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# **Fibre and the Diabetic Diet**

**An evaluation of the metabolic response to standardized meals**

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## ABSTRACT

Dietary fibre has a beneficial influence on glucose homeostasis, varying for different fibre sources. Fruit, wheat, rye and beet fibre were studied in isoenergetic meals for NIDD patients and healthy volunteers. The effects of extrusion cooking and flaking were also evaluated. The metabolic response was followed by continuous glucose monitoring and by analyses of pancreatic and gastrointestinal hormones as well as plasma lipid concentrations.

For NIDD patients the effects, reflected in the area and the shape of the glucose curve, were greater for the more soluble fibre types, but the insulin and C-peptide responses were largely unaffected by dietary fibre. Beet fibre gave increased somatostatin concentrations also in age-matched healthy controls. They showed, however, unchanged plasma glucose responses and markedly decreased insulin and C-peptide levels. These changes were associated with less pronounced postprandial glycerol reduction, but otherwise none of the fibre preparations affected the postprandial lipemia. Extruded bread, based on whole-grain wheat flour, with high availability of in vitro starch, elicited a greater glucose response than wholegrain wheat bread, associated with a modest increase of GIP and insulin and with a stimulated early glucagon secretion. Flaked rye seemed to contain both faster and slower carbohydrates than the corresponding rye bread of similar fibre content. Analyses of the glucose curves suggested that the effect of fibre might be mediated by an effect on glucose absorption and parallel experiments in rat indicated that a delayed rate of gastric emptying might contribute. Further, the liver glycogen content was higher in rats given a slowly absorbed gastric load.

A realistic increase in fibre content, given in long-term treatment, improved the metabolic control in NIDD patients, by decreasing the fasting blood glucose and LDL-cholesterol levels, as well as the LDL/HDL ratio. Hypothetically, slower absorption achieved with dietary fibre increases the proportion of glycogen in the liver. This postprandial improvement may cause the long-term trend to normalization of the fasting blood glucose level.

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ABBREVI

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METHODS

NIDD

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RESULTS

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REFERENCES

ACKNOWLEDGEMENTS