Concurrent Session 17: Dietary Antioxidants and Health

Antioxidant compositions of selected fruits, vegetables and beverages in Fiji
J Lako and S Sotheeswaran
Faculty of Science and Technology, The University of the South Pacific, Suva, FIJI ISLANDS

Background – This paper reports the antioxidant compositions of fruits, vegetables and beverages in Fiji.
Objectives – The availability of such data will help promote their use in the daily diet of the people in Fiji.
Design – The total antioxidant capacity (TAC) was assayed using trolox equivalent antioxidant capacity (TEAC) decolourization method (1). The total polyphenol (TPP) assay was performed using the Folin-Ciocalteu method (1). HPLC was used to determine the major carotenoid and flavonoid profiles.
Outcomes – Commercial noni (Morinda citrifolia) fruit drink, which is exported to Australia, was shown to have the highest total polyphenol levels (375.1 mg/100g juice) followed by turmeric (Curcuma longa) (320 mg/100g). Sweet potato leaves (Ipomoea batatas) (240-280 mg/100g) and drumstick (Moringa oleifera) leaves (260 mg/100g) were also high in total polyphenols. The paper also discusses the TAC levels of the foods assayed. Flavonoid assay showed that quercetin was present in sweet potato leaves (43-90 mg/100g), drumstick leaves (100 mg/100g) and also in turmeric (41 mg/100g). It appears that polyphenols and carotenoids contribute to the antioxidant capacity of most foods (2).
Conclusion – Attempts are made to publicise and promote the consumption of a variety of the antioxidant-rich vegetables and fruits in the diets of the people of Fiji.

References

Antioxidant capacity of plant extracts: comparing in vitro and in vivo measures
N Balasundram1,2, K Sundram1, S Samman1
1 Human Nutrition Unit, School of Molecular and Microbial Biosciences, University of Sydney, NSW 2006
2 Malaysian Palm Oil Board, 6 Persiaran Institusi, 43000 Kajang, Malaysia

Background – Polyphenols from different plant sources have been investigated for their antioxidant activities. Polyphenols have been reported to exhibit anti-allergic, anti-inflammatory and cardioprotective effects (1).
Objective – To compare the outcomes of in vitro and in vivo measures of antioxidant activity of palm polyphenols.
Design – In the in vitro experiments, human plasma was incubated with palm polyphenol extracts, and the antioxidant capacity was measured by two methods: 2,2’-azino-bis(3-ethylbenzothiazoline-6-sulfonic acid) radical cation (ABTS+) scavenging and ferric reducing antioxidant power (FRAP) assays. For the in vivo study, hamsters were fed an atherogenic diet and supplemented with palm fruit juice (PFJ) for 8 wk. PFJ was administered at three different polyphenol concentrations, 750, 1000, and 1500 mg gallic acid equivalents (GAE)/L. The antioxidant capacity of the hamster plasma was measured at the end of 8 wk by the ABTS+ scavenging and FRAP assays.
Outcomes – Incubation of human plasma with palm polyphenols did not result in a significant increase in plasma ABTS+ scavenging capacity, but plasma FRAP values were significantly elevated. A similar trend was observed in the in vivo experiments. ABTS+ scavenging capacity in hamster plasma was unaffected by PFJ treatment at the different PFJ concentrations administered. Plasma FRAP values, on the other hand, increased from 45.64 ± 24.96 µM Trolox equivalents (TE) in control animals given water, to 82.33 ± 41.26 µM TE in animals supplemented with PFJ at 1500 mg GAE/L.
Conclusions – In vitro measures of antioxidant capacity are useful indicators of possible outcomes of in vivo trials. Nevertheless, the quantitative outcomes of the latter may differ from what could be extrapolated from purely in vitro measures due to absorption, metabolism and bioavailability of ingested antioxidants.
Reference