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IMPACT OF LIVE WEIGHT ON THE QUALITY OF PIGS HALVES AND MEAT OF THE LARGE WHITE BREED

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Abstract: The research was conducted on pig carcasses and meat of 12 pigs breed big Yorkshire fattened to approximately 125 kg body mass (group A), and 12 pigs of the same breed fattened to approximately 108 kg body mass (group B). Pigs were kept in the semi-outdoor system, with the same housing and feeding conditions. Meat quality was determined on the sample from M.longissimus dorsi, taken between the 13th and 14th rib. Body mass of pigs prior to slaughter 125..22 kg. and 108. 52 kg.) significantly influenced the quality of pigs breed big Yorkshire carcasses , but not the quality of the meat.

Pigs with higher body mass (125.22 kg) had carcasses of different conformation (significantly higher relative share of yawl and abdominal rib -part and a lower relative share of less worth parts and shoulder) and composition (a lower relative share of meat on shoulder and a higher relative share of meat on abdominal-rib part) in relation to pigs with lower body mass (108.52 kg). The meat contents in carcasses was almost equal (47.04 % and 47.20%) in both analyzed groups of pigs. In terms of meat quality, that was usual, no significant differences ($p>0.05$) were determined between the analyzed groups of pigs.

Key words: Big Yorkshire, body mass, meat and carcass quality

Introduction

Essential interest for the meat industry is fleshy breeds of pigs that have developed muscles in the regions where you are getting the best quality of meat (thigh, shoulders, spine) such as the meaty type of pigs in which the meat industry shows a special interest as they give a high percent of meat, particularly from the trunk area (leg, spine and shoulders), and have a small percentage of subcutaneous fat tissue.

Quality of pig meat and carcass is influenced, in addition to genetic and Para genetic factors to genetic factors *(Ellis and Betol, 2001; Miller et al., 2000;*

Therkildsen et al., 2001; Chiba et al., 2002; James et al., 2002; Nisen et al., 2006), among which there is also the final body mass of fattened pigs *(Ellis and Betol, 2001; Senčić et al., 2005)*.

Optimum final body mass of fattened pigs depends on requirements of consumers, needs of the processing industry, production efficiency, but also on genetic potential of pigs for meat production.

Quantitative evaluation of the quality and value of the pig half's beside other parameters we consider the thickness of back fat and the percentage of meat in separate parts.Fleshy breeds of pigs in which is included Yorkshire breed, are accumulating fat tissue in the body while achieving higher live-weight, and the fleshy-fat breeds of pigs accumulates fatty tissue when reach a less live-weight.

The objective of this study is to determine how the live weight influences the slaughter house quality of pigs breed big Yorkshire .

Materials and Methods

The research was conducted on pig carcasses and meat of 12 pigs breed big Yorkshire fattened to approximately 125 kg body mass (group A), and 12 pigs of the same breed fattened to approximately 108 kg body mass (group B). Pigs were kept in the semi-outdoor system, with the same housing and feeding conditions.

Pigs were fed fodder mixture (ST-1) with 16% crude protein and min .2. 5 MJ/ME kg in the period from 25 - 60 kg. body mass and with fodder mixture (ST -2) with min.14 % crude protein and min.12. 5 MJ/ ME kg in the period from 60 kg Body mass to the end of fattening which consume *ad libitum.*

Dissection of right cooled pig carcasses (+4ºC) was conducted according to the modified method of *Weniger et al. (1963).* According to this modification, the total quality of muscle tissue does not include muscle tissue of head, which was not dissected. pH1 value of meat was de termined 45 minutes post mortem, and pH2 value 24 hours post mortem, by means of contact pH-meter Lu-co. Meat quality was determined on the sample from *M. longissimus dorsi,* taken between the 13th and 14th rib. From the chemical analysis performed examination of water content, fats, proteins and minerals. Moisture content was determined after drying to constant weight; protein content was determined by the Kjeldahl method and the factor 6.25 was used for conversion of nitrogen to crude protein; crude fat content was determined after extraction of lipids by means of an automated Soxlet procedure *(AOAC, 1995)*. Mineral content with mineralization in muffle oven on temperature of 550-650 degrees *(Pozarskaja et al., 1964).*

Water holding capacity was determined according to *Grau and Hamm (1952)*. Statistical processing of data vas done using program .

