New meta-analysis shows that consumption of foods with added plant sterols leads to only modest increases in plasma plant sterol concentrations.

Key Highlights
- First systematic assessment of the effect of foods with added plant sterols on plasma plant sterol concentrations
- Intake of food with added plant sterols increases plasma sitosterol and campesterol concentrations whilst also reducing total- and LDL-cholesterol concentrations
- Total plant sterols remain below 1% of total sterols circulating in the blood

Consumption of plant sterol-enriched foods and effects on plasma plant sterol concentrations – a meta-analysis of randomized controlled studies

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Introduction
Intake of foods with added plant sterols effectively lowers plasma total- and LDL-cholesterol concentrations while increasing plasma plant sterols concentrations. The magnitude of this increase has not yet been systematically assessed until now.

This meta-analysis of randomised controlled studies was performed to estimate the absolute & relative change in plasma concentrations of the main plant sterols (i.e. sitosterol & campesterol) after consumption of foods with added plant sterols.
Methodology

- Studies searched in six databases through June 2012
- Studies selected that fulfilled predefined inclusion and exclusion criteria
- Relevant data extracted and data transformed where needed
- Control-adjusted absolute (µmol/L or mmol/L) and relative (%) changes plus accompanying within-study SEs calculated for each study for the following outcome variables:
  - Sitosterol
  - Campesterol
  - Total, LDL-cholesterol, HDL-cholesterol
- Random-effects models used to calculate net effects while weighing studies by the inverse of their variances
- Heterogeneity and publication bias analyses performed

Results

The meta-analysis included data from 41 studies (55 strata) with 2084 subjects in total. The average dose of plant sterols from enriched foods was 1.6 g/d (range: 0.3-3.2 g/d). Plasma sitosterol and campesterol concentrations were increased by on average 2.24 µmol/L (31%) and 5.00 µmol/L (37%), respectively, compared to control. Total- and LDL-cholesterol were reduced by on average 0.36 mmol/L (5.9%) and 0.33 mmol/L (8.5%), respectively. There was no effect on HDL-cholesterol.

The increase in sitosterol and campesterol was impacted by the dose of plant sterols, the baseline plant sterol concentration and the plant sterol composition of the test products. In the highest plant sterol dose category (2.0-3.2 g/d), increases in sitosterol and campesterol were on average 3.56 µmol/L and 7.64 µmol/L, respectively.

Conclusion

Intake of plant sterol enriched foods modestly increases plasma sitosterol and campesterol concentrations. However, total plant sterols remain below 1% of total sterols circulating in the blood.

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