ENZYMES

Enzymes help promote canine and feline health by supporting digestion, helping break down food and transporting nutrients in the body. Digestive enzyme supplements are useful for pets with sensitive stomachs or other digestive system upsets, as well as in food transitioning. Enzyme supplements can also benefit pets that are unable to produce enough of their own enzymes, which can become an issue for older pets as they age.

Enzymes are categorized by the substances that they break down: proteins, fats, and carbohydrates. A variety of enzymes may be considered for use in pet supplement formulations for both digestive and joint health.

Acid Protease 3.0
• A protein-digesting enzyme, effective at pH levels as low as 3.0
• Ideal for a pet formulation, considering pets have relatively lower pH conditions in the GI tract
• Particularly essential for the predominantly carnivorous diet of felines
• Effective for the reduction of feline hairballs, which are made up of 91% protein

Bromelain & Papain
• Protein-digesting enzymes sourced from pineapples and papaya, effective at pH levels as low as 3.0
• Degrades proteins associated with inflammatory response
• Effective for both digestive and joint health formulations

Peptidase Prolyl Exopeptidase
• Also known as DPPIV, the enzyme most commonly associated with gluten digestion
• Aid in the digestion of gluten proteins that may be present in pet foods

Lipase
• A fat-digesting enzyme
• Offers more thorough digestion of fats often associated with carnivorous, raw diet

Pancreatic Lipase
• A fat-digesting enzyme, a derivative of natural pancreatic enzymes (bovine or porcine)
• Also contains amylase (carbohydrate-digesting) and protease (protein-digesting) activities

Amylase & Glucoamylase
• Carbohydrate-digesting enzymes
• Aids in the thorough digestion of cereal grains and meals present in many dried pet foods

Xylanase
• A carbohydrate-digesting enzyme
• Breaks down starches that have xylose-containing polymers like those in wheat, oats, and barley
• Particularly effective when combined with other carbohydrases such as cellulase and beta-glucanase

Beta-glucanase
• A carbohydrate-digesting enzyme
• Breaks down polysaccharides known as beta D-glucans, which are associated with grains such as barley, oats, and wheat

Cellulase
• Carbohydrate-digesting enzymes not endogenously produced by dogs and cats (or humans)
• Breaks down the fibers in plants (cellulose)
• Aids in digestion of many pet foods which contain cellulose as a bulking agents or functional ingredient (source of fiber)
**PROBIOTICS**

Domestic pets’ digestive systems are home to billions of bacteria that keep their gut running smoothly. The gut is the largest immune organ in the body; its function is to allow absorption of food, while excluding elements like certain bacteria and toxins. For cats and dogs, studies show that a healthy population of gut bacteria is vital to a fit gastrointestinal tract. The cause of gastrointestinal problems for dogs is often related to their tendency to eat things they shouldn’t, while cats may suffer digestive system upset as a result of parasites in their prey. A probiotic supplement formulation for pets can help balance intestinal microflora for pets that may have compromised digestive function (vomiting, diarrhea, constipation, flatulence) due to various factors, including medications or stress.

Probiotics are beneficial bacteria that help to maintain the health of the intestinal tract, aid digestion and modulate the immune system. Species with specific strains known to benefit dogs include *Bacillus coagulans*, as well as *Lactobacillus acidophilus* which has been shown to improve frequency and quality of stools in dogs with sensitive digestive systems. Probiotics are also of particular importance in cats with any type of digestive problem, including vomiting, hairballs, diarrhea, and constipation.

A variety of probiotic strains may be considered for use in a pet supplement formulation, including:

- **Bifidobacterium bifidum**
- **Bifidobacterium longum**
- **Lactobacillus acidophilus**
- **Lactobacillus casei**
- **Lactobacillus delbrueckii**
- **Lactobacillus casei**
- **Lactococcus lactis**
- **Lactobacillus plantarum**
- **Streptococcus thermophilus**
- **Bacillus coagulans**
- **DE111™ Bacillus subtilis**

**References:**


