

Top 14 Ket Ogenic Foods

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TOP 14 KETOGENIC FOODS

In case you haven't heard, there's a (not-so-new) diet craze that's winning the world over. It's called the Ketogenic Diet, and while it's recently experienced renewed interest and an explosive rebirth, it's been in practice for nearly a century. Scratch that, it's likely been in practice for *thousands* of years.

But what is the ketogenic diet? What can it do for you? How does it work? What foods can—and *can't*—you eat? Does it live up to the hype? Are there any disadvantages? Should you jump on the bandwagon?

What is the Ketogenic Diet?

The ketogenic diet is a very-low-carbohydrate, high-fat, adequate-protein dietary approach. In fact, it is more commonly referred to as a very-low-carbohydrate ketogenic diet (VLCKD).

We'll get into more specifics in a moment, but first a brief lesson in history. Don't worry, there won't be a quiz. Feel free to skip this section if you'd like. We think this background is downright fascinating. So, if you jump ahead, it's your loss, not ours.

The History of the Ketogenic Diet

As far back as 500BC, there is documentation of using fasting and diets that mimic fasting to treat epilepsy. Heck, there's even reference to it in the New Testament of the Bible. For instance, in the book of Mark, there's a story of Jesus curing an epileptic boy.

So, what does fasting and epilepsy have to do with the ketogenic diet? Great question!

Back in the early 1900s, a pair of French doctors were the first to document their use

of fasting to treat children and adults with epilepsy. They found that the starvation diets resulted in significant improvements—fewer seizures and those that they did experience were less severe.

In the 1920s in the United States, Dr. Hugh Conklin experienced a great deal of success using starvation as a treatment for epilepsy. Another pioneer ahead of his time was Bernarr Macfadden, who was a fitness guru and referred to by some as "the Father of Physical Culture." Macfadden authored a magazine, *Physical Culture*, where he suggested that any illness could be prevented or cured with a combination of exercise and diet, with an emphasis on periodic fasting. His rationale was that because so much of the body's energy goes into digesting food, if there's none to digest, more energy could be applied to recovering health.

Dr. Conklin and Macfadden ended up teaming up, and it was their work that drew the attention of endocrinologist Dr. Rawle Geyelin, who used their methods to treat epilepsy. Dr. Geyelin also noticed how fasting seemed to improve cognitive function. Harvard Drs. Stanley Cobb and W. G. Lennox attended one of Dr. Geyelin's presentations, and their interest was piqued by his success. Drs. Cobb and Lennox wanted to dig deeper and study what was happening. Why was starvation so effective?

They found that improvement usually took place after about 2-3 days of starvation. Even more importantly, they found that, around this time, there was a shift in the body's metabolism. More specifically, in the absence of carbs, the body was forced to shift into a full-fledged fat-burning mode.

Of course, there are problems with starvation. Compliance is obviously an issue. Oh yeah, then there's the finality of death.

Dr. Russell Wilder, at the Mayo Clinic, recognized that there was another way to get the body to "shift" into this state that mimicked fasting *without starvation*. Dr. Wilder created a "ketone-producing diet" as a treatment for epilepsy in 1924, and he proposed that it would be as effective as fasting. Not only that, it could be maintained for a much longer period of time. Dr. Wilder referred to this new diet as the "ketogenic diet."

Dr. Wilder's ketogenic diet was pretty straightforward. Patients consumed about 0.45

grams of protein per pound of body weight, and they were restricted to 10 - 15 GRAMS of carbohydrate per day. The rest of their food intake was from fat.

Despite its effectiveness, the ketogenic diet was gradually used less and less for this application. If you've guessed that "big pharma" played a role, you are right. However, around 2000, things changed substantially thanks to NBC's *Dateline*, which highlighted the ketogenic diet on a national level.

The TV program shared the true story of 2-year-old Charlie Abrahams, who had difficult-to-control epilepsy (despite using multiple medications). As a last resort, his parents turned to the ketogenic diet. It worked. Charlie became seizure- and drug-free within a month, and he hasn't had a seizure since. In 1994, his parents founded the Charlie Foundation, which is recognized as a global leader in promoting ketogenic therapies for people with epilepsy, other neurological disorders, select cancers, and various other health conditions.

