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Our Members Asked:

Butyrate Supplements for Gut Health: Does butyric acid really work and is it safe?

Latest Update | Butyrate for Weight?


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Latest Update March 19, 2026 ⓘ

Answer:

Butyrate supplements are promoted for a wide range of digestive health benefits, from improving overall gut health to decreasing symptoms of irritable bowel syndrome and Crohn's disease. They are also promoted for improving blood sugar and insulin function, promoting weight/fat loss, and for more general benefits such as decreasing inflammation, boosting the immune system, and increasing energy. Several small preliminary trials suggest potential benefits, but there is not enough evidence to prove that butyrate supplements do all that they promise.

What is butyrate and what is its function in the body?

Butyrate, also known as butyric acid or butanoic acid, is a short-chain fatty acid (SCFA) that is naturally present in dairy foods such as milk, cream, butter, yogurt, certain hard cheeses such as cheddar and parmesan, and some fermented foods such as sauerkraut and fermented soy (Pituch, Prz Gastroenterol 2013).

In the body, butyrate is one of three main SCFAs produced in the colon by the fermentation of dietary fibers and resistant starch (such as potato starch) that are not digested in the small intestine. Although less abundant than the other two key SCFAs, acetate and propionate, butyrate has been of particular interest because it helps to repair and enhance the barrier function of cells that line the colon (Liu, Adv Nutr 2018), being the main source of energy for these cells, and promotes the absorption of water, sodium, and potassium in the colon, which helps to prevent diarrhea (Bedford, Anim Nutr 2018).

Laboratory and animal studies suggest that butyrate also exerts anti-inflammatory and immune-modulating effects, and may inhibit the growth of colon cancer cells (Liu, Adv Nutr 2018; Steliou, Biores Open Access 2012).

Forms of butyrate in supplements

In supplements, butyrate is typically sold in the form of a salt, as sodium butyrate, as a calcium-magnesium butyrate compound, or in the triglyceride form, tributyrate. Tributyrate is the form of butyrate that that naturally occurs in butter, and preliminary evidence from an animal study suggests that this form may have more beneficial effects in the intestines than sodium butyrate (Xiong, Braz J Poult Sci 2018), although more research in people is needed to confirm this. Unlike tributyrate, a large proportion of sodium butyrate, when taken orally, is absorbed in the upper gastrointestinal tract, before it reaches the lower intestine and colon. For this reason, sodium butyrate supplements are sometimes sold in enteric-coated or slow-release formulations.

Health benefits of butyrate supplements

Irritable bowel syndrome (IBS)

Two small studies suggest butyrate may reduce pain and urgency of bowel movements, and may reduce symptoms such as abdominal pain and bloating in some people with IBS, but larger, better-designed studies are needed to prove a benefit.

One study in Italy among 50 men and women with either diarrhea-predominant or constipation-predominant IBS suggested that butyrate supplementation may have a greater benefit in people with diarrhea-predominant IBS. In the study, all of the participants took 420 mg of sodium butyrate combined with inulin (amount not provided) taken as an enteric-coated tablet four times daily (providing a total of 1,000 mg sodium butyrate per day) for one month. At the end of the study, participants with diarrhea-predominant IBS had significant reductions in abdominal pain, bloating and flatulence *compared to baseline*, while those with constipation-predominant IBS did *not* have a decrease in symptoms. A greater number of participants with diarrhea-predominant IBS also reported complete improvement compared to those with constipation-predominant IBS (15 vs 4). However, because the supplement included inulin (a prebiotic compound that "feeds" bacteria in the colon), it's not known which ingredient was responsible for these effects, and the lack of a placebo-control (needed to prove a benefit) limits the significance of these findings (Scarpellini, Dig Liver Dis 2007).

A study in Poland among 66 men and women (average age 32) with mild to moderate IBS (not differentiated by type) found that 150 mg of microencapsulated sodium butyrate taken twice daily (a total of 300 mg per day) for 12 weeks decreased abdominal pain, pain during bowel movements and urgency of bowel movements, but did not reduce abdominal pain, straining during bowel movements, or flatulence, compared to placebo (Banasiewicz, Colorectal Dis 2013).

