

# ***Protein Primer***

Never has the world of nutrition and exercise been as contentious as it is current day. Sure, there were the low-fat and low-carb scares of the last several decades, but it seems the dietary current state of affairs is in significant disarray. Bias is at an all-time high and if you don't align with particular a nutritional faction (paleo, vegan, intermittent fasting, etc.) you might find yourself the outcast. Central to this volatile topic is that of protein consumption; how much, what type, and when? While the answer to these questions may be simple, albeit nuanced, bias tends to overshadow actual evidence leading many in the wrong direction. Thus, what follows is my best attempt at giving substantiated and practical advice on how to employ protein in your diet.

## ***How Much?***

The more I learn about diet and exercise the more I find myself saying "it depends." Frankly this answer leaves people, well, unanswered. However, the truth is that context will always dictate what is best for someone and accounting for intra-individual variables (e.g. age, weight, goal, current caloric intake) will play a large role in how you guide them. The current USDA recommended daily allowance (RDA) is 0.8 grams per kilogram of bodyweight or 0.36 grams per pound of bodyweight for those of us who aren't metric system savvy. This number has been shown to fall quite short of what is optimal for exercising individuals time and time again (JISSN). In the latest position stand by the International Society of Sports Nutrition it is recommended that whether your goal is endurance, strength/power, or body composition-based, "daily intakes of 1.4-2.0g/kg (.63-.9g/lb bodyweight) operate as a minimum recommended amount."

To further this, a growing body of research has shown that increasing this recommendation during times of caloric restriction may not only be helpful but needed. Helms et al (2013) showed that upwards to 2.3-3.1 g/kg may be needed to spare fat-free mass while losing fat mass depending on the severity of caloric restriction. Another recent study conducted by Campbell et al (2018) on female physique athletes showed that a high (2.5g/kg) compared to a low (0.9g/kg) protein diet was superior at both increasing fat free mass and decreasing fat mass. So, for those who participate in weight-restricted sports, aesthetic based competition, or simply are eating to lose body fat, higher dietary protein amounts may be required.

## ***What Type?***

The more "religious" and dogmatic camps of nutrition start to rear their head when the topic of food choice comes up. Putting moral and ethical stances aside, animal-based protein sources make it easier for one to optimize protein intake compared to plant-based ones. This is not to say that vegan or vegetarian diets are incapable of producing muscular development and recovery from exercise, but rather those who choose to eat this way will have to employ a more strategic and qualitative approach to their consumption.

Animal-based protein sources contain all 9 essential amino acids (EAA's) in sufficient quantities which makes them "complete proteins." EAA's are termed as such because they are needed from our diet, our bodies cannot construct them. In contrast, while there are some plant-based complete protein sources, most are "incomplete proteins," lacking one or more of the EAA's or

in a significant enough amount to augment muscle protein synthesis (MPS). When it comes to this muscle building effect, a total amount of 6-15 grams of EAA's, and approximately 1-3 grams of Leucine, a prominent EAA, appear to be needed on a per meal basis (JIISN). Basically, if you want to build muscle and recover from your training optimally, animal-based sources are going to be your best bet.

When it comes to protein quality there are a handful of measurements that we can use. These measurements essentially look at how effective a protein is at stimulating MPS and subsequently muscle hypertrophy (Lemon, 2000). I will spare you the long list and use two of the most common and well accepted measures; Protein Digestibility Corrected Amino Acid Score (PDCAAS) and Biological Value (BV). Table 1. Provides a ranking of protein sources using the aforementioned measurements. As you can see egg and whey serve as a relative “gold standard” of protein quality.

Table 1

Protein Source	PDCAAS	BV
Beef	.92	80
Whey	1.00	104
Egg	1.00	100
Casein	1.00	77
Milk	1.00	91
Black Beans	.75	-
Soy	1.00	74
Peanuts	.52	-
Wheat Gluten	.25	64

(Schoenfeld, 2016)

It may also be prudent to rotate sources of protein on a relatively regular basis, or at the least consume a variety of sources. While there may not be a tremendous amount of definitive research on the topic, functional medicine practitioners are recognizing the link between compromised gastrointestinal health contributing to food sensitivities, intolerances, and autoimmune disease. By extension, if you are overconsuming any one foodstuff with compromised gut health its reasonable to think it would become problematic. Tummy issues aside various foods contain different vitamin, mineral, fatty acid, and micronutrient profiles in general. Hence, if your grocery store trip is your own rendition of Groundhogs Day you may want some diversity.

