

## PARTICLE SIZE, SATIETY AND THE GLYCAEMIC RESPONSE

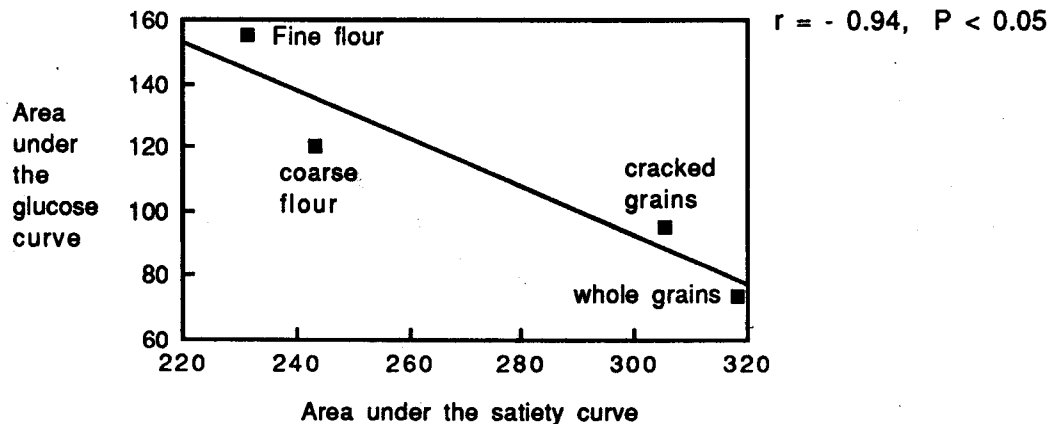
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We and others have shown an inverse association between glycaemic - insulin responses to food and subjective perception of satiety (Holt et al. 1992). In the present study we investigated the hypothesis that the smaller the particle size of the food, the higher the glycaemic - insulin response and the lower the satiety rating.

Ten healthy subjects (5 female, 5 male) consumed equal carbohydrate portions (0.75 g/kg body weight) of four isocaloric test meals of equivalent nutritional composition based on four different grades of wheat: whole grains, cracked grains, coarse and fine wholemeal flour. Plasma glucose, insulin and subjective satiety (measured by rating scale) were assessed over two hours and quantified as the area under the incremental curve (AUC) which was then used to calculate the glycaemic index (GI), insulin index (II) and satiety index (SI).

The GI values (mean  $\pm$  SEM) ranged from  $53.6 \pm 5.9$  for whole grains to  $106.6 \pm 11.2$  for fine flour, using white bread as a reference food. The whole grains meal produced a satiety response (SI) 150 % higher than the fine flour meal. Significant inverse relationships were observed between subjective satiety and both the plasma glucose and insulin responses (AUC:  $r = -0.94$  and  $r = -0.95$ ,  $P < 0.05$ ).

### Relationship between plasma glucose and perceived satiety



The results confirm that the higher the glycaemic - insulin response to carbohydrate-rich foods, the lower the perceived satiety. Since particle size is a major determinant of the glycaemic response, high speed milling which produces fine particle size flour may be implicated in the aetiology of overweight.

HOLT, S., BRAND, J., SOVENY, C. and HANSKY, J. (1992). *Appetite* 18: 129.