# Macronutrients: Protein Sources in the Diet

## Transcript

Hello and welcome to the Institute of nutritional Endocrinology's, macronutrient module. And today we are going to look at protein sources in the diet. And it's an exciting topic and I think it's something there's a lot of misunderstanding about. And you are going to really need to get so that you can explain to your clients- where do they get their protein.

So before we begin, I want to make sure that you remember that this is not medical advice and this should be used by people in conjunction with working with qualified health practitioners. It's not diagnosing, it's not treating. We are just kind of pointing out to you what the role of protein is in your client's diets, how you assess it, how you can give them good information about how to optimize their protein.

So let's take a look at what factors might contribute to a person becoming deficient in protein. We hear a lot about, yeah, you have to eat a certain amount of meat, you have to eat a certain amount of g of protein a day but what's the reality of it, how many people are deficient in protein because they don't eat enough?

It's usually not a matter of not eating enough because if somebody eats a calorie sufficient diet as long as it's whole foods they are going to get enough protein. So the people you worry about not getting enough protein are people that don't eat right or picky eaters. There are also people who have low hydrochloric acid in their stomach.

In the digestive module we go through what that is and what the cells producing it and how you can optimize it. But when somebody has low hydrochloric acid they can't digest the protein very well. Proteins and minerals require that there be a good source of acid in the stomach in order for them to be broken down and absorbed by the body.

So if there is low acid in the stomach which is actually quite a common problem as people age then there can be a deficiency of protein and we will learn ways to look at blood tests and analyze what those are. So deficient pancreatic enzymes, the pancreas is the bland kind of organs.

It is one of the hybrids that has some glandular function and it's an endocrine gland, it's an exocrine gland and it's an organ.

So the pancreas produces enzymes to help break down the foods. So the protease enzymes break down protein, the amylase break down the starch, and lipase breaks down the fat, the cellulase breaks down the cellulose although not very efficiently.

If you are deficient or if your client is deficient in pancreatic enzymes, in particular the protease enzymes, then they will be low in protein because a lot of the protein they are eating is just not getting digested and absorbed. Also poor liver function can contribute to a deficiency of protein.

The amino acid metabolism is controlled in the liver. So the movement between one amino acid and another, the combination of those together has a lot to do with what is going on in your liver. Another thing that can impair protein absorption and utilization and the movement from one protein to another, the amino acids that get formed together is vitamin B6 deficiency because it is a co-factor for the manufacture of many essential amino acids.

So a person may have a certain amount of protein in their diet but not enough of the amino acids. And really when you are looking at people you don't want to look at are they deficient in protein, it's more amino acids if you want to look at a dietary perspective because inevitably the protein has to get broken down and utilized.

If you were to take say 50g of amino acids and take them into the system and it was the right balance for your tissues that would be more efficient and much more equivalent to protein than if you took 50g of protein in steak or animal products. Any kind of infection or severe physical trauma can use up the proteins stores.

Why do you think that is? Well, it's because when you are having a trauma there is going to be repair of all that needs to happen. There are tissues that have to build back up. We have to be able to form collagen and that takes having a sufficient amino acid. And then finally bacterial and viral infections are going to create an influx of immunoglobins and immunoglobins are anti-bodies and those are proteins.

So you could see that protein deficiencies I don't believe it's real common but I think that when these other situations happen it makes it more of a problem. Let's take a look at protein requirements. It is really hard to say an adult female need 20g or 50g of protein a day or a male needs 100g there is a whole different adult size of males and females, there are whole different activity levels.

So we can't really blanket say this is how much. But these are the things that have been in the literature so you will run across it: they say the RDA is 0.6g per pound, that is the official government standard 0.63g per pound so that is approximately a gram for every 3 pounds of body weight so if someone weighs 120 pounds and you divide that by 3 you get 40 so that a person probably needs about 40g of protein.

Whereas if they weigh 200 pounds, 200 divided by 3 is going to give you close to 70 so that's the way you do it. And if a person is more athletic it is said 0.6-0.9g per pound, again it goes by pound. Paleo diets look at 1g per pound and they are very heavily meat-oriented. Zone diet says protein should be 30% of calories regardless of the amount.

