WHAT IS PROTEIN?

Protein is an essential nutritional product for the growth and development of all humans, both in and out of their mother's womb. Protein is made of amino acids. After the body consumes proteins it then breaks them down into amino acids which are the building blocks for the body. There are approximately 28 amino acids that the body uses for proper functioning. Nine of them are called essential amino acids (EAA) and must be taken into the body from an outside source. The remaining 14 are synthesized by the body itself.

Images of methionine, an amino acid, by Michael W. Davidson and The Florida State University.

The easiest way to feed the body the EAA is through animal products which are called "complete" proteins because they contain all nine essential amino acids in one source. The vegetarian will need to watch their diet more closely than one who eats animal proteins because plant sources do not have all nine EAA in one food, specifically their foods do not have the EAA in the right proportion. Because of this, they will need to find foods high in one and match it with foods high in another to create a complete food. In spite of this ability to mix and match to create a complete food, all plant sources are low in three specific EAA, tryptophan, cystin and threonine.

Pregnant woman require, on average, 80-100 grams of protein a day. 20-30% of the daily intake should be a complete protein; the rest can be incomplete and come from many different plant sources.

It is important to note that the body does not store much protein, maybe 80-90 gram of complete protein (the daily intake for a pregnant mom), therefore a daily consumption is required. A deficiency in just one amino acid will result in the body being unable to produce the other proteins the body needs - even if the protein intake is high. The amount of protein needed by an individual is…individual. Various genetic and hormonal factors impact what an individual may need. When a woman is pregnant, she will need to increase her protein intake for the baby.

HOW MUCH PROTEIN IS NEEDED?

This question can be answered many ways depending upon the individual person and their circumstances. There is the belief in our culture that Americans consume too much protein and naturally that thought can be argued many different ways. Questions that should be answered before coming to the conclusion that someone is consuming too much protein would be their lifestyle, how active or inactive they are, how often do they work out, where their protein is coming from and most important to this work, is this person a woman and is she pregnant?

Pregnant woman require, on average, 80-100 grams of protein a day. Naturally there are women who require less than that and there are women who require more than that, but 80-100 grams is a great place to start at. How much of those 80-100 grams needs to be "complete" protein? 20-30% of the daily intake should be a complete protein; the rest can be incomplete and come from many different plant sources. Other factors that are important include the quality of the protein source. Animal proteins coming from an organic farm, where the animals are raised free of

HOW MUCH PROTEIN? WHERE DO I FIND IT?

food	*serv. size*	*grams*
milk	8oz	8g
yogurt	8oz	8g
cheese	2oz	14g
egg	1 whole	6g
steak	4oz	24g
chicken	4oz	32g
fish	4oz	28g
venison	4oz	32g
ham	4oz	24g
almonds	1/2c	10g
walnuts	1/2c	9g
cashews	1oz	5g
peanuts	1/2c	19g
peanutbutter	2Tbsp	8g
black beans	1c	15g
pinto beans	1c	12g
lentils	1/2c	25g
kidney beans	1/2c	24g
peas	1c	16g
pumpkin seeds	1/2c	17g
Kashi Golean	1c	14g
oatmeal	1packet	4g
baked potato	1 large	7g
broccoli (raw)	1c	3g
corn	1/2c	2g
spinach	2c	2g
banana	1 medium	1g
strawberries	1c	1g

To learn about the nutritional value of more foods, go to: www.nutritiondata.com.

hormone treatments, antibiotics and the various other chemicals common to animals raised in mass production, will provide much higher quality nutrients.

It is important for the pregnant mom to take in enough calories as well as protein. If mom's intake of calories is too low, the body will then use the protein intake as energy and its role of "building" is sacrificed.

WHY DOES THE BODY NEED PROTEIN?

Protein, and the amino acids that make up protein, is essential for growth and development. Think about the baby in the mother's womb, its entire focus is growth and development!

