EATING QUALITY OF MEAT FROM GRAZING HOLSTEIN BULLS AND LIMOUSINE X HOLSTEIN BULLS AND HEIFERS

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BACKGROUND

• In Denmark there are about 60,000 organic dairy cows.
• Potentially, 25,000 bull calves are available for beef production
• However less than 4,000 organic bulls or steers are slaughtered each year
• The rest is ’exported’ to conventional veal/beef production
BACKGROUND

- Organic beef production requires outdoor production at least 6 mo/year.
- Feeding with a minimum of 60% roughage.
- This causes low daily gain and poor classification on the EUROP scale for traditional purebred dairy breeds.
BACKGROUND

Crossbreeding between dairy cows and a beef breed is expected to contribute with

- better growth rate
- higher carcass weight
- better EUROP conformation
AIM

To test a concept for production of organic beef based on crossbred animals from dairy cows sired with a beef breed.
## DESIGN - ANIMALS

<table>
<thead>
<tr>
<th>Breed Type</th>
<th>Category</th>
<th>Quantity</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Holstein x Limousine</td>
<td>Bulls</td>
<td>15</td>
<td>CB</td>
</tr>
<tr>
<td>Holstein x Limousine</td>
<td>Heifers</td>
<td>15</td>
<td>CH</td>
</tr>
<tr>
<td>Holstein x Holstein</td>
<td>Bulls</td>
<td>15</td>
<td>HB</td>
</tr>
</tbody>
</table>
**DESIGN - PRODUCTION**

- Spring born calves
- Weaned 3 months old
- Raised on pasture 1st summer (2½ mo)
- Raised indoor on low-energy grass-haylage ration during winter (7½ mo)
- Raised on pasture 2nd summer (3½ mo)
- Slaughterd 16.9 mo old
SLAUGHTER AND ANALYSES

- Slaughtered at Danish Crown and classified according to EUROP
- 24 h post mortem pH was measured in filet (LD) and round (SM)
- Muscles removed and aged for 14 d, before frozen storage
- Sensory evaluation of aroma, taste and texture by trained panel
PRODUCTION RESULTS

Live weight, kg

Age, d

Pasture periods

HB
CB
CH
## PRODUCTION AND CARCASS TRAITS

<table>
<thead>
<tr>
<th>Trait</th>
<th>HB</th>
<th>CB</th>
<th>CH</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Average daily gain 2nd summer, g/d</strong></td>
<td>1081&lt;sup&gt;b&lt;/sup&gt;</td>
<td>1357&lt;sup&gt;a&lt;/sup&gt;</td>
<td>847&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td><strong>Carcass weight, kg</strong></td>
<td>272&lt;sup&gt;b&lt;/sup&gt;</td>
<td>315&lt;sup&gt;a&lt;/sup&gt;</td>
<td>249&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td><strong>EUROP conformation</strong></td>
<td>3.0&lt;sup&gt;c&lt;/sup&gt;</td>
<td>7.0&lt;sup&gt;a&lt;/sup&gt;</td>
<td>5.3&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td><strong>EUROP fatness</strong></td>
<td>1.0&lt;sup&gt;b&lt;/sup&gt;</td>
<td>1.2&lt;sup&gt;b&lt;/sup&gt;</td>
<td>2.9&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td><strong>pH&lt;sub&gt;24&lt;/sub&gt; LD</strong></td>
<td>5.88</td>
<td>5.61</td>
<td>5.55</td>
</tr>
<tr>
<td><strong>pH&lt;sub&gt;24&lt;/sub&gt; SM</strong></td>
<td>5.62</td>
<td>5.56</td>
<td>5.59</td>
</tr>
</tbody>
</table>
SENSORY EVALUATION – FILET
TASTE AND TEXTURE

![Graph showing the sensory evaluation of filet taste and texture for HB, CB, and CH.](image)
SENSORY EVALUATION – FILET AROMA

Meat

Game

Liver

Metal

Acidic

HB

CB

CH
CONCLUSION

• Crossbreed Limousine and Holstein bulls and heifers are alternatives to purebred Holstein bulls when it comes to production, EUROP conformation, aroma and taste.

• But tenderness and fatness of Crossbred bulls need to be improved to be attractive for consumers.
PERSPECTIVE FOR PRODUCTION OF ORGANIC BEEF

• Slaughter of intact bulls directly from pasture is critical because of risk of fighting and stress
• A finishing feeding with high energy feed to improve fat cover, daily gain prior to slaughter and tenderness development post mortem
• This finishing feeding should be developed in order to keep the nutritional benefits in the organic meat from the pasture
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