High Protein Diet Reduces Food Intake and Adiposity and Alters the Intestinal Microbiome

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High protein diets reduce adiposity perhaps through effects on food intake and energy expenditure. Diet composition influences the gut microbiota and recent reports support this microbiome influences energy balance. We explored whether high protein diets influence the microbiome in the hindgut. Male Sprague-Dawley rats (n=24) were fed a control diet (15% kcal as protein) ad libitum (C) or pair-fed (PF) or a high protein diet (HP: 50% kcal as protein) for 14 d. HP rats consumed 15% less (p<0.05) but similar weight gain. EchoMRI and dissection on day 14 confirmed HP rats had a 24% decrease (p<0.05) in body fat. Rats were euthanized and digesta samples collected from the ileal-cecum. Bacterial 16s rRNA from digesta were amplified before being pyrosequenced. The greengenes database was used to align and identify the gene sequences of the bacterial species found. There was a 6-fold increase in Lactobacillus, a 42% decrease in Lachnospiraceae, and a 3-fold increase in “unclassified bacteria” in HP-fed rats. The later accounts for 23% of total microbial population. Further refinements of samples to define subspecies and the implication of the shift in microbiome when high protein diets are fed are still in progress. Supported by The Undergraduate Research and Mentoring in New Biology program, NSF award #1041233.