Effect of the age at 2nd Improvac® vaccination on fatty acid composition in back fat of male pigs and comparison to entire boars and barrows

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Aim of the study

Comparison of carcass quality and fatty acid composition between:

- Two groups of GnRH vaccinated male fatteners
  - 2\textsuperscript{nd} vaccination at different ages
- Surgically castrated male fatteners
- Entire boars
Material and Methods - *Animals and Vaccination*

- **Group A „Improvac® A“** 40 male fatteners
- **Group B „Improvac® B“** 40 male fatteners
- **Group C „Entire boars“** 45 male fatteners
- **Group D „Castrates“** 41 male fatteners

**Age (weeks)**
- Suckling: 4 weeks
- Nursery: 11 weeks
- Fattening: 18, 21 weeks
- Slaughter: 26, 27 weeks

**Vaccinations**
- *1st Vaccination* at 11 weeks
- *2nd Vaccination* at 21 weeks

**Group D** Surgical castration

**Group B** Group A Slaughter
Material and Methods – analysed Parameters

- Carcass quality
  - Lean meat percentage
  - Loin muscle, back fat thickness
- Meat quality
  - Fatty acid composition in back fat by gas chromatography
- Statistical Analysis
  - Anova and Bonverroni
## Results - Carcass quality
– Piétrain-crossbreed

<table>
<thead>
<tr>
<th></th>
<th>Slaughter weight kg</th>
<th>Lean meat %</th>
<th>Loin muscle mm</th>
<th>Back fat mm</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Improvac A</strong></td>
<td>101</td>
<td>59,1&lt;sup&gt;a&lt;/sup&gt;</td>
<td>63,7</td>
<td>14,5&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>9,6</td>
<td>63,7&lt;sup&gt;a&lt;/sup&gt;</td>
<td>2,1</td>
<td>2,3</td>
</tr>
<tr>
<td><strong>Improvac B</strong></td>
<td>99</td>
<td>58,1&lt;sup&gt;a;c&lt;/sup&gt;</td>
<td>63,8</td>
<td>15,5&lt;sup&gt;a;c&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>10,2</td>
<td>63,8&lt;sup&gt;a&lt;/sup&gt;</td>
<td>2,5</td>
<td>2,9</td>
</tr>
<tr>
<td><strong>Castrates</strong></td>
<td>99</td>
<td>56,7&lt;sup&gt;b&lt;/sup&gt;</td>
<td>66,7</td>
<td>16,8&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>7,9</td>
<td>66,7&lt;sup&gt;b&lt;/sup&gt;</td>
<td>3,5</td>
<td>3,7</td>
</tr>
<tr>
<td><strong>Entire boars</strong></td>
<td>102</td>
<td>60,0&lt;sup&gt;a;d&lt;/sup&gt;</td>
<td>64,6</td>
<td>13,4&lt;sup&gt;a;d&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>7,8</td>
<td>64,6&lt;sup&gt;a&lt;/sup&gt;</td>
<td>2,6</td>
<td>2,7</td>
</tr>
</tbody>
</table>

p<0,01 a:b p<0,05 c:d
## Results - Meat quality / fatty acid composition – Piétrain-crossbreed

<table>
<thead>
<tr>
<th>FA %</th>
<th>C16</th>
<th>C18</th>
<th>C18:1</th>
<th>C18:2</th>
<th>C18:3</th>
<th>C20</th>
<th>C20:1</th>
<th>C20:2</th>
<th>C20:3+4</th>
<th>C24</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improvac A</td>
<td>25.6</td>
<td>14.8</td>
<td>38.7</td>
<td>12.9</td>
<td>0.79</td>
<td>0.18</td>
<td>0.79</td>
<td>0.55</td>
<td>0.45</td>
<td>0.08</td>
</tr>
<tr>
<td>Improvac B</td>
<td>25.6</td>
<td>14.8</td>
<td>39.4</td>
<td>12.1</td>
<td>0.76</td>
<td>0.18</td>
<td>0.81</td>
<td>0.52</td>
<td>0.43</td>
<td>0.08</td>
</tr>
<tr>
<td>Castrates</td>
<td>26.0</td>
<td>15.1</td>
<td>40.0</td>
<td>11.0</td>
<td>0.70</td>
<td>0.20</td>
<td>0.85</td>
<td>0.49</td>
<td>0.39</td>
<td>0.07</td>
</tr>
<tr>
<td>Entire boars</td>
<td>24.4</td>
<td>13.7</td>
<td>39.1</td>
<td>14.6</td>
<td>0.94</td>
<td>0.16</td>
<td>0.74</td>
<td>0.60</td>
<td>0.52</td>
<td>0.10</td>
</tr>
</tbody>
</table>

Significant differences:

C 8, C10, C12, C14:1, C15, C16:1, C17 very small amounts, no significances
Results – Fatty acid composition

Saturated fatty acids

Monounsaturated fatty acids

Positive correlation to back fat thickness

\[ r^2 = 0.29 \]

\[ r^2 = 0.32 \]
Results – Fatty acid composition

Polyunsaturated fatty acids

Negative correlation to back fat thickness

$r^2 = -0.51$
Summary

• Carcass quality
  • Did not differ between vaccination groups
  • Vaccinated pigs had leaner meat and less back fat than castrates

• Fatty acid composition in back fat
  • Did not differ between vaccination groups, although some PUFA showed a tendency
  • Vaccination groups had a fatty acid composition between entire boars and castrates

• Correlation between back fat thickness and fatty acid composition