

## Protein

### Transcript

Hello, and welcome to our Energy Recharge Coaching Module about protein. My name is Dr. Ritamarie Loscalzo. Protein is a really important topic and one that a lot of people have confusion about. I think it's important to understand where your protein comes from, how your protein is utilized in your body, and what the best sources of protein are for you to be optimally healthy. Let's go ahead and begin.

I like to start with a little disclaimer that the information that I'm presenting to you is not intended as medical advice. It's not intended to be a diagnosis of any condition. It's just intended of sharing from me to you. If you're under the care of any doctor, I recommend that you run this material by him or her, and make sure that it's in alignment with whatever care or medications you are receiving from your practitioner.

With that in mind, let's start to talk about protein. There's a big myth going around that people have propagated, and a lot of people, when they decide to go vegetarian or go on a health care diet, and cut down on the amount of meat that they're eating or cut it out completely, others are asking them all the time, "Where do you get your protein?" This is a great picture ... The people that generally ask me things like, "Where do you get your protein?" and "How can you eat like that and be healthy?" are generally people that are not very healthy.

We're going to give you some answers to the questions, "Where do you get your protein?" I want you to understand where protein comes from because contrary to popular belief, meat and dairy products are not the only protein source, and of course, eggs, but those are not the only protein sources. Actually, you can get excellent sources of protein from, believe it or not, plants, and believe it or not, green leafy plants, which are the plants that I've been encouraging you to eat.

Let's discuss what we're going to learn in this presentation. What you're seeing on the screen is a very elaborate thought of chemical equations and chemical structures; and we're going to touch a little bit upon that, but don't get worried about that. We're not going to have a really deep, in-depth, depth chemistry class tonight, so no worries. Let's talk about ... We're going to go through what actually a protein is, how to resolve the protein dilemma of too little versus too much because just like many nutrients, enough is the way we want to go, and people tend to air on the side of, "Well, if we need this much, let's get double that much just to make sure we get enough," and that can get you into trouble, so we'll talk more about that.

We'll talk about how to determine if you're indeed low in protein. Some people are and need to do some special things to make sure that they get enough and that they're absorbing enough. We're going to make that distinction. I'll also talk about food sources of protein, which food sources are your best source, and for different people, that maybe different foods. Protein powders versus whole food proteins, what those are and how they're different. Finally, how and when you would consume protein powders as part of your nutritional protocol.

This is the structure of a protein. You don't have to memorize it. You don't have to know it. What I would like you to know is how to distinguish it from carbohydrate or fat, and the big way is you're going to see a bunch of "N's" in the structure, and "N" is for nitrogen. There's just a very long string of amino acids that are put together to make a protein. Let's look at what a protein is. Proteins are vital components of the physical stuff that you can touch in your body, the body's tissues, the bone, the enzymes, the immune cells, and it accounts for approximately 20% of your weight.

It's a combination of different amino acids linked together in a unique combination, and they contain carbon, oxygen, hydrogen, nitrogen, and sometimes even sulfur. You've probably heard of "sulfur-containing amino acids". Maybe like cysteine and methionine. Those are stopped because they contain sulfur. Not all of them contain sulfur.

Finally, we'll look at that deficiencies in amino acids cause your body to have to break down muscle and structural components to create the amino acids that are needed for function. It's really important to get enough protein, so you don't start eating the inside of the body, but also really important is making sure that you're absorbing and utilizing the protein that you are taking in because that seems to be a big problem.

Let's look at the function of protein. Function. A protein makes up the structural component of your body, so anything that you can physically touch and hold, muscles, ligaments, tendons, hair, skin, nails. In addition, enzymes in the body are made up of protein. When you talk about taking digestive enzymes or needing enzymes, they are proteins. Hormones are actually proteins as well, so any of your hormones like thyroid hormone, and estrogen, adrenal hormones like cortisol and adrenaline, and DHEA, and all those hormones are made up of protein.

Then, we have transport protein, and we'll talk more about that in thyroid, and we've talked about that in relationship to other hormonal parts of the body, but transport proteins actually connect and attach to proteins of the body ... Hormones of the body like thyroid hormone, for example. There's a transport protein called "thyroid-binding globulin". There's another one that will bind estrogen or progesterone, and it's called "sex hormone-binding globulin", so those are proteins.