For you movie buffs out there, Charlie's father Jim produced and directed the movie "...First Do No Harm" starring multiple award-winning actress Meryl Streep. The story, which is loosely based on the Abrahams' experiences with Charlie, is about a boy whose severe epilepsy, which is unresponsive to medications, is controlled by the ketogenic diet.

While that marked its resurgence on several levels, the ketogenic diet started gaining popularity as a weight-loss diet in the 1970s when Dr. Robert Atkins published a book titled *Dr. Atkins' Diet Revolution: The High-Calorie Way to Stay Thin Forever.* And while the rest of this article will focus on the application of the ketogenic diet in weight management and overall health, it's important to highlight that there's more and more scientific research evidence mounting suggesting the therapeutic potential of the ketogenic diet for:²

- Cancer
- Autism
- ALS
- Parkinson's
- Alzheimer's

- Traumatic Brain Injury
- Type 2 Diabetes (T2D)
- Metabolic Syndrome
- Polycystic Ovary Syndrome
- Acne

Why is it Called the Ketogenic Diet?

After a few days of fasting or several days of severe carbohydrate restriction (< 20 – 30 grams per day), the body's reserves of carbohydrate become depleted. This is important for a couple of reasons. First, under normal circumstances, the brain and central nervous system (CNS) use glucose for fuel.

Naturally, if carbohydrate is not available, then the body switches to fat for fuel. That's no problem considering that most of us have more than enough to spare, right? Wrong. The brain and CNS can't use fats for fuel. As a result, the body is forced to find an "alternative energy source."

The alternative energy source that the body creates is ketone bodies, or "ketones" for short. (If you're interested, there are three ketone bodies: acetoacetate, acetone, and beta-hydroxybutyrate.) The liver is responsible for producing ketone bodies, which it does from by-products of fat burning. This process of creating ketone bodies is called ketogenesis.

Ketones not only fuel the brain, they are used by skeletal and heart muscles. Not only are ketone bodies a critical "alternative" energy source, they are the most energy-efficient fuel, yielding more usable energy than glucose or fat.

Simply put, the ketogenic diet shifts the body's metabolism away from using and relying on carbs; rather, it results in a virtual complete shift toward fat burning. It's worth reiterating that there are two ways to upregulate ketogenesis: 1. Fasting; and 2. Severe carbohydrate restriction, which is synonymous with the ketogenic diet.

So, not only is the ketogenic diet a very-low-carbohydrate diet, metabolically speaking, it also mimics fasting. This is very important, and we'll come back to this.

How Do I Know I'm in Ketosis?

There are a few different ways that you can test whether or not you're in ketosis. If you're just experimenting with the ketogenic diet for the first time or you're "a numbers kinda guy or gal," these can be useful.

The most popular methods include:

- Urine strips
- Blood Ketone Meters
- Breath Ketone Analysis

Each of these tools is basically assessing your state of ketosis by testing for ketones in your pee, blood, and breath (more on this in a moment), respectively. Under normal non-ketogenic circumstances, the amount of ketones is very low. Research says you've hit "nutritional ketosis" when your ketone levels are between 0.5 - 8 (the unit of measure is mmol/L), and most people say that the "optimal" range is between 1 - 3.

What's really important, though, is finding what's optimal for YOU. And that can vary from person to person, and it can also take time to figure that out. But once you do, that's all that matters and measuring ketones is really not that relevant. When you've established a ketogenic state, you're likely to feel what many describe as a "euphoric" state on increased energy, mental clarity, and increased cognitive performance.

While numbers are cool—and important at times—it's really about finding your "keto zone."

Is it Effective for Weight Loss?

There's a never-ending debate about what's the "best" diet for weight loss. Purely from a weight-loss perspective, there is more than one way to skin a cat. That being said, there's no shortage of evidence clearly and convincingly showing that the ketogenic diet is a highly effective tool for weight management.

