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Utilization of Chicken Skin Based Products as Fat Replacers for Improving the Nutritional Quality, Physico-Chemical Characteristics and Sensory Attributes of Beef Fresh Sausage

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Abstract : Fresh sausage is one of the cheapest and delicious meat products that are gaining popularity all over the world. It is considered as a practice of adding value to low-value meat cuts of high fat and connective tissue contents. One of the most important characteristics of fresh sausage is the distinctive marbling appearance between lean and fatty portions, which can be achieved by using animal fat. For achieving the marbling appearance of fresh sausage, a lager amount of fat needs to be used. The use of animal fat may represent a health concern due to its content of saturated fatty acids and trans-fats, which increase the risk of heart diseases. There is a need for reducing the fat content of fresh sausage to obtain a healthy product. However, fat is responsible for the texture, flavor, and juiciness of the product. Therefore, developing reduced-fat products is a challenging process. The main objectives of the current study were to incorporate chicken skin based products (chicken skin emulsion, gelatinized chicken skin, and gelatinized chicken skin emulsion) during the formulation of fresh sausage as fat replacers and to study the effect of these products on the nutritional quality, physicochemical properties, and sensory attributes of the processed product. Three fresh sausage formulae were prepared using chicken skin based fat replacers (chicken skin emulsion, gelatinized chicken skin, and gelatinized chicken skin emulsion) beside one formula prepared using mesenteric beef fat as a control. The proximate composition, fatty acid profiles, Physico-chemical characteristics, and sensory attributes of all formulas were assessed. The results revealed that the use of chicken skin based fat replacers resulted in significant ($P < 0.05$) reduction of fat contents from 17.67 % in beef mesenteric fat formulated sausage to 5.77, 8.05 and 8.46 in chicken skin emulsion, gelatinized chicken skin, and gelatinized chicken skin emulsion formulated sausages, respectively. Significant reduction in the saturated fatty acid contents and a significant increase in mono-unsaturated, poly-unsaturated, and omega-3 fatty acids have been observed in all formulae processed with chicken skin based fat replacers. Moreover, significant improvements in the physico-chemical characteristics and non-significant changes in the sensory attributes have been obtained. From the obtained results, it can be concluded that the chicken skin based products can be used safely to improve the nutritional quality and physico chemical properties of beef fresh sausages without changing the sensory attributes of the product. This study may encourage meat processors to utilize chicken skin based fat replacers for the production of high quality and healthy beef fresh sausages.

Keywords : chicken skin emulsion, fresh sausage, gelatinized chicken skin, gelatinized chicken skin emulsion
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