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### Usual intake of isoflavonoids and lignans in association with urinary excretion - evaluation of an Australian dietary tool

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**Objective** - To evaluate a phytoestrogen frequency questionnaire by examining the association between intake and urinary excretion of isoflavonoids or lignans in a group of Australian women.

**Design** - A sample of 141 women aged 40 to 59 y was recruited from a larger cohort participating in the Brisbane Longitudinal Assessment of Ageing in Women (LAW). Phytoestrogen intake over the previous month from food and supplements was assessed using a specially-designed food frequency questionnaire containing 112 items, selected to include major sources of isoflavonoids and lignans in the Australian market. Excretion was determined by analysis of nine isoflavonoids and four lignans from three 24 h urines, using HPLC MS/MS. Analyses were conducted separately for the total group and soy consumers defined as consuming  $\geq 1$  serve/ month of soy foods.

**Outcomes** - Median (range) intakes of isoflavonoids and lignans were 0.021 (0-153) and 1.61 (0.4-23) mg/d, respectively. There was a significant association between intake and excretion of isoflavonoids in the total group ( $r=0.192$ ,  $P<0.05$ ), with a stronger association in soy consumers ( $r=0.497$ ,  $P<0.01$ ). There was no significant association between intake and excretion of lignans, however both intake and excretion were associated with energy-adjusted consumption of dietary fibre ( $r=0.303$  and  $r=0.230$ , respectively,  $P<0.01$  for both).

**Conclusions** - The current phytoestrogen questionnaire was useful for assessment of isoflavonoids; it was not acceptably precise for measurement of lignans, however dietary fibre intake could be an appropriate surrogate. A more comprehensive phytoestrogen database, especially for lignan content, would enable more accurate estimation of intake for epidemiological studies on the relationship between phytoestrogen status and health.

### Intake of phytoestrogen-rich foods and associated lifestyle and sociodemographic characteristics in Australian women

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**Background** - Phytoestrogen-rich soy and linseed foods are not a traditional component of Western diets however their intake has been promoted on the basis of the purported health benefits associated with high intake.

**Objective** - To determine intake of soy and linseed foods and constituent isoflavones and lignans in a representative sample of Australian women, and to investigate sociodemographic and lifestyle variables associated with intake.

**Design** - Subjects were 500 women aged 40-80 y randomly selected from the electoral roll and participating in the Brisbane Longitudinal Assessment of Ageing in Women (LAW). Intake of isoflavonoids and lignans from food and supplements was assessed by a phytoestrogen frequency questionnaire. Data were collected on nutrient intake, physical activity, smoking, alcohol intake, use of supplements, socio-economic position (SEP) (subject or partner's occupation) and education. Differences between soy or linseed consumers and non-consumers were investigated.

**Outcomes** - Consumption of soy food was reported by 40% and consumption of linseed by 34% of women. Median (range) intakes in soy/ linseed consumers for isoflavonoids, 3.87 (0-173) mg/d, and lignans, 2.40 (0.1-33) mg/d, were significantly higher than corresponding intakes in non consumers of 0.005 (0-2.6) and 1.57 (0.4-4.7) mg/d, respectively ( $P<0.001$ ). Soy/linseed consumers, compared to non-consumers, had higher intakes of dietary fibre ( $P=0.003$ ) and energy ( $P=0.043$ ); they also reported a higher level of physical activity ( $P=0.006$ ), SEP ( $P<0.001$ ), education ( $P<0.001$ ) and supplement use ( $P<0.001$ ). There were no significant differences between consumers and non consumers in alcohol intake, smoking or use of HT.

**Conclusions** - Few women who chose phytoestrogen-rich foods consumed amounts similar to women with traditional soy based diets. Women who consumed soy or linseed foods differed in lifestyle and sociodemographic characteristics that could influence the association with disease outcomes in epidemiological studies.