

## **Impact of prebiotics on equol production from soymilk isoflavones by two Bifidobacterium species**

### **ABSTRACT**

The influence of commercial prebiotics (fructo-oligosaccharides and inulin) and sugars (glucose and sucrose) on enhancing equol production from soymilk isoflavones by *Bifidobacterium longum* BB536 and *Bifidobacterium breve* ATCC 15700 was evaluated in vitro. Sterilized soymilk was inoculated with each bacterial species at 37 °C for 48 h. The growth and  $\beta$ -glucosidase enzyme activity for the two *Bifidobacterium* species in soymilk throughout fermentation were assessed. The highest viable count for *B. breve* (8.75 log CFU/ml) was reached at 36 h and for *B. longum* (8.55 log CFU/ml) at 24 h. Both bacterial species displayed  $\beta$ -glucosidase activity. *B. breve* showed increased enzyme activity (4.126 U) at 36 h, while *B. longum* exhibited maximum activity (3.935 U) at 24 h of fermentation. Among the prebiotics screened for their effect in isoflavones transformation to equol, inulin delivered the highest effect on equol production. The co-culture of *B. longum* BB536 and *B. breve* ATCC15700 in soymilk supplemented with inulin produced the highest level (11.49 mmol/l) of equol at 48 h of fermentation process. Level of daidzin declined whereas that of daidzein increased, and then gradually decreased due to formation of equol when soymilk was fermented using bifidobacterial. This suggests that the nutritional value of soymilk may be increased by increasing bioavailability of the bioactive ingredients. Collectively these data identify probiotics and prebiotic combinations suitable for inclusion in soymilk to enhance equol production.

**Keyword:** Food science; *Bifidobacterium* spp; Prebiotic $\beta$ -Glucosidase; Isoflavones; Transformation