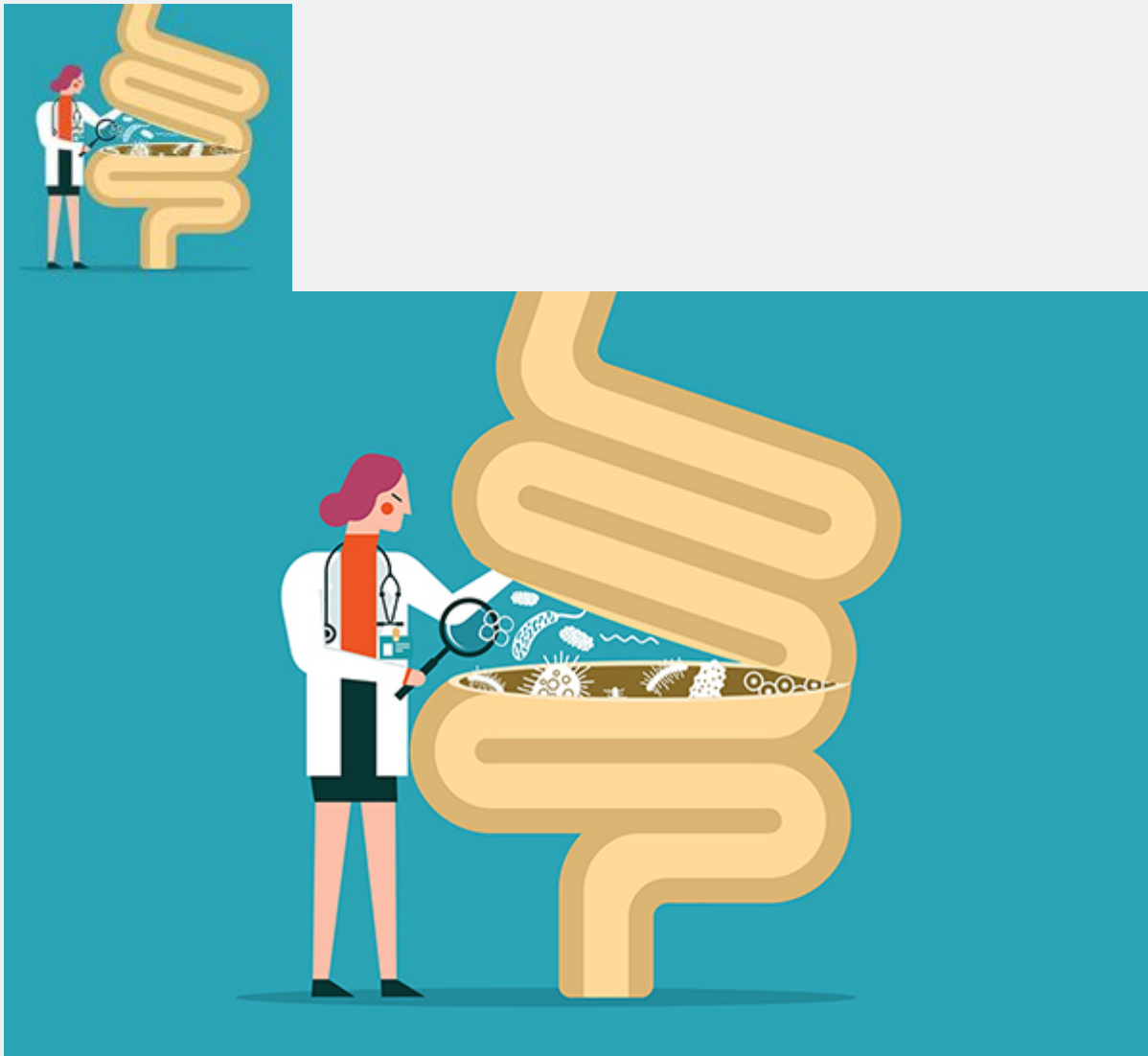


Supporting your digestion with dietary supplements



There's more to GI health than whether or not to take an acid-blocker. All too frequently drugs are the answer to bothersome digestive problems. Fortunately, there are a wealth of gentler, safer natural alternatives. Learn about them in the following article from my friends at Protocol for Life Balance.

