

Eating Beta-Glucan In Oats Lowers Blood Cholesterol

06 June 2012

In view of the increasing prevalence of cardiovascular disease (CVD), identifying functional foods that reduce CVD risk factors (including high blood cholesterol) is an important area of research. A body of evidence has accumulated, strengthening the association between oat beta-glucan consumption and a decrease in blood cholesterol, according to a review by researchers from the University of Manitoba, Canada.

The researchers reviewed studies that assessed the effects of oat beta-glucan on blood cholesterol levels over a minimum of two weeks. Sources of oat beta-glucan included oat bran, oat meal and rolled oats, which were consumed as breakfast cereals, biscuits, bread, muesli, muffins, and powders. The selected studies were published between 1997 and 2010; 22 studies met the inclusion criteria (20 clinical trials, 1 systematic review, and 1 meta-analysis).

Beta-glucan, a type of dietary fibre found in abundance in oats, has been recognised as having blood cholesterol-lowering properties. A major proposed mechanism is that dietary oat beta-glucan forms a viscous layer in the small intestine. The viscous layer attenuates the intestinal uptake of dietary cholesterol as well as the re-absorption of bile acids (which the body makes from cholesterol). In response, the body draws upon the pool of circulating cholesterol to produce new bile acids. Lower uptake of cholesterol from the gut combined with more bodily cholesterol used for bile acid production results in reduced levels of cholesterol circulating in the blood.

Overall, the majority of observational studies published since 1997 support a relationship between dietary beta-glucan and a reduction in blood cholesterol levels. Daily doses of at least 3 grams may reduce plasma total and LDL cholesterol levels by 5-10%, respectively. Such intakes can be achieved by consuming 2-4 portions daily of oat-based products (e.g. breakfast cereals, breads and crackers).

Interestingly, the mode of administration and/or the food matrix as well as the method of processing the oat products may all influence its cholesterol-lowering abilities. When beta-glucan is added to a liquid matrix, such as milk or fruit juice, it appears to be more effective compared to a solid matrix, such as bread or cookies which yielded conflicting results. Furthermore, the molecular weight and viscosity of oat beta-glucan may play a significant role in determining its cholesterol lowering ability. It has been observed that the physical structure of beta-glucan is prone to being damaged during the processing and cooking of oats, which may decrease its molecular weight and viscosity. However, this remains an area requiring further research.

The Dietetic Products, Nutrition and Allergies panel of the European Food Safety Authority (EFSA) concluded that on the basis of the data available, a cause and effect relationship has been established between the consumption of beta-glucans and the reduction of blood cholesterol concentrations. Hence, the following health claim has been approved by EFSA: "Regular consumption of beta-glucans contributes to maintenance of normal blood cholesterol concentrations." To be eligible for this claim, foods should



provide at least 3 grams per day of beta-glucans.

In line with the EFSA opinion, the authors concluded that consuming at least 3 grams per day of oat beta-glucan, as part of a diet low in saturated fat and a healthy lifestyle may promote cardiovascular health.

For further information, see

[Othman RA, et al. \(2011\). Cholesterol-lowering effects of oat beta-glucan. Nutrition Reviews 69 \(6\):299-309.](#)

[Scientific Opinion on the substantiation of a health claim related to oat beta glucan and lowering blood cholesterol and reduced risk of \(coronary\) heart disease pursuant to Article 14 of Regulation \(EC\) No 1924/2006. EFSA Journal 2010;8\(12\):1885.](#)