

Enzymes



NOW® *Guide to Enzymes*

The Health Benefits of Enzymes



What Are Enzymes and Why Are They Important?

Enzymes are your body's engineering, building, maintenance, and demolition crews, all in one. These biological molecules are almost exclusively proteins, although some are actually more specialized RNA molecules that fill specific roles. There are three basic categories of enzymes – metabolic, digestive, and food-based.

Metabolic enzymes are your body's engineers and maintenance crew. Your body produces them naturally. These enzymes are necessary for the growth, maintenance and repair of all tissues and organs. They're also essential for the disposal of microscopic debris and waste, keeping us clutter-free at the cellular level.

Digestive enzymes, which we'll cover more thoroughly in this brochure, are also naturally produced by your body, like metabolic enzymes. These specialized enzymes break down the foods we eat into nutrients and waste, and are responsible for the absorption and delivery of these nutrients to the target tissues and organs.

Food-Based enzymes, or food enzymes, are the only enzymes our body uses that are produced externally. They're obtained from raw foods and supplements and assist your body's demolition crew, helping the body's internally produced digestive enzymes break down the foods we eat.

What Do Enzymes Do?

All enzymes are classified as catalysts, or substances that increase the rate of a chemical or biochemical reaction, and they do so using less energy than would normally be needed. Basically enzymes take reactions that might take days or even weeks to occur (or might never occur at all) and perform them almost instantly. They're incredible models of efficiency.

Enzymes never rest. They're involved in billions of recurring chemical reactions throughout your body. This includes providing the raw materials needed for

growth and recovery, digestion, nutrient delivery, cellular waste removal, the transfer of energy, neurotransmission, and much more.

Virtually every chemical process that occurs in the human body involves enzymes at some point. Without them our bodies would be quickly reduced to an inoperable arrangement of cellular clutter. The body produces and utilizes specific enzymes to carry out specific actions, and each is of great importance.

Digestive Enzymes and the Digestive Process

In humans and many other vertebrates, digestion is the process of breaking down the foods we ingest into smaller, more absorbable molecules, including the nutrients our body needs to function properly.

Digestion begins as soon as you take your first bite of food. Enzymes present in our saliva begin the process of breaking down food into individual components, and they continue this process until your pre-digested food reaches the stomach. Different digestive enzymes take over here, further breaking down your food and preparing it for its individual components to be properly absorbed (or disposed of) during the final phase of digestion, which occurs in the small intestine.

Digestive enzymes play an absolutely essential role in the digestive process. Without them we wouldn't be able to obtain the nutrients we need from our food.

What is the Impact of Poor Digestion?

When our digestive system is functioning as it should, and enzymes are doing their job, digestion is effortless and unnoticed. When it's not, the

impact on our health and mental well-being can be profound. Compromised digestive function can adversely affect every tissue, organ, and body system, primarily due to insufficient nutrition.

Poor digestion comes with a host of undesirable occurrences such as bloating and flatulence. When you're not digesting properly, toxins and waste materials can remain and accumulate, which can lead to health issues down the road. In addition, the modern diet, which is often composed of a high proportion of processed foods, can be taxing on the G.I. tract and may contribute to digestive distress.

Digestive complaints are some of the most common reasons for doctor visits today, so it's evident we need to do a better job supporting healthy digestion. Enzymes can be helpful in this process.



How Can I Improve My Digestion?

If you're experiencing poor digestion the most likely culprit is a poor diet. The easiest way to maintain healthy digestion is to eat a healthy, balanced diet, which can provide all the nutrients your body needs in the proper ratios for optimal health. Try to reduce or eliminate processed foods and focus on raw and whole foods, which help to maintain healthy digestion.

Primary Digestive Enzymes

Lipase is an enzyme that processes fats, oils and triglycerides. Since fat isn't water-soluble, it requires special digestive processing before it can be absorbed and utilized by your body. Also, lipase facilitates the absorption of fat-soluble vitamins and nutrients,



including vitamins A, D, E, and K, as well as carotenoids like lutein and astaxanthin and plant constituents like curcumin.

Protease/Proteolytic - In order to properly break down protein the body needs a specific group of enzymes called proteases, which are also referred to as proteinases. These enzymes are secreted by glands in the stomach and pancreas. There are different proteases produced that act at different pH levels through the intestinal tract. This helps generate greater value from the foods we eat.

Amylase – Today's diets are typically heavy on carbohydrates, and the job of breaking them down goes to amylase. This important enzyme is present in our saliva and begins the digestive process as soon as you take your first bite of food. Simply put, amylase converts carbohydrates into simple sugars to be used by your body, primarily for energy.

