



Store hours:
Thurs. 9AM - 8PM
Fri. 8AM - 8PM
Sat. 8AM - 6PM



Pancreatic Enzymes

Visit our internet store at: www.shaffervitamins.com We feature over 700 Brand Names Featuring over 14,000 Products! **SAVE at least 30%-40%** on Every Order! **NO COMPUTER - NO PROBLEM!** Call (484) 695-9496 if you need assistance or if you would like us to place the order for you! We are also listed at <http://www.fairgroundfarmersmkt.com> listed under Merchants — Specialty Shops. Check out our in store monthly specials!

What is the pancreas?



ASK THE DOCTOR

Answers to Your Health Questions

Michael T. Murray, N.D., is a leading researcher and author in the field of natural medicine. He is co-author of *The Encyclopedia of Natural Medicine*, and sole author of several books, including his latest *Natural Alternatives to Over-the-Counter and Prescription Drugs*, *The Healing Power of Herbs*, and *Natural Alternatives to Prozac*

Ask the Doctor publications are available on the Internet at: www.ATDonline.org

The pancreas is a digestive organ in the abdomen that's located just below the stomach. Its primary job is to produce enzymes required for the digestion and absorption of food. Each day the pancreas secretes about 1.5 quarts of pancreatic juice into the small intestine. The enzymes secreted by the pancreas break down food by breaking the chemical bonds that hold food molecules together. Enzymes secreted include lipases which digest fat, proteases which digest proteins, and amylases which digest starch molecules.

Pancreatic Enzymes

Lipases: The pancreatic lipases, along with bile, function in the digestion of fats. Deficiency of lipase results in malabsorption of fats and fat-soluble vitamins.

Amylases: Amylases are enzymes which break down starch molecules into smaller sugars. Amylase is secreted by the salivary glands as well as the pancreas.

Proteases: The proteases secreted by the pancreas (trypsin, chymotrypsin, and carboxypeptidase) function in digestion by breaking down protein molecules into single amino acids.



Q. What are some conditions that pancreatic enzymes have been helpful for?

A Pancreatic enzymes are most often employed in the treatment of pancreatic insufficiency. Pancreatic insufficiency is characterized by impaired digestion, malabsorption, nutrient deficiencies, and abdominal discomfort.

The most obvious clinical use of pancreatic extracts is for impaired digestion due to either pancreatic insufficiency or a disease like cystic fibrosis. While cystic fibrosis is a rare, inherited disorder, pancreatic insufficiency is thought to be relatively common in the elderly.

While starch and fat digestion can be carried out satisfactorily without the help of pancreatic enzymes, the proteases are critical to proper protein digestion. Incomplete digestion of proteins creates a number of problems for the body including the development of allergies and formation of toxic substances produced during putrefaction. Putrefaction refers to the breakdown of protein material by

bacteria.

As well as being necessary for protein digestion, the proteases serve several other important functions. For example, the proteases, as well as other digestive secretions, are largely responsible for keeping the small intestine free from parasites (including bacteria, yeast, protozoa, and intestinal worms).¹ A lack of proteases or other digestive secretions greatly increases an individual's risk of having an intestinal infection, including an overgrowth of the yeast *Candida albicans*.

Q. How do I determine if my pancreas is secreting enough enzymes?

A Physicians use both physical symptoms and laboratory tests to assess pancreatic function. Common symptoms of pancreatic insufficiency include abdominal bloating and discomfort, gas, indigestion, and the passing of undigested food in the stool. For laboratory diagnosis, most nutrition-oriented physicians use the comprehensive

stool and digestive analysis. This comprehensive analysis will usually reveal the level of pancreatic enzymes being dumped into the intestines from the pancreas by determining the level of excess fat in the stool, excess nitrogen in the stool, and the presence of any other partially or completely undigested food elements. In addition, the complete stool and digestive analysis will also reveal the health of the bacteria flora which often reflects the degree of pancreatic function.

Q. Are pancreatic enzymes absorbed?

A. There is strong evidence that the body seeks to conserve its digestive enzymes by reabsorbing them. Numerous human studies have shown that when supplemental pancreatic enzymes (trypsin and chymotrypsin) are given orally they are absorbed intact into the bloodstream.^{2,5} Even more dramatic is the finding that pancreatic enzymes are not only absorbed intact from the gut, but also transported through the bloodstream, taken up intact by pancreatic secretory cells, and secreted into the intestines by the pancreas.⁶ The existence of this circulation of pancreatic enzymes is quite similar to the recycling of bile salts by the liver.

Of further interest is the possibility that oral supplementation with pancreatic enzymes may have a sparing effect on the body's own digestive enzymes, perhaps reducing the stress on the pancreas and allowing the body to redirect energy to other areas.

Q How can pancreatic enzymes help food allergies?

