

### Concentrations of isoflavone phytoestrogens and the nature of their glucosides in Australian soy foods

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The possible role of the soy isoflavones in human health is of considerable current interest. In this study the content of the isoflavones daidzein, genistein and glycitein in their aglycone forms and in their glucoside, malonyl glucoside and acetyl glucoside forms were measured for the first time in twelve soyfoods available in Australia.

The concentration of total isoflavones in the foods ranged from just detectable in soy sauce to approximately 305 mg/100 g in some soybeans. Values for some of the foods analysed are summarised in the table. Using our values we estimated that a serve of soymilk would on average provide about 20 mg isoflavones, and a serve of either tofu or soy and linseed bread about 10 mg (see table), which together would provide an amount that is similar to the estimated average daily Chinese and Japanese intake of 30-40 mg. In soybeans the isoflavones were present predominantly in their glucoside and malonyl glucoside forms. The pattern of conjugates depended on the nature of the soy food. Thus the acetyl conjugates were only just detectable in unprocessed soybeans, whereas canned beans and textured vegetable protein contained approximately 20% of the total in this form. In soybeans about 60% of the total was present in the malonyl form and 40% in the glucoside form, but in soymilk only about 5% was present in the malonyl form, whereas approximately 90% was in the simple glucoside form. The aglycone form was very low or undetectable in most soyfoods, but it represented about one-half of the total in soy sauce.

	Brands assayed	Daidzein <sup>1</sup>	Genistein <sup>1</sup>	Glycitein <sup>1</sup>	Estimated mg isoflavone per serve
Soybeans – dry	4	65 ± 16	108 ± 23	16 ± 1.6	37 ± 7
Soy & linseed bread	3	4.9 ± 1.4	9.1 ± 1.8	0.7 ± 0.4	8.8 ± 1.5
White bread	3	0.1 ± 0.1	0.2 ± 0.1	nd	0.2 ± 0.1
Powdered soy drink powder	4	32 ± 4	65 ± 10	9.0 ± 2.5	27 ± 3
Soy flour	3	69 ± 12	126 ± 17	20 ± 1.4	43 ± 5
Soy milk	5	2.9 ± 1.2	6.2 ± 2.3	0.6 ± 0.0	19 ± 6
Tofu	6	7.8 ± 1.3	12 ± 1.6	1.9 ± 0.2	11 ± 1

<sup>1</sup> mean ± SEM; values are expressed as mg aglycone equivalents per 100 g of food as purchased

The present study provides values for isoflavone content of a range of Australian soyfoods that should be of value to nutritionists and dietitians.