Nutrition Spotlight:

U.S. Dairy Proteins and Healthy Aging

Aging is inevitable. The key is to modify one's lifestyle — diet and exercise — today in order to avoid many of the health issues and compromising symptoms that may begin to arise in the future. Maintaining muscle mass, strength and functionality throughout the life span is an easy first step on the path toward healthy aging and maintaining a high quality of life. Without intervention, loss in muscle mass, strength and functionality can lead to a domino effect of consequences:

- Decreased activity
- Increased risk of falls
- Loss of autonomy
- Greater dependency

It's important to start early as the prevalence of muscle loss is ~ 0.5 to 1 percent per year starting around age 40.[1]

DID YOU KNOW

High-quality, complete dairy proteins such as U.S. whey and milk proteins can play an important role in healthy aging by helping people:

- Minimize or avoid progressive muscle loss that can lead to a syndrome called sarcopenia
- Follow a higher-protein diet to maximize health and wellness benefits
- Spread protein intake evenly at each meal throughout the day

SPOTLIGHT

Spotlight on Sarcopenia

Sarcopenia is the age-related loss of muscle and function. This progressive process can be characterized by approximately 3 to 8 percent reduction in lean muscle mass per decade after 30 years of age — a rate that may be even higher as individuals age.[2,3,4,5,13] Sarcopenia may affect more than 20 percent of people in their 60s and 70s,[6,7] and nearly 50 percent of people over 80 years of age.[8,9,10]

Inadequate dietary protein intake and lack of exercise can exacerbate this situation. The good news is that consuming protein at rest and following exercise can help support new muscle growth in older adults.[11,27]

3–8%

approximate reduction in lean muscle mass per decade due to sarcopenia after 30 years of age

20%

of people in their 60s and 70s may be affected by sarcopenia

50%

of people over 80 years of age may be affected by sarcopenia

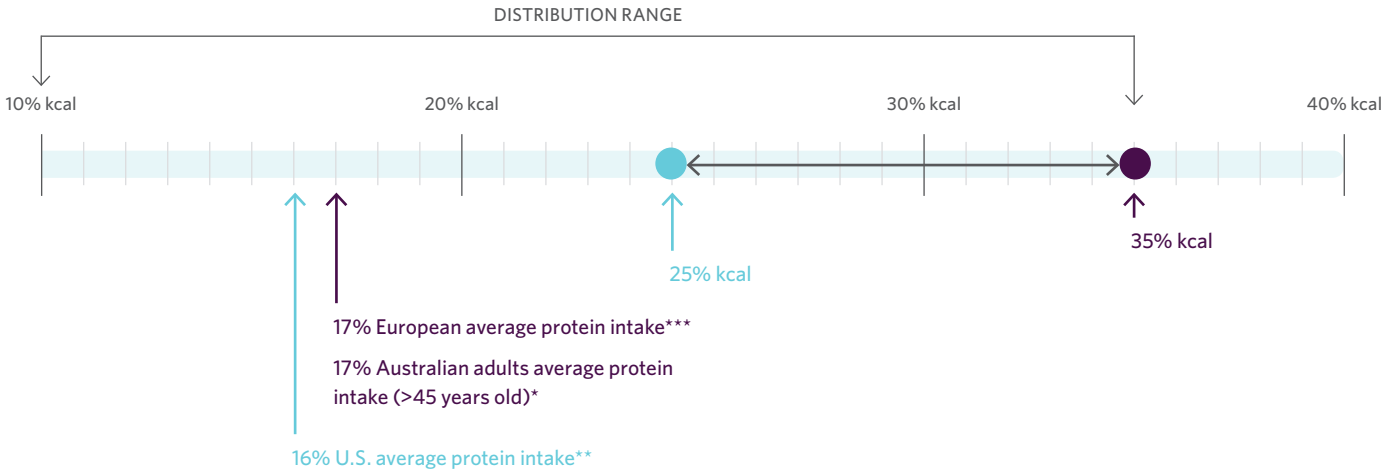
Three Simple Steps to Maintain — Even Increase — Muscle While Aging

