

What Are Digestive Enzymes?

Enzymes help the body's reactions happen easier and faster than if the enzymes weren't present. While we have enzymes enabling chemical reactions throughout the cells of our bodies, not all enzymes are the same.

So, what are digestive enzymes? What is the digestive enzymes definition? Digestive enzymes occur naturally in saliva, stomach juices, and intestinal and pancreatic secretions. The function of digestive enzymes is to facilitate the body's reactions that break down and process food. Although most types of digestive reactions occur in the small intestine, the preparatory reactions that occur in the mouth and stomach are also important.

How do digestive enzymes work?

The primary purpose of digestive enzymes is to aid digestion. How do enzymes help digestion? Starting in the mouth and working throughout the gastrointestinal system, digestive enzymes break down large macromolecules into smaller units, like sugars or amino acids; however, they don't work alone. Hydrochloric acid (HCl) is formed in the stomach, where it sterilizes food, breaks down proteins, and activates the digestive enzymes that work in the stomach.

As food passes into the small intestine, HCl from the stomach triggers intestinal digestion – the pancreas releases a variety of digestive enzymes plus bicarbonate, and the gallbladder releases bile into the small intestine. Bicarbonate is an alkaline substance that neutralizes the acid, deactivates stomach enzymes, and activates intestinal enzymes.

Bile salts emulsify fats, allowing the body to absorb them more easily. The gallbladder stores and concentrates the bile salts produced by the liver. If the gallbladder is removed, then bile is not stored for release when needed, so less is available to aid digestion.

How do digestive enzymes support good health?

There are several benefits of digestive enzymes. When your naturally produced digestive enzymes are in balance, their actions quickly release nutrients from your food. This keeps things moving through your gut, reducing both irritation and undesirable conditions like heartburn, gas, and bloating. The released nutrients then provide the raw materials that are needed for your body's processes to occur efficiently, which is the foundation of good health. By digesting food properly, healthy gut bacteria are also supported.

How do digestive enzymes get out of balance?

Disruptions to your digestive tract, gallbladder, or pancreas can alter digestion, making it less efficient. For instance, aging, illness, stress, chronic use of antacids or acid-blockers, smoking, alcohol abuse, and medical interventions (such as gallbladder removal or gastric bypass) all

cause changes in enzyme production and function. Imbalances in stomach acid can have a domino effect on digestive processes and enzyme activities. Some nutrient deficiencies, like zinc and B vitamins, can also disrupt digestion.

What happens when digestive enzymes don't work properly?

Without properly functioning digestive enzymes, the body doesn't effectively break down food into nutrients. If nutrients aren't released from food, then the body doesn't absorb them to help maintain good health. Poor digestion can lead to nutritional deficits, especially some vitamins.

You might also experience a variety of discomforts such as heartburn, indigestion, gas, bloating, diarrhea, and constipation. In addition, the healthy bacteria that live in your gut can become unbalanced because of chronic exposure to undigested food.

Are all digestive enzymes alike?

No. Just like different tools help with different tasks, different enzymes facilitate different reactions. Digestive enzymes are specialized to break down specific parts of food. So, what are digestive enzymes that you might see on a digestive support product label? Here is a list of digestive enzymes you might see on a digestive support product label:

<u>Enzyme type</u>	<u>Helps break down</u>
Protease	Proteins
Lipase	Fats
Amylase	Starches (carbs)
Lactase	Lactose (carbs)
Cellulase	Cellulose (carbs)

You should also know that some ingredient names refer to a combination of enzymes. For example, Thorne's pancreatin ingredient is a combination of amylase, protease, and lipase enzymes that are derived from the pancreas.

Can I get digestive enzymes from food?

Yes. Regarding *what* contains digestive enzymes, many foods contain naturally occurring enzymes that support healthy digestion. Pineapple, papaya, kiwi, and ginger contain proteases that break down proteins, for example. Mango, banana, and apricot contain amylases and other enzymes that break down carbohydrates. Avocado contains lipase that breaks down fats. Raw honey and many fermented foods (like kefir, kimchi, miso, sauerkraut, and tempeh) typically contain a variety of enzymes that aid digestion.

It can be impractical for people to eat these foods regularly. But fortunately, nutritional supplements are available to fill in the gaps when diet alone can't meet the body's needs.

How do I recognize a high-quality digestive enzyme supplement?

Digestive enzymes have standard values for quality, purity, strength, and identity. These standard values are used to define and maintain manufacturing quality standards. The United States Pharmacopeia (USP) is the independent repository of those standards. Sometimes the USP values represent minimum values for quality purposes that don't reflect all the acceptable values for a substance.

For example, full-strength pancreatin is 9 times more potent than the minimum digestive power required by the USP. Digestive enzymes available at higher strengths are often diluted. When enzymes are diluted, it is often done with lactose, which is typically not listed on the label and is difficult for some individuals to digest.

Are digestive enzymes safe? Yes, they are generally safe. However, if you have questions about whether they are right for you, you should consult your healthcare professional.

Why take digestive enzymes from Thorne?

Thorne's quality digestive enzyme products have transparent labels and don't contain substances like lactose that can cause gas and bloating if you are lactose intolerant. The best digestive supplements won't contain diluted enzymes. For example, the "9" in Thorne's Dipan-9 (now Pancreatic Enzymes) refers to the full-strength pancreatin that Thorne uses.

Thorne only uses full-strength enzymes with no lactose.

Looking beyond quality, consider the digestive functions the supplement supports in the context of what your body needs. For example, if you need help digesting proteins, look for a product with protease activity. If it's digesting fatty foods, you need help with, look for lipase activity.

It might seem counterintuitive, but many cases of heartburn are actually caused by not having enough stomach acid, causing food to remain in the stomach for too long. This leads to irritation. Providing some extra acid (like betaine HCl) with the enzymes can support enzyme activation and improve digestive efficiency in the stomach, which can get things moving along faster, leaving less opportunity for irritation to occur.

If you've had your gallbladder removed, consider products that supply bile salts like ox bile. There are even plant-sourced digestive enzymes if that is your preference.

What digestive enzyme supplements are available from Thorne?

Thorne offers a wide variety of high-quality digestive enzyme supplements that suit many needs and preferences. Take Thorne's [digestive enzyme quiz](#) or use the "cheat sheet" below:

1. [Advanced Digestive Enzymes](#) – most comprehensive, includes bile, best choice after gallbladder removal.
2. [Multi Enzyme](#) – full-spectrum support with pancreatin and HCl, but without bile
3. [Plantizyme](#) – the best-balanced option for individuals who prefer non-animal sourced enzymes.
4. [Pancreatic Enzymes](#) – the best option for fat digestion.
5. [Betaine HCL & Pepsin](#) – the best option for protein digestion.

It is always best to discuss wellness strategies with your healthcare practitioner. If you struggle with digestive upset and are looking for a solution in the dietary supplement space, then find out if one of Thorne's many options is right for you. For a more comprehensive evaluation of your gut health, consider the Thorne [Gut Health Test](#), which provides a personalized plan based on your test results.

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