They're used as energy intermediates. In the carb cycle, when your body is converting the glucose to ATP, there are some proteins that are required as intermediates and mainly amino acids. They're used for growth and repair. If you've got a structural tissue, obviously, muscle, or skin, or hair, and there's damage to it, the body is going to have to grow new pieces or repair it using proteins.

Next, we have neurotransmitters, and neurotransmitters are made up of amino acids. Not really whole proteins, but amino acids. For example, there's a neurotransmitter called "serotonin", and serotonin is very important for steady mood. People who have serotonin deficiencies are often depressed or anxious. That neurotransmitter, serotonin, is actually made from the amino acid tryptophan, which gets converted to 5-hydroxytryptophan, and then to serotonin.

The neurotransmitters, the parts of the brain, they're actually communicating between the parts of the brain, and the brain, and the body. You could see that it's really important to have the right amino acids inside, so that you can make the right brain chemistry. Sometimes, people do have deficiencies. From a nutritional functional medicine standpoint, we can help people to recover from problems with neurotransmitters, and brain problems, and depression a lot of times using the amino acids and using ... Making sure people get enough protein and other vitamins and minerals.

Finally, protein is important for pH balance. Too much protein creates a lot of acid residue in the body, which throws the body towards acidity. Right amount of protein will keep the body in the right range. What are amino acids? Amino acids are these little groups that are biologically important. They're organic compounds. They're in the body. They're abundant in the body, and what they're made up of is what's called an "amine group", which is nitrogen, hydrogen, and two ... Actually, two hydrogens, so it's NH<sub>2</sub>.

They're also contained of one called "carboxylic acid", so that's COOH. Carbon, two oxygens, and a hydrogen. The picture shows that. You've got an "NH<sub>2</sub>" on one end, a "COOH" on the other end, and then there's some unique structure in the middle, which makes each and every one of the amino acids a little bit different. Okay? They call that the "side chain". The key elements that are composing amino acids would be carbon, hydrogen, oxygen, and nitrogen. Like we mentioned earlier, some of them actually have sulfur. There's an amino acid structure up close. You see the "NH<sub>2</sub>" all the way over here on the left, and then you have the "COOH" on the right. The double line is a double bond, but we don't have to get that geeky on our chemistry right now.

Here's a list. There are actually nine essential amino acids. They're listed here, and their chemical structure is shown over on the right-hand side. We have leucine, isoleucine, and valine, and those are usually considered branched-chain amino acids.

What that means is that in a pinch, they can get converted into energy, and actually, they are quite often. We have lysine, methionine, tryptophan, phenylalanine, threonine, and histidine. Those are all the main amino acids. The picture shows a few extras.

Then, we have what's called "conditionally essential amino acids". We have arginine, asparagine, glutamine, glycine, proline, serine, tyrosine, and cysteine. What that means is that typically, in a situation where you have plenty of amino acids and plenty of protein, even if you don't have enough of these particular ones, your body can make it. They can make it by specific chemical reactions with the others, the essential ones. The essential ones, your body can't make. No matter how much of the raw materials it has, it just can't make those; but with the conditionally essential, they can, your body can.

Then, we have nine essential amino acids. Does it mean that they're not essential to life? No, and I want to make sure that's clear. It just means that you can make them as long as you have an abundance supply of essential amino acids. Plus, you need a compound called "alpha-ketoglutarate" and vitamin B6 in order for that synthesis to occur. If you've got somebody or you're a person who eats a lot of refined food, sugars, and refined carbohydrates, and foods that are on the low-nutrient density end, may not have enough vitamin B6 in order to synthesize your amino acids, your nonessentials.

I'm just going to classify some of the amino acids just to give you a general idea. There are some group of amino acids that are neurotransmitter precursors. These are really important for brain chemistry. If you're a person who tends to have some depression or memory issues, or you have anxiety, these are specific amino acids that are important for you to make sure that you're getting enough of, and they are phenylalanine and tyrosine. Both of those together are actually precursors to the neurotransmitter dopamine. Dopamine is an important neurotransmitter for keeping you up and your motivation high, and keeping you interested and motivated.