Protein for everyone is used for:

- Healthy growth of: bones, muscles, skin, blood, hair, nails, organs, connective tissues and nerves
- Development of the brain and nervous system, in particular amino acids that contain sulfur, (this is easy to access through eggs and meats).
- Maintaining proper acid-alkali balance
- Helping the liver detoxify and synthesize plasma proteins

Protein in the pregnant mom is used for:

- Development of baby's tissues and brain
- Growth of the uterus, breasts and blood volume in pregnancy
- Forming the placenta
- Production of hormones, enzymes and antibodies needed in labor, postpartum and nursing
- Production of milk for nursing
- Help with the process of blood clotting which it vital in the postpartum period

WHAT HAPPENS IF THE PROTEIN INTAKE IS TOO LOW?

There are several things that are important to be aware of with protein deficiency. These effects are bad for the non-pregnant person, but for the woman who has a baby growing within her, these effects can "have serious immediate consequences" *(Frye 1 p218).*

- stunted growth and development
- loss of muscle tone
- feeling of decrease in energy, fatigue
- loss of appetite
- diarrhea and vomiting
- edema
- depression
- increased susceptibility to infection
- delayed healing of wounds and injuries
- reduced immune function
- some research shows that pregnant moms with low or poor protein intake will be at greater risk of becoming preeclampsic, toxemic or eclampsic

OTHER NUTRIENTS ASSOCIATED WITH PROTEIN

Protein and amino acids do not work alone. Animal sources of protein provides the body with important vitamins, miner-

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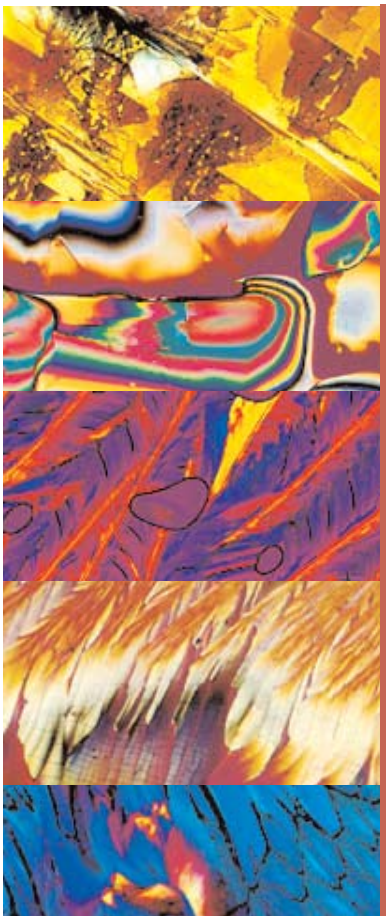

What are the Eight Essential Amino Acids?

Amino Acid	Abbreviation	Minimum Daily mg	Generates	Works With	Augments
histidine	His	none for adults 28 for infants and essential for the neonate			myelin sheaths, blood
isoleucine	Ile	10	-	-	muscles
lysoluecine	Leu	14	-	-	blood, muscles, hormones
lysine	Lys	12	-	calcium	herpes triglycerides
methionine	Met	13	cysteine	selenium, zinc	hair, skin, chelator
phenyalanine	Phe	14	tyrosine	B6	depression
threonine	Thr	7	glycine, serine	-	collagen, tooth enamel
tryptophan	Trp	3.5	niacin, seratonin	-	depression
valine	Val	10	-	-	muscles

Images of amino acids by Michael W. Davidson and The Florida State University.

SNEAKY WAYS TO BOOST YOUR PROTEIN IN YOUR DIET

Eggs:

Each egg packs 6 whole grams of protein in one small nugget, plus it's filled with most of the vitamins and minerals including iron that every pregnant mom needs.

- Hard boil a dozen and have them as a snack throughout the day.
- Add a diced hardboiled egg or two to your salad
- Use a raw egg or two in your smoothie (make sure your eggs are of the highest, organic quality)

Nuts:

There are many different nuts and many uses for them. They are a great source of protein that can often be overlooked. Some people avoid them, fearful of the fat that they contain. Yet not all fat is the same and many forget that fat is another essential component to our health. Try these ways to include nuts in your diet.

