

Ketosis and the Keto Diet

Naturopathic Perspectives



by Christopher Habib, ND
www.chrishabib.com

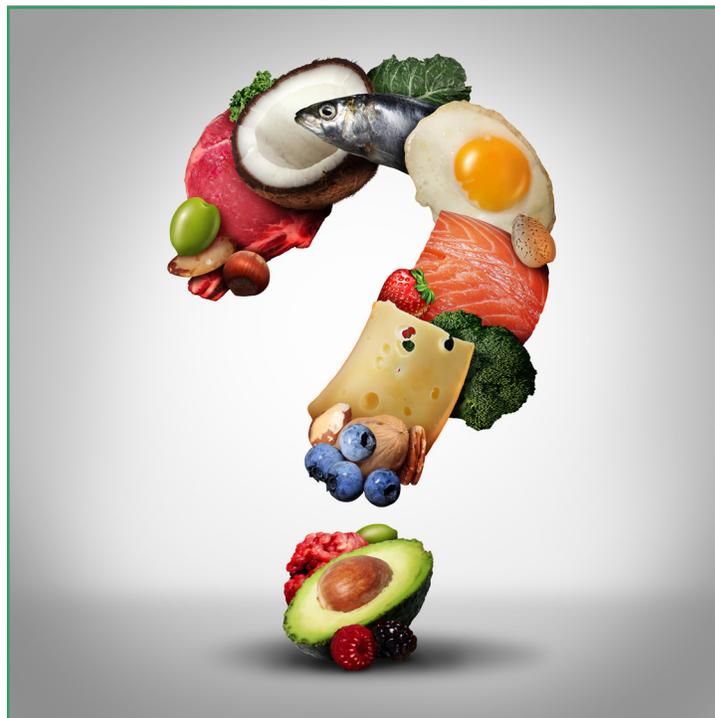
Introduction

What is ketosis and the keto diet? Is it good for you, or is it just another lifestyle trend that we'll forget about in a few years? In this article, we'll try to answer this question and review the available evidence to see what we can learn.

First, let's start with explaining ketosis. Ketosis is a metabolic state—in other words, a time when your body is doing something specific, or working in a specific way. Normally to produce energy, your body will use sources of fuel like sugar (glucose), especially the brain, which requires a lot of fuel. However, if the regular sources of fuel aren't available, then fat can be broken down and turned into ketones.¹

Everyone has ketones. They are chemicals made in the liver and they get sent into the bloodstream, to be eventually consumed by muscles and the rest of the body. For context, people with diabetes who don't produce enough insulin may sometimes have higher levels of ketones, as the body tries to find alternate sources of fuel because glucose isn't being absorbed. The reason it can cause problems in some health conditions like diabetes is because ketones and glucose can accumulate in the blood, almost as though the body thinks it's starving, but it's not, and this can lead to serious problems. But what about for those of us without metabolic health conditions?

Normally, ketones get formed in a process called ketogenesis. Fat, specifically fatty acids, are broken down. Our bodies do this because historically our



ancestors would have experienced periods of time when food wasn't readily available. So, in a way, this process was a way of storing energy and having it available during these periods of time. Our bodies still work the same way today. In fact, ketosis occurs naturally during pregnancy and infancy as well.

Although it's often discussed within the context of a low-carb diet, ketosis can actually happen in a number of circumstances. So yes, the first is when carbohydrates or sugars are completely removed; however, some say this leads to hormone imbalances. Second is when we fast, either intermittently or on a regular basis. The problem with this is potential cortisol (stress hormone) imbalances and muscle loss, both of which are better avoided. Third is when we exercise and increase our physical activity level. Similarly, this can cause cortisol problems and muscle loss. Lastly, when we are in an overall calorie deficit, ketosis can happen, as in eating less of all macronutrients (less protein, less carbohydrate, less fat).

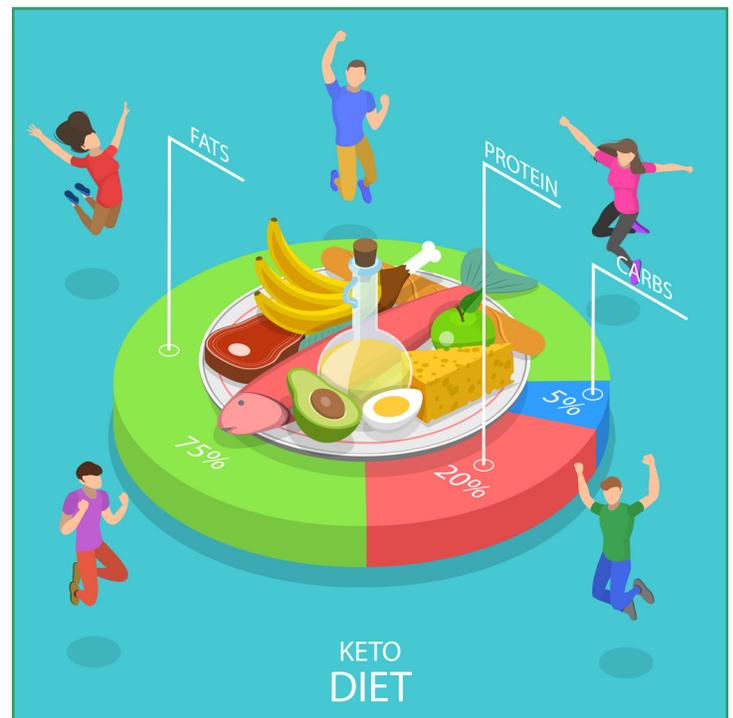
What Are the Purported Benefits of Ketosis?

