



The Importance of Nucleotides

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We all want to provide the absolute best for our pets and thanks to a revolutionary breakthrough it will be possible to offer your pet a complete food unlike any other on the market today. One that will provide your pets with unique nutrients that will allow them to become the healthiest possible. Our complete foods contain an abundance of nucleotides. These nucleotides are one of the nutrients that separate Young Again Pet foods from other pet foods available today.

What are nucleotides and what makes them such a valuable addition to a pet's nutrition? To answer this question, we need to have a brief lesson in biochemistry.

Nucleotides are the building blocks that are necessary for making new DNA and RNA. They can be thought of as DNA food. Next, we need to think back to high school when we learned about the double-helix of DNA. Remember the spiral-appearing ladder with the different colored rungs? That is a **model of the DNA** that makes up the genes and chromosomes found in us all. **DNA** is a very large molecule, and the **rungs of the DNA ladder** are made up of a combination of four different nucleotides, the alphabet of life. The nucleotides are molecules, called **guanosine** and **cytosine**, that pair up together, and **adenosine** and **thymidine**, which also pair up together. Adenosine and guanosine are called **purines**. Cytosine, thymidine and uradine are called **pyrimidines**. **RNA** is similar to DNA, (the sugar component is ribose instead of deoxyribose), except that the molecule uradine replaces thymine in that pair, and RNA is an intermediary between DNA and protein. A **gene** is a discrete sequence of DNA nucleotides, and genes are what make up our **chromosomes**. So, it makes sense that genes are made of DNA.

While all of this sounds very technical, what you need to understand is that nucleotides are molecules that are essential to the creation of new DNA and RNA molecules which are then used by new cells of all kinds. This is important because nucleotides, either by themselves, or in combination with other molecules, are involved in almost all activities of the cell (and therefore, the body).

So, what exactly makes nucleotides so important? For a cat, human, dog, or other animal to continue to live, grow and develop, it must create new cells all the time, to replace dying cells. Millions of cells must be made every minute, just to maintain the body as it is. These cells all must use nucleotides to make new cells, relying on DNA and RNA to correctly multiply cells. Nucleotides are used for creating cells, replacing cells, including developing immune cells, developing sperm cells and embryos and supporting the female reproductive tract.

Which tissues and cells require the largest numbers of nucleotides? While all cells require large numbers of nucleotides, some cells, including red blood cells, white blood cells, intestinal cells, bone marrow cells and some brain cells cannot make (or produce enough) nucleotides to cover their requirements. Nucleotides are essential for the proper functioning of the immune system, for cell repair after injury or disease and to help prevent disease. Stress can also increase the need for nucleotides, which are necessary for overcoming the negative effects of hormones released (during stress), for building up the immune system.

Since we now know that nucleotides are essential in repairing and replacing cells, we must now ask, where do these nucleotides come from? Many tissues are not able to manufacture (via synthesis) the nucleotides called purines. If an animal cannot produce adequate nucleotides, they must then absorb them from foods they have eaten. Some foods are higher in usable nucleotides than others. But, in most normal foods, the amounts of usable nucleotides are quite low, compared to the need for them. Relatively high concentrations of nucleotides are found in intestines of animals, and also in bacterial and yeast cultures, none of which, obviously, are usually consumed. So, normally, for an animal to get their requirement of dietary nucleotides from food, they will need to break down the complex cellular structures that make up that food we eat. There are numerous steps and enzymes that are necessary to break food down to the basic structure of individual nucleotides. You can imagine that this is a rather time consuming and inefficient process, when there is a high demand for nucleotides, at times of stress, disease/toxin challenge, or reproduction.

The foods being offered by Young Again Pet Food, could be described as DNA Food, as they have abundant available purified nucleotides in them, which allows an animal to absorb and utilize all that they need almost immediately. The fact that these foods contain abundant nucleotides is one of the factors that make them unique and so beneficial to the health of our pets. By supplying abundant nucleotides, the immune system will be able to function at peak efficiency, the liver will be better able to repair itself after insult from toxins (for example, from toxins produced by harmful bacteria), and other tissues will be able to repair themselves after injury.

