PIG CARCASS PRESENTATION WITH FLARE FAT IN CZECH REPUBLIC

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Abstract

The price of pig carcasses is determined on the basis of lean meat content and the weight of the carcass presented according to the EU reference method. To be able to apply an alternative carcass presentation with flare fat remaining in the carcass, the corrective factor adjusting the carcass weight for EU reference carcass presentation has been developed. The use of such a factor is necessary for the calculation of weekly prices. Average carcass weight including flare fat (92.90 ± 0.418 kg) and flare fat weight alone (1.93 ± 0.022 kg) were determined in a total of 761 pigs. The average lean meat content was 55.70 ± 0.140 %. To report pig carcass prices calculated on a uniform weight basis obtained using the EU reference presentation (y), the weight of carcass including flare fat (x_1) is corrected using the equation $y=1.65651+0.96139x_1$.

Key words: pig; carcass including flare fat; correction for EU reference presentation; SEUROP system

In countries with a developed pig breeding system the pig carcass classification according to objective carcass measurements has been applied since the 1980s. Payments to suppliers are based on carcass quality derived from the carcass lean meat content (e.g. BRANSCHEID, SACK and SCHOLZ, 1988; AUGUSTINI, DOBROWOLSKI and HEINING, 1993). The system of carcass classification is based on the same principles not only in all EU countries but also e.g. in Switzerland and Norway. This so called SEUROP system allows to determine the carcass lean meat content and to assign quality grades using different approved grading methods.

Carcass lean meat content is expressed as a muscle proportion of carcass weight. Therefore, it is necessary that pig carcasses are uniformly presented according to EU standards (reference presentation). Thus, the carcasses are presented as two sides of the same animal including head and skin, without brain, spinal chord, diaphragm, kidneys, flare fat, genital organs, hooves, and organs of thoracic, abdominal and pelvic cavities removed with adjacent fat (Council Regulation (EC) No 1234/2007). The uniform carcass presentation allows comparing classification results, and along with lean meat content it provides a basis for payments to pig suppliers.

The EU legislation affords the opportunity to apply, in justified cases, other carcass presentations provided that it is possible to derive the weight of carcass presented according to the definition given in Council Regulation (EC) No 1234/2007. Some abattoirs in the Czech Republic require using the presentation with the flare fat remaining on the carcass. The objective of the study was to develop an approach allowing to estimate the weight of carcasses with the reference presentation from the weight of carcasses presented with the flare fat.

Material and Methods

A total of 761 pigs from commercial pig herds were included in the analysis. The ratio gilts : barrows was almost 1 : 1. Until 45 minutes *post mortem*, following carcass traits were measured:
weight of carcass including flare fat (kg)
weight of removed flare fat (kg)
carcass lean meat proportion based on the SEUROP system (%)

The former two traits were determined by weighing both carcass sides and the flare fat from both carcass sides, respectively. The lean meat proportion was measured on the left carcass side. Data were analysed using the procedures MEANS and GLM of SAS, version 9.1 (SAS Institute Inc., 2002).

Results and Discussion

The average weight of carcasses including flare fat and removed flare fat were 92.86 ± 0.418 kg and 1.93 ± 0.022, respectively. The average lean meat proportion measured according to the principles of the SEUROP system was 55.68 ± 0.140 %. All these values are similar to those reported previously (KERNEROVÁ et al., 2007; STUPKA et al., 2008) and correspond to the mean values of the Czech pig population.

Table 1 gives descriptive statistics for the flare fat weight in different carcass weight intervals. The results show that with the growing carcass weight the weight of flare fat increases from 0.92 in the lightest to 2.97 kg in the heaviest pigs. Over the weight intervals examined, the growth allometry was present as described by e.g. LAWRENCE and FOWLER (1997) and JAKUBEC et al. (2002). This tendency was also shown when the flare

weights were expressed as the proportions of carcass weights. While the flare fat proportion was 1.37 % in the lightest pigs, it gradually increased to 2.55 % in the heaviest pigs. The differences in the flare fat weights between each two neighbouring weight intervals ranged from 0.27 to 0.56 kg and were statistically significant. Similar results have been previously reported by BRANSCHEID et al. (1990) and BACH and HÖRETH (1992).