Other Enzymes of Note

BioCore® DPP-IV (dipeptidyl peptidase-IV) is a unique fungal-derived protease enzyme complex that specifically targets the digestion of gluten. Gluten is a cereal protein found in certain grains such as wheat that's notoriously difficult for some individuals to digest. Poor digestion of gluten can lead to gastrointestinal distress consisting of temporary bloating, gas and more. DPP-IV is intended to support the digestion of small amounts of gluten that might be eaten inadvertently, affording individuals who are sensitive to gluten a little extra peace of mind.* While DPP-IV can help improve digestion of gluten-containing foods, it is not intended for use in individuals with Celiac disease or severe gluten allergies, except when used under physician/practitioner supervision.*

Lactose is a sugar found in milk and other dairy products. An estimated 30 to 50 million Americans suffer from dairy, or lactose, intolerance. Lactose-intolerant individuals are typically deficient in lactase, an enzyme needed to break down lactose during digestion. Many dairy products also contain high levels of protein and fat. In order to digest the lactose, protein, and fat that is found in dairy products, the body needs an ample supply of specific enzymes, such as lactase, proteases, and lipase.



*These statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure or prevent any disease.

Other Enzymes of Note (continued)

Cellulase is actually several similar enzymes, all of which break down cellulose from plants. Our bodies don't naturally produce cellulase, so it's important we obtain it through our diet. It's also produced through fermentation via gut flora (probiotic organisms). Plant cell walls cannot be broken down by other enzymes, so cellulase can help us to obtain the greatest nutritional benefit from the fruits and vegetables we eat.



Enzymes as We Age

Your body's production of enzymes declines as you age, and the enzymes it does produce become less efficient. For example, as children most of us are able to easily digest most dietary substances, such as lactose found in dairy. As we age, many of us find that we begin to have difficulty digesting dietary components we once digested with ease. In addition, changes in diet, decreased physical activity, stress, hormonal changes, medications, and other factors can all adversely affect the body's ability to produce certain enzymes.

Other Uses for Enzyme Supplements

In addition to digestive support, various enzymes serve diverse roles in the human body, and these enzymes and enzyme products offer a wide range of benefits.

Nattokinase is an enzyme isolated from natto, a traditional Japanese fermented soy food. Natto has been consumed for thousands of years for its numerous health-promoting properties.* More recently, both clinical and non-clinical studies have demonstrated that nattokinase, a specialized protease, can help to promote heart and circulatory health by helping to maintain healthy levels of fibrin.* Fibrin is a large, insoluble protein involved in proper blood clotting and is essential for normal wound healing. NOW® Nattokinase is derived from non-GMO soy and has 2,000 FUs (fibrinolytic units) per 100 mg serving.

Serrazimes® is a proteolytic blend composed of enzymes derived from the edible fungi *Aspergillus oryzae* and *Aspergillus melleus*. Serrazimes® acts systemically in the maintenance of a balanced immune system response by helping to break down protein-based immune cell secretions,

thereby facilitating their elimination.* In this way, Serrazimes® may promote vascular and respiratory health by supporting the body's own natural processes for both drainage and repair.*

Bromelain is a proteolytic enzyme derived from the stem of the pineapple plant that has protein-digesting properties.* When taken with food, bromelain can help to support healthy digestion; when taken between meals, it may help to support joint comfort and may help to relieve temporary soreness that is associated with muscle overuse.* Bromelain is designed by nature to support proper gastrointestinal function and may also help to promote the comfort of muscles and joints.*



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Super Enzymes

Super Enzymes is a comprehensive blend of enzymes that supports healthy digestion.* Formulated with bromelain, ox bile, pancreatin and papain, Super Enzymes helps to optimize the breakdown of fats, carbohydrates and protein.*

Digest Ultimate™

Digest Ultimate™ is a potent combination of digestive enzymes produced through controlled fermentation of select microbial species and is stable throughout the pH range of the GI tract. This full-spectrum digestive support formula helps to optimize nutrient absorption by assisting in the breakdown

of protein, carbohydrates and fats, as well as dairy, grains and indigestible fibers found in foods such as vegetables and beans.* In addition, Digest Ultimate™ is suitable for vegetarians.

Dairy Digest Complete

Dairy Digest Complete is a comprehensive blend of enzymes, produced through controlled fermentation of select microbial species, that is formulated to aid in the digestion of dairy products.* Intolerance to dairy is often due to the inability to digest milk sugar known as lactose. However, intolerance is also frequently related to the difficult-to-digest proteins and fats inherent in dairy products. NOW® Dairy Digest Complete combines lactase for lactose digestion with proteases and lipases that specifically target milk proteins and fat for digestion.* Dairy Digest is suitable for vegetarians.



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The NOW® Difference

With NOW's comprehensive selection of digestive enzyme formulas and a healthy, balanced diet it's a lot easier to ensure you're getting the enzymes your body needs to help maintain normal, healthy digestive function.* We incorporate the latest research into our contemporary enzyme formulas, and just like every NOW product, our digestive enzyme formulas are manufactured with NOW's industry-leading attention to quality.

For more detailed information on NOW's digestive enzyme products, including how to choose the right enzyme formula for your needs, visit nowfoods.com.

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