1. Power Up on High-quality Protein

Diets higher in protein have been shown to help maintain muscle as people age.[1,11,12,13] In fact, consuming more protein than what is recommended in the United States and abroad[15,16] (0.8 g/kg body weight) may be more appropriate for muscle maintenance among the aging population. Research shows that protein intake at the higher end of the acceptable range as a percent of total calories (25 to 35 percent, depending on the country[17,22]) may help older individuals better maintain bone and muscle mass and meet their metabolic and physiological needs.[18]

INTERNATIONAL RECOMMENDATIONS FOR MEETING PROTEIN NEEDS AS A PERCENTAGE OF TOTAL CALORIES	
Australia/New Zealand[19]	up to 25%
European Food Safety Authority[20]	up to 27%
United States[21]	10% to 35%
World Health Organization[22]	up to 27%

CURRENT DAILY PROTEIN INTAKE RANGES FROM 14 TO 17 PERCENT OF DAILY CALORIES, SO THERE'S ROOM TO GROW.



*Australian Bureau of Statistics and Department of Health and Aged Care Services. National Nutrition Survey: Nutrient Intakes and Physical Measurements, Australia, 1995. Canberra: Australian Bureau of Statistics; 1998.
**Dairy Research Institute®; citing National Health and Nutrition Examination Survey, 2001-2008.
***European Food Safety Authority Panel on Dietetic Products, Nutrition and Allergies. *Scientific Opinion on Dietary Reference Values for Protein. EFSA J.* 2012;10(2):2557.

2. Spread Out Protein to Increase Effectiveness

There is a limit to how much protein the body can use at one time, so it's important to spread it out evenly throughout the day. Research and protein experts recommend aiming for 20 to 30 grams of high-quality protein per meal.[11,13,24,25] And, focusing on breakfast and snacks — which typically are low in protein — is a great first step to help people achieve this goal.

Balance protein intake throughout the day to maximize health and wellness benefits.

3. Add Exercise for More Benefits

Exercise helps to slow muscle loss associated with aging:[25]

Consuming 40 grams of protein after resistance exercise is recommended for older adults to maximize muscle protein synthesis.[25,27]

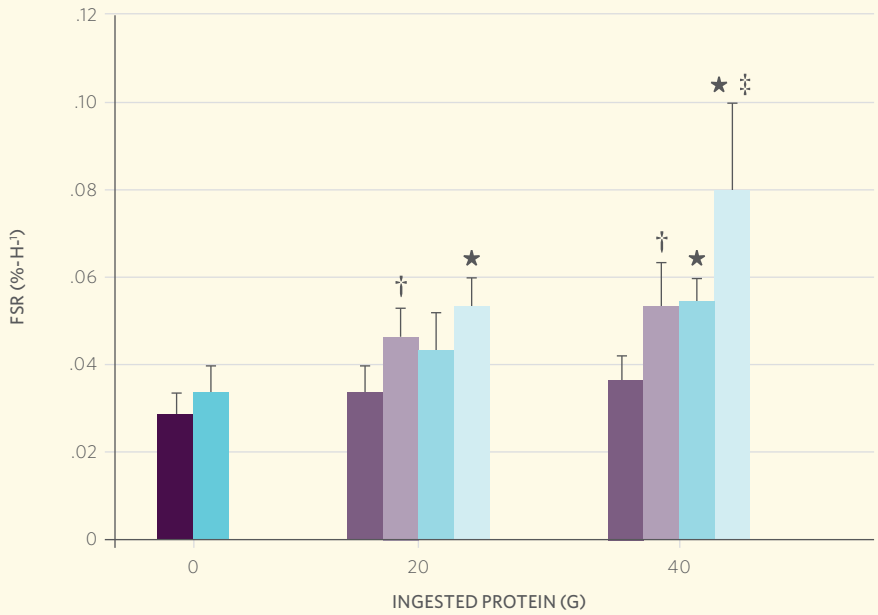
Strengthening exercise: at least two days a week[26]