- add them to your salads
- sprinkle them over the top of your casseroles for an extra crunch
- when treating yourself to a baked good, like muffins, cookies or pies, add some walnuts or pecans for a hidden source of protein
- sprinkle on top of cereal and oatmeal at breakfast time

Spirulina powder:

This deep green powder is an algae that is packed with a very significant amount of protein, including the all important essential amino acids, B12, calcium, beta-carotene and iron. It is also good for stabilizing a person's blood sugars. 1 Tbsp is 4 grams of protein (it is 60-70% protein!) Start with a small amount as you acquaint yourself with its flavor.

- Add to your smoothie, start with a teaspoon until you are comfortable with the taste and then increase the amount.
- Add a teaspoon to 2 eggs and scramble them up for authentic... and healthy... "green eggs" and serve with a slice of ham.
- Sprinkle some over the top of a hot-dish, into a stew, chili, soup, etc.

Bread and other grain products:

For those who are creative in the kitchen, try using products like vital wheat gluten, wheat germ and flax seed. Vital wheat gluten has 21 grams of protein per ounce and wheat germ has 6 grams per ounce. Add it to your bread, muffins, pancakes and any other place you can think of.

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als and fat. It is believed that the body needs the fat that is found with animal protein foods to properly utilize the amino acids. It is the fats that supply the body with vitamin A and D. When eating low fat foods and lean meats, use caution as this can create a deficiency in vitamin A, D and B12.

A diet low in animal proteins will also be low in important minerals such as zinc, iron and calcium. Zinc deficiency can lead to learning disabilities and mental retardation and in the male, fertility issues. Iron deficiency is related to poor mental development and weakness with the immune system. Calcium is needed for the bones and teeth, but also for the heart, nervous system, muscle growth and contraction. Calcium needs vitamin D to be able to properly absorb calcium. The B12 vitamin occurs only in animal proteins and the body can store it for 2-5 years. It is interesting to note that nursing infants of vegetarians can show a deficiency of B12 and that plant sources of B12 actually cause a deficiency.

Protein is an important key element to the proper functioning of the human body. During pregnancy, this becomes even more true. Staying in turn with your diet is key to staying low-risk during pregnancy and avoid-

WHAT ABOUT PROTEIN POWDER SUPPLEMENTS?

The first thing to remember with protein supplements is that they are just that, supplements. Make sure the majority of protein you consume each day comes from whole food sources. There are many different types of protein out there, whey protein, casein protein, soy protein, egg protein, meat protein, the possibilities appear endless and confusing. Looking at protein supplementation from a pregnant momma's perspective will help and is worth it because of all the ways it can be used to enhance mom's diet.

You need to start with learning which kind of protein to purchase. There are many sources out there to help you learn. Two of those sources with much research and articles written for a lay person to easily understand are: www.prosourcenutrition.com and www.bodybuilding.com. These are also great places to purchase high quality protein with competitive pricing.

Over and over you will find that whey protein appears to be the favorite protein at this time. It is a high quality protein powder that comes from cow's milk without the lactose and sugars associated with milk as a food. It has many high points, but again, when we focus on the pregnant mom we see that it's absorption is high and fast which is very beneficial when the body is working to repair muscle damage...think postpartum healing here! Also think of all the stresses that the body goes through as it grows to accommodate the uterus, placenta and baby growth. Whey protein has also been shown to reduce blood pressure which is important to the pregnant mom as she wants to avoid toxemia and it also has immune-promoting properties that help the

ing health issues such as high blood pressure, pre-eclampsia and toxemia. The great thing about good nutrition is that it's easy to achieve!

For more great information on nutrition, check out the references listed below and the websites listed throughout this article. You have the power within yourself to create the optimal health for both yourself and your baby and your family.

