The influence of grazing time on *Angelica archangelica* on volatile compounds and sensory quality of meat from pasture lambs

G. Thorkelsson, R. Jonsdottir, O.T.Hilmarsson, A. Olafsdottir and E.Martinsdottir

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Introduction
Introduction
The aim of this study was to determine the influence of finishing traditional grazing lambs on a field of *Angelica archangelica* on volatile compounds, fatty acids and odour and flavour of cooked meat.
<table>
<thead>
<tr>
<th>Treatments</th>
<th>Weeks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0-3</td>
</tr>
<tr>
<td>Control</td>
<td></td>
</tr>
<tr>
<td>3 weeks</td>
<td></td>
</tr>
<tr>
<td>6 weeks</td>
<td></td>
</tr>
</tbody>
</table>
Methods

L.dorsi+subcutaneous fat

Sensory Analysis
- QDA
  - Flavour and odour descriptors

Chemical and Sensory Analysis
- GC-MS
  - Volatiles

- GC-O
  - Odour descriptors

- GC
  - Fatty acids

Statistical analysis
- Analysis of variance
- PCA
- PLSR
## Results of QDA

<table>
<thead>
<tr>
<th>Odour</th>
<th>Pasture</th>
<th>3 weeks</th>
<th>6 weeks</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Of meat</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spicy</td>
<td>27</td>
<td>37</td>
<td>35</td>
<td>*</td>
</tr>
<tr>
<td>Lamb meat</td>
<td>52</td>
<td>48</td>
<td>46</td>
<td>*</td>
</tr>
<tr>
<td>Wooly</td>
<td>26</td>
<td>15</td>
<td>16</td>
<td>***</td>
</tr>
<tr>
<td>Fatty</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Of fat</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fatty</td>
<td>36</td>
<td>30</td>
<td>29</td>
<td>*</td>
</tr>
<tr>
<td>Sweet</td>
<td>29</td>
<td>28</td>
<td>29</td>
<td></td>
</tr>
</tbody>
</table>

*(p<0.05), ** (p<0.01), *** (p<0.001)
## Results of QDA

<table>
<thead>
<tr>
<th>Taste</th>
<th>Pasture</th>
<th>3 weeks</th>
<th>6 weeks</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Spicy</td>
<td>25</td>
<td>35</td>
<td>36</td>
<td>**</td>
</tr>
<tr>
<td>Lamb meat</td>
<td>54</td>
<td>49</td>
<td>49</td>
<td></td>
</tr>
<tr>
<td>Sour</td>
<td>22</td>
<td>23</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Livery/Game</td>
<td>43</td>
<td>40</td>
<td>39</td>
<td></td>
</tr>
<tr>
<td>Wolly</td>
<td>14</td>
<td>10</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>Iron</td>
<td>36</td>
<td>34</td>
<td>34</td>
<td></td>
</tr>
<tr>
<td>Fatty</td>
<td>23</td>
<td>21</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>Off flavour</td>
<td>6</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

** (p<0.01)
Results of PCA

Original: Bi-Plot

PC2 (4.6%)

PC1 (95.4%)

3 week

Sour flavour

Lamb meat odour

Off odour of meat

Fatty odour of fat

Livery/Game flavour

Wolly odour

Spicy flavour

Wooly flavour

Off flavour

Swett odour of fat

6 week

Pasture

Fatty flavour

Iron flavour

0.0
PLSR model plot

Correlation Loadings (X and Y)

PC1

PC2

GC_FA_Sensory, X-expl: 53%, 16%  Y-expl: 58%, 18%

Limonene
C20:5n3

C18:1n9

C16:0

Pinene

Ethyl-hexanol

3-Methyl-hexan-3-ol

Octen-3-ol

1-Pentan-3-ol

1-Pentanol

Octanal

beta-Phellandrene

2-Butanone

C14:0

C12:0

C10:0

trans C18:1
other C18:1
trans C18:2

lamb meat odour
wool odour
fat odour

spicy odour
spicy flavour

unknown

HÁSKOLI ÍSLANDS
matis
Conclusions

1. Grazing traditional grass pasture lambs on angelica fields changes the flavour of the meat.

1. The time of grazing on angelica had some influence. It decreased lamb meat odour.

1. The analysis of volatile compounds confirms the difference between the angelica lambs and the pasture lambs.
Aknowledgements

The farmers Halla Steinólfsdóttir and Guðmundur Gíslason of Ytri Fagridalur, Skardstrond are thanked for providing the sheep and pastures for this trial. Sigridur Johannesdottir of Bunadarsamband Vesturlands is thanked for arranging the Angelica lamb meat project. The Sheep Farmers Association of Iceland supported the project financially.