

## Why C8 oil is the best brain fuel

Your brain cells (neurons) can run on only two fuels – glucose or ketones, made in the liver from fat. Think of both of them as five star fuels – super-powered high energy fuel for immediate combustion by these tightly packed together neurons. When neurons are presented with both fuels they actually prefer ketones.

Ketones are made from a type of fat called medium-chain triglycerides, known as MCTs and there's a big increase in sales high in MCTs, broadly called MCT oil although the amount and kind of MCTs can vary a lot. Also gaining in popularity are ketone salts and pure synthetic ketones, although these are yet to clear EU Novel Foods so are not yet available in Europe.

MCTs are found in high concentrations in both coconut and palm oil, as well as dairy butter and convert readily into ketones in the liver. Coconut oil is 60% MCTs. Ideally avoid palm oil unless from undeniably sustainable sources since the destruction of the rainforest to grow palm oil is the reason the orangutan is threatened with extinction.

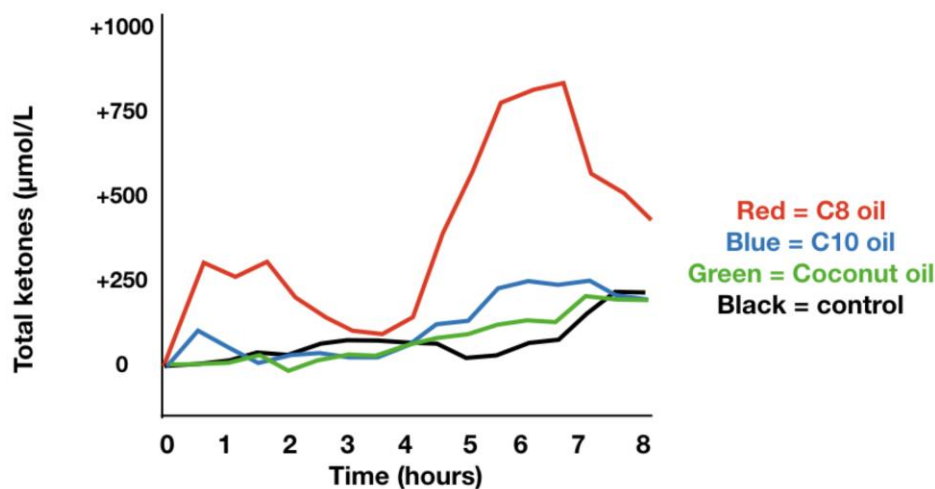
Fats, including MCTs, are made of carbon chains of differing lengths. Stearic acid, the main fat in meat, has 17 carbon chains, while olive oil is mainly 14 chains (C14). Anything below 12 chains (C12) and above 6 chains (C6) is classified as 'medium chain' or MCT. The gut bacteria can synthesize very short chain fats such as butyric acid, which is C4. There's also some C4 in goat's cheese.

The different MCTs are:

- C6 – caproic acid triglyceride
- C8 - caprylic acid triglyceride, also called tricaprylin)
- C10 – capric acid triglyceride
- C12 – lauric acid triglyceride

Of these, C8 most readily converts into ketones, raising ketones in the blood, way more than just coconut oil. In the graph below is a study that gave volunteers either a control substance, with no oil, coconut oil was little better than the control, while C8 oil raised ketone levels almost five times higher.

Some better quality MCT oil combine C8 and C10 but even so this is much less effective than pure C8 oil. For example, C8 oil raises ketones roughly four times higher than C10.<sup>1</sup> (See the graph below.)



*Data from Vandenberghe et al, Current Developments in Nutrition, 2017*

This vast superiority of C8 oil to coconut oil is not surprising when you realise it is the C8 oil in coconut that actually makes the ketones. While coconut oil is 60 per cent MCTs only 12 per cent of MCTs is C8. That means that only 7 per cent of coconut oil is C8. That means you'd have to consume ten times as much coconut oil to get the same amount of C8 as pure C8 oil, which is a lot of extra fat and calories for the body to process. However, despite this case studies with coconut oil have shown short-term beneficial effects in people with Alzheimer's, with improved mental clarity. Just imagine what pure C8 oil might do.