In a randomized controlled trial published in the journal *Endocrine*, researchers from

Spain found that obese participants following a ketogenic diet (VLCKD) for just two months lost nearly 30 pounds. During the same time, participants following a standard low-calorie diet lost just 10 ½ pounds. After 12 months, 88% of the folks in the VLCKD group had lost more than 10% of their initial starting weight and nearly 3 times more weight than the low-calorie group.³

Several well-controlled studies have shown similarly impressive results with the ketogenic diet. In one study published in *The American Journal of Clinical Nutrition*, researchers found that obese men following the ketogenic diet for 4 weeks lost nearly 14 pounds—46% better results than a group eating a "moderate" carbohydrate diet. Even more fascinating was that the men lost the weight without having to consciously restrict calories!⁴

Meanwhile, additional randomized controlled trials have shown that participants sticking to the ketogenic diet lose 2 – 3 times more weight than a typical low-fat or heart healthy diet.^{5,6}

Perhaps most striking are the results from two separate systematic reviews, which arguably represent the most critical assessment on the topic. In a meta-analysis of randomized controlled trials published in the *British Journal of Nutrition*, Brazilian researchers concluded, "Individuals assigned to a VLCKD achieve a greater weight loss than those assigned to a [conventional low-fat diet] in the long-term; hence, a VLCKD may be an alternative tool against obesity."

In a meta-analysis published in *The Lancet*, an esteemed panel of researchers from Harvard Medical School concluded, "In weight loss trials, higher-fat weight loss interventions led to significantly greater weight loss than low-fat interventions."

How Does It Work?

Clearly, when it comes to weight loss, the ketogenic diet works very effectively. So, how exactly *does* it work? Great question!

The answer is that it depends on who you ask. I know, how boring is that answer?

According to Italian researcher Dr. Antonio Paoli, who has published several studies

on the ketogenic diet, the most likely explanation for improved weight loss is appetite suppression.² Indeed, a recent review study published in the journal *Obesity Reviews* found that the ketogenic diet suppresses appetite, reduces hunger, increases satiety (feelings of fullness and satisfaction).⁹

Additional studies have shown that the ketogenic diet reduces levels of the "hunger hormone" ghrelin and increases levels of satiety hormones, such as CCK.¹⁰ It is thought that ketone bodies have direct appetite-suppressant properties.

This explanation is very important; in fact, it's arguably more important than a metabolic advantage. How many times have you dieted to lose fat only to lose the battle with uncontrollable hunger and cravings? If you're like most people, probably more often than not.

After all, under normal circumstances, when you follow a reduced-calorie diet and lose weight, your body fights back ferociously by increasing hunger hormones and reducing satiety hormones. In other words, your body is programmed to combat your best efforts by pushing you to overeat, especially high-calorie, tasty foods (i.e., "junk" foods).

Contrast that with the ketogenic diet, which has been shown to prevent an increase in appetite *despite* weight loss. In fact, a recent study published in the *International Journal of Obesity* showed that, like any diet, the early stages of the ketogenic diet can lead to increased hunger. However, after just a couple weeks, hunger is suppressed and appetite is regulated—despite continued weight loss. ¹¹ As you might have guessed, this has tremendous implications for long-term weight loss and weight maintenance.

What Other Health Benefits are Associated with the Ketogenic Diet?

Carbohydrate Management

Looking for a surefire way to improve glycemic control and metabolic function? Cut carbs.

Given the very nature of the ketogenic diet, it should come as no surprise it is a highly effective dietary strategy for folks who are carbohydrate intolerant. In fact, studies have shown that when carbohydrate intolerant individuals follow the ketogenic diet, the

"results have been nothing short of remarkable," including dramatic improvements in glycemic control, insulin sensitivity, and body weight.^{2,12,13}

For what it's worth, exercise, particularly resistance training, is also remarkably effective at improving carbohydrate metabolism and overall metabolic health. So, why not do them both? Studies combining weight lifting with the ketogenic diet result in impressive changes in body composition and strength.

