	16.275 ^{ab}	14.875 ^{bc}	0.244	p<0.01
II method, %	54.819 ^d	56.870 ^{ab}	57.668 ^a	56.263 ^{abc}	55.201 ^{cd}	56.104 ^{bcd}	0.153	p<0.01

SEM, Standard error of the means; MCCS, Mass of cooled left carcass sides; ^{a, b, c, d} in a row, the least squares means with a different superscript differ significantly (p<0.01)

Kosovac et al. (2007) using *Džinić et al. (2004)* model in their research stated lower values of meat percentage in carcass sides (49.20 – 55.52%) compared to values obtained in this research with ultrasound device, which are in concordance with values obtained by *Tomović, (2002)*. However, our data on yield of muscle tissue in carcass sides obtained by method of “two points” are lower than results stated by *Kušec et al., (2006)* and *Zekić et al., (2007)*. *Kralik et al. (1996)* suggested that meatiness of the progeny significantly depended on boar genotype.

Conclusion

The overall results showed that sire breed has major effect on carcass quality. However, there is large difference between methods. Further studies must be conducted to clarify why there is so much difference in final results.

Uticaj rase oca na mesnatost polutki svinja

Vladimir Živković, Lukasz Migdal, Władysław Migdal, Čedomir Radović, Slavča Hristov, Marija Gogić, Nenad Stojilković

Rezime

Cilj ovog rada je bio da se utvrdi uticaj rase nerasta na mesnatost polutki. Ogljed je izveden na 480 životinja, potomaka 6 nerastova, rasa Švedski Landras (ŠL) i Veliki Jorkšir (VJ). Prosečna masa ispitanika je iznosila 114,5 kg. Mesnatost polutki je procenjena na liniji klanja korišćenjem dve metode. Prvi metod koristi dve tačke kao osnovu za procenu. Prva mera je dubina *m. longissimus* izmerena na mestu gde je najkraća konekcija od kranijalnog dela *m. gluteus medius* do dorzalnog dela kičmenog kanala, dok je druga mera gde *m. gluteus medius* prodire u masno tkivo najviše. Druga metoda takođe koristi “dve tačke”: X1= debljina ledjne slanine (sa kožom) između trećeg i četvrtog lumbalnog pršljena, X2= debljina ledjne slanine (sa kožom) između trećeg i četvrtog rebra. Mesnatost je veoma značajno varirala između genotipova ($p < 0,01$). Potomci nerastova rase ŠL su imale bolje rezultate mesnatosti kod obe metode (60,47; 56,45%), u odnosu na potomke rase VJ (60,35; 55,85%).

Ključne reči: potomci, ledna slanina, klanične karakteristike

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