Biotechnology in Animal Husbandry 25 (3-4), p 161-172 , 2009 ISSN 1450-9156
Publisher: Institute for Animal Husbandry, Belgrade-Zemun UDC 637.5

THE EEFECT OF BOARS AND SOWS ON MEAT QUALITY AND CALORIFIC VALUES IN THE PROGENY

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Original scientific paper

Abstract: In this article analysis data about boars and sows influence on progeny meat quality and calorific value are represented. In order to assess boar and sow influence on meat quality of their offspring, 144 animals were selected and investigated. For assay Large White, Yorkshire, Landrace and Lithuanian White pigs were selected. Six boars of each breed were selected. For analysis of each boar offspring of 3 sows was used. For each sow litter were evaluated by 2 offspring. The samples were taken from the *musculus longissimus dorsi* between twelve and last rib. For samples 500 – 550 g size of muscle was taken. The meat quality was evaluated 48 hours after slaughtering. The chemical composition, physical and technological properties of meat were estimated by using common accepted methods. Caloric value of meat was counted according *Watt, Mersil* (1975) formula. Experiments have shown that in offspring from analyzed pig breeds the highest correlation coefficients determined between calorific value of meat and dry matter, and protein content (p<0001). Between calorific value of meat and meat intramuscular fat content strong significant positive link was established only in the Landrace breed offspring (r = 0.56, p<0001). Dispersive analysis (ANOVA) showed, that the sows and boars had a major influence on offspring meat quality. The biggest statistically significant influence of boar estimated for offspring meat intramuscular fat percentage - 52.1 percentage (p ≤ 0001), and of sow for offspring meat redness (a *) - 37.7 percentage (p<0.05). And from all genetic factors only boar statistically significant influenced meat calorific value 21.9 percentage (p<0.05). Meanwhile, the offspring sex statistically significant had influence on the meat shear force kg/cm2 (p<0001), drip loss percentage 2.2 percentage (p<0.05) and water holding capacity 1.6 percentage (p<0.05). It is important to clarify the best combinations of boars and sows, because these combinations can ensure increase of high-quality pork in the country.

Key words: boars, sows, breed, meat quality, the calorific value.

Introduction

The meat production yield and quality of pigs depend on many factors: for example on breed, individual traits of pigs, feeding and housing conditions, the ability to adapt to different breed combination in the breeding and use of theirs genetic potential producing good quality, marketable commercial products (*Klimas, Klimienė 2001, Jukna et.al., 2003*). Consumers appreciate the most lean, juicy, tasty, high biological value meat, which has good culinary properties (*Kortz et. al., 2003, Jukna at. al., 2004; Grunert et. al., 2004; Todd See, 2004*). Biological value is the main quality index of meat. Meat biological value pertains on nutrition, organoleptic, hygienic characteristics and calorific value.

Meat quality and its nutritional value depend on meat components ratio (*Culioli et. al., 2003*). The main component of meat is muscle tissue. Valuable constituent component of a muscle is protein, which composes about 80 percentage of muscle tissue material (*Flores et al., 1999; Pettigrew et. al., 2001*). Intramuscular fat and protein amount had the most influence on caloric value of meat. It was established by many researchers that the caloric value of meat increases with the increase of the quantity of intramuscular fat in the meat (*Fernandez et al., 2000, Fortin et al., 2004; Purslow, 2005; Jukna et al.. 2007*). Intramuscular fat accumulation and distribution in the pork depends on animal genotype. In improving of the quality of meat important role is on boars and sows (*Mabry, 1998; Klimas, 2001*). It is necessary to have knowledge of selected breed characteristics for the purpose of crossbreeding proper regulation of hzbridiyation (*Johnson, 1981*). A maternal breed should be distinguished for domestic features and characterize good reproductive traits, while paternal – high fattening and meaty traits (*Kriauzienė, Rekštys 2003*). Pedigree sows evaluation according to the traits of meat quality of their offspring is realized in almost all European Union countries. This assessment is very important for pig breeding process and directly has influence of producible pork for competitive (*Klimas et al. 2006*). Assessment of boars and sows according to the meat quality traits of their offspring was initiated in year 2003 in Lithuania. The evaluation of analyzed data revealed diversity of meat qualitative indicators. The aim of this study was to assess boars and sows influence on meat quality and meat calorific value in their offspring.