Then, there's tryptophan, which is an important precursor for the neurotransmitter serotonin, which is really important for keeping your mood up. When you're deficient, you'll have some anxiety, some depression, and a lot of times, people will have OCD type symptoms when they're low in serotonin. We have glutamic acid, which is actually an excitatory neurotransmitter. It's very important excitatory neurotransmitter to keep alertness up; but often times, it gets out of balance with GABA, gamma-aminobutyric acid, which is a calming neurotransmitter.

People who have problems with too much glutamic acid tend to be really hyper and they can't focus, and people who have deficiencies of GABA tend to be too hyper, and they can't focus, and they can't fall asleep. They're a pair, and they have to be really regulated well. There's amino acids that are important for collagen, for forming collagen.

We have proline, hydroxyproline, and glycine are the main ones. Collagen, meaning the structural tissue that makes up your connective tissue, your tendons, your muscles, and your joints.

Then, there's the sulfur-containing amino acids, and these are really important in cleansing and detoxification. You've got methionine, cysteine, homocysteine, cystathionine, and taurine. Those are your principal sulfur-containing amino acids. We have energy-producing amino acids, isoleucine, leucine, and valine, which are considered branched chain amino acids.

Three percent of muscle protein and 50% of dietary amino acids are isoleucine, leucine, and valine. When there's deficiencies in these or when there's improper protein absorption, and there's deficiencies of these, you have lots of low energy, and I've worked with people who do have deficiencies with these and increasing ... Just base preform these amino acids in the diet makes a huge difference in their health.

Then, there's histidine, which is high when there's muscle breakdown, and it's low in rheumatoid arthritis. Lysine is important for collagen cross-linkages, so the ability of the collagen to form these bonds that hold it together and make it strong. Again, collagen being the tissue that's in your joints, and your bones, and your muscles. Whenever you have an injury, it's very important to supply enough of the collagen-making amino acids. Then, threonine is another amino acid that's important in keeping blood sugar steady, and low levels have been associated with hypoglycemia.

We've talked about what a protein is, we've given you a little bit of categorization, so let's give you a little bit of what the symptomology would be when you have either too little or too much protein, so it's the Goldilocks principle. Not too little, not too right ... Too much. We want it just right. When you have too little protein, you might be experiencing low energy, poor immune function, hormonal imbalance, depression, muscle weakness, weak or brittle nails, hair that's thinning or falling out, poor recovery from injury, and inability to increase muscle bulk or strength with weights.

Let me just mention quickly on hair growing, hair thinning or falling out. A lot of people have this problem, and it's multifactorial. A lot of folks have it because their adrenals are whopped out. Others have it because they have low thyroid function. Still, others have it because they don't have enough protein, and still, others have it because of a combination of all of those.

Let's look at what too much protein can cause. Too much protein leads to a lot of extra work for you kidneys to try to get rid of the extra nitrogenous waste and acidic residue, so it could lead to kidney stress and low back pain, which could be a sign of kidney stress.

It could lead to bone loss. Because when there's too much protein, there's a lot of acidic waste, a lot of nitrogenous waste, and your body tries to neutralize that, so that it can be excreted and prevent your blood from getting too acidic; and that can cause minerals to be leached from the bone and lead to bone loss.

Too much protein can actually lead to decreased appetite, nausea, acidic urine and saliva, dehydration, constipation, increased risk of cancer and heart disease. That's a summary, so let's talk about some of the factors that might contribute to a deficiency of protein. You've probably heard of hydrochloric acid. Hydrochloric acid is a substance that's produced by your stomach in order to help the breakdown of protein.

Hydrochloric acid activates the protein digesting enzyme protease or pepsin in the stomach. It's what it's called, and that can help ... That helps your body to break down the protein. If you don't have enough hydrochloric acid, you don't break down the protein very well. It also affects your mineral absorption. Also, produces enzymes to help with the breakdown of carbohydrates and fats, and those are amylases and lipases.

Another thing that can affect the protein level in a person is poor liver function because it controls the amino acid metabolism. If you have a vitamin B6 deficiency, that can impair the ability of your body to manufacture those nonessential amino acids from the essential. Even if you have enough of the essential amino acids, if you have a B6 deficiency, you're not going to manufacture the nonessential amino acids.

Remember what we said. The nonessential amino acids don't mean that they're not essential. It means that it's not essential that you have them in your diet, but you have to have enough of the essentials to have enough of the amino acids leftover to be able to create the nonessentials. Finally, if you've got some bacterial or viral infections, or severe physical trauma, you can use up your protein source really quickly because your body is trying to repair and has a lot more repair to do.

