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## Science in the News - How much protein can the body use in a single meal for muscle building? Implications for daily protein distribution.

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### Science in the News

This article<sup>1</sup> investigates how much protein is required per meal for young adults based on previous literature. I chose this article because we talked about amino acids (protein building blocks) in class, and while I was at the gym, I overheard people talk about how much protein they've been eating in order to increase their gains. I realized that although I knew that some amino acids are necessary for us to get through our diet, I didn't know how much should be ingested and decided to look it up.

A prior paper suggested that 20-25 g of protein every 3 hours<sup>2</sup> optimizes muscle protein synthesis (MPS) in young adults (age not defined), and the authors of this article<sup>1</sup> sought to overcome some limitations they found in the prior study<sup>2</sup>. The main limitation that Schoenfeld and Aragon found was that the subjects of the prior study had 80g of whey protein over a period of 12 hours<sup>2</sup>, which was a very small portion of the subjects' body masses. The prior study also failed to address the fact that most people focusing on muscle gain regularly ingest 2-4 times that amount (80 g) per day<sup>1</sup>. The Schoenfeld and Aragon paper found that a minimum of 1.6 g of protein/kg/day (spread evenly across 4 meals) and a maximum of 2.2 g of protein/kg/day are the lower and upper thresholds for optimizing anabolism and lean tissue building.

The problem relates to what we're learning in the class because it deals with proteins (and therefore amino acids) and how they're utilized in the human body, specifically how it relates to muscle gain and nutrition. With so many companies making "natural" muscle-building supplements, I wondered how many were based on actual scientifically proven research instead of how many intelligent-sounding words they could cram into the name of the supplement(s).

In order to make these insights, Schoenfeld and Aragon looked at previous studies and aggregated that information to cover a broader spectrum of subjects (men *and* women, different ages, different diets, etc.) From this, they surmised that the protein ingestion threshold for optimizing anabolism and lean tissue building is 1.6-2.2 g/kg/day, spread out evenly across 4 meals (0.4-0.55 g/kg/meal).

I actually went straight to PubMed to look at primary articles/sources, since I knew that anything reported could be influenced with ads or biased to favor the supplement companies. I then looked up what various websites recommended for protein intake for people with regular and intense work outs. One bodybuilding site<sup>3</sup> stated that although the US has a recommended dietary allowance (RDA) of 0.8 g/kg/day for sedentary people, higher intensity athletes (like the subjects referenced in the primary article) need more than twice that amount. Since twice the RDA of sedentary people is 1.6g/kg/day, that lines up with the minimum threshold described in the paper. However, no upper limit of protein is described, and the bodybuilding article states that "studies have also shown no real benefit to consuming more than 20 grams of protein at any meal." This mostly contradicts the paper's upper threshold limit of 0.4-0.55g/kg/meal since it would require the subjects to only weigh between 80 and 110 pounds to have a max of 20 g of protein/meal; while it's possible that intense exercisers are 80-110 lbs, it's extremely unlikely that bodybuilders would weight that little. The website's claim that the upper limit is about 20 g/meal also doesn't take into account the athletes' individual weights, which was one of the limitations that Schoenfeld and Aragon pointed out earlier.

## References (AMA Citation):

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