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Bioactive compounds in commercial nitrite-cured cooked pork products

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Introduction

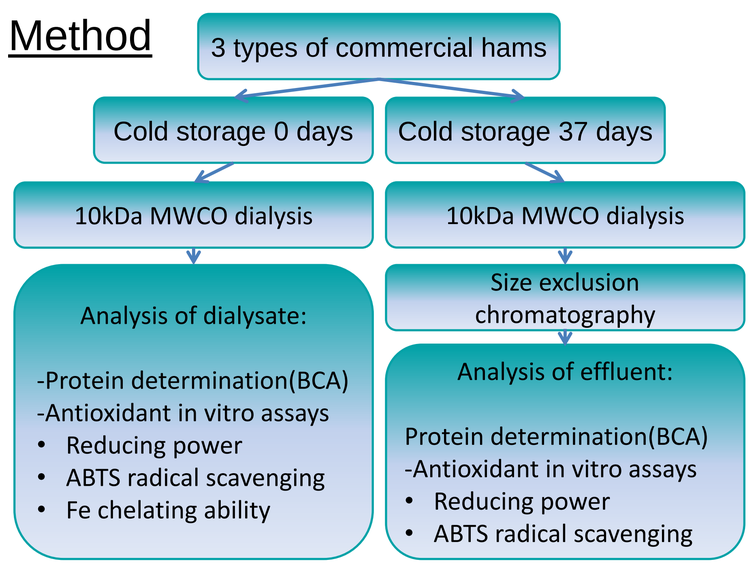
Nitrite is a key-responsible for the oxidative and microbial stability of cured meat products. However, residual nitrite levels go down during cooking and storage while the product retains a relatively long shelf life

Some of the added nitrite reacts with myoglobin to form the cured meat pigment, nitrosyl-myoglobin 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



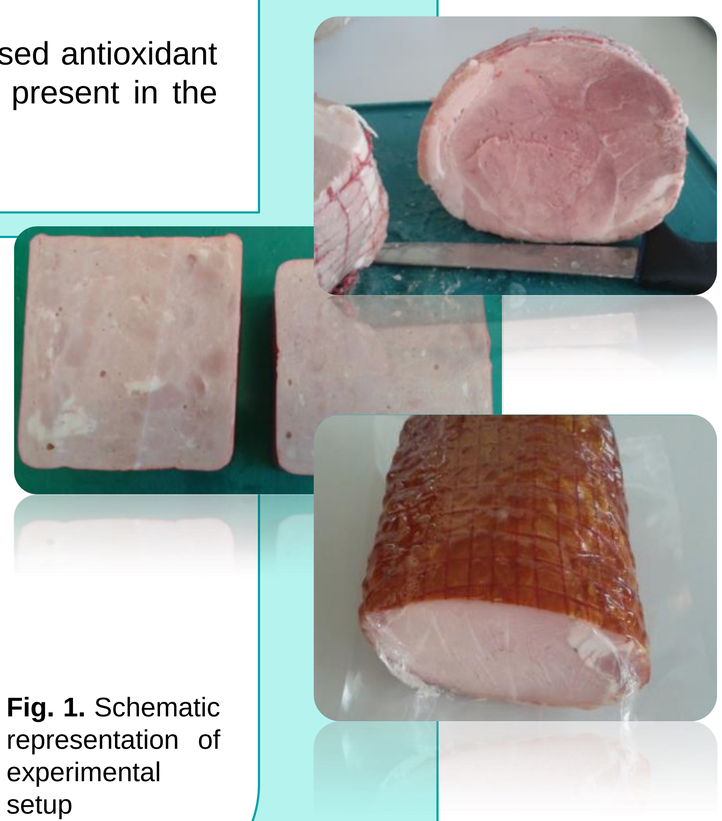


Fig. 1. Schematic representation of experimental setup

Results part 2 – Antioxidant activity and peptide content in fractionated extracts (37 days)

The previously observed antioxidant activities were mainly associated with a fraction giving a high reading at 254nm indicating that the activity might be related to compounds containing an aromatic ring.

