

Digestive Enzymes

Digestive enzymes are what their name implies and more. These enzymes contribute to the 1.5 quarts of pancreatic juice that is dumped into the small intestine daily and aid in the process of digestion. These enzymes include proteases which function to digest proteins into polypeptides or chains of amino acids and lipases which breakdown fats, and amylases which reduce carbohydrates into simpler sugars. These are just a few of the over 50,000 different enzymes in the human body. The most familiar digestive enzymes are likely bromelain and papain. Bromelain comes from the pineapple plant and papain comes from the not-so-ripe papaya fruit and is often used in the manufacturing of meat tenderizers. These are two examples of proteases.

Digestive enzymes can be helpful in minimizing the symptoms of indigestion, bloating, gas, and gastric discomfort, among other gastro-intestinal symptoms. Live-food enthusiasts purport that raw foods provide their own enzymes, and do not deplete the body of its own digestive enzymes. Also, cooking is thought to inactivate food enzymes. Foods which lack their own enzymes may also be deficient in zinc, magnesium, manganese, B-6, or protein. They are often found to have insufficient fiber.

Supplementing with digestive enzymes may assist in the breakdown process, diminishing mal-absorption of proteins, fats, and carbohydrates. Large proteins, absorbed into the GI tract intact, are thought to cause increased gut permeability. The body recognizes these proteins as foreign and may create antibodies to them, which may cause an allergic response. Food allergies have been associated with a variety of chronic conditions, including asthma, sinusitis, ear infections, and arthritis.

Digestive enzymes have been shown to play an important role in controlling the symptoms of many of these conditions. Bromelain, for example, in addition to digesting proteins, has been noted to be useful in improving the healing of the stomach lining. Some studies have shown this extract of the pineapple to have other properties, including immune modulating properties, stimulating white blood cells against cancer cells. As an anti-inflammatory agent, bromelain has been found to improve stiffness and joint pain, as well as reduce pain and speed healing following surgery.

Curcumin, which is the source of the yellow/gold color in turmeric (*Curcuma longa*) also possesses enzymatic activity. The anti-inflammatory properties have been found to equal the effects of some of the more traditional non-steroidal anti-inflammatory medications (NSAIDs) in acute conditions. It is also a potent antioxidant.

These digestive enzymes occur naturally in food, and are found in a wide variety of fruits and vegetables, with just a few of the most common forms mentioned above. They can also be taken as supplements, and should be taken just prior to a meal to enhance the body's digestive function. As with taking any other medication or supplementation, consult your healthcare practitioner.

PINEAPPLE PAPAYA SMOOTHIE

1/2 cup orange juice
1/4 cup peeled, cored and cubed pineapple
1/4 cup peeled, seeded and chopped ripe papaya
honey to taste
1/2 cup ice

Place the juice, fruit and honey in a blender. Blend on high speed for 30 seconds. Add the ice and blend until smooth.