

ABSTRACT

EFFECTS OF BRAN IN DIABETES MELLITUS

A clinical and experimental study on certain aspects of glucose metabolism. Page 1 - 76.

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The purposes of the present study were, firstly, to find out whether an increase in a concentrated fiber source such as bran affects glucose metabolism in diabetes mellitus and in the normal state, and secondly, to find out whether various rye and wheat brans differ in this respect.

Rye bran was used untreated or in a high-bran bread. This bread was prepared from whole rye flour and rye bran in the proportion of 3:2. For comparison, a low-bran bread made of refined rye meal was used. Extrusion-cooked, acid-treated or untreated wheat bran was also studied. The experimental diets were nutritionally adequate.

The experiments were performed on alloxan diabetic rats, normal rats, genetically diabetic CB7BL/KsJ-db/db-mice, normal KsJ-+/+-mice, non-inbred ob/ob-mice and on insulin-dependent diabetic patients.

The diabetic rats fed the high-bran bread lost less body weight, exhibited lower blood glucose levels and lower urinary glucose excretion than the animals fed the low-bran bread.

In KsJ-db/db-mice, the low-bran bread aggravated the diabetic syndrome. These animals had a shorter life-span and more severe hyperglycemia than the animals fed the high-bran bread.

Rye bran (untreated or in bread) slightly lowered blood glucose levels and led to slower weight gain in normal rats and mice and in ob/ob-mice than in those fed low-bran diets.

In insulin-dependent diabetic patients the effects of the high-bran bread were compared with those of either the low-bran bread or the patients' usual bread. The increase in dietary fiber was not more than 24 g/d. When the high-bran bread was included in the diet the glucose profile during the day improved or the insulin doses had to be reduced.

The urinary glucose-lowering effect in diabetic rats was greater for untreated rye bran than for the high-bran bread or for untreated wheat bran. On the other hand, extrusion-cooked or acid-treated wheat bran were as effective as untreated wheat bran in this respect.

Key words: Rye, wheat, bran, dietary fiber, diabetes mellitus, blood glucose, glucosuria, insulin.

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