

Part 3: Protein is Protein Right?

Say the word protein and most people immediately think meat. The reality is that there is protein in all plant matter as well as in meats. According to the Association of American Feed Officials, the minimum amount of protein required by an adult dog is 18%. So you look at the guaranteed analysis on the back of the bag of dog food you are feeding and it says 26%. You are well over the minimum amount of protein your dog needs. The problem is the guaranteed analysis doesn't give you any indication of whether the protein is coming from animal matter or plant matter.

So, what difference does it make, protein is protein, right? Actually no. Not all proteins are created equal. To make this all make sense let's look at a couple of terms and their definitions.

Digestibility Is a measure of the content of food that is retained in the body after the food is eaten. (Wikipedia, the free encyclopedia) In other words how much of the food consumed is used by the animal and how much just passes through the system as waste.

Species Biologically Appropriate Diet The animal and vegetable materials that are easily digested by the creature consuming the material. Feeding your horse hay and grain is biologically appropriate. (Try giving your schnauzer a bale of hay.)

High Quality Protein A food source that contains high amounts of both the essential amino acids and nonessential amino acids. Examples of high-quality proteins include eggs, beef, fish, and milk. Grains, potatoes and beans, (with the exception of soy) are generally low quality proteins.

The 26% protein listed on the back of your dog food bag could primarily be coming from grains. Grains can only be digested by dogs if predigested for them by cooking and or grinding them into a meal. If you have any doubt about this try feeding your dog whole kernels of field corn and then checking its stool.

An article on www.PETEDucation.com by Veterinary & Aquatic Services Department, Drs. Foster & Smith, Inc. states, *"Our pets do not need the protein but they need the building blocks that make up the protein, amino acids."* There are 20 amino acids that animals need. Animals can synthesize 10 of them. *"The remaining ones must be consumed. The ones that the animals cannot synthesize are called **essential amino acids**. They are arginine, histidine, isoleucine, leucine, lysine, methionine, phenylalanine, threonine, tryptophan and valine... A deficiency in any of the amino acids can cause health-related problems."*

So what is the difference between plant and animal proteins? All plant proteins, with the exception of soy, are considered incomplete proteins because they lack or are deficient in at least one amino acid. This deficiency is called a **limiting amino acid**. The best explanation I have heard of how this works is if all the essential amino acids in a protein were rated at 10 except Lysine which was rated at 1, the body could only use 1 of all the other amino acids and the remaining 9 could not be used by the body but would be filtered out of the body as waste. The other example I have heard is if you look at a recipe to bake a cake. The recipe calls for two cups of flour, a cup of oil and two eggs. I have all the ingredients except I only have one cup of flour. All I

can do is bake ½ a cake and use the one cup of flour, ½ cup of oil and one egg. The left over oil and egg can not be used.

So let's say the major source of protein in a dog food was corn. According to Latham, Michael C. (1997). *Human Nutrition in the Developing World*. Rome: FAO Publishing. *"Corn is deficient in two essential amino acids: lysine and tryptophan, making it a poor protein food."*

Corn alone is an incomplete protein. If your dog is fed a diet primarily of corn it is possible to have a protein deficient diet even if the guaranteed analysis says 18%, because the protein was not digestible. (Your dog only got to eat a ½ cake.)

What premium dog food manufacturers try to do is balance the proteins. This is done by taking different protein sources and putting them in combinations that make up for what one food lacks and the other has. For example, rice's limiting amino acid is lysine, beans limiting amino acid is tryptophan. By combining the two in the same food the limits of one food is boosted by the availability of the amino in the other. Making a great dog food is truly a balancing act!

Can you feed too much protein?

Two years ago I heard someone say "Schnauzers can't handle high levels of protein." When I asked why I was told because it causes kidney stones and kidney failure. So off I went to EBSCO an academic research database and looked and looked some more for articles on dogs and the adverse effects of high protein levels.

I found an old study that was used by dog food companies. The study stated that high levels of protein caused kidney damage and failure in some test animals. The dog food companies jumped on this study, because after all, after advertising what is the most expensive ingredient in dog food? The myth that high proteins cause kidney damage was born and probably encouraged by dog food manufacturers. Why a myth? Well first of all the study was done on rats. A species whose biological appropriate diet is grains. Second the study fed the rats a diet of almost 90% animal protein.

Demystifying Myths About Protein from Today's Breeder Magazine states, *"In contrast, research over the past 10 years or so has shown that protein does not harm the kidney of dogs. In studies conducted at the University of Georgia in the early 1990s, both in dogs with chronic kidney failure and in older dogs with only one kidney, protein levels as high as 34 percent caused no ill effects. . . In other studies, David S. Kronfeld, Ph.D., indicated that compared with high- or low-protein diets, moderate-protein diets, those with up to 34 percent protein, had no ill effects in dogs with chronic renal failure and were associated with general improvement."*

An eleven-year study of 1624 nurses indicated that high protein intake had no effect on kidney function for women with normal kidneys, but that high protein (particularly meat) accelerated decline in kidney function in women with mild kidney impairment [ANNALS OF INTERNAL MEDICINE; Knight,EL; 138(6):460-467 (2003)].

I have not yet found any research that would indicate that a high protein diet would cause kidney damage in a dog with healthy kidney function.

I do believe however, that you could feed a high protein diet that was made of incomplete proteins that would cause protein deficient health issues.

(The author is not a vet or a nutritionist, the above article is based solely on research and personal opinion. It is highly recommended that you do your own research when deciding what to feed your dogs.)