THE RESEARCH

High-quality Protein Stimulates Muscle Protein Synthesis

In a 2012 study, when compared with soy protein, whey protein demonstrated a greater ability to stimulate muscle protein synthesis at rest and following resistance exercise.[28]

- 30 elderly men (age 71 ± 5 years) completed a bout of unilateral knee-extensor resistance exercise prior to ingesting no protein (0 grams), or either 20 grams or 40 grams of soy protein isolate. These results were compared with previous responses from similar-aged men who had ingested 20 grams and 40 grams of whey protein isolate.
- Rates of muscle protein synthesis for soy — both 20 grams and 40 grams — were lower than whey in both exercised and nonexercised leg muscles.
- Conclusion: Researchers found that consuming 20 grams of whey protein at rest, or 40 grams of whey protein following resistance exercise, maximized muscle protein synthesis in older adults.



RESTED
RESTED - SOY
RESTED - WHEY
EXERCISED
EXERCISED - SOY
EXERCISED - WHEY

† Indicates a significant (P<0.05) difference from the 0 g dose within the rest condition

★ Indicates a significant (P<0.05) difference from the 0 g dose within the exercised condition

‡ Indicates a significant (P<0.05) difference from the 20 g exercised condition within the same protein source

Data are means ± SD.

Aerobic exercise: at least three days a week, aiming for 2 1/2 hours per week[26]

[1] Paddon-Jones D, Short KR, Campbell WW, Volpi E, Wolfe RR. Role of dietary protein in the sarcopenia of aging. *Am J Clin Nutr.* 2008;87(5):1562S-1566S.

[2] Volpi E, Nazemi R, Fujita S. Muscle tissue changes with aging. *Curr Opin Clin Nutr Metab Care.* 2004;7(4):405-410.

[3] Holloszy JO. The biology of aging. *Mayo Clin Proc.* 2000;75(Suppl S3-8):S8-9.

[4] Melton LJ III, Khosla S, Crowson CS, et al. Epidemiology of sarcopenia. *J Am Geriatr Soc.* 2000;48(6):625-630.

[5] Fielding RA, Vellas B, Evans WJ, et al. Sarcopenia: an undiagnosed condition in older adults. Current consensus definition: prevalence, etiology, and consequences. International working group on sarcopenia. *J Am Med Dir Assoc.* 2011;12(4):249-256.

[6] Berger MJ, Doherty TJ. Sarcopenia: prevalence, mechanisms, and functional consequences. *Interdiscip Top Gerontol.* 2010;37:94-114.

[7] Janssen I, Heymsfield SB, Ross R. Low relative skeletal muscle mass (sarcopenia) in older persons is associated with functional impairment and physical disability. *J Am Geriatr Soc.* 2002;50(5):889-896.

[8] Baumgartner RN, Koehler KM, Gallagher D, et al. Epidemiology of sarcopenia among the elderly in New Mexico. *Am J Epidemiol.* 1998;147(8):755-763.

[9] Iannuzzi-Sucich M, Prestwood KM, Kenny AM. Prevalence of sarcopenia and predictors of skeletal muscle mass in healthy, older men and women. *J Gerontol A Biol Sci Med Sci.* 2002;57(12):M772-M777.

[10] von Haehling S, Anker SD. Cachexia as a major underestimated and unmet medical need: facts and numbers. *J Cachexia Sarcopenia Muscle.* 2010;1(1):1-5.

[11] Pennings B, Groen B, de Lange A, et al. Amino acid absorption and subsequent muscle protein accretion following graded intakes of whey protein in elderly men. *Am J Physiol Endocrinol Metab.* 2012;302(8):E992-E999.

[12] Morley JE, Argiles JM, Evans WJ, et al. Nutritional recommendations for the management of sarcopenia. *J Am Med Dir Assoc.* 2010;11(6):391-396.

