

# Digestive Enzymes

100 vegetable capsules / Code FE2013



**Digestive Enzymes** is a combination of **pancreatin** (extract of the pancreatic gland containing protease, amylase and lipase), **betain** (source of HCl extracted from beetroot), **ox gall extract** (with a high share of taurine) **papain** (extracted from papaya) and **pepsin**.



**FORMAT:** 100 vegetable capsules

## FORMULA

### Ingredients:

Pancreatin (porcine-sourced pancreatic enzymes concentrate), pepsin A, bulking agent: microcrystalline cellulose, betaine hydrochloride, bile extract (from *Bos taurus* liver), papain (from *Carica papaya* fruit), anticaking agents: silicon dioxide and magnesium salts of fatty acids, vegetable capsule (glazing agent: hydroxypropylmethylcellulose; purified water).

<b>Nutritional information:</b>	<b>1 capsule</b>
Pancreatin 4x	200 mg
Protease	20.000 USP-PC
Amylase	20.000 USP-AGU
Lipase	4.000 USP-LU
Betaine (HCl)	105,3 mg
Bile extract [45% bile acids]	64,8 mg
Pepsin A (162 mg)	324.000 IU-PU
Papain (10,97 mg)	384.000 USP-PU

USP: United States Pharmacopeia.

IU : International Units

PC: Proteolytic hydrolysis of casein

AGU: Glucoamylase Units

LU: Lipase Units

PU: Papain units

### Cautions:

It's recommended not to use this product if you are pregnant or breast-feeding, if you have gastrointestinal ulcers, gallstones or biliary obstruction. Consult with a health-care practitioner before using if you are being treated with medication (anticoagulants, anti-inflammatories, diuretics) or if you have a special medical condition (diabetes, pancreatitis). Do not use if you are sensitive to pancreatic enzymes or to pork proteins.

### Recommended daily dose:

1 capsule one to four times daily with food. Swallow whole; do not crush or chew. Do not exceed the stated recommended daily dose. Consult a health care practitioner for use beyond four weeks

**Indications and uses:** Different studies have shown that the ingredients in DIGESTIVE ENZYMES can relieve the following conditions:

- Pancreatic insufficiency characterized by poor digestion, malabsorption, abdominal bloating, a feeling of fullness, gas, constipation and gastrointestinal inflammation.
- It's also used in the treatment of pancreatic insufficiency, cystic fibrosis, chronic pancreatitis, post-pancreatectomy, post-gastrointestinal bypass surgery, obstruction or narrowing of the bile or pancreatic duct, hypochlorhydria or achlorhydria, pancreatic secretion deficiency and food allergies, among others.
- Patients suffering from cancer have been observed to have pancreatic enzyme deficiencies so proteolytic enzymes are considered to be potentially helpful.

### DETAILS:

**DIGESTIVE ENZYMES** is a combination of enzymes adapted to break food down into nutrients in order to facilitate digestion. The human body produces 22 different digestive enzymes, but this production decreases with age. Other critical enzymes that facilitate digestion are found in fruit, vegetables and meat, such as betaine, papain and pepsin. Disease and obstruction of the pancreatic duct can deteriorate the digestive process even more.

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Pancreatin is an extract of the pancreatic glands that contains multiple enzymes, particularly protease, amylase and lipase which complement pancreatic function by breaking down proteins, carbohydrates and fats, respectively, in order to maximize nutrient absorption from food. In conditions of poor absorption, such as pancreatic insufficiency and cystic fibrosis, supplementation with digestive enzymes is recommended. Pancreatic enzymes have also been shown to favour the reduction of gas, distension and fullness after fatty meals.

There is a theory according to which allergies may be provoked by a lack of digestive proteins. Therefore, proteolytic enzymes might reduce allergy symptoms by breaking proteins down into smaller sizes to facilitate digestion. Betaine is essential for breaking down fats and proteins and establishing the appropriate pH for gastric function. Ox bile extract increases bile production which also aids fat digestion. Papain and pepsin initiate protein digestion in the stomach, breaking it down into amino acids and peptides which facilitate intestinal absorption.

