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## Physicochemical, Sensorial and Textural Properties of Vegan Ice Creams Produced From Cowpea Milk Analogs

Fatma Korkmaz<sup>1</sup>, Ali Emre Andaç<sup>2</sup>, Neşe Yılmaz Tuncel<sup>3\*</sup>, Havva Polat Kaya<sup>3</sup>, Necati Barış Tuncel<sup>2</sup>

<sup>1</sup>Balıkesir University, Faculty of Engineering, Department of Food Engineering, Balıkesir, 10010, Türkiye

<sup>2</sup>Onsekiz Mart University, Faculty of Engineering, Department of Food Engineering, Çanakkale, 17100, Türkiye

<sup>3</sup>Onsekiz Mart University, Faculty of Applied Sciences, Department of Food Technology, Çanakkale, 17100, Türkiye

### Abstract

The aim of this study was to determine the physicochemical, sensorial, and textural properties of vegan ice creams made from different concentrations of cowpea milk (5-20 %), fat (8-20 %), sugar (15-30 %), gum (0.2-1 %), emulgator and aroma (at fixed concentrations). Twenty different formulations of ice cream or frozen dessert were produced using response surface methodology, Box-Behnken design. The whiteness value of the products was significantly affected by the amount of fat, independent of the legume concentration. However,  $b^*$  values of the ice creams showed high and significant correlation with the concentration of the cowpea. Destabilized fat index increased in formulations with high fat and low gum content ( $p<0.05$ ). The amount of gum was also highly effective on the melting characteristics of the ice cream samples. The higher the gum content, the longer the first dripping time. When the textural properties were examined, it was determined that the highest stickiness was observed in ice cream samples which have the minimum sugar content and *vice versa*. Also, it was observed that the gumminess and chewiness values were higher in the samples with less sugar and more gum content ( $p<0.05$ ). Consumer acceptance test was conducted to assess the appeal and overall acceptability of the vegan ice cream samples using 9-point hedonic scale. The scores of overall acceptance ranged between 5.50 and 7.50. In general, it was determined that the formulations with the highest sensory scores were the samples with high sugar content and medium concentrations of gum and cowpea.

**Keywords:** Plant-based milk, milk analog, milk substitute, cowpea, legume, sensory properties

