

MCT'S

**BENEFITS AND
HOW TO
SUPPLEMENT
WITH**

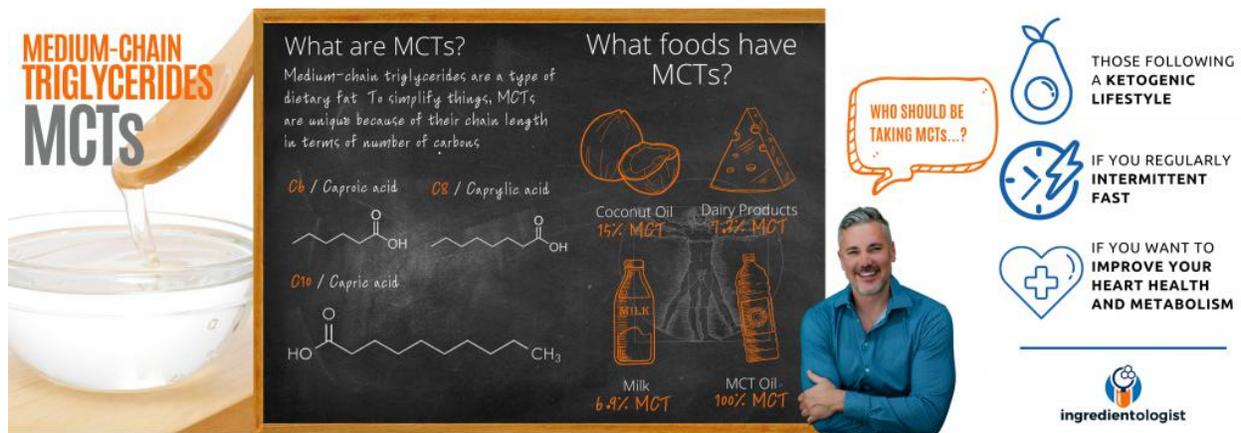


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This guide will cover one of the most common supplements to the ketogenic diet; medium-chain triglycerides, aka MCTs. If you're new to keto, those three letters may sound new to you, but even the seasoned keto dieter can have quite a bit of misunderstanding about them.

MCTs are widely available, extremely effective and are relatively affordable as a supplement, making them a prominent feature in many people's keto lifestyles. Their main attraction is their ability to raise ketone levels in the blood relatively quickly. While they don't contain any ketones, they possess a type of fat that is readily converted into ketones by the body.

In this guide, I want to educate you on exactly what MCTs are and how they work in the body so that you're not fooled by all the marketing claims out there.



The infographic is divided into several sections. On the left, a glass bowl contains a white liquid being poured from a wooden spoon, with the text 'MEDIUM-CHAIN TRIGLYCERIDES MCTs' overlaid. The central part features a chalkboard with the following content:

- What are MCTs?**
Medium-chain triglycerides are a type of dietary fat. To simplify things, MCTs are unique because of their chain length in terms of number of carbons.
- What foods have MCTs?**
 - Coconut Oil: 15% MCT
 - Dairy Products: 7.3% MCT
 - Milk: 6.4% MCT
 - MCT Oil: 100% MCT

Chemical structures are shown for C6 (Caproic acid), C8 (Caprylic acid), and C10 (Capric acid). A speech bubble asks 'WHO SHOULD BE TAKING MCTs...?'. To the right, three icons with text describe who should take MCTs:

- Avocado icon:** THOSE FOLLOWING A KETOGENIC LIFESTYLE
- Lightning bolt icon:** IF YOU REGULARLY INTERMITTENT FAST
- Heart with cross icon:** IF YOU WANT TO IMPROVE YOUR HEART HEALTH AND METABOLISM

The 'ingredientologist' logo is at the bottom right.

What are MCTs?

Medium-chain triglycerides are a type of dietary fat. To simplify things, a 'triglyceride' is a technical term for fat. If you were to draw your blood and measure the amount of fat in it, you'd be measuring triglycerides. All triglycerides are made up of three fatty acids bound to a glycerol backbone.

Most people know that there are different types of fats, such as saturated, monounsaturated, and polyunsaturated, which are classifications based on the presence and number of double bonds in a fatty acid's carbon chains. But, fats are also named based on the length of their carbon chain. We have short-chain fatty acids, medium-chain triglycerides and long-chain fatty

acids (these are the common terms, but 'triglyceride' and 'fatty acid' are often used interchangeably).