Brain Health

Considering that the body is equipped to create ketones just so that it can fuel the brain, you may be wondering if the brain is actually designed and intended to run on this clean, efficient, alternative source of energy. In other words, are ketones the "preferred" source of fuel for the brain?

That's an interesting question, and there are certainly folks who believe that's the case. Experientially, many ketogenic dieters report better focus, less brain fog, and fewer energy crashes. And some studies have shown that the ketogenic diet improves cognitive performance.^{14,15} On top of that, research is accumulating showing that the ketogenic diet may be neuroprotective, helping preserve cognitive function.²

Heart Health

The ketogenic diet is very high in fat, so it *must* be "bad" for your heart, right? WRONG.

For starters, if you're still stuck in the mindset that fat is bad, particularly saturated fat, give me your hand. I'm going to pull you out of that deep, archaic rut. It's now well-established and widely accepted that saturated fat is *not* associated with heart-related issues and other adverse health outcomes.¹⁶

If you're wondering what is to blame, ironically, it's the exact foods that we've been told to replace saturated fats with: 1. Refined vegetable oils high in omega-6 fatty acids (e.g., replace butter with margarine); and 2. Refined carbohydrates and added sugars (e.g., low-fat processed foods).

Anywho, the ketogenic diet may improve heart health a number of ways. Like we've already mentioned, it's been well-established to decrease body fat and improve glycemic control and insulin sensitivity, all factors that influence cardiovascular health. On top of that, multiple studies have shown that VLCKD can help maintain blood lipids (e.g., cholesterol, triglycerides) and blood pressure in a healthy range.

In fact, comprehensive review studies show that the ketogenic diet has a more favorable impact on markers of cardiovascular health than the more commonly recommended low-fat diet.^{6,17–19} If you're shaking your head in disbelief, I am too. But maybe for a different reason. It is shocking, befuddling, and disappointing that the misguidance to eat low-fat and replace saturated fats with vegetable oils is still so pervasive.

Healthy Aging

With profound heart and brain health benefits, it's not a surprise that the ketogenic diet helps support healthy aging. After all, these are easily two of your most precious organs. You can't age healthfully and gracefully without them both in tip-top shape.

Beyond those benefits, the ketogenic diet has some very unique anti-aging properties that are often overshadowed by its weight-loss advantages. Even though you'll be eating on a ketogenic diet, you may recall that it, for all intents and purposes, simulates fasting.

Fasting and caloric restriction are regarded as the most effective ways to slow down the aging process.^{20,21} Like fasting and caloric restriction, the ketogenic diet upregulates important cellular processes, promoting stress resistance and autophagy, which essentially means "cellular cleaning" or "cellular detoxing."²² Pretty cool stuff!

While it can get a little complex, the ketogenic diet also acts similarly to caloric restriction and fasting by upregulating key coactivators, enzymes, and genes (such as PGC1α, AMPK, and SIRT-1).²² You don't have remember the alphabet soup. What's important is that these compounds have powerful anti-aging properties.

For instance, they can help increase the number of mitochondria (through a process known as mitochondrial biogenesis), which are known as the "powerhouses" of cells because they create energy. These compounds are also known as "exercise

mimetics."²³ In other words, activating them through the ketogenic diet may offer some of the same beneficial effects as endurance exercise.

One more thing to mention again is that ketones are a very clean, efficient source of energy. By that, I mean that your body can generate more cellular energy from ketones than glucose or fat. That also means that when your body metabolizes ketones, it generates much lower levels of oxidative stress. This is important because excessive levels of oxidative stress are associated with cellular aging and the aging of virtually every tissue in your body, including the brain, heart, joints, and more.

Athletic Performance

Recently, the ketogenic diet has strongly re-emerged as a tool to enhance sports performance many thanks to recent research, enthusiastic claims, testimonials, and perhaps most influential, social media.²⁴ I say "re-emerged" because, for years, scientists have tried, largely unsuccessfully, to prove that "fat loading" protocols like the ketogenic diet could enhance endurance performance.²⁵

It makes sense that a high-fat ketogenic diet would help fuel performance in longduration sports like running and cycling. After all, well-trained athletes can burn an enormous amount of fat during these types of exercise, and a metabolic adaptation to the ketogenic diet is shifting the body into burning fat and ketones exclusively.

