

# CARCASS TRAITS AND MEAT QUALITY OF DIFFERENT PIG GENOTYPE

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**Keywords:** pigs, carcass traits, meat quality

## Introduction

For the production of pork in the Republic of Croatia, different combination of crossbred (meat type) pigs are used, as well as imported hybrid pigs. The main objective is to evaluate pig genotypes characterized by both quantity and quality of produced meat. Intensive selection for fast growth and high lean meat proportion resulted in increased sensitivity of pigs to production and environmental conditions. This resulted in higher production of meat with poor technological quality traits. Poor meat quality decreases any positive economic effect which is one of the biggest problems in the slaughter industry in Croatia today. Because of the high heritability of pork quality traits, it is possible to influence on their improvement with selection. Edwards *et al.*, (2003) demonstrated that proper characterization of different breeds and lines for carcass and meat quality traits is essential to the choice of parents for pork production. The aim of our research was to compare the leanness and meat quality traits of the Croatian genotypes (CCB) with imported TOPIGS hybrids and to evaluate which genotype can be considered as more desirable regarding the carcass and meat quality traits.

## Materials and Methods

Research was performed on pig carcasses with Croatian genotypes (LWxSL)GL - CCB (n=20) and TOPIGS hybrids (n=20). At the slaughter line, the measurements of warm carcass weight, carcass length ("a" from *os pubis* to the 1<sup>st</sup> rib; "b" from *os pubis* to *atlas*), ham length and circumference were taken from which ham index was calculated. Initial pH values (pH<sub>45</sub>) were measured 45 minutes after exsanguination. After 24 hours of cooling, cold carcass weight, muscle surface and (belonging) backfat surface of the *M. longissimus dorsi*- MLD (cm<sup>2</sup>), ultimate pH (pH<sub>24</sub>) values, water holding capacity (WHC, cm<sup>2</sup>), drip loss (%) and colour of the *M. longissimus dorsi* were taken. Shares of muscle tissue, fatty tissue and bones were determined by total dissection of the carcasses by the method of Weniger *et al.* (1963). Backfat and MLD surface were measured by the geometric procedure (Comberg, 1978) and expressed as the fat/muscle area ratio; water holding capacity (w.h.c.) was determined using the compression method (Grau and Hamm, 1952) and by measuring drip loss according to Kauffmann *et al.* (1992). The lightness of meat was measured using a "Minolta CR-300" device on a *M. longissimus dorsi* cut and expressed as CIE L\* value. Statistical analysis was performed using STATISTICA (6.0) for Windows program.

## Results and Discussion

Table 1 presents carcass quality traits of investigated pig groups. Significant differences were identified for carcass length, ham index and fat / MLD surface ratio. CCB pigs had significantly (P<0.05) longer carcass length "a", and more significantly (P<0.001) longer carcass length "b". Ham index was significantly higher (P<0.01) for the CCB genotype compared to TOPIGS. TOPIGS hybrid pigs had more desirable fat / MLD surface ratio; the difference between examined groups was significant (P<0.01). It is evident that carcasses from examined groups had similar shares of lean meat, fatty tissue and bones of the main and less valuable carcass parts (P>0.05).

Meat quality trait measurements on investigated pigs are presented in Table 2. Results of pH values in MLD samples, according to border initial pH<sub>45</sub> value 6.0, recommended by Hoffmann (1994), as well as the final pH value (pH<sub>24</sub> 5.5) recommended by Forest (1998) showed that both pig groups are characterized with "normal" meat quality. Statistically significant differences in pH<sub>24</sub> and meat colour (P<0.05) between Croatian crossbreeds and TOPIGS group suggest better meat quality traits of the former. The mean values of WHC >9 cm<sup>2</sup> (Blendl *et al.*, 1991), drip loss >5% (Kauffman *et al.*, 1992) and Minolta L\* >53 (Hofmann, 1994) indicate PSE condition of meat originating from TOPIGS hybrid pigs.

**Table 1:** Carcass quality traits.

| Indicator                                       | CCB         | TOPIGS      | Significance of differences |
|---|-------------|-------------|-----------------------------|
| Weight of warm carcasses (kg)                   | 86.40±8.42  | 85.55±8.40  | n.s.                        |
| Weight of refrigerated carcasses (kg)           | 84.60±6.11  | 83.84±7.78  | n.s.                        |
| Lean meat percentage (%)                        | 55.27±3.34  | 54.12±2.43  | n.s.                        |
| Fatty tissue percentage (%)                     | 24.61±2.61  | 24.74±2.48  | n.s.                        |
| Bone percentage (%)                             | 10.17±0.98  | 9.53±0.34   | n.s.                        |
| Carcass length - a (cm)                         | 87.55±2.39  | 85.65±2.37  | *                           |
| Carcass length - b (cm)                         | 105.85±3.17 | 102.40±2.28 | ***                         |
| Ham index                                       | 0.46±0.01   | 0.44±0.02   | **                          |
| MLD surface (cm <sup>2</sup> )                  | 41.21±3.50  | 45.87±7.29  | n.s.                        |
| Surface of MLD belonging fat (cm <sup>2</sup> ) | 17.55±1.38  | 15.14±2.77  | n.s.                        |
| Fat/MLD surface ratio                           | 0.43±0.03   | 0.33±0.05   | **                          |
| Ham (%)   | 30.26±1.00  | 30.30±0.38  | n.s.                        |
| Loin (%)  | 17.18±1.03  | 16.39±1.33  | n.s.                        |
| Belly-rib part (%)                              | 16.64±1.30  | 16.91±0.91  | n.s.                        |
| Shoulder (%)                                    | 13.50±0.23  | 13.93±0.68  | n.s.                        |
| Neck (%)  | 10.73±1.00  | 10.80±0.62  | n.s.                        |
| Less valuable parts (%)                         | 11.69±0.37  | 11.67±0.36  | n.s.                        |

**Table 2:** Meat quality.

| Indicator                 | CCB        | TOPIGS     | Significance of differences |
|---------------------------|------------|------------|-----------------------------|
| pH <sub>45</sub>          | 6.26±0.21  | 6.25±0.19  | n.s.                        |
| pH <sub>24</sub>          | 5.55±0.10  | 5.50±0.05  | *                           |
| W.H.C. (cm <sup>2</sup> ) | 8.76±1.70  | 9.94±2.03  | n.s.                        |
| Drip loss (%)             | 3.73±1.24  | 5.92±2.66  | n.s.                        |
| Colour (Minolta L*)       | 51.59±3.33 | 56.19±2.92 | *                           |

### Conclusions

On the basis of the present study, the following conclusions can be derived:

- Croatian genotypes (CCB) had significantly longer carcasses and more favorable ham index than TOPIGS hybrid pigs. On the other hand, TOPIGS hybrids had better fat/MLD ratio than CCB pigs. Other carcass traits did not differ significantly.
- Although significant differences between investigated groups were found only for pH<sub>24</sub> and Minolta L\* values, Croatian genotypes of pigs may be considered as more desirable regarding the meat quality traits, because of high incidence of PSE meat in TOPIGS hybrid pigs.

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