

## Webinar 2 Handout: PROTEIN

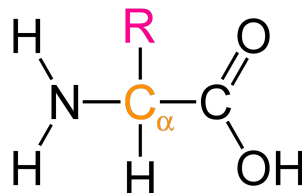
Protein is so talked-up in the media and in marketing, many people worry that they aren't eating enough of it. In actuality, most of us get enough or sometimes even too much protein in our diets! There is at least a little protein in many things we eat and we really don't need a ton for our bodies to function properly. About 15% of daily calories from protein (50 grams for the average adult) will meet basic needs, but I believe eating as much as a third of your daily calories from protein is both safe and beneficial.

Protein is used in many bodily functions including cell maintenance and repair, blood clotting and the production of antibodies. It is the primary component of many body tissues such as skin, hair, and muscle. We need the most protein when we are growing (childhood and pregnancy) and repairing (injury or recovery from intense strength training). Protein is digested more slowly than carbohydrates and helps increase feelings of satisfaction - aka my favorite word, satiety.

Research from the Nurse's Health Study shows the average American adult, aged 19 - 30, eats about 91 grams/day. So we're eating enough of it; the struggle for most people is eating the best kinds of protein, and eating a little protein at every meal and snack rather than loading up at dinner.

### Amino acids

This little paragraph holds a lot of information, so dog-ear the page now. Protein is made up of chains of **amino acids**. All amino acids follow the same general chemical formula. There is a central carbon (called the alpha carbon) with four parts attached to it: a hydrogen (-H), a carboxyl group (-COOH), an amine group (-NH<sub>2</sub>), and a variable group (known as R). This R group is what makes each amino acid different.



When you eat protein, your body breaks it down into individual amino acids. Amino acids are then pieced back together in different combinations to make new proteins the body will use to build muscle, enzymes, hormones and other substances needed for structure and function. There are 20

amino acids (in thousands of combinations) that make all the proteins you need. There are 11 **nonessential** amino acids, meaning the body can break down existing amino acids in the blood and put them together again to get the specific amino acid needed. There are 9 **essential** amino acids that the body cannot make by itself, meaning they must be ingested through foods. The essential amino acids are: Histidine, Isoleucine, Leucine, Lysine, Methionine, Phenylalanine, Threonine, Tryptophan, and Valine.

## Protein quality

Protein quality is an area of confusion even for savvy nutritionists. Protein quality usually refers to the levels of essential amino acids found in the food. Animal proteins, such as beef, eggs, chicken, fish and poultry contain high levels of all of the essential amino acids, and so they are referred to as **complete proteins**. Soy-based foods, such as tofu and tempeh, quinoa and hemp are also considered complete (don't get too hung up on this; keep reading). Many plant foods such as legumes, rice, beans and nuts do not contain all the essential amino acids in high amounts and may be referred to as **incomplete proteins**. For example, legumes are lower in methionine, and most other plant foods are lower in lysine. In the 1970s, the concept of complementary or combining protein became popular. The idea was that you need to eat certain foods together at a meal to get all of the essential amino acids in and form complete proteins.

Turns out, this is a myth. So long as you eat a wide variety of protein-containing foods throughout the day and meet your caloric needs, you are pretty much guaranteed to get adequate amounts of all the amino acids. You are bound to discuss protein quality especially when working with vegetarian and vegan clients. Rather than focusing on which specific foods to combine, the bigger takeaway should be to eat a varied diet that includes a mix of unprocessed soyfoods, legumes, seeds, beans and nuts. We'll talk more about these diets in Lesson 9.

## High protein / Low carb diets

Conventional "diets" have the same lose-weight-quick but then eventual gain-it-back (plus extra pounds) results. The Nutritious Life philosophy teaches lifestyle and behavior changes to avoid this trap. People will swear up and down that following a high protein, Atkins-esque diet has helped them lose weight. While this may be a short term experience, the weight loss benefits never last.

The truth is these clients are no more successful in the long run than those who follow any of the fad diets out there. What's worse, it is absolutely possible to overdo it with protein. Eating too much

protein is hard on the kidneys, leaches calcium from the bones, damages organs, causes constipation and may cause nutritional deficiencies long term. While protein does play a very important role in weight loss, the portions and proportions in the diet shouldn't be extreme in either direction. *(In general, I like to think in thirds: if you focus on having about 1/3 of your diet from protein, 1/3 from healthful fats and 1/3 from high quality carbohydrates, you will meet your needs without overdoing it or under-doing it, and the 1/3 balance should hit your satiety center!)* If we go back to that protein molecule above, you'll remember that a protein molecule is essentially a carbohydrate molecule with a nitrogen molecule attached to it. When people follow very low carbohydrate diets, the body is forced to cleave that nitrogen molecule off so that energy can be used and released (mostly for the brain to function, but in other tissues as well). Those cleaved nitrogens accumulate in the blood and cause **ketosis**, which is damaging to the kidneys and other organ systems as they are excreted into the urine. Your body does not store excess protein, and if you eat too much protein it can eventually be converted to fat. Super high protein diets -- especially in the absence of carbohydrates -- can be very damaging to the body.

