Breed and sex effect on pork meat quality

S. Rodrigues, M. C. Lourenço, E. Pereira, and A. Teixeira
CIMO, Escola Superior Agrária, Instituto Politécnico de Bragança, Apt. 1172, 5301-855, Bragança, Portugal

Introduction
Pork is one of the most traditional meats consumed by Portuguese people. From the 800 thousand tonnes of meat and meat products produced in Portugal, pork represents about 43% of total value. Also the idea that pork is not indicated for hypo-caloric or low in cholesterol diets is something not real and has been decreasing.

The Preto Alentejano is a local non improved swine breed which survived during the last years owing to a demand increasing of Iberian products and the protection of origin designation products. Commercial pig breeds have great prolificacy and precocity, raised purely on an intensive way, using a more advanced technology that translates into a possible improvement in terms of carcass yield.

Aim
The objective of this work was to study the effects of sex and breed in the characterization of pork meat from a comercial and a local breed (Preto Alentejano).

Materials and methods
Animals:
- 8 Females; 8 Males.
- Experimental and Preto Alentejano breeds.
- Live weight: 80-100 kg.
- Longissimus muscle (5th thoracic vertebra – 10th lumbar vertebra).

Physical and chemical analysis:
- Water holding capacity, and texture: protein, total fat and fatty acids profile, pigments, ashes, dry matter.
- Chemical: Palmitic acid and C18:1, oleic acid. Also there was a predominance of MUFA, followed by SFA and mono-unsaturated fatty acids (MUFA) and only an interaction effect on poly-unsaturated fatty acids.

Sensory analysis
Trained taste panel of 11 experts, in five sessions.
- Samples prepared according to a standard methodology.
- Evaluated parameters:
  - odour intensity, toughness, juiciness, flavour intensity, flavour quality, and overall acceptability.

Statistical analysis
- Experimental design was a factorial plan with 2 sexes and 2 breeds as fixed factors.
- Physical-chemical data analyzed using Univariate Analysis of Variance procedure of the SPSS.
- Sensory data analyzed using the Generalized Procrustes Analysis by XLSTAT.

Results

Physical evaluation
Table 1 shows the physical characteristics of pork meat of males and females of the commercial and the local breed. Commercial breed presented higher water losses than the local breed.

Table 1: Means for the effect of breed and sex on the physical evaluation of pork meat.

<table>
<thead>
<tr>
<th>Breed</th>
<th>Sex</th>
<th>Colour</th>
<th>Odour</th>
<th>Texture</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preto Alentejano</td>
<td>Males</td>
<td>5.56</td>
<td>3.33</td>
<td>8.00</td>
</tr>
<tr>
<td></td>
<td>Females</td>
<td>5.00</td>
<td>2.83</td>
<td>8.00</td>
</tr>
<tr>
<td>Commercial</td>
<td>Males</td>
<td>5.00</td>
<td>2.50</td>
<td>8.50</td>
</tr>
<tr>
<td></td>
<td>Females</td>
<td>4.50</td>
<td>2.00</td>
<td>9.00</td>
</tr>
</tbody>
</table>

Chemical evaluation
Table 2 shows the chemical characteristics of pork meat by sex and breed. It can be observed that breed had a significant effect on protein content, total fat, pigments and dry matter.

Table 2: Means for the effect of breed and sex on the chemical evaluation of pork meat.

<table>
<thead>
<tr>
<th>Breed</th>
<th>Sex</th>
<th>Protein</th>
<th>Total fat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preto Alentejano</td>
<td>Males</td>
<td>1.17</td>
<td>0.80</td>
</tr>
<tr>
<td></td>
<td>Females</td>
<td>1.17</td>
<td>2.29</td>
</tr>
<tr>
<td>Commercial</td>
<td>Males</td>
<td>1.17</td>
<td>2.00</td>
</tr>
<tr>
<td></td>
<td>Females</td>
<td>1.17</td>
<td>2.34</td>
</tr>
</tbody>
</table>

Fatty acids
Figure 2 shows the pork meat fatty acids grouped by saturation degree of males and females from the commercial and the local breed. There was significant breed, sex and interaction effects on saturated fatty acids (SFA), breed and sex effects on mono-unsaturated fatty acids (MUFA) and only an interaction effect on poly-unsaturated fatty acids.

Conclusions
All treatments presented significant differences for total fat and pigments content.

Acknowledgements
Indústrias de Carne do Minho – PRIMOR.
Preto Alentejano producers – Garbão, Portugal