The ham extracts displayed ABTS radical scavenging activities of different kinetics.

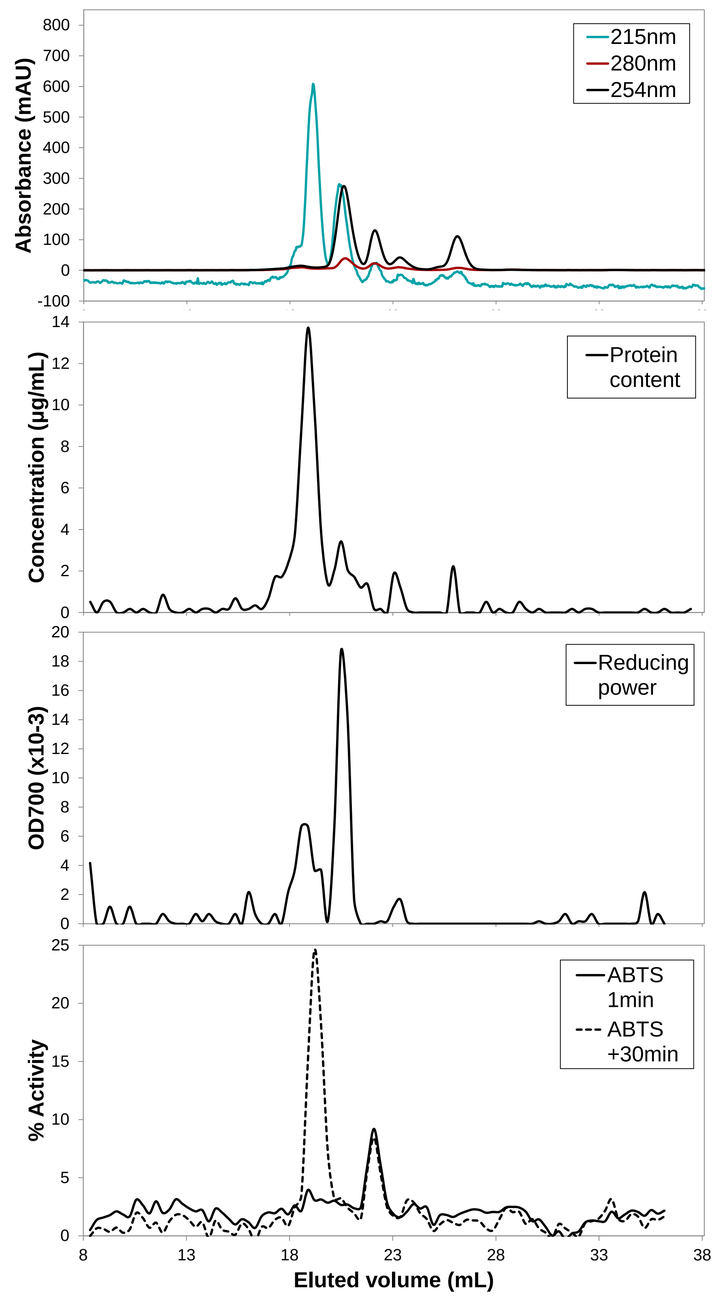


Fig. 2. Representative example of FPLC size exclusion chromatogram detected at 215, 280 and 254 nm aligned with protein content, reducing power and ABTS radical scavenging activity of the size separated fractions. for the sandwich ham

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 1. Initial specific activity expressed in activity % (Fe chelating and ABTS radical scavenging) or OD700 (reducing power) per mg of peptide or positive control ([a]0.5mM EDTA, [b]0.5mM ascorbic acid and [c]2.5mM trolox)

	Fe chelating	Reducing Power	ABTS radical scavenging
Danish sandwich ham	8190.4	46.42	11993
Swedish dinner ham	Activity below 0	42.12	14324
Swedish pork saddle	2237.4	37.93	10470
Positive control	24222[a]	330.57[b]	23956[c]

Conclusion

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

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