Statistic processing of research result s was done using program *Stat. Soft. Inc. (2001*) STATISTICA (data analysis software system).using standard mathematical statistical methods and Analysis of variance.

Results and Discussion

Data in the Table 1 indicate that there are significant differences in conformation of carcasses of big Yorkshire pig in terms of their body mass prior to slaughter. Pigs with larger body mass produced carcasses with a higher relative share of yawl and abdominal-rib part, while pigs with lower body mass produced carcasses with a significantly higher share ($P<0.05$) of shoulder and a significantly very higher ($P<0.01$) share of less valuable parts. Considering the share of hams, no significant differences ($P>0.05$) were determined between the analyzed groups of pigs. *Cisneros et al. (1996)* reported that the growth of slaughterhouse body mass was followed by increased percentage of fat in carcasses, while the share of hams, shoulders and abdominal-rib part was decreasing.

Table 1. Conformation of pig carcasses in relation to live weight

Indikator	group A	group B	Significant differences
	$\bar{X} \pm Sd$	$\bar{X} \pm Sd$	
Body mass	125.22 ± 5.20	108.52 ± 4.52	**
Cold carcas (kg)	43.52 ± 3.25	52.22 ± 3.92	**
Less valuable parts (%)	9.52 ± 0.75	8.42 ± 0.72	**
Yawl (%)	1.25 ± 0.25	1.92 ± 0.37	**
Fat (%)	2 .12 ± 0.48	2.22 ± 0.52	Ns
Neck (%)	12 .22 ± 1.12	3.28 ± 2.02	Ns
Back part (%)	13.52 ± 2.98	13.78 ± 1.22	Ns
Shoulder (%)	12.28 ± 0.84	12.05 ± 0.81	*
Ham (%)	28.25 ± 1.38	27.48 ± 1.45	Ns
Abdominal-rib part (%)	17.22 ± 2.42	20.58 ± 1.02	**

*p<0.05; **p<0,01; Ns-non significant

From the Table 2 it shows that the composition of pig halves differed in both groups of pigs, although there are not determined statistically significant differences ($P> 0.05$). Pigs with bigger live-mass have statistically significant ($P>0.01$) a larger relative share of meat in the stomach-rib part in the halves, and relatively smaller share of meat in the shoulders and thighs but those differences are not statistically significant ($P>0.05$). Share of shoulder and cooled pig carcasses has statistically significance ($P<0.05$).

Composition of pig carcasses (Table 2) also differed to some extent between pigs from different weight groups. Although no significant differences ($P>0.05$) were determined in terms of meat contents in carcasses, pigs of higher body mass had a very significantly ($P<0.01$) bigger relative share of abdominal-rib part meat in carcasses, as well as a smaller relative share of ham meat in carcasses, but this was not statistically significant ($P>0.05$).

Table 2. Composition of pig carcasses in relation to body mass

Indikator	group A	group B	Significant differences
	$\overline{X}$ ± Sd	$\overline{X}$ ± Sd	
Cold carcas mass (kg)	43.52 ± 3.44	52.22 ± 3.95	**
Share of meat in carcasses (%)	47.04 ± 2.22	47.20 ± 2.19	Ns
Share of neck meat (%)	7.88 ± 1.78	8.05 ± 1.15	Ns
Share of back part meat (%)	6.28 ± 1.58	6.08 ± 0.55	Ns
Share of shoulder meat (%)	6.48 ± 0.32	6.12 ± 0.55	**
Share of ham meat (%)	16.42 ± 1.28	15.48 ± 1.39	Ns
Share of abdominal-rib part meat (%)	9.92 ± 1.28	11.22 ± 0.52	**

**p<0.01; Ns-non significant

Our results are consistent with the results of *Senčić et al*. *(2005)*, *Pulkrabek et al. (2006)*. In researches of crossbreds of Great Yorkshire, Swedish Landrace and Pietren fattened to 90.30 kg, 100.40 kg, 110.130 kg 120.50 kg and 130.20 kg body mass, *Senčić et al. (2005)* determined that as final body mass of fattened pigs was increasing, a relative share of ham meat in carcasses was decreasing to a statistically significant extent , as well as a relative share of back and shoulder meat, but not statistically significant (P>0.05).

