



KARYN SHANKS MD

Heart, Hope, Healing

Protein: a Primer

BY KARYN SHANKS MD | DECEMBER 10, 2018



What Are Our Daily Protein Requirements?

I look at the food diaries of my clients every day in my office and almost no one consumes enough protein to meet their basic needs. Protein runs all of the major business of the body. Without enough we are left vulnerable and at risk for illness, loss of muscle mass, injury, and loss of vital energy. Optimizing daily protein intake is a crucial aspect of improving health.

What is Protein?

Protein is a macronutrient that we digest into amino acids and small protein fragments to become the foundation of all structure and function in the body. They work synergistically with health fats, complex carbohydrates, and the vast array of micronutrients and phytonutrients we get from our food to support us on every level.

The benefits of getting enough protein in the diet include:

- Supports muscle protein synthesis (MPS)—lean body mass, muscle growth, injury healing.

- Supports neurotransmitter synthesis—better sleep, mood, and cognitive ability.
- Supports energy production.
- Supports detoxification.
- Supports insulin and glucose metabolism.
- Reduces inflammation.

Why is Muscle Protein Synthesis (MPS) Important?

It is good to be strong, stable, and balanced in our bodies through muscular strength development. Our muscles are the largest repository of mitochondria (where our energy is made) in the body. MPS ramps up the number of mitochondria as well as their function, increasing our biological energy reserve.

Our muscles are the largest consumers of glucose in the body: MPS leads to greater insulin sensitivity and lower blood glucose levels. MPS contributes to reducing inflammation throughout the body.

How Much Protein Do We Need?

This depends entirely on each of our unique bodies, stage of life, level of activity, state of health, and energy requirements, but we can make some generalizations based upon scientific data:

- The minimum daily protein requirement for generally well sedentary adults is 1.2 grams protein per kilogram body weight, or 0.5 grams per *pound* body weight.
- If you are this person and weigh 150 pounds, you need 75 grams of protein each day as a minimum standard to stimulate MPS and support the essential protein needs of the body.
- For those who are ill or highly active, the protein requirements increase to 1.2-1.5 grams per kilogram body weight, or 0.7 grams protein per pound body weight.
- Elite athletes and body builders need even more—up to 2.0 grams per kilogram body weight, or 0.9 grams per pound body weight. So that 150-pound person in these categories will need close to their body weight in protein each and every day as a minimum standard.

Branched Chain Amino Acids

The other interesting scientific evidence that needs to be factored into how we think about our protein needs is that a *minimum of 30 grams* of high quality protein is required at a *single meal* to stimulate muscle protein synthesis (MPS). This is because we require the presence of the branched-chain amino acid, leucine, to stimulate MPS. It takes at least 30 grams of protein to reach the 2.5-2.8 gram threshold for the amount of leucine we need to stimulate MPS through genetic signaling.

How Much Protein is In Our High Protein Foods?

- Chicken, turkey, beef, bison: 1 ounce=7 grams protein
- Fish: 1 ounce=5-7 grams protein
- Eggs: 1 egg=6 grams protein

What are High Leucine Foods?

- Chicken breast 6 oz=2.9 gm
- Beef 6 Oz=2.8 gm
- Salmon 6 oz=2.7 gm
- Egg (one)=0.54 gm (need 5 eggs)
- Ground almond meal 1 cup=1.41 gm
- Almond butter 1 cup=3.71 gm
- Cashews 1 cup= 1.76 gm
- Chia seed 1 oz=0.39 gm

A Note to Vegans

You will need to work especially hard to meet your daily and per meal protein requirements for MPS. Meeting this threshold level may require the use of protein supplements. These are listed below. Pea or hemp protein are good options, augmented with a branched-chain amino acid supplement for an adequate supply of leucine.

How to Jumpstart Your Protein Plan

Start by measuring your body weight in pounds. I like to use an estimate of *ideal* body weight (for both over and under weight) for calculating protein needs.

Decide where you are on the 0.5-0.7 grams protein per pound body weight scale based on how active you are and whether your body is stressed by an acute or chronic illness. Error on the high side. If you are an athlete trying to build muscle go as high as 0.9 grams protein per pound body weight.

Calculate your total daily protein requirement.

Divide your total daily protein requirement amongst the number of meals

and snacks you eat per day. Make sure that any given meal contains a minimum of 30 grams

of protein in order to reach the leucine threshold that stimulates MPS.

If you are very ill or an elite athlete or body builder, your protein needs will be higher than 0.7 grams per pound of body weight and possibly as high as 0.9 grams per pound body weight, or higher. Work with a professional to determine what they are.

If you have kidney disease check in with your trusted health provider first. Those with severe forms of kidney disease, not on dialysis, may need a reduced protein intake.

High quality protein supplements are a great way to fill in the gaps of your food protein intake and are convenient for travel and those busy days. See a list of options below.

It helps to keep track of your protein intake for a few weeks until you get familiar with the routine that you need to fulfill your needs. Keep a food log and use a nutrient tracker (such as My Fitness Pal).

Excess Protein

It is possible to consume too much protein, though I mostly encounter the opposite problem—of not eating enough protein. Those at risk include those supplementing with protein excessively, protein enthusiasts, or those with metabolic disorders (such as kidney disease). For most people consuming protein in excess of needs only becomes a problem when it is a persistent habit. Since protein has calories (4 calories per gram), eating too much means excessive calories. It also poses a detoxification challenge. The body needs to clear the toxic ammonia compounds that are created in protein metabolism. Eating in excess adds to the total toxic load delivered to the liver and kidneys. The problems may be subtle or more impactful for those with impairments in detoxification capacity.

