

Equol status and changes in fecal microbiota in menopausal women receiving long-term treatment for menopause symptoms with a soy-isoflavone concentrate

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The knowledge regarding the intestinal microbial types involved in isoflavone bioavailability and metabolism is still limited. The present work reports the influence of a treatment with isoflavones for 6 months on the fecal bacterial communities of 16 menopausal women, as determined by culturing and culture-independent microbial techniques. Changes in fecal communities were analyzed with respect to the women's equol-producing phenotype. Compared to baseline, at 1 and 3 months the counts for all microbial populations in the feces of equol-producing women had increased strongly. In contrast, among the non-producers, the counts for all microbial populations at 1 month were similar to those at baseline, and decreased significantly by 3 and 6 months. Following isoflavone intake, major bands in the denaturing gradient gel electrophoresis (DGGE) profiles appeared and disappeared, suggesting important changes in majority populations. In some women, increases were seen in the intensity of specific DGGE bands corresponding to microorganisms known to be involved in the metabolism of dietary phytoestrogens (*Lactonifactor longoviformis*, *Faecalibacterium prausnitzii*, *Bifidobacterium* sp., *Ruminococcus* sp.). Real-Time quantitative PCR revealed that the *Clostridium leptum* and *C. coccoides* populations increased in equol producers, while those of bifidobacteria and enterobacteria decreased, and vice versa in the non-producers. Finally, the *Atopobium* population increased in both groups, but especially in the non-producers at three

months. As the main findings of this study, (i) variations in the microbial communities over the 6-month period of isoflavone supplementation were large; (ii) no changes in the fecal microbial populations that were convincingly treatment-specific were seen; and (iii) the production of equol did not appear to be associated with the presence of, or increase in the population of, any of the majority bacterial types analyzed. © 2015 Guadamuro, Delgado, Redruello, Flórez, Suárez, Martínez-Cambor and Mayo.

Equol

Fecal microbiota

Intestinal microbiology

Menopause

Probiotics

Soy isoflavone

creatinine

equol

isoflavone derivative

phytoestrogen

soy isoflavone concentrate

unclassified drug

adult

Article

bacterial count

Bifidobacterium

Clostridium

comparative study

culture technique

denaturing gradient gel electrophoresis

diet supplementation

drug effect

Faecalibacterium prausnitzii

feces analysis

feces microflora

female

gene amplification

gene sequence

human

menopausal syndrome

middle aged

nonhuman

real time polymerase chain reaction

Ruminococcus

ultra performance liquid chromatography

urinalysis