

Digestive Enzymes in Nutrients

Istvan Danko*

Department of gastroenterology, University of Wisconsin-Madison, USA

Introduction

Digestive enzymes play a key role in breaking down the food you eat. These proteins speed up chemical reactions that turn nutrients into substances that your digestive tract can absorb. Your saliva has digestive enzymes in it. Some of your organs, including your pancreas, gallbladder, and liver, also release them. Cells on the surface of your intestines store.

Different nutrients:

- Amylase breaks down carbs and starches
- Protease works on proteins
- Lipase handles fats

This is when your small intestine doesn't make enough of the enzyme lactase, which breaks down the natural sugar in milk called lactose. With a shortage of lactase, lactose in dairy products that you eat travels straight to your colon instead of getting absorbed into your body. It then combines with bacteria and causes uncomfortable stomach symptoms. You are born with a gene that makes you lactose intolerant. The gene is most common in people of African, Asian, or Hispanic background. Your lactase levels drop suddenly as a child. Then you're no longer able to digest dairy as easily. This is the most common type of lactose intolerance. Your small intestine makes less lactase after an illness, injury, or surgery. It can also be a symptom of both celiac disease and Crohn's disease. Digestive enzymes are proteins that break down larger molecules like fats, proteins and carbs into smaller molecules that are easier to absorb across the small intestine. Without sufficient digestive enzymes, the body is unable to digest food particles properly, which may lead to food intolerances.

Digestive enzymes can be obtained from supplements or naturally through foods. Foods that contain natural digestive enzymes include pineapples, papayas, mangoes, honey, bananas, avocados, kefir, sauerkraut, kimchi, miso, kiwifruit and ginger. Adding any of these foods to your diet may help promote digestion and better gut health. Fermentation is a process that involves bacteria and yeast breaking down sugars. Not only does fermentation help enhance food preservation, but eating fermented foods can also boost the number of beneficial bacteria, or probiotics, found in your gut. Probiotics have been associated with a variety of health benefits, including improved digestion, better immunity, and even increased weight loss. Bacteria, viruses, fungi and other microscopic living things are referred to as microorganisms, or microbes, for short.

Trillions of these microbes mainly inside your intestines

Although many different types of microbes live inside you, bacteria are the most studied. In fact, there are more bacterial cells in your body than human cells. There are roughly 40 trillion bacterial cells in your body and only 30 trillion human cells. That means you are more bacteria than human. What's more, there are up to 1,000 species of bacteria in the human gut microbiome, and each of them plays a different role in your body. Most of them are extremely important for your health, while others may cause disease. Altogether, these microbes may weigh as much as 2–5 pounds.

Stomach and gastric enzymes

The enzymes that are secreted in the stomach are gastric enzymes. The stomach plays a major role in digestion, both in a mechanical sense by mixing and crushing the food, and also in an enzymatic sense, by digesting it. The following are enzymes produced by the stomach and their respective function.

Pepsin is the main gastric enzyme. It is produced by the stomach cells called chief cells in its inactive form pepsinogen, which is a zymogen. Pepsinogen is then activated by the stomach acid into its active form, pepsin. Pepsin breaks down the protein in the food into smaller particles, such as peptide fragments and amino acids. Protein digestion, therefore, primarily starts in the stomach, unlike carbohydrate and lipids, which start their digestion in the mouth (however, trace amounts of the enzyme kallikrein, which catabolises certain protein, is found in saliva in the mouth). Gastric lipase is an acidic lipase secreted by the gastric chief cells in the fundic mucosa in the stomach. It has a pH optimum of 3-6. Gastric lipase, together with lingual lipase, comprise the two acidic lipases. These lipases, unlike alkaline lipases (such as pancreatic lipase), do not require bile acid or colipase for optimal enzymatic activity. Acidic lipases make up 30% of lipid hydrolysis occurring during digestion in the human adult, with gastric lipase contributing the most of the two acidic lipases. In neonates, acidic lipases are much more important, providing up to 50% of total lipolytic activity. Hydrochloric acid This is in essence positively charged hydrogen atoms, or in lay-terms stomach acid, and is produced by the cells of the stomach called parietal cells. mainly functions to denature the proteins ingested, to destroy any bacteria or virus that remains in the food, and also to activate pepsinogen into pepsin.

*Corresponding author: Istvan Danko, Department of gastroenterology, University of Wisconsin-Madison, USA, E-mail: news@pediatrics.wisc.edu

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