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Most substances that trigger allergic reactions are in themselves harmless. An allergic reaction only happens when the immune system identifies that substance as a threat.

When susceptible animals encounter an allergen, their immune system produces antibodies called IgE antibodies that are specific to that particular substance. Thousands of these antibodies bind to the surface of special cells in body tissue called mast cells, ready for the next exposure to that specific allergen. While waiting, mast cells absorb many different chemicals from the blood that will aid in the body's defense. When next exposed to the allergen, the allergen binds to the IgE antibodies on the surface of the mast cells, causing them to release the chemicals. One of these chemicals,

histamine, is a big player in the allergic response system and causes many of the typical allergy symptoms. Allergy medications are often antihistamines, which block histamine from binding to its receptor.

New research is connecting allergies with elemental minerals. There are two ways that minerals can cause allergic responses:

- × Direct toxicity from toxic metals such as aluminum, arsenic and mercury;
- × Nutrient mineral imbalances, which cause an inflammatory response due to poor immune system function.

Many dogs are affected by both types of exposure, resulting in allergies and other behavioral and health problems.

Allergies and Elemental Minerals: A New Understanding

By Noa Martinsen and Julie Casper



Toxic Metals In The Environment

One of the major contributors to canine health problems is the constant exposure to the harmful toxins present in the environment. Some of the most physically and neurologically damaging of these are the toxic metals, particularly aluminum, lead, mercury, arsenic and cadmium. They contribute to everything from dental problems and bad breath, to allergies and skin diseases, and even to serious life threatening illnesses such as cancer, arthritis, kidney failure, congestive heart disease, liver disease and diabetes. Toxins damage the immune system, reducing its defense against infections as well as bacterial, viral and fungal diseases.

Once absorbed, heavy metals are distributed to various organs, glands and the central nervous system, where they poison enzymes. This causes increased free radical production and competes with essential elements, which make up the mineral-enzyme complexes. Toxic elements compete with the absorption of nutritional minerals and the resulting symptoms can range from physical problems such as allergic disorders, to digestive problems and even cancer.

New research shows that allergies and many other diseases are the result of toxins in the environment. Allergies can be viewed as a warning sign indicating a biochemical imbalance. Because of their shorter life span and faster metabolic rate, our dogs are acting as the "canines in the coal mine," letting us know what persistent environmental toxicity is doing to us all.

Any toxic metal can cause an allergic response. The immune system recognizes a toxic metal as a foreign substance and a healthy body will attempt to remove it. If there are not enough protective nutrient minerals present to support natural detoxification, the toxins will be retained.

Dogs live close to the ground, rolling around, licking and ingesting these toxins and heavy metals that have settled onto our lawns, streets, parks and floors. Every day, your dog inhales and eats toxic heavy metals, and depending upon their chemical form, they can also be absorbed through the skin.

The levels of toxins in body tissues increase with every generation, even if exposure doesn't increase. In the mid 1900's, Dr Henry Schroeder saw that rats exposed to toxic metals carried increasing loads with each generation, even though they were all exposed to the same level of toxins. Within seven generations, the animals were no longer able to reproduce. Dr Schroeder's work on lead toxicity helped to legislate its removal from gasoline.

This generational increase in toxins happens because the growing embryo is far more vulnerable than an adult, and many toxins pass through the placenta and are then incorporated into the developing tissues. Since dogs have a much shorter life span than humans, as well as faster metabolisms and predominantly smaller sizes, this increased concentration over generations happens much more quickly.

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body will attempt to remove it. If there are not enough protective nutrient minerals present to support natural detoxification, the toxins will be retained. For example, if there is not enough calcium, lead might be substituted for it in bone and tooth formation, thus building up in these tissues where it will cause tooth and gum problems, skeletal pain and abnormalities, even cancer.

Here are some common toxic metals commonly found in dogs.

