ENZYMES - Digestive

by Chris Morris ND

When we hear the word enzymes we are probably most familiar with the ones that involve our digestion. And we learn about digestive aids like *Enzalase* or *MetaGest* as supplements. In the body the mouth, stomach, pancreas, liver, and small intestine produce various forms of digestive enzymes whose job is to break down any food we eat into usable components so they can be absorbed in the intestinal tract and used for energy or stored for later use.

There are three main categories of digestive enzymes. Amylase enzymes that digest sugars such as milk sugar is digested by lactase, and cane sugar by sucrase. Amylase is found in saliva, pancreatic juice and intestinal juice. Next there are proteases that are responsible for breaking down proteins and are found in the stomach and pancreatic juices. And lipases from the liver and pancreas that digest fat and are released in the stomach and intestines.

Enzyme supplements like *MetaGest* can also contain betaine HCl, to increase stomach acid and facilitate the workings of the protein digesting enzymes, or bile concentrates, to digest fats. One way digestive enzymes can improve a health complaint is by breaking down undigested protein particles that would get into the bloodstream and cause allergic reactions to certain foods as in the case of a condition known as “leaky gut” syndrome.

To get down to some basics, an enzyme is essentially a long chain protein molecule that magically speeds up all kinds of chemical reactions. Enzymes are the key components of life and they’re found prevalent in all living tissue. Inside the cells, enzymes perform their actions by mobilizing atoms and molecules for all the miraculous living processes they direct. Without enzymes, chemical reactions would be so slow that life as we know it would not be possible. As a matter of fact it wouldn’t exist at all.

So, how do enzymes work? Enzymes work under unique conditions and at their own speed. To get some idea of the speed of enzyme reactions, let’s consider the slowest known enzyme, lysozyme. Lysozyme is found in our tears, saliva and blood and helps destroy bacteria. It can process about 30 substrate molecules per minute. A substrate is the substance the enzyme is working on or what triggers its activity. So in the case of lysozyme that is one substrate every two seconds and as fast as that seems it is nothing compared to the enzyme carboanhydrase which processes an astonishing 36 million substrate molecules in one minute or 1.2 million substrate molecules every two seconds.

The speed and activity of an enzyme is greatly influenced by its environment. It is like the work conditions in a factory. If a worker has a pleasant condition he or she will be happier and work harder. If it is too cold or too hot, the workers will suffer and so will production. So it is with enzymes, they must have optimal working conditions. For example, enzymes work best within a specific range of pH, the measure of acidity and alkalinity. Some enzymes work better in an acid environment like the ones in your stomach while others need a more alkaline environment to do their jobs sufficiently.

Some of the first signs of enzyme deficiency usually will be digestive problems like indigestion, upset stomach and gas. Many people notice a bloated feeling after eating a particular food such as beans,

cabbage or nuts. This is a sign they do not have the enzymes necessary to adequately digest the food consumed. Illness is probably the most obvious other sign we are not getting enough enzyme activity or that our body enzyme levels are depleted. As mentioned previously enzymes make our body work. Any illness or disease process such as cardiovascular disease, liver disease, cancer, or even a slow recovery rate after an injury are all indications that your body's enzymes are deficient or not working optimally.

As we get older, food begins to move sluggishly through our digestive tract because our body produces fewer digestive enzymes. Bloating, flatulence and a lingering feeling of fullness results. The 12 high potency enzymes in *Enzalase* work together to prevent indigestion by boosting the body's digestive power. In addition, *Enzalase* stimulates probiotics with bifidogenic enzymes that break down soluble fiber to support active probiotics that further reduce indigestion.

Compared to other enzyme supplements *Enzalase* has the highest lipase (fat digesting) activity per capsule and, since fat slows down other digestive enzymes, having high lipase is vital to improving total food digestion. All of the enzymes in *Enzalase* are protected from stomach acid by a buffered biogel that insures their safe delivery deep into the intestinal tract to finish digestion.

Low stomach acid impairs one's ability to digest food by limiting the release and functioning of other digestive enzymes. Although it may seem contradictory, low stomach acid can also lead to gastric reflux (heartburn or GERD). Closure of the valve at the top of the stomach is stimulated by the hydrochloric acid that is released in response to food intake. In an individual with low stomach acid the valve does not close and allowing the remaining acid to push up into the esophagus and cause a burning sensation. Betaine hydrochloride is recommended for indigestion, low stomach acid and gastric reflux.

If one is experiencing the symptoms of low stomach acid? *MetaGest* is a high potency digestive supplement with 650mg of active betaine HCl and 45mg of pepsin. Stomach acid initiates the digestive process by beginning the breakdown of food, especially protein. It is also an important protective mechanism against infection by killing any microbes that are contained in the food or water we consume. So *MetaGest* complements the natural production of digestive agents and helps food absorb in the intestinal tract for much smoother digestion.

Let's talk about the food we eat. Now most of us know what we should eat. But when it actually comes down to it, many of us simply eat food that "we are hungry for." We can't really be blamed for this, right? Billions of dollars are spent conditioning us about what we should feel hungry for. Look at TV, billboards, radio, newspapers. What are we constantly assaulted with? Images of burgers, fries, ice cream, chips, sodas, candy, milk, cheese, etc. Just hearing these words makes our Pavlovian mouths water.

