

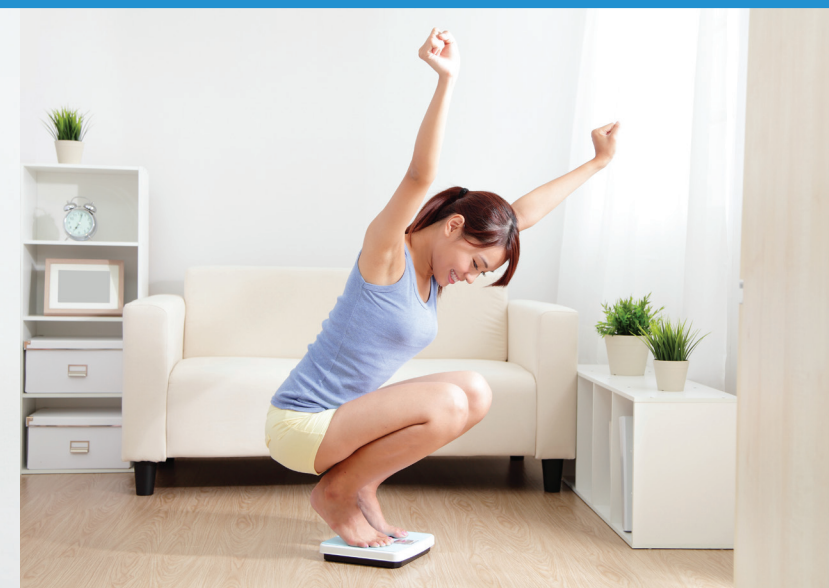


Power of U.S. Whey and Milk Proteins

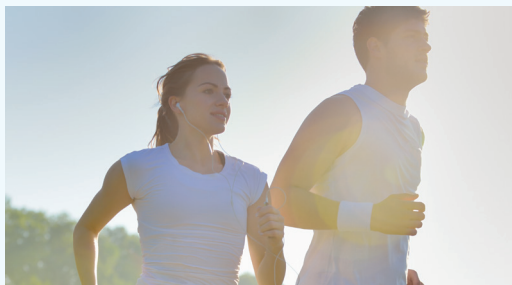


✓ Smart Choices to Support

- Healthy Aging
- Weight Management
- Exercise Recovery
- Muscle Maintenance



U.S. Dairy Proteins: Get the Facts



Misconception #1

Muscle loss only happens in the elderly population.

Fact: Sarcopenia, the age-related loss of muscle and function, is a progressive process that can be characterized by approximately 3-8% reduction in lean muscle mass per decade after 30 years of age.^{1,2,3,4,5} U.S. dairy proteins can help protect against age-related muscle loss.



Misconception #2

Dairy proteins are most suitable for athletes and body builders.

Fact: U.S. whey and milk proteins, as part of a higher protein diet, have much broader benefits including helping people maintain a healthy weight,^{6,7,8,9,10,11} curbing hunger,^{12,13,14} building lean muscle (with regular resistance exercise),^{15,16,17} enhancing exercise recovery,^{18,19,20,21} and maintaining muscle.^{22,23}



Misconception #3

Most people already get enough protein in their daily diets.

Fact: Protein recommendations are for a minimum amount needed to avoid deficiency, not an optimal amount to maximize benefits. Seniors, athletes, weight conscious individuals and others may benefit from a higher protein diet. Both protein quantity and quality matter for optimizing benefits.



Misconception #4

People can optimize the benefits of protein by eating one high-protein meal a day.

Fact: There is a limit to the amount of protein the body can use at once; it is important to evenly space out protein intakes throughout the day — aim for 20-30 g of high-quality protein at each meal. Adding whey protein to breakfast is a simple way to boost protein intake.

Protein Type	PDCAAS	Biological Value	Net Protein Utilization	Protein Efficiency Ratio
Whey Protein	1.00	104	92	3.2
Milk	1.00	91	82	2.5
Casein	1.00	77	76	2.5
Egg	1.00	100	94	3.9
Soy Protein	1.00	74	61	2.2
Beef	0.92	80	73	2.9
Black Beans	0.75	N/A	0	0
Peanuts	0.52	N/A	N/A	1.8
Wheat Gluten	0.25	64	92	0.8

U.S. dairy proteins are complete sources of essential and non-essential amino acids and score at the top of measurements used for protein quality.

For references and more information on U.S. dairy health and nutritional benefits, visit www.ThinkUSAdairy.org/Nutrition.

Protein Source	Leucine	BCAA
Whey Protein Isolate	14%	26%
Casein	10%	23%
Milk Protein	10%	21%
Egg Protein	9%	20%
Muscle Protein (Meat, Chicken, etc.)	8%	18%
Soy Protein Isolate	8%	18%
Wheat Protein	7%	15%

Whey protein, specifically, stands out as one of the best sources of branched-chain amino acids (BCAA), including leucine, which is unique in its ability to initiate new muscle synthesis.

