Tri-Butyrin Supreme™

designs for health®

*Unique postbiotic support for gut health, digestive and immune function**

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Tri-Butyrin Supreme™ represents a new approach to gut health and immune function by modulating intestinal flora, promoting colonocyte health and supporting proper gut permeability.* This product features CoreBiome™, a patent-pending form of tributyrin, consisting of three molecules of butyric acid (butyrate) bound to glycerol. Each softgel provides 300 mg of this novel, broad-application compound.

Short-chain fatty acids (SCFAs) are produced by colonic bacteria as a result of fermentation of prebiotic fibers. These include acetate, propionate, and butyrate,[1] with 4-carbon butyrate being the most widely studied and having the most evidence supporting beneficial effects on gut health and gut-associated immune function. Many of the positive effects associated with consumption of dietary fiber may be mediated through signaling properties of butyrate. And while most North Americans could likely benefit from increased fiber intake, various circumstances may make it undesirable to increase fiber consumption.[2] In these cases, and for individuals who may benefit from a higher amount of butyrate in the gut, Tri-Butyrin Supreme™—as a direct source of butyrate—may help promote many of the positive effects typically attributed to dietary fiber both localized within the gut and systemically.*

Benefits*:

- Supports integrity of the gut lining
- Supports healthy gut flora
- Promotes regularity
- Supports healthy immune function
- Promotes a normal inflammatory response in the GI tract
- Supports overall systemic health via crosstalk between the gut and extraintestinal tissues

"Postbiotics"—a new frontier in gut health

Contributors to gut health can be divided into three categories: prebiotic, probiotic, and postbiotic. Prebiotics are fibers the human body cannot digest, such as resistant starch.[3] These fibers serve as food sources for the beneficial organisms in the colon, known as probiotics. "Postbiotics" is a new term for the metabolic byproducts of these beneficial bacteria, one such byproduct being butyrate. While the butyrate present in foods (such as butter, cheese, cream, and other high-fat dairy products and fermented vegetables) is primarily metabolized in the stomach and small intestine, the tributyrin in this product withstands degradation in the upper GI tract and arrives in the colon, where its effects are targeted.

Dietary fiber may be required for some of the noted health effects of fiber-rich diets, but SCFAs themselves, independently of fiber, may be crucial factors in healthy gut function. According to a review of the influence of these "postbiotic" colonic microbial metabolites on intestinal health:

> "Reviewing the literature as present today, it can be concluded that physiological levels of SCFA are vital for the health and well-being of the host and that the presence of carbohydrates (dietary fibre, prebiotics) is essential to favour the metabolic activity in the direction of carbohydrate fermentation. For optimal motor activity of the ileum and colon, to regulate the physiological intestinal mobility, steadily fermentable dietary fibres or prebiotics are crucial. The formation of SCFA, especially propionate and butyrate, up to high physiological levels in the colon, much likely also contributes to the defence mechanisms of the intestinal wall."[4]

Functional medicine and nutrition practitioners know that some individuals may not have a significant positive outcome from supplementation with probiotics. It may be that for some patients, temporarily increasing the bacterial population in the gut this way may not have the intended effect. It is possible that a more favorable outcome may be achieved by cultivating a more hospitable environment to encourage the growth and proliferation of these beneficial organisms. An internal study from the manufacturer of CoreBiome™ showed that compared to placebo, individuals taking 300 mg of tributyrin daily for three weeks showed a 41% increase in *Faecalibacterium prausnitzii* and a 67% increase in *Anaerostipes*, which are both butyrate-producing bacteria in the gut.[5] This indicates that tributyrin contributes to butyrate status in the gut in two ways: first by being a direct source of butyrate, and second by stimulating proliferation of bacterial strains that will generate more butyrate.