These processed substances are some of the best poisons ever made. Not only do they contain little or no nutrient, these foods have no enzymes in them at all. All the enzymes were taken out during processing. Therefore, the entire burden of digestion is placed on our body's own enzymes. Foods are being broken down only partially, or not at all, by our own digestive enzymes, because many foods are so foreign, so processed, so new to the human race that they overstress our body's ability to metabolize them.

A famous expert on enzymes Dr. Edward Howell made the observation that humans are the only animals who, in their natural environment, live their lives with disease. Think about it: how many diseases there are for humans in the pathology textbooks? 500? 1000? What other animal in nature gets even five diseases? Why? As Dr. Howell explains, humans are the only animals that eat processed foods, and the only animals who subsist on dead enzyme less food.

Enzyme supplements are such a simple solution to a whole spectrum of health challenges, even though they are generally not considered by mainstream practitioners. Most MDs are taught to look for the dramatic rescue, the quick-acting drug, the heroic procedures which can snatch the patient from the jaws of death, or whatever. That's more sexy; it's like the fictional medicine we see on TV. The problem is that medical doctors have a very limited exposure to enzymes in medical school. The only concept they usually have is what is found in *Guyton's Physiology*, the standard medical text. They learn that enzymes are "catalysts," which means they cause things to happen but are themselves unchanged in the process.

But if we go back historically, we can find out a little bit more on how enzyme therapy got started. The pioneers of enzymes are really Dr. Karl Ransberger and Dr. Max Wolf. Back in the 30s, through to the 60's Dr. Wolf was at Columbia University, and not only was he an MD but I believe he had some seven other doctorates after his name. He discovered that around age 25, we start to lose our enzyme potential. We stop making the many enzymes that our body is used to making, and this starts the cycle of accelerated aging. So in physiology we're taught that our aging or the aging process begins around 25. So from the ages of 25 to 35 this marks the time when we start to feel more aches and pains, arthritic changes in our bodies, and this is due to the fibrosis, the scar tissue that start to build up in the organs, the vessels and the muscles. And the immune function begins to lag adding to this fibrotic build-up.

Then you see from 35 to 45, as we further drop in our enzyme production and the stress of lifestyle, this accelerates the reduction of hormone production, because hormones start to reduce as well in the early 20's. But this is accelerated again by the reduction of enzymes. So you see things like libido, the sex drive, the mental drive, our attitudes, our zest for life, starts to wane. Bone density drops, muscle mass and just overall energy just start to reduce significantly. And then around age 45 we start experiencing difficulties in absorbing nutrient and all the things we need to maintain our enzyme activity.

As a practitioner I can tell you personally something interesting about the pioneers of nutrition like Dr. Paul Kellogg, Dr. Bernard Jensen, Dr. Carlton Frederick, Pavo Airola. All of these men were my early mentors in getting me to learn about natural and safe alternative health care working with nutrition. But when you look at their lives, Dr. Kellogg died of a heart attach, Dr. Jensen, prostate cancer, Carlton Fredericks, lung cancer, Pavo Airola, a stroke. But there was one pioneer that really understood the secret of enzymes that corroborates the philosophy we teach at Mind Body & Spirit. That was Dr. Paul Bragg. At age 93 he was still living a vibrant and active life. You look at his pictures as a 90 year old, and he looks like he's in his 40s or 50s. He was able to maintain his health and vitality because he understood the importance of nutrient dense foods and the vibrancy of the enzymes that you got from these foods. So he maintained his body, his vitality and his energy into his 90s. Sadly he died at the age of 93, but not because of old age. He was knocked unconscious and

drowned while surfing.

So, how do you know if you are enzyme deficient? Well, our body's ability to function, repair when injured and ward off disease is directly related to the strength and number of our enzymes. That is why an enzyme deficiency can be so devastating. Disease, diets consisting of foods with no enzymes, drugs, stress, physical injuries, illness, aging, and our digestive problems can all affect our enzyme levels. So, sometimes just eating right and living a healthy lifestyle are not enough. Certain individuals have genetic or inborn problems assessing their enzyme production or activity. Those who suffer from lactose intolerance do not produce enough of the enzyme lactase which digests the milk sugar lactose. Most of these enzyme deficiency diseases can be corrected with supplemental enzymes. Some cannot. An enzyme deficiency might not have to have blatant symptoms or become life threatening. Many of us who are suffering from sub optimal health are mainly victims of our enzymes being deficient.

The fact that we over eat the modern American processed food diet, our only salvation from "digging our graves with our spoons" is supplementing with enzymes. In the next article on *'Systemic Enzymes'* we can grasp what it means when someone says 'we are as old as our enzymes'. And why it makes sense to try and replenish those depleted enzymatic stores. We can learn to reallocate enzymes to the digestive system where it's weak and strengthen it so that it can function on its own again. We can reallocate enzymes to the immune system and get its activity up and running. So we can maintain the body's vitality in order to support it in any of the areas that have been compromised.