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Tea is the major source of flavonoids in older women in South East Queensland

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Background – Flavonoids are biologically active polyphenolic compounds ubiquitously distributed in plants that have been linked to various cardio- and chemoprotective effects. Data on dietary intake in Australia are limited.

Objective – To determine the dietary flavonoid consumption (mg/d) and major food sources in a sample of healthy women aged 40-80 years from South East Queensland.

Design – An individual diet history interview was conducted with 470 women (mean ± SD age 61.3 ± 10.6 y) participating in the Longitudinal Assessment of Ageing in Women based in Brisbane, Queensland. Data were analysed for 26 individual flavonoids within five major subclasses, using the US Department of Agriculture database (Release 2.0, 2006).

Outcomes – Mean (SEM) daily intake for total flavonoids was 610 ± 22.5 mg/d, with the individual subclasses providing 534 ± 21.8 mg/d for flavan-3-ols, 34.9 ± 0.83 mg/d for flavonols, 18.7 ± 0.94 mg/d for flavanones, 18.1 ± 0.80 mg/d for anthocyanidins, and 4.09 ± 0.26 mg/d for flavones. The major food sources were: black tea (90%), green tea (6%), and apples (with and without skin) (1%) for flavan-3-ols; black tea, onions and apples (with skin) for the flavonols; oranges and orange juice, mandarins and red wine for flavanones; banana, red wine, red grapes, strawberries and apples (with skin) for anthocyanidins, and fresh parsley, olives and red wine for flavones. Black tea accounted for 497 mg/d (81%) of the total daily flavonoid intake followed by green tea with 34.2 mg/d (6%), red wine 9.72 mg/d (1.6%), apples 7.97 mg/d (1.3%), oranges 7.21 mg/d (1.2%) and bananas 6.93 mg/d (1.1%).

Conclusion – Black tea was the major dietary source of flavonoids in this group of women in South East Queensland. Flavan-3-ols were the major subclass, comprising 87.6% of total daily intake, followed by the flavonols (5.7%), flavanones (3%), anthocyanidins (3%) and flavones (0.7%). Establishing flavonoid composition data for Australian foods and standardised tools specifically designed for the measurement of flavonoid intake would greatly assist the accuracy of local intake assessment as well as aiding comparisons at the national and international level. Improved estimations of flavonoid intake and bioavailability will be crucial in determining the proposed relations between these compounds and chronic disease states.

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Incorporation and metabolism of punicic acid in rats

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Background – It was reported recently that conjugated linolenic acid (CLNA) has a cytotoxic effect on cultured human tumor cells, inhibiting carcinogenesis and altering the lipid metabolism in animals. Punicic acid (9c, 11t, 13c-CLNA, PA) is a main isomer of CLNA in Trichosanthes kirilowii Maxim (TK seed) in China.

Objective – The aim for this study was to investigate the incorporation and metabolism of punicic acid (PA) in tissues and plasma in rat.

Design – Thirty male Sprague-Dawley rats were fed a fat-free diet during a two-week acclimatization period. All animals had free access to food and water. The rats were fasted for 12 h, 2g of TK seed oil was given intragastrically, and then rats were randomly divided into 5 groups (n= 6), no food was allowed throughout the experiment. The rats were killed under anaesthesia (diethyl ether) at 0, 4, 8, 12, 24 h thereafter, blood and tissue samples were collected. Fatty acid composition in plasma and tissues were measured by HPLC and GC-MS.

Outcome – PA was incorporated and metabolized to 9c, 11t-CLA in rat plasma, liver, kidney, heart, brain and adipose tissue. The level of PA and CLA in liver and plasma was higher than in brain, heart, kidney and adipose tissue, and the lowest accumulation occurred in the brain.

Conclusions – PA can be converted into 9c, 11t-CLA. This has gained increased importance since it has been demonstrated that 9c, 11t-CLA exerts many biological activities. Therefore natural resources containing CLNA, especially edible TK seed could be a good dietary resource of CLA, following PA metabolism. PA is expected to be used as a functional food and nutraceutical.