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The benefits of increased protein intake in older adults

Original paper



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Quick Summary

In this 12-week randomized controlled trial in older adults (average age of 60) with type 2 diabetes and signs of sarcopenia, a higher-protein diet improved physical function and prevented reductions in muscle mass.

Key study details

The 26 participants were assigned to eat either a higher-protein diet (1.2–1.5 grams of protein per kilogram of body weight per day) or a lower-protein diet (0.8–1.0 grams of protein per kilogram of body weight per day).

After 12 weeks, appendicular (arm and leg) lean mass decreased in the lower-protein group (–4 lb or –1.8 kg) compared to the high-protein group (+1 lb or +0.5 kg).

Physical function improved in the higher-protein group compared to the lower-protein group, as evidenced by improvements in handgrip strength, gait speed, and performance on a balance test. There was no difference between groups for performance on the sit-to-stand test or Timed Up and Go test.

The big picture

Muscle tissue is constantly turning over, with the rates of *muscle protein synthesis* (MPS) and muscle protein breakdown fluctuating throughout the day. The balance between these processes dictates changes in muscle mass. For example, MPS must exceed muscle protein breakdown for an increase in muscle mass to occur.

Aging-related declines in muscle mass, strength, and physical function are caused by a myriad of factors.^[6] One such factor is anabolic resistance, which refers to a blunted MPS response — to illustrate, if a young adult and an older adult consume 20 grams of protein, the responding increase in MPS will generally be lower in the older adult.^[7]

Because of this phenomenon, older adults benefit from consuming more protein. It's been shown that young adults are able to achieve a maximal MPS response following a single meal with a protein dose of approximately 0.24 grams per kilogram of body weight (g/kg), but older adults need approximately 0.40 g/kg to manage this feat.^[8]

In the summarized study, the lower-protein group consumed approximately the recommended dietary allowance (RDA) for protein intake (0.8 g/kg/day for adults), which is the amount estimated to meet basic nutritional requirements and avoid deficiencies in almost all adults. Otherwise stated, the RDA is not intended to be an estimate of the amount of protein needed to optimize skeletal muscle health. Accordingly, there was a decrease in muscle mass and grip strength in the lower-protein group compared to baseline and the higher-protein group.

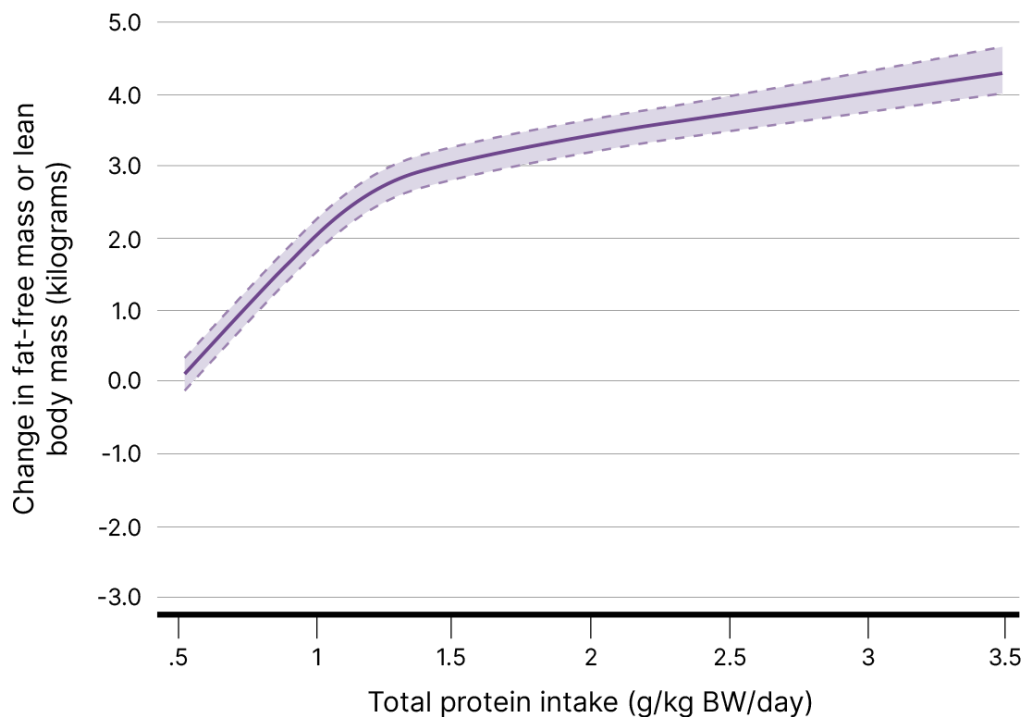
In support of these findings, a randomized controlled trial in older adults found that a daily protein intake of 1.5 g/kg produced a significantly greater MPS rate over 22 hours compared to 0.8 g/kg,^[9] and longer-term studies in older adults have reported that habitual consumption of the protein RDA is associated with a decrease in muscle mass over time.^{[10][11]} Additionally, a meta-analysis of randomized controlled trials published in 2020 reported that protein intakes that exceeded the RDA (1.3 g/kg, on average) increased muscle mass compared to the RDA.^[12]

Evidently, older adults benefit from consuming more protein than the RDA, and the results of the summarized study add to a body of evidence which demonstrates that the daily protein intake of older adults should be at least 1.2 g/kg, an amount that not many older adults achieve.^{[13][14]} Nevertheless, could a protein intake that is higher than what was evaluated in the summarized study be even more beneficial?

There's a lack of direct studies on this topic in older adults, but one 24-week study in participants ages 50 to 70 reported that a daily protein intake of 1.6 g/kg increased muscle mass compared to a daily protein intake of 1.2 g/kg.^[15] Although further studies in older adults with a similar design are needed, insight can be obtained from studies conducted in mostly younger adults.

In this population, a daily protein intake of at least 1.6 g/kg has been shown to maximize gains in muscle size and strength,^{[16][17]} and according to one meta-analysis, a dose-response relationship exists, which means that greater protein intakes (up to 3.5 g/kg/day) are associated with greater increases in muscle mass.^[18]

Dose-response relationship between total daily protein intake and changes in lean body mass



Adapted from Tagawa et al., 2020, Nutr Rev.

Because there's no reason to think that these findings wouldn't translate to older adults — if anything, it might be the case that older adults can benefit from even more protein due to anabolic resistance^[19] — individuals who are interested in doing everything they can to mitigate aging-related declines in muscle mass and physical caution should err on the side of caution and pursue a daily protein intake of at least 1.6 g/kg.

Our take

Observational studies in older adults report that higher protein intakes are associated with stronger grip strength, better physical function, and higher muscle mass.^{[1][2]} The results of the summarized study add to a body of evidence which indicates that older adults can benefit from a protein intake of 1.2g/kg/day.^[3] Although more direct studies in older adults are needed to determine how much protein is needed to optimize skeletal muscle health and physical function, there's good reason to think that it's at least 1.6 g/kg/day.^{[4][5]}

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