

# MCT Powder

Fuel for Brain and Muscles\*



Available in 30 stick packs

## Discussion

Medium-chain triglycerides (MCTs) are found in coconut oil, palm kernel oil, and dairy fat. MCTs differ from other triglycerides in that each fat molecule comprises only six to 12 carbons in length. Due to this structural uniqueness, MCTs are absorbed and utilized differently from long-chain triglycerides. They are relatively soluble in water and more readily hydrolyzed, which facilitates absorption. Once in the bloodstream, MCTs are transported through the portal system, bypassing adipose tissue. This route makes them less susceptible to hormone-sensitive lipase and deposition into adipose tissue stores.<sup>[1]</sup> The liver metabolizes MCTs into ketones which can then be used as a quick fuel source alternative to glucose and does not appear to impact insulin levels. Furthermore, MCTs can permeate the mitochondria without the aid of enzymes.<sup>\*[2]</sup>

Due to the collective significance of these attributes, it has been suggested that MCTs may have a role to play in the management of healthy body weight, body composition, and exercise performance.<sup>[1,3-5]</sup> However, other than a presumed potential benefit in supplementing MCTs to individuals who do not absorb long-chain dietary fats well, further research is needed to determine efficacy and ideal dosage.\*

Additionally, although most of the clinical research has utilized the oil form of MCT, anecdotal feedback suggests that a powdered delivery form offers the same benefits as the oil but with better gut tolerability (or less GI distress) and is more convenient to the consumer. To convert the oil to a solid powder form, the MCT oil is spray-dried and micro-encapsulated with acacia fiber.\*

Human studies utilizing a 3 g powdered dose of MCT are limited; however, the results of a 90-day study (2007) in moderately overweight free-living type 2 diabetic subjects in urban China (N = 40) suggested that moderate consumption of MCTs might be linked to improved risk factors in this population. The test group consumed 18 g/day of MCT oil; the controls were given corn oil. While the corn oil group had no significant changes, the MCT group showed an across-time (0, 45, 90 days) reduction in body weight and waist circumference, an increase in serum C-peptide concentration, a reduction in homeostasis model assessment of insulin resistance, and a decrease in serum cholesterol concentration (P < .05, repeated measures). The MCT group also showed a reduction in daily caloric intake,<sup>[2]</sup> a phenomenon similar to that identified in a 1983 three-part rat study. In the study, diabetic rats that ingested MCTs reduced their food intake within two hours while diabetic rats that consumed long-chain triglycerides in the form of corn oil reduced their caloric-intake in two to four hours.<sup>\*[6]</sup>

## Clinical Applications

- » May Support Management of Healthy Body Weight and Body Composition\*
- » Ketone Body Precursor\*
- » Supports Cognitive Health\*
- » Provides Direct Fuel Source for Energy\*
- » May Enhance Exercise Performance\*
- » Promotes Gut Health\*

*MCT Powder features goMCT® a patented medium-chain triglyceride (MCT) powder with high caprylic acid and capric acid content (C8/C10). MCTs are absorbed intact, are not stored as body fat, are excellent ketone body precursors, and provide a quick energy source without impacting insulin levels. goMCT® also contains acacia fiber, a prebiotic that may promote gut health.\**

A 2013 systematic review and meta-analysis of randomized controlled studies on the effect of MCTs versus long-chain triacylglycerols (LCTs) on body composition in adults (11 studies, five deemed not to have any bias) demonstrated that individuals who replaced dietary LCTs with MCTs showed “significantly reduced body weight (WMD, -0.69 kg; 95% confidence interval [CI], -1.1 to -0.28; p = 0.001); body fat (-0.89 kg; 95% CI, -1.27 to -0.51; p < 0.001), and WC (waist circumference) (-1.78 cm; 95% CI, -2.4 to -1.1; P < 0.001).” However, the reviewers stated that “overall quality of the evidence was low-to-moderate” and that “trials with a crossover design were responsible for the heterogeneity.”<sup>\*[7]</sup>

Research into the effect of MCTs has been ongoing since 2013. Though not having human subjects limits relevancy, a 2018 study (similar to the 2007 human study noted prior) demonstrated a positive effect on serum lipids of MCTs combined with a controlled diet. This eight-week study on streptozotocin-induced type 2 diabetes (T2DM) rats given a high-fat or a low-fat diet with either soybean oil or MCT oil showed that MCT oil in conjunction with a high-fat diet lowered serum low-density lipoprotein cholesterol (LDL-C), non-esterified fatty acids, and liver total cholesterol while it increased serum high-density lipoprotein cholesterol (HDL-C) and the HDL-C/LDL-C ratio. In comparison to T2DM rats fed a high-fat soybean oil diet, the rats on the low-fat MCT oil diet had lower body weight and reproductive white adipose tissue. Also, compared to the T2DM rats given the low-fat soybean oil diet, the T2DM rats on the low-fat MCT oil diet showed higher hepatic acyl-CoA oxidase activities (an enzyme key to peroxisomal beta-oxidation).<sup>\*[8]</sup>

