



The effect of supplementation with a calcium rich marine-derived multi-mineral supplement and short-chain fructo-oligosaccharides on serum lipid concentrations in postmenopausal women: a 24 month double blind randomized controlled study

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Calcium (Ca) supplements are widely taken by postmenopausal women owing their role in the maintenance of bone health and the prevention of osteoporosis. Beneficial effects on circulating high-density lipoprotein (HDL), low-density lipoprotein (LDL) and total cholesterol (TC) have also been reported following Ca supplementation with or without vitamin D⁽¹⁾. Short-chain fructooligosaccharides (scFOS) increase Ca absorption *in vivo* and thus may mediate beneficial effects on lipid concentrations⁽²⁾. The aim of this study was to investigate the effects of a Ca rich marine-derived multi-mineral supplement administered alone or in combination with scFOS on serum lipid concentrations in postmenopausal women.

A total of 214 postmenopausal women (mean BMI 27.3 (SD 4.7) kg/m²) aged 48–75 years completed a two year double-blind placebo controlled trial. Participants were randomly assigned to daily supplements of 800 mg of Ca (2.4 g Aquamin[®]) ($n = 75$), 800 mg of Ca with 3 g of scFOSs (3.2 g Nutraflora[®]) (CaFOS) ($n = 60$) or maltodextrin (MD) ($n = 79$). The TC, LDL, HDL and triglyceride concentrations were measured at baseline and 24 months. Per-protocol analysis was undertaken using ANCOVA (with baseline measures as covariates) to assess time \times treatment effects between groups, controlling for age, BMI and baseline Ca intake (mean intake 868 mg Ca/day) using least significant difference for post hoc comparisons.

A significant time \times treatment effect was observed for LDL for the Ca ($P = 0.009$) and CaFOS groups ($P = 0.01$). Furthermore, a significant time \times treatment effects were observed for TC for the Ca and CaFOS groups ($P = 0.02$ and $P = 0.03$ respectively). There was no significant treatment effect of Ca or CaFOS on HDL, LDL:HDL and triglycerides. Supplementation with this Ca rich marine-derived multi-mineral supplement has beneficial effects on LDL and TC concentrations in postmenopausal women over two years. It is plausible that the available Ca is binding to fat and forming insoluble Ca-fatty soaps within the gut. These insoluble Ca-fatty soaps may limit lipid absorption and subsequently increase lipolysis⁽³⁾. Administration of Aquamin may have a role in maintaining cardiovascular health in women and further research on this area is warranted.

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