According to WebMD there's a bunch of guidelines and infants just need a little 10g a day, whereas pregnant or lactating women need all the way up to 71g a day. Teenage boys we think of them as growing really fast they are estimated according to WebMd, like it's the most reputable source, about 56g a day, teenage girls 46g, adult men 56g, adult women 46g.

It's really not a whole lot of protein and when you start to look at where it comes from in a whole-food high plant based diet, it's really not that hard to get. The problem usually is the digestion. So let's look at how cooking affects protein. Heating and beating cause denaturation and coagulation. Heating is obvious what that is; it's baking it, it's frying it. The picture on here is cooking it over a barbeque and that is like the worst way, charred meat is really horrendous in terms of toxins.

But basically heating and beating is like say you take an egg and you open it up and you start beating it around before you make it. That beating of the egg and the yolk in addition to oxidizing the cholesterol and making it damaging actually messes up with the structure of the egg white and it could cause them to coagulate or denature.

So let's look at what those things mean. Denaturation changes the shape of the protein and decreases its ability to dissolve in liquid. Coagulation causes the protein molecules to come together and then they are harder to get up taken to the tissue where they are needed. Overcooking as you can well imagine destroys things, heat sensitive things, heat sensitive amino acids.

The bonds between them can change the shape of the protein so we really want to watch for that. And also it makes some of them resistant to digestive enzymes. So they aren't able to be broken down. Basically because the shape has changed of the molecules and that's not what those digestive enzymes are looking for.

There are times when people will need higher protein and you need to be able to assess that and talk to them about how to handle it. Things like a muscle wasting disease, yes you want to get to the underlying cause of what that is but sometimes it's a vicious cycle that they can't exercise their muscles are wasting because they can't exercise is that going very slowly and at their own pace is going to make a huge difference.

Muscle wasting and weight loss conditions definitely are going to need a higher repair, frequent infections and severe edema as well. So if somebody is on a weight loss diet they are restricting their calories to maybe 1000 less than they are actually burning so that they can drop some weight.

If they are doing that and are not being really careful about the protein, they are still taking a proportionate same amount of protein, it absolutely not going to be enough. So that is time to really look at it. Fatigue and weakness, when somebody is really wiped out, oftentimes they are some protein issues. But then again it's a self propagating cycle there. Frequent infections again an issue where people need more protein to try and make the immunoglobins to protect them.

Severe anemia and fluid retention could require a high protein so the liquids don't suck out into the joint spaces and their muscles. When you have a child who is growing slowly of course you have to look at are they eating gluten, are they eating allergens which will absolutely affect the way they will grow but it's something that's worth checking into.

Bruising and Burns and competitive athletes, they all need extra, it's not as much extra as we have made to believe. I don't think anybody needs 200g of protein but they may need over 100 in times of specific stress whether it's work stress, or home stress or physical stress. Let's move into looking at how you can assess whether the person you are working with has some protein insufficiency issues.

The first thing you want to look at is how much protein are they taking in? Take a look at their diet records, you can run it through a program like www.fitday.com or any other program you might have just to get an idea of how many grams of protein are they taking in and is that sufficient for their level of activity, for their age, for their needs in terms of are they in a healing process?

Have they just been traumatized, had an accident, do they have some other issues going on with their gut. So you have to really look at, how much are they taking in compared to how much they need? And that's kind of a guess, there are some formulas which we shared already.

The other thing to look at is the adequacy of their stomach acid. There are some fancy tests you can do to check that, we talk about that in the digestive modules but they are expensive, they are hydro bird tests, they are inconvenient, there is one where they drop the string attached to ph paper down and then you have to swallow it and then have to pull it back up.

Most people don't really want to do that but what you really want to do is symptomatology and you have got access to a bunch of forms and the score card type of questionnaires. That said, given a certain care on this it looks like they may have excess stomach acid or insufficient stomach acid. Insufficient stomach acid is really where they are going to be at if they have protein insufficiency and it's so common.