References:

1 Prescription for Nutritional Healing, *Balch, Phyllis A, CNC*
2 Holistic Midwifery, *Frye, Anne*
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5 The Very Important Pregnancy Program, *Brewer, Gail Sforza*
6 The Natural Pregnancy Book, *Romm, Aviva Jill*
7 Metabolic Toxemia of Late Pregnancy Brewer, *Thomas H M.D.*
8 For the Ultimate Protein Value, Quality Beats Quantity, *Whitehall, Robert 2008 Prosource Performance Nutrition Catalog/ProductGuide, vol 2*
9 Super Powder: Research Confirms the World's Premier Protein for Packing on Lean Mass, *LeFavi, Bob PhD, CSCS 2008 Prosource Performance Nutrition Buyer's Guide*

How do vegetarians combine their food to ensure that they are receiving all eight of the essential amino acids each day? This guide is a great way to start addressing your "combinations".

Food	Deficient Essential Amino Acid	Complimentary Protein Combinations	
Grains	Lysoluecine & Lysine	rice + legumes corn + legumes wheat + legumes wheat + peanut + milk wheat + sesame + soybean* rice + nutritional yeast	
Legumes	Tryptophan & Methionine	legumes + rice beans + wheat beans + corn soybeans* + rice + wheat soybeans* + corn + milk soybeans* + wheat + sesame soybeans* + peanuts + sesame soybeans* +peanuts + wheat +rice soybeans* + sesame + wheat	
Nuts & Seeds	Lsoleucine & Lysine	peanuts + sesame + soybeans* sesame + beans sesame + soybeans* + wheat peanuts + sunflower seeds	
Vegetables	Lsoleucine & Methionine	lima beans or green beans or brussels sprouts or cauliflower or broccoli	+ sesame seeds or brazil nuts or mushrooms
		greens + millet or rice	

Worthington, et.al., 1977

** Soy products are much debated these days among health experts. It has become a significant food staple for vegetarian and vegan families and has also shown up, hidden, in many other foods. Most experts appear to be comfortable with a small amount of soy products in a person's diet, however there are many concerns about its safety when consumed in large, frequent quantities. It would be wise to research this subject and decide what you are comfortable with feeding your family. Great places to start your research could be the following web sites and simply enter the word "soy" into their search engines to learn more, www.mothering.com, www.westonaprice.org*

mom stay healthy and accepting of the baby growing within her womb.

When shopping for a whey protein, there are many choices and varying degrees of prices. If you shop wisely you will get a great protein for a great value. Seek a protein that is a whey isolate which is over 90% protein and avoid the whey concentrate, which, depending upon the brand is only 25-80% protein, so you will end up paying a lot of money for very little protein. You also want to seek a protein that is labeled "cross-flow micro/ultra which is in reference to how the protein is extracted. Some forms of extraction will leave the product with very little nutritional value in the end which is the most common negative you will see associated with protein powders. But as science improves and new techniques of extraction develops, the protein powder is becoming a very healthy source of nutrition.

So how does mom use this whey protein isolate? Mom can go with the simple way of mixing it with water and drinking it as a snack, though many people this hard to stomach. It can be blended with some milk, ice cubes and fruit for a great smoothie. Here you can go crazy with limitless options of what to add to the smoothie. Fruits and veggies go great in smoothies and the nutritional value can't be beat! Add some spirulina and a small amount of mint extract and it looks and tastes like a mint shake! Put in some oats, flax seed, peanut butter, an egg or two, the list is endless. Experiment and change it up so you don't get bored with it. You can also add protein to your pancake batter, your french toast, muffin mixes, etc. Write down all your recipes so you can use them over and over again and share them with your pregnant friends! You will also want to continue with the 80-100 grams of protein after the baby is born as you nurse him or her. You body needs a lot of calories and high nutrition to make the best milk for you child. As your baby grows and enters toddler-hood, they too will love the protein shakes and you can pack a lot of nutrition in and the pickiest toddler can still have a healthy diet!