Let's take a look at protein recommendations. There are variety of sources that make protein recommendations, and there's some differences between them. The RDA, the Recommended Daily Allowance, which is set by our government is .36 grams per pound. For example, if you have a person who weighs 100 pounds, that would imply that they need 36 grams of protein. If you have a very small child who weighs only 50 pounds, they only 18 grams of protein. Quite frankly, that's very easy to get.

For athletes though, it's recommended that it'd be between .6 and .9 grams per pound, so that same 100-pound person ... Unlikely to have a 100-pound athlete because they usually have so much muscle on them, but that 100-pound athlete would require between 60 and 90 grams of protein a day. You see, it's getting to be a little bit more.

The paleo diet people say we should have 1 gram per pound, so a 100-pound person, that's 100 grams of protein, which can be a lot.

The zone diet says that protein should be 30% of calories. Let's assume that that 100-pound person is ... Calculates that they need about 1,800 calories per day to be healthy and to get the ... Keep their steady weight. If you do that, that's 1,800 calories, 30% of that would be 540, so 540 grams ... 540 calories of protein. Each protein gram has 4 calories, so if we divide the 540 by 4, we would get 135 and say 30-something, which is a lot of protein. You'd see that the paleo and the zone are really up there in terms of a lot of protein.

According to WebMD, it was one of the online places, talk about infants needing about 10 grams a day, teenage boys up to 52, teenage girls up to 46, adult men, 56, adult women, 46, and lactating or pregnant women, 71. When you look at the numbers, the around 40 grams for a 100-pound person is more likely to be the case; but when you deal with people who have injuries or they have some imbalances in the gut and there's a lot of need for protein for repair, obviously, they're going to need more. What's not mentioned here is when you're injured or having surgery. You need more protein.

The range, I would say the range for the average adult woman is going to be somewhere between 40 and 100 grams, unless they're extremely athletic, and then it might be a little bit more. Okay. Let's look at the effects of various things on protein, and we'll start by looking at how cooking affects protein. As you know, most of the animal source proteins that people eat are ... They're cooked, right? They're either grilled, or boiled, or pan-seared, or something like that. If you're going to be getting most of your protein from animal sources that way, you should really know what the effects of cooking are.

"Hitting and beating" is what it's called. Hitting, and pounding, and like beating like eggs when you put the egg in, and you beat them up. You beat them around. That's what we mean by hitting and beating. What that causes is denaturation and coagulation of those protein, so let's talk about those. Denaturation changes the shape of the protein and decreases its solubility. Meaning, it becomes harder to absorb into the body. Coagulation causes the protein molecules to come together, which again make them harder to breakdown and absorb.

Overcooking foods destroys heat-sensitive amino acids, especially lysine, and makes protein resistant to digestive enzyme. If you're eating this very heavily cooked food and it's a high-protein food, you're not going to get as many of the amino acids out of it as you think. Let's talk about conditions under which higher protein is needed. Muscle wasting. If someone is in a situation where they're in what's called "cachexia" like in cancer situation where they're breaking down their body may need extra protein.

When someone is on a weight-loss diet, because they're consuming less calories, a higher percentage of those calories would need to be protein. In a situation of fatigue and weakness, and the body is needing more protein to try to build itself up. In case of frequent infections, again, your body is needing more proteins to be able to fight off the infection, and develop, and create those immune system factors that are needed. Also, could be used in needed in severe edema, which is fluid retention, and that tends to be ... Found that increasing the protein will help to increase the excretion of those extra fluids.

Slow growth and development in children, so looking at a child and seeing, "Wow, they're not growing as fast as they should." You may want to look at their total calories in general, and also to make sure that they're getting enough protein, utilizable protein. Severe trauma. Even normal trauma, but severe trauma for sure requires a lot of more protein. If you've got a broken bone or you had some severe lacerations or even burns, you're going to need more.

Then finally, competitive athletes. We're not talking just somebody who runs around the block 3 miles a day. We're not talking about somebody who rides their bike. We're talking about competitive athletes who are out there, and they're pushing themselves day after day. They're going to need more protein because actually they're trying to build up their muscle.