Material and methods

In order to assess boars and sows influence on meat quality in their offspring, 144 animals were selected and investigated. Boars and sows were raised in the same feeding and housing conditions in the control pig feeding station in the years 2007 – 2008. For assay Large White, Yorkshire, Landrace and Lithuanian White pigs were selected. Six boars from each breed were selected. For analysis of each boar were used 3 sows offspring's. From each sow nest were evaluated by 2 offspring. The breed's influence to meat quality offspring's was evaluated according data collected in the control pig feeding station.

The samples were taken from the *musculus longissimus dorsi* between twelve and last rib. For samples, 500 – 550 g size of muscle was taken. The meat quality was evaluated 48 hours after slaughtering. The chemical composition and physical and technological properties of meat were estimated using common accepted methods. Meat quality assay was performed in the Lithuanian veterinary academy, Laboratory of Meat Characteristics and Quality Assessment in the year 2008. The amount of dry matter was measured by the automatic scale for humidity assessment Scaltec SMO – 01, drying samples at 105° C, pH – by a pH-meter Inolab 3, by a contact electrode (pH ISO 2917:1999 Meat and meat products. Measurement of pH). Meat colour by a Minolta Chroma Meter 410, measuring values L * – for lightness, a * − for redness and b * − for yellowness; fat – by an automatic system for fat extraction Soxterm SE 416 macro, shear force – according to Warner-Bratzler method, water-holding capacity by Grau and Hamm method, cooking loss by cooking meat in the circulating bath at 70°C, ash – by organic matter incineration at 700°C, protein according to Kjeldal method, drip loss – by sample weight reduction after 24 hours.

Total meat calorific value (kcal) was calculated using the Atwater method. The following equation was used for calculation (*Watt and Mersil, 1975)*: $K= [(F_p \times P) + (F_l \times L) + (F_c \times C)]$, where K is the calorie; F the multiplication factor for each component (F_p : 4.27 for protein, F_l : 9.02 for lipid, F_c : 4.10 for carbohydrate); P the protein content (g/100g); C the carbohydrate content (g/100g) and L the lipid content (g/100g). Carbohydrate content was estimated by difference.

Statistical analysis

The R statistical package version 2.0.1. (*Gentlemen, Ihaka, 1997*) was used to estimate data. Influence of genetic factors on chemical and physical properties and calorific value of meat was calculated according the dispersive analysis (ANOVA) with the following linear models:

$$\mathbf{y_{ijklm} = \mu + breed_i + boar_j + sow_k + sex_l + e_{ijklm}}.$$

Results and discussion

Analysis of meat chemical properties demonstrated that some of the meat quality indicators of progeny from different boars differed significantly (Table 1).

