

Article No. 6

Influence of incorporation of orange juice by-product on the quality properties of sponge cake and low-fat beef burger

Khaled A. Selim*, Osama H. Ismaael and Mohamed S. Abdel Bary

Food science and technology dept., Faculty of agriculture, Fayoum University, Fayoum, Egypt

Journal of food science and technology, V. 4 No.7, pp 860-876 (2019).

Abstract

The purpose of this study was to evaluate the properties of the orange juice by-product as potential ingredient and to investigate the effect of incorporation of this by-product as wheat flour replacer in cake and fat replacer in low-fat burger on physicochemical and sensory characteristics of sponge cake and low-fat beef burger. The analysis comprised: chemical composition, total phenolic and flavonoids content and antioxidant activity of the dried orange juice by-product. The results showed that dried orange by-product contents 8.23% ash, 1.02% fat, 8.12% protein, 78.19% total carbohydrate and 63.05% total dietary fiber. The results showed that the extract yield was 29.89 and 28.25% and total polyphenolic content recorded 22.615 and 21.045mg/g dried extract while the total flavonoids content recorded 5.166 and 4.937mg/g dry extract for methanol: water and ethanol: water extracts respectively. The antioxidant activity of the methanolic and ethanolic extracts of orange juice by-product was assessed using stable DPPH radical. Both orange juice by-product extracts exhibited very strong antioxidant activity with EC₅₀ of 11.67 and 13.21µg extract/ µg DPPH, respectively.

Effects of replacement of cake wheat flour with different levels of dried orange by-products (5%, 7.5% and 10%) were investigated regarding sensory aspects. The sensory profile of cake with OJBP showed that addition 5% orange juice by-product as wheat flour replacer in the cake formula improved the appearance, color, taste, odor and overall acceptability of the cakes comparing to the control sample. When the replacement level was increased to 7.5 and 10% all the sensory properties showed significant decrease comparing with the control sample.

Orange juice by-product was evaluated as a fat replacer on physicochemical and sensory characteristics of low-fat burger. The results showed that OJBP at all replacement levels reduced the cooking loss, shrinkage % and prolonged the storage stability of the produced burger compared to the control samples. The replacement of fat by OJBP in burger at low level (2.5%) led to improvement of all the sensory parameters. Whoever, at the highest level (7.5%) partially impairs the acceptance of the product compared to the control samples.

Keywords: *Orange juice by-product, bioactive compounds, sponge cake, low-fat burger*