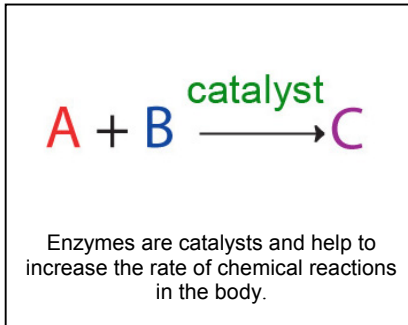


ENZYMES

What are enzymes?



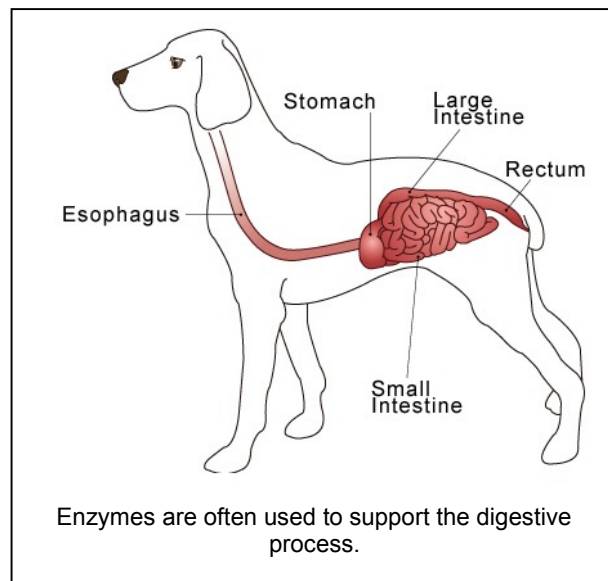
Enzymes catalyze (enhance through increased rate of chemical reaction) virtually every function in the body, from digestion to tissue repair, and from hormone function to energy production. Without them, these same processes would occur much too slowly to be compatible with life. Veterinarians may prescribe enzymes when they feel a particular body process needs to be supported. Commonly prescribed enzymes include combinations of lipase, amylase, protease, papain, bromelain, and cellulase.

Why recommend administration of enzymes to my pet?

Enzymes are chiefly provided in veterinary medicine to support digestion and to reduce inflammation. Often, the same enzyme fulfills both functions, since proteases break down proteins, whether they are a part of the diet or a chemical mediator of inflammation.

Digestive support may be required because of gastrointestinal disease or normal depletion of enzymes through aging. Some conditions that arise from incomplete digestion include food sensitivity disorders such as allergic dermatitis or perhaps even epilepsy of unknown cause. These are just some of the conditions in which a veterinarian may prescribe enzymes.

Enzyme supplementation may even be useful as an addition to the diet of healthy animals. Certain whole foods such as grains contain enzymes that can facilitate their own digestion. Normally, the activity of these enzymes is held in check by built-in inhibitors until they are needed, such as during the process of sprouting. There is some speculation that optimal digestive health depends on the enzymes normally found in whole foods, but which are destroyed during processing dry and canned pet foods. In addition, enzymes normally found in foods may assist in the regulation of other unrelated internal body processes, and their absence in foods may place an extra metabolic burden on the body.



Supplying additional enzymes as supplements can replenish enzymes absent in processed foods. Even pets on natural raw diets may benefit from additional enzymes if the animal's digestive capacity has become very debilitated. Illness, stress, allergy, food intolerance, advancing age and oral medications such as antibiotics can impair gastrointestinal function through a variety of mechanisms that may be partly compensated for with the addition of digestive enzymes.

How much experience is there with the use of enzymes in pets?

Enzymes have been used for many years in people and pets. While they can be a useful supplement for all pets, they have been anecdotally reported to help pets with arthritis, allergies, cancer therapy, digestive disturbances (including inflammatory bowel disease and coprophagy, a behavioral disorder in which the pet eats feces), and excessive shedding. In people (and possibly pets) enzymes have been shown to reduce pain after strenuous exercise or soft tissue trauma.

Papain, the plant enzyme extracted from papaya, has been shown to be as effective as aspirin in several studies. Bromelain, the plant enzyme extracted from pineapple, was shown in one study to decrease the spread of implanted lung cancer in mice. Bromelain has also been shown to be anti-inflammatory and may be useful in the treatment of skin allergies (atopic dermatitis) and arthritis.

Enzymes have been recommended for use in cancer and immune diseases in people including AIDS (and in similar disorders in pets) although good studies are lacking. Since zinc deficiency impairs immunity, it may be that the increased zinc levels in the blood that occur after plant enzyme supplementation improve the functioning of the immune system in people and pets. Aging decreases immune function and zinc levels. Supplementing with enzymes may be indicated in older pets to correct this.

Digestive enzymes also appear to enhance selenium absorption. Selenium is an antioxidant that works in conjunction with vitamin E. In rats, selenium appears to be an essential component of the enzyme that converts the inactive form of thyroid hormone (T4) to the active form (T3), which might explain the enhanced hair growth and increased energy levels in pets supplemented with plant enzymes. Poor hair growth and lethargy are common symptoms of canine hypothyroidism (low thyroid levels in dogs).

What species of animals are being treated regularly with enzymes?

Any species of pet can potentially benefit from enzyme supplementation.

How much research has been conducted on this supplement?

Extensive research has been conducted with humans and pets. Studies in pets show that enzymes decrease excessive shedding and decrease coprophagy.

How successful are enzymes?

Enzymes are very successful in treating coprophagy, gastrointestinal disorders, excessive shedding, and to help some pets with allergies and arthritis.

How safe are enzymes?

Supplementation with enzymes is extremely safe. In rare instances, since enzymes increase the digestion and absorption of nutrients, mild weight gain may occur.

Where do I get enzymes and do I need a prescription?

Your veterinarian may have preferred supplements that he or she will recommend. Some enzyme sources may be more powerful than others, and considerable variation may exist



among products available over-the-counter. Supplements are not highly regulated and labels may not be completely accurate. A prescription is not needed for enzymes.

*This client information sheet is based on material written by Steve Marsden, DVM ND MSOM LAc DiplCH
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