Antioxidant capacities, total phenolic and ascorbic acid content of fruit available in New Zealand

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Introduction

The consumption of fruit on a regular basis is promoted as part of a healthy diet as they contain many phytonutrients including those with antioxidant activity. The development of many chronic diseases have been linked to oxidative stress and antioxidants have the potential to reduce this.

Although berries are recognised as good sources of antioxidant capacity, Other fruits can contribute to the antioxidant content of NZ diets. This study evaluates the antioxidant capacities of NZ grown stone fruit and tropical fruits available in NZ.

Materials and methods

Nine stone fruit and 6 tropical fruit varieties (see table 1), were purchased from a variety of Christchurch retailers and analysed at ready -to-eat stage.

Antioxidant capacities, total phenolic and ascorbic acid contents were quantified using ABTS[1] and ORAC[2], Folin-Ciocalteu[3] and titration with DCPIP[4] assays respectively.. Data were compared with Anova and regression analysis.

Results and Discussion

Table 1. Antioxidant capacities as measured by ABTS and ORAC, total phenolic and Ascorbic Acid concentrations of fruit available in New Zealand.

	ABTS (µmol TE/100g FW)	ORAC (µmol TE/100g FW)	Total Phenolics (mg GAE/100g FW)	Ascorbic acid (mg/100g FW)	AsA contributio towards ORAC (%)
Tropical fruits					
Avocado	196.5 ± 11.6	374.9 ± 20.5	59.5 ± 3.2	10.4 ± 1.0	2.3
Banana	354.7 ± 7.5	853.7 ± 11.5	119.6 ± 7.4	8.7 ± 0.5	3.1
Carambola	975.7 ± 1.4	3017.5 ± 10.4	475.5 ± 0.8	n.d.	-
Passion fruit	86.2 ± 0.2	506.7 ± 11.5	269.6 ± 0.5	30.2 ± 1.1	17.9
Persimmon	134.5 ± 0.4	785.3 ± 12.1	114.2 ± 0.8	62.7 ± 1.2	24.0
Pineapple	211.7 ± 1.7	607.3 ± 10.3	27.4 ± 0.7	47.4 ± 1.0	23.4
Stone Fruit					
Apricot	33.8 ± 0.5	615.9 ± 22.1	63.0 ± 1.0	14.6 ± 0.4	7.1
Cherry (black Tartarian)	301.1 ± 1.1	1754.6 ± 19.1	277.6 ± 0.2	10.2 ± 2.1	2.8
Cherry (red Bing)	285.7 ± 2.0	1457.2 ± 10.5	181.2 ± 1.2	14.2 ± 1.3	1.7
Cherry (yellow Royal)	269.1 ± 1.1	1357.3 ± 12.2	211.2 ± 1.1	12.6 ± 1.2	2.9
Nectarine (white flesh)	175.4 ± 1.9	1071.6 ± 12.2	102.3 ± 1.3	7.5 ± 0.2	2.1
Peach (white flesh)	160.7 ± 0.5	1117.1 ± 18.5	51.3 ± 0.8	8.5 ± 1.1	2.3
Plum (black)	511.2 ± 1.1	2821.6 ± 9.1	367.1 ± 0.7	12.5 ± 0.2	4.1
Plum (cherry)	311.3 ± 2.7	1745.1 ± 21.1	214.1 ± 1.1	10.1 ± .01	1.7
Plum (red)	356.3 ± 1.0	1924.3 ± 11.6	285.3 ± 0.3	10.2 ± 1.1	1.8

TE Trolox Equivalents GAE Gallic Acid equivalents FW fresh weight

The fruits contained a wide range of antioxidant activities. Results ranged from 374.5 to 3017.5 µmol Trolox equivalents (TE)/100g FW for ORAC; 33.8 to 975.7 µmol TE/100g FW for ABTS; 27.4 to 475.5 mg gallic acid equivalent (GAE)/100g FW for total phenolic concentrations and 7.5 to 62.7 mg ascorbic acid/100g FW. There was no difference in antioxidant capacities measured by ORAC, ABTS and total phenolics between the stone fruit and the tropical fruits. Both ORAC and ABTS antioxidant capacities were significantly correlated to the total phenolic concentrations ($p < 0.001$) suggesting that phenolic compounds are primarily responsible for the free radical scavenging ability of both fruit types. The tropical fruit had higher ascorbic acid content than the stone fruit ($p < 0.05$) and the calculated contribution of ascorbic acid to ORAC values was a larger proportion for tropical fruits than stone fruits.

References

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