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

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Abstract

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

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