Fate of dietary phytosteryl/-stanyl esters: analysis of individual intact esters in human feces.

Abstract:

The objective was to investigate the metabolic fate of phytosteryl/-stanyl fatty acid and ferulic acid esters upon consumption by healthy humans. A capillary gas chromatographic methodology was employed to follow a randomized, single-blind three group crossover clinical trial and to quantify simultaneously individual intact esters, liberated phytosterols/-stanols and their metabolites in feces. Skimmed milk drinking yogurts enriched with complex mixtures of phytosteryl/-stanyl fatty acid esters and ferulates, respectively, were employed as food carriers. On average, 73% of total plant stanyl fatty acid esters and 80% of total plant steryl fatty acid esters were hydrolyzed. Among the individuals, the hydrolysis rates ranged from 40 to 96%. In addition, there were subject-dependent discrepancies between the amounts of phytosterols/-stanols actually determined in the feces and the calculated hydrolysis rates. On average, 69% of the amounts of sterols/stanols expected from the amounts of remaining intact esters were found. The study revealed large interindividual variability regarding the recoveries of dietary phytosteryl/-stanyl esters upon gastrointestinal passage in healthy humans. Nevertheless, there was a significant impact of the acid moiety (oleate=linoleate=linolenate>eicosanoate>palmitate>ferulate) on the hydrolysis rates; the influence of the phytosterol/-stanol moiety was less...
pronounced.

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