A Pancreatic enzymes can help with food allergies by improving digestion. In order for a food molecule to produce an allergic response it must be a fairly large molecule. In studies performed in the 1930s and 1940s, pancreatic enzymes were shown to be quite effective in preventing food allergies.^{7,8} It appears that many practitioners are not aware of, or they have forgotten about, these early studies. Typically individuals who do not secrete enough proteases will suffer from multiple food allergies.

Q Why are pancreatic enzymes used as natural anti-inflammatory agents?

A The proteases are important in preventing tissue damage during inflammation and the formation of fibrin clots. Proteases cause an increase in the breakdown of fibrin, a process known as fibrinolysis. Fibrin's role in the promotion of inflammation is to form a wall around the area of inflammation which results in the blockage of blood and lymph vessels which leads to swelling. Fibrin can also cause the development of blood clots which can become dislodged and produce strokes or heart

attacks. Pancreatic enzymes and protease enzyme preparations have been shown to be useful in the treatment of many acute and chronic inflammatory conditions including sports injuries, tendinitis, and rheumatoid arthritis.^{9,10} In addition to being used as an anti-inflammatory agent in cases of trauma and inflammation, pancreatic enzymes are often used in the treatment of thrombophlebitis, a disease in which blood clots develop in veins, which become inflamed, and can dislodge to cause strokes or heart attacks.

Q Do the pancreatic enzymes digest blood proteins?

A No! There are special factors in the blood which block the enzymes so that they do not digest blood proteins.



How do the pancreatic enzymes help autoimmune conditions like rheumatoid arthritis?

A The benefits in some inflammatory conditions appear to be related to helping the body break down immune complexes formed between antibodies produced by the immune system and the compounds they bind to (antigens).

Conditions associated with high levels of immune complexes in the blood are often referred to as "autoimmune diseases" and include such diseases as rheumatoid arthritis, lupus, scleroderma and multiple sclerosis. Higher levels of circulating immune complexes are also seen in ulcerative colitis, Crohn's disease, and AIDS.¹¹⁻¹³

The presence of immune complexes in these diseases are thought to contribute greatly to the disease process. Ex-

perimental and clinical studies have shown that pancreatic enzyme preparations are extremely effective in reducing circulating immune complex levels in several of these diseases. The clinical improvement corresponds with a decrease in the level of immune complex circulating in the blood.

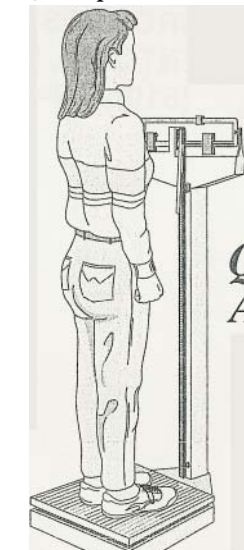
For example, in the treatment of multiple sclerosis, pancreatic enzyme preparations have been shown to produce good effects in reducing the severity and frequency of symptom flare-ups.¹² Especially good results were noted in cases of visual disturbance, urinary bladder and intestinal malfunction, and sensory disturbances. However, it should be pointed out that there was little effect on dizziness or tremor noted.

Most of the clinical studies using pancreatic enzyme preparations in inflammatory or autoimmune diseases have utilized enzyme preparations which are relatively weak in potency when compared to a number of enzyme preparations available at health food stores. Presumably, by using a higher potency product the impressive results demonstrated by weaker preparations can be improved upon.

Q Are pancreatic enzymes helpful in cancer?

A One of the most controversial uses of pancreatic enzymes is in treating cancer. Enzyme preparations have been promoted by numerous alternative cancer practitioners for many years, but most recently by William Kelley, D.D.S., and Nicholas Gonzalez, M.D. Like most alternative cancer treatments, there is little evidence in the scientific literature to support their use. Several studies have been conducted in Germany and Austria, but further research is definitely required.^{14,15}

Q Can pancreatic enzymes help people lose weight?



A. Pancreatin supplementation has been shown to result in decreased food intake and a significant loss of body weight in animals.¹⁶ Pancreatin appears to either contain or stimulate the manufacture of compounds which suppress appetite.

Although, to my

knowledge, there are no human studies with pancreatin as a weight loss aid, I have seen pancreatin supplementation promote dramatic weight loss. The best example I can think of is a friend of mine, Jim, who lost at least 40 pounds and 6 inches around his waist simply by supplementing his diet with pancreatin. Jim decided to try pancreatin because he was extremely sensitive to some of the thermogenic formulas containing ephedrine and caffeine.

Q Is there any other condition that pancreatic enzymes have been helpful for?

