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Nutrition Journal
Volume 5

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Consumption of resistant starch decreases postprandial lipogenesis in white adipose tissue of the rat

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Nutrition Journal 2006, 5:25 doi:10.1186/1475-2891-5-25

Published: 20 September 2006

Abstract

Chronic consumption of diets high in resistant starch (RS) leads to reduced fat cell size compared to diets high in digestible starch (DS) in rats and increases total and meal fat oxidation in humans. The aim of the present study was to examine the rate of lipogenesis in key lipogenic organs following a high RS or DS meal. Following an overnight fast, male Wistar rats ingested a meal with an RS content of 2% or 30% of total carbohydrate and were then administered an i.p bolus of 50 μCi $^3\text{H}_2\text{O}$ either immediately or 1 hour post-meal. One hour following tracer administration, rats were sacrificed, a blood sample collected, and the liver, white adipose tissue (WAT), and gastrocnemius muscle excised and frozen until assayed for total ^3H -lipid and ^3H -glycogen content. Plasma triglyceride and NEFA concentrations and ^3H -glycogen content did not differ between groups. In all tissues, except the liver, there was a trend for the rate of lipogenesis to be higher in the DS group than the RS group which reached significance only in WAT at 1 h ($p < 0.01$). On a whole body level, this attenuation of fat deposition in WAT in response to a RS diet could be significant for the prevention of weight gain in the long-term.