

DIGESTIVE ENZYMES

Ingredients Profile & Scientific References

By Dr. Scott Treadway

**Enzyme Blend:**

**#1 Protease**

Protease breaks down proteins and gluten. During the digestive process, proteases hydrolyzes (breaks down) protein into smaller polypeptides and free amino acids. This action increases the digestibility of proteins, regardless of their source. Protease enzyme helps hydrolyze all types of protein including gluten from cereal grains. Many people are sensitive to the gluten in wheat, barley and rye. The reaction can be from minor abdominal discomfort up to very severe reactions in those people with celiac disease. Protease can hydrolyze "hidden" gluten found in highly processed foods.

**#2 Amylase**

Amylase enzyme helps to break down starches such as those found in rice and potatoes and is vital for good digestion.

**#3 Glucoamylase**

Glucoamylase breaks down starches. Glucoamylase is an exoamylase that hydrolyzes (breaks down) starch, producing maltose and free glucose subunits from the non-reducing end of the starch. Along with other enzymes, glucoamylase further enhances the digestion and nutritional value of food based starches.

**#4 Lactase**

Lactase breaks down lactose (milk sugar). Nutritionists estimate that 10 - 20% of the U.S. population is lactose intolerant. Some ethnicities have much higher levels of lactose intolerance. Lactase is designed to hydrolyze (break down) milk sugar, called lactose, into its component parts, glucose and galactose. Manyt Asian, African, and Native American people are lactose intolerant. Fifty percent of Hispanics and about 20 percent of Caucasians do not produce lactase as adults and should supplement their diet with lactase.

**#5 Cellulase l and II**

Cellulase breaks down cellulose as found in fruits and vegetables. Every plant cell is surrounded by a cell wall. A major component of cell walls is the complex carbohydrate known as cellulose. Humans do not normally produce enzymes needed to digest cellulose. Cellulase enzymes aid in the total digestion of plant-based foods and increase the nutritional value of those foods.

**#6 Maltase**

Maltase breaks down maltose as contained in cereals, legumes and barley. Maltase is an exo-carbohydrase enzyme that acts only on the non-reducing end of starch, producing the disaccharide maltose. Combined with the other carbohydrase enzymes, it enhances the overall digestion of starch and other carbohydrates.

**#7 Hemicellulase**

Hemicellulase breaks down hemicellulose as found in fruits, vegetables, grains, and cereals. Hemicellulose is another major component of the cell wall of plants. Hemicellulase aids in the total digestion and increases the nutritional value of plant-based foods.

**#8 Xylanase**

Xylanase breaks down xylose as found in high fiber foods, grains and cereals. Xylanase is a special kind of emicellulose. It is especially effective at digesting high fiber foods, which have a very high content of xylans, a complex polysaccharide made up of a chain of 5-carbon sugars called xylose.

**#9 Beta Glucanase**

Beta Glucanase breaks down beta glucans as found in high fiber foods, grains and cereals. The cereal grains, wheat, barley and rye, contain beta glucans, a kind of carbohydrate. Beta glucans can become viscous in the intestinal tract, slowing natural peristalsis (intestinal contractions). The Beta glucanase enzyme hydrolyzes these glucans, reducing viscosity and balancing natural peristalsis.

**#10 Serrapeptase**

Serrapeptase breaks down fibrin and mucous. Serrapeptase is a powerful proteolytic enzyme with fibrinolytic and redness-reducing activity. Serrapeptase is used primarily as a systemic enzyme. It supports healthy joint function, helps maintain a normal swelling response and demonstrates powerful fibrinolytic activity, which is important for cardiovascular support. Other functions include a lessening of scar tissue and a reduction in the viscosity of mucous in lungs and nasal passages.

**#11 Nattokinase**

Nattokinase breaks down fibrin and mucous, and is derived from Bacillus natto or Bacillus subtilis natto. The organism that produces nattokinase was originally discovered in a fermented soy food called natto, a traditional fermented soybean food that is very popular in Japan.

**#12 Bromelain**

Bromelain breaks down proteins. Bromelain is an extract from the stem or juice of pineapples, Ananas comosus. Bromelain helps digest proteins and can also be used for its resistance to swelling when used systemically.

**#13 Papain**

Papain breaks down protein and is derived from Carica papaya. Papain is an extract from immature papaya fruits. Papain demonstrates both exoprotease and endoprotease activity with a broad Ph range. It helps digest proteins and can also be used for reducing swelling when used systemically.

**#14** **Alpha Galactosidase**   
Alpha Galactosidase breaks down complex carbohydrates. Alpha Galactosidase helps digest grains and legumes, which contain many non-digestible sugars called oligosaccharides. These often result in abdominal discomfort, gas and bloating. Alpha Galactosidase breaks down these oligosaccharides very effectively.

**#15 Lipase**  
Lipase breaks down fats and oils. Lipase is a lipolytic enzyme produced by the fermentation of Aspergillus niger. Lipase catalyzes the hydrolysis of fats and oils, yielding monoglycerides, diglycerides, glycerol and free fatty acids. It has broad substrate specificity on the fats and oils of vegetable and animal origins.

**#16 Catalase**   
Catalase breaks down H2O2 (Hydrogen Peroxide) to water and oxygen. Catalase is an antioxidant enzyme that catalyzes the conversion of hydrogen peroxide into water and oxygen. Hydrogen peroxide is a by-product of cell metabolism.

**#17 Invertase**   
Invertase breaks down sucrose. Invertase is another carbohydrase enzyme that splits sucrose (common table sugar) into its component parts, glucose and fructose. Combined with all the other carbohydrases, it enhances the overall digestion of starch and other carbohydrates.

