

A full serving of protein at each meal needed for maximum muscle health

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Most Americans eat a diet that consists of little to no protein for breakfast, a bit of protein at lunch and an overabundance of protein at dinner. As long as they get their recommended dietary allowance of about 60 grams, it's all good, right?

Not according to new research from a team of scientists led by muscle metabolism expert Doug Paddon-Jones of the University of Texas Medical Branch at Galveston. This research shows that the typical cereal or carbohydrate-dominated breakfast, a sandwich or salad at lunch and overly large serving of meat/protein for dinner may not provide the best metabolic environment to promote healthy aging and maintenance of muscle size and strength.

The new study, now online in press in the *Journal of Nutrition*, shows that the potential for muscle growth is less than optimal when protein consumption is skewed toward the evening meal instead of being evenly distributed throughout the day.

Age-related conditions such as osteoporosis (bone weakening) and sarcopenia (muscle wasting) do not develop all of a sudden. Rather they are insidious processes precipitated by suboptimal lifestyle practices, such as diet and exercise, in early middle age, the study states.

The study's results were obtained by measuring [muscle protein synthesis](#) rates in healthy adults who consumed two similar diets that differed in protein distribution throughout the day. One of the diets contained 30

grams of protein at each meal, while the other contained 10 grams at breakfast, 15 grams at lunch and 65 grams at dinner. Lean beef was the primary nutrient-dense source of protein for each daily menu. Using blood samples and thigh muscle biopsies, the researchers then determined the subjects' [muscle protein](#) synthesis rates over a 24-hour period.

The UTMB researchers provided volunteers with a generous daily dose of 90 grams of protein—consistent with the average amount currently consumed by healthy adults in the United States. While very active individuals may benefit from a slightly higher protein intake, the team's previous research suggests that, for the majority of adults, additional protein will likely have a diminishing positive effect on muscle metabolism, while any less may fail to provide optimal muscle metabolism support.

When study volunteers consumed the evenly distributed protein meals, their 24-hour muscle [protein synthesis](#) was 25 percent greater than subjects who ate according to the skewed protein distribution pattern. This result was not altered by several days of habituation to either protein distribution pattern.

The results of the study, Paddon-Jones points out, seem to show that a more effective pattern of [protein consumption](#) is likely to differ dramatically from many Americans' daily eating habits.

"Usually, we eat very little protein at breakfast, a bit more at lunch and then consume a large amount at night. When was the last time you had just 4 ounces of anything during dinner at a restaurant?" Paddon-Jones said. "So we're not taking enough protein on board for efficient muscle building and repair during the day, and at night we're often taking in more than we can use. We run the risk of having this excess oxidized and ending up as glucose or fat."

A more efficient eating strategy for making muscle and controlling total caloric intake would be to shift some of the extra protein consumed at dinner to lunch and breakfast.

"You don't have to eat massive amounts of protein to maximize muscle synthesis, you just have to be a little more thoughtful with how you apportion it," Paddon-Jones said. "For breakfast consider replacing some carbohydrate, particularly the simple sugars, with high-quality protein. Throw in an egg, a glass of milk, yogurt or add a handful of nuts to get closer to 30 grams of protein, do something similar to get to 30 for lunch, and then moderate the amount of protein for dinner. Do this, and over the course of the day you will likely spend much more time synthesizing [muscle protein](#)."

More information: "Dietary Protein Distribution Positively Influences 24-h Muscle Protein Synthesis in Healthy Adults" *Journal of Nutrition*, 2014.

Provided by University of Texas Medical Branch at Galveston

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