

HUMAN NUTRITION

Title: A High Protein Weight Loss Treatment for Sarcopenic Obesity: Using Pork as a Meal Supplement to Improve Muscle Mass and Functional Status in Women – **NPB #13-207**

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Scientific Abstract:

The POWR-UP trial examined a protein-enhanced weight loss regimen for the treatment of sarcopenic obesity in middle-aged and older women. Women have higher rates of obesity than men and experience greater physical impairment as a result. Seeking an effective intervention for geriatric obesity, we randomized 80 obese (mean BMI=37.8 kg/m²) women aged 45 to 78 years to a Control-Weight Loss (500 kcal deficit; protein 0.8g/kg body wt; C-WL) or to a High Protein-Weight Loss (500 kcal deficit; protein 1.2 g/kg body wt; 30 g high quality protein at 3 meals; HP-WL) study arm. The protein for HP-WL was provided as pork—tenderloin, deli ham, chops, lean ground—for 2 of 3 meals each day.

Intervention delivery proved highly feasible and efficacious; both groups significantly lowered their calorie intakes ($p<0.001$). Compared to baseline, body weights were lower ($p<0.001$) by 5.7 and 5.2% at 4 months and 6.4 and 6.2% at 6 months for C-WL and HP-WL, respectively (no group difference). The HP-WL increased their protein intakes from 0.8 to 1.3 g/kg body wt/day and achieved (or exceeded) target protein intakes at each meal; average intakes were 31, 35, and 40 g, respectively, for breakfast, lunch, and dinner, compared to 16, 27, and 30 g for C-WL (by 3-day diet record).

Several measures of function showed clinically important improvements. The primary outcome of distance walked in 6 minutes increased ($p<0.01$) at 4 months in HP-WL and at 6 months in both arms ($p<0.01$). Along with 8-foot up and go scores ($p<0.01$), Short Physical Performance Battery scores also improved ($p<0.001$) at 4 and 6 months in both groups; however, only the HP-WL improved significantly ($p<0.01$) in the gait speed component. As expected, reductions in lean mass, fat mass, and waist circumference occurred at 4 ($p<0.01$) and 6 months ($p<0.01$) in both groups. Age tended ($p=0.058$) to be positively associated with weight loss and affected the time course, such that being older was associated with more weight loss at 6 than at 4 months ($F(1,48) = 4.71, p=0.03$).

Implications: In summary, both C-WL and HP-WL lost weight and robustly improved their ability to function. These findings agree with growing scientific evidence (including from our laboratory) that an optimal quality, quantity, and meal distribution of protein aids muscle function, and likely other metabolic systems as well. If these findings continued to be extended and confirmed, they will lend important support to an upwards revision of protein intake recommendations for older adults. **In summary**, our findings support the feasibility and the strong potential functional benefits of including a protein-enhanced weight loss regimen in obesity interventions for older women.

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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