CARCASS VALUE IN DIFFERENCED GROUPS OF SLAUGHTER PIGS

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Abstract

The total of 141 slaughter pigs of representative genotypes were selected also with regard to representativity in weight, sex and backfat depth. The pigs in the sample were slaughtered and the basic characteristics were measured on the carcass. The carcasses were graded with the FOM device and then dissected. The sample was first divided in two groups depending on the weight of the carcass (60-90kg and 90-120kg), second divided into gilts and barrows. The groups were compared regarding to the carcass value, especially the lean meat content. There were no significant differences between the compared groups in any of the measured characteristics.

Key Words: Carcass value, pig, FOM, dissection

The research of the pig carcass quality is very actual and many studies are focused on these problematic. The research reacts to the demand of consumers and also to the fact that the carcass value is a complex of many partial characteristics. Except the quality of meat this complex concerns i.a. the carcass yield, the share of the main meaty parts and the lean meat content which one is the basic characteristic while implementing the carcass grading process according to the EC rules.

The actual development of the market demands is to reach an adequate increase of the main meaty parts share and of the lean meat content. Agreeable with Whitemore (1998), who evaluated the slaughter pig population in Western Europe, Rybář (2002) presents that also in the Czech Republic the fat -share in the pig carcasses is lowered below 20%. The importance of evaluating the carcasses mentioned also Václavovský et al. (2002), Vítek et al. (2008) and others. The review of the carcass value by the pig final hybrids in the Czech Republic was published by Šimek et al. (2004). Some differences in lean meat content were found out between the apparatuses used for the carcass grading (Kvapilík et al., 2009). The development of the grading methods prefers the increasing share of methods using automatic and semi-automatic devices which fulfil the statistical accuracy requirements. The requirement is to reach the correlation coefficient at least 0.8 between the estimated and the real lean meat content in the pig carcass. This corresponds to the determination coefficient at the minimal range of 0.64 and the RMSEP (root mean square error of prediction) up to 2.5.

The carcass composition is also intacted by the system of cyclic fattening. By using this system is the whole fattening hall emptied in one day i.e. 200 to 500 pigs and that brings a lot of variability especially in the carcass weight. The variability appears in every production system, especially in these with worse management degree.

For the estimation of the lean meat content according to the SEUROP-system is the back fat thickness in the P2 point the most important characteristic. This thickness can vary a lot in the big samples of carcasses. Therefore are developed systems and processes which should decline the variability by making smaller groups of slaughter pigs separately according to their grow-ability or separated fattening of gilts and barrows.

The aim of the work was to appreciate the main characteristics of the carcass value by the weight-differenced groups.

Material and Methods

For the experiment purposes was selected a representative sample of 141 slaughter pigs. The carcasses were selected with regard to the carcass weight, the back fat thickness and to the equal share of gilts and barrows. The pigs were slaughtered in standard conditions in selected plants in the Czech Republic.

The characteristics measured on the left carcass half until 45 min. *post* mortem:

- the back-fat thickness with skin measured with the FOM device at the P2 point (between the 2nd and the 3rd last rib, 70mm from the split line) – **S-FOM**
- the muscle thickness measured at the same place (P2) with the FOM device – **M-FOM**
- lean meat content in the carcass estimated with the FOM device (%) - **LMC FOM**

The characteristics measured 24 hours *post* mortem:

The left carcass halves were divided according to the EC-reference method (Walstra, Merkus, 1996) and the detailed dissection of the carcasses were done to determine the exact lean meat content.

Results and Discussion

At first was observed the dependence of the lean meat content on the carcass weight. This relationship is illustrated in the Figure 1 and the correlation coefficient is 0.26. Similar results from the pig carcass evaluation in the Czech republic presented i.a. Eidelpesová et al. (2009).

