Dr. Smith Live

November 14, 2024

Energy Medicine: The New Frontier

Topic: Digestive Process

- **What role do the salivary glands play in digestion?**
- **What are the components of the digestive process?**
- **Why do we need a healthy microbiome?**
- **How does the thyroid contribute to digestion?**
- **How can we enhance the digestive process?**
- **Why is our digestive system so dysfunctional?**

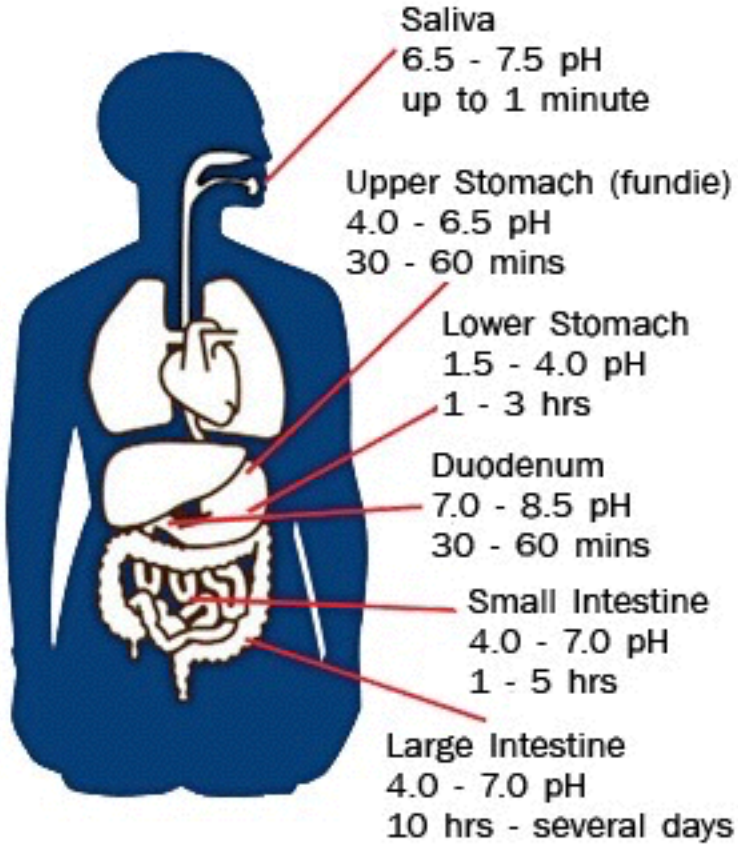
Larry Yelin

Complimentary and Energy Medicine

Patricia Sihlanick

Regenerative Health Technology Specialist

The digestive process starts in the oral cavity. There are three salivary glands: submandibular gland, sublingual gland, and the parotid gland. These glands function to keep your mouth and throat lubricated, produce enzymes to start the digestive process, and help maintain pH balance in the mouth. The salivary glands produce enzymes or catalysts, lipases and ptyalin or amylases, which speed the digestion of triglycerides and starches. The partial digestion helps take the burden off of the stomach. The various pHs function to control the enzyme activity. For example, pepsinogen, which is secreted by the gastric chief cells,is converted to pepsin by hydrochloric acid and it digests protein; pepsin works optimally at a pH of 2 and is deactivated at a pH above 5. Pepsin works primarily in the stomach where the pH range is 1 to 3; the first part of the small intestine is the duodenum, which has a pH range of 7.0 to 8.5. So pepsin does not work in the duodenum.



There are two types of enzymes: digestive enzymes that breakdown food and systemic enzymes (Zymessence) which breakdown foreign protein (viruses and bacteria), scar tissue, reduce inflammation, breakdown blood clots. FYI: Enzymes are measure by activity not milligrams.

Function of the Stomach: Primarily protein digestion - pH 4 to 6.5
It serves as a muscular bag. It acts as a storage for the food and provides enough time to digest meals. The stomach also produces digestive enzymes, lipase, which breaks down fats, and a small amount of amylase, which breaks down carbohydrates; it also produces hydrochloric acid that maintains acid pH and the process of digestion. In addition, the stomach secrets mucus, which helps to protect the stomach lining from the corrosive effects of the digestive enzymes and acid. Lastly, the stomach secrets **Intrinsic factor**, which is a protein that is essential for the absorption of vitamin B12 in the ileum section of the small intestine. The release of these enzymes is regulated by the presence of food in the stomach and the release of hormones like gastrin. Together, these enzymes and other substances facilitate the breakdown of food in the stomach, preparing it for further digestion and absorption in the small intestine.

