



Honeycomb Haven Wellness

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Digestive System Health

How the Digestive System Works & the Role of Enzymes

“All diseases begin in the gut” – Hippocrates (460-370 BC)

Our bodies are made up of nutrients and 96% of the human body is made up of only four atoms – carbon, nitrogen, oxygen, and hydrogen. With the addition of macro and micronutrients(4%) from our food, we can turn these four atoms into 100 trillion cells. These cells form into tissues, the tissues form into organs, then the organs work together to form our eleven systems. The result is one complete human being.

That means the cell is the fundamental unit of life, and when the cell does not receive nutrients, *it dies!* The number one priority of each and every cell in the body is therefore to acquire the nutrients that will support structure and function. And in order to acquire nutrients, we must have a fully functioning digestive system.

All systems rely on digestion! This message is certainly not a new one, however because it's so simple, we tend to overlook it. If we take care of our bodies nutritionally and digestively, we will be well on our way to a disease free life. So let us take a closer look at this critically important system and its role in foundational wellness.



What Happens When We Eat?

Through research it has been determined that 80-90% of all diseases originate in the digestive system. The digestive tract is primarily responsible for the absorption of nutrients and the elimination of waste. It is also our first line of defense and barrier to invading organisms. **Supporting digestive health and living a preventative lifestyle is therefore vital for proper immune function, longevity, and wellness. Good health begins — and can end! — along the path of the digestive tract.**

Now we will review the process of physical digestion. Food enters the digestive tract through the mouth, where the chewing action causes the enzymes amylase and lipase to begin breaking down food and then it's passed into the pharynx. The food, **the bolus**, is propelled by peristalsis through the **esophagus and past the gastroesophageal sphincter**. Digestion continues in the stomach by the addition of mucus, hydrochloric acid (HCL), pepsin and more lipase enzymes. The food, now known as **chyme**, travels through the **pyloric sphincter to the small intestine**. For the most part most of the chemical digestion occurs in the small intestine with the help of pancreatic secretions containing a variety of enzymes.

Microvilli, villi and circular folds within the small intestine are primarily responsible for surface absorption. The **large intestine (the colon)** absorbs water from the digested macromolecules and eliminates residues from the body. Mucus in the large intestine helps ease the passage of digested food from the digestive tract as feces.



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Accessory digestive organs also play a role in complete and proper digestion. **Salivary glands** exist in the mouth to secrete mucus and serous fluids, collectively known as saliva. Mucus moistens and binds the food together for swallowing. Serous fluid contains salivary amylase and lipase, the enzymes for starch and fat digestion. Saliva enhances taste sensations as well as containing bacteria-inhibiting substances such as lysozymes and antibodies.

The **pancreas** is a gland that stretches between the spleen and the duodenum above the colon. The main function of the pancreas is to **secrete amylase, sucrase, maltase, lactase, trypsin, chymotrypsin, peptidase, and lipase enzymes**. These enzymes enter the duodenum in an alkaline solution to neutralize the acidic chyme, and to continue the process of digestion. The pancreas is also responsible for secreting the hormones insulin and glucagon that help balance blood glucose levels. For pancreas and glucose support see [PANC Medix](#), [SC Medix](#), [Blood Sugar SRF](#) and [BioPhasic 2](#).



The **liver**, the largest gland in the body. Aside from assisting in other metabolic and regulatory processes, the liver's function in digestion is to **produce bile**, a yellowish green liquid solution. The **gallbladder** is a small sac located adjacent to the stomach that stores, concentrates, and releases bile into the duodenum. Bile salts work to emulsify fats, which helps the enzyme lipase digest them more completely and efficiently. For liver and gallbladder support see [LVR Medix](#), [GB Medix](#), [Liver Gallbladder SRF](#), [Liver Gallbladder Cleanse](#) and [BioPhasic 3](#)

Digestion & Immune Function

Did you know that 80% of immune response occurs in the gut? **Gut-Associated Lymphatic Tissue (GALT)** lies underneath the thin lining of the gut and exists as the GI tract immune system. *GALT is composed of lymphoid tissue* that contains various specific **immune cells, tonsils, adenoids, and Peyer's patches**. When a foreign substance (antigen) enters the digestive system, M-cells carry it to the intestinal lining, where it is sampled by Peyer's patches. As part of the human body's cell-mediated immune response, the **Peyer's patches alert T and B-cells** to begin elimination by **macrophages** contained in the intestinal mucosa. Antibodies in the intestinal mucosa then alert cytokines to instigate an inflammatory response to rid the body of the antigen.

