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The effects of resistant starch on appetite, food intake and insulin

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Previous work by our group has shown a significantly lower energy intake and postprandial insulin response following acute (24 h) consumption of resistant starch (RS), a type of insoluble dietary fibre, compared with an energy and carbohydrate matched placebo in healthy, normal weight young men[(1)]. Following on from this work, the current study investigated the effects of RS, consumed for 4 weeks, on appetite, food intake and insulin.

To date thirteen overweight participants have been recruited to this randomised cross-over study consuming 40 g/d RS for 4 weeks compared with the matched placebo. Diet diaries were completed for the last 7 d of each intervention period. At the end of each leg participants attended for two study visits. The first visit was a postprandial study morning; following a standardised fibre-free breakfast, blood samples and visual analogue scales (to assess effects on appetite) were completed every 30 min for 3 h. At the end of the 3 h period participants were provided with an *ad libitum* test meal (to assess effects on food intake). The second visit was an insulin modified frequently sampled intravenous glucose tolerance test, the data from which was modelled using the MINMOD Millennium program[(2)]. Seven participants (5M:2F) (aged 33 (SEM 5.4) years, BMI 29.3 (SEM 0.7) kg/m^2) have so far completed both legs of the intervention.

Interim analysis, for the seven participants who have completed, has shown no difference between the RS and placebo for appetite, food intake or postprandial metabolites. However, data from the frequently sampled intravenous glucose tolerance test (for six of the participants) has shown concentrations of insulin and c-peptide to be significantly higher ($P = 0.003$, $P = 0.039$, respectively) following the RS compared with the placebo. While modelling of the data does not yet reveal significant differences between the RS and placebo, the median value for the measure of first-phase insulin response was higher with the RS than placebo (543.5 µm.l-1.min *v.* 392.5 µm.l-1.min, respectively).

The findings so far indicate that RS does not have an affect on appetite and food intake but there may be the potential for RS consumption to enhance the first-phase insulin response, the primary defect in type 2 diabetes. We are currently increasing the sample size to confirm these initial findings.

1. Bodinham CL, Frost GS & Robertson MD (2010) Acute ingestion of resistant starch reduces food intake in healthy adults. *Br J Nutr* **103**, 917–922.
2. Bergman RN (2005) Minimal model: prospectives from 2005. *Horm Res* **64**, 8–15.