

FAILURE OF A HIGH-FIBRE DIET TO INFLUENCE  
GLUCOSE METABOLISM IN NORMAL SUBJECTS

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The postulated benefits of dietary fibre on glucose metabolism were studied in seven healthy men in a controlled environment. Diets rich in starch (carbohydrate provided 62% energy) contained either 16 g or 100 g fibre from several sources of food and were given for 10-d periods. Three parameters of glucose control were measured: glycaemic and plasma insulin responses to oral glucose, insulin sensitivity during insulin-glucose infusions, and glucose production measured by infusing tritiated glucose tracer.

In studies that tested in turn the effects of low-fibre, high-fibre and low-fibre, there was a progressive significant improvement in glucose tolerance and in insulin sensitivity; when this was taken into account there was no residual benefit due to fibre. The integrated glycaemic responses during the 2-h glucose tolerance tests were  $366 \pm 63$  vs  $372 \pm 60$  mM.min for high-fibre and low-fibre respectively; the corresponding integrated plasma insulin levels were  $6173 \pm 711$  vs  $6491 \pm 1100$   $\mu$ U/mL.min. Mean ( $\pm$  SEM) values for insulin sensitivity were  $11 \pm 1.5$  vs  $10 \pm 1.6$  mg glucose utilised/kg.min/ $\mu$ U insulin/mL.

Basal glucose production was also not influenced significantly by fibre, being  $2.0 \pm 0.1$ ,  $1.9 \pm 0.1$ , and  $2.4 \pm 0.3$  mg/kg.min with low-fibre, high-fibre and low-fibre respectively.

However the plasma cholesterol concentration was significantly lowered by high-fibre ( $138 \pm 10$  mg/dL versus  $157 \pm 11$  mg/dL with low-fibre).

The studies show that, in normal subjects eating high-starch diets, glucose metabolism is not improved if 100 g fibre is included in the diet. This does not negate the possibility that fibre may be beneficial when glucose metabolism is abnormal as in diabetes mellitus.