The digestive system is host to approximately one hundred trillion bacteria, some beneficial and some harmful. They function symbiotically to protect our health and account for more than 80% of the dry weight of stool. The **lactic acid-producing bacteria** work to protect the digestive tract from the overgrowth of harmful bacteria. **Probiotics** are the supplemental form of eubiotics, the "healthful to life" intestinal flora that provide protective and nutritive support. See [Probiotics Plus](#) which contains 18 strains of highly resilient probiotics (pH stable); 5 spore based strains (SBO); Super Growth Factors; Nanoceutical Prebiotics; 8 billion active CFU/ dose; Oral Care Probiotics K-12 & M-8. For gut health and overall health of the body. Survives stomach acid and shelf stable. These organisms enhance the ecological balance of friendly bacteria.



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Metabolism & Absorption

Glucose, derived from carbohydrates, is the main source of energy for the human body. Glucose is digested (oxidized) resulting in the formation of **carbon dioxide, water, and adenosine triphosphate (ATP)** the “energy” used by our cells. To maintain proper blood sugar levels, glucose is stored as glycogen or converted to fat when not needed. If glucose is needed, fat catabolism occurs to provide glucose to the blood.

- **Fat** metabolism occurs mostly in the liver and provides essential functions such as temperature regulation, protection of organs, and reserve energy. If too many fats are oxidized, the blood can become too acidic, altering body processes and further impairing digestion. Excessive fat intake is stored in adipose tissue for future use by the body. See [Phoenix](#) and [Phoenix Boost](#) weight loss supplements which are based on the new science of recruiting the proliferation of brown and white adipose tissue, with activation of thermogenesis in these two tissues.
- **Proteins** are broken down into amino acids, the building blocks that provide cells with functional proteins (enzymes, hormones, antibodies, hemoglobin) and structural proteins (connective tissue fibers, muscle proteins). Amino acids circulating in the blood are also utilized for the building of enzymes.

Common Digestive System Disorders

What happens when there is an interruption in the primary functions of the digestive system?



- **Nutrient Deficiency** - The body is unable to recognize, transport, absorb, and utilize nutrients essential for health and its cells malfunction or die. [Total Nutrition Plus](#) is a food based nutrition that is in micro sized particles allowing 100% absorption thru the mucosa lining as cell ready food with an immune mushroom complex to support the immune system.
- **An Impaired Immune System** - The digestive system, our first line of defense, is negatively impacted plus poor nutrition compromises immunity. See [Immune SRE](#), [IMN Medix](#), [VBF Defense](#) and [Viral Rx](#) for immune system support.
- **Disrupted Detoxification** – Undigested molecules and inefficient removal of metabolic waste creates a toxic terrain that burdens the immune system and impairs cellular function.

When our digestive system fails, we may experience a few early warning signs such as indigestion, heartburn, burping, belching, gas, flatulence, bloating, constipation, diarrhea, fatigue, headaches, gut inflammation, food intolerances and food allergies

If we choose to ignore these warning signals we can develop leaky gut, GERD, ulcers, hemorrhoids, pancreatitis, hepatitis, diverticulitis, gastritis, colitis, IBS, gallbladder stress/stones, celiac disease, Crohn’s disease, cystic fibrosis, autism, malabsorption, malnutrition, weakened immunity, chronic inflammation, and a host of degenerative or autoimmune diseases. [Click Here](#) for an article about **Gut Support PTL II/Qi-5 Protocols and Gut Support Products**.



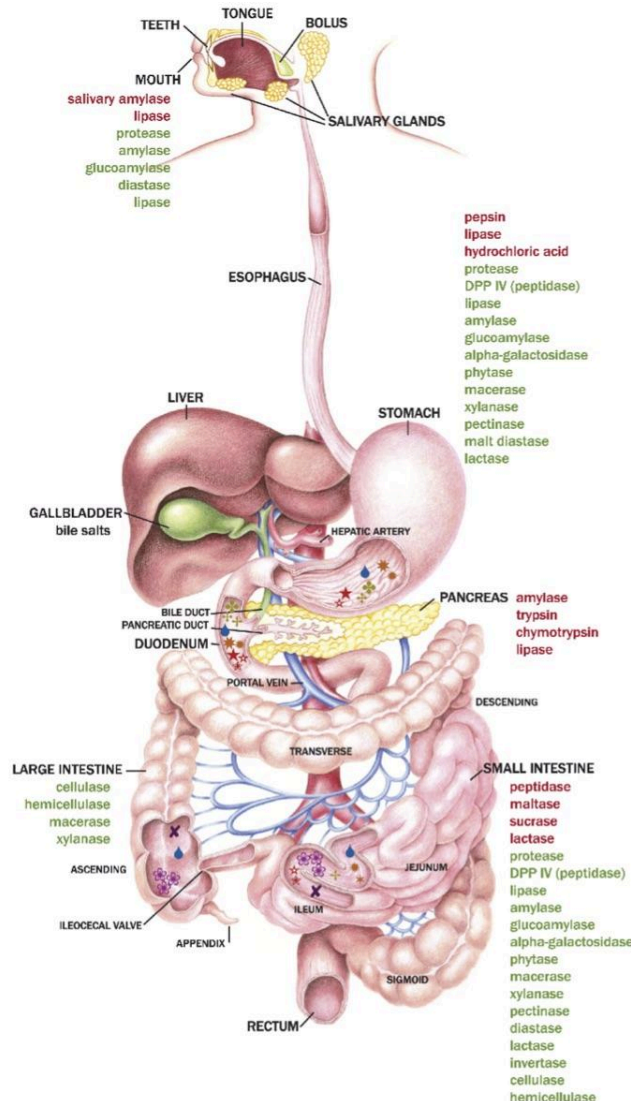
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Psalm 139.14