Let's talk about how you can get that. We'll look at how do you assess somebody's protein status. You can look at what they're taking in. You could just count it up. You can go to something like FitDay.com or get any number of online little assessments, and just put in the amount of food you're eating, and the specific foods and the quantities, and that will give you an idea of what your protein intake is.

You want to look at stomach acid. Are there signs of stomach acid? We gave you a quiz that talked about stomach acid. It might be worthwhile to redo that quiz and look at what does it say about your stomach acid. Assessing pancreatic enzyme status. Again, it was a little questionnaire with a scorecard. You can do that again and see where that is. If you have things like bloating, and gas, and indigestion, it's a good sign that you have low pancreatic enzymes.

You can look at signs of neurotransmitter imbalance like, are you depressed or anxious? You're having mood swings. Are you having memory issues, brain fog? That might be a clue that you need more protein to make these neurotransmitters. Then, hormone adequacy. We have given you questionnaires to help you assess each of these and healing an immune issue, so figure out what you've got going on there. If you've got some low or high scores, meaning that you got some disruption in these areas, it may be sign that there's protein problems.

Finally, we can look at the vitamin and mineral status. Again, we have given you questionnaires, but you can also look at blood and urine test. There's a few parameters on your typical blood test that talk about protein. One of them is BUN, Blood Urea Nitrogen. The other one is total protein. Another one would be albumin and globulin. This would give you a sign as to whether your body is making enough protein; but the problem is with those is that they usually show after the problem has been going on for a while, so they may not be very sensitive tests.

Let's look at some of these protein status, blood assessments, and this. You can go back and look at your labs; or if you haven't done your labs, you can do your labs and look for things. If you've got protein, albumin and globulin, BUN, creatinine, and your gas at all low or some number of those low, it could be an indication that you've got the protein or indication that you're not absorbing your protein well. There are also some other blood indicators of low stomach acid.

What we're looking at is overall nutrient status. If you're seeing a lot of things being low, especially minerals and proteins, that's going to be a sign that you're not absorbing the food very well, and you need to look at your stomach acid, so calcium, iron. Your BUN, it could be high or low. Your chlorides, your carbon dioxide is usually high. Your hemoglobin would be low. Your MCV might be high, indicating a folate or B12 deficiency, same with MCH and MCHC. You might have low phosphorous, protein, albumin, and high globulin. High globulin is often a sign of protein deficiency. If you have any of these indicators, it may be a sign that you need to be looking at how do you take in more protein and how do you absorb more protein.

This is a chart. I got a series of charts here for your reference for just the protein content of a variety of animal foods. You can see like at the top is 4 ounces of tuna, which contains 147 calories and 33 grams of protein. Four ounces of tuna is not all that much. You see, if you are eating animal foods, it's very easy to get way more protein than what you need. This is from WHFoods.com. They have some great charts. Then, looking at protein in dairy and eggs. A cup of yogurt has about 8-1/2 grams of protein for 149 calories.

Let's look now at some of the legumes. Legumes would be the highest sources of protein in the plant kingdom. For calorie, your greens are going to be your highest source of protein; but in terms of normal serving sizes, the beans are going to be ... Miso, 4 ounces of miso is not a normal serving. That's actually a very large serving, but you could do, easily do a half an ounce of miso in a sitting, and you can throw that into dressings, so that would still give you a decent amount of protein.

Soy sauce, 4 ounces. Again, you're not going to eat 4 ounces; but if you did, 20 grams. You could easily put an ounce of soy sauce in a salad dressing.

Lentils. We're getting a little bit more realistic. A cup of lentils is easy enough for someone to eat, provides 229 calories and 17 grams of protein. You could see that if you start to include a variety of different foods in the diet, it's not that hard to reach that 45-ish amount of grams of protein, and it's even not that hard to reach 100. That's all your beans.

Here's some vegetables. A cup of spinach, which isn't all that much spinach, has 5.35 grams. If you do a green smoothie and you blend up 4 cups of spinach, which isn't all that much. It's not like over the top. There you go. You've got over 20 grams of protein with just the spinach part of that smoothie. You could see some of these others. Swiss chard, mustard greens, asparagus, bok choy, they all have a fair amount. Spinach and asparagus seemed to be right there at the top.