People who suffer from acid reflex or heartburn are prescribed either a histamine antagonist or proton pump inhibitor such as Prilosec, Prevacid, Nexium, Aciphex, and Protonix are reducing hydrochloric acid production which will cause proteins to putrefy and make the intestines toxic. The proton Pump is located in the cannilicular membrane of the parietal cells. These drugs work by binding to two amino acids, cysteines, on the ATPase, resulting in its irreversible inactivation.

Histamine is one of the primary regulators of acid secretion, and the parietal cell receptor for histamine is of the H2 type. H2 receptor antagonists are quite effective in inhibiting hydrochloric acid secretion.

Examples of these drugs are Tagamet HB, Zantac 75, Pepcid AC, and Axid AR. These drugs, particularly Tagamet, are among the most widely prescribed drugs in man. Over the long term the patient becomes toxic.

Contrary to popular belief most heartburn and acid reflux are caused by a lack of HCL and not hyper acidity. A better solution would be to take digestive enzymes and HCL. In addition if a gastritis exists, one needs folic acid and glutamine to heal the inflamed stomach lining. The stomach lining turns over in 3 to 5 days.

FYI: Taking Tums for heartburn or acid indigestion works for the wrong reason. Tums is made from calcium carbonate or limestone. It is very alkaline and forces the parietal cells to produce more acid to neutralize it. The increased acid then converts the pepsinogen to pepsin digesting the protein and reducing the organic acids. A faster and safer way to combat heartburn is to take a half a teaspoon of baking soda in 6 ounces of water. Relief will occur in 3 to 5 minutes.

Function of the Pancreas: pH 7 to 8.5

The pancreas is the main organ for digestion; it has two main functions: an exocrine function that helps in digestion and an endocrine function that regulates blood sugar. The exocrine glands produce enzymes important to digestion. These enzymes include trypsin and chymotrypsin, which finalize the digestion of protein; amylase for the final digestion of carbohydrates; and lipase for the final break down of the unsaturated fatty acids. When food enters the stomach, these pancreatic enzymes are released into a system of ducts that culminate in the main pancreatic duct. The pancreatic duct joins the common bile duct to form the ampulla of Vater which is located at the first portion of the small intestine, called the duodenum. The common bile duct originates in the liver and the gallbladder and produces another important digestive enzyme called bile. The pancreatic enzymes

and bile that are released into the duodenum, help the body to break down the long chain unsaturated fatty acids (fats found in seeds, nuts, and vegetables), carbohydrates, and proteins. Also the bile controls the population of the intestinal bacteria.

It has been estimated that 1 in 4 adults over the age of 60 have some type of pancreatic issues ranging from insulin resistance to pancreatitis. Insulin resistance is really due to the cell membranes becoming adulterated from ingestion of adulterated omega 6 oils. The cell membranes literally turn into plastic preventing the insulin from bringing in the glucose. The end result of insulin resistance is diabetes.

After the age of 27, the pancreas decreases its production of chymotrypsin, which results in the production of adhesions and scars. Taking Zymessence will reduce post surgical scars and adhesions.

The endocrine component of the pancreas consists of the islets of Langerhans that create and release important hormones directly into the bloodstream. Two of the main pancreatic hormones are insulin, which acts to lower blood sugar, and glucagon, which acts to raise blood sugar. Maintaining proper blood sugar levels is crucial to the functioning of key organs including the brain, liver, and kidneys.

FYI: The most common form of pancreatic cancer is pancreatic adenocarcinoma, an exocrine tumor arising from the cells lining the pancreatic duct.

Pancreatitis is inflammation of the pancreas that occurs when pancreatic enzyme secretions build up and begin to digest the organ itself. It can occur as acute painful attacks lasting a matter of days, or it may be a chronic condition that progresses over a period of years.

Vitamins that help pancreatic function:

- Vitamin A (VA), from beef lipids is an essential nutrient that is only obtained from the diet.
- Magnesium participates in the protein synthesis of pancreatic enzymes.
- Antioxidant vitamins A, C, E, D, the B-complex vitamins, and trace minerals, such as magnesium, calcium, zinc, and selenium.
- Sour fruits like lemon and kiwi improve the production of digestive enzymes in the pancreas.
- Vanadium can repair the damaged beta cells, prevent pancreatic islet atrophy and restored islet insulin storage.
- Trivalent chromium has been proposed to be the cofactor for a biologically active molecule that could enhance the effects of insulin on target tissues.
- Chromium uptake is enhanced in animals when given at the same time as vitamin C. **FYI:** diets high in refined sugars increase urinary chromium excretion in adults.
- 1/2 cup of broccoli contains 11 ug of chromium.
- Daily values of most nutrients may provide 10 to 180 µg/day of chromium, which is generally considered safe.