Table 1. The meat chemical composition and calorific value in analyzed progeny

Breed	Dry materials, %	Intramuscular fat ,%	Ash , %	Protein, %	Calorific value, kcal/100g
Large White 1	25.79±0.32	1.09±0.11	1.23±0.01	23.47±0.32	115.06±1.56
Large White 2	26.84±0.82	1.61±0.17	1.19±0.02	24.04±0.66	122.04±4.26
Large White 3	26.56±0.79	3.01±0.50	1.15±0.01	22.31±0.67	127.87±4.98
Large White 4	27.42±0.53	1.61±0.22	1.13±0.02	24.68±0.68	124.55±1.69
Large White 5	26.69±0.74	1.32±0.09	1.16±0.02	24.20±0.69	120.01±3.37
Large White 6	25.98±0.85	1.51±0.12	1.17±0.01	24.17±0.54	119.51±1.27
Lithuanian White 1	26.70±0.54	1.43±0.14	1.14±0.01	24.14±0.57	120.60±2.36
Lithuanian White 2	28.50±0.78	1.96±0.12	1.16±0.02	25.91±0.75	128.95±3.54
Lithuanian White 3	25.42±0.21	1.50±0.16	1.16±0.04	22.76±0.27	115.46±1.16
Lithuanian White 4	26.59±0.47	1.92±0.23	1.17±0.01	23.50±0.43	122.44±2.62
Lithuanian White 5	27.09±0.44	1.73±0.31	1.16±0.01	24.20±0.27	123.65±3.16
Lithuanian White 6	26.86±0.61	1.13±0.14	1.16±0.01	24.57±0.59	119.88±2.80
Yorkshire 1	27.28±0.92	1.85±0.22	1.18±0.02	24.25±1.00	125.09±3.86
Yorkshire 2	24.97±0.57	1.19±0.11	1.19±0.03	22.59±0.53	112.04±2.85
Yorkshire 3	25.83±1.56	1.41±0.17	1.19±0.02	23.23±1.43	116.77±7.28
Yorkshire 4	27.27±1.33	1.32±0.12	1.21±0.01	24.74±1.22	122.48±6.20
Yorkshire 5	27.72±1.05	1.92±0.04	1.22±0.01	24.68±1.03	126.82±4.51
Yorkshire 6	28.00±0.83	1.44±0.13	1.16±0.01	25.82±0.78	126.34±3.86
Landrace 1	26.60±0.42	1.67±0.13	1.16±0.01	23.77±0.41	121.29±2.01
Landrace 2	26.00±0.32	1.32±0.09	1.20±0.02	23.48±0.27	117.08±1.66
Landrace 3	26.76±0.50	1.87±0.09	1.17±0.01	23.72±0.54	122.95±1.91
Landrace 4	27.31±0.41	1.89±0.13	1.13±0.01	24.49±0.39	126.49±2.14
Landrace 5	26.95±0.39	1.33±0.26	1.15±0.01	24.48±0.37	120.35±2.72
Landrace 6	27.27±0.44	1.44±0.14	1.17±0.01	22.77±0.26	121.13±2.44

***p < 0.001; **p <0.01; *p < 0.05

Most of dry matter was estimated in the meat from offspring of boar (2) Lithuanian White breed. In regard to meat dry matter statistically significant differences were detected 3.08 percentage between progeny deriving from boar (2) and boar (3) of the Lithuanian White breed and 3.03 percentage between boar (2) and boar (6) of the Yorkshire breed ($p<0.05$). Intramuscular fat influences meat juiciness and improves the taste. The most fats are those that accumulated between the muscle bunch and fibres (*Jukna et al.. 2007*). In meat deriving from progeny of Large White breed, statistically significant differences in content of intramuscular fat were detected between boar (3) and boar (1) 2.0 percentage, and boar (5) 1.77 percentage ($p<0.05$). Intramuscular fat content difference was 0.79 percentage ($p<0.05$) between boar (6) and boar (4) and 0.60 percentage between boar (5)

($p<0.01$) in Lithuania White breed. In Yorkshire breed, differences in intramuscular fat content between progeny of boar (1) and boar (2) 0.66 percentage ($p<0.01$), boar (3) 0.44 percentage and boar (4) 0.53 percentage ($p<0.05$) were established. Statistically significant differences were established between boar (3) 0.55 percentage and boar (2) and boar (5) 0.54 percentage ($p<0.05$) in the Landrace breed. In regard to mineral matter and protein content differences were obtained in meat of progeny of separate boars. The varying coefficient of ash amount investigated in offspring meat was inconsiderable. Although, the ash amount in meat varies slightly, statistically significant differences were obtained among Large White breed boar (1) and boar (3) 0.08 percentage ($p<0.05$), boar (4) - 0.1 percentage ($p<0.01$) and boar (5)-0.06 percentage ($p<0.05$). Slight differences were noted for protein amount in meat of progeny of analyzed boars and sows. Statistically significant difference was established in protein amount only in Lithuanian White and Large White pig breeds, between boar (2) and boar (3) 2.6 percentage ($p< 0.05$) and boar (4) 1.8 percentage ($p<0.01$) in Lithuanian White breed, and between boar (3) and boar (4) 2.3 percentage ($p<0.05$) and boar (5) 1.8 percentage ($p<0.05$) in Large White pig breed. Calorific value of meat deriving from progeny of analyzed breeds ranged from 112.0 to 128.9 kcal/100g. The highest meat calorific value was established in progeny of boar (2) of Lithuanian White breed. Statistically significant difference was obtained in meat calorific value between boar (2) and boar (3) 13.5 percentage ($p<0.05$) in Lithuanian White breed. The meat calorific value difference established between boar (1) and boar (3) was 12.8 percentage ($p<0.05$) in Large White breed. Similarly, statistically significant differences on meat calorific value were obtained between boar (2) and boar (4) 9.4 percentage ($p<0.05$) in Landrace breed and between boar (2) and boar (6) 16.3 percentage ($p<0.05$) in Yorkshire breed.

