

# Strength Index



## *Avoiding Muscle Loss as We Age*

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Inactive aging is associated with significant amounts of muscle loss on a year-by-year basis. Adults who do not perform some type of strength training sacrifice more than 5 pounds of muscle tissue every decade, and older adults lose even more than that. Because our muscles function as the engines of our bodies, muscle tissue reduction has serious repercussions in terms of health and fitness. For example, muscle loss leads to bone loss and metabolic slowdown.

Fortunately, our research and many other studies have shown that regular resistance exercise can prevent muscle loss, and can actually increase muscle mass at any age. For example, the 90-year old men and women in our nursing home study added almost 4 pounds of muscle after just 14 weeks of relatively brief (20 minute) resistance training sessions performed twice a week<sup>1</sup>. However, there are 2 sides to the muscle building coin. One side is providing the essential strength training stimulus, and the other side is attaining the essential amino acids (proteins) for muscle tissue remodeling.

While it would seem that most Americans eat enough protein-rich foods, this is frequently a faulty assumption, especially for adults over age 50. Basically, the amount of daily protein that is sufficient for younger adults is not adequate for older adults. There are two reasons for this common occurrence. First, older men and women do not process protein as efficiently as younger adults, so their bodies need more protein intake for tissue remodeling. Second, older adults' muscles need larger amounts of protein than younger adults to stimulate protein synthesis necessary for making new muscle tissue. According to leading nutrition researcher, Wayne Campbell, people over age 50 need at least 25 percent more protein than the Recommended Daily Allowance (RDA) to maintain their muscle tissue even if they perform regular resistance exercise<sup>2</sup>. He further states that to increase their muscle mass, seniors must combine sensible strength training with at least 50 percent more protein than the RDA. Many prominent

nutrition researchers suggest that older adults consume at least 20 grams of protein at breakfast, lunch and dinner, and some advocate eating up to 30 grams of protein at each meal.

In addition to eating more protein-rich foods, an emphasis should be placed on those that contain the essential amino acids. Only the essential amino acids in our food can produce protein synthesis, and of the 9 essential amino acids the most important appears to be leucine. These proteins are best attained in eggs, low-fat dairy products, lean meats, poultry and fish.

While eating more protein should be a lifestyle priority for senior men and women, the timing of protein consumption may be even more important with respect to muscle building. Several studies have demonstrated that ingesting protein shortly after a resistance training session is significantly more effective for gaining strength and adding muscle tissue<sup>3</sup>.

We recently conducted two strength training studies in which half of the participants drank a protein rich shake right after doing their resistance exercise (11 resistance machines) and the other half did not do so. In the first study<sup>4</sup>, those who consumed 24 grams of post-exercise protein added 5.5 pounds of muscle compared to 3.9 pounds of new muscle for those who did not take extra protein. In the second study<sup>5</sup>, those who consumed 24 grams of post-exercise protein added 5.2 pounds of muscle compared to 3.9 pounds of new muscle for those who did not take extra protein. Additionally, in the first study, the participants who drank the protein shake after their workout lost 9.0 pounds of fat, whereas those who did not do so lost only 4.9 pounds of fat.

Our research results are consistent with many other studies that have demonstrated significant body composition benefits by taking a protein-rich snack right after your strength training session. Although our study participants ingested a commercial protein shake, other research has shown similar effects from milk, chocolate milk, yogurt and other good sources of amino acids/proteins. Nutrition authorities recommend consuming about 20 grams of post-exercise protein for best results, and this is especially important for older adults who do not process protein as efficiently as younger adults.

It would therefore appear that the best approach for maintaining and increasing muscle tissue is a two-part process that combines regular strength training with post-exercise protein supplementation. Properly performed resistance exercise is essential for stimulating muscle tissue remodeling processes that lead to larger and stronger muscles.

Readily available protein is necessary for supplying the amino acids that provide the muscle tissue building blocks. According to leading medical researchers, muscle tissue is especially receptive to assimilating amino acids right after exercise. Consuming extra protein at meals has been shown to be less effective for muscle development than ingesting supplemental protein at the time of your workout.

If you are interested in building bone, our recent research indicates that post-exercise protein plus daily calcium and vitamin D supplements may be more beneficial than strength training alone. The participants in our 9-month osteoporosis prevention study who did not exercise or take the nutritional supplements lost 1 percent of their bone mineral density. Those who did strength training but did not take the nutritional supplements maintained their initial level of bone mineral density. The participants who did strength training and consumed the nutritional supplements increased their bone mineral density by 1 percent. These results are supported by other studies that have shown greater musculoskeletal benefits when resistance training is coupled with supplemental protein and key nutrients, such as calcium and vitamin D.

Based on our study results, we suggest that musculoskeletal development may be optimized by including the following exercise and nutrition components: (1) 8 to 12 resistance exercises that cumulatively address all of your major muscle groups, performed 2 or 3 non-consecutive days per week; (2) post-exercise protein supplement that supplies approximately 20-25 grams of protein; (3) daily calcium supplement that provides approximately 500 mg; and (4) daily vitamin D supplement that provides approximately 1200 IUs.

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