Using Digestive Enzymes

These supplements may help improve digestion and reduce inflammation

proteins involved in the digestion of food. Found naturally in the body and available in
prescription form, digestive enzymes are also sold as dietary supplements. Proponents claim
that these over-the-counter enzymes can help treat a whole host of health problems, including
digestive issues like:

- Celiac disease
- Crohn's disease
- Heartburn
- Indigestion
- Irritable bowel syndrome
- Ulcerative colitis

Secreted mostly by the pancreas, digestive enzymes aid the body in breaking down fats,
proteins, and carbohydrates. When normal functioning of the pancreas is disrupted and causes
insufficient enzyme production, the body may be unable to properly absorb these nutrients.
Digestive enzyme supplements protect against this malabsorption, which can slow digestion
and lead to uncomfortable symptoms like bloating, flatulence, abdominal cramps, and
diarrhea. For instance, physicians often prescribe Rx digestive enzymes to people with
pancreatic insufficiency from conditions like pancreatitis, pancreatic cancer, and cystic
fibrosis. More commonly, people who lack the enzyme lactase, which helps digest lactose,
the sugar in milk products, often take OTC lactase supplements to avoid indigestion when
eating dairy products. Similarly, those who lack the enzyme to digest the sugars in beans may
take an alpha-galactosidase supplement, such as Beano or Bean Relief.

The digestive enzymes in supplements come from various sources, including animal
pancreases (pigs, cows, or lambs) or from plants. For instance, bromelain is derived from
pineapples, papain from papayas, and lactase from purified yeasts or fungi. Supplements also
often contain a mixture of enzymes, such as proteolytic enzymes like bromelain
and papain (needed to digest protein), lipase (needed to digest fat), and amylase (needed to
digest carbohydrates).
Although digestive enzymes supplements are normally taken with meals for digestive purposes, when taken in between meals on an empty stomach, they promise to stimulate the immune system, manage arthritis, reduce inflammation, improve liver health, fight cancer, and more. Indeed, so much ado is being made about the purported benefits of digestive enzymes that the global market for these supplements is expected to reach $1.6 billion by 2025.

Health Benefits

Though some studies seem to support some of the purported benefits of digestive enzymes, as with many dietary supplements, there is insufficient evidence to demonstrate clear health benefits. Many of the studies are small, poorly designed, have conflicting outcomes, and as a result, are far from convincing. Here's a look at some key findings on the potential health benefits of supplements containing digestive enzymes:

Irritable Bowel Syndrome

A digestive enzyme known as pancrelipase may alleviate some symptoms of irritable bowel syndrome (IBS), according to a pilot study published in *Frontline Gastroenterology* in 2011. For the study, 69 patients with irritable bowel syndrome were given either pancrelipase or a placebo before consuming foods known to trigger their symptoms. Study results showed that those treated with pancrelipase experienced a significantly greater improvement in such symptoms as cramping, bloating, and pain.

Another study involved a multi-ingredient formulation called Biointol. This supplement contains digestive enzymes along with beta-glucan and inositol. In this small study, 50 IBS patients received the supplement. Their symptoms were compared with a 40 IBS patient no-therapy control group. The results indicated that the supplement reduced abdominal pain, bloating and flatulence. Unfortunately, without placebo control, there's no way to conclude that the supplement itself caused the reduction in symptoms.

Inflammatory Bowel Disease

Several preliminary studies suggest that bromelain may help manage colitis, a type of inflammatory bowel disease (IBD). For example, a 2010 study published in *Inflammatory Bowel Diseases* found that bromelain helped decrease inflammation of the colon in mice with colitis.
Digestive enzymes may also be helpful in people with IBD who experience symptoms of IBS, such as abdominal pain and diarrhea, despite little or no active inflammation. This new disorder is called IBD-IBS syndrome. A study published in 2017 involved patients who received the anti-inflammatory drug mesalamine, a standard treatment for IBD, plus Biointol, the same multi-ingredient formulation mentioned above, or just treatment with mesalamine. Those who received both mesalamine and Biointol reported a reduction in abdominal pain and a reduction in bloating and flatulence after four weeks, while those who took just mesalamine reported only a mild reduction in the urgency to evacuate. Again, without placebo control, there's no way to conclude that the supplement itself caused the reduction in symptoms.

Digestive Enzymes Help for IBS?

Cancer

Digestive enzymes have been reported to be beneficial to people undergoing cancer treatment versus affecting the disease process itself, for instance by decreasing complications of therapy. But according to a 2014 article in Mayo Clinic Proceedings, these studies either weren't statistically analyzed or did not show significant or consistent improvement with OTC enzymes. For example, a retrospective study reported that complementary treatment with OTC enzymes improved quality of life for patients with colorectal cancer by reducing signs and symptoms of the disease and reducing adverse reactions associated with adjuvant therapies. However, a randomized controlled trial of treatment with proteolytic enzymes showed no reduction in acute toxic effects of adjuvant pelvic radiotherapy, nor did it improve tolerance to the treatment.