—Dr. Ronald Hoffman

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The Gastro-Intestinal (GI) tract is an extraordinarily complex system of organs working together to ensure that our food is smoothly and properly digested. It is also a powerful barrier against environmental aggressors, as well as the host of an intricate community of symbiotic microbiota. The GI tract must be permeable enough to let nutrients reach the general circulation, and, at the same time, selective enough to prevent unwanted chemicals and microorganisms to penetrate the body. With such a challenging task to complete, our GI tracts can really benefit from dietary supplements that help to maintain the integrity of the GI lining and ensure a smooth digestive process.* It would not be possible to list all of the available dietary supplements that support a healthy GI tract in one article, so we will focus here on

some ingredients that are regularly found in dietary supplements that work in different ways to support a healthy GI lining and a healthy digestion: zinc-carnosine complex, digestive enzymes, betaine HCl, ox bile, mastic gum, slippery elm, and some essential oils.*

The main constituent of the zinc-carnosine complex is zinc, an essential micronutrient present in all cells of the body, where it is known to be an essential structural component of proteins.* Zinc plays a major role in a variety of functions within the body such as wound healing, immune function, growth and development, and the regulation of various endocrine functions.* Zinc is also an essential nutrient in gut barrier function, ensuring that the intestinal wall is strong and non-porous.*

Carnosine, the other part of the zinc-carnosine complex, consists of amino acids beta-alanine and L-histidine. In laboratory experiments, it has been shown to function as a free radical scavenger.* Carnosine is also involved in many cellular biological processes, including modulation of the production of compounds involved in the aging process, regulation of enzymatic activity, and the ability of impact nitric oxide release.* At the cellular level, these functions contribute to carnosine's ability to support normal wound healing.* Carnosine also has the ability to chelate minerals; it forms a strong zinc-carnosine complex that is stable in the acidic environment of the stomach, which is able to adhere to the stomach lining better than either zinc or carnosine alone.*

A zinc-carnosine complex, known as PepZin GI®, has been used in many randomized clinical trials at daily doses ranging from 75 mg to 150 mg, where it was confirmed to help maintain the integrity of the stomach lining and support gastric health and comfort.*

As we age, the production of pancreatic enzymes tends to decrease, which may impair our ability to absorb all the nutrients we need to meet our energy needs and to maintain a healthy weight and muscle mass. In these cases, an intake of digestive enzymes in the form of supplements can be useful.¹

Digestive enzymes constitute a large category of popular dietary supplements. Enzymes are proteins that act as biological catalysts (facilitators) by accelerating chemical reactions.* In dietary supplements they are typically lipases, proteases, and carbohydrases. Lipases break down large molecules of fat into smaller fatty acids, proteases break down proteins into smaller peptides and carbohydrases break down complex sugars into simpler sugars.* This process liberates elemental macronutrients into the digestive tract to allow for a better absorption of these nutrients into the bloodstream.*

Supplemental enzymes such as lipases, proteases and cellulase (an enzyme breaking down cellulose) may also have a beneficial effect on gut microbiota. Indeed, in preclinical experiments, *Aspergillus*- derived protease, lipase, and cellulase preparations have bifidogenic effects on rats fed a high-fat diet.* These results need to be confirmed in human clinical trials, but this suggests that dietary supplementation with enzymes could have a prebiotic-like effect.^{2,3*}

An important aspect to consider when choosing a dietary supplement comprised of digestive enzymes is quality. The supplement fact panel should display the weight of enzymes (usually in milligrams) included in the product, and it should also show the enzymatic activity for each enzyme. The enzyme activities are displayed in different units (USP Units, GDU, SAPU, FIP...) that have been established for each type of enzyme. These units refer to the potency of the enzyme and its ability to breakdown of standardized amount of substrate over a period of time at a specific temperature

and pH. It is also important to choose a reputable brand of dietary supplements that follows rigorous quality and good manufacturing practices, since recent industry testing of products bought online has shown that some products containing bromelain had little or even no enzymatic activity.

Other dietary ingredients that work well with enzymes to support a healthy digestion and an optimal absorption of nutrients are betaine HCl and ox bile extract. Betaine HCl, due to its hydrochloric acid, is used as a pH regulator to support the healthy low pH necessary for the stomach to function adequately.* About 10% of healthy adults over the age of 70 have elevated stomach pH (>5.0) which can negatively impact their ability to properly digest food and absorb nutrients, including vitamins.⁴ Altered gastric pH is also known to negatively affect intestinal microbiota. It is therefore important to maintain a healthy low pH in the stomach to preserve the delicate balance of commensal bacteria[□] lining the small and large intestine. By contributing to the maintenance of a healthy pH in the stomach betaine HCl may indirectly contribute to the maintenance of a healthy gut flora.*⁵

Ox bile has a long history of use to support digestion.*⁶ Ox bile has a complex composition. The ox bile used in dietary supplements is often standardized to a percentage of cholic acids. During the normal digestion process, a minimal concentration of endogenous bile acids is necessary for the proper digestion and absorption of fats. Endogenous bile acids play also a role in the regulation of colonic water transport.⁷ Dietary supplementation with ox bile may contribute to the healthy digestion of fats.*

