

What Ketosis Can and Can't Do For Your Health and Longevity

6 MIN READ

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A new study found keto participants lost more fat in their liver. But they weren't eating piles of bacon and butter.

Given its focus on higher-fat foods, you might think that a keto diet would increase fat all over the body. But in **a small study published last month**, scientists from Washington University in St. Louis found that people on a ketogenic diet actually lost more fat in their livers than other dieters who lost weight with two other approaches.

In the study, scientists divided 42 obese dieters into three groups: One group ate a ketogenic diet, with just four percent of calories coming from carbs, and 73 percent from fats. Another group ate a traditional Mediterranean diet, with half carbs and 35 percent fat. And a third group ate a low-fat, plant-focused diet with 70 percent carbs, 15 percent fat.

After roughly five months on their respective diets, all three groups lost about 10 percent of their body weight and improved their insulin sensitivity. But the keto group reduced their liver fat by 67 percent, compared to 45 percent for the other two diet groups.

That matters for longevity because fat in the liver can kill you: When it's combined with another cardiometabolic risk factor (like, in this case, obesity) extra fat in the liver contributes to **metabolic dysfunction-associated steatotic liver disease (MASLD)**, formerly known as nonalcoholic fatty liver disease. In **one Swedish study** that analyzed data from more than 10,000 people, those with MASLD had a more than 75 percent higher risk of dying over the 14-year study period compared to those without fatty liver. The MASLD patients died of liver cancer, cardiovascular disease, and cirrhosis.

But before you load up your plate with bacon and butter, read on: the keto diet isn't a slam dunk for longevity, at least as far as human data is concerned, and it presents specific risks for certain populations. The diet's also hard to stick to, and what you *think* is a keto diet may not be a true ketogenic diet after all. (Hint: You may wind up eating too much protein.)

Here, we'll dive into the potential longevity benefits of keto, some common pitfalls, and long-life alternatives with expert guidance from:

• **Maura Fanti, PhD**, a gerontology researcher at the Longo Lab at the University of Southern California who has studied the impacts of different diets on longevity

• **Rima Kleiner, MS, RDN, LDN**, a registered dietitian and nutritionist at Smart Mouth Nutrition

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What Exactly Is Ketosis?

If you've seen keto recipes on Instagram or keto-friendly foods on your grocery store's shelves, but you're not *really* sure what *ketogenic* means, there's probably one thing you do know: It's a low-carb diet.

Ketogenic diets, which intentionally switch on this backup energy system, were **originally developed to treat epilepsy** in the 1920s, as a way to mimic the seizure-reducing effects of fasting. Exactly why they work is still debated, but shifting the brain away from glucose and toward ketones appears to make neurons less prone to the runaway firing behind seizures.

Over time, keto diets became increasingly popular as tools for weight loss. But before you jump on the bandwagon, it's important to understand what ketosis is: a

metabolic state in which your body switches from burning carbohydrates to burning fat as its main fuel.

“The body’s preferred, or primary, fuel source is glucose, which we get from carbohydrates. And when those carbohydrates are severely restricted to less than 50 grams or so, basically the body needs a backup fuel source because it’s not getting that glucose regularly, or in an adequate amount,” explains Kleiner. “So the body turns to stored fat.”

In this carb-starved state, **triglycerides from stored fat** are turned into free fatty acids. These are sent to the liver, where the fatty acids are turned into an energy source called ketone bodies, which the body and brain use as an alternative energy source.

When carbs get very scarce, through fasting, long bouts of exercise or a ketogenic diet, glucose reserves run low within a day or two and insulin levels fall. That means that entering and staying in true ketosis requires consistency if you want to

How Does Ketosis Impact Longevity?

In addition to weight loss and the liver fat results from last month’s study, there are also some preliminary study findings which suggest possible longevity benefits. Important to note: there’s no human lifespan data to prove that keto diets help people live longer.

That said, ketosis mimics some effects of fasting and calorie restriction, the most reliable lifespan extenders in animal research. The main ketone, beta-hydroxybutyrate, does more than supply fuel. In **lab studies** it acts as a signaling molecule that dampens inflammation and switches on cellular stress-resistance pathways linked to aging. Additionally:

“In **studies on rats and worms**, keto diets have been shown to reduce mortality.”

â?¢ In studies of humans, low-carb, high-fat ketogenic diets inhibit mTORC1, a protein complex involved in muscle protein synthesis; when this complex is suppressed, cardiovascular function is improved, as is cellular autophagy, a process by which old, dysfunctional cells are killed off and replaced.

â?¢ Keto diets have also helped reduce blood glucose levels in Type 2 diabetes patients more than other diets when an equal amount of weight is lost.