However, the research is conflicting. Some studies have shown a clear performance benefit while others have shown no beneficial effect. Overall, it seems like the ketogenic diet doesn't necessarily impair performance, but it also doesn't seem to consistently improve endurance performance.^{24,26} There are several reasons why this may be the case, including poor study design. For example, it may take some athletes longer to adapt than others.

Because of the lack of carbohydrate, it is often speculated that the ketogenic diet results in poor performance in high-intensity activities. While that may be the case in certain instances, recent studies have shown that combining the ketogenic diet with weight lifting results in comparable (and in some cases, better) improvements in strength, power, and body composition as the typical Western diet.^{27–29}

So, the ketogenic diet may lead to improvements in sports performance and adaptations to exercise training. Like any dietary approach, if you choose to give the ketogenic diet a shot, make sure you're consistent and stick with it!

Are There Any Disadvantages to the Ketogenic Diet?

Like any dietary approach, there are some potential downsides to the ketogenic diet. That's right, as exciting and alluring as the prospective benefits may be, the ketogenic diet may not be for you. Having said that, there are a few issues to consider:

- Limited food choices. If we haven't already made it abundantly clear, the ketogenic diet severely restricts carbohydrates. We're talking about a measly 20 grams or so per day. Essentially, the only carbs that you'll be eating are from green veggies, nuts, and seeds. You can still eat a bunch of tasty foods on the ketogenic diet; however, just recognize that by eliminating a whole macronutrient category (carbs), your menu options will be limited. The good news is that since keto is becoming more and more popular, more and more people are sharing delicious recipes online and through social media. You'll be shocked by the tasty meals, snacks, and desserts that are out there; you may not even miss your carbs!
- **Keto breath.** One of the by-products of being in the state of ketosis is "keto breath," which range from mildly sweet and fruity to a chemical smell (like nail polish). This is a direct result of elevation of ketones—in particular, the ketone body acetone. In fact, breath levels of acetone are thought to be both an indicator of ketosis and rate of fat loss. 30 As you might have imagined, it's not uncommon for your urine, which will also contain ketones, to have a fruity smell when you're following the ketogenic diet.
- Athletic and exercise performance. As mentioned above, it's not uncommon for some folks to experience a short-term decrease in performance—whether that's on the field or court or at the gym—when starting the ketogenic diet. This is usually transient, and many report improved performance over the long haul. With that in mind, if you notice your performance slipping in the early stages, stick with it! Also, make sure that you're consuming enough fat. Often, when going keto, athletes drop carbs (and even lower their protein intake a bit) but don't make up for it by ramping up their fat intake high enough, which can mean

impaired performance.

Adaptation period. Like anything in life, with change comes growing pains. As you shift to a fat-burning machine, there are many changes going on in your body. Along those lines, it's not uncommon for some folks to experience a little discomfort when first going keto, including lower energy levels and some brain fog. Fear not, my friend, this too shall pass. That said, when people are eating enough fat, not overeating protein, drinking plenty of water, and making sure they're getting enough electrolytes, this doesn't seem to be a problem. If you're exercising regularly, which we strongly recommend, then you should be getting 3 – 5 g/day of sodium and 2 – 3 g/day of potassium.³¹

What Does the Ketogenic Diet Look Like?

Remember, the ketogenic diet is a very-low-carbohydrate, high-fat, adequate-protein dietary approach. Traditionally, ketogenic diets are:

- Very high in fat (~70 80% of calories)
- Very low in carbohydrate (~5% of calories or ≤ 30 grams per day)
- Adequate in protein (~ 15 20% of calories)

What does that translate to? Here's what the ketogenic diet would look like on a traditional 2,000-calorie diet:

- 165 grams of fat (75% of calories)
- < 30 grams of carbohydrate (5% of calories)
- 100 grams of protein (20% of calories)

Now, if math isn't your thing or you simply want more personalized results, then your best bet is to head over to Ketogenic.com and use the nifty Keto Calculator, which provides you a complete breakdown of fats, protein, and carbs based on your height, weight, age, sex, activity level, and goal.