The relationship between the flare fat and carcass weights is described by the equation:

$$y = 0.0397x - 1.757$$

Where:

y = flare fat weight in kg

x = carcass weight in kg

The flare fat weight was also observed in the carcasses classified in different SEUROP quality grades (Table 2).

The average flare fat weights were 1.44 ± 0.056, 1.82 ± 0.026, 2.18 ± 0.040, 2.37 ± 0.090, and 2.63 ± 0.503 in the carcasses graded S (n = 81), E (n = 395), U (n = 226), R (n = 56), and O (n = 3), respectively. Due to a low count of O carcasses, the figures presented for this grade are only a rough estimate. The flare fat weight differences between quality grades were somewhat lower than between weight intervals and not significant between neighbouring groups. In spite of that, a tendency towards the increasing flare fat weight in the carcasses with a lower lean meat proportion was clearly indicated in Figure 2. This relationship is described by the following equation:

$$y = - 0.0693x + 5.769$$

Where:

y = flare fat weight (kg)

x = carcass lean meat proportion (%)

Table 1. Descriptive statistics of the flare fat weight as affected by carcass weight (reference presentation according to EU standards)

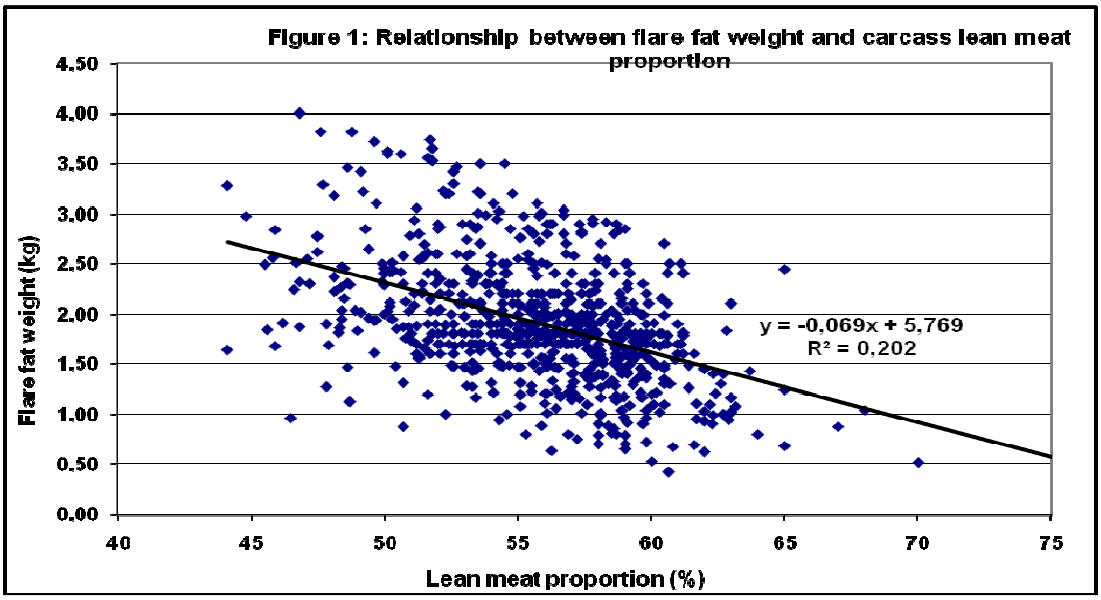
Carcass weight (kg)	Flare fat (kg)			
	n	$\bar{x}$	s	$s_{\bar{x}}$
< 70	11	0.92[a]	0.472	0.142
70 – 79.9	87	1.36[b]	0.377	0.040
80 – 89.9	229	1.63[c]	0.340	0.022
90 – 99.9	254	1.97[d]	0.413	0.026
100 – 109.9	124	2.41[e]	0.543	0.049
≥ 110	56	2.97[f]	0.552	0.074

Means with the same superscripts are not significantly different (P > 0.05).