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DIGESTION AND ENZYMES OVERVIEW



Digestive Organs

- mouth (teeth, tongue and salivary glands)
- esophagus
- stomach
- liver
- gallbladder (bile duct)
- pancreas
- small intestine (duodenum, jejunum and ileum)
- ileocecical valve
- appendix
- large intestine (ascending, transverse, descending and sigmoid)
- rectum

Endogenous Enzymes

- salivary amylase (mouth)
- pepsin (stomach)
- lipase (mouth, stomach and pancreas)
- hydrochloric acid (stomach)
- bile salts (gallbladder)
- amylase, trypsin and chymotrypsin (pancreas)
- maltase, sucrase and lactase (small intestine)
- peptidases (small intestine)

Enzymes

- protease (mouth, stomach and small intestine)
- DPP IV (peptidase) (stomach and small intestine)
- lipase (mouth, stomach and small intestine)
- amylase (mouth, stomach and small intestine)
- glucoamylase (mouth, stomach and small intestine)
- alpha-galactosidase (mouth, stomach and small intestine)
- phytase (stomach and small intestine)
- macerase (stomach, large and small intestine)
- xylanase (stomach, large and small intestine)
- pectinase (stomach and small intestine)
- diastase (mouth, stomach and small intestine)
- lactase (stomach and small intestine)
- invertase (small intestine)
- cellulase (large and small intestine)
- hemicellulase (large and small intestine)

Food Nutrients

- * starches
 - o disaccharides (maltase, sucrase, and lactase)
 - * monosaccharides (glucose, fructose and galactose)
- * proteins
 - * peptides
 - * amino acids
- * fats
 - * fatty acids
 - * glycerol
- o water

Microflora

- o probiotic (friendly)
- x potentially pathogenic



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Nutrition & Enzyme Therapy

The goal of enzyme therapy is to promote optimal cellular function, circulation, and immune function as well as a healthy gut environment. The resulting benefits will lead to peak performance of the digestive system, optimal nutrition, and overall wellness. See the following products for nutrition and enzyme support.

- [Health Zymes Plus](#) includes highly active enzymes with a broad range of specificities to support digestion of all food preferences. This enzyme supplement was designed to help promote availability and absorption of nutrients, health, and vitality of cells, and improved overall digestive and immune system health.
- [BioDigest Ultra](#) supports GI tract (mucosal lining) healing and complete digestion of complex carbohydrates, proteins and fats with enzymes and herbs formulated to alleviate occasional gastrointestinal discomfort. Includes a blend of antioxidants with Flax seed, Alpha-lipoic acid, Ginseng, and Eleuthero Root.
- [Protease Ultra](#), our systemic protease formulation, includes over 355,000 HUT units of protease activity for supporting healthy circulation (blood and lymph) and optimal immune health. Supporting circulation with protease encourages delivery of oxygen and nutrients to the cell for health and vitality, removal of metabolic wastes from the cell, and transport of immune cells throughout the body to help maintain a healthy internal environment. [Click Here](#) for the **Baylor Study**.
- [Serrapeptase](#), a powerful proteolytic enzyme & herbal formula known to aid in expediting tissue repair and integrity, plus clears inflamed tissue, dead tissue, blood clots and reduce most inflammation. Serrapeptase is known as an oral blood chelator. Designed to support normal enzymatic activity in the arteries, veins, joints or throughout the body.

For more information about Digestive Support Products and PTL II/Qi-5 protocols, [Click Here](#).

Portions of this article are from Lisa Hudson, RDN

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