Physical and chemical properties describe meat culinary, technological and nutritional value (*Jukna et al. 2007; Jukna et al. 2005).* The meat physical properties obtained in analysis of results are presented in table 2.

Meat pH is an important indicator of quality, determinative for longer storage possibility and some technological properties (*Todd See et al., 2002; Jukna et al., 2004*). Statistically significant differences in meat pH between progeny of boars of Large White breed were established: between boar (2) and boar (5) −0.10 percentage ($p<0.05$). Difference in meat pH between progeny of boars of Lithuanian White breed was as follows: between boar (1) and boar (3) - 0.09 percentage ($p<0.05$), between boar (2) and boar (3) - 0.12 percentage ($p<0.01$) and between boar (3) and boar (4) - 0.11 percentage ($p<0.05$). Statistically significant difference in meat pH was detected between progeny of Yorkshire breed, between boar (1) and boar (6) 0.18 percentage ($p<0.05$). In Landrace breed differences were following: between boar (1) and boar (2) 0.13 percentage and between boar (1) and boar (3) 0.10 percentage ($p<0.05$).

Table 2. The meat physical properties of analyzed boars and sows offspring's

Breed	n	pH	Color			Drip loss, %	Water holding capacity, mg/%	Cooking loss, %	Shear force, kg/cm²
			L*	a*	b*				
Large White 1	6	5.42±0.02	56.42±0.89	13.32±0.34	6.29±0.12	9.78±1.31	53.38±3.14	28.63±0.56	1.52±0.12
Large White 2	6	5.44±0.06	54.85±1.15	15.40±1.01	10.62±0.39	15.60±1.64	62.02±1.04	29.15±1.39	1.76±0.09
Large White 3	6	5.41±0.04	55.03±0.45	14.89±0.88	8.63±0.95	6.10±0.47	50.62±2.48	25.85±1.76	1.61±0.17
Large White 4	6	5.34±0.03	53.35±1.10	13.71±0.39	7.40±0.88	6.23±1.30	52.30±1.26	22.17±0.46	1.62±0.06
Large White 5	6	5.35±0.02	55.58±0.99	14.38±0.55	5.95±0.32	8.91±0.68	52.21±1.56	24.04±0.72	1.44±0.13
Large White 6	6	5.36±0.03	54.03±1.01	13.89±0.79	6.01±0.39	9.01±0.89	51.20±1.35	23.56±0.55	1.58±0.11
Lithuanian White 1	6	5.45±0.03	55.44±1.37	14.25±0.55	6.02±0.20	7.82±1.27	52.27±0.70	24.46±0.60	1.60±0.13
Lithuanian White 2	6	5.42±0.03	53.05±0.46	14.74±0.41	5.70±0.28	8.10±0.90	53.91±1.08	26.99±1.37	1.38±0.06
Lithuanian White 3	6	5.54±0.04	52.41±1.49	14.06±0.32	5.40±0.37	8.06±1.24	59.92±0.98	29.33±0.94	2.38±0.33
Lithuanian White 4	6	5.43±0.04	53.62±0.99	15.59±0.50	7.13±0.37	6.80±0.93	50.15±1.22	25.17±0.57	1.48±0.10
Lithuanian White 5	6	5.44±0.03	53.95±0.81	15.22±0.46	6.51±0.60	5.97±0.90	55.49±2.50	22.34±1.09	1.51±0.09
Lithuanian White 6	6	5.52±0.05	55.23±1.32	14.80±0.59	6.05±0.34	7.94±1.63	49.01±2.03	26.41±0.63	1.62±0.08
Yorkshire 1	6	5.38±0.05	54.69±0.65	15.10±0.53	7.89±0.87	6.12±0.93	57.31±0.61	29.27±1.09	1.46±0.14
Yorkshire 2	6	5.48±0.01	54.34±0.29	15.15±0.61	6.92±0.63	8.84±1.07	58.97±1.08	29.71±0.61	1.73±0.16
