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EFFECTS OF BREED,TISSUE AND GENDER ON CHOLESTEROL CONTENTS OF PORK FROM LOCAL LITHUANIAN PIG BREEDS

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Animal derived food, including pork is the main source of exogenous dietary cholesterol. The previous study showed that longissimus muscle from both Lithuanian pig breeds has lower contents of cholesterol compared with the conventional hybrids. The objective of this study was to examine the effects of breed, anatomical tissue location, gender and feeding level on the cholesterol content in Lithuanian pig breeds .

MATERIAL AND METHODS

The study was carried out on 24 Lithuanian White (LW) and 18 Lithuanian Indigenous Wattle (LIW) pigs, 28 females and 14 castrated males. Lithuanian White pigs were developed on XX century under purposeful selection, whereas no selection was carried out for old Lithuanian Indigenous Wattle pigs.

All pigs used in the study up to 60 kg live weight were fed ad libitum and after 60 kg weight a half of the animals from both breeds were fed restricted diet of approximately 80% of average ad libitum feeding intake on conventional concentrates.

To analyse cholesterol content the samples of M. longissimus lumborum (LL) and backfat were taken at 1-2 lumbar vertebra and samples of M. semimembranosus (SM) were collected from the ham of the left side of carcasses.

The cholesterol content was determined by HPLC analysis using the system Shimadzu 10Avp. The content of cholesterol was expressed as mg/100 g fresh meat.

The data were subjected to the analysis of variance in GLM procedure in SPSS 17 with LSD significance test.

RESULTS

The comparisons of local conserved Lithuanian breeds showed neglible differences in the longissimus muscle fat content, however semimembranosus muscle of Lithuanian White pigs had higher fat content than the same muscle of Lithuanian Indigenous Wattle pigs ($P<0.05$). Only the backfat of Lithuanian White pigs had higher content of cholesterol than the backfat from Lithuanian indigenous wattle pigs ($P<0.05$). The lowest contents of cholesterol were found in the backfat ($P<0.001$) and the highest contents in the semimembranosus muscle from both breeds, however, the differences between the muscles were not significant (Table 1). The gender of pigs showed its effect on the semimembranosus cholesterol content ($P<0.05$): females had higher content of cholesterol than castrated males. Feeding level did not affected cholesterol content in the pork. Cholesterol contents in both muscles showed negative correlations (Table 2) with pig age ($P<0.001$). In the semimembranosus muscle cholesterol content showed negative correlation with pig weight ($P<0.05$). Negative correlations were also found between backfat thickness and cholesterol content in backfat.

CONCLUSION

Breed and gender of pigs showed their minimal effect on cholesterol content in backfat and semimembranosus muscle, respectively: Lithuanian White pigs had higher content in backfat compared with Lithuanian Indigenous Wattle pigs and females had higher content of cholesterol than castrated males. Feeding level did not affected cholesterol content in the pork.

Table 1. Effects of breed, anatomical tissue location, gender and feeding level on cholesterol content

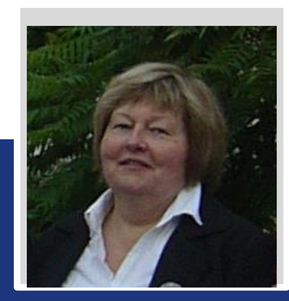
Tissue	Breed		Gender		Feeding level		SED
	LW	LIW	Castrates	Females	Ad libitum	Restricted	
LL	37,77^{E}	38,40^{E}	37,67	38,51	37,07	39,01	1,88
SM	39,65^{E}	40,22^{E}	37,76^{a}	42,10^{b}	38,36	41,50	2,09
Back fat	32,98^{a,F}	29,90^{b,F}	30,75	32,12	30,91	31,96	1,21

Mean values with different superscripts within a row differ at $^{a-b}$ $P<0.05$ and within column $^{E-F}$ $P<0.001$

Table 2. Correlation coefficients between cholesterol content in different tissues and other parameters

Tissue	Age	Weight	Average backfat depth	Fat LL	Fat SM
LL	-0,419**	-0,194	-0,209	-0,221	-0,329*
SM	-0,504***	-0,326*	-0,149	0,116	-0,521***
Backfat	0,172	0,072	-0,342*	-0,396*	0,165

* $P<0.05$; ** $P<0.01$; *** $P<0.001$



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