Similarly, while laboratory studies have shown that proteolytic enzymes can affect the growth of cancer cells and adjuvant treatment with proteolytic enzymes were reported to benefit patients with cancer, according to a report by the Memorial Sloan Kettering Cancer Center, recent studies do not support such claims.

Arthritis

Some, but not all, studies on bromelain show it may help relieve pain related to osteoarthritis (OA), likely due to its ability to reduce inflammation. In a research review published in Arthritis Research & Therapy in 2006 that looked at nine clinical trials testing bromelain's effects on patients with OA, the review's authors found some evidence that bromelain may
offer pain-reducing effects similar to those of diclofenac, a non-steroidal anti-inflammatory drug (NSAID) often prescribed for OA.

More recently, a 2015 randomized double-blind prospective study compared a commercial enzyme preparation containing bromelain, trypsin, and rutin with the NSAID diclofenac in the treatment of 150 patients with moderate-to-severe OA of the knee joint. The commercial preparation, called Wobenzym, produced significant improvements in joint pain and function after 12 weeks compared with the NSAID, including significant improvements in the ability to walk for a distance and affected knee joint flexibility. Studies with another commercial enzyme preparation containing the same ingredients, Phlogenzym, have shown similar results. The upshot: Enzymes may have a clinical role in improving symptoms of OA, but larger studies are needed to confirm these effects.

Natural Osteoarthritis Pain Relief Remedies

Muscle Soreness

The evidence regarding the effectiveness of OTC enzymes in improving muscle soreness is mixed, and many studies are small and dated. In one study from 2004 that involved 20 men, protease supplements facilitated muscle healing and lessened perceived increases in pain after intense exercise, while in another study from 1965 they reduced pain and swelling associated with injuries and sped the healing process. However, a double-blind randomized controlled trial of 39 people from 2002 showed no difference between bromelain, Ibuprofen, or placebo in treating post-exercise muscle soreness. A double-blind study of 50 people with soft-tissue (muscle, tendon, or ligament) ankle injuries published in 1975 showed no significant difference in swelling, bruising, and function in the group given proteolytic enzymes. More recently, a study involving 20 men from 2016 found that, compared to placebo, taking a branded enzyme blend, DigeZyme, significantly reduced pain and tenderness after a treadmill running test.

Autism

While there is growing evidence for a gut-brain connection associated with autism spectrum disorders (ASD), research on the benefits of digestive enzymes on children with ASD is mixed. In one double-blind, placebo-controlled study published in 2015, children that received digestive enzyme therapy for three months had significant improvement in
emotional response, general behavior, and gastrointestinal symptoms (quality of stools, abdominal pain, vomiting, and food variety) compared to children in the control group.

Conversely, in a more rigorous randomized, double-blind, placebo-controlled, crossover study published in 2010, researchers reported no statistically significant clinical improvements on any parameter except the food variety score (selective eating is common with ASD), which was the only outcome measure that showed a statistically significant improvement on proteolytic enzyme therapy compared with placebo.

More research is certainly necessary. Still, despite the contrary results, because digestive enzymes are inexpensive, readily available, and have an excellent safety profile, some researchers believe their use should be encouraged in children with ASD. Speak to your doctor before giving them to your child.

Possible Side Effects

Unless you're taking them in very high dosage, the risks for most enzyme supplements are pretty minimal. Digestive enzymes may trigger a number of side effects, including stomach pain, nausea, diarrhea, and vomiting. In addition, some people may experience allergic reactions to digestive enzymes.

Bromelain, the enzyme from the pineapple, may have anti-platelet activity. If you take blood thinners or have anti-platelet activity, taking it could possibly increase the risk of bleeding.

Pregnant and lactating women are advised to consult their doctor before taking these products.

Dosage and Preparation

There's no standard dosage for digestive enzymes. Studies often used preparations that contain mixtures of several enzymes and effective dosages vary widely. If you're going to try digestive enzymes, consider a short trial period of two or three weeks. If it works, you may want to continue with it. If not, stop taking it.

What to Look For

Digestive enzymes are widely available online and in many natural-foods stores, drugstores, and stores specializing in dietary supplements. A ConsumerLab review showed that some
enzyme products did not contain all the enzyme activity expected from labels, and some weren't labeled clearly enough to allow you to know their activity. Furthermore, products varied considerably in the enzyme activity they offer. If you decide to give digestive enzymes a try, find a brand from a reputable manufacturer that's tested and approved by a recognized certifying body, such as U.S. Pharmacopeia (USP), NSF International, or ConsumerLab. This can help ensure the highest quality and safety possible.

It's important to note that self-treating a chronic condition with digestive enzymes and avoiding or delaying standard care may have serious consequences. If you're considering the use of digestive enzymes, make sure to consult your physician first.