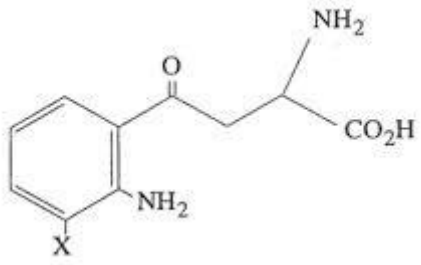
the nutrition school

Webinar 2 Handout:

Protein

Protein is such a talked-up nutrient in the media that many of us are always worried about getting enough in. In actuality, most of us get too much protein in our diets! There is at least a little protein in almost everything we eat and we really don't need a ton for our bodies to function properly. It is recommended that approximately 15% of your daily calories come from this macronutrient to meet your basic needs. I believe a healthy diet may safely have as much as ⅓ of your daily calories from protein, and there is good reason to get that much in. 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 (kids and pregnancy) and repairing (injured or recovering from intense strength training). Protein is digested more slowly than carbohydrates and helps increase feelings of satisfaction - aka my favorite word, satiety. The average adult needs about 50 grams per day to meet his/her needs. Research from the Nurse's Health Study shows that the average American adult, aged 19 - 30 eats about 91 grams/day.



Amino acids

This little paragraph holds a lot of information, so dog-ear the page now. Amino acids are called the building blocks of cells. Protein is made up of **amino acids**. There are more than 50 amino acids in the body, but 20 of them are responsible for protein building. All amino acids start off like a carbohydrate with a carbon (C), oxygen (O) and hydrogen (H) molecule, but protein molecules also contain a nitrogen (N) molecule. This nitrogen component makes the cell more intricate than a simple C-H-O molecule. 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. Most animal proteins, such as beef, eggs, chicken, fish and poultry contain all of the essential amino acids, and so they are referred to as a **complete protein**. *(Of note, soybeans, hemp and quinoa are the only common plant based foods that are complete proteins).* Foods such as legumes, rice, beans and nuts do not contain all the essential amino acids and may be referred to as **incomplete proteins** but you can combine foods (think beans and rice) together to get all of the essential amino acids in and form complete proteins. *(You don't need to eat the incomplete proteins in the same meal!).* You need both essential and nonessential amino acids for your body's cells to perform all of their functions. A diet that is varied will help to get all of these amino acids in, and maximize wellness; this is one reason why we do not recommend eating the same foods every day.

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, Atkin's-esque diet has helped them to lose weight. While this may be a short term experience, the weight loss benefits never last. The truth of the matter is that these clients are no more successful in the long run than those who follow any of the fad diets out there. And, 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 if used 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 ⅓ of your diet from protein, ⅓ from healthful fats and ⅓ from high quality carbohydrates, you will meet your needs without overdoing it or under-doing it, and the ⅓ 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 an N 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 extra 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 bod, 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, 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 artificial supplementation with soy isolates may include weight gain, kidney damage and intolerances. The verdict is still out on 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 from too much include nausea, thirst, bloating, cramping, fatigue and headaches. Bottom line: whole foods can be used to supplement a bodybuilder's diet. Instead of artificial powders, try adding tofu, flax, hemp, nut butters and yogurt or milk to smoothies.

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, do your best to choose lean options. The fat in meats and dairy tends to be the less healthful kind and can contribute to diseases such as heart disease, cancer and obesity.

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

Protein	Serving Size	Grams of Protein
Almonds	1 ounce, 24 pieces	6
Black beans	½ cup	8
Brewer's yeast	2 tablespoons	16
Cheddar/Colby cheese, low-fat	1 ounce, 1 standard slice	7
Chia seeds	1 ounce	5
Chicken, white meat, skinless	4 ounces	20
Cod	4 ounces	24
Egg	1 large	6
Egg whites	2 large	8
Flounder	4 ounces	28
Garbanzo beans (chickpeas)	½ cup	6
Greek yogurt, low-fat	¾ cup or 6 ounces	11
Halibut	4 ounces	28
Hemp seed	1 ounce	10
Ham, sliced, extra lean	4 ounces, 4 standard slices	20
Lobster	4 ounces	22
Mussels	4 ounces	27
Nutritional yeast	2 tablespoons	8
Peanut butter	1 tablespoon	4
Pork tenderloin	4 ounces	20
Pumpkin seeds	1 ounce	5
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	10
Top round steak	4 ounces	31
Tuna, fresh or canned in water	4 ounces	28

Turkey breast, skinless	4 ounces	20
Wild salmon	4 ounces	28
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. 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).