For instance, according to the Keto Calculator, a 6-foot, 200-pound, 40-year-old male who's moderately active and is looking to drop weight would eat:

- 2,118 calories
- 165g of fat
- 132g of protein
- 26g of carbs

Meanwhile, a 5-foot, 6-inch, 160-pound, 50-year-old female who's lightly active and wants to lose weight would eat:

- 1,373 calories
- 107g of fat
- 86g of protein
- 17g of carbs

There are many factors that go into determining what the "best" caloric intake is for an individual, such as goals, age, body composition, weight, activity level, and more. Even the most reliable and scientifically-validating methods have a margin of error. In other words, any calculator that you use is simply meant to be a guide. At the end of the day, week, and month, just ask yourself a simple question: "How's that working for you?"

Our good friends at Precision Nutrition have teamed up with the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) and the National Institutes of Health (NIH) to put together a weight loss calculator that factors in how your metabolism really works to predict how long it'll take to reach a particular weight loss goal.

If you're interested, check out Precision Nutrition's Weight Loss Calculator. Based on recommended caloric intake, you can then use the percentages above to figure out how much fat, protein, and carbohydrate you should be eating daily to achieve your target while maintaining a ketogenic lifestyle.

One final word on caloric intake. While daily calorie restriction is most common for weight loss, all that matters is that, on average, you're eating fewer calories than you burn. If you'd rather eat a little more some days and a little less on others, that's fine and usually equally effective. In fact, some take this to a bit more of an extreme through some sort of intermittent fasting. For example, you might eat 25% of your daily target one day and 125% the next. Research has shown that this pattern of eating—called

alternate-day fasting—is just as effective for weight loss and improving health as daily calorie restriction.³²

What ISN'T the Ketogenic Diet?

The ketogenic diet is NOT a typical low-carbohydrate diet. In fact, VLCKD are distinct from other diets that restrict carbohydrate, which are unlikely to be ketogenic and are typically defined as:³³

- "Low-carbohydrate" diets contain less than 130 grams of carbs per day or 26% of the energy from a 2,000-calorie diet.
- "Moderate-carbohydrate" diets provide between 26 45% of calories from carbohydrate.

The ketogenic diet is NOT a high-protein diet. A true ketogenic diet provides moderate amounts of protein. In fact, consuming too much protein may impair ketogenesis. Whether it's through the process of converting excess protein to carbs (gluconeogenesis) or simply burning it for energy (prioritizing amino acids over fats), extra protein can reduce the body's need to produce ketones.

What types of foods can you eat on a ketogenic diet?

Like any diet, the ketogenic diet is not about a specific food; it's about your entire body of work. In other words, rather than a single food or meal, it's important that you consistently meet your goals for fat, protein, and carb intake in order to get into ketosis and reap the potential benefits.

Given the constraints of keto, I'll give you two guesses as to which types of foods you'll find in the following list. If you guessed fat and **more fat,** then you'd be right on point. If you guessed carbs and more carbs, then it's obvious that I'm a terrible writer.

All kidding aside, fat-dense foods provide the foundation of the ketogenic diet. Proteinrich foods are also a staple of keto; however, it's important to remember that the ketogenic diet is not a high-protein diet. In fact, too much protein can keep you from getting into or staying in ketosis. Finally, it's kind of a misnomer to say that there are "ketogenic foods." While there are some foods that lend themselves very well to the ketogenic diet (due to their fat content), there are very few foods that directly contribute to a ketogenic state.

Having said all that, it's time to go keto!