Mastic gum (from the sap of *Pistacia lentiscus*) and slippery elm powder (from the bark of *Ulmus rubra*) comes from trees and have been used by traditional herbalists for their demulcent properties.* Mastic gum has been used by traditional healers to alleviate typical upper abdominal discomfort and indigestion symptoms.* These effects are possibly due to the mucosal soothing properties of mastic gum.^{8*} In a randomized, placebo-controlled clinical study on 148 volunteers complaining of occasional dyspepsia (upper GI pain, bloating, belching, nausea after eating) receiving 350 mg three times daily of mastic gum or placebo for 3 weeks, authors observed a significant reduction of symptom scores in the mastic gum group compared to the placebo group.* There was a marked improvement of symptoms in 77% of the volunteers receiving mastic gum.^{9*} Similarly, slippery elm has a long traditional use for its therapeutic properties, typically for the larynx and pharynx (upper airway) as well as the GI tract.^{10,11*} The principal constituent of interest in slippery elm is mucilage. Mucilages are complex carbohydrates, that once hydrolyzed forms uronic acid units that can trap water and form a viscous gel. Slippery elm inner bark soothes and moistens tissues and mucous membranes by providing a viscous coating of mucilage when used locally and soothes and moistens tissues when consumed orally.^{11*} In dietary supplements it is usually used for the relief of occasional mild heartburn or occasional indigestion.^{11*}

Essential oils, including peppermint oil, oregano oil, ginger oil, and fennel oil, have also been traditionally used for GI support.* It is now well established that peppermint oil through its main component, menthol, is able to relax GI smooth muscle.* This property was found in clinical settings, notably during GI procedures such as endoscopies and barium enemas (peppermint oil in these situations was not used a supplement but applied directly).¹²⁻¹⁵ To fully benefit from the spasmolytic properties of peppermint oil in the intestine, it is typically encapsulated in enteric-coated softgels that allow for the release of the oil directly in the small intestine, without release in the stomach where its spasmolytic effect is typically

unwanted.*

Oregano oil with its main active compound carvacrol is known to have free radical scavenging properties, antispasmodic activity, soothing properties, and helps regulate gut microflora.^{16*} While these properties have been well demonstrated in veterinary medicine where oregano oil is regularly added to animals' diet to maintain their health, studies in humans are still scarce. In one clinical study where volunteers with known microbial intestinal imbalance received 0.8 mL oregano essential oil twice a day for ten days, authors observed a normalization of gut microflora as well as a reduction in functional complaints (diarrhea, GI pain, flatulence) compared to baseline.^{17*}

Ginger essential oil is known for its free radical scavenging properties, as well as its ability to regulate immune response to biological stress.^{18*} Ginger oil may also help to maintain healthy gut microbiota.^{19*} However, clinical studies confirming that supplementing the diet with ginger essential oil for digestive support are lacking, the addition of this ingredient in a dietary supplement for digestive support is based on its properties seen in laboratory and pre-clinical studies on animal models.*

Finally, fennel essential oil is also often added to dietary supplements for digestive support.* Just like oregano and ginger oils, fennel oil is known for its free radical scavenging properties, its ability to help regulate gut microflora, as well as its ability to regulate immune response to biological stress.^{20*} The use of fennel oil as digestive support is based on a long traditional use in the Mediterranean basin where it is used as an antispasmodic and carminative agent (flatulence relief), however modern clinical studies confirming this traditional use are currently lacking.^{21*}

For individuals eager to maintain a healthy gastrointestinal lining, PepZin GI® represents a great dietary ingredient to support gastric health and comfort.* For those trying to optimize nutrient bioavailability digestive enzymes complemented with betaine HCl and ox bile offer a great addition to their meals. For individuals seeking to achieve intestinal comfort, peppermint, oregano, ginger and fennel essential oils are a great supplements to relieve temporary intestinal upset.*

Protocol For Life Balance® offers a unique formulation with PepZin GI® known as **GI Guard™**, with 37.5 mg PepZin GI® per tablet to support daytime gastric health and comfort.* It also features calcium carbonate, mastic gum, and slippery elm for an added soothing effect.* Protocol For Life Balance® also has **Peppermint oil G.I.™** enteric-coated softgels with 0.4 mL peppermint oil per two-softgel serving. This formula is completed with ginger and fennel oils for added support.* Taken 30 minutes before meals, Peppermint Oil G.I.™ will contribute to a healthy and smooth digestion.* We also carry an **Oregano oil** blended with ginger and fennel oils for intestinal support in an enteric-coated softgel providing 0.2 ml of each oil per serving. Finally, Protocol For Life Balance® offers **Enzymes-HCl™**, a comprehensive enzyme formula designed to support both gastric and intestinal digestive functions.* Betaine HCl helps to start digestion in the stomach and prepares its contents with the correct pH to stimulate intestinal function.* A full spectrum of proteases further assists the intestine in the complete breakdown of food for enhanced absorption.* Ox bile extract completes this formula for added digestive support.*

When you are looking for upper-GI comfort or smooth digestion, especially after a heavy meal, Protocol For Life Balance® supplements are here to support your digestive tract daily, when you need it.*

***These statements have not been evaluated by the Food Drug Administration. These products are not intended to diagnose, treat, cure, or prevent any disease.**

□ Commensal bacteria are the bacteria that reside on the surface of the mucosa without harming human health.

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