Aluminum

Aluminum is the most common toxic element found at high levels in dogs. The most common source is from their food. Other sources include vaccinations and medications. Aluminum's toxic effects have been known since at least 1911. Dr Harvey Wiley, the first commissioner of the US Food and Drug Administration (FDA), stated "From the earliest days of food regulation, the use of aluminum in foods has been condemned. It is universally acknowledged as a poison in all countries. If the Bureau of Chemistry had been permitted to enforce the law ... no food product in the country would have any trace of ... any aluminum or saccharin." Dr. Wiley was the major force behind the first pure food law in the United States. He resigned from the FDA because the laws were not being enforced. Aluminum ammonium sulfate, aluminum silicate, calcium aluminum silicate, sodium aluminum phosphates, and sodium aluminosilicate are still being used as food additives.

Aluminum has been described as a protoplasmic poison and a pernicious and persistent neurotoxin. While the body is able to excrete aluminum in its natural form, the element, like mercury, is toxic to all life forms when concentrated in their tissues. It has a tendency to accumulate in the brain and nerve tissues and in the bones and teeth.

Aluminum interferes with the absorption of a number of essential elements including iron, fluoride, phosphorus and calcium. It inhibits gastric muscle contraction and can cause constipation. This disrupting effect on the essential minerals leads to endocrine gland dysfunctions as these glands all depend on balanced mineral ratios. These dysfunctions include hypo or hyperthyroidism, hypo or hyperadrenalism, hypoglycemia, diabetes, dry dull coats, dry or flaky skin, and digestive disorders due to a lack of pancreatic digestive enzymes and gastric hydrochloric acid.

Studies in animals show that the nervous system is a sensitive target for aluminum toxicity. Central nervous system symptoms found in dogs with aluminum toxicity include bizarre behaviors such as chewing wallboards and door knobs and trying to catch imaginary objects in the air, and the common and frustrating issue of aggressive, violent behavior.

Aluminum's toxic effect on the skeletal system was first recognized in the late 1970s. In animal studies it was found to induce anemia. Perhaps the common iron deficiency we find in dogs is due to the also common finding of aluminum toxicity. Any impairment of kidney function will increase aluminum toxicity as the kidneys are the main route of excretion.

Since aluminum has an affinity for brain and nerve tissue, it can affect any organ in the body via the central nervous system. This can lead to a multitude of health problems and a weakening of the immune response. Aluminum toxic dogs are more susceptible to bacterial, fungal and viral diseases, chronic dermatitis, nasal discharges and loss of black pigment on the nose. Other symptoms of aluminum toxicity in dogs include extreme nervousness, weak muscles, seizures, loss of balance, and loss of energy.

Arsenic

Arsenic is number one on the Agency for Toxic Substances and Disease Registry 2011 Priority List of Hazardous Substances. It's a known carcinogen and affects the skin, digestive system, liver, nervous system and respiratory system. Arsenic compounds can create reactions in the body that disrupt enzymes involved in cellular respiration and fat and carbohydrate metabolism. The accumulation of toxic levels of arsenic can result in paralysis, coma, cardiovascular collapse and death. Today in the United States, the quantity of arsenic released by human intervention exceeds amounts released from natural sources by at least threefold.

Hypoallergenic Dog Foods

If your dog has been diagnosed with allergies, a typical recommendation is to feed them a commercial "hypoallergenic" dog food. This does not address the underlying cause of the allergic symptoms or the immune system's inability to respond effectively. Additionally, most of these foods contain known canine allergens (and carcinogens) such as grains and starches, preservatives such as BHA, soybean oil or other soy products, processed meats from commercially raised animals fed antibiotics, pesticide and herbicide dosed foods, and toxic metals from the extrusion process, among other unregulated and proprietary ingredients.

Sometimes simply changing from a processed kibble to a raw, species appropriate diet can have rapid, dramatic and immediate results. Yet, some dogs may still have health or behavior problems. Confusing but not uncommon, this occurs for several reasons; there is inadequate detoxification, the dog is born with nutrient deficiencies, has absorbed toxins in the womb, or has been exposed to environmental toxins. Stress can also cause imbalances and most rescue dogs experience high levels of stress. So heavy metal screening and nutritional therapy may be needed for these dogs.

Organic forms of arsenic are actually fed to pigs and poultry to improve production, and in the case of swine, to treat diarrhea. This meat is then used in commercial dog foods (and human foods). Arsenic can also be found in many commonly used products including fungicides, pesticides, herbicides, laundry products, tobacco smoke, paints, and wood preservatives. Global industries such as mining and smelting, chemical and glass manufacturing produce arsenic as a by-product. This in turn finds its way into our water supplies and food sources.

