Bioactive compounds in commercial nitrite-cured cooked pork products

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Bioactive compounds in commercial nitrite-cured cooked pork products

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**Introduction**

Nitrite is a key-responsive for the oxidative and microbial stability of cured meat products. However, residual nitrite levels go down during cooking and storage while the product retains a relatively long shelf life. Some of the added nitrite reacts with myoglobin to form the cured meat pigment, nitrosyl-myooglobin while some reacts with secondary amines to form carcinogenic nitrosamines. Decades ago nitrite was reported to also react readily with other proteins than myoglobin.

**Aim**

To see if extract of cooked nitrite-cured pork possessed antioxidant activity and whether it could be related to peptides present in the extracts.

**Method**

3 types of commercial hams

- Cold storage 0 days
- Cold storage 37 days
- 10kDa MWCO dialysis
- Size exclusion chromatography
- Analysis of dialysate:
  - Protein determination (BCA)
  - Antioxidant in vitro assays
  - Reducing power
  - ABTS radical scavenging
  - Fe chelating ability
- Analysis of effluent:
  - Protein determination (BCA)
  - Antioxidant in vitro assays
  - Reducing power
  - ABTS radical scavenging

![Fig. 1. Schematic representation of experimental setup](image)

**Results 1 – Specific antioxidant activity (0 days)**

Generally the specific antioxidant activity initially increased with peptide content towards a steady level. The peptide specific antioxidant activity was very similar between the three products in regard to reducing power and ABTS radical scavenging activity. Iron chelating activity did not appear to correlate with peptide content.

<table>
<thead>
<tr>
<th></th>
<th>Fe chelating</th>
<th>Reducing Power</th>
<th>ABTS radical scavenging</th>
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</thead>
<tbody>
<tr>
<td>Danish sandwich ham</td>
<td>8190.49</td>
<td>46.42</td>
<td>11993</td>
</tr>
<tr>
<td>Swedish dinner ham</td>
<td>Activity below 0</td>
<td>42.12</td>
<td>14324</td>
</tr>
<tr>
<td>Swedish pork saddle</td>
<td>2237.4</td>
<td>37.93</td>
<td>10470</td>
</tr>
<tr>
<td>Positive control</td>
<td>24222\textsuperscript{a}</td>
<td>330.57\textsuperscript{b}</td>
<td>23956\textsuperscript{c}</td>
</tr>
</tbody>
</table>

**Conclusion**

- Commercial ham extracts possess reducing power and the ability to chelate iron and scavange radicals
- Reducing power and radical scavenging activities correlate with protein content
- Specific antioxidant activity is related to specific fractions

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