[13] Paddon-Jones D, Rasmussen BB. Dietary protein recommendations and the prevention of sarcopenia: Protein, amino acid metabolism and therapy. *Curr Opin Clin Nutr Metab Care.* 2009;12(1):86-90.

[14] U.S. Department of Agriculture and U.S. Department of Health and Human Services. *Dietary Guidelines for Americans 2010.* 7th ed. Washington, DC: U.S. Government Printing Office; 2010.

[15] European Food Safety Authority Panel on Dietetic Products, Nutrition and Allergies. *Scientific Opinion on Dietary Reference Values for Protein. EFSA J.* 2012;10(2):2557.

[16] World Health Organization, Food and Agriculture Organization of the United Nations, United Nations University. *WHO Technical Report Series 935: Protein and Amino Acid Requirements in Human Nutrition: Report of a Joint FAO/WHO/UNU Expert Consultation.* Geneva, Switzerland: WHO Press; 2007.

[17] Institute of Medicine. *Nutrition and Healthy Aging in the Community: Workshop Summary.* Washington, DC: The National Academies Press; 2012:93: 5-10.

[18] Bauer J, Biolo, G, Cederholm T, et al. Evidence-based recommendations for optimal dietary protein intake in older people: a position paper from the PROT-AGE Study Group. *J Am Med Dir Assoc.* 2013;14(8):1-18.

[19] Australian Government, Department of Health and Ageing, National Health and Medical Research Council. *Nutrient Reference Values for Australia and New Zealand: Including Recommended Dietary Intakes.* Canberra, ACT: National Health and Medical Research Council; 2006.

[20] European Food Safety Authority Panel on Dietetic Products, Nutrition and Allergies. *Scientific Opinion on Dietary Reference Values for Protein. EFSA J.* 2012;10(2):2557.

[21] U.S. Department of Agriculture and U.S. Department of Health and Human Services. *Dietary Guidelines for Americans 2010.* 7th ed. Washington, DC: U.S. Government Printing Office; 2010.

[22] World Health Organization, Food and Agriculture Organization of the United Nations, United Nations University. *WHO Technical Report Series 935: Protein and Amino Acid Requirements in Human Nutrition: Report of a Joint FAO/WHO/UNU Expert Consultation.* Geneva, Switzerland: WHO Press, 2007.

[23] National Center for Health Statistics. Table 67: Mean macronutrient intake among adults aged 20 and over, by sex and age, United States, selected years 1971-1974 through 2007-2010. In: *Health, United States, 2013: With Special Feature on Prescription Drugs.* Hyattsville, MD: U.S. Government Printing Office; 2014: 221.

[24] Layman, DK. *Dietary Guidelines* should reflect new understandings about adult protein needs. *Nutr Metab.* 2009;6:12.

[25] Breen L, Phillips SM. Skeletal muscle protein metabolism in the elderly: interventions to counteract the 'anabolic resistance' of ageing. *Nutr Metab (Lond).* 2011;5:8:68.

[26] U.S. Department of Health and Human Services. Active Older Adults. In: *2008 Physical Activity Guidelines for Americans.* 2008: 29-32.

[27] Yang Y, Breen L, Burd NA, et al. Resistance exercise enhances myofibrillar protein synthesis with graded intakes of whey protein in older men. *Br J Nutr.* 2012;108(10):1780-1788.

[28] Yang Y, Churchward-Venne TA, Burd NA, et al. Myofibrillar protein synthesis following ingestion of soy protein isolate at rest and after resistance exercise in elderly men. *Nutr Metab (Lond).* 2012;9(1):57.

GET IN TOUCH

Looking for more information on dairy proteins?

While the U.S. Dairy Export Council® (USDEC) does not manufacture or sell dairy products, we proudly support the people who do. Search ThinkUSAdairy.org/Nutrition for more information on the health and nutritional benefits of U.S. dairy proteins.






To learn more and find a USDEC representative near you, go to ThinkUSAdairy.org/global-presence.

U.S. Dairy Export Council
Ingredients | Products | Global Markets

Managed by Dairy Management Inc.™