

Assessment of Antioxidant Profile and Vitamin C Content in Commercially Cultivated Berries in Sri Lanka and their Processed Jams

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Berries are recognized for their high antioxidant capacity and vitamin C content, which contribute significantly to human health. In Sri Lanka, the commercial cultivation of blackberry (*Rubus fruticosus*), blueberry (*Vaccinium corymbosum*), raspberry (*Rubus idaeus*), and strawberry (*Fragaria ananassa*) is expanding; however, limited information exists on their nutritional properties and the effect of processing. This study assessed the antioxidant activity, total phenolic content (TPC), total flavonoid content (TFC), and vitamin C content of fresh berries and their jams processing. Freeze-dried berry and jam extracts were analyzed using DPPH, FRAP, and ABTS assays, while vitamin C was quantified by redox titration. Data were expressed as mean $\pm$ SD (n=3) and analyzed using one-way ANOVA with Tukey's HSD ($p < 0.05$). Results demonstrated that processing significantly reduced the antioxidant and vitamin C content of all berries, though the magnitude varied by fruit type. Fresh raspberries showed the highest DPPH (584.10 ± 14.35 μ mol TE/100g). Interestingly, FRAP activity increased in blackberry jam (169 ± 3 μ mol TE/100g) compared to fresh blackberries (129 ± 6 μ mol TE/100g), suggesting the formation of heat-stable antioxidant compounds during processing. Similarly, raspberry jam (936 ± 42 μ mol TE/100g) displayed elevated ABTS activity despite a marked decline in vitamin C, indicating contributions from non-ascorbic antioxidants. Among compositional parameters, TPC was highest in fresh blueberries (734 ± 13 mg GAE/100g), TFC in fresh blackberries (209.12 ± 6.03 mg QE/100g), and vitamin C in fresh strawberries (67.36 ± 1.51 mg/100g). Jams generally contained lower levels of all measured parameters. These findings highlight that processing markedly alters the antioxidant and nutritional profiles of berries and the importance of optimizing processing conditions to preserve bioactive compounds in berry-based products.

Keywords: Antioxidant activity, Berries, Jam processing, Nutritional quality, Vitamin C

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