Carbon chain length:

Short-chain fatty acids (SCFA) - 2 to 6 carbons

Medium-chain triglycerides (MCT) - 8 to 10 carbons

Long chain fatty acids (LCFA) - 12 to 22 carbons

Most naturally-occurring fats - both in the diet (e.g., oleic acid from olive oil) and in the body - contain 16 - 18 carbon atoms, and are therefore considered long-chain fatty acids. While short-chain fatty acids consist of 2 - 6 carbons (for example, butyrate, which has 4 carbons and is referred to as C4).

MCTs are unique because of their chain length. The 3 MCTs include:

- C6 / Caproic acid
- C8 / Caprylic acid
- C10 / Capric acid

There is debate around whether C12 is considered a long or medium chain fat, but it does not retain the same unique properties that the other MCTs do.

What makes MCTs so special?

- They're 10% lower in calories than long-chain fats (8.3 calories vs 9.0 calories per gram)
- Because of their shorter chain, they get absorbed in the gut more rapidly than LCFA
- They get converted into energy (ATP) in the mitochondria more quickly than LCFA

These points alone explain why eating more MCTs instead of LCFAs could be beneficial for weight loss. But, let's take a look at exactly how MCTs work.

How do MCTs work?

The length of MCTs is what makes them function differently in the body. There is a big difference in the rate of absorption in the gut between LCFAs and MCTs and when we understand this difference, we realise how powerful they can be as a supplement.

When LCFA are ingested, they have to be broken down into individual fatty acids by enzymes called lipases. These fatty acids then pass through the gut lining and get packaged into micelles - parcel-like structures that carry fats - which are transported into the lymphatic system. Here, the fats get converted back into triglycerides and can go into the bloodstream. This whole process involves many enzymes, bile salts and is a very complex process.

In comparison, MCTs are absorbed from the intestine straight into the bloodstream where they are transported directly to the liver. They do not require any micelles or enzymes in this process. Once in the liver, they get broken down into two-carbon fragments called acetyl-coA. Acetyl-coA is basically the building block of energy for our cells and gets converted into ketone bodies: beta-hydroxybutyrate and acetoacetate to be used for energy.

This essentially means that MCTs bypass all the complex processes long-chain fats undergo to be metabolized and instead get transported straight to the liver to be turned into energy.

This is the underlying reason that they are a perfect supplement for the keto diet. When you begin a ketogenic diet, you restrict carbohydrates by quite a lot, depriving your body of its 'normal' fuel source: glucose. When you continue to restrict carbs, you force your body to start burning an alternative fuel source: fat.

But, this process does not take place immediately. It takes time for your body to adapt to burning fat, and to actually switch on those metabolic pathways. Your body is so used to just burning glucose day in and out, that it has to 'learn' how to convert fat into energy.

While this phase of 'keto-adaptation' is taking place, you may experience energy slumps and fatigue, or other unwanted side effects like nausea, lightheadedness, cramping and headaches which are known as the 'keto-flu'.

Because MCTs are rapidly converted into ketones and can produce energy readily in the body, they are a great way to support this transition from carb to fat burning. They can help you raise your ketones and give you a boost of energy, preventing those 'keto-flu' symptoms.

Where do MCTs come from?

Many food sources contain MCTs like coconut oil, palm kernel oil, butter, milk, yogurt, and cheese. Coconut oil is well-known for its MCT content, but about 13 - 15% of the fat in coconut oil comes from the MCTs C8 and C10. While, about 7 – 9% of the fat in butter comes from these very same MCTs.

Coconut oil only contains about 13 - 15% as the MCTs C8 and C10. The overwhelming majority of the fat in coconut oil comes from lauric acid (C12). While lauric acid is sometimes classified as an MCT, caprylic acid (C8) and capric acid (C10) seem to be responsible for the benefits typically associated with MCTs. In other words , coconut oil does not equal MCT oil, and along those lines, it does not necessarily provide the same benefits (although many would leave you believing that it does).

There is no doubt that purified MCT oil where C8 and C10 are concentrated from coconut oil is a far more effective way to supplement.