References

- 1 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.
- 2 Volpi E, Nazemi R, Fujita S. Muscle tissue changes with aging. *Curr Opin Clin Nutr Metab Care*. 2004;7:405-410.
- 3 Holloszy JO. The biology of aging. *Mayo Clin Proc*. 2000;75(Suppl):S3.
- 4 Melton LJ III, Khosla S, Crowson CS, et al. Epidemiology of sarcopenia. *J Am Geriatr Soc*. 2000;48:625-630.
- 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;12:249-256.
- 6 Josse A, Atkinson S, Tarnopolsky M, Phillips SM. Increased consumption of dairy foods and protein during diet- and exercise-induced weight loss promotes fat mass loss and lean mass gain in overweight and obese premenopausal women. *J Nutr*. 2011;141:1626-1634.
- 7 Baer D, Stote KS, Paul D, Harris G, Rumpler W, Clevidence B. Whey protein but not soy alters body weight and composition in free-living overweight and obese adults. *J Nutr*. 2011;141:1489-1494.
- 8 Westerterp-Plantenga M, Nieuwenhuizen A, Tome D, Soenen S, Westerterp K. Dietary protein, weight loss, and weight maintenance. *Annu Rev Nutr*. 2009;29:11.1-11.21.
- 9 Claessens M, van Baak M, Monsheimer S, Saris WHM. The effect of a low-fat, high-protein or high-carbohydrate ad libitum diet on weight loss maintenance and metabolic risk factors. *Int J Obes*. 2009;33:296-304.
- 10 Westerterp-Plantenga M, Lejeune M, Nijs I, van Ooijen M, Kovacs E. High protein intake sustains weight maintenance after body weight loss in humans. *Int J Obes*. 2004;28:57-64.
- 11 Lejeune M, Kovacs E, Westerterp-Plantenga S. Additional protein intake limits weight regain after weight loss in humans. *Br J Nutr*. 2005;93:281-289.
- 12 Institute of Medicine. *Macronutrients and healthful diets. Dietary Reference Intakes for Energy, Carbohydrate, Fiber, Fat, Fatty Acids, Cholesterol, Protein, and Amino Acids (Macronutrients)*. 2005. Washington, DC, National Academies Press.
- 13 Smeets A, Soenen S, Luscombe-Marsh N, Ueland O, Westerterp-Plantenga M. Energy expenditure, satiety, and plasma ghrelin, glucagon-like peptide 1, and peptide tyrosine-tyrosine concentrations following a single high-protein lunch. *J Nutr*. 2008;138:698-702.
- 14 Leidy H, Armstrong C, Tang M, Mattes R, Campbell W. The influence of higher protein intake and greater eating frequency on appetite control in overweight and obese men. *Obesity*. 2010;18:1725-1732.
- 15 Churchward-Venne T, Burd N, Mitchell C, et al. Supplementation of a suboptimal protein dose with leucine or essential amino acids: Effects on myofibrillar protein synthesis at rest and following resistance exercise in men. *J Physiol*. 2012;590:2751-2765.
- 16 Tang J, Phillips S. Maximizing muscle protein anabolism: The role of protein quality. *Curr Opin Clin Nutr Metab Care*. 2009;12:66-71.
- 17 Tang J, Moore D, Kujbida G, Tarnopolsky M, Phillips S. Ingestion of whey hydrolysate, casein, or soy protein isolate: Effects on mixed muscle protein synthesis at rest and following resistance exercise in young men. *J Appl Physiol*. 2009;107:987-992.
- 18 Tipton KD, Elliott TA, Cree MG. Ingestion of casein and whey proteins result in muscle anabolism after resistance exercise. *Med Sci Sports Exerc*. 2004;36:2073-2081.
- 19 Howarth KR, Moreau NA, Phillips SM, et al. Coingestion of protein with carbohydrate during recovery from endurance exercise stimulates skeletal muscle protein synthesis in humans. *J Appl Physiol*. 2009;106:1394-1402.
- 20 Tang JE, Manolagos JJ, Kujbida GW, et al. Minimal whey protein with carbohydrate stimulates muscle protein synthesis following resistance exercise in trained young men. *Appl Physiol Nutr Metab*. 2007;32:1132-1138.
- 21 Tipton KD, Elliott TA, Cree MG, et al. Stimulation of net muscle protein synthesis by whey protein ingestion before and after exercise. *Am J Physiol Endocrinol Metab*. 2007;292:E71-E76.
- 22 Houston D, Nicklas J, Harris T, et al. Dietary protein intake is associated with lean mass change in older, community-dwelling adults: The Health, Aging, and Body Composition (Health ABC) study. *Am J Clin Nutr*. 2008;87:150-155.
- 23 Mojtahedi M, Thorpe M, Karampinos D, et al. The effects of a higher protein intake during energy restriction on changes in body composition and physical function in older women. *J Gerontol A Biol Sci Med Sci*. 2011;66:1218-1225.