Those stomach acid levels go down as we age and there are so many things that affect the stomach acids in terms of the kinds of foods people are eating, the substances they are taking in, some of the drugs they take etc. So really assessing do you suspect that they have low stomach acid? That would help you to know whether they are good on their protein.

You also want to look at the pancreatic enzyme status. Well how do you test that? Well that's not an easy thing to test either so again it's a guessing, it's looking at some of the questionnaires; are they having bloating and gas, what's the timing of the after meals, do they seem like they are taking in really good levels of foods but not getting it, showing signs of deficiencies?

The other thing that you could do is your stool analysis. A lot of the stool analysis is functional analysis so they look not only for bugs or imbalances in flora. But they will look to see if there is anything. There is something called pancreatic elastase will show up in a stool analysis.

So if you happen to have a stool analysis because you are suspecting gut stuff, or because they've brought it in from another practitioner then you can look at that to see and get a guess as to what their pancreatic enzyme status is.

Again we need protease to help digest and how you are going to address some of these insufficiencies is well helping them to produce more stomach acid, helping to give them some stomach acid while you are training them to produce more stomach acid and then looking at taking in more pancreatic enzymes or protease type enzymes similar to what the pancreas would produce.

Or looking at how do you get the body to need less enzymes meaning have more enzyme rich foods like living foods, fermented foods, probiotic rich, enzyme rich foods and raw foods. The other thing that I would look for in terms of assessing somebody for protein status is signs of neurotransmitter imbalance.

We'll get further into that in our neurotransmitter brain chemistry part of the course but all those neurotransmitters have as pre-cursors amino acids and some of them actually are amino acids. So we want to look at do they have some depression, do they have lack of motivation, and are they having difficulty focusing and concentrating?

That might be a sign that they need more of particular neurotransmitter precursor amino acids. Again looking at hormone sufficiency hormones need protein in order to be produced. So if somebody is chronically low in their protein because either they are not getting it enough or they are digesting it well enough then you might see some hormone inefficiencies.

Sometimes hormone deficiencies clear up by simply addressing nutritional needs and one of those would be the protein. We'll look at healing and immune issues, if they tend to have nails that don't grow, brittle nails, if they tend to have wounds that don't heal quickly, if they tend to be chronically ill over and over again, it's possible that they have protein insufficiencies.

So you want to make sure that you explore that and look for other signs and experiment with it. When I am on the edge I am not sure, sometimes I will just recommend somebody, get some extra protein powder to see how they do with it, see how well that works for them. And sometimes when they are low they need a concentrated source of the protein.

Sometimes they just need individual amino acids. And they need individual amino acids is based on nutrition but also on their genetics. They may just have a problem with certain pathways with the synthesis of certain proteins from amino acids, proteins within the body. Clues to vitamin and mineral status, if they've got low protein status because of lack of digestion you are also going to see vitamin and mineral imbalances as well so you want to look for that.

You also can look at blood and urine tests. You can do blood and urine tests for amino acids and then there are other signs on the blood test on a standard blood cam that will say whether or not this person is adequately digesting protein. Again there are indirect measures but they certainly can be helpful.

And in terms of urine tests there is the 24hour collection of urine for testing amino acids but there are also organic acids. We will be going into way more details about those in the appropriate module. So let's look a little bit on the blood assessment of protein status. We'll go way more into the detail of the blood testing when we get into that module.

But I just want you to have a sense of what kind of things could indicate low protein because you will have access to people's blood tests whether you invite them to order it through www.directlabs.com or through their own doctors or it's labs that they have brought in and said here is the labs that my doctor ran, does it give me any nutritional clues?

And then you take off your thinking hat and say of course it does. So the things you are looking for of low protein status in the body I should say are is low protein are obvious, also low albumin, high or low globulin, BUN, low generally, and creatinine, low. Any of these indicators that they may have low protein in the body.

Obviously protein and albumen they do have low protein in their body. Other blood indicators that might suggest that they have low stomach acid would be: low in terms of some of the minerals, so calcium is low, iron is low. With stomach acid BUN can be high or low, chloride is often low, carbon dioxide is often high and that is a measure of acid/alkaline residue in the body, and high carbon dioxide can indicate that they don't have enough stomach acid to do the alkaline minerals.