Yorkshire 3	6	5.47±0.02	53.93±1.06	13.87±0.28	5.74±0.34	7.20±1.18	58.53±1.47	29.88±0.57	1.90±0.26
Yorkshire 4	6	5.43±0.02	54.15±1.19	14.16±0.50	5.50±0.33	7.60±0.96	55.69±1.53	29.02±1.05	1.43±0.09
Yorkshire 5	6	5.46±0.02	54.80±0.78	15.04±0.62	7.67±0.25	9.71±1.61	55.40±1.16	29.15±0.80	1.52±0.38
Yorkshire 6	6	5.56±0.11	52.19±2.20	13.25±0.42	4.03±0.33	5.53±0.61	55.66±1.30	28.77±1.18	2.05±0.15
Landrace 1	6	5.34±0.03	54.69±0.43	14.29±0.35	6.34±0.38	9.00±0.91	49.41±1.02	24.50±0.63	1.80±0.15
Landrace 2	6	5.47±0.03	54.21±0.79	14.42±0.48	6.06±0.36	7.65±0.83	58.34±0.72	28.31±0.29	1.52±0.13
Landrace 3	6	5.44±0.03	54.11±0.67	15.77±0.46	8.56±0.56	8.66±1.44	55.24±1.46	26.08±1.73	1.28±0.05
Landrace 4	6	5.32±0.02	53.09±1.00	15.95±0.53	7.65±0.57	7.28±1.39	53.00±1.62	23.19±1.42	1.64±0.12
Landrace 5	6	5.26±0.02	53.82±0.63	15.31±0.30	6.53±0.26	9.04±0.54	52.72±1.56	24.06±0.79	1.41±0.15
Landrace 6	6	5.42±0.03	53.96±0.76	15.42±0.38	6.98±0.42	8.52±1.22	54.30±1.23	25.20±0.73	1.35±0.09

***p < 0.001; **p <0.01; *p < 0.05

The meat coloration results obtained for progeny varied. In Large White breed the meat lightness L* was obtained in progeny of boar (1), by 3.07 percentage (p<0.05) higher compared to boar (4), while the meat redness a* was assessed for boar (1) by 2.08 percentage (p<0.05) lower than in progeny of boar (2). The meat yellowness b* was determined in progeny of boar (1) by 4.33 percentage lower than in boar (2). In Lithuanian White breed, meat lightness L* indicators in progeny statistically significantly differed between boar (3) and boar (4) by 1.21 percentage (p<0.05) and the meat yellowness b* in progeny of boar (3) was by 1.73 percentage (p<0.05) lower than in progeny of boar (4). Statistically significant difference of meat redness a* was 2.28 percentage (p<0.05) between boar (1) and boar (4) in Yorkshire breed. Between progeny of boar (1) and boar (3) in regard to meat yellowness b* difference composed 2.22 percentage ($p<0.05$) in Landrace breed.

The meat drip loss is important technological indicator, that specifies meat suitability for making of special products and influence of commodity pork quality (*Jukna et al., 2007*). Differences established in meat drip loss in progeny of boars of Lithuanian White, Yorkshire and Landrace breeds were statistically insignificant. The meat drip loss difference between progeny of boar (2) and boar (3) composed 9.5 percentage ($p<0.05$) in Large White breed. Differences in regard to water holding capacity were observed between progeny of different boars, but statistically insignificant.

Statistically significant differences were established in meat cooking loss between progeny of boar (1) and boar (2) - 3.81 percentage ($p<0.05$) in Landrace breed, meanwhile in other breeds differences were statistically insignificant.