Inflammatory bowel disease

Crohn's disease

A 90-day study among 60 adults with Crohn's disease, most of whom were in remission or had mild disease, showed that taking 600 mg/day of sodium butyrate in a slow-release microcapsule formulation (by SILA SpA, which funded the study) as add-on therapy caused a very slight but statistically significant improvement in quality of life (+7 points on a scale of 32 to 224) compared to placebo (Facchin, Dig Liver Dis 2025). In a preliminary study in Italy with no placebo control, 8 of 13 adults (average age 40) with mild to moderate Crohn's disease who took butyrate every day for eight weeks had clinically-meaningful improvement in symptoms, and five of them had complete remission confirmed by endoscopy. The participants took slow-release enteric coated tablets providing 2,000 mg of butyrate twice daily (a total of 4,000 mg of butyrate per day – form of butyrate not provided) in addition to standard medication (mesalazine, 2.4 grams per day). One participant was removed from the study due to worsening symptoms (Sabatino, Aliment Pharmacol Ther 2005).

Ulcerative colitis

People with ulcerative colitis have fewer gut bacteria that produce short-chain fatty acids such as butyrate, and reduced fecal concentrations of butyrate, compared to people without this condition. Since butyrate provides energy for colon cells, promotes intestinal barrier function, and has anti-inflammatory effects, low butyrate levels are thought to contribute to symptoms and severity of ulcerative colitis (Rotondo-Trivette, Physiol Rep 2021).

However, two placebo-controlled studies failed to show a benefit when adding butyrate to medical therapy. A benefit was suggested by the third study, but it lacked a placebo control.

A 90-day, placebo-controlled study among 80 adults with ulcerative colitis, most of whom were in remission or had mild disease, showed that taking 600 mg/day of sodium butyrate in a slow-release microcapsule formulation (by SILA SpA, which funded the study) as add-on therapy did *not* significantly improve quality of life or disease activity, or reduce fecal calprotectin levels (a marker of intestinal inflammation) compared to placebo (Facchin, Dig Liver Dis 2025). An earlier study, among 25 adults (average age 47) with mild to moderate ulcerative colitis, showed that supplementing with 3.12 grams of butyrate (as sodium butyrate) daily for 6 weeks while also taking mesalazine (2.4 grams/day) did *not* significantly increase remission rate or improve symptoms including bowel movements, urge to go to the bathroom without being able to go, blood in stools, or abdominal pain compared to placebo plus mesalazine, although both groups showed significant improvement compared to baseline (Vernia, Dig Dis Sci 2000). A study among 42 people with ulcerative colitis in remission showed that a greater percentage of those who received add-on therapy with butyrate (1 gram daily as Butyrose by Sila s.r.l., which does not appear to be sold in the U.S.) along with mesalazine (2.4 grams/day) for 12 months maintained remission compared to those taking mesalazine alone (83.3% vs. 47.6%). Also, a greater percentage of those in the butyrate group showed improvements in subjective symptoms (quality of life and abdominal pain) compared to the control group (72.2% vs. 23.8%) (Vernero, J Clin Med 2020). However, this study did not include a placebo group, which is needed to prove a benefit.

Diverticulitis

One clinical trial suggests butyrate supplementation may have benefit in people with diverticulitis, a condition in which small, bulging pouches develop at weak places along the intestine, particularly the colon, which can become inflamed, bleed, or perforate. In the study, 52 men and women (average age 64) in Poland who had diverticulitis for an average of about 10 years took either a butyrate supplement (150 mg of microencapsulated sodium butyrate taken twice daily) or placebo, for one year. Over the course of the year, the number of participants who had episodes of diverticulitis was significantly lower among those who took butyrate compared to placebo (2 vs 7). In addition, a greater percentage of those who took butyrate reported adequate relief of abdominal pain and discomfort (56% of participants vs 24%) (Krokowicz, Int J Colorectal Dis 2014).

Alzheimer's disease

It's been theorized that dysregulation of bacteria in the gut, particularly overgrowth of pro-inflammatory bacteria or lack of bacteria that produce butyrate, may play a role in the neurological diseases such as Alzheimer's via the "gut-brain-axis" – the biochemical communication that occurs between the gut and the central nervous system (Tremlett, Ann Neurol 2017). Laboratory and animal studies also suggest that, in the brain, butyrate may help to protect brain cells, and one study found that giving sodium butyrate improved memory performance in

mice with advanced-stage Alzheimer's like disease (Govindarajan, J Alzheimers Dis 2011). Two small studies have found that older adults with Alzheimer's disease or other forms of dementia were more likely to have a lower proportion of bacteria that can synthesize butyrate, and a higher prevalence of bacteria known to produce inflammatory substances, than those without Alzheimer's (Haran, mBio 2019; Stadlbauer, BMC Geriatr 2020). However, these results do not prove that lack of butyrate causes Alzheimer's disease or dementia, nor does it prove the butyrate supplementation improves memory or cognition in people with dementia or related conditions. There does not appear to be any research on the effects of butyrate supplementation in people with dementia.