Benefits of MCTs

Despite falling under the umbrella of saturated fats, which have also been mistakenly demonized, MCTs have also earned a health halo. For example, many in the scientific community have dubbed MCTs as “functional” fats thanks to the wide array of potential health benefits they offer.

Two of the most important benefits of MCTs are:

1. Increased Ketone Bodies.

One of the most outstanding benefits of MCTs is that they are known to have a high “ketogenicity”, which means they are readily converted to ketone bodies. Having said that,

research has shown that C8 increases ketones by approximately 3 times more than C10 and 4 times more than coconut oil. In other words, C8 is the most ketogenic MCT.

The very reason many athletes, biohackers, celebrities and many more high performers adopt a ketogenic diet is for the effects of ketones themselves. They're an important energy source for the brain, and for the heart, skeletal muscles and other tissues that are more energy-efficient and provide more energy per molecule compared to glucose. This makes MCTs a powerful supplement to enhance the diet's effectiveness.

Along with their ability to boost endogenous ketone production, MCTs can be used by those who don't follow a keto diet. So, you can still get the benefits from ketones themselves without the dietary restriction that comes with a ketogenic diet!

It is also worth mentioning the therapeutic effects of ketones. They have been shown to act as signalling molecules in the body giving them potent anti-inflammatory, antioxidant and even anticancer effects. The presence of ketones in the blood has been used to treat many disease like Alzheimer's, epilepsy, cancer, diabetes and other neurodegenerative conditions.

2. Enhanced Focus, Mental Clarity, and Cognitive Function

Ketones, unlike fatty acids, can cross the blood-brain barrier making them a key energy source for the brain. This is important to note because, while the brain usually relies on glucose for fuel, it cannot use fats for fuel. Fats need to be converted into ketones (as MCTs do in the liver) to become an important "alternative energy source" for the brain. In fact, some believe that ketones are the brain's preferred source of fuel, particularly during periods of fasting and extended exercise.

Many studies have shown supplementing with ketones to improve cognitive function, learning and memory. They're often incorporated into many 'nootropic stacks' for this very reason.

In summary, they're a powerful brain-boosting supplement that can not only enhance the brain's function, but also protect and nourish the brain.

Other benefits include:

Increased Energy Levels

Because of their shorter length, MCTs are easily digested and rapidly absorbed in the body and are transported directly to the liver, where MCTs are quickly and efficiently burned for energy.

Less Likely to be Stored as Fat

Because they are transported directly to the liver, they bypass adipose (fat) tissue, which makes them less susceptible to be stored as fat. What's more, while dietary fat typically provides 9 calories per gram, MCTs provide only 8.3 calories per gram.

Increased Metabolic Rate

Compared to long-chain fats, MCTs have been shown to increase metabolic rate (i.e., thermogenesis) and total daily caloric expenditure.

Enhanced Satiety and Appetite Management

Several studies have shown that MCTs may increase satiety, reduce appetite, and decrease total caloric intake. Research suggests that MCTs may trigger the release of key satiety and appetite-suppressing hormones (to a greater degree than other types of fats).

Improved Weight Management

Considering that MCTs may both increase metabolic rate and help manage food intake (i.e., calories out and calories in, respectively), it stands to reason that supplementing with MCTs and replacing normal dietary fat (i.e., LCFAs) with MCTs can help support weight management.

Supplementing with MCTs

MCTs typically contain a mixture of the different medium-chain triglycerides described above. Caprylic acid or C8 is the most ketogenic MCT, with C10 being slightly less effective. Some brands have MCTs as either 100% C8 or C10. Lauric acid, or C12, while technically a LCFA is the least effective at raising ketones but is a powerful antimicrobial, making it a perfect immune system supplement.

Use & Timing

MCTs are very versatile as it can be used in:

- Coffee (Bulletproof coffee - a high-fat coffee blended with butter and MCT oil)
- Smoothies/Protein shakes
- Salad dressings
- Baking

It can also be taken as is. Keto dieters will often knock back a tablespoon of MCT oil to give them a boost in their ketone levels throughout the day. They're also a great way to increase fat intake on a ketogenic diet due to their associated health benefits.



