RESEARCH ABSTRACT
HUMAN NUTRITION

Title: A Randomized, Controlled, Crossover Trial to Assess the Effects of a Lean Pork-containing, High-protein Breakfast on Indices of Satiety and Metabolic Health In Men and Women with Prediabetes **– NPB #16-104**

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Scientific Abstract:
BACKGROUND: Pre-diabetes is a common condition in the U.S. and places individuals at a higher risk for developing diabetes. Replacing refined carbohydrates (CHO) with protein in the diet may impact satiety and glucose and lipid metabolism.

OBJECTIVE: The objectives of this study were to assess the effects of consumption of a lean pork-containing, high protein (pPro) breakfast versus a refined CHO-rich breakfast for 2 weeks on satiety and cardiometabolic parameters in overweight or obese adults with pre-diabetes.

METHODS: In this crossover study, overweight or obese men and women with pre-diabetes were provided with either a pPro breakfast meal or a refined CHO breakfast meal (2-week intervention, ≥2-week washout). Visual analog scales (VAS) were used to determine satiety and related outcome measures; fasting glucose, insulin, lipids and related markers of glucose and lipid metabolism were assessed.

RESULTS: A total of 21 (13 females and 8 males) were included in the efficacy evaluable sample and had a mean (± standard error of the mean; SEM) age of 44.4 ± 3.1 y and a mean BMI of 30.4 ± 0.9 kg/m^2. Mean hunger net incremental area under the curve from pre-meal to 240 min post-meal (niAUC$_{0\text{-}240min}$) was significantly ($p = 0.041$) lower following the pPro breakfast intake compared to the refined CHO breakfast intake; mean desire to eat niAUC$_{0\text{-}240min}$ was also significantly ($p = 0.040$) lower following the pPro breakfast intake compared to the refined CHO breakfast intake. No other assessed markers of satiety, including mean niAUC$_{0\text{-}240min}$ for fullness and prospective consumption, daily VAS average scores for hunger and fullness and

ad libitum lunch energy intake and food intake, were significantly affected by diet condition. Energy $niAUC_{0\text{-}240min}$ and focus $niAUC_{0\text{-}240min}$ were also not significantly affected by intake of a pPro breakfast or refined CHO breakfast. The mean incremental AUC for glucose and insulin were significantly lower, $p = 0.003$ and $p = 0.001$, respectively, following the pPro breakfast intake versus the refined CHO breakfast intake. The mean percent change from baseline for triglycerides (TG) at 120 min was significantly ($p = 0.006$) less pronounced following intake of the pPro breakfast (10.0 ± 6.8% increase) compared to intake of the refined CHO breakfast (32.3 ± 7.7% increase). No other significant differences were observed related to the assessed lipid parameters.

CONCLUSIONS: Intake of a lean-pork containing breakfast may have a favorable effect on some acute aspects of satiety, and circulating glucose, insulin and TG levels. Evaluation of the longer-term effects of some of the acute differences observed between consuming lean pork versus refined CHO at the breakfast meal is warranted