Table 3. Quality of pig meat in relation to body mass

Indikators	group A	group B	Significant differences
	$\overline{X}$ ± Sd	$\overline{X}$ ± Sd	
pH i	6.38 ± 0.24	6.24 ± 0.28	Ns
pH k	5.55 ± 0.12	5.62 ± 0.22	Ns
Water holding capacity (cm^2)	5.18 ± 1.15	4.72 ± 1.72	Ns
Crude proteins (%)	20.52 ± 0.68	20.39 ± 0.72	Ns
Crude fats (%)	2.45 ± 1.70	2.88 ± 1.81	Ns
Ash (%)	1.00 ± 0.02	1.02 ± 0.02	Ns
Water (%)	72.64 ± 1.52	71.55 ± 1.28	Ns

Ns – non significant

There are not identified significant differences in the quality of the meat between the analyzed groups of pigs (Tab 3). The values of the studied indicators of quality of flesh moved within normal limits. Differences in the quality of the meat were not statistically significant (P>0,05) *(Zanardi et al., 1998;Chandlek - Potocari and Kovac, 2004; Petričević et al., 2000)* found that the content of fat in the meat of cultural pig's breeds ranges from 0.5 to 3.5%. *Senčič et al. (2005)* found that with increasing body weight of pigs grew pH value of meat, has increased ability to bind water and marbleized the meat.

Conclusion

Body mass of pigs prior to slaughter 108.52 kg and 125.22 kg significantly influenced the quality of Big Yorkshire pig carcasses, but not the quality of their meat. Pigs with higher body mass (125.22 kg) had carcasses of different conformation (significantly higher relative share of yawl and abdominal-rib part and a lower relative share of less worth parts and shoulder) and composition (a lower relative share of meat on shoulder and a higher relative share of meat on abdominal-rib part) in relation to pigs with lower body mass (108.52 kg). The meat contents in carcasses was almost equal (47.04 % and 47.20 %) in booth analyzed groups of pigs. In terms of meat quality, that was usual, no significant differences were determined between the analyzed groups of pigs.

Uticaj žive mase na kvalitet polutki i mesa svinja rase veliki jorkšir

A. Kuzelov, N. Taskov, T. Angelkova, E. Atanasova, M. Mladenov

Rezime

U radu su dati rezultati ispitivanja polutki i mesa 12 svinja rase veliki jorkšir tovljenih do oko 125 kg žive mase (grupa A) i 12 svinja iste rase tovljenih do oko 108 kg (grupa B).

Svinje su držane u poluotvorenom sistemu u istim smeštajnim i hranidbenim uslovima. Kvalitet mesa je određen na uzorku dugog leđnog mićića (*M. Longisimus dorsi*) uzetom u visini između 13. i 14. rebra.

Živa masa masa svinja pre klanja (108,52 kg i 125,22 kg) imala je značajan uticaj na kvalitet polutki velikog jorkšira ali ne i na njihovog mesa. Svinje veće žive mase (125,22 kg) imale su polutke sa različitom konformacijom (značajno veci relatvni udeo podbradka I trbušno - rebarnog dela, a manji relativni udeo manje vrednih delova i plećke) i sastava (manji relativni udeo mesa plećke i veći relativni udeo mesa trbušno – rebarnog dela) u odnosu na svinje manje žive mase (108,52 kg). Udeo mesa u poltkama bio je podjednak (47,04 % i 47,20% i kod obe analizirane grupe svinja. U pogledu kvaliteta mesa, koja je bila normalna, nisu utvrđene značajne razlike ($p>0,05$) između analiziranih grupa svinja.

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