So-called 'bullet-proof' coffee advocates adding coconut oil but you'd have to add so much to get any meaningful ketone advantage that, quite frankly, it would become undrinkable. The Hybrid Latté includes a tablespoon of C8 oil, although you might want to start with a teaspoon to build up tolerance, which is going to make a significant difference.

A study gave 52 people with pre-dementia either two tablespoons (30g) of C8 oil or a placebo and measured changes in their cognitive function.<sup>2</sup> They were also able to measure how well neurons were functioning and determined that the participants' brain cells were not fully firing, in other words they would be experiencing effectively a lack of brain energy which would be experienced as poor concentration, memory and ability to process information.

When they were given two tablespoons of C8 oil the half-firing neurons came back to life. Brain ketone metabolism increased by 230% indicating that their brain cells were switching to using ketones as fuel, and the more this was happening the more cognitive improvements occurred. The authors suggested that three tablespoons (45g) of C8 oil might be better. However, please bear in mind that it takes a few days to

adapt and, if you start with too high an amount you can experience either diarrhoea or stomach cramps which resolve as your body gets used to this new source of fuel. Unlike other fats C8 oil goes straight to the liver via the portal vein, thus not requiring all the digestion that other fats need. The ketones then enter the blood and are taken up, as an energy source, by all cell's mitochondria, the energy factories.

In this study the participants weren't on a ketogenic diet, thus were still eating carbs, but clearly got a significant brain benefit. The researchers excluded diabetics from the study so they weren't looking at people with abnormal glucose metabolism, however they were people with cognitive decline.

So, what this means is that C8 oil is specifically good for the brain if you have some level of cognitive deficit. Much like the early studies with omega-3 fish oils, which helped children with ADHD or poor reading or writing skills, but didn't show benefit to those at the top of the class already, we don't know if taking in more C8 oil will help those without cognitive issues. In other words, could C8 oil improve brain function or cognition in those without any deficit? Time will tell as this area becomes more researched.

Nerve cells are also neurons so it is likely that C8 oil will help those with compromised nerve cell function. Think Parkinson's, multiple sclerosis, epilepsy and other neuropathies. Epilepsy, for example, has been successfully treated in both children and adults with a high fat ketogenic diet since the 1920's often halving frequency of fits.<sup>3</sup> Although we have yet to see studies specifically testing the effects of C8 oil. A recent study on people with Parkinson's found that those placed on a high fat diet had 41 per cent reduction in shaking, compared to 11 per cent on a low fat diet.<sup>4</sup> Now, just imagine what C8 oil might do. There's also a potential benefit in chronic fatigue syndrome.<sup>5</sup> The potential of C8 oil in these kind of conditions could be substantial.

In practical terms, there's merit to having a tablespoon of C8 oil a day anyway, or include in a Hybrid Latté, as part of a daily 18 hour carb fast based on dinner at 6 or 7pm and lunch at 12 or 1pm the next day. You could do this three days a week. If, on the other hand, you are going ketogenic, on the high fat phase of the Hybrid Diet for example, then increase your intake of C8 oil to three tablespoons a day. C8 oil is available in health food shops and on line. It is better than MCT oil and much better than coconut oil.

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<sup>1</sup> C. Vandenberghe *et al.*, *Current Developments in Nutrition* (2017), vol 1(4):e000257.

<sup>2</sup> M. Fortier *et al.*, *Alzheimer's & Dementia* 2019; 1-10

<sup>3</sup> M. Nei *et al.*, *Seizure*. 2014;23(6):439-42.

<sup>4</sup> M. Phillips *et al.*, *Movement Disorders* 2018; 33(8):1306-1314

<sup>5</sup> Craig C. *Med Hypotheses*. 2015;85(5):690-3