So hemoglobin is often low but then MCV and MCH and MCHC, which are usually suggestions of the red bloods cells which tend to suggest folate and B12 insufficiencies, also phosphorus low and of course the standards of protein, albumen and globulin would be low, globulin high or low is usually the case. But oftentimes it is high.

So I'm going to give you a little bit of a sense of where the protein comes from food. But how much because a lot of people think, oh you have got to just eat half a cow to get enough of protein, and realistically when you look at some of the ideal numbers that we looked at earlier the high ones were in the 72 range for pregnant women.

Now of course if somebody is very athletic it may be higher. If someone is a burn victim, they may be higher, it can be a 100g a day, people who have leaky gut may be higher, phase 2 detoxification problems could be a little higher, because they need those amino acids for doing those processes or for doing their repair.

But in general if we think they are a normal sized weight woman, 120 pounds say, would need maybe 60g at the highest unless she is a super competitive athlete and is lifting lots of weights and she is doing it daily and she is a body builder, maybe she needs 80: so really not all that much. Here is looking at some of the meats which are obviously the higher sources are all the way to tuna at the top (33.06g/4oz) down to sardines at the bottom at 22g/3.2oz.

Some of these numbers are a little bit off because they are all not four ounces, the sardines are a little bit less, probably that's because they have them in a can and that's how people usually eat them but in general between 23g and 33g of protein per serving. That is decent, that is like half of the requirement and probably more than half of what really is required.

And this is from WH Foods by the way and there is a link there, a really excellent resource by the way if you want to look up where to find nutrients in certain foods. They stuck in here, soy bean right in the middle there. Because a cup of soy beans, I'm assuming they mean cooked because a lot of people aren't eating them raw.

So a cup of cooked soy beans are 28g. So a cup of cooked beans is not a tremendous amount so it's not unreasonable thing. Tofu is probably more concentrated, tempeh is more concentrated because it is packed in a denser way. Soy is a good source of protein and so is animal flesh. So I stuck the soy in the middle there so you can see how it compares.

Dairy products are typically said oh yeah they are a great source of protein. In reality a cup has about 8gram, 8 and a half. Cheese has 7, eggs have 6.29 and cow's milk has 3.4 in four ounces. People will typically drink a cup of cow's milk, so say 8, so all of these are in the neighborhood of 6-8g of protein per serving.

We are just looking for comparison because you want to be able to give people these. We don't recommend the dairy products because I just believe they are mucus forming and they are inflammatory and they cross react with gluten and they can cause all kinds of problems in the body and they are known to be problematic, we can look into more of that.

And we will go into more of that when we go into our food religions kind of course work. So here is looking at legumes. Legumes are beans, the bean family. There are a lot of them in there. A typical serving size might be a whole cup. Obviously miso, we are not going to eat 4 ounces in a sitting and we are not going to take four ounces of soy sauce in a sitting unless you like you food really salty.

So you have to keep in mind when you are looking at the nutrition charts, just the amounts. And I just copied these straight from WH Foods because they have done all the research. You know I could have looked them up and done it but they are a good source and I'm promoting them and sending them your way to look at them.

I actually bought their biggest fat book just to have it on my desk so if I am doing some research and wanting to create some of these charts I can. But looking at this, miso and soy sauce are at the top but obviously nobody is going to eat that quantity in one sitting so let us look realistically.

A cup of beans, a cup of lentils, in some cases I watch the way my kids eat, they probably eat two cups of lentils in a sitting or two cups, or at least a cup and a half of cooked beans. They are loading it up in their tacos and they are putting a big load of it on their plate or they are having it with a big bowl of chili.

So one to two cups will be a serving size for a robust growing person and cup will be certainly the minimum that anybody would need at a time and look how much protein is in there so 17g starting with lentils down to 14g per cup on Garbanzos. So you compare that to the dairy product it's actually about double the amount in dairy products.

People say that dairy products you have to have dairy it's a good source of protein, your legumes are a better sources and quite frankly they are not that far off of the flesh. So if somebody is vegetarian and you are working with somebody who is vegetarian and they need more protein in their diet these legumes are a good source.

