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ISOFLAVONES IN SOYBEANS: A NEW APROACH AIMING AT DIFFERENT CONSUMERS

ISOFLAVONAS EM SOJA: NOVA VISAO OBJETIVANDO CONSUMIDORES DIFERENCIADOS

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Abstract

Isoflavones are phytoestrogens with several uses and medical properties. Among animals, especially mammals and fish, these phytoestrogens can bind to estradiol receptors, so they can be used for natural hormonal treatments. Isoflavones include genistein, daidzein and glycitein. A large number of plants also contain such compounds, mainly Leguminosae (such as soybeans, peas, lentils, chickpeas, etc.) and mushrooms. Isoflavones are commercially extracted from soybeans (Glycine max), which are rich in phytoestrogens, especially genistein. Antioxidant, anti-fungal, anticancer and estrogenic activities are among the characteristics of this aglycone substance, which is used to ameliorate the symptoms of menopause. The identification and quantification of isoflavones is needed to find new sources of this compound. As a secondary compound, its amount in the plant depends on the climate conditions and varies among different cultivars. In this work, immunoassays based on polyclonal antibodies from rabbits were used to quantify isoflavones in 27 soybean cultivars, harvested in two different plots in Sao Paulo State (in the municipalities of Itapetininga and Adamantina). The soybeans were harvested at 14% moisture, ground and submitted to heat treatment and methanol extraction. The supernatants were placed in microplates for the plate trapped antigen enzyme linked immunoassay (PTA-ELISA). This assay showed several advantages, in particular the ability to conduct speedy analysis of a large number of samples. Besides that, it has a lower cost in comparison to chromatography or radioimmunoassay. In this experiment, in general the isoflavone content was higher in the Adamantina samples (higher temperature and lower altitude) in comparison to Itapetininga. Our results show that the same cultivar, when grown in different locations, can be targeted at different consumer niches. Due to their high content of isoflavones, soybeans can be indicated for pharmaceutical uses, such as extraction of phytoestrogens, for treatment of menopause symptoms in women who cannot use hormones, or for several cosmetic uses. In contrast, when isoflavones are present in low amounts, these soybeans can be indicated for human consumption, especially for vegans and vegetarians, consumers who obtain proteins mainly from leguminous seeds. Lower amounts of isoflavones are desired for teenagers and children, since it is an estrogen mimic. Of the 27 soybean cultivars, one harvested at Itapetininga and six from Adamantina had had high isoflavone content; and the remaining 20 did not differ statistically at 5% by the Tukey test

Keywords

Leguminosae, menopause, vegetarians and vegans