Meat shear force is very significant indicator, which illustrates meat quality value (*Jukna et al., 2004; Todd See, 2004; Jukna et al., 2006*). However, statistically significant difference was obtained only in Lithuanian White breed between progeny of boar (1) and boar (2) 0.78 kg/cm^2 ($p<0.05$).

The high positive statistical significant correlation coefficients were estimated between meat calorific value, dry matter and proteins in meat, according data correlation analysis accomplished in all analysed breeds. The most link (r = 0.99; r = 0.96 $p<0.001$) between meat calorific value, dry matter and proteins content was established in Yorkshire pig breed. The correlation coefficients were less of mentioned indicators in other breeds. Between meat calorific value and meat intramuscular fat amount the strongest correlation coefficient was established in Landrace breed (r = 0.56, $p<0.001$). The negative statistically significant weak link was found between meat calorific value and ash only in Landrace breed (r = - 0.35, $p<0.05$). Other breed correlations according these indicators were statistically insignificant. A small negative correlation was found between meat calorific value and meat water capacity in Landrace (r = -0.34, $p<0.05$) and the Large White (r = - 0.37, $p<0.05$) breeds. In mentioned breeds negative statistically significant link between meat calorific value and meat cooking loss (r = - 0.35, $p<0.05$ and r = - 0.47, $p<0.01$) was established. According, dispersive analysis (ANOVA) obtained statistically not significant influence of genetics factors on dry matter and protein percentage in meat (Table 3).

The breed had influence on pH of meat -15.6 percentage ($p<0.001$), yellowness (b*) - 12.9 percentage ($p\leq0.001$), water holding capacity - 9.2 percentage ($p<0001$), cooking loss - 22.7 percentage ($p\leq0.001$) and ash amount - 8.0 percentage ($p<0.05$). Similarly, breed influence established for mentioned meat quality characteristics and in other studies (Jukna et al., 2006).

Table 3. Genetic factors influence of meat chemical and physical properties and calorific value

Meat chemical and physical properties		Breed	Boar	Sow	Sex of progeny
Dry matter, %		0.4%	19.0%	32.9%	1.9%
pH		15.6%***	25.5%***	28.7%	0.6%
Color	L*	3.0%	13.0%	45.0%**	0.4%
	a*	3.4%	24.8%**	37.7%*	0.1%
	b*	12.9%***	45.8%***	23.2%**	0.3%
Drip loss, %		5.0%	32.2%***	26.1%	2.2%*
Water holding capacity,%		9.2%***	40.9%***	25.0%*	1.6%*
Cooking loss, %		22.7%***	34.4%***	22.5%*	0.01%
Shear force, kg/cm2		0.9%	27.7%**	28.4%	4.6%***
Intramuscular fat, %		2.2%	52.1%***	21.3%*	0.9%
Ash, %		8.0%*	22.8%	33.0%	0.01%
Proteins, %		1.1%	21.0%	32.9%	1.2%
Calorific values, kcal/100g		0.1	21.9%*	32.4%	1.8%

*** P <0.001, ** P <0.01; * P <0.05

The highest statistically significant sow influence was established for meat redness (a *) - 37.7 percentage (p<0.05). Sow influence for this indicator 12.9 percentage higher than the effect of male. Statistically significant influence of sows was established in meat yellowness (b *) - 23.2 percentage (p<0.01) water holding capacity - 25.0 percentage. (p<0.05), cooking loss - 22.5 percentage (p<0.05) and intramuscular fat amount - 21.3 percentage (p<0.05) of their progeny. Considerable sow influence on meat quality characteristics of their progeny was investigated and identified by many scientists (*Mabry et al., 1998, Jukna et al., 2004; Jukna et al., 2006; Gilbert et al., 2007*).

The greatest boar influence was established in meat intramuscular fat percentage - 52.1 percentage (p<0.001) in their progeny. Influence on this indicator was by 30.8 % higher than the sow influence. For all genetic factors entirely statistically significant influence of boar was obtained on meat calorific value 21.9 percentage (p<0.05). Quite considerable statistically significant influence of boar was established on meat yellowness (b *) - 45.8 percentage (p<0.001), redness (a *) - 24.8 percentage (p<0.01), pH of meat - 25.5 percentage (p<0.001), water holding capacity - 40.9 percentage (p<0.001), drip loss - 32.2 percentage (p<0.001), cooking loss - 34.4 percentage (p<0.001) and shear force of meat - 27.7 percentage (p<0.01) in their progeny.