Function of the Small Intestine: duodenum, jejunum, and ileum - pH 4 to 7

The small intestine's principal function is to break down food, absorb nutrients the body needs, and excrete unnecessary components. This gastrointestinal segment also participates in immune functions, acting as a barrier to intra-luminal bacteria. The small bowel also has an endocrinologic role, producing digestive and energy-regulating hormones like cholecystokinin, secretin, gastric inhibitory peptide, and glucagon-like peptide-1.

The 3 small intestinal segments have the following functions:

• The duodenum receives chyme—a mix of gastric acid and food—from the stomach and is where nutrient absorption begins. Pancreatic enzymes enter the descending segment's posteromedial wall via the hepatopancreatic ampulla, which is regulated by the muscular sphincter of Oddi. Pancreatic enzymes break down chyme. Brunner glands secrete bicarbonate into the duodenum to neutralize stomach acid before chyme reaches the jejunum. The duodenum and upper jejunum are the main dietary iron absorption sites.[5] Bile from the liver also enters the duodenum through the hepatopancreatic ampulla. Bile is essential for lipid digestion and absorption. Smooth muscle contraction helps widen the duodenojejunal junction, assisting in the forward movement of intestinal contents.

• The jejunum primarily absorbs carbohydrates, amino acids, and fatty acids through the villi. Jejunal and ileal plicae circulares increase surface area and enhance nutrient absorption.

• The ileum takes in the nutrients unabsorbed by the first 2 small intestinal components, the most important being vitamin B12 and bile acids. These substances are recycled after absorption.

Function of the Colon: pH 4 to 7

The large intestine has 3 primary functions: absorbing water and electrolytes, producing and absorbing vitamins, and forming and propelling feces toward the rectum for elimination. By the time indigestible materials have reached the colon, most nutrients and up to 90% of the water has been absorbed by the small intestine. The role of the ascending colon is to absorb the remaining water and other key nutrients from the indigestible material, solidifying it to form stool. The descending colon stores feces that will eventually be emptied into the rectum. The sigmoid colon contracts to

increase the pressure inside the colon, causing the stool to move into the rectum. The rectum holds the feces awaiting elimination by defecation.

Importance of fermented foods in extending shelf-life and enhancing the digestive process:

Fermented foods have been a part of the human diet for almost 10,000 years. Fermentation is the process whereby alcohols, carbon dioxide, and/or organic acids are produced by microorganisms, primarily from sugars and under mostly anaerobic (low oxygen) conditions, for production of energy. The accumulation of alcohol and organic acids and the associated increase in acidity of the food substrates inhibits the growth of other microorganisms and the activity of enzymes in the food system, thus **reducing the rate of spoilage and resulting in foods with extended shelf-life. Fermentation was a way the ancient peoples discovered to save food available in a time of plenty for one of relative scarcity. Examples: conversion of milk to cheese, which provided an energy-dense and nutritious food.**

The process of fermentation has been exploited by almost all peoples and has been applied to plant materials (including fruits, seeds, tubers and other vegetative and non-vegetative materials) and animal materials (including meat, milk, fish, and eggs), reflecting the base foods available in different regions.

The digestive benefits of eating fermented foods is derived from the production of:

1. Lactic acid which helps maintain the acid pH of the small and large intestines.
2. Introduction of microbiota which occur naturally in raw foods.
3. Helps control the population of potentially harmful bacteria.

4. Fermentation can enhance the digestibility of complex carbohydrates and proteins through the breakdown of starch to oligosaccharides and polypeptides to amino acids.
5. Fermentation enhances milk protein digestibility by the destabilization of the casein micelle by bacteria present in milk.
6. Fermentation facilitates the concentration of key nutrients through removal of water and enhances the bioavailability of calcium.
7. Fermentation can facilitate transformations in raw foods that allow these foods to be tolerated by consumers that are intolerant of the original raw product. A good example of this is the ability of lactose-intolerant individuals to consume fermented dairy products, in particular ripened cheeses such as Cheddar.

FYI

The reason for this is that during fermentation and cheese ripening, the LAB metabolize the lactose, significantly reducing the level of lactose in the resulting fermented food product.

In addition, the presence of the lactase enzyme produced by bacteria present in the fermented matrix can help to further remove any residual lactose during ingestion and digestion.

8. The production of vitamins and antioxidants during food fermentation has been reported for many LAB species.
9. Bioactivities from fermentation are linked to lowering of blood pressure and cholesterol, improvement in metabolic syndromes, anti-cancer effects, and improvement in immune function have all been described. Vitamins biotin (B7), Folic acid (B11), and B12 are produced in fermented dairy products by Lactobacillaceae.

The take-away message is to consume as much as possible of organic raw and fermented foods to enable your body to heal itself.