

Egg Nutrition Center



Protein Research

Symons TB, Sheffield-Moore M, Wolfe RR, Paddon-Jones D. A moderate serving of high-quality protein maximally stimulates skeletal muscle protein synthesis in young and elderly subjects. *J Am Diet Assoc* 2009;109:1582-6.

Ingestion of sufficient dietary protein is a fundamental prerequisite for muscle protein synthesis and maintenance of muscle mass and function. Elderly people are often at increased risk for protein-energy malnutrition, sarcopenia, and a diminished quality of life. This study sought to compare changes in muscle protein synthesis and anabolic efficiency in response to a single moderate serving (113 g; 220 kcal; 30 g protein) or large serving (340 g; 660 kcal; 90 g protein) of 90% lean beef. Venous blood and vastus lateralis muscle biopsy samples were obtained during a primed, constant infusion (0.08 $\mu\text{mol/kg/min}$) of L-[ring- $^{13}\text{C}_6$] phenylalanine in healthy young ($n=17$; 34 ± 3 years) and elderly ($n=17$; 68 ± 2 years) individuals. Mixed muscle fractional synthesis rate was calculated during a 3-hour postabsorptive period and for 5 hours after meal ingestion. Data were analyzed using a two-way repeated measures analysis of variance with Tukey's pairwise comparisons. A 113-g serving of lean beef increased muscle protein synthesis by approximately 50% in both young and older volunteers. Despite a threefold increase in protein and energy content, there was no further increase in protein synthesis after ingestion of 340 g lean beef in either age group. Ingestion of more than 30 g protein in a single meal does not further enhance the stimulation of muscle protein synthesis in young and elderly.