Improving gut microbiome

A small, preliminary study among 32 men and women (average age 29) showed that supplementation with 300 mg of tributyrin for 21 days modestly altered the ratio of certain potentially beneficial bacteria and bacteria that produce butyrate in stool, but these changes were not statistically significant compared to placebo, and the study did not measure any clinical outcomes (Grosicki, J Acad Nutr Diet 2021).

Obesity

Sodium butyrate may aid in weight loss, although the benefit may only be modest and limited to people without diabetes.

A study in Italy among 46 overweight or obese adults following a low-calorie diet showed that taking 625 mg of sodium butyrate three times daily with meals (total daily dose: 1,875 mg) for 12 weeks did *not* result in greater loss of fat compared to placebo. Further analysis, however, showed that those *without* type 2 diabetes had a greater reduction in **body weight** (8.2 pounds more lost) than those given placebo, but this was not the case among those *with* type 2 diabetes (Testa, Clin Nutr 2026).

Another study in Italy, this time among 54 children ages 8 to 18 with obesity, found that taking butyrate (average dose of 800 mg of sodium butyrate per day) for six months resulted in a slighter greater reduction in BMI-SDS (a measurement of body mass index relative to average BMI for gender, age, and height) than placebo. Average BMI-SDS prior to treatment was 3.15 in both groups, which fell to 2.58 in the butyrate group versus 2.89 in the placebo group. Compared to the placebo group, those who took butyrate also averaged greater decreases in waist circumference (-5.07 cm), BMI (-2.26 kg/m^2), fasting insulin levels (-5.41 µU/mL) and insulin resistance (-1.14 HOMA-IR), and levels of ghrelin, the "hunger hormone" (- 47.89 µg/mL). However, there were no improvements in fasting blood sugar, cholesterol, or triglyceride levels, and no significant changes in gut microbiota, compared to placebo. Changes in body weight were not reported. Two of the 23 children treated with butyrate experienced mild nausea and headache during the first month of supplementation (Coppola, JAMA Netw Open 2022).

Safety

Butyrate supplements appear to be generally well-tolerated, although rarely, mild nausea and headache have been reported in children taking sodium butyrate.

Be aware the supplements containing the sodium butyrate form of butyrate can contain a significant amount of sodium. For example, a suggested 2-capsule daily serving of *BodyBio's Sodium Butyrate* contains 313.3 mg of sodium.

Products on the market:

The cost of butyrate products on the market vary in cost depending on the form of butyrate and dosage. For example, a 30-day supply (60 capsules) of *BodyBio's Sodium Butyrate*, which provides 1,200 mg of butyrate per 2-capsule serving and is not enterically coated or slow-release, costs $20.00. *Healus Complete Biotic Tributyrin Based Butyrate Supplement*, which contains 500 mg of tributyrin per capsule in a delayed-release capsule, costs about three times as much per capsule at $59.99 for a 30-day supply if taking two capsules daily (suggested use is to start with one capsule, and increase to two to three times per day).

Be aware that butyrate and sodium butyrate have a strong odor that many people find unpleasant, which may be noticeable, especially if breaking apart capsules or tablets. Tributyrate has a fainter odor, and some people prefer it for this reason.

Getting (or making) butyrate from food

Consuming dairy products such as butter, yogurt and cheese can provide small amounts of butyrate. Butter, for example, contains 3–4% butyric acid in the form of tributyrate. In addition, consuming foods high in dietary fiber and/or resistant starch, such as beans and legumes, bananas, onions, and asparagus, can naturally increase butyrate levels in the colon (Bourassa, Neurosci Letters 2016).

The bottom line for butyrate:

Small clinical trials suggest that butyrate supplements, in doses from 300 mg to 4,000 mg per day, are generally well-tolerated and may reduce symptoms of certain digestive conditions such as irritable bowel syndrome and diverticulitis. However, due to the lack of details about the formulation used, or lack of placebo controls in some of these studies, more research is needed to prove a benefit. Consuming healthy foods that provide resistant starch or non-digestible fiber (such as legumes, bananas, and onions) may boost butyrate-producing bacteria in the gut.

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