

# ANY QUESTIONS?

## Soybean products

*An article in the Sydney Morning Herald, discussing the diet of Japanese, stated that soybean products contain oestrogen or oestrogen-like substances and they modify the behaviour of Japanese men. Is this true and if it is, how safe is it to consume soy milk (Sogood) and other foods made of soybean?*

Soybeans, in common with most legumes and many other foods of plant origin, contain phytoestrogens (phyto = plant). These natural compounds, which are partial agonists of oestrogen, are products either of the plant itself or of pathogenic fungi that may contaminate badly stored crops (the latter may be better described as mycoestrogens.)<sup>1</sup>

Most of the oestrogenic compounds produced by plants are non steroidal in structure, their potency being considerably less than that of their steroidal analogues. This does not preclude a biological effect, however, since they are present in relatively large amounts in certain foods, and the consequences of long term ingestion have yet to be established in humans.

In animal species, the best known example of such an effect is 'Clover Disease', an infertility syndrome occurring in sheep after prolonged grazing on certain varieties of clover.<sup>2</sup>

The identification of the active phytoestrogen metabolite, equol, in human urine has aroused considerable interest. Equol has a potency of  $10^{-3}$  to  $10^{-5}$  times less than that of oestradiol and is typically present in amounts similar to that of the endogenous oestrogens. Daily ingestion of 40 g of soya was demonstrated to increase by 50 to 1000 times the urinary excretion of this compound in four out of six subjects (three men and one woman).<sup>3</sup>

Given that urinary excretion of oestrogens in men is of the order of 30 to 50 mcg daily, and excretion of equol after soya ingestion was as much as five to seven mg daily, this could represent an increase in oestrogen load from anywhere between one tenth of a per cent and 20 per cent.

Other dietary factors besides phytoestrogens may affect hormonal status. For example, decreased fat, increased protein and increased fibre in the diet tend to lower oestrogen (and testosterone)

levels;<sup>4</sup> boron, found in fruits and vegetables, may elevate plasma levels of oestradiol and free testosterone;<sup>5</sup> dietary factors may affect levels of sex hormone-binding globulin (SHBG).<sup>4</sup> Furthermore, many phytoestrogens have such low activity that their effect would be predominantly antioestrogenic, thus tending also to counteract the effect of the more potent compounds with which they frequently coexist.

While some foods, such as soybeans, do appear to possess net oestrogenic activity, the question whether they affect the behaviour of Japanese men,<sup>6</sup> plausible as it may seem, is purely speculative, and heavily confounded by a host of other sociocultural variables.

With regard to the safety of soybean products, such as soy milk, the answer is probably yes, but like all things, in moderation. It is possible that a certain level of intake of such compounds is beneficial (not just from a feminist viewpoint), given the apparent hormone-dependent nature of many degenerative diseases.

It should be noted that life expectancy for Japanese is among the highest in the world as it is for Greeks, who also consume a diet high in phytoestrogens.

Mark L Wahlqvist  
Professor of Medicine  
Monash University  
Melbourne, Vic.

Gisela Wilcox  
BMedSci student

## References

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