

Dietary protein to attenuate muscle loss in the older population

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Aging is accompanied by a progressive loss of skeletal muscle mass and strength, leading to the loss of functional capacity and an increased risk of developing chronic metabolic disease. The age-related loss of skeletal muscle mass is attributed to a disruption in the regulation of skeletal muscle protein turnover, resulting in an imbalance between muscle protein synthesis and degradation. As basal (fasting) muscle protein synthesis rates do not seem to differ substantially between the young and elderly, many research groups have started to focus on the muscle protein synthetic response to the main anabolic stimuli, *i.e.* food intake and physical activity. Recent studies suggest that the muscle protein synthetic response to food intake is blunted in the elderly. This anabolic resistance is now believed to represent a key factor responsible for the age-related decline in skeletal muscle mass. We recently applied contemporary stable isotope methodology with the use of specifically produced intrinsically labeled milk protein. This approach allows us to study dairy protein digestion and absorption kinetics, as well as the subsequent muscle protein synthetic response *in vivo* in humans. Besides food intake, physical activity and/or exercise stimulate muscle protein accretion. However, the increase in muscle protein synthesis rate following exercise largely depends on the timed administration of amino acids and/or protein prior to, during, and/or after exercise. Prolonged resistance type exercise training represents an effective therapeutic strategy to augment skeletal muscle mass and improve functional performance in the elderly. This provides proof that the ability of the muscle protein synthetic machinery to respond to anabolic stimuli is preserved up to very old age. Research is warranted to elucidate the interaction between nutrition, exercise and the skeletal muscle adaptive response. Such research is needed to define more effective strategies that will maximize the therapeutic benefits of lifestyle intervention in the elderly.