**#18 Pectinase**   
Pectinase breaks down pectin and dietary fiber. In plant cells, pectin consists of a complex set of polysaccharides that are present in most primary cell walls and are particularly abundant in the non-woody parts of plants, especially fruit and vegetables. Pectinase selectively hydrolyzes and depolymerizes naturally occurring pectin.

**#19 Phytase**   
Phytase breaks down seeds, corn, soy and nuts. Phytase is an enzyme that catalyzes the hydrolysis of phytic acid (myo-inositol hexakisphosphate), an indigestible, organic molecule that contains six phosphate molecules. Phytic acid not only reduces the available phosphorus, but it binds certain important minerals making them unabsorbable. These include zinc, iron, and to a lesser extent, calcium and magnesium. Phytic acid and its salt form, phytate, are commonly found in many plants, especially grains and seeds. Phytase catalyzes the release of inorganic phosphorus, as well as other bound essential minerals.

**#20 Glucose**   
Rarely found in a blend of systemic enzymes or digestive enzymes supplement, glucose oxidase breaks down glucose. Glucose oxidase is an oxidoreductase enzyme. That is, an enzyme that catalyzes the transfer of electrons from one molecule (the reductant) to another (the oxidant). Glucose oxidase catalyzes the oxidation of glucose to hydrogen peroxide (H2O2) and D-glucono-d-lactone. In cells, glucose oxidase aids in breaking sugar down into its metabolites. It also provides significant antibacterial activity from the production of H2O2.

**Other Ingredients – Proprietary Blend:**

**#1 Astragulus**

Astragulus is a traditional herb used historically for immune system vitality.

This [adaptogen herb helps to lower cortisol](https://draxe.com/7-adaptogen-herbs-to-lower-cortisol/), aka the stress hormone.

Astragalus contains three components that provide a positive impact on human health: saponins, flavonoids and polysaccharides, which are all active compounds contained in certain plants, including some fruits and vegetables.  Saponins are known for their ability to lower cholesterol and improve the immune system. ([3](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2928447/)) Flavanoids, also found in astragalus, provide health benefits through cell signaling. They show antioxidative qualities, control and scavenging of free radicals, and can help prevent heart disease, and immunodeficiency viruses. [Polysaccharides](https://en.wikipedia.org/wiki/Polysaccharide) are known to have antimicrobial, antiviral and anti-inflammatory capabilities, among other health benefits.

**Astragulus, an Anti-Inflammatory:** [**Inflammation** **is at the root of many problematic health conditions**](https://draxe.com/inflammation-at-the-root-of-most-diseases/). From arthritis to heart disease inflammation is often the culprit. Many studies show that saponins and polysaccharides as found in Astragalus can reduce inflammatory response in connection to a number of health conditions, from helping to heal wounds and lesions to reducing inflammation in diabetic kidney conditions.

Boosting the immune system: A study out of Beijing displayed Astragulus activity to control t-helper cells 1 and 2, essentially regulating the body’s immune responses.

**Protecting the Cardiovascular System:** The flavonoids present in astragalus are antioxidants that help prevent plaque buildup in arteries and narrowing of vessel walls by protecting the inner wall of the vessel. In addition, a 2014 study published in the Chinese Journal of Integrative Medicine suggests injection of astragalus, combined with conventional treatment for viral [myocarditis](http://www.mayoclinic.org/diseases-conditions/myocarditis/basics/definition/con-20027303) (inflammation of the middle layer of the heart wall), makes treatment more successful in heart conditions.

**#2 Milk Thistle**

Milk Thistle has been used traditionally as a liver tonic herb. Milk thistle extract is used to help maintain liver health and to protect the liver from the effects of toxins such as alcohol, a polluted environment or workplace, and a host of liver related conditions.

**#3 Triphala**

Digestion is the primary function for good health. Without proper digestive function nutrients from food cannot be properly utilized or assimilated. Triphala or “3 Fruits” is a traditional herb used for digestive balancing. Triphala gently, yet profoundly cleanses the digestive tract and helps to provide clearer channels of nutrient delivery and assimilation.

**#4 Bladderwrack**

Bladderwrack is a seaweed high in naturally occurring minerals including iron and iodine. We are all aware of the importance of fiber as it relates to overall health and digestive health in particular.

Bladderwrack is a good source of several types of healthy fiber including a fiber called alginic acid.**Alginic acid has a very beneficial effect on digestion.** It can add bulk to the food passing through the bowels help relieve constipation. It also improves nutritional uptake making the food we eat more beneficial to our bodies.

Bladderwrack also contains large amounts of a unique form of fiber called fucoidan.**Fucoiidan has been linked to a number of different health benefits including a reduction in cholesterol, reduced blood sugar and it may even have anti-tumor effects.**

**#5 Kale**

**Kale, like spinach, has an impressive profile of essential vitamins and minerals needed for good health.**

**K**ale contains bile acid sequestrants, which can lower cholesterol levels in the digestive system. This may lead to a reduced risk of heart disease over time.

**#6 Shilajit**

Shilajit is a traditional herbal remedy that has been used historically to support liver, kidneys, bladder and urinary systemic health. Urinary system health is important for good digestive health since it helps eliminate toxins left over from the digestive process. Good liver health is vital to support proper digestion. Shilajit is also used for chelation of heavy metals and as an antioxidant and rejuvenator. Known historically as the “Destroyer of Weakness”, Shilajit has naturally occurring Fulvic Acid and Humic Acid to help support general immune health.

In traditional medicine Shilajit is considered a panacea herbal remedy since it has so many positive benefits for supporting good health, general strengthening and general vitality.

**#7 Inulin**

Inulin fiber may help reduce symptoms of ulcerative colitis and reduce inflammatory markers in other related digestive conditions. Daily supplementation with inulin improved bowel function and quality of life in elderly people with constipation.

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