The influence of the carcass weight (x) on the lean meat content (y) mentioned also Vítek et al. (2006) using the regression formula $y = 63{,}636 - 0{,}0937x$. Fischer et al. (2006) and Correa et al. (2006) observed the two weight-differenced groups to improve the accuracy of the lean meat content estimation.

For the estimation of the lean meat content are decisive the S-FOM and M-FOM measurements. These were evaluated separately for the weight group 60-90 kg (n=65) and for the weight group 90-120 kg. The results are presented in tables 1 and 2.

By the lighter weight category (table 1) reached the average carcass weight the value 79.95 kg (s=7.008) with the variation interval from 61.06 to 89.86 kg. The backfat thickness measured with the FOM device reached the

average of 14.40 mm (s=2.949) and this characteristic varied in the interval between 10 and 22 mm. The second characteristic, muscle depth, reached the average of 58.25 mm (s=6.638) lying in the interval from 43 to 82 mm. The average lean meat content from dissection was 59.46% (s=3.239) with the variability from 52 to 65.25%. Similar results were estimated also with the FOM device – the average at 59.60% (s=2.224) with the variation in between 53.85 – 62.92%.

The heavier weight category (table 2) reached the average carcass weight the value 98.50 kg (s=6.603) with the variation interval from 90.57 to 118.47 kg.

The backfat thickness measured with the FOM device reached the average of 16.20 mm (s=3.294) and this characteristic varied in the interval between 10 and 24 mm. The second characteristic, muscle depth, reached the average of 63.29 mm (s=5.075) lying in the interval from 53 to 80 mm. The average lean meat content from dissection was 58.25% (s=3.787) with the variability from 43.70 to 67.16%. Similar results were estimated also with the FOM device – the average at 58.23% (s=2.486) with the narrower variation in between 52.38 – 62.90%.

Figure 1.Dependence of the lean meat content from dissection on the carcass weight