MCTs have also been suggested to be a beneficial adjunct to a ketogenic diet because of their ability to convert to ketone bodies. Concluding in a March 2018 published narrative review that the number and scope of studies related to the use of nutritional supplements to induce ketosis and reduce symptoms associated with keto induction were inadequate,<sup>[9]</sup> the same researchers performed a randomized, double-blind, placebo-controlled trial (N = 28) in May 2018 to determine whether MCTs reduce time to nutritional ketosis. Secondly, the researchers wanted to see if MCTs reduce symptoms that commonly occur as the body transitions from a glucose-dominant fuel system to reliance on ketones and whether mood is affected. Participants were randomized into two groups and received 30 mL/day of MCT or sunflower oil for 20 days in conjunction with a ketogenic diet. Although differences between the MCT and sunflower oil groups failed to meet significance (P = 0.30), mean time to nutritional ketosis was one day shorter in the MCT group. Compared to the control group, the MCT group had comparatively lower symptoms associated

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with keto-induction for some but not all days. The difference between groups for mood was unclear.\*<sup>[10]</sup>

Animal and human studies have explored the potential role of MCTs in increasing ketones and supporting brain health. In a study of adults (N = 20) with cognitive impairment who were given MCTs or placebo, significant increases in beta-hydroxybutyrate (BHB)—one of the three primary ketone bodies—were observed 90 minutes post-treatment when recall tests were administered.<sup>[11]</sup> In a 90-day, randomized, double-blind, placebo-controlled, parallel group study, subjects (N = 152) with mild-to-moderate Alzheimer's disease were given an oral ketogenic MCT compound to determine if ketosis could affect cognitive performance. Significantly elevated levels of BHB were seen two hours after administration when compared to placebo. Correspondingly, elevated BHB levels resulted in significant differences in Alzheimer's Disease Assessment Scale-Cognitive Subscale (ADAS-Cog) scores when compared to placebo.\*<sup>[12]</sup>

A 2018 study demonstrated increased mitochondrial biogenesis and metabolism thereby improving exercise performance in mice.<sup>[13]</sup> Research on MCTs as fuel for exercise also continues to emerge. A small study using recreational athletes as subjects (N = 8) suggested that when consuming MCTs, blood lactate levels and rate of perceived exertion during moderate-intensity exercise were significantly reduced.<sup>[14]</sup> Another small study suggested that endurance-trained cyclists (N = 6) who consumed MCTs during moderate-intensity exercise for two hours had significant improvements in time-trial performances during subsequent high-intensity exercise.<sup>[15]</sup> Additional research in larger trials is necessary before any definitive conclusions can be drawn related to the effects of MCTs on exercise performance enhancement.\*

XYMOGEN's MCT Powder contains a patented medium-chain triglyceride powder with a high caprylic and capric acid content plus acacia fiber. This fiber acts as a prebiotic that promotes changes in the composition and/or activity in the gastrointestinal microflora. Acacia fiber resists digestion in the small intestine; it is fermented by the gut microflora in the colon to promote overall gut health.<sup>[16]</sup> With the knowledge of the importance of the role of gut-brain axis in health, this formula combines MCT and acacia fiber to potentially optimize this axis.\*

### MCT Powder Supplement Facts

Serving Size: 1 Stick Pack (about 7.8 g)

	Amount Per Serving	%Daily Value
Calories	45	
Total Fat	3.5 g	4% <sup>†</sup>
Saturated Fat	3.5 g	18% <sup>†</sup>
Total Carbohydrate	4 g	1% <sup>†</sup>
Dietary Fiber	4 g	14%
goMCT <sup>®</sup> Medium-Chain Triglycerides (MCTs)	3 g	**

<sup>†</sup> Percent Daily Values are based on a 2,000 calorie diet.  
\*\* Daily Value not established.

**Other Ingredients:** Gum acacia and silica.

**DIRECTIONS:** Mix the contents of one stick pack in 6-12 oz of water or beverage of choice, or use as directed by your healthcare practitioner.

Consult your healthcare practitioner prior to use. Individuals taking medication should discuss potential interactions with their healthcare practitioner. Do not use if stick pack is damaged.

**STORAGE:** Keep closed in a cool, dry place out of reach of children.

**DOES NOT CONTAIN:** Wheat, gluten, yeast, corn, soy, animal or dairy products, fish, shellfish, peanuts, tree nut protein, egg, ingredients derived from genetically modified organisms (GMOs), artificial colors, artificial sweeteners, or artificial preservatives.



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Additional references available upon request

All XYMOGEN<sup>®</sup> Formulas Meet or Exceed cGMP Quality Standards.

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