How do we know that nucleotides can do these things? Studies have been performed on birds and mice that have shown remarkable benefits to added nucleotides in the foods. A study was performed on chickens, challenging them with the Newcastle's Disease virus, and birds fed a food with a commercial preparation of nucleotides before and during the challenge with the virus had a much higher survival rate than those fed a normal poultry feed.

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The supplementation of nucleotides will increase the resistance to bacterial infections in animals and humans. This was demonstrated in another study that was performed on mice. Mice were exposed to a pathogenic (disease-causing) strain of Staphylococcus aureus bacteria. The group fed a regular rodent feed experienced a 100% mortality rate. Those fed differing amounts of increased nucleotides in their feed had much higher survival rates: 53% mortality in a group fed .25% RNA in the feed, 74% mortality in a group fed 0.06% adenine, and 58% mortality in a group fed 0.06% uracil. This is very exciting research and what it means is that instead of 100% of mice dying after being infected with the Staph. bacteria, of those fed additional uracil only, 42% survived the infection, with no additional treatment with antibiotics or other care.

Toxins are a big concern for pet owners, as these toxins can be present in many ingredients. Toxins of one form or another are responsible for many pet food recalls. Toxins cannot be seen, tasted or smelled. Studies were performed on poultry and pigs, fed either a standard feed, or one supplemented with nucleotides. The results showed that the livers of the animals fed additional nucleotides had significantly lower levels of mycotoxins than those fed a standard feed. Also, toxins levels in the feces of the supplemented animals were higher than standard-fed animals, showing that they were able to excrete more toxins than the control group.

Additional Benefits

There are other studies that show additional benefits from the supplementation of the diet with nucleotides.

Benefits include:

- increased resistance to challenge to bacterial and viral infections
- acceleration of antibody production
- increase in white blood cells called neutrophils
- increase in the number of macrophages
- increased effectiveness of vaccinations
- reversal of malnutrition and starvation-induced immuno suppression
- increase in natural killer (NK) cell activity and interleukin-2 production
- increase of plasma HDL cholesterol ("good" cholesterol)
- decrease in the concentration of LDL cholesterol ("bad" cholesterol)
- reduction in lactic acid build-up in blood after endurance exercise
- increase in red blood cell production
- decrease in glucose level and increased survival rate (with diabetes)
- faster recovery of the liver after injury
- effective detoxification from e.g. Toxins by the liver
- positive effects on the intestines
- improved feed conversion and nutrient uptake
- intestinal repair after diarrhea
- positive effects of recovery from stress
- increase in fertility
- higher quality embryos

There are scientific studies to demonstrate all of these positive effects.

Young Again Cat Food is entirely formulated to better approximate the natural nutrition of felines. In addition to supplying the cat with abundant nucleotides, it is also much lower in carbohydrates than most other cat foods on the market, as cats are true carnivores and would normally ingest a small percentage of carbohydrates. This should have positive effects on the pancreas as carbohydrates are involved with insulin secretion. There are no grains or plant proteins in any of our cat foods. There is research to show that these nucleotides significantly improve the survival rate of mice with diabetes. This carnivore feeding regime, especially tailored for cats, containing abundant nucleotides, proteases, other enzymes and probiotics, will provide a balanced, healthy daily food as well as providing the cat with nutrients that should enhance the immune system and promote faster healing. Young Again foods are highly digestible and should decrease the volume of feces. It should be beneficial for cats with infectious diseases.

Young Again Pet Foods represent a true breakthrough in nutrition for your pets. Since nucleotides are naturally-occurring substances, they are extremely safe to include in a feeding regime, and are nothing like antibiotics and other types of additives that may prove detrimental in the long run. Abundant nucleotides will allow your pet to become the healthiest possible, and the correct percentages of protein, fat, vitamins and minerals will provide the nutritional support for the life of your pet.

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