

The Influence of Galactooligosaccharide Addition to A Plant Sterol-Enriched Beverage upon Plant Sterol Colonic Metabolization: A Clinical Trial

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Abstract: The consumption of milk-based fruit beverages enriched with plant sterols (PS) has previously showed a cholesterol-lowering effect in postmenopausal women [1]. The addition of galactooligosaccharides (GOS) to this kind of beverages could enhance their functionality, however, its effect on the colonic metabolism of PS is yet unknown. To shed light into this regard, a randomized, double blind, crossover study with postmenopausal women ($n=42$, 58 ± 4 years) was carried out with the aim of evaluating GOS effect on PS colonic metabolism. Volunteers consumed daily 250 mL of a PS-enriched beverage (1%, w/v) with or without GOS (1.8%, w/v) for 6 weeks and feces samples were collected before and at the end of each intervention period. The contents of PS (sitosterol, sitostanol, campesterol, campestanol and stigmasterol) and its metabolites (ethylcoprostanol from sitosterol, methylcoprostanone from campesterol and ethylcoprostenol from stigmasterol) were measured by CG-MS [2]. Statistically significant increments ($p<0.05$) in sterol concentrations (mg/g freeze-dry feces) were observed after the consumption of any of the beverages (with *vs.* without GOS addition) expressed as median (percentile 25;75%): 8.29 (1.49;17.27) *vs.* 10.79 (2.14;19.30) for sitosterol, 12.95 (2.65;20.66) *vs.* 14.47 (4.91;21.56) for ethylcoprostanol, 2.84 (1.34;4.91) *vs.* 3.16 (1.27;4.80) for sitostanol, 1.09 (0.34;2.03) *vs.* 1.41 (0.47;2.11) for campesterol, 0.15 (0.03;0.40) *vs.* 0.18 (0.03;0.45) for methylcoprostanone, 0.46 (0.20;0.80) *vs.* 0.44 (0.23;0.82) for campestanol, and 0.07 (0.00;0.19) *vs.* 0.09 (0.02;0.23) for stigmasterol. No significant changes were observed in ethylcoprostenol contents after the consumption of the beverage with or without GOS (0.01 (-0.01;0.02) *vs.* 0.002 (-0.02;0.02)). No significant differences in net increments were observed between beverages. These results indicate that the presence of GOS in PS-enriched beverages does not modify the colonic biotransformation of PS.

Keywords: clinical trial; feces; galactooligosaccharides; milk-based fruit beverages; plant sterols

[1] Alvarez-Sala et al. (2018), *Food Funct.*, 91: 5209-5219; [2] Cuevas-Tena et al. (2019), *Clin. Nutr.*, 38:1549-1560.

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