Table 2. Flare fat weight as affected by carcass quality grades

Quality grade	Flare fat (kg)			
	n	$\bar{x}$	s	$s_{\bar{x}}$
S	81	1.44[a]	0.502	0.056
E	395	1.82[ab]	0.521	0.026
U	226	2.18[bc]	0.604	0.040
R	56	2.37[cd]	0.676	0.090
O	3	2.63[d]	0.872	0.503

Means with the same superscripts are not significantly different (P > 0.05).



Four groups of carcasses were formed according to their flare fat weights. As shown in Figure 2, only few carcasses (3.42 and 8.15 %) fall into the two extreme intervals (less than 0.9 or more than 2.9 kg of flare fat weight, respectively). The proportions of carcasses in the intervals from 0.9 to 1.89 and from 1.9 to 2.89 were 47.96 and 40.47 %. It is evident that the overwhelming number of carcasses is located within the range of ± 1 kg from the mean value and the incidence of extreme values is relatively low.

Traditions as well as current supplier-customer relations within the pig meat industry in the Czech Republic require using both reference pig carcass presentation and the presentation including the flare fat.

Therefore, the correction method recalculating the weight of carcasses with the flare fat to the weight of carcasses with the reference presentation was derived as follows:

$$\mathbf{Y = 1.65651 + 0.96139 * X_1}$$

Where:

Y = hot carcass weight – reference presentation according to Council Regulation (EC) No 1234/2007

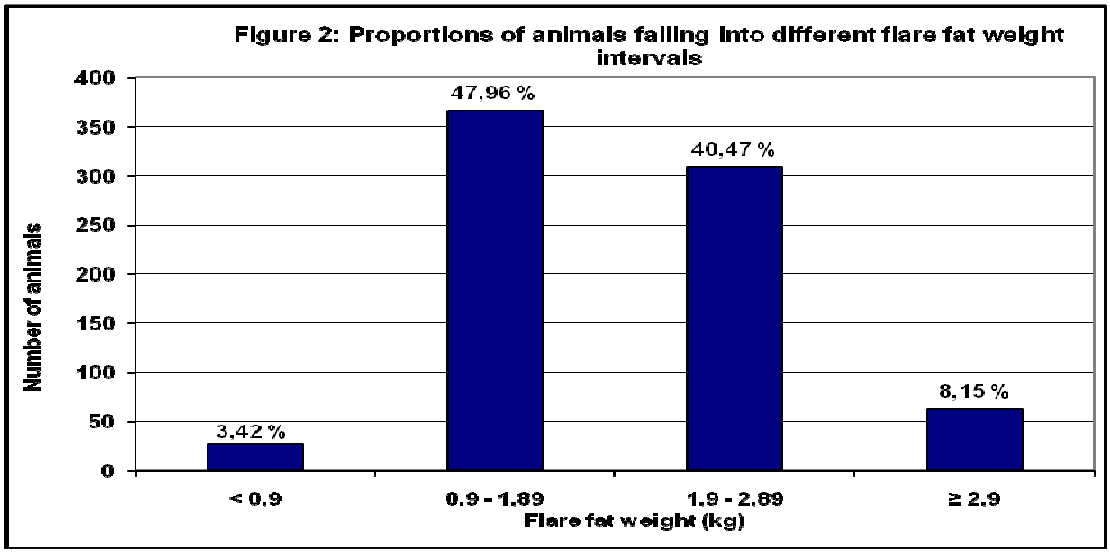
X_1 = hot carcass weight including the flare fat

Statistical indicators of accuracy:

$\mathbf{s_e = 0.42256}$ $\mathbf{r = 0.999}$

$\mathbf{R^2 = 0.998}$

The calculated equation parameters indicate a high predicative ability of the developed correction method. The correction equation allows estimating the weight of hot carcass with reference presentation (Council Regulation (EC) No 1234/2007) with a relatively high accuracy.



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