

## **SUBSTITUTION EFFECT OF FRESH MILK WITH BEETROOT EXTRACT (*Beta vulgaris L.*) ON PHYSICO-CHEMICAL QUALITY AND ANTIOXIDANT ACTIVITY OF GELATO**

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### **ABSTRACT**

Gelato is a frozen food that has characteristics like ice cream. This research aimed to determine the physical qualities, chemical qualities, antioxidant activity, and organoleptic properties of gelato which was made by substitution of cow milk and beetroot. Gelato was made with ratio of cow milk and beetroot 100:0; 87.5:12.5; and 75:25. Physical analysis on gelato were overrun, melting point, and total solid. Chemical analysis on gelato were pH, fat content, glucose content, and antioxidant activity. Data was analysed used oneway ANOVA with 3 replications. The results showed that the increase beetroot substitution in gelato was significantly different ( $P < 0.05$ ) in overrun, pH, fat content, and antioxidant activity, but it was not significantly different ( $P > 0.05$ ) in melting point, total solid, glucose content, and organoleptic properties. Gelato was made of cow milk (100:0) and substitution of cow milk and beetroot (87.5:12.5 dan 75:25) had overrun  $31.59 \pm 0.87\%$ ,  $38.71 \pm 0.75\%$ ,  $42.74 \pm 1.50\%$ , pH  $6.53 \pm 0.01$ ,  $6.34 \pm 0.04$ ,  $6.29 \pm 0.01$ , fat content  $5.18 \pm 0.23\%$ ,  $4.26 \pm 0.04\%$ ,  $3.94 \pm 0.15\%$ , and antioxidant activity  $20.28 \pm 1.40\%$ ,  $32.87 \pm 0.00\%$ ,  $37.06 \pm 1.40\%$ . Gelato was made of cow milk (100:0) and substitution of cow milk and beetroot (87.5:12.5 dan 75:25) had melting point  $45.49 \pm 2.25$  minutes,  $44.23 \pm 0.13$  minutes, and  $44.72 \pm 0.53$  minutes, total solid  $34.59 \pm 0.93\%$ ,  $33.69 \pm 0.34\%$ , and  $33.69 \pm 0.54\%$ , and glucose content  $12.11 \pm 2.57\%$ ,  $13.08 \pm 1.87\%$ , and  $13.53 \pm 2.24\%$ . Organoleptic properties of gelato was made of cow milk (100:0) and substitution of cow milk and beetroot (87.5:12.5 dan 75:25) had score of color  $7.40 \pm 1.14$ ,  $6.80 \pm 1.74$ , and  $7.15 \pm 1.57$ , score of taste  $7.50 \pm 1.24$ ,  $6.70 \pm 1.34$ , and  $5.80 \pm 1.77$ , score of flavour  $7.50 \pm 1.24$ ,  $6.70 \pm 1.34$ , and  $5.80 \pm 1.77$ , score of texture  $7.20 \pm 1.54$ ,  $6.70 \pm 1.17$ , and  $5.85 \pm 1.66$ , and score of acceptability  $7.50 \pm 1.19$ ,  $6.80 \pm 1.24$ , and  $5.95 \pm 1.70$ . The conclusion of this research was the beetroot increased overrun and antioxidant activity, and decreased fat content and pH. Gelato made with 12.5% beetroot has the best effect on gelato quality.

Key word : Gelato, Beetroot, Physical quality, Chemical quality, Antioxidant activity, Organoleptic properties.