â?¢ And the production of ketone bodies may provide neuroprotective benefits on aging brain cells, enhancing the function of mitochondria in the brain.

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The Downsides of a Keto Diet, and the Case For Keto Cycling

Donâ??t throw your bread away just yet. Ketogenic diets also increase levels of oxidative stress, an imbalance of reactive oxygen species and antioxidants thatâ??s tied to diseases including Alzheimerâ??s, Parkinsonâ??s, cardiovascular disease, and cancer. And while it can lower triglyceride levels and increase HDL (the â??goodâ?• cholesterol), keto diets often increase

LDL cholesterol, the “bad” kind associated with cardiovascular risk.

It’s also worth considering what you lose when you cut out entire food groups—especially those as important as grains and fruits. Diets which have more carbohydrates and more plants, and with less meat consumption than we normally associate with ketogenic diets, have more robust evidence for longevity and healthspan, says Fanti.

There’s a case to be made that ketosis may be good for you in doses, but not as a permanent state. In a **2024 study in mice**, researchers at UT Health San Antonio found that a continuous ketogenic diet triggered a buildup of senescent cells, damaged “zombie” cells that stop dividing but linger and drive inflammation, in organs including the heart and kidneys. Mice that followed keto in cycles, with regular breaks to eat a normal diet, didn’t show that buildup at all.

A **separate 2025 mouse study** found that staying on keto long-term led to rising blood fats, poor blood sugar control and, in males, fatty liver. Notably, the blood sugar problems cleared up once the mice came off the diet. (It seems relevant, then, that the original fatty liver study followed only a six-month study period, with just five months of active weight loss and one more of maintenance.)

Meanwhile, some of the most promising longevity results come from studies that built in breaks. In a **2017 study from the Buck Institute**, mice that alternated a week on keto with a week off had lower midlife mortality and kept their memory sharper into old age. One theory is that the body benefits from the *switch* itself. Shifting into ketosis briefly activates stress-resistance and anti-inflammatory pathways, much like fasting or exercise, while returning to a normal diet lets the body recover before those benefits tip into strain. It’s a pattern familiar from longevity science: a short, manageable stress makes the body more resilient, while a constant one wears it down. The caveat is that this research has been done in mice, and no one yet knows the ideal rhythm for people, whether that’s alternating weeks, a few keto days a month or simply eating within a shorter daily window.

What You Think Of as Keto May Not Be Ketogenic After All

Depending on how a person eats keto, they may not actually be triggering ketosis, Fanti adds. Get it wrong, and you may actually be eating in a way that accelerates certain aging patterns and processes.

That's because ketosis doesn't simply mean restricting carbs. It also means eating a diet that's high in fat and relatively low in protein. (The classic ketogenic diet is just 6% protein, while more modern approaches bump the protein content up to 30-35% of calories.) Many people who try keto diets eat much more protein than that recommended amount, lowering the fat content.

That's a problem, since adherence is one of the toughest things about ketogenic diets, and eating too little fat may undermine it. In a **pair of studies** from the 1920s and 1930s intended to mimic the meat-only diet of the Inuit, scientists found that eating too much protein and not enough fat in the diet resulted in hunger; but when the diets had higher percentages of fat (75-85%), the diet was easier to stick to.

Our collaborators from Harvard did an epidemiological study in 2016 that correlates Type 2 diabetes risk to higher intakes of animal protein, Fanti says. Higher protein diets can **also trigger certain aging pathways**, she adds.

But the pendulum swings both ways. *Lower* protein diets appear to promote longevity, but also may leave people frail due to lost muscle, Fanti says. In places with exceptional longevity, people often eat less meat and protein. They may live a long time, but they're frail, she notes.

Fanti and her colleagues at USC and Harvard tested multiple diets in a mouse model to see if they could undo this frailty factor: **In a study published earlier this year**, they had some mice eat a keto diet, and some eat a diet based on the longest-lived people, but supplemented with methionine, an essential amino acid that's missing when a diet is mostly plant-based. Adding this amino reduced frailty and cardiometabolic risk markers; the mice on keto, on the other hand, gained fat mass.

Why did these mice gain fat, while mice in other studies (and the people in the Washington University study) lose it? This diet, unlike those, was *ad libitum*, meaning the mice could eat as much as they wanted. And that's important, Fanti says.

There are studies that show that [ketogenic] diets are very effective in extending lifespan only if the calories are restricted," she says. "We formulated a keto diet based on what humans normally follow."

The keto diet that people "normally" follow doesn't always match what was in the 2026 liver fat study, Kleiner says. In this study, participants were given all of their meals from the Washington University kitchens, and their keto fare wasn't the butter-bombs you'll see on Instagram: They had some treat-like foods, like pulled pork and an omelet with bacon and sausage, but they also had pecan-encrusted tilapia, and salmon with cauliflower or broccoli.

