

**DIETARY EFFECTS ON BILE ACID AND
CHOLESTEROL EXCRETION IN MAN**
A study in ileostomy subjects

Akademisk avhandling

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- I. Bosaeus I, Andersson H. Short-term effect of two cholesterol-lowering diets on sterol excretion in ileostomy patients.
Am J Clin Nutr 1987;45:54-59.
- II. Bosaeus I, Carlsson N-G, Sandberg A-S, Andersson H. Effect of wheat bran and pectin on bile acid and cholesterol excretion in ileostomy patients. Hum Nutr: Clin Nutr 1986;40C:429-440.
- III. Bosaeus I, Andersson H. Influence of exchanging polyunsaturated fat for carbohydrate on bile acid and cholesterol excretion in ileostomy patients. Accepted for publication in Hum Nutr: Clin Nutr.
- IV. Bosaeus I, Carlsson N-G, Andersson H. Low-fat versus medium-fat enteral diets. Effects on bile salt excretion in jejunostomy patients. Scand J Gastroenterol 1986;21:891-896.

- V. Bosaeus I, Sandström B, Andersson H. Bile acid and cholesterol excretion in humans given soya-bean- and meat-protein-based diets: A study in ileostomy subjects. Accepted for publication in Br J Nutr.

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ABSTRACT

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The mechanisms by which dietary factors influence blood cholesterol levels are incompletely known. Change in faecal excretion of bile acids and cholesterol is one of several possible mechanisms involved. Earlier studies using sterol balance techniques have produced conflicting results, especially regarding effects of changes in dietary fat on faecal sterol excretion. Part of this controversy may be due to methodological problems and difficulties to study rapid changes.

Patients with an ileostomy offer a model for studies of sterol excretion, where several of these difficulties may be overcome - bowel transit time is short and bacterial degradation can be minimized, making short-term studies of excretion feasible.

The aim of this study in ileostomy subjects was to investigate the short-term effects of quantitative and qualitative changes in dietary fat, fibre and protein on bile acid and cholesterol excretion in man.

Constant experimental diets - both solid mixed diets and liquid formulas - were given in 2-4d periods to ileostomy subjects. Bacterial degradation of ileostomy contents was minimized by frequent collection and immediate freezing. Bile acids and cholesterol were quantified by gas-liquid chromatography.

Increase of polyunsaturated fat in a solid mixed diet gave an increased bile acid and cholesterol excretion. A low-fat solid mixed diet increased cholesterol and total sterol excretion. Addition of citrus pectin to a low-fibre diet increased bile acid and cholesterol excretion, whereas addition of wheat bran produced no consistent change. A low-fat liquid formula diet induced a decreased cholesterol excretion together with a tendency of increased bile acid excretion, so that total sterol excretion remained unchanged. When the same diet was given to patients with distal small bowel resections, a lower

bile acid excretion was found instead, indicating a possible physiological role of the ileum in sterol excretion in response to changes in dietary fat. Exchange of moderate amounts of meat protein for three different soy protein products did not alter sterol excretion.

It is concluded, that the ileostomy model seems appropriate for studies of dietary effects on sterol excretion in man. Various dietary changes with an expected cholesterol-lowering effect gave a prompt increase in sterol excretion. An early increase in sterol excretion may be part of the mechanism of action of cholesterol-lowering diets.

Key words: Dietary fat, dietary fibre, dietary protein, bile acids, cholesterol, ileostomy patients.

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