PREDICTION OF MEATINESS OF PIGS FROM M.L.D. AND FAT AREAS MEASURED AT VARIOUS PARTS OF CARCASS

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Summary

The possibility to predict chosen carcass data by using some measures of the carcass was studied in 122 hybrids at pre-slaughter weight 110 kg, lean meat contenc (LMC) in vivo (by apparatus PIGLOG 105) and/or post mortem 52.51 resp. 54.63% and m.l.d. and/or backfat area at the last rib 39.98 cm^2 and/or 15.64 cm^2. LMC in vivo correlated most closely with the relationship backfat area over m.l.d.: m.l.d. area at 3rd-4th last rib (r = -0.90), while the LMC post mortem correlated most closely with the rate backfat area over m.l.d.: m.l.d. area at the last rib (r = -0.86). The correlation between backfat area over m.l.d. at the last rib (r = -0.88 and/or -0.84), between 3rd - 4th last lumbar vertebrae (r = -0.77 and/or -0.86) and 3rd - 4th last ribe (r = -0.75 and/or -0.87) on one hand and parameters of carcass meatiness (LMC in vivo and/or post mortem) on the other were higher than between the LMC in vivo and post mortem and m.l.d. area at given areas of measurements (r = 0.51 and/or 0.56; 0.60 and/or 0.67 and 0.48 and/or 0.54).

Introduction

The aim of the pig breeders and producers is to assist in predictin of lean meat content at classification and quality assesment of dressed carcasses of pigs. Because in slaughterhouse it is impossible to make partial or detailed dissection of carcass, prediction is realized by apparatus, utilizing some carcass measures (i.e. backfat thickness and thickness of m.l.d. at different spots of carcass).

It was observed that the correlation coefficients between backfat thickness and lean meat content are higher than relationship between thickness of m.l.d. and muscle percentage (1, 4). The correlation between m.l.d. area and lean meat content was at the level r = 0.31 to 0.66 (2, 3).

The objective of the paper was to evaluate opportunities for exploitation some spots of carcass for lean meat content prediction.

Material and method

The experimental hybrid pigs SLOVHYB-2 (n=122) at the parity sex ration of gilts: barrows received a commerial mixture (crude protein 17.6 %, lysine and/or energy content 0.9% resp. 12.9 MJ ME) to pre-slaughter weight 110 kg. The in vivo percentage of muscle was determined instrumentally by the apparatus PIGLOG 105 a day before slaughter. A detailed dissection of carcasses was done on the second day after slaughter to determine the basic tissues (meat, fat, bones and skin). The areas of m.l.d. and/or backfat above m.l.d. were measured at the last rib (m.l.d. area$_1$ and/or backfat area$_1$), at the third and fourth lumber vertebrae (m.l.d. area$_2$ and/or backfat area$_2$) and between the third and fourth last rib (m.l.d. area$_3$ and/or backfat area$_3$). In these positions of carcass also the ratios of m.l.d. area to backfat area above m.l.d. and relationships between backfat area above m.l.d. to m.l.d. area were calculated.

Results and discussion

At the pre-slaughter weight of approx. 110 kg reached the hybrid pigs SLOVHYB-2 the lean meat content in vivo and/or post mortem at the level 52.21 and/or 54.63%. The average m.l.d. and/or backfat area above m.l.d. (in cm^2) at the last rib, between 3.-4. lumbar vertebrae and at 3.-4. last rib had 39.98 and/or 15.64; 41.10 and/or 20.82 and 39.65 and/or 16.42.

The relationships between the investigated carcass values are collected in table 1.

Table 1. - STATISTICALLY SIGNIFICANT CORRELATION COEFFICIENTS BETWEEN INVESTIGATED PARAMETERS OF CARCASS VALUE

Traits	Llean meat content (%)	
	in vivo	post mortem
1. m.l.d. area$_1$	0.51	0.56
2. m.l.d. area$_2$	0.60	0.67
3. m.l.d. area$_3$	0.48	0.54
4. Backfat area$_1$	- 0.88	- 0.84
5. Backfat area$_3$	- 0.77	- 0.86
6. Backfat area$_3$	- 0.75	- 0.87
7. Ratio between trait 1:4/4:1	0.76/-0.81	0.85/-0.86
8. Ratio between trait 2:5/5:2	0.75/-0.89	0.85/-0.84
9. Ratio between trait 3:6/6:3	0.78/-0.90	0.81/-0.81

r≥0.20 : P≤0.05

r≥0.26 : P≤0.01

r≥0.31 : P≤0.001

The correlation coefficients betwee m.l.d. areas at various parts of loin and lean meat content (LMC) varied from r=0.48 to 0.67; it is in good agreement with informations of other authors (2, 3). These relationships were lower than correlation coefficients between backfat area above m.l.d. at the various parts of carcass and the lean meat content, if coefficients receiving r=-0.75 t o-0.88.

Statistically highly siginficant relationships were determined between LMC in vivo and the ratio backfat area above m.l.d.:m.l.d. area at the 3.-4. last rib (r=-0.90), while relationship between LMC post mortem and ratio backfat area above m.l.d.: m.l.d. area at the last rib was on the level r=-0.86.

With the respect to the calculated correlation coefficients between m.l.d. area and backfat area above m.l.d. and other investigetad carcass values (rations between these parameters) it is possible to look for an opportunity to predict meatiness in vivo and to use the parameters for the prediction on meatiness in breeding pigs (e.g. in boars of father populations which are used for A.I. and/or natural breeding). The results suggested that it is possible to use the correlations between backfat areas and m.l.d. to determine the proportion of lean meat cuts and/or muscular substance with an apparatus when constructing the regression equations.

The level of correlations suggests that the backfat area and/or the proportion between backfat area and m.l.d. area could be more reliable indicators of meatiness in carcass than m.l.d. area and/or the backfat of m.l.d. thickness alone in individual positions of the pig carcass.

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PREDVIĐANJE MESNATOSTI SVINJA IZ MLD-a I MASNIH PODRUČJA MJERENIH NA RAZNIM DIJELOVIMA POLOVICA

Sažetak

Mogućnosti predviđanja podataka iz odabranih polovica primjenom nekih mjera polovica ispitivana je na 122 hibrida težine od 11o kg prije klanja. Sadržaj krtog mesa (LMC) in vivo (aparatom PIGLOG 105) i/ili post mortem bio je 52.51 odnosno 54.63% a m.l.d. i/ili područje leđne slanine na zadnjem rebru 39.98 cm^2 i/ili 15.64 cm^2. LMC in vivo najviše je odgovarao odnosu područja leđne slanine iznad m.l.d.: području m.l.d. na 3.-4. zadnjem rebru (r=-0.90) dok je LMC post mortem najviše odgovarao stopi područja leđne slanine preko m.l.d.: m.l.d. područja na zadnjem rebru (r=-0.86). Korelacija između područja leđne slanine iznad m.l.d. na zadnjem rebru (r=-0.88 i/ili -0.84), između 3. i 4. zadnjeg lumbalnog kralješka (r=-0.77 i/ili -0.86) i 3.-4. zadnjeg rebra (r=-0.75 i/ili -0.87) s jedne strane i parametara mesnatosti polovica (LMC in vivo i/ili post mortem) s druge bili su viši nego između LMC in vivo i post mortem i m.l.d. područja na zadanim mjestima mjerenja (r=0.51 i/ili 0.56:0.60 i/ili 0.67 i 0.48 i/ili 0.54).