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The acute effects of resistant starch on the postprandial insulin responses and appetite

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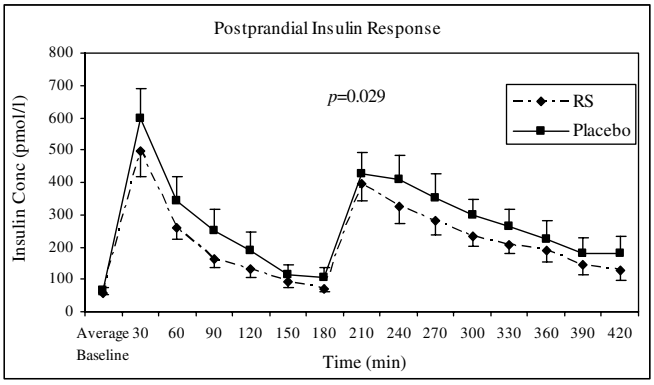
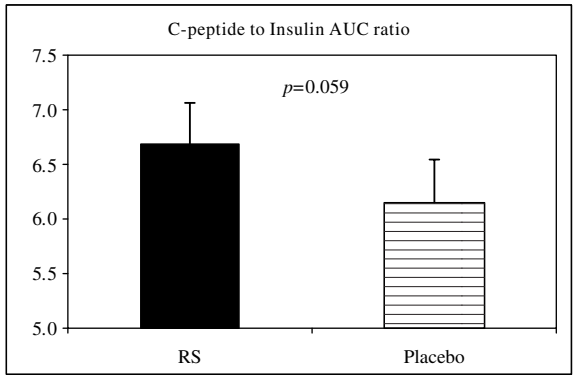
The aim of the study was to investigate the effects of 24 h supplementation with resistant starch (RS; type 2) on postprandial insulin responses and appetite compared with a placebo (rapidly-digestible starch).

The study was a randomised single-blind balanced cross-over study. On two different study visits that were ≥1 week apart twenty healthy young adult males consumed either 48 g RS or an energy- and carbohydrate-matched placebo. The supplements were consumed as part of standardised breakfast and lunch meals that were of identical portion size on each visit. Blood samples were taken every 30 min for the 7 h intervention period to assess postprandial glucose, insulin and C-peptide levels. Subjective measures of appetite were also taken using 100 mm visual analogue scales. Following the 7 h intervention food intake was quantified by an *ad libitum* test meal. Participants were then able to consume food and drink freely for the remainder of the day, which was recorded in diet diaries to obtain overall 24 h intake. Bowel diaries were also completed on the day of the study and the following day to monitor gastrointestinal effects and tolerance of the supplements.

Postprandial plasma glucose levels were not significantly different between the two supplements; however, following the RS supplement there was a significantly lower insulin response compared with the placebo supplement ($P=0.029$). The lower insulin response was not accompanied by a significantly different C-peptide response, although C-peptide:insulin was significantly higher following the RS supplement compared with the placebo (6.69 *v.* 6.13; $P=0.059$).





Following the RS supplement there was also a significantly lower intake at both the *ad libitum* test meal (5200 kJ *v.* 5560 kJ; $P=0.033$) and over the 24 h period (12 464 kJ *v.* 13 783 kJ; $P=0.051$) compared with the placebo supplement. However, these lower intakes were not accompanied by significant differences between the supplements for any of the subjective ratings of appetite. The supplements were reported to be well tolerated.

The lower insulin response seen in the present study, which was accompanied by a relatively similar glucose response, would suggest a beneficial role of RS in the postprandial insulin response, especially in insulin clearance, as suggested by the higher C-peptide:insulin. Following the RS there was also a significantly lower energy intake, which if maintained long term could have beneficial implications in the management of obesity. Further studies are required to: determine the mechanisms for the effect on the insulin response and appetite; establish whether the effect on energy intake can be maintained long term; identify whether a similar response is seen in other population groups.