Protein Beneficial for Satiety and Weight Management

Introduction

Protein is required in the body for providing the necessary amino acid building blocks for growth, development, tissue repair, hormone and enzyme building. Evidence suggests that protein may also be beneficial for weight management, improved body composition, and satiety. There is slight variability in protein recommendations depending on the source. Generally most research agrees that protein intake must be consistent for weight management and body composition benefit.1

The United States Food and Nutrition Board Recommends 0.8g/kg/day for adults, while the World Health Organization (WHO), recommends 0.838g/kg/day and the most recent Dietary Guidelines for Americans from the US Department of Agriculture and the US department of Health recommend between 10-35% of total daily dietary macronutrient intake to be from protein.ii While the Recommended Dietary Allowance (RDA) for protein is generally similar among sources, many researcher suggest that the RDA is a minimum recommendation for protein intake, and that higher than RDA levels should be recommended for optimal health.1 Protein intake of approximately 20-30% of total caloric intake promotes better diabetes control and weight reduction, while improving inflammatory markers, lipid profile, blood pressure and insulin response, ultimately leading to significant reduction in hemoglobin A(1c).iii

Protein for Weight Management

Obesity is strongly associated with a significant increase in all cause mortality, specifically diabetes, insulin resistance, cardiovascular disease stroke and hypertension. Optimal management of body weight in overweight and obese people requires a multi-pronged approach, including dietary interventions, exercise promotion, and lifestyle and behavioral modifications. In one large multi-center trial in the Diabetes Prevention Program, researchers found that a weight reduction of 7% prevented the progression of glucose intolerance, to diabetes by 58%.iv In general weight reduction above 5% has been shown to decrease dyslipidemia, hypertension and diabetes, which are all risk factors for cardiovascular disease.v Optimizing protein intake in overweight and obese individuals may provide a beneficial non-pharmacologic, low cost and accessible treatment option for improving weight and body composition while decreasing obesity related mortality.

Protein quantity, type and timing of ingestion all play a role in the successful application of protein as a weight management intervention tool. Protein levels near 50g per ingestion time have been shown to have a strong effect satiety, while other research supports satiety promotion at doses between 15-20g.6,9 In one study of 60 subjects, those assigned to a low calorie, high protein, and low fat diet had better weight maintenance, of approximately 2.3 kg, after four weeks, when compared to subjects on a high-carbohydrate and low fat diet.vi

Protein may assist in weight management by promoting satiety better than other macronutrients.vii,vi,ix Timing of ingestion seems to play an important role in the
physiologic activity of protein ingestion. Breakfast macronutrient composition had significant effect on postprandial response and feelings of hunger in overweight, obese and normal weight children ages 8-12 years old. Children that consumed a protein rich breakfasts, consisting of 18g of protein, 22% of total energy intake, showed increased fullness, decreased desire to eat, and consumed less food following the protein rich breakfast than the children eating the carbohydrate rich breakfast regardless of body weight. This data suggests that including a protein rich breakfast may positively influence satiety enough to cause weight reduction over time. There is still some uncertainty about the best sources or combinations of protein for optimal satiety, but milk, whey, pea, casein, soy and egg have all shown strong satiating ability.

**Protein Types**

There is still some uncertainty about the best sources or combinations of protein for optimal satiety, but milk, whey, pea, casein, soy and egg have all shown strong satiating ability. In a 2015 study of dietary protein composition in adults with metabolic syndrome, researchers concluded that improvement in metabolic syndrome criteria and weight loss resulted regardless if protein was from animal or plant sources. In overweight adults with metabolic syndrome weight loss of approximately 5% was achieved and maintained after 23 weeks of intervention and follow-up an all protein rich diet groups. The assigned diet groups were as follows: Modified DASH diet with 18% protein and two-thirds plant protein sources, DASH diet rich in animal protein 18% protein with two-thirds animal source, moderate protein diet 27% protein two-thirds animal sources. This data suggests that weight reduction and improvements in metabolic syndrome criteria can be achieved with both plant and animal protein sources.

**Animal Sources**

Some research has suggested that whey has a stronger effect over casein protein for satiety and decreasing overall food intake, however more recent research finds whey and casein to have similar effects. Whey protein may be beneficial as a functional food because of its strong ability to effect feelings of satiety. Whey appears to influencing satiety signals that affect short-term and long-term food intake regulation. Dietary whey protein intake is influenced by whey protein when compared to placebo, carbohydrates and other proteins. Some research suggests that whey protein may also be insulinotropic and have an effect of the rennin-angiotensin-aldosterone system, thus may provide benefit for overweight and obese people with other associated comorbidities, like hypertension, type two diabetes and dyslipidemia.

Dairy products and milk proteins have been shown to reduce food intake and promote satiety, which is crucial for weight reduction and management. Milk proteins may also help stabilize blood glucose response when consumed both alone or in combination with other carbohydrates. Milk protein supports healthy body weight and may have physiologic functions that could prove beneficial for people with metabolic syndrome and associated conditions, by regulating food intake and blood glucose.

**Plant Sources**

Interest in non-animal protein sources is increasing. Research on plant protein sources suggests that pea protein may offer significant dietary therapeutic benefit for promoting
satiety and controlling weight. Research suggests that pea protein, given at a dose of 15g may offer superior ability to promote satiety when compared to a the same dose of whey protein, or milk protein (80% casein, 20%whey), based on hunger score and longest inter-meal interval, the time it takes the hunger score to reach baseline following the protein ingestion. Another study suggests that 20g of casein or pea protein had a stronger influence on reducing food intake and promoting the feeling of satiety, when compared to whey, egg albumin, or maltodextrin.

Conclusions
Dietary macronutrient content has a significant influence on weight reduction, weight maintenance and a number of cardiologic risk markers. Achieving protein intake in the range of 18-30% of total caloric intake may promote greater feelings of fullness and satiety, while reducing food intake and body weight by 5-7%. Plant and animal sources of protein both appear to have similar influence on physiologic mechanisms controlling food intake, blood glucose regulation, and other markers of metabolic syndrome. Including protein rich dietary composition in the treatment of overweight and obese adults and people with metabolic syndrome is an effective, non-pharmacologic nutrition-based intervention for the management of body weight and cardiometabolic disease.

References

10 Baum JI, Gray M, Binns A. Breakfasts Higher in Protein Increase Postprandial Energy Expenditure, Increase Fat Oxidation, and Reduce Hunger in Overweight Children from 8 to 12 Years of Age. J Nutr. 2015;145(10):2229-35.