Arsenic is stored in the hair follicles, skin, and nails. Throughout history, it's been a popular choice of poisoners because it mimics so many chronic diseases that it cannot be diagnosed except through hair analysis.

Mercury

Mercury is one of the most studied toxic heavy metals. The lethal effects of both acute and chronic low level exposures are well documented. Mercury can be found in vaccines, prescription drugs and in many commercial dog foods. It's often used in household products such as batteries, light bulbs, fabric softeners, latex gloves, paint, plastics, ink, and solvents. Mercury vapors are subsequently released with home renovations. Mercury will concentrate at floor level where dogs are lying or walking. Even some cosmetics contain it (consider this when your dog licks your face). Mercury salts are sometimes used in skin lightening creams and in antiseptic creams and ointments. Like other heavy metals, it's in our air, water and ground where our dogs are continually exposed.

Mercury accumulates in the brain and central nervous system. Mercury also adversely affects your dog's overall immune system by attaching to the immune cell structure and altering their ability to function normally. Mercury can cause kidney and cardiac diseases, respiratory problems, arthritis, and gum disease in your dog.

Symptoms of high mercury tissue levels include loss of balance, fatigue, vomiting, hair loss, diarrhea, weakness, and excessive salivation. High levels can also interfere with enzyme activity, resulting in blindness and paralysis. It also causes convulsions, anorexia, tremors, swollen gums and behavior problems in animals.

Mercury prevents glucose transport, thus reducing cellular energy availability. Mercury also prevents the absorption of important nutrient minerals such as zinc, iron, selenium and sulphur.

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Toxic Metals In Food

Most food today is grown on depleted and toxic soils and because of this, our feed animals are being fed nutritionally deficient foods. They have limited access to a variety of wild foods, so their flesh is limited in trace minerals and nutritional elements. Toxic chemicals applied to the soils are also in the plants that are eaten, and subsequently in the meat. The same applies to grains that are added to dog food. Not only are grains deficient and toxic, they are also biologically inappropriate for dogs and often indigestible.

The chemicals and machinery used in processing pet foods add even more toxins at various levels and amounts (and this is often unregulated). Packaging and preservatives introduce an array of toxic chemicals and contaminants to most commercially processed foods. The result of combining nutritionally depleted food with a toxic environment is under-nutrition. Malnourished animals express various degrees of health problems and allergy symptoms, including inflammation and skin problems.

When nutritional deficiencies are present, toxic metals replace nutrient minerals in the body. Poor diets lack nutrient minerals and this leads to heavy metal accumulation. The response of the pet food industry to the nutritional deficiency issue is to enrich their products by adding a standard amount of isolated chemical supplements, even though it's now understood that each individual's vitamin and mineral needs are unique, especially for very active dogs.


The result is that dogs are not getting enough of some of the nutrients needed while some animals are getting too much of certain nutrients, both of which will create mineral imbalances, leading to an array of health problems. Many health problems associated with under nutrition and toxicity are frustratingly difficult to diagnose and treat.

Nutritional and Toxicological Screening

Health screening can be an invaluable tool in the prevention and management of allergies and other health conditions. Hair Tissue Mineral Analysis (hTMA) is a noninvasive and inexpensive screening test that the EPA recommends for toxic metal screening.

For over 40 years, hair tissue analysis has been an effective and routine screening tool for heavy metals. When a hair sample is properly obtained, analyzed and interpreted, it can be an economical solution for identifying toxic metal exposure as well as nutrient and nutritional status.

Once metal toxicities are identified, changing the diet accordingly can go a long way to reverse the cumulative damage. When nutrient minerals are available at optimal levels and ratios, the body's natural detoxification system is better able to protect against the absorption of toxic metals and remove toxins as well. Identifying nutritional mineral deficiencies or excesses in your animal helps to form an individualized nutritional supplementation protocol.

Nutrient minerals have been thoroughly researched and defined, and play key roles in metabolic processes such as muscular activity, endocrine function, reproduction, skeletal integrity, and overall development. When nutrient levels and ratios are close to ideal, the immune system and metabolism function optimally. 

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