

WHAT MAKES RYE BREAD HEALTHY?

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Abstract

Rye bread baked of whole meal flour is a traditional element of the Finnish diet. The average consumption of rye bread in Finland is 66 g/d (women) and 100 g/d (men) (Findiet 2002). The rapidly expanding evidence from epidemiological studies about the protective effects of whole grain foods and cereal fibre against chronic diseases give a good background to study further the mechanisms by which rye bread may contribute to health.

In addition to its good and well balanced composition of macronutrients, rye features the highest dietary fibre content of all common grains. Rye is also rich in minerals, vitamins, sterols and phenolic compounds, such as phenolic acids, lignans and alkyresorcinols. These compounds, concentrated on the outer layers of rye grain, have many types of bioactivities (antioxidativity, anticarcinogenity etc) which may contribute to the health effects of rye bread. Our knowledge of their uptake and functions in the human body is quickly increasing.

Rye bread has in postprandial studies in healthy humans repeatedly shown to induce lower insulin responses than white wheat bread (Leinonen *et al.*, 1999, Juntunen *et al.*, 2002, 2003a). Intervention studies have shown that whole meal rye bread improves postprandial first-phase insulin secretion in oral glucose tolerance test, which is believed to be of importance for lowering the risk of type 2 diabetes (Juntunen *et al.*, 2003b, Laaksonen *et al.*, 2005). Most recently a diet rich in rye bread was shown to down-regulate gene expression in adipose tissue, including genes linked to insulin signalling and apoptosis, as compared to a diet rich in wheat and oat bread (Kallio *et al.*, 2007).

Rye bread is also known to improve bowel function (Gråsten *et al.*, 2000, 2007). Rye fibre is rich in arabinoxylan, which may positively affect the microflora of our gut, have prebiotic properties. Outer layers of rye bran also contain fructans, which are readily fermented by the gut bacteria and are known to be bifidogenic. The gut also acts as an important site for absorption of many of the phytochemicals of rye.

Key words: rye, health, dietary fibre, insulin response

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