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## INGREDIENTS:

**PANCREATIN:** A preparation of pancreatic enzymes isolated from fresh pig pancreas. It provides **amylase**, which intervenes in the breakdown of starch and carbohydrate molecules into smaller sugars. The different types of amylase dissociate molecules of different types of sugars, lactase dissociates lactose (milk sugar), maltase dissociates maltose (malt sugar) and sucrase dissociates sucrose (cane and beet sugar). **Protease** intervenes in protein digestion and breaks it down into simple amino acids. Protease enzymes, like other digestive secretions, are responsible for maintaining the small intestine free of parasites. A lack of protease enzymes increases the risk of intestinal infection. These include trypsin, chymotrypsin and carboxypeptidase. **Lipase**, along with bile, intervenes in fat digestion. A deficiency in pancreatic lipase results in poor absorption of fat and fat soluble vitamins. The action of pancreatin is favoured by the presence of betaine, pepsin and papain<sup>(3)</sup>.

**BETAINE HCl:** A great source of hydrochloric acid. Stomach cells secrete this type of enzyme, though often not enough of it. It is not found in foods, but is essential for breaking down fats and proteins. The presence of this acid lowers the pH of the stomach to very low levels (pH 1-2), needed for its optimal functioning. Clinical experience has shown that these complementary sources of hydrochloric acid often relieve symptoms of acid gas and improve digestion in people with hypochlorhydria and short bowel syndrome<sup>(4)</sup>. Different studies confirm that betaine is necessary for protein, calcium, vitamin B12, iron and zinc metabolism (absorption). It also sterilizes foods in the stomach, allowing for the digestion of bacteria and microorganisms. It therefore helps maintain normal stomach function, particularly in people who produce scarce amounts of hydrochloric acid (hypochlorhydria and achlorhydria). It's known that with age, the production of hydrochloric acid decreases, more notably after 30, causing acid gas and reflux, deficiencies in vitamin B12 and minerals such as calcium, iron (anaemia) and zinc, protein malabsorption, food allergies and many other consequences<sup>(5)</sup>.

**BILE EXTRACT:** Bile extract contains a high taurine content and is an excellent complement to bile production and function. It improves fat digestion, helping the body absorb vitamins A, D, E and K which are fat soluble. It inhibits the formation of gallstones (cholelithiasis) and participates in the elimination of free radicals, responsible for ageing<sup>(6)</sup>. It also has a role in modulating the concentration of free intracellular calcium, and though it's one of the few amino acids not incorporated in proteins, taurine is one of the most abundant amino acids in the brain, retina, muscle tissue and organs throughout the body<sup>(7,8)</sup>.

**PEPSIN A:** A digestive enzyme released in the stomach as a pepsinogen. The release of hydrochloric acid stimulates the release of this basic form of pepsin at very low pH levels. Its main function is to break down proteins in peptides<sup>(3)</sup>. It's used as a coadjuvant to pancreatin and bile salts in cases of pancreatic secretion deficiency.

**PAPAIN:** Coming from papaya, papain digests proteins in peptides or even in amino acids, stimulating pancreatic juices for better protein digestion. Papain has been shown to digest wheat gluten and make it innocuous for people with celiac disease<sup>(9)</sup>.

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## References:

- 1) Thorat, V. et al. (2012). Randomised clinical trial: the efficacy and safety of pancreatin enteric-coated minimicrospheres (Creon 40000 MMS) in patients with pancreatic exocrine insufficiency due to chronic pancreatitis - a double-blind, placebo-controlled study. *Alimentary Pharmacology and Therapeutics*, 36, 426-436.
- 2) Löhr, JM., et al. (2013). Synopsis of recent guidelines on pancreatic exocrine insufficiency. *United European Gastroenterology Journal*, 1(2), 79-83.
- 3) Hernández-Ledesma, B. et al. (2007). Identification of bioactive peptides after digestion of human milk and infant formula with pepsin and pancreatin. *International Dairy Journal*, 17, 42-49.
- 4) Teixeira, G. et al. (2014). Betaine; a potential agent for the treatment of hepatopathy associated with short bowel syndrome. *Nutrición Hospitalaria*, 29(6), 1366-1371.
- 5) Sugimoto, K. et al. (2005). Betaine improved restriction digestion. *Biochemical and Biophysical Research Communication*, 337, 1027-1029.
- 6) De la Puerta, C. et al. (2010). Taurine and glucose metabolism: a review. *Nutrición Hospitalaria*, 25(6), 910-919.
- 7) Rips, H. et al. (2012). Review: Taurine: A "very essential" amino acid. *Molecular Vision*, 18, 2673-2686.
- 8) Rutherford, JA. et al. (2010). The effect of acute taurine ingestion on endurance performance and metabolism in well-trained cyclists. *International Journal of Sport Nutrition and Exercise Metabolism*, 20, 322-329.

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9) Yogiraj, V. et al. (2014). Carica Papaya Linn: An overview. International Journal of Herbal Medicine, 2(5), 01-08.