

HUMAN NUTRITION

Title: The effects of protein quantity and source on postprandial satiety and plasma amino acid concentrations (#10-170) revised

This project is an addendum to our study co-sponsored by the National Pork Board (NPB Project #09-155) and the National Cattlemen's Beef Association to evaluate the effects of dietary protein quantity and predominant source on indices of appetite and whole body energy expenditure during weight loss.

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Scientific Abstract: (This abstract was submitted to Experimental Biology, 4/12)

Effects of protein quantity and source (animal versus plant) on appetite and plasma amino acid responses in energy-restricted subjects

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This study was designed to assess appetitive and plasma amino acid (AA) responses to protein (P) intakes that span the acceptable macronutrient distribution range and predominantly from meat vs. plant sources. Thirty-four overweight/obese subjects (53 ± 12 y, BMI 30.8 ± 2.6 kg/m² mean \pm SD) were randomly assigned to consume diets with 750 kcal/d below energy need and beef/pork (5M:12F) or soy/pulses (6M:11F). All subjects randomly completed 3, 28d trials with the diets containing 10, 20 or 30% energy from P. On day 28 of each trial, subjects consumed a trial specific test meal and rated hunger and fullness before and 25, 60, 120, 180 and 240 min after eating. AAs were measured in 5 subjects each from the two P source groups. Postprandial (PP) branched chain, essential, and large neutral AA and leucine (weighted averages) were higher for beef/pork vs. soy/pulses ($p < 0.05$) and progressively higher with increasing P intake ($p < 0.01$). PP hunger was lower and fullness was higher than fasting ($p < 0.001$). The hunger response was greater for 30 vs. 20 and 10 % P, whereas P quantity did not affect fullness. Protein source did not affect hunger or fullness. PP hunger and fullness responses were not related to PP AA responses. Higher protein intake from meat or plant sources promotes reduced hunger, unrelated to differential plasma amino acid responses to feeding.

These research results were submitted in fulfillment of checkoff-funded research projects. This report is published directly as submitted by the project's principal investigator. This report has not been peer-reviewed.

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