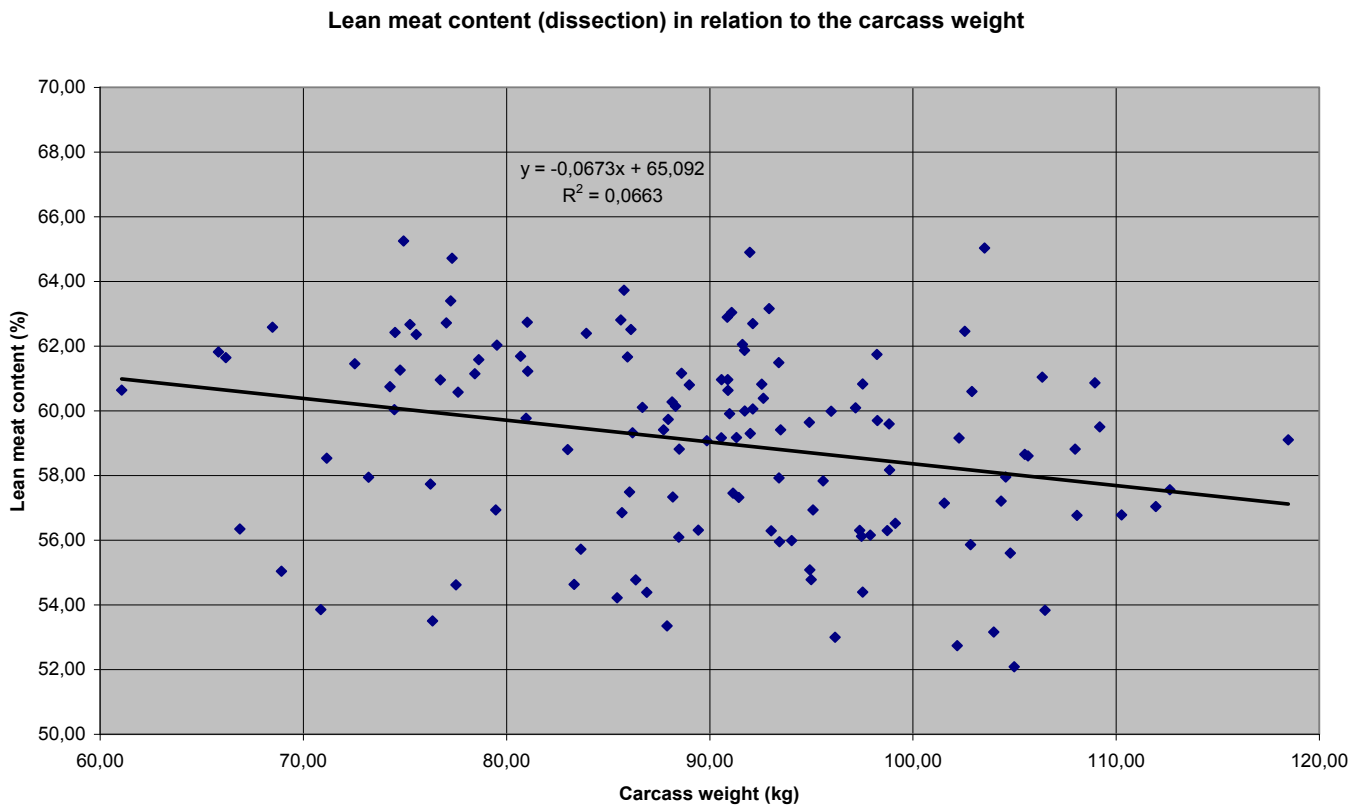


Table 1.Statistical characteristics for the lighter weight cathegory

	Lighter weight category (60 - 90 kg) n = 65			
	mean	s	Xmin	Xmax
Carcass weight (kg)	79.95	7.008	61.06	89.86
S - FOM (mm)	14.40	2.949	10.00	22.00
M - FOM (mm)	58.25	6.638	43.00	82.00
LMC - dissection (%)	59.46	3.239	52.00	65.25
LMC - estimation (%)	59.60	2.224	53.85	62.92

Table 2. Statistical characteristics for the heavier weight cathegory

	Heavier weight cathegory (90 - 120 kg) n = 76			
	mean	s	Xmin	Xmax
Carcass weight (kg)	98.50	6.603	90.57	118.47
S - FOM (mm)	16.20	3.294	10.00	24.00
M - FOM (mm)	63.29	5.075	53.00	80.00
LMC - dissection (%)	58.25	3.787	43.70	67.16
LMC - estimation (%)	58.23	2.486	52.38	62.90

The changes in the lean meat content in dependence to the changes of the backfat thickness and the linear regression models are shown in figure 2.
From the second figure is evident that the lean meat content by the lighter carcasses is more influenced by the changes of the backfat thickness than by the heavier carcasses.

Further were the data analysed from the view of the influence of sex. The evaluation of the sample separately for gilts and barrows are shown in tables 3 and 4.

From the tables 3 and 4 result that the differences between the two groups while dividing the sample into gilts and barrows was very small. The lean meat content from the dissection was slightly higher by the gilts than by barrows by 1.43 percentage point. This value was also higher by the gilts when measuring with the FOM device.

The changes in the lean meat content depending on changes in the backfat thickness are shown in Figure 3 – separately for gilts and barrows.

Figure 2. . Dependence of the LMC on the backfat thickness according to the carcass weight