Some people who will end up with gas and bloating from the legumes because they don't tolerate them real well and you've got to take that into account when you are dealing with what to put somebody on food-wise in order to get their protein. But you can sprout them, at least lentils and mung beans which are not listed here, mung beans and aduki beans they are up there, they are just not listed on this chart.

So I would look those up separately in a different spot and see how much is in there. And if somebody did eat two cups like my son eating his lentil soup, he is getting about 35g of protein in that meal which compares very favorably and is actually higher than most of the animal flesh, the four ounces of animal flesh.

And I'd much personally I would rather see him eating lentils they have far more other values and they are rather cleaner. He has been big since birth and he is robust and big muscles and very healthy and very strong. He's one of the fastest kids in his life guarding class so he is really getting plenty of protein because he's eating hummous, gets plenty of garbanzo beans and tahini which is a good source, and lentils.

He eats pinto beans and the other kind of beans and he eats a ton of vegetables. So we will see in a little bit that vegetables are good sources of protein too. So here is a listing of the amount of protein in servings or what they consider a serving size of spinach. Now if you are anything like me you are putting at least four cups if not sometimes eight cups of greens into a smoothie.

And if you are juicing you are juicing a heck lot more than a cup because that would give you a couple of little ounces in the cup.

The myth that it propagates is that you have to have a little bit of flesh foods or concentrated vegan sources of beans in order to get enough protein. And quite frankly if you are a smoothie maker or if you are someone who likes to make a whole bunch of vegetables in a pot and steam them and then blend them up and make a soup, you are getting a ton of protein.

So if I look at spinach, say I put two cups of spinach which is not very much and then I put couple cups of collard greens and then I put a couple of stalks of broccoli and a couple of cups of carrots. I can make my day of smoothies that way. I just think I added up about 30g of protein. And I've done the nutritional analysis on some of my smoothies and soups and I generally get somewhere in the neighborhood of 20-30g depending on how much I am making.

One of the things I love to do for dinner is to steam up a pot of broccoli and cauliflower and cabbage and then blend it up and put some coconut and some Thai seasonings in there or other kinds of seasoning and make a delicious soup. Well I typically have way more than a cup of broccoli, I'll generally have three or four cups of broccoli there. So you see right it's almost 15g just from the broccoli.

The cabbage I usually have at least two cups of cabbage in there and we are looking at another five so we are up to 20 already on the protein. I will have kale, either I will have the kale blended up in there but usually I keep the baby kale small and I will pour that in, I'll use that raw.

But in any case that's at least is another cup there. And then if I throw in some sea vegetables and then throw in some mushrooms so this is adding up tremendously. And then if you just take a quarter cup of pumpkin seeds pumpkin seeds are great source of zinc, a good source of fat 180 calories per quarter cup, not bad.

You put that in you make a cream of something soup with pumpkin seed as the creamer, you just added almost 10g of protein. So let's just add that up so let's say I make a cream of broccoli soup and I use the quarter cup of pumpkin seeds and I use three cups of broccoli and a cup of cabbage, so what do we have there?

Maybe I will throw some spinach in there. So I will throw in two cups of spinach, two cups of broccoli and a cup of cabbage. So that would be 11 plus 8 is 19 plus, that's 20 on the vegetables alone and then another 9 on the pumpkin seeds that's 30g of protein right there. So really your clients are like I don't know where to get my protein, and I want to do this diet or I want to fast or cleanse or whatever and how am I going to get enough protein.

People say that to me all the time when they are doing the green cleanse. How am I going to get enough protein? Well I am just saying, follow the recipes add it all up it will come up to at least 60g if not 100g of protein. And it is good, easy to digest protein. I'm not saying everybody has to be vegetarian or vegan but I am saying there is no reason to worry about protein on a vegan diet.

There is plenty of it. There is no reason to stock up and have to feel like you have to eat a tons of beans to get it especially when you fart when you eat beans or your clients say I can't eat beans I get gassy. Then with the vegetables and when you teach them to do blended soups and smoothies and juices, woo, tons of protein.