A closer look at butyrate

The intestinal lining is one of the body's primary structural and biochemical lines of defense against pathogens and other harmful substances.[6] Numerous chronic, non-communicable diseases—particularly autoimmune and irritable bowel conditions—have been associated with increased intestinal permeability, more commonly referred to as "leaky gut."[6-11] Butyrate is the main energy source for colonocytes[12] and "presents trophic action"[13] on these cells. This pivotal molecule supports the crucial barrier function by promoting assembly of tight junctions as well as by stimulating intestinal mucus production.[12,14]

By promoting intestinal integrity, butyrate may influence a number of physical and psychological health concerns. Crosstalk between the gut and the brain is well known—a.k.a. the gut-brain axis—but medical literature also documents a gut-skin axis,[15] a gut-kidney axis,[16] a gut-lung axis,[17] and links between the gut and a host of other extra-intestinal tissues, suggesting that gut dysfunction and/or altered gut flora may contribute to pathologies throughout the body. In particular, neurological and neurodegenerative disorders, such as Parkinson's disease, as well as select psychiatric disorders, are theorized to have origins in gut disturbances,[18-23] and targeting butyrate production is being investigated as a potential therapeutic intervention for various neurodegenerative and psychiatric conditions.[24-26] Most of the butyrate produced by bacterial fermentation serves to nourish colonic cells, but small amounts enter systemic circulation and may be beneficial to the brain and central nervous system.[27]

Supplement Facts

Serving Size 1 softgel

Amount Per Serving		% Daily Value
Tributyrin (as CoreBiome™)	300 mg	*

*Daily Value not established.

Other Ingredients: Bovine gelatin, purified water, glycerine, black cumin seed oil (*Nigella sativa*), medium chain triglycerides.

One of butyrate's key properties is histone deacetylase (HDAC) inhibition.[28] HDACs are a family of enzymes that regulate specific genes via epigenetic mechanisms. HDAC inhibition may have positive effects on gut health and gut-associated immune function. Reduced histone acetylation is a feature of several neurodegenerative disorders, making HDAC inhibition a potential target for interventions that may be helpful in these conditions.[29-31] Additionally, butyrate may also support immune function by stimulating production of retinoic acid (RA) from dietary vitamin A in the gut.[32] Vitamin A metabolites are critical for both innate and adaptive immunity,[33] with RA having been called "the maestro behind various functions of vitamin A."[34] Regarding gut-associated immune activity, "RA stimulates the migration of immune cells including dendritic cells, T cells, and B cells to the intestine and helps inform their function. [...] RA regulates the levels of antimicrobials as well as secretory immunoglobulin A (IgA), which also influences the microbial composition in the gut."[33]

Looking at other immune-supportive effects of butyrate, this compound increases production of antimicrobial compounds in intestinal macrophages in vivo and downregulates the inflammatory response.[34,35] It drives differentiation of monocytes to macrophages. Butyrate is believed to play a role in decreasing risk for colon cancer via various mechanisms, such as inhibition of initial carcinogenesis, reducing oxidative stress, and anti-inflammatory effects in the gut.[37-39]

Regarding constipation, butyrate stimulates absorption of sodium and water in the colon,[13] which may aid in promoting regularity. This effect of butyrate may be an additional mechanism by which fiber promotes regularity beyond simply increasing stool bulk. Clinical trials evaluating the effects of butyrate on functional constipation have shown that supplementation results in significant decreases in pain during defecation, improvements in stool consistency, and decreased incidence of constipation.[12] Researchers noted, "Butyric acid was documented to increase peristaltic efficiency by improving colonic smooth muscle contractility and regulating intestinal neurotransmission, especially in the case of slow peristalsis."[12]

For inflammatory bowel conditions in general, "IBD patients have dysbiosis with reduced numbers of SCFAs-producing bacteria and reduced BT [butyrate] concentration that is linked to a marked increase in the number of proinflammatory immune cells in the gut mucosa of these patients. Thus, microbial dysbiosis and reduced BT concentration may be a factor in the emergence and severity of IBD."[40]

Recommended Use

- Take 1 softgel per day, or as directed by your health care practitioner.

For a list of references cited in this document, please visit:

https://www.designsforhealth.com/techsheet-references/tri-butyrin-supreme-references.pdf

Dosing recommendations are given for typical use based on an average 150 pound healthy adult. Healthcare practitioners are encouraged to use clinical judgement with case-specific dosing based on intended goals, subject body weight, medical history, and concomitant medication and supplement usage. Any product containing botanical substances has the potential for causing individual sensitivities. Individual monitoring, including liver function tests, may be appropriate.

CoreBiome™ is a registered trademark protected by Patents Pending claiming priority to Serial No. 16/434, 051 and 16/519, 434 under exclusive global distribution by Compound Solutions, Inc.

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