Collard greens are good too. You go a little bit lower. Brussel sprouts, broccoli. A cup of broccoli, you could easily eat. Lightly steamed, you could easily three or four cups, or made into a blended soup. Kale, similarly to spinach, you can add a bunch of that to your smoothie. Cooked pretty easily. Cauliflower. A cup of cauliflower is really easy to get, especially if you blend it up, and you make one of these cool recipes that make like cauliflower rice; or if you lightly steam it, you can easily eat a couple of cups.

Cabbage, sea vegetables, mushrooms, summer squash, tomatoes. There's a lot of food on this list, and they're all pretty good sources of protein. If you're really curious where it's coming from, start to add it up. Don't just count the high-protein foods like a lot of well-meaning, but ill-informed people and authors do. They'll just count the 10 sources, but you can see with the amount of greens that I encourage you to eat, it should be pretty easy. I put sea vegetables. It's just a tablespoon. A tablespoon might be a little bit high, but I can see you eating a tablespoon of sea vegetable by breaking up some dulse and putting it into a smoothie or on a salad. It's not that hard to do.

Let's just look at protein in nuts and seeds. A lot of people call their nuts and seeds high-protein foods as vegans or raw vegans, but they're really not that high. They're mostly fat. Not to say it's not bad, but they are mostly fat. As you recall from our fat talk or when you get to our fat talk if you haven't done it yet, you will know that we talk about fat extensively and how important it is to get the right kind of fat. Cashews and almonds tend to be higher in carbs as your flaxseeds than some of the other nut or seeds.

Most of it is going to be soluble fiber, quite frankly, but the highest percentage of protein in any nut or seed happens to be pumpkin seeds, so they're 16% protein. What does this mean? It means like say you eat a quarter cup of pumpkin seeds in a day.

That's about 200 calories, 16% of those calories will be protein. If we calculate that, that would be say 200, that's 20, would be 10%, and then the extra 6% would be say 30, 31. That's 31 calories worth of protein, and then you have to divide that by four, so you're really talking somewhere in the neighborhood of 8-ish grams of protein.

A quarter cup of pumpkin seeds, 8 grams of protein. Not bad, because when you're adding all of these little things up across the day, you're going to be getting quite a bit. Flaxseeds generally grilled to flaxseeds or chia seeds. I didn't have the numbers for chia seeds on here, but they're probably similar to flax. When you're adding this to your chia porridge or you're adding them to various foods, you're getting fair amount.

The biggest thing you have to watch for in using nuts and seeds as a protein source is making sure that you balance your omega 6 and 3 fats. Remember, the omega 6's are more inflammatory. The omega 3's are more anti-inflammatory, so you got to make sure that you balance those.

Here's just a list of the particular amounts of protein, and I do have chia seed here, so a quarter cup A.K.A. 4 tablespoons, which is a decent amount. It's not that hard to eat, especially if you're making dips or dressings. Chia seeds do come to the top with 12. If you're doing a chia porridge as your breakfast, you're getting 12 grams of protein just from the Chia. Now, if you're also making a green smoothie and you're putting in at least 4 cups of greens, you're probably getting another 20 grams of protein there, so that's 32 right there from a breakfast.

If you add to that some cashew yogurt and say another quarter cup, right? That would be another four. We're already up to breakfast, somewhere in the 35 grams of protein range. I've talked too about eating protein for breakfast, and I always say teasingly, "It doesn't have to be bacon and eggs." The protein breakfast that you get if you're following the guidelines that we've laid out are phenomenally high in protein.

Some of the protein in grains. Grains are mostly carbs like nuts and seeds are mostly ... Nuts and seeds are mostly going to be fat. Grains are going to be mostly carb, and then your beans and legumes are a combination. Low fat, but combination, half and half protein and carb. Buckwheat, 12% protein, millet, 11% protein, oats are 15% protein, quinoa is 15% protein, so decent amounts in your protein ... Of protein in your grains.

There's your legumes in terms of the percentages, right? Carbs are higher, but they definitely are higher in protein than the nuts or the grains. Up in the neighborhood of 25-ish percent. The legumes can be challenging to break down. The ones that are easiest would be things like lentils and adzuki beans. Mung beans and sweet peas, a little bit easier than say kidney beans and the other beans. Those tend to be a little bit harder.

I've given you references. If you want to look any of these up, there's a link on every single one of these slides. Then, vegetables like percentage-wise. Asparagus is 27% protein, beets are 11% protein, mushrooms are 37% protein, broccoli is 20% protein, zucchini is 18.5% protein, then you have good old spinach, which I didn't put on the chart, which is around 49%.

