

## CARCASS COMPOSITION OF PIGS CLASSIFIED IN DIFFERENT SEUROP GRADES

*Pulkrábek J., Víttek M., Vališ L., David L.*

*Institute of Animal Science Prague, Czech Republic*

### Abstract

A total of 225 carcasses from the pig hybrid combinations most frequently used in the Czech Republic were included into the analysis. As sires, purebred boars of Czech Large White (sire line), line 38 (DxPN), and line 68 (HxPN) were used. Pigs were fattened under production conditions commonly used in the CR. Left carcass sides were analysed and detailed dissections were performed according to the EU reference method. The proportion of main meat parts (HMČ-ČR) – ham, loin, neck and shoulder, always without fat cover – was  $57.11 \pm 0.294$ ,  $54.48 \pm 0.170$ ,  $51.44 \pm 0.174$ , and  $48.53 \pm 0.280$  % in classification grades S, E, U, and R, respectively. The difference between the extreme grades was 8.58 percent points. If the proportion of main meat parts in the grade S is considered 100 %, its value in the grade R would be 84.9 %.

**Key Words:** Pig; carcass value; SEUROP; carcass composition

### Introduction

The most efficient measures leading to the improvement of pig carcass value are based on selection and hybridization approaches due to the genetic characteristics influencing the development of different body components (Kernerová et al. 2000, Jakubec et al. 2002 and others). Pig production is almost entirely based on final pig hybrids resulting from differentially focused selection programmes that are performed within dam and sire populations.

Similarly to the other EU member states, the quality of pig carcasses in the CR is evaluated according to the SEUROP system with the lean meat content as the main estimated parameter. Lean meat content is derived from the dissection of all striated muscle tissue from the carcass as far as possible by knife. A total of three classification methods are currently applied in the CR. These methods allow predicting lean meat content and the classification of pig carcasses in quality grades according to the EU standards (Pulkrábek et al. 2004, Víttek et al. 2008).

The objective of this study was to quantify the composition differences in pig carcasses classified in selected quality grades.

### Material and Methods

Pigs (n = 225) of three hybrid combinations were included in the experiment. F<sub>1</sub> crossbreeds of Czech Large White (ČBU) and Czech Landrace were always used as dams. They were sired by boars of either the sire line of Large White (BO) or the hybrids of Hampshire (H), Duroc (D), and Pietrain (P). The final combinations were (ČBUxČL)xBO, (ČBUxČL)x(DxPN), and (ČBUxČL)x(HxPN). The ratio of gilts and barrows was almost 1:1. Pigs were slaughtered under common slaughtering practice. Twenty-four hours *post mortem*, the carcasses

were dissected and the lean meat content was determined according to the method of Walstra and Merkus (1996).

Data were analysed using the linear model with fixed effects using the GLM procedure of SAS, version 8.2.

### Results and Discussion

First, the proportion of different parts was evaluated. The parts were aggregated into five groups: main meat parts (HMČ-ČR, HMČ-EU), fat, fatty parts, and bony parts. The results in different carcass grades are presented in Table 1. The carcasses of quality grades O and P were not present in the analysed group. This is the evidence that the lean meat content of pigs has increased compared to the time when the SEUROP system was introduced in the Czech Republic. The proportion of main meat parts (HMČ-ČR) consisting of ham, loin, neck, and shoulder – always without skin and subcutaneous fat – was  $57.11 \pm 0.294$ ,  $54.48 \pm 0.170$ ,  $51.44 \pm 0.174$ , and  $48.53 \pm 0.280$  % in classification grades S, E, U, and R, respectively. The difference between the extreme grades is 8.58 percent points. If the proportion of main meat parts in the grade S is considered 100 %, its value in the grade R would be 84.9 %.

In our study, the differences in the proportion of different carcass parts with respect to the total lean meat content were observed in the all-in-all-out management system with a constant fattening period. Such a pig production system is currently frequently applied. Different slaughter live and carcass weights of pigs were only the result of their different growth ability. The relationship of this trait with the SEUROP evaluation was strong, which is in agreement with Kernerová et al. (2004), Šprysl (2005) and others. It means that the reduced proportion of carcass fat is associated with the increased proportion of valuable meat parts. This fact supports the method of pig carcass evaluation according to lean meat content and agrees with

general conclusions given by Daumas (2003), Sládek, Čechová a Mikule (2004) and others.

Different proportions of carcass parts aggregated in groups, that are evident from Figure 1, logically confirmed the concordance with the results of the SEUROP classification. It was clearly shown in the case of main meat parts (HMČ-ČR) and particularly in fatty parts which consisted of subcutaneous fat and skin from ham, loin, shoulder, and neck.

To quantify the results, we calculated the difference of fat proportions between the extreme classification grades, which was 6.62 percent points. This proportion was  $9.53 \pm 0.263$  % (100 %) in the grade S and then continually