TOP 3 WAYS TO USE MCTs

SMOOTHIES
Add it to your favorite fruit or veggie shake for enhanced metabolism.

SALAD DRESSINGS
Stir some MCTs into your salad dressing to increase your energy levels and decrease appetite.

KETOGENIC COFFEE
MCTs are best taken in the morning, with a Bulletproof® coffee for a brain boost. The best way to do this is to add 1 tsp. coconut oil and 1 tsp. butter to your coffee and mix well.

To benefit from MCT's studies suggest a range between **18 - 24 grams per day** of a combination of **C8 and C10**. If you are new, start slow!

MCTs typically contain a mixture of medium-chain triglycerides.

- C8** Caprylic acid or C8 is the **most ketogenic** MCT.
- C10** Slightly less effective. C10 is **slightly less ketogenic** than C8.
- C12** Least effective at raising ketones but **is a powerful antimicrobial**, making it a perfect **immune system supplement**.

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MCT oil vs Powder:

Depending on what you're looking for out of an MCT supplement, you may prefer one form over the other.

MCT Powder:

- + Easier on the GI system
- + Mixes easily into drinks
- + Easy to travel with or take on-the-go
- + Often comes blended with added health benefits (e.g. MCT + collagen powder)
- Can be 2x the price of oil
- May contain additives and fillers that decrease MCTs per gram
- Not as well researched as MCT oil

MCT Oil:

- + Cheaper

- + More widely available
- + Good substitute for other oils
- Can leave oily layer in drinks
- Can cause GI issues
- Less travel-friendly

MCTs are best taken in the morning, with a coffee or a high-fat shake, for example. They will raise ketones more effectively this way. However, some people may experience some gastrointestinal discomfort, especially if taken on an empty stomach.

Dose

Generally speaking, for metabolism, appetite, and weight management benefits associated with MCTs, studies suggest a range between 18 – 24 grams per day of a combination of C8 and C10.

A normal dose is 1 tablespoon of MCT oil. MCT powders may have different doses depending on other ingredients. 1 tablespoon contains roughly 14 grams of fat.

If you're new to supplementing with MCTs, be sure to begin with smaller servings to avoid GI distress. Start with 1 tsp and work your way up to a full serving.

It is generally accepted that there is no associated risk with normal consumption levels of MCTs. Remember, they are a source of calories (8.3 calories per gram to be exact!) and so overconsuming them isn't a good idea if your goal is weight-loss.

What To Look Out For

Look at the label of an MCT product and it should list the breakdown of the types of MCTs that have been extracted from either coconut oil or palm oil. Good brands will contain roughly 60% caprylic acid (C8) and 40% capric acid (C10) and less than 1.5% lauric acid (C12).

The best MCT supplements are those that are 100% C8 MCT, as this is the most ketogenic MCT there is. C8 raises ketones far more rapidly than C10 and C12.

If the product doesn't list the breakdown, it is likely to be lower in C8 and C10 and contain more C12. This extraction process is more expensive and the cheaper MCT supplements are usually the brands that don't go through this process, resulting in a less effective MCT oil.

Who Should Be Taking MCTs?

- **Those following a ketogenic lifestyle & anybody who is new to a ketogenic diet:** MCTs are a great way to increase the percentage of fat in your diet, and due to their ability to raise ketones, they can aid in the fat adaptation phase.
- **If you're intermittent fasting:** A serving of MCT oil will not spike your insulin and is therefore often accepted as a fasting supplement as it can help boost your energy and reduce appetite.
- **Any healthy individual:** Anyone can consume MCTs as they're less likely to be stored as fat and can be converted into energy immediately, compared to LCFAs that require many more steps before being burned. While MCTs can be (and often are) used in tandem with intermittent fasting and ketogenic diets, it is possible to induce ketosis without extreme dietary restriction by using MCTs as ketone precursors.

The Takeaway

Whether your goal is to lose some weight or to elevate your ketone levels, taking an MCT oil or powder supplement is a better way to do this than relying on coconut oil or other natural MCT sources. If you're looking for the most effective ketone boost, choose 100% C8 MCTs.

Supplementing with MCTs can not only provide you with sustained ketosis for a boost in energy and cognitive clarity, but it can also help to regulate your appetite, increase your metabolism and support your weight management goals.

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