### ***When?***

Forgive the pun, but most fit chicks and bros alike won't have any “beef” on the amount or type of protein that should be consumed. However, when it comes to when and how often there seems to be a bit more controversy and one might even say misinformation. The illustrious post workout “anabolic window” has prevailed in bodybuilding lore for quite some time. And while there certainly substantiated merit for this and peri-workout (before, during, and after workout) nutrition in general, the context of daily protein intake seems to take precedent.

The positive effects of a meal containing sufficient, high-quality protein seems to last for 1-4 hrs (JISSN). Taking this into account it sensible to spread one's daily protein needs across 3-4 meals at the least. To give context to this, research (Arciero, Areta) has found that frequent meals (4-6meals/day) consisting of 20-40g protein per meal is favorable for decreasing body fat and increasing lean body mass. Luckily this won't seem to far-fetched for those macro-counters amongst us.

But what about the peri-workout window? Good news, there's up-to-date evidence here as well. Two of the brightest minds in the nutrition and muscle building business, Brad Schoenfeld and Alan Aragon, pooled together all the research on this very topic and came up with pretty practical conclusion. A dose of ~0.4-0.5g/kg (0.18-0.23g/lb) of high-quality protein both pre- and post-workout taken within 4 to 6 hours of each other act as an effective amount. For the standard 180lb male weight lifter this means approximately 30-40 grams of protein consumed at these meals. Train fasted? It would be prudent to get this amount in as quick as possible post training.

### ***Supplementation***

It's rare to find a gym bag that hasn't been occupied by a jug of protein powder. Protein powders and amino acid supplements are and have been a mainstay for most who desire to build muscle or simply be active. The question is, are they actually needed?

While supplemental protein consumption isn't inherently necessary it's definitely helpful. Whey protein is arguably the most popular form of protein powder. It is an easily digestible, fast absorbing form of protein containing a high amount of EAA's, leucine, and a stellar protein quality score across the board. Because of this, whey can make the process of getting in your total daily intake much more effective and convenient. When it comes to isolated amino acid supplements, the Branched-Chain Amino Acids (BCAAs) have been extremely popular over the last decade. BCAAs are 3 of the 9 EAAs and are composed of leucine, isoleucine, and valine. However, recently it has been shown that "a dietary supplement of BCAAs alone cannot support an increased rate of muscle protein synthesis" (Wolfe, 2017). While this doesn't infer that BCAAs lack merit, it just means that sufficient EAAs should be consumed in regular intervals in either supplemental or whole-food forms in order to make the muscle building machinery run optimally.

### ***Landing the plane***

Let's attempt to reel all this protein-packed information into an easily digestible summary. What it seems like from the current body of research is that for individuals who exercise, especially for those who train with muscular development in mind, the current RDA of 0.8 grams of protein just isn't enough. A better recommendation in this case would be 1.4-2.0g/kg (.63-.9g/lb bodyweight). If you restrict your caloric intake there also is evidence that you should consume towards the upper end of that recommendation if not a bit more.

The timing and frequency of your protein consumption seems to have an impact given that total daily protein requirements are met. Consuming a high-quality protein in a relative amount of 20-40g approximately every 3-4 hours serves as an effective strategy for optimizing your exercise

recovery and muscular development. If you're consuming animal-based protein sources, meeting protein quality standards is relatively easy. However, for vegan/vegetarian individuals you may need to be more cognizant of combining protein sources and reaching total daily requirements.

Consuming protein supplements is an easy and effective way to meet daily protein needs. Protein powders such as whey in its various forms and supplemental EAAs may be helpful at planning protein consumption around the peri-workout window and have been used as such for quite some time. The jugs occupying your cupboards are safe until further evidence says otherwise.

My hope is that you turn the page more empowered. That I helped let evidence speak for itself and freed you from misinformation. Now you can feel confident dialing in your dietary tracker of choice and in your ability make gains!

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