The sex of progeny had statistically significant influence on meat shear force kg/cm2 (p<0.001), drip loss percentage 2.2 percentage (p<0.05) and water holding capacity 1.6 percentage ($p<0.05$). Sex influence of meat quality and other scientists found (*Latore et al., 2003, Furman et al., 2007*).

Conclusion

1. In progeny of analysed pig breeds, the highest correlation coefficients were determined between calorific value of meat and dry matter, and protein content ($p <0001$). Between calorific value of meat and meat intramuscular fat content strong significant positive link was only established in progeny of Landrace breed ($r = 0.56$, $p <0001$).
2. Dispersive analysis (ANOVA) showed, that the sows and boars had major influence on meat quality of their progeny. The greatest statistically significant influence of boar was determined on meat intramuscular fat percentage - 52.1 percentage ($p \leq 0001$), and of sow on meat redness (a *) - 37.7 percentage ($p <0.05$) of their progeny. And from all genetic factors only statistically significant influence of boar was obtained for meat calorific value 21.9 percentage ($p< 0.05$).
3. The analysis of data shows the sows and boars of have important influence on meat quality of their progeny. It is important to clarify the best combinations of boars and sows, because these combinations can ensure increase of production of high-quality pork in the country.

Uticaj nerasta i krmača na kvalitet mesa i kalorijsku vrednost mesa njihovih potomaka

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Rezime

U ovom radu su predstavljeni rezultati analize podataka o uticaju nerasta i krmača na kvalitet mesa kod potomstva i njegovu kalorijsku vrednost. U cilju ocene uticaja nerasta i krmača na njihovo potmostvo, odabrane su i ispitane 144 životinje. U ovoj analizi su korišćene sledeće rase: velika bela, jorkšir, landras i litvanska bela svinja. Šest nerastova svake rase je korišćeno u istraživanju i njihovo potomstvo od 3 krmače. Uticaj krmača je ocenjivan na osnovu 2 potomka iz legla. Uzorci su uzimani sa mišića *musculus longissimus dorsi* između 12. i poslednjeg rebra, i to 500 – 550 g. Kvalitet mesa je ocenjivan 48 sati nakon klanja. Hemijski

sastav, fizičke i tehnološke osobine meta su ocenjivane korišćenjem ustaljenih, prihvaćenih metoda. Kalorijska vrednost mesa je izračunata po formuli *Watt, Mersil* (1975). Eksperimenti su pokazali da u potomstvu analiziranih rasa svinja najviši koeficijenti korelacije su utvrđeni između kalorijske vrednosti measa i suve materije, i sadržaja proteina (p <0001). Između kalorijske vrednosti mesa i sadržaja intramuskularne masti utvrđene su jake pozitivne veze samo kod potomaka landrasa (r = 0.56, p <0001). Disperzivna analiza (ANOVA) je pokazala da su krmače i nerastovi imali značajan uticaj na kvalitet mesa potomstva. Najveći statistički signifikantan uticaj nerasta je utvrđen za osobinu procenta intramuskularne masti u mesu - 52.1 procenata (p ≤ 0001), a krmače na crvenu boju mesa potomaka (a *) - 37.7 procenata (p <0.05). A od svih genetskih faktora, samo je nerast statistički signifikantno uticao na kalorijsku vrednost mesa 21.9 procenata (p< 0.05). Pored toga, pol potomaka je statistički signifikantno uticao na silu sečenja mesa kg/cm2 (p <0001), kalo 2.2 procenta (p <0.05) is sposobnost vezivanja vode 1.6 procenata (p <0.05). Podaci dobijeni analizom pokazuju su imali značajan uticaj na kvalitet mesa potomaka. Važno je utvrditi koje su najbolje kombinacije nerasta i krmača, jer to može obezbediti proizvodnju svinjskog mesa visokog kvalitet u zemlji.

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