A. Yes, probably many. New studies are showing pancreatic enzymes to be useful in other health conditions. For example, a recent study has shown orally administered pancreatic enzyme preparations to be helpful in the treatment of shingles—a painful infection of the skin caused by the herpes zoster virus. In fact, pancreatic enzymes were more effective than the standard drug therapy (acyclovir) without the side effects.¹⁷ The 90 patients with shingles were randomly assigned to receive either acyclovir (800 mg) or an enzyme preparation (120 mg trypsin, 40 mg chymotrypsin, and 320 mg papain) five times per day for a treatment period of 7 days. The parameters of pain and skin lesions were measured over 14-21 days. Results indicated no statistically significant difference in either parameter between the two groups indicating the enzyme preparation is as effective as acyclovir (Zovirax), but it is significantly less expensive and safer. The proposed mechanisms of action for the enzyme preparation was stimulation of the breakdown of immune complexes as well as enhancement of immune function.

Q. If I need to take pancreatic enzymes, how can I determine potency?

A. Pancreatic enzyme products are quite popular nutritional supplements. Most commercial preparations are prepared from fresh hog pancreas. The United States Pharmacopoeia (USP) has set strict definition for levels of activity. A 1X pancreatic enzyme (pancreatin) product has in each milligram not less than 25 USP units of amylase activity, not less than 2.0 USP units of lipase activity, and not less than 25 USP units for protease activity. Pancreatin of higher potency is given a whole number multiple indicating its strength. For example, a full-strength undiluted pancreatic extract that is 10 times stronger than the USP standard would be referred to as 10X USP.

Full-strength products are preferred to lower-potency pancreatin products because lower-potency products are often diluted with salt, lactose, or galactose to achieve desired strength (e.g., 4X or 1X). The dosage recommendation for a 10X

USP pancreatic enzyme product would be 350 to 700 mg, three times a day, taken immediately before meals when used as a digestive aid and 10-20 minutes before meals or on an empty stomach when anti-inflammatory effects are desired.

Enzyme products are often enteric-coated, that is, they are coated to prevent digestion in the stomach, so that the enzymes will be liberated in the small intestine. However, non-enteric coated enzyme preparations actually outperform enteric coated products if they are given prior to a meal (for digestive purposes) or on an empty stomach (for anti-inflammatory effects).

Q. Are pancreatic enzyme preparations safe?

A. Pancreatic extracts are generally well-tolerated and are not associated with any significant side effects. However, my recommendation is to utilize these preparations only when there is apparent need.

References

1. Rubinstein E, et al.: "Antibacterial activity of the pancreatic fluid." *Gastroenterol* 88:927-32, 1985.
2. Ambrus JL, et al.: "Absorption of exogenous and endogenous proteolytic enzymes." *Clin Pharmacol Therap* 8:362-8, 1967.
3. Kabacoff BB, et al.: "Absorption of chymotrypsin from the intestinal tract." *Nature* 199:815-7, 1963.
4. Martin GJ, et al.: "Further in vivo observations with radioactive trypsin." *Am J Pharm* 129:386-92, 1964.
5. Avakian S: "Further studies on the absorption of chymotrypsin." *Clin Pharmacol Therap* 5:712-5, 1964.
6. Liebow C and Rothman SS: "Enteropancreatic circulation of digestive enzymes." *Science* 189:472-4, 1975.
7. Oelgoetz AW, et al.: "The treatment of food allergy and indigestion of pancreatic origin with pancreatic enzymes." *Am J Dig Dis Nutr* 2:422-6, 1935.
8. Carroccio A, et al.: "Pancreatic enzyme therapy in childhood celiac disease. A double-blind prospective randomized study." *Dig Dis Sci* 40:2555-2560, 1995.
9. Innerfield I: "Enzymes in Clinical Medicine." *McGraw Hill*, New York, 1960.
10. Horger I: "Enzyme therapy in multiple rheumatic diseases." *Therapiewoche* 33:3948-57, 1983.

11. Ransberger K: "Enzyme treatment of immune complex diseases." *Arthritis Rheuma* 8:16-9, 1986.
12. Steffen C, et al.: "Enzyme therapy in comparison with immune complex determinations in chronic polyarteritis." *Rheumatologie* 44:51-6, 1985.
13. Ransberger K and van Schaik W: "Enzyme therapy in multiple sclerosis." *Der Kassenarzt* 41:42-5, 1986.
14. Hoefler-Janker H: "The importance of vitamin A and proteolytic enzymes in cancer therapy." *Arz Praxis* 54:2805-6, 1971.
15. Rokitsky O: "Adjuvant enzyme treatment before and after breast cancer surgery." *Dr Med* 1:16, 1980.
16. Dean DH and Hiramoto RN: "Weight loss during pancreatin feeding of rats." *Nutr Reports International* 29:167-72, 1984.
17. Kleine MW, Stauder GM and Beese EW: "The intestinal absorption of orally administered hydrolytic enzymes and their effects in the treatment of acute herpes zoster as compared with those of oral acyclovir therapy." *Phytomedicine* 2:7-15, 1995.