"Most people are not necessarily choosing those high-quality foods," Kleiner says. "You can go on a keto diet and eat those foods that aren't as nutrient-dense and lose weight, but that doesn't mean that the goal of overall health is there, and you're getting that benefit."

With so few carbs available to keto dieters, Kleiner says, they often opt for something they *want*, like a keto cookie, and skip nutrients their bodies need for longevity — especially fiber. **A 2025 study from *Nutrition and Metabolism*** that analyzed data from 10,000 Americans over 19 years found that those who ate more fiber were 20 percent less likely to die than those who ate less, and their risk of cardiovascular disease mortality was 39 percent lower.

Want to Try Keto? Follow This Dietitian's Five Tips

The results and side effects of keto diets vary from person to person, Kleiner says. Some people find themselves irritable or have trouble sticking to the plan, while others thrive. If you try keto and find yourself struggling, it's important not to think

of it as a personal failure, she says.

“A lot of people say it becomes tiresome eating the same foods, and they want to have more variety in their diet,” she says. “It’s not a matter of them failing.”

Unsure whether you’ll flail or flourish on keto? Kleiner offers these tips to the newly low-carbed:

☛ **Make sure it’s not contraindicated for you:** Certain people shouldn’t go on keto diets, Kleiner says. If you’ve got kidney disease or existing liver problems, the process of turning fat into ketones can put undue stress on these organs. The risk of increased LDL cholesterol can make it dangerous for people with existing cardiovascular disease factors. Keto also impacts your body’s insulin production, so people who are already taking insulin need to be careful. And women who are pregnant or breastfeeding may need carbs on board to help with baby’s development.

Before starting this diet, ask your doctor, especially if you’ve got any of the above conditions.

☛ **Choose high-quality foods:** When people start on keto, Kleiner says, they’re often excited that they can lose weight while eating what you might think of as “cheat” foods. But on the diets in research studies that show not just weight loss but improvements in metabolic health, dieters are eating “healthy” foods, just with fewer carbs and more focus on fat.

People who succeed with keto diets, she says, choose fiber-rich carbs and the “healthy” fats you’re used to seeing in Mediterranean diets: Fatty fish, olive oil, nuts, and seeds. If you’re choosing butter and bacon as your primary fat sources, she says, you may lose weight, but you’re losing the other nutrients you’d get from the more traditionally “healthy” options, too.

☛ **Actually count your carbs:** Many people who try keto without a specific plan, doctor, or dietitian wind up feeling “scared” about carbohydrates, Kleiner says.

They think they're more likely to enter ketosis if they eschew carbs completely. As a result, they not only miss out on energy, but on fiber and other key micronutrients for healthspan that come from vegetables and other carb sources.

According to the **Cleveland Clinic**, eating between 20 and 50 grams of carbohydrates each day will usually put you into a state of ketosis within two to four days. For some people it's a week, and things like age, activity level, sleep, stress, metabolism, and your diet before starting a keto diet can all factor in.

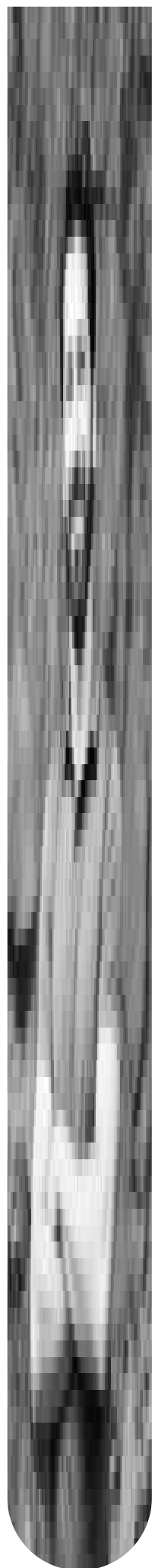
• **Eat adequate protein:** While the classic keto diet is extremely low in protein, more modern approaches include 30-35 percent of calories in the form of this nutrient, which can help maintain muscle. Make sure you're hitting this macronutrient goal, Kleiner says, while also keep your eye on quality. Diets that are high in red meat and highly processed meats, like sausages and hot dogs, are **associated with higher incidence of cancer**.

• **Be OK with quitting, or taking breaks:** Keto diets can be a good jumpstart for people, Kleiner says, and may improve metabolic health numbers like insulin and hemoglobin a1C. Some people who try the diet may find they enjoy this style of eating, and want to continue long-term. But for many others, keto diets are better used intermittently, paired with other high-quality nutritional plans that are easier to sustain.

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