So put it to bed, put it to sleep, feel comfortable with this. So here is just a little list of some of the proteins and seeds and how they break down. How much carb, protein and fat. A lot of people will say I'm vegan, I'm raw, I get my protein from my nuts and seeds. Well yeah you do get some protein but mainly you get fat and that's good as long as it is not an out of balance fat.

But a lot of folks really just eat a lot of almond milk, eat a lot walnuts and pecans which are omega 6. And as we learned in the fat module, if you haven't watched that one, you've go to the fat module you have got to make sure you balance the omega 3s and 6s it is really important.

And on this chart right here where we are looking and nuts and seeds the ones that have the most omega 3s would be the flax seeds and second the walnut. And again this was just taken from specific lists. We could add hemp seed to it, we could add Chia they are all good sources.

And I would encourage you in order to really get comfortable with how much protein is in that quarter cup or two tablespoons of chia. So you could easily give feedback to people and say, look this is good stuff. These are good sources. So let's just look at some of these common nuts and seeds that we would typically recommend to people for a lot of reasons.

Chia and Hemp, I put chia and hemp in my breakfast. So I will typically soak a quarter cup of chia in about five cups of water or more and that would be an amazing porridge so 12g of protein. That is pretty darn good. Add some hemp seeds. I might not add a full quarter cup of hemp seeds in there, maybe I will put two tablespoon or half a cup, that would give me 5.

So if I sprinkle some flax seed on them, maybe two tablespoons of flax seeds maybe 4, so that's is another 20. So that just gives us an idea of how much actual protein is in these foods.

The higher the fat in the nut, the lower the protein content, we sees cashews at the bottom but this is good stuff to know.

Grains are also a source of protein. Not very much but we are looking at 12% in buckwheat, 11% in millet, 15% in oats and 15% in quinoa. So they are good sources and if your client tolerates grains they don't have a cross reactivity to gluten or they are not really carbohydrate sensitive or glycemic sensitive, insulin resistant then this is going to be good sources of some additional protein.

And then again we are looking at percentages so where split peas are up, legumes are up in the 25-27% as opposed to in the 12 vicinity for the grains. So you see where to get your protein? It's not that hard. It really isn't that hard and I encourage you to really get familiar with this so when somebody is questioning this you give them really good answers.

And you can use things like I said online, there's www.fitday.com, there are others where you can just plug in a day or two in your intake or what you can do is make up some recipes or use some of my recipes if you want to get them and run them through one of these programs. Say look if you make this smoothie and you have half of it in the morning you can have it in the afternoon you are going to get 60g of protein.

And then if they need a little extra then they can get the good protein powders and there are some high quality protein powders. In our next presentation we are going to look in depth at some of those protein powders. The pros the cons, when you would need them, when you would not need them and how much protein is actually in them.

So our last slide is just looking at percentage wise how much of the various vegetables are protein. Asparagus is up there with the legumes at 27%. You may think well I don't need that much asparagus but if you make a cream of asparagus with mushroom soup even I have a wonderful recipe with asparagus and tomato and some really cool spices and it's blended, and it's really, really delicious.

But yes you could do a whole bunch of it you can get quite a whole lot of protein. 27% beets are only 11, because they are higher in carbs, they are a lot sweeter. Then mushrooms 37% of their calories are from protein, can you imagine? So yeah make yourself some broccoli soup with mushrooms or asparagus soup. Broccoli 20% protein, zucchini 18.5 % and there are some other charts that show kale and spinach up there in the 40%.

So it's good stuff and you can help your client get lots of good quality protein without the residues, the toxic residues of excess nitrogenous waste that they will get when they consume too much of the animal protein.

Again I am not saying everybody has to be vegan and you have to go off of that. I think there are definite advantages for some people in many situations and some people feel like they don't want to psychologically let go of it and they are physiologically their bodies have adapted so they don't do as well.

Part of that is detox and you have got to work with them on that. But what I am saying is you don't need to be sitting there and saying oh you can't be vegan you have to get your protein. You know now where you can get your protein. So this is Doctor Ritamarie I will see you on the next video.