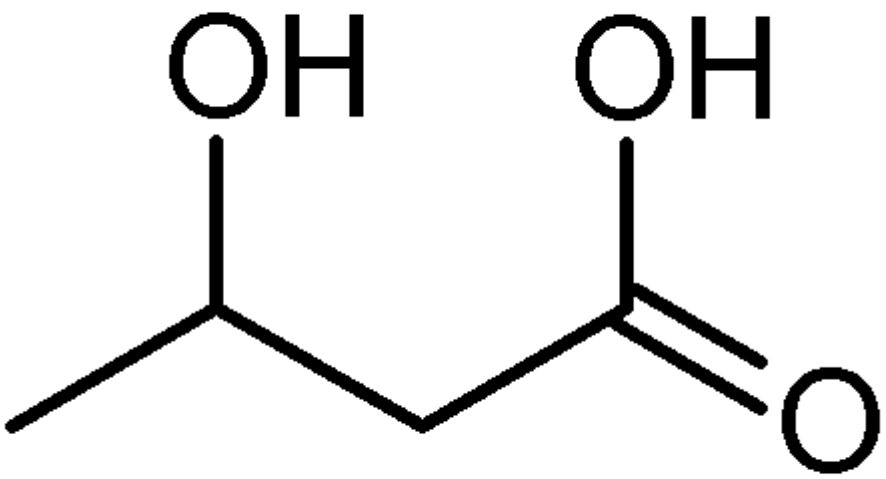

Ketone Supplements Extend Lifespan

Very Low Carbohydrate Ketogenic Diets

Eating a very low-carbohydrate diet results in the production of ketones, which the body uses as an alternative fuel source; hence very low-carbohydrate diets (VLCKD) diets are called ketogenic.

The liver makes ketones from fatty acids when glycogen (the storage form of carbohydrate) has been depleted, hence going without carbohydrates, or fasting altogether (for around 16 hours or more), ramps up ketone production, and it does this to spare glucose so that the brain can use it. While it’s been known for a long time that ketogenic diets have

therapeutic uses, such as for weight loss and in epilepsy, new research is showing the relation between ketones, longevity, and cancer.

Ketone supplements extend lifespan

The ketones, often referred to as ketone bodies, are beta hydroxybutyrate (BHB), acetoacetate, and acetone.

Ketogenic diets are therapeutic for several reasons, one of the most important being a decrease in levels of the hormone insulin. Low insulin allows fat to be released from fat (adipose) tissue, hence a ketogenic diet speeds weight loss.

One of the main benefits of ketogenic diets may be the production of ketone bodies themselves. Ketones mimic many of the changes that calorie restriction causes, and ketones have been found to extend lifespan in C. elegans.

Scientists believe ketones should also extend human lifespan.

Calorie restriction works via ketones

Calorie restriction as a method of extending lifespan in animals has been known or a long time, maybe 80 years or so, but the concept goes back much further. Luigi Cornaro

(1464-1566) sought the advice of physicians when he was in his 30s (placing the time at about 1500) when he was so sick that he felt he was going to die; Cornaro may have been diabetic. One of the doctors advised him to cut back his food intake radically, which he did, eating only one meal a day, including a half a bottle of wine. Cornaro returned to health, lived to over 100 years of age, and wrote about his experiences in his book, *On the Temperate Life*.

Since one of the physicians knew that cutting food meant better health, that knowledge must have been around long before Cornaro's time and passed down among physicians.

In modern times, scientists discovered that restricting rats' food by 10% or more made them live longer, contrary to expectations. It is counter-intuitive, as one might think that more food means the body can repair itself better, but that's not the case; excess food drives aging faster. Since calorie restriction (CR) is one of the very few interventions that extends lifespan, we'd like to know how it works. If we could discover that, we could intervene in other ways, for example with CR mimetics such as resveratrol.

Many theories have sought to explain CR, e.g.

- it results in less fat mass

- less oxidative stress and inflammation
- beneficial changes in the gut microbiome
- lower insulin, growth hormone, and IGF-1
- a lower metabolic rate
- less iron accumulation
- others.

But what may have escaped notice is that CR reliably produces ketones in virtually every species.

The production of ketone bodies could account for the life-extension effects of calorie restriction, at least in part.

Maybe just as important, exogenous ketones could extend human lifespan. No need for calorie restriction or very low carbohydrate ketogenic diets (VLCKD), although the benefits of a VLCKD likely go far beyond just the production of ketones.

Giving exogenous (from outside the body) ketones to rats decreases blood glucose and insulin. When rats were given 30% of their calories as corn starch, palm oil, or beta hydroxybutyrate (BHB, the most quantitatively important ketone body), those that got the ketones had about half the glucose and insulin levels of the group given starch. Their food intake also dropped by about half. The experiment lasted only 6 days, so no weight loss, which probably would have happened if it

had gone on longer.

MCT oil, which produces ketones in humans, results in better weight loss than an equal amount of olive oil.

Exogenous ketones may extend lifespan partially by lowering glucose and insulin. But they also increase antioxidant defense mechanisms.

As humans age, blood glucose and insulin increase, possibly as a result of decreased muscle mass and increased fat mass. Exogenous ketones (a ketone supplement) could improve these. Alzheimer's, which has lately come to be called type 3 diabetes, could possibly be treated with exogenous ketones. (Recall the well-known N=1 study in which a doctor treated her husband's Alzheimer's with coconut oil.)

Ketones can treat cancer

In mice who that had metastatic cancer, exogenous ketones increased survival time by 70%. That survival time was *independent of glucose level or calorie restriction.* This effect looks like a direct targeting of the Warburg effect, i.e. it's a treatment based on the metabolic theory of cancer.

Many people, even cancer patients, won't cut their carbohydrates to get into ketosis. Exogenous ketones could help.

For anti-aging purposes also, ketone supplements could work; MCT oil probably would as well. I regularly eat a very low carbohydrate diet, but even here, boosting ketones with a supplement might be advantageous.

Ketone supplements

I've tried KetoCaNa, a ketone supplement, and it works; killed my appetite when I took it. Currently, I occasionally use MCT oil, since it's a lot cheaper than exogenous ketones. You can put a tablespoon or more in your coffee in the morning instead of breakfast, get those ketones going. BTW, these are NOT raspberry ketones, which don't work.

PS: I devote a section to ketones in my latest book, Best Supplements for Men.

PPS: Check out my Supplements Buying Guide for Men.