How do you know? What's the difference? There's so much pabulum about protein powders these days. I use protein powders myself sometimes, but what is the real ... Where do we really want to get our protein? We really want to get it from real food, but there are lots of times when there's an advantage to using protein powders.

Number one, they're predigested and easy to absorb, so they're broken down, and they're much easier to absorb than eating a whole food. It's easier to absorb say a hemp protein powder than it would be to absorb perhaps seeds because the protein is already extracted. Again, we like whole foods, so as much as possible, we want the whole foods. Because they're easier to absorb, because they're easier to consume, it's also easy to get too much. It's not that hard to three or four times a day, put a big scoop of protein powder into something, and end up just from the protein powder, you're getting 60 to 80 grams of protein.

Now, that can be very helpful if you're doing a cleanse. If you really want to do a cleanse, but you don't want to lose any muscle tone, you can do green juices with protein powder and have an amazingly high amounts of protein; but again, you have to be careful not to get too much. Reiterate. Protein powders are not whole foods. The same way that sugar is not a whole food. White rice is not a whole food. Even olive oil and coconut oil as good as they might have be for therapeutics, they're not whole foods, and protein powders aren't.

When we pull out just the carbohydrate out of our food, we call it sugar and say it's bad. When we pull out the fat out of it, we call it "yummy" for sautéing or "yummy addition" to our food, but really, it's just the fat being taken out of the food. Then, when we pull the protein out again, it's like revered; but in fact, these are not whole foods. As much as you can, get whole foods, but there's definitely times when doing protein powders is of an advantage.

When we're looking at protein powders that are available commercially, let's look at some of the ingredients that we want to be aware of when you're reading the labels. Added sweeteners. Some of them have fructose. Some of them have dextrose. Some of them even have corn syrups, some of the commercially made ones. Nonfat milk solids, very common in a lot of protein powders. In fact, some of them from reputable companies.

You want to be careful about soy if you tend to be allergic. I don't think that very much soy is good, unless it's fermented. Unless you can get a fermented soy protein shake, then I would probably stay away from the ones that have soy in them. Casein, which is milk protein.

It's very highly allergenic, and even for people who don't have allergies to it. It's very gummy and goey, and it can gum up the villi in your small intestine.

Whey, okay? That's one of those ways some people say, "No way to whey," and other people think it's a gift from the gods. Again, whey is extracted from cow's milk. There's protein and ... There's the protein. It's broken into casein and whey. Whey does have some therapeutic value if it's cold-processed and the person is not allergic to it. It definitely has some immunoglobulins and things like that in it, but you have to be really careful because some of the companies are not real careful about breaking out the casein. You might have traces of casein or even lactose in there, and they may cause digestive upsetness.

Non-sprouted grains. You've got a lot of rice protein powder, and rice protein powder is a little on the iffy side right now because they're finding that it's concentrating some of the metals. There's either sprouted rice protein powder or non-sprouted. The non-sprouted is going to be more difficult to absorb. When you sprout it, you're germinating it and releasing the free-form amino acids that are trapped inside. Watch for added oils and some of them that add canola oil to their protein powder.

Let's look at choosing the protein powders, plant versus animal. There's white fish protein, there's egg protein, there's gelatin, and there's whey. You have to decide, is it whey or no whey? Again, those are considerations we've talked about. Sprouted rice versus heated brown rice. More absorbability on the sprouted rice. Hemp protein is great for a lot of people. Some people get digestive upsets from it. Pea and other legume proteins can be awesome for some people. Some people get digestive enzymes ... Problems from it.

Quinoa and other grain proteins. These are in quite a number of things. Quinoa, and triticale, and millet, and all these different things. Again, some people can do them. Some people, they can't. If you choose a vegan protein powder that you like, you will take it more often. If you taste it and it tastes awful to you like some people say, "Well, this. The hemp protein tastes awful, but I like the pea protein." Okay. Some people say, "I hate the pea protein. I love the pea protein, but I hate the hemp."

