A Whey Protein Hydrolysate May Positively Augment Resting Metabolism Compared to Intact Whey Protein

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Methods

In a single-blind, within-subjects design, 7 recreationally-active males (175.3±4.8 cm; 77.8±13.8 kg; 23.3±2.4 years; 62.3±11.3 kg lean) ingested 0.3g/kg lean soft tissue WPH (Lacprodan Hydro.365, Arla Foods Ingredients, Denmark), WPC (WPC80, Arla Foods Ingredients, Denmark), or carbohydrate (maltodextrin) and had their resting energy expenditure (REE) measured using indirect calorimetry over a 3-hour post-prandial period and compared to a pre-treatment, fasting baseline. Average dose of treatment was 18.7g of protein or carbohydrate. Participants were given 10 minute breaks after each hour of testing. Data were collected at pre, 15, 30, 45, 60, 90, 105, 120, 150, 165, and 180 minutes using the average of the previous 10 data points. Thermogenic effect of food (TEF) was estimated from the AUC of the REE delta values from baseline. Data were analyzed using 3x11 (treatment x time) repeated-measures ANOVA. Calculated delta and TEF values were analyzed using one-way ANOVA. If significant interactions were observed, Bonferroni post-hoc tests were used to locate differences. Data are reported as mean±standard deviation.

Results

No differences existed at baseline between treatments for REE (WPH: 0.015±0.003; WPC: 0.015±0.002; carbohydrate: 0.015±0.002 Cal/minute) or RQ (WPH: 0.81±0.04; WPC: 0.80±0.04; carbohydrate: 0.81±0.04). Significant interactions (p<0.05) were observed for REE and RQ. Wherein, WPH and WPC elevated REE at 45 (WPH: 0.164±0.099; WPC: 0.182±0.082 Cal/minute) and 60 (WPH: 0.211±0.162; WPC: 0.218±0.111 Cal/minute) minutes post-ingestion versus carbohydrate (45m: 0.092±0.117; 60m: 0.044±0.064 Cal/minute). Only WPH lowered RQ compared to carbohydrate at 90 minutes post-ingestion (WPH: 0.791±0.03; carbohydrate: 0.844±0.03). Delta from baseline indicated significant (p<0.05) increases in REE for both WPH (+0.026±0.069 Cal/minute) and WPC (+0.096±0.074 Cal/minute) versus carbohydrate (-0.073±0.033 Cal/minute) only at 90 minutes post-ingestion. TEF was significantly (p<0.05) greater for WPH (+12.2±8.0 Cal) and WPC (+11.9±4.4 Cal) than carbohydrate (+3.5±3.7 Cal) beginning at 90 minutes and remained greater through 180 minutes (WPH: +19.3±12.1 Cal; WPC: +19.9±8.1 Cal; carbohydrate: +3.8±2.2 Cal). RQ changes from baseline to 90 minutes and to 105 minutes post-ingestion were significant (p<0.05) only for WPH (90m: -0.022±0.02; 105m: -0.017±0.02) versus carbohydrate (90m: +0.036±0.05; 105m: +0.032±0.05).

Conclusions

Both WPH and WPC induce equal increases in REE over 3 hours versus carbohydrate of isocaloric dosage. WPH, but not WPC, significantly influenced substrate utilization with a directional shift favoring lipid metabolism versus the carbohydrate treatment, which may help explain previous findings of fat loss with WPH, but not WPC.

References


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