A study conducted several years ago found that dietary ketosis enhances memory, when there's mild cognitive impairment.² Twenty-three (23) older adults with mild cognitive impairment were randomized either to a high- or low-carbohydrate diet. After six weeks, they were tested for verbal memory performance, weight, waist circumference, fasting glucose, and fasting insulin. Improvements were seen in all categories. Ketone levels were positively correlated with memory performance. The authors conclude that low carbohydrate consumption may be useful in adults with an increased risk for Alzheimer's disease.

Some people worry that ketosis might lead to problems with brain function. However, another study showed that two things happen in a state of ketosis.³ First, more glucose is shuttled into the brain to try to balance it out. Second, ketones themselves are used by the brain. So, overall, it looks like—although there might be some short-term adjustments the body will need to make—ketosis appears generally good for mental performance.

What about physically? Well, it looks like over time the body adapts well to ketosis states. One study examined ultra-endurance runners.⁴ Twenty-eight (28) distance triathletes performed an exercise test. One group normally ate higher carbohydrate and another group normally ate lower carbohydrate. The results of the study showed that those with low-carbohydrate diets had much higher rates of fat oxidation (meaning they were better at using fat as an energy source). Also, glycogen (the storage form of glucose) and repletion patterns and after testing were similar in both groups, so it's not as though they suffered on a separate metric.

Another article examined the ability of athletes to access energy stored as fat.⁵ One element of deteriorating exercise capacity during physically demanding sport is the reduced carbohydrate availability coupled with an inability to effectively use alternative fat sources as fuel. Physical decline



is associated with glycogen depletion, even though there's an abundance of fuel stored as fat. Using high carbohydrates before and during exercise can impede the body's ability to use fat. It's efficient to accelerate the body's ability to oxidize fat by lowering carbohydrate intake, which increases fat intake for several weeks. The body then adapts to this state and gets better at using fat during exercise.

Studies have also shown that people on a ketogenic diet lose weight, compared to a low-fat, calorie-restricted diet. People tend to feel less hungry and are more satiated, probably because of ketosis. Ketosis is being studied for a number of other potential health benefits, including for heart disease and cancer, some of the top killers in the developed world. It's also being studied for Parkinson's disease and acne.

Are There any Negative Effects of Ketosis?

Yes! Especially if not done properly or if it is something new you are experimenting with. The shift in metabolism can act as a stressor on your body. The main problems are the loss of water and electrolytes, as these items get lost when the body is focused on fat-burning.⁶ Some of the

symptoms people feel might include headaches, irritability, weakness, and fatigue. Unsurprisingly, these are similar to symptoms of low blood sugar or hypoglycemia.

How Do You Implement Ketosis?

The general way to implement ketosis is to decrease your daily carbohydrate intake to less than 50 g—for some people, even less. However, you likely want to replace these calories with fats and proteins, so calorie tracking may be important.

Some people recommend eating two cups of cooked vegetables twice a day, in the form of soups, baked, steamed, stir-fried, or cold and added to green salad. Cooked vegetables have more fibre than greens, cucumber, and celery. The fibre keeps you full and lowers insulin.

Protein is important. Usually, the recommendation is 1.6 g of protein per kg of body weight, or more (2.2 g/kg BW) if you need to gain muscle or bone. Start the day with a fat and starchy carb-free breakfast, which will keep you in ketosis from your overnight fast. Consider adding spices, as they can lower insulin, reduce inflammation, and increase metabolism while reducing hunger cravings.

Conclusion

Ketosis is a natural metabolic state that can be achieved by selecting which foods to consume.



It can take a little while to get used to the feeling, but overall it seems the body is adaptable. However, ketosis is not without risks. Those with health conditions, specifically diabetes and especially if not well-managed, may want to be careful. It appears ketosis has a number of potential health benefits including weight loss, better endurance performance, and mental benefits.

The implementation of ketosis or a ketogenic diet can be quite difficult to accomplish alone. Many resources are available online to help, but even with support, many find it difficult to navigate cooking and eating out to maintain the diet properly. For this reason, it's often recommended that you seek the services of a naturopathic doctor, who would be able to assist you both in terms of safety and in terms of implementing things properly and without causing a negative impact to stress hormones and muscle mass.

•NC

References

- 1 Felson, S. "What are ketones?" *WebMD*. · <https://www.webmd.com/diabetes/qa/what-are-ketones> · Reviewed 2018-11-12. · Accessed 2019-11-27.
- 2 Krikorian, R., et al. "Dietary Ketosis Enhances Memory in Mild Cognitive Impairment." *Neurobiology of Aging*, Vol. 33, No. 2 (2012): 425.e19–27.
- 3 Hasselbalch, S.G., et al. "Blood-brain Barrier Permeability of Glucose and Ketone Bodies During Short-Term Starvation in Humans." *The American Journal of Physiology*, Vol. 268, No. 6, Pt. 1 (1995): E1161–E1166.
- 4 Volek, J.S., et al. "Metabolic Characteristics of Keto-Adapted Ultra-Endurance Runners." *Metabolism*, Vol. 65, No. 3 (2016): 100–110.
- 5 Volek, J.S., et al. "Rethinking Fat as a Fuel for Endurance Exercise." *European Journal of Sport Science*, Vol. 15, No. 1 (2015): 13–20.
- 6 Sigler, M.H. "The Mechanism of the Natriuresis of Fasting." *The Journal of Clinical Investigation*, Vol. 55, No. 2 (1975): 377–387.