

## ICCN Poster Presentations

### Novel foods in clinical practice

#### **Total antioxidant capacity and selected flavonols and carotenoids of some Australian and Fijian fruits and vegetables**

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The consumption of fruits and vegetables has been reported to improve health and reduce the burden of disease conditions in part probably because of the provision of various forms of phytochemicals with antioxidant properties present in these foods. The major classes of phytochemicals in foods with antioxidant properties are the carotenoids and polyphenols (such as flavonoids and anthocyanins). Selected Australian and Fijian fruits and vegetables were analysed for their total antioxidant capacity (TAC), total polyphenols (TPP), total anthocyanins (TAT), flavonols and carotenoids. Results for the Australian foods showed that blueberries contain the highest TAC (560 mg/100g), TPP (310 mg/100g) and TAT (14 mg/100g). Red onions (42 mg/100g quercetin, 0.4 mg/100g kaempferol) and baby spinach leaves (30 mg/100g quercetin, 6.0 mg/100g kaempferol) are rich in flavonols. For the Fijian foods, sweet potato leaves contain the highest TAC (650 mg/100g), TPP (270 mg/100g) and flavonol (46 mg/100g quercetin). Ginger orange-yellow (360 mg/100g TAC, 320 mg/100g TPP), and ginger white (320µmg/100g TAC, 200 mg/100g TPP) contain substantial amounts of TAC and TPP respectively. Purple beans (44 mg/100g quercetin), ginger orange-yellow (28 mg/100g quercetin) and spring onions also (38µmg/100g kaempferol) contain good amounts of flavonols.

#### **D-Psicose, a rare sugar that provides no energy and additionally beneficial effects for clinical nutrition**

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D-Psicose (D-ribo-2-hexulose), a C-3 epimer of D-fructose, is a "rare sugar" present in small quantities in commercial mixtures of D-glucose and D-fructose obtained from the hydrolysis of sucrose or isomerization of D-glucose. Because of the very small amounts of D-psicose in natural products, few studies of D-psicose metabolism in mammals have been conducted. Recently, we developed a new method to produce D-psicose enzymatically on a large scale, making it possible to conduct scientific studies. In this study, we examined (1) the metabolic effects of D-psicose, (2) the available energy of D-psicose and (3) acute and subchronic toxicity to gather basic data regarding the safety of using as a new sugar substitute. (Experiment 1) We investigated the absorption and excretion of D-psicose when orally administered (5g/kg body weight) to Wistar rats, and the fermentation of D-psicose was measured as cecal short-chain fatty acids (SCFA) when fed to rats in controlled diets (0-30%). Urinary and fecal excretions of D-psicose over the 24 h were 11-15% of dosage for the former and 8-13% of dosage for the latter. Rats fed on D-psicose diets showed SCFA production. (Experiment 2) Wistar rats received 7 g daily of a basal diet to which fixed amounts of D-psicose (0.5-2.0 g) were added for 20 days. Body energy gain did not increase with D-psicose. One gram of D-psicose produced a net energy gain of 0.007 kcal and the energy value of D-psicose was effectively zero. (Experiment 3) Wistar rats were orally given D-psicose in dose of 8-20 g/kg. The calculated LD<sub>50</sub> value was 16.3 g/kg. Another Wistar rats were fed diets containing 0-40% of D-psicose for 34 days. Body weight gain and food intake were more extensively suppressed by the higher D-psicose diets. These results suggest that D-psicose displays nutritional characteristics unlike other monosaccharides such as D-glucose or D-fructose and provides no energy for growth. D-Psicose is not a toxic sugar but should be used carefully, if at all, as a dietary fiber-like substance or sweetener in food manufacturing.