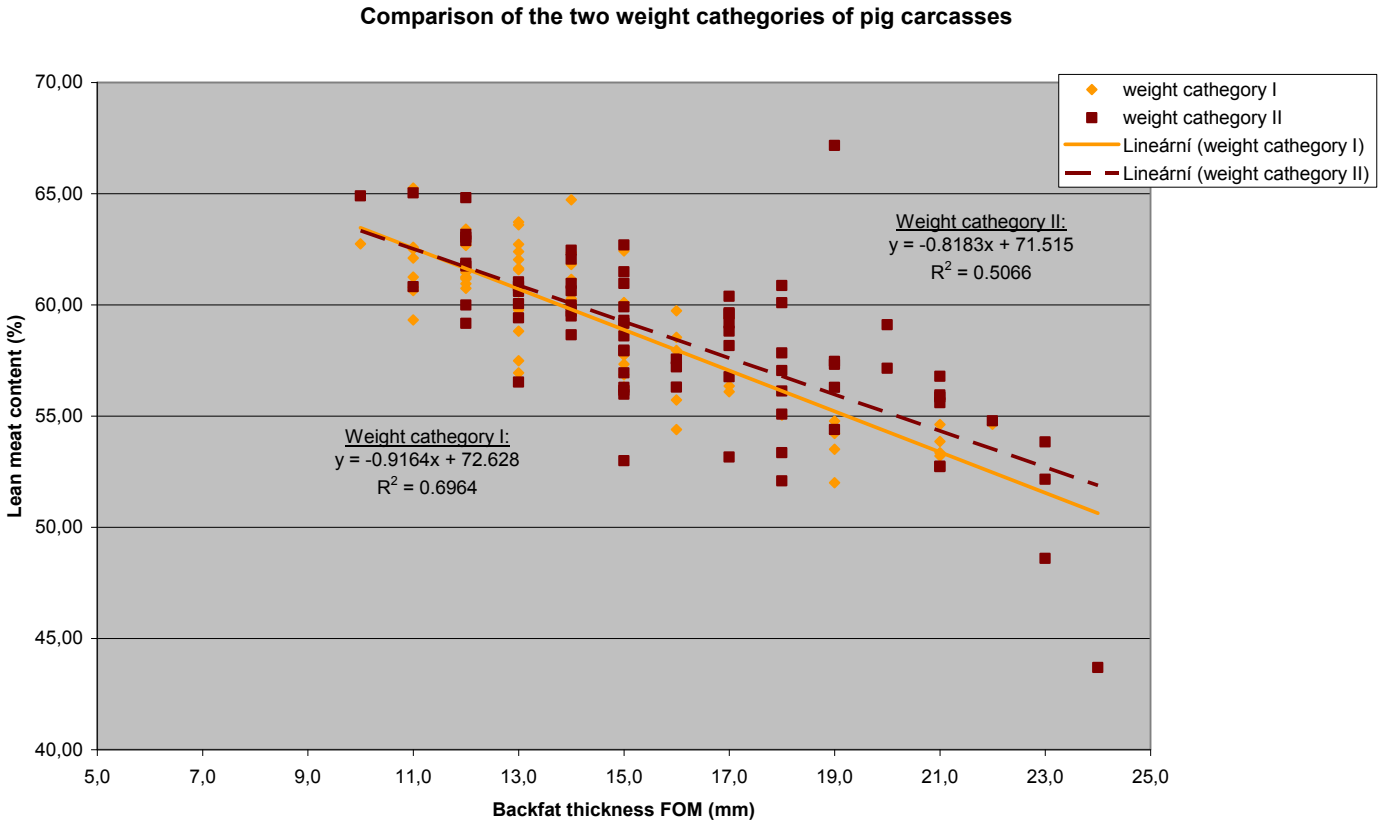


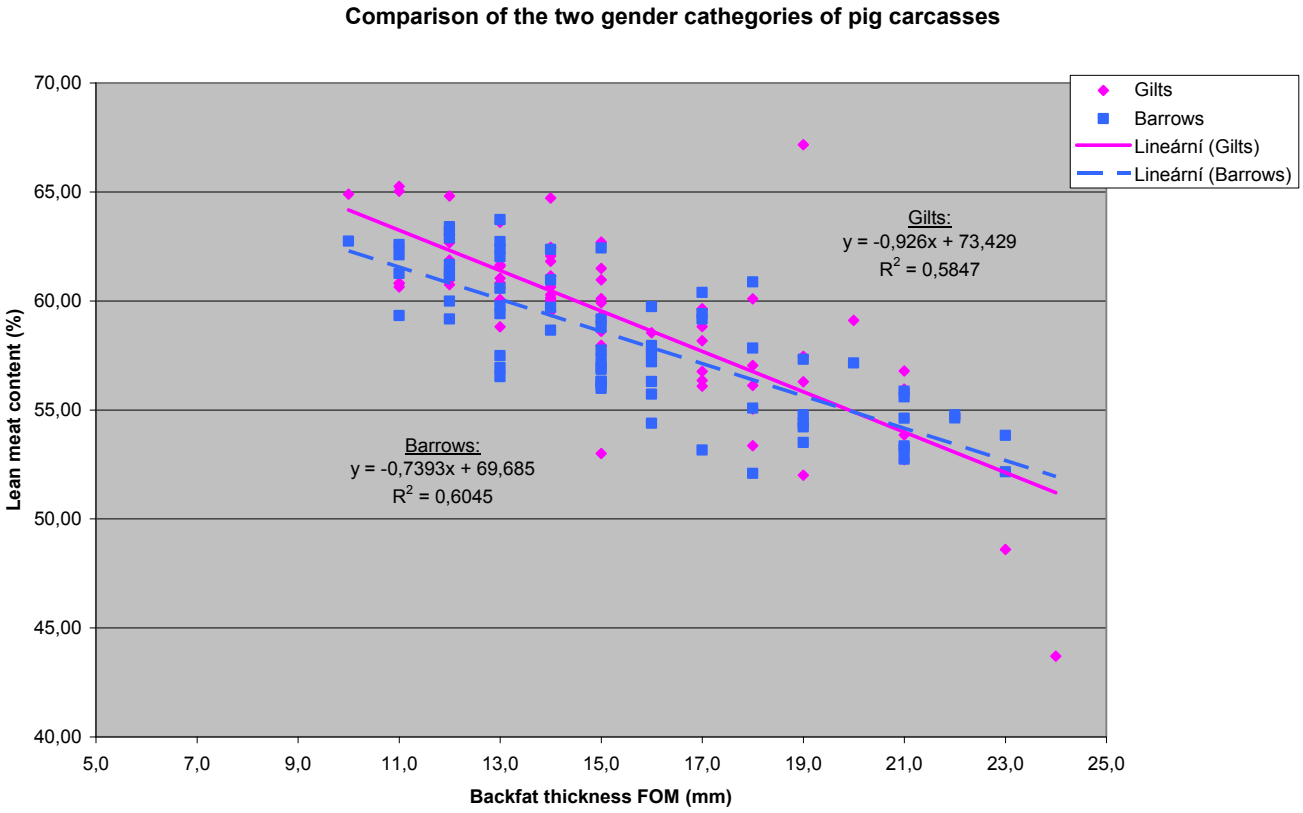
Table 3.Statistical characteristics for the gender „gilts“

	Gilts n = 72			
	mean	s	Xmin	Xmax
Carcass weight (kg)	90.20	12.633	61.06	118.47
S - FOM (mm)	15.00	3.151	10.00	24.00
M - FOM (mm)	61.51	7.139	43.00	82.00
LMC - dissection (%)	59.50	3.816	43.70	67.16
LMC - estimation (%)	59.11	2.376	52.38	62.90

Table 4.Statistical characteristics for the gender „barrows“

	Barrows n = 69			
	mean	s	Xmin	Xmax
Carcass weight (kg)	89.68	10.113	68.48	112.64
S - FOM (mm)	15.70	3.354	10.00	23.00
M - FOM (mm)	60.39	5.382	47.00	78.00
LMC - dissection (%)	58.07	3.189	52.08	63.73
LMC - estimation (%)	58.60	2.527	53.12	62.92

Figure 3. Dependence of the LMC on the backfat thickness according to gender



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