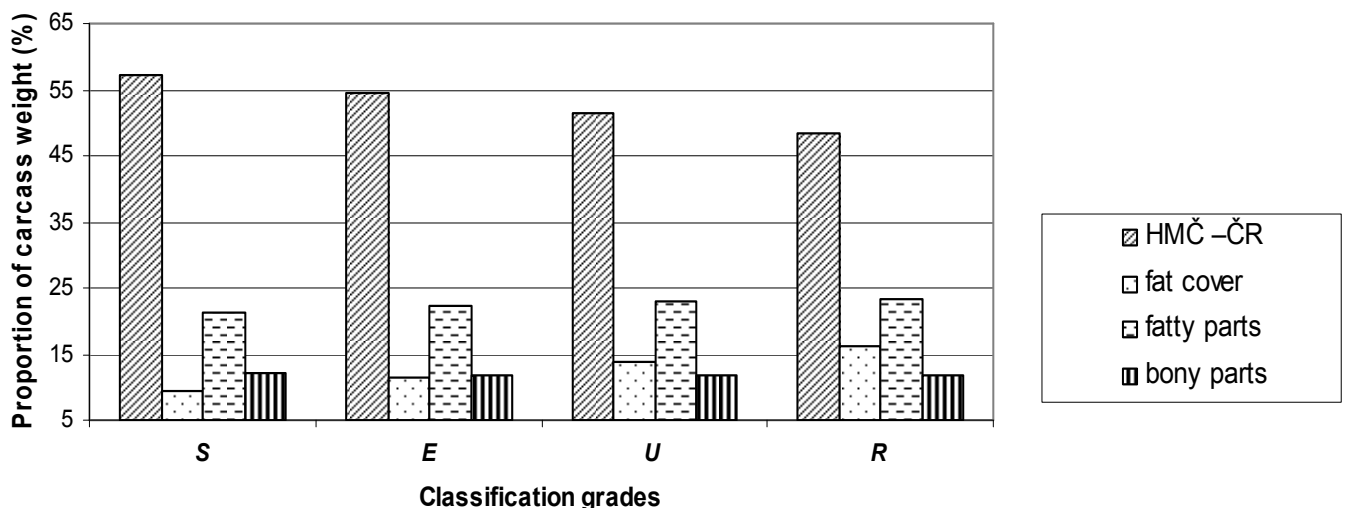
increased until its maximum in the grade R –  $16.15 \pm 0.250$  % (169.5 %). The differences between class means were high and significant. A similar but less marked tendency was also observed in fatty parts, which consisted of belly, cheek, and groin. Their importance results from the fact that they represent quite a large proportion – more than 20 % - of carcass weight. The difference between S and R grades in the proportion of fatty parts was 1.98 percent points. Bony parts had similar proportions in all quality grades. The differences were small and insignificant.

**Table 1. Proportions of different parts aggregated according to the dominant tissue in different carcass quality grades**

Proportion of carcass weight (%)	Quality grade							
	S (n = 29)		E (n = 84)		U (n = 80)		R (n = 32)	
	$\bar{x}$	$S_{\bar{x}}$	$\bar{x}$	$S_{\bar{x}}$	$\bar{x}$	$S_{\bar{x}}$	$\bar{x}$	$S_{\bar{x}}$
HMČ –ČR (ham, loin, neck, shoulder without fat, filet)	57.11 <sup>a</sup>	0.294	54.48 <sup>b</sup>	0.170	51.44 <sup>c</sup>	0.174	48.53 <sup>d</sup>	0.280
HMČ –EU (leg, loin, neck, shoulder with fat, filet)	66.83 <sup>a</sup>	0.257	66.14 <sup>b</sup>	0.148	65.61 <sup>c</sup>	0.153	64.60 <sup>d</sup>	0.245
Fat (fat cover of ham, loin, shoulder, neck)	9.53 <sup>a</sup>	0.263	11.51 <sup>b</sup>	0.152	13.98 <sup>c</sup>	0.156	16.15 <sup>d</sup>	0.250
Fatty parts (belly with bones, tip of belly, belly without bones, cheek, groin)	21.41 <sup>a</sup>	0.243	22.30 <sup>b</sup>	0.140	22.87 <sup>c</sup>	0.144	23.39 <sup>c</sup>	0.231
Bony parts (head, shanks, feet)	11.95 <sup>a</sup>	0.135	11.71 <sup>a</sup>	0.078	11.71 <sup>a</sup>	0.080	11.93 <sup>a</sup>	0.129

Means within a row with the same superscripts do not significantly differ ( $P \leq 0,05$ ).

**Figure 1. Proportion of selected carcass parts in different quality grades**



## References

- Daumas, G.: A description of the European slaughterpig populations and their classification. EUPIGCLASS report, 2003, s.42.
- Jakubec, V., Říha, J., Matoušek, V., Pražák, Č., Majzlík, J.: Šlechtění prasat. ÚCHS Rapotín, 2002, s. 218.
- Kernerová, N., Matoušek, V., Novotný, F.: Aktuální otázky zpeněžování jatečných prasat. In: Sborník z odborného semináře „Aktuální otázky zpeněžování jatečných zvířat“. JU-ZF České Budějovice, 2000, s. 21-24.
- Kernerová, N., Matoušek, V., Novotný, F., Vejčík, A.: Analýza výkrmnosti a jatečné hodnoty vybrané hybridní kombinace prasat s ohledem na složení krmné směsi a pohlaví. In: Aktuální problémy chovu prasat. ČZU v Praze 2004, s. 161 – 169.
- Pulkrábek J., Wolf J., Vališ L., Vítek M., Höreth R.: Vergleich verschiedener Methoden zur Bestimmung des Muskelfleischanteils im Schlachtkörper des Schweins. Züchtungskunde, 2004, roč. 76, č. 1, 6-17.
- Sládek, L., Čechová, M., Mikule, V.: Vliv podílu svaloviny na obsah intramuskulárního tuku v MLLT u testovaných hybridních prasat. Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis, 2004, LII, (5), s. 41-46.
- Šprysl, M.: Analýza produkčních vlastností současných populací hybridních prasat. Habilitační práce, ČZU, Praha, 2005, s. 120.
- Vítek M., Pulkrábek J., Vališ L., David L., Wolf J.: Improvement of accuracy in estimation of the lean meat content in pig carcasses in the Czech Republic. Czech J. Anim. Sci., 53, 2008, (5): 204 – 211.
- Walstra, P., Merkus, G. S. M.: Procedure for assessment of the lean meat percentage as a consequence of the new EU reference dissection method in pig carcass classification. Zeist, 1996, s. 1 – 22, NL: ID-DLO.