

Accepted Manuscript



Impact of inclusion of flaxseed oil (pre-emulsified or encapsulated) on the physical characteristics of chicken sausages

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PII: S0260-8774(18)30081-5
DOI: 10.1016/j.jfoodeng.2018.02.026
Reference: JFOE 9181
To appear in: *Journal of Food Engineering*
Received Date: 06 December 2017
Revised Date: 20 February 2018
Accepted Date: 24 February 2018

Please cite this article as: Zara Bolger, Nigel P. Brunton, Frank J. Monahan, Impact of inclusion of flaxseed oil (pre-emulsified or encapsulated) on the physical characteristics of chicken sausages, *Journal of Food Engineering* (2018), doi: 10.1016/j.jfoodeng.2018.02.026

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1 **Impact of inclusion of flaxseed oil (pre-emulsified or encapsulated) on the physical**
2 **characteristics of chicken sausages**

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6
7 **Abstract**

8 Functional meat products containing elevated omega-3 (*n*-3) fatty acids, such as α -linolenic
9 acid (ALA), may be formulated by replacing animal fat with flaxseed oil, but the addition of
10 flaxseed oil to meat products can adversely affect sensory properties, particularly textural
11 properties. The objective of this study was to investigate how different methods of flaxseed
12 oil incorporation into chicken sausages affected their physical characteristics, as assessed by
13 proximate composition, water holding capacity, water and fat binding capacity, cook loss,
14 texture profile analysis (TPA), rheological analysis and nuclear magnetic resonance
15 relaxometry (NMR). Sausages were formulated to contain enough ALA to meet the European
16 Food Safety Authority requirements for nutrient and health claims (0.6 g per 100 g and 100
17 kcal) and compared with a non-oil containing control (C). Flaxseed oil, as a source of ALA,
18 was incorporated in the following forms: direct addition (O); pre-emulsified (E);
19 encapsulated and freeze-dried (F); encapsulated with cross-linker genipin and freeze-dried
20 (G); encapsulated and spray-dried (S). When compared to the other formulations, the F and G
21 formulations had lower values for storage and loss modulus and for all TPA measurements
22 ($p \leq 0.05$). G and S formulations had lower values ($p \leq 0.05$) for cook loss than the other

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