

The Dose Effect of Whey Protein on Insulin Responses in Pre-Diabetic and Type 2 Diabetics

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ABSTRACT

People with pre-diabetes and type 2 diabetes have shown an increase in insulin secretion after ingesting 55 g of whey protein coupled with a glycemic challenge. However, the effect of lower amounts of whey protein on insulin responses remains unclear. Our hypothesis was that both 20 g and 30 g of whey consumption prior to an oral glucose tolerance test (OGTT) would produce an increase in insulin secretion, with 30 g producing the greatest increase compared to a control. **PURPOSE:** The purpose of this study was to examine the effect of two different doses of whey protein ingested 30 min prior to a 50 g OGTT on glucose, insulin, C-peptide, and glucagon responses. **METHODS:** Diabetic or pre-diabetic participants (n=9, mean ± SD; age: 64.3 + 8.1 yrs; BMI: 29.4 + 6.0 kg/m²; body fat percentage: 42.5 + 7.8 %; fasting plasma glucose: 6.9 + 1.2 mmol/l; HbA1c: 6.4 + 0.6 %) completed three trials. The randomly assigned trials consisted of: 250 ml of water (CON), 250 ml of water + 20 g whey (20g), and 250 ml of water + 30 g whey (30g), followed by an OGTT. Blood was collected at -30, 0, 15, 30, 60, 90, 120, and 150 min for the measurement of glucose, insulin, C-peptide, and glucagon. The whey protein mixture was administered immediately following the -30 min blood draw, and the 50 g OGTT began immediately following the 0 min blood draw. Glucose was analyzed using a YSI 2900D glucose analyzer and insulin, C-peptide, and glucagon were measured via multiplex fluorescent detection (MagPix). A one-way repeated measures ANOVA (**RESULTS:** Incremental area under the curve (AUC) for glucose presented no difference between the 3 trials. Insulin AUC was significantly increased from CON to 20g (p=0.004, 36.3%), CON to 30g (p=0.002, 61.7%), and 20g to 30g (p=0.030, 18.6%). C-peptide and glucagon AUC significantly increased from CON to 20g (p=0.018, 20.6%; p=0.046, 33.1%) and CON to 30g (p=0.001, 30.1%; p=0.017, 33.7%). **CONCLUSION:** Whey protein elicited a dose response on plasma insulin, increasing concentrations from CON to 20g, and