Protein Gram Chart

The following chart provides a sampling of the protein contents of common foods in the *FINE* and *GRIN* food plans. Protein grams are rounded to the nearest whole number. Note that exact protein content will vary slightly from one serving to the next.

Rule of Thumb

Three to four ounces of meat is approximately the size of a deck of cards and is about 25 grams.

Protein Source	Quantity	Grams
Almonds, raw	¼ cup	8
Almond meal/flour	¼ cup	6
Almond milk, unsweet.	1 cup	1

Apple	1 small	.25
Avocado, edible portion	1 cup	3
Beef, lean	3 ounces	22
Blueberries	1 cup	1
Black beans	1 cup	2
Blackberries	1 cup	1
Broccoli, raw	1 cup	3
Brussels sprouts, cooked	1 cup	4
Cabbage, red, raw	1 cup	1
Calves liver	4 ounces	25
Carrots, raw	1 cup	1
Cashews, raw	¼ cup	6
Cauliflower, raw	1 cup	2
Celery, raw	1 cup	1
Cheese, mozzarella	1 ounce	7
Chia seed	1 Tbsn	3
Chicken breast, roasted	½ breast	26
Chicken liver	1 liver	5
Chicken thigh, roasted	1 thigh	14
Cod, cooked	3 ounces	20
Collard greens, cooked	1 cup	4
Coconut flour	2 Tbsn	2
Coconut oil	1 Tbsn	0
Cod	4 ounces	26
Cucumber	1 cup	1
Dates	1 cup	4
Egg, pouched	1 medium	6
Flax seed, ground	2 Tbsn	3
Garbonzo beans, cooked	1 cup	15
Hemp seed, whole	3 Tbsn	11
Hemp milk	1 cup	2

Herring, pickled	3 ounces	12
Kale, raw	1 cup	2
Lamb loin, broiled	3 ounces	25
Macadamia nuts, raw	¼ cup	3
Onion, raw	1 cup	2
Pear	1 small	1
Pecans, raw, halves	¼ cup	2
Pinto beans	1 cup	14
Potato, boiled	1 cup	3
Pumpkin seeds, raw	1 ounce	9
Pea Protein	¼ cup	24
Raspberries	1 cup	2
Salmon	4 ounces	29
Scallops	4 ounces	23
Shrimp, boiled	4 ounces	24
Soybeans	1 cup	27
Spinach, cooked	1 cup	5
Strawberries	1 cup	1
Sunflower seeds, raw	¼ cup	6
Sweet potato	1 small	2
Tahini	1 Tbsn	3
Tuna	4 ounces	34
Walnuts, raw	¼ cup	4

Protein Supplement Options for the [FINE](#) and [GRIN](#) Food Plans

Hydrolyzed Collagen (=Collagen Hydrosylate)

This is protein derived from the bones and connective tissue of grass fed cows. It is tasteless, odorless, and dissolves well into liquid of any temperature. It is high in glycine, an amino acid important for gut and joint health. One tablespoon contains 6 grams of protein. I like the collagen hydrosylate made by Great Lakes Collagen. Suitable for both *FINE* and *GRIN* food plans.

Pea Protein

Derived from split peas. My favorite is PurePea from Designs for Health. It has a high protein

content, 24 grams in 2 scoops. It has a complete amino acid profile. Not recommended for those on strict *GRIN* plan, but is suitable for *FINE*.

Ground Hemp Seed

Hemp seeds are rich in health omega-3 fats and particularly high in protein for a seed. Three tablespoons contains 11 grams of protein. Suitable for both *FINE* and *GRIN* food plans.

Medical Foods

OptiCleanse GHI Detoxification Support Protein Supplement

This is a medical food with high protein content made by Xymogen. It contains 26 grams per 2 scoops of pea protein, taurine, glycine, rice protein and l-glutamine. This product is designed to nutritionally support detoxification, gut healing, and reducing inflammation. Best for *FINE*.

UltraClear Plus pH Detoxification Protein Medical Food

This is a classic medical food made by Metagenics, designed to support detoxification. It is made with hydrolyzed rice protein. The process of hydrolysis pre-digests the protein into its basic amino acids. This makes it easy to digest and hypoallergenic. It contains 15 grams of protein per 2 scoops. Suitable for both [FINE](#) and [GRIN](#) plans.

Resources

Karyn Shanks, MD. [The Foundational Intensive Nutrition Energy \(FINE\) Food Plan](#). 2018.

Karyn Shanks, MD. [The Gut-Immune Restoration Intensive Nutrition \(GRIN\) Food Plan](#). 2016.

Wilkinson DJ, et al. [Effects of leucine and its metabolite beta-hydroxy-beta-methylbutyrate on human skeletal muscle protein metabolism](#). J Physiol. 2013 Jun 1; 59(11): 2911-23.

Bauer J, 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 Aug; 14(8): 542-59.

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Karyn Shanks, MD, is a physician who lives and practices in Iowa City. Her work is inspired by the science of Functional Medicine, body-mind principles, and wisdom

gleaned from the transformational journeys of thousands of clients over her twenty-five-year career. Her work honors each individual and the power of their stories, their inner wisdom, and innate healing potential. She believes that the bones of healing are in what we do for ourselves. She is the author of *Liftoff*, a manual of energy recovery and healing through essential self-care practices.

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