

Effect of different levels of fat, sodium chloride, and sodium tripolyphosphate on the physicochemical and microstructure properties of Jamnapari goat meat emulsion modelling system

ABSTRACT

Jamnapari goat meat has the potential to be used for producing quality meat products. The present work thus aimed to evaluate the properties of Jamnapari meat emulsion. A two-level factorial design with three independent variables (23), fat (10 and 30%), sodium chloride (NaCl) (0.8 and 2.4%), and sodium tripolyphosphate (STPP) (0.5 and 1.5%) was used to randomly produce eight formulations of Jamnapari goat meat emulsion. The total expressible fluid (%TEF), expressible fat (%EFAT), pH, cooking loss, water holding capacity (WHC), texture, and microstructure properties of the eight Jamnapari goat meat emulsions were analysed. The %TEF was highly influenced by all factors (fat, NaCl, and STPP), while the %EFAT was only affected by the amount of fat. The pH and cooking loss were affected by fat and STPP levels, while the WHC was affected by the NaCl level. The hardness of the cooked Jamnapari meat emulsion was influenced by all the factors, while the cohesiveness by the fat and NaCl, the springiness by the fat content, and the gumminess, chewiness, and resilience by the STPP. A high NaCl level resulted in a homogeneous microstructure and smaller fat droplets. Although Formulation 3 (10% fat, 2.4% NaCl, and 0.5% STPP) showed good results in emulsion stability, cooking loss, WHC, textural properties, and uniform fat distribution within the meat protein matrix, Formulation 7 (10% fat, 0.8% NaCl, and 0.5% STPP) could be more preferable for its lower salt level. To conclude, the present work developed a stable formulation of Jamnapari goat meat emulsion that can be used to produce meat products.

Keyword: Emulsion stability; Goat meat; Jamnapari breed; Meat products; Meat quality