## Special populations

There are some populations who may need extra attention paid to protein in their diets:

- **Vegans and Vegetarians:** It can be challenging to be a healthful and responsible non-meat eater. While you can absolutely eat healthfully and meet all nutritional needs without animal based foods, it is not the norm in our country, so it takes some extra planning. Sometimes the only vegan option is the french fries on the menu. Strict herbivores are the most likely to develop protein deficiencies and symptoms include fatigue, weight loss, dry hair, ridges in fingernails and edema. Most non meat eaters are already really savvy with their eating, but those who are newly adopting a meat-free diet may need help with strategies. Vegetarians can more easily meet their protein needs with the use of dairy and eggs, but special attention should be given to assure they are consuming recommended amounts. Vegans will typically use nuts, seeds, beans and nutritional and/or Brewers yeast to get their protein quota for the day, but since these aren't always readily accessible everywhere, it can be more of a challenge to eat well. Focus on being a responsible vegetarian: plan ahead and pack foods and snacks that are protein rich, or eat before events and stick to veggies where options are limited. I encourage all of my clients to partake in meatless meals often. I'm not just talking about a meatless Monday, but meatless meals and snacks that are built into every day that satisfy. Not only do vegetarian meals benefit the body, but they benefit mother earth, as vegetarian foods are less taxing to the environment.

- **Bodybuilders:** True bodybuilders and athletes who work their muscles to extreme fatigue regularly do require additional protein to replete and replenish their muscles. When muscles are put to extreme work, the tiny fibers that make up the muscles tear. Repairing those tears requires protein -- this process both repairs the muscles and builds their size. Most adults need 0.8 - 1.0 gram/kg protein per day for basic needs, but bodybuilders may need between 1.4 - 1.7 grams/kg. While the best protein comes from foods, many choose to supplement with powders and shakes to get the calories and protein in with less work. Note that most protein shakes are full of junk such as soy protein isolates and artificial sweeteners. Side effects from supplementation with soy isolates may include thyroid problems, nutrient imbalances, fertility issues and intolerances. Many other protein supplements and powders are made with whey and casein protein isolates. They have not been deemed unsafe and their effects are considered benign. Both come from dairy processing and side effects can include nausea, thirst, bloating, cramping, fatigue and headaches when you overdo it. If your client is looking for a supplement, I prefer those made with pea protein or a blend of plant proteins, such as Life's Abundance made with pea protein concentrate, hemp protein, pumpkin protein, quinoa and chia seeds. Whole foods can be used to supplement a bodybuilder's diet. Focus on adding tofu, flax, hemp, nut butters and yogurt or milk to smoothies, and if you go the supplement route, make sure you read the ingredients label.

## Recommended protein rich foods

Protein can be found in a variety of foods including fish, poultry, meats, legumes, soy, nuts, seeds, and dairy. Lesser amounts of protein can also be found in whole grains and vegetables. When choosing protein rich foods, opt for lean sources. The fat in conventional meats and dairy tends to be the less healthful kind and can contribute to diseases such as heart disease, cancer and obesity--go for the grassfed versions and you'll get a better fat profile.

These are examples of good protein sources, the serving size and protein content:

Protein	Serving Size	Grams of Protein
Almonds	1 ounce, 23 pieces	6
Black beans	½ cup	8
Brewer's yeast	2 tablespoons	10
Cheddar/Colby cheese, low-fat	1 ounce, 1 standard slice	7
Chia seeds	1 ounce	5
Chicken, white meat, skinless	4 ounces	25

Cod	4 ounces	20
Egg	1 large	6
Egg whites	2 large	7
Flounder	4 ounces	14
Garbanzo beans (chickpeas)	½ cup	7
Greek yogurt, low-fat	¾ cup or 7 ounces	20
Ground beef, grassfed	4 ounces	21
Halibut	4 ounces	25
Hemp seed	1 ounce	10
Ham, sliced, extra lean	4 ounces, 4 standard slices	20
Lobster	4 ounces	22
Milk, grassfed	1 cup	8
Mussels	4 ounces	27
Nutritional yeast	2 tablespoons	10
Peanut butter	1 tablespoon	4
Pork tenderloin	4 ounces	29
Pumpkin seeds	1 ounce	8
Sardines, canned in water	3 sardines	24
Scallops	4 ounces	24
Sea bass	4 ounces	26
Shrimp	4 ounces	24
Sliced roast beef, extra lean	4 ounces	28
Soybeans	½ cup	15
Swordfish	4 ounces	28
Tenderloin steak, or filet mignon	4 ounces	30
Tofu	½ cup	11
Top round steak	4 ounces	40
Tuna, fresh or canned in water	4 ounces	33
Turkey breast, skinless	4 ounces	34
Wild salmon	4 ounces	22
Yogurt, low fat	¾ cup, 6 ounces	7

Protein choices to limit or avoid entirely include: sausage, bacon, 15% or higher fat ground beef, poultry with skin, hamburgers, hot dogs, ribs, salami, bologna, pastrami and marbled (fatty in the meat, not just around the edges) cuts of beef and lamb. The benefits of the protein in these choices

is overshadowed by the unhealthful fat and/or processed ingredients. The same is true for **protein concentrate**, which is basically a milk protein concentrate added to foods like cream cheese and nutritional shakes. While products with these fillers may not be known to cause harm, it's better to get good protein from whole food sources when possible.

**Nutritious Life Tip:** A serving of poultry, beef, pork, lamb or fish is about the size of an iPhone, give or take. All of your clients come in different shapes and sizes and so their needs will not all be the same -- some may need a little more or less. This portion standard has become common knowledge, but it really works to use visual associations to help your clients understand if they are making strong choices. It is easy to count out a serving of almonds, but figuring out how many slices of turkey make up the 4 ounces recommended in a sandwich can be a head-scratcher. (Less well known, a standard deli slice is about an ounce).