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Why cooking of dog food can cause allergies and malnourishment...

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Has anyone ever see a wolf sitting around the campfire cooking his food?

When we heat food, we dramatically change the chemistry of it. Humans cook food because we want to eat food we are not biologically programmed to eat. We cannot digest raw meat - but we can handle the cooked meat...

Dogs are carnivores. They are programmed to digest *raw meat* - and they don't deal very well with cooked food...

Understanding the chemistry of digestion

Proteins are huge molecules - thousands of atoms combined. They are so big that they cannot penetrate the intestine's semi-permeable walls and enter into the blood stream. They must first be broken down to smaller molecules, sometimes the very building stones of proteins - amino acids (typically some 10-100 atoms). However, more often than not, the digestion process does not go that far. The body cannot build *everything* from amino acids. The "protein fractions" that are produced by the digestion process are thus a very fine adjusted "compromise" between whole protein molecules (that are too big and too complex to be useful) and simple amino acids (that are too small and too simple to be useful).

These "protein fractions" (typically a few hundred atoms) are very unique for the species. They represent a very delicate balance between the nutrients the body needs and can make good use of and the specific chemistry provided by the enzymes in the stomach when given access to the natural food.

You can think of an enzyme as "a hand" that grabs a piece of the big protein molecule and breaks this piece off. That piece now becomes a "protein fraction", with a very unique chemical structure. The enzyme continues doing this, until the protein no longer contains any parts it can grab.

There are thousands of enzymes. Each one is unique. Each one attacks a very specific part of a protein. Each enzyme must find an exact match in order to "break it off" the protein molecule.

The total effect of all the enzymes is that they break the proteins down into "protein fractions" that are small enough to be absorbed and transported by the blood, and they are extremely unique and exactly fitted to what the body needs. Each enzyme produces its own "fraction" from an adequate food source. If the food source isn't adequate, it cannot produce anything, even though the food appears to contain "all the fundamental nutrients" in the form of all the right amino acids...

Heating protein - breaking the structure down

In a way, this enzyme breakdown process is similar to what happens when you heat a protein. Heat generally means, "supplying molecular energy". The protein molecules absorb this energy by *moving*. They shake and rotate. The more heat, the faster they move.

Now, when you start to shake and vibrate a huge "clumsy" molecular structure like a protein, it will break into pieces! Literally. When you cool those pieces down again, they do not recombine, because they got separated from each other... hence the irreversible change of the structure by cooking.

Many of those pieces that were created by the heat process will now be small enough to be absorbed through the wall of the intestines, so they go into the blood. Others will still retain parts that can be adequately treated by some of the enzymes, at least partially. Some of them will even be identical to some of those that were made by the enzymes when they worked alone - but that is the rare exception...

All these fractions might still, to some degree, be useful for the body. It might be able to find ways of using those "unusual" ones that are produced in addition to those that are identical to what was produced exclusively by the enzyme process. It might cause some stress, though...

The problem is that mixture of protein-fractions that is produced by the cooking *plus* the enzyme digestion is NOT the same as what is produced by the enzymes alone....

It is documented that several vital components are missing (at least 30 chemically known such "protein fractions", called "missing links", are identified as vital for dogs, just as vitamins are for you and me - and those "missing links" are not to be found in any heat processed meat.)

Why some dogs get allergies from cooked meat...

There are also components generated that are not fitting with the body's metabolism, but they are small enough to get absorbed into the blood... They could very well be allergens!

The risk of this is particularly increased because heating generates a lot of "protein fractions" that are identical - and hence occur in large concentrations. "Large", compared to what the body can handle, as far as its ability to deal with inadequate protein goes. It does not take much to exceed the immune system's threshold for what it considers "a concern" - and you have an allergy break-out as a result of feeding cooked meat, which really is nothing but an overreaction from the immune system towards a foreign substance it cannot deal with in any other way...

Coagulation

There is another big difference between raw and cooked. Many proteins will, when heated, not only break down into smaller pieces, but those smaller pieces will, in certain cases, recombine with each other and generate a substance that is similar to a plastic polymer. This way, the original protein is transformed into another huge macromolecule that may or may not be easy for the enzymes to attach.

A similar process can happen also on dehydration.

The classic examples are egg yolk and blood. When heated, egg yolk coagulates into a solid substance that still contains many of the original building elements of the raw yolk, but not all of them. On top, the structure has totally changed because of this polymerization, and there is no way you will ever get the original raw yolk back...

With blood, it is similar, except that, here, the coagulation is caused by a combined effect of dehydration and exposure to oxygen in the air. As all mothers know, bloodstains do not get liquid again when you try to add water...

The combined effect of all this

The thermal decomposition will also have some positive effects: it will literally make certain parts of the digestion process easier and less demanding on the enzymes, as the cooking already did part of their job breaking down the big protein molecules in the food. But the price was a toll on the available nutrients, and the creation of some that may not be adequate food at all... For people, who are not meant to be carnivores but want to eat meat, this is great news - it enables us to eat meat! But for a dog that is meant to handle the raw food, it is outright destructive.

Coagulation alone can explain why certain nutrients "disappear" when you cook food. But the two types of processes both work for that. Personally, I believe it is a combination of the two that produces the overall effect.

The conclusion should be obvious: Don't cook your dog's food!

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