Whatever it is that you prefer, "I prefer, I prefer," you go with the vegan proteins, but there's considerations for sometimes people need and some of the other proteins. It's really a matter of deciding for you. You've got to look at the one that tastes best for you, but makes you feel the best. If you take a protein powder and you get gas from it, it's not agreeing with you. Okay? If you have a few that you like, alternate them to both prevent boredom, but also to broaden the nutrient intake, the amino acid profile.

When you actually look at the amino acid protein of some of the protein powders like the whey protein versus say one of the Sunwarrior proteins, they're actually very similar, so good things. How do you consume protein powder? If you decide you're going to do protein powders, you can do them in a number of ways. You can add flavor to them. You can put them in ... And add fruits and stuff, but you could add cacao powder, vanilla, stevia, xylitol. There's a number of things you can do for flavor.

You can add ice or frozen berries to make them smoother. A lot of people complain that they're too gritty and grainy. If you just put it in water and stir it up, it could be; but if you blend it, and you add some ice or frozen berries, it can taste much better. Many of them come in single-serving size packages, so I suggest that before you invest in a \$50 big giant tub of protein powder that can last you a couple of months, try it out first. Try out the single-serving sizes. Then, when you find a brand you like, get some of the packages. Make up your own to-go bag for quick meals on the road.

What I like to do is if I'm traveling, I'll keep a couple of those little foil packets in my bag. If I'm stuck somewhere where I can't get food or all I can get is a salad, but there's nothing good to go on it, and I need a little extra protein, I'll drink one of those. From in an airport, I'm travelling, and I have a plane delay, I'll put some green powder and protein powder in a little shaker jar, and shake it up. I carry those around. I find those little ... Those packets that are pre-sealed more convenient because I sometimes carry the zip-lock bags with some measured out, and sometimes the zip-lock bags spring a hole or the zip opens up, and you end up with a mess in your bag.

Here's a few. I'm just going to show real quickly. I'll just run through a few of them. These are some of the ones available from Sunwarrior. Again, on each of this page, there's a link where you can go and find it. They have their Warrior Blend Natural, which is the combination of pea, hemp, and cranberry of all things, and they have three flavors in that. They have vanilla, chocolate, and natural. They've also got the regular raw protein, and they also have the same thing natural, chocolate, and vanilla. That's just the sprouted rice. You've got Vega, which has a nutritional shake. It's more than just a protein. Some people do well with it, some people don't.

You've got HealthForce Nutritionals, which has warrior food, and they have plain, and they have vanilla-enhanced. Now, they have chocolate-enhanced. You've got Garden of Life Raw Protein, and they've got ... That's basically a rice-based protein, and they've got chocolate. They've got chai. They've got plain. Here's another couple of different kinds, and you check them out. See which ones you like the best. You've got the Living Harvest. You've got Nutiva. You've got Manitoba Harvest in various flavors, so there's a lot of choices. If I were to make this presentation 5 years ago, there would be very few choices.

Here's one that I'm never ... I've never used this one but it looks pretty decent in the ingredient list. Epic Protein, Inca Meal Protein. Peaceful Planet, I've heard of that brand. Very reputable brand. This Boku Protein that was rated on Natural Health News and said it was a good one. Swanson has an organic rice protein. Designs for Health has pure pea. Actually, that's the only pea that I've had that I liked. I liked the Sunwarrior Blend. That one is good because they've got other stuff in it, but the plain pea that I've had, I just didn't like. This one, it's got stevia and mint in it, so it actually tastes pretty good.

Then, there's this JUVO Raw Green Protein, and that's mostly greens. There's a new one from HealthForce Nutritionals that is a variety of green proteins, so they have one called "Elite Green Protein" in either mint flavor or mesquite flavor. Vega has some proteins. Then, there's one that's Greens Plus Chia. Very high in protein and omega 3's. Then, here's a list of resources.

In summary, we've talked about what protein is, why it's important, you have an understanding of what amino acids are, and then we talked about how do you get enough protein. We talked about the food sources, gave you lots of lists. We talked about the protein powders, and we gave you lots of lists. Go at it, and make sure that you get enough protein because it's very important. You can be getting a lot of protein, not absorbing it.

Make sure that you do all the great things that we teach you to do for your digestion like being calm before you eat, chewing your food thoroughly, and making sure that your enzymes and hydrochloric acid are intact. This is Dr. Ritamarie Loscalzo. I trust that you've enjoyed this presentation and got a lot out of it. I would say go and take a look at your own protein status.