1. Coconut Oil

If there *was* one ketogenic food, it would be coconut. While coconut oil is made up mostly of saturated fats (over 90%), as much as 70% of them are a special type of fat called medium chain triglycerides (MCTs). You see, unlike long chain fatty acids (LCFAs), which are the more common fats found in foods, MCTs are easily burned for energy and are far less likely to be stored as fat.³⁴

MCTs are considered "functional" fats, and they have been shown to lower body weight, improve markers of metabolic health, reduce belly fat, and improve insulin sensitivity.³⁵ In other words, all fats are not created equally, and coconut oil is a very rich source of this unique, health-promoting saturated fat.

What's particularly interesting about MCTs is that they are easily absorbed and metabolized by the liver, where they are readily converted to ketone bodies. Now you can see how coconut oil may actually be a ketogenic food. MCTs have been shown to boost metabolism, and they have also been shown to suppress appetite, an effect that's likely due to their conversion to ketones.

Not surprisingly, coconut oil and MCTs have been shown to promote weight loss. In one study, a group of Brazilian researchers found that women who consumed two tablespoons of coconut oil per day for 12 weeks while following a reduced-calorie diet and including daily exercise lost significantly more belly fat compared to the placebo group (i.e., diet and exercise alone).³⁶ In another study, researchers from Malaysia found that men who added 2 tablespoons of coconut oil to their normal diets for 4 weeks significantly reduced belly fat.³⁷

Meanwhile, several trials have shown that supplementing the diet with MCTs (like those found in coconut oil) leads to greater weight loss and reductions in belly fat than

other fats (e.g., olive oil, soybean oil, canola oil, and corn oil). This is likely due to the beneficial effects of MCTs on metabolic rate, fat burning, and appetite.^{38–42}

2. Avocados

With right around 80% of calories from fat, avocados are another near-perfect food for ketogenic dieters. While one-half an avocado contains about 8 grams of carbs, nearly all of them (6 grams) are fiber, which are indigestible.

That brings up an important point when it comes to the ketogenic diet. Generally speaking, most keto resources suggest that you count "net" or "usable" carbs toward your total daily allotment. In other words, indigestible carbs (such as insoluble fiber) don't count. So, when you're counting carbs, make sure you subtract indigestible carbs from the total carb count.

In this example, one-half an avocado contains 8 grams of total carbs and 6 grams of dietary fiber. So, one-half an avocado contains just 2 grams of net carbs.

Avocados are also very nutrient-dense containing upwards of 20 essential nutrients, including vitamin K, folate, vitamin B6, vitamin C, vitamin E, pantothenic acid, riboflavin, and niacin. Avocados are a great source of potassium, which is a very important mineral to consume on the ketogenic diet. In fact, active people should take in about 2-3 grams of potassium per day.³¹ One-half an avocado gets you almost 25% of the way there, providing just under 500mg.

3. Olive Oil

As a pure source of fat, olive oil is another staple of the ketogenic diet. But olive oil doesn't provide just any type of fat. It's bursting with heart-healthy monounsaturated fats and antioxidants. For instance, olive oil contains the polyphenol oleocanthal, which has been shown to promote a healthy inflammatory response.

Olive oil is perhaps best known as a staple of the Mediterranean diet, which has been shown to be an effective tool for promoting heart health, improving carbohydrate management, maintaining healthy blood pressure, improved cognitive function,

and promoting weight management. While it may come as somewhat of a surprise, Mediterranean-style diets typically provide up to 37 - 40% of total calorie intake from fat—up to 50% of which comes from monounsaturated fats (predominantly extra virgin olive oil).⁴³

In an interesting study, researchers tested a "Mediterranean style" ketogenic diet (MED-KETO), which stuck to the high-fat, very-low-carbohydrate nature of keto while maintaining some advantages of the Mediterranean diet, such as the liberal use of olive oil and some green vegetables.⁴⁴ After 6 weeks, the MED-KETO diet led to significant weight loss, improvements in markers of heart health, and reduced weight circumference.

Olive oil is a great choice as a base for homemade salad dressings, drizzling on green vegetables, low-heat cooking, and for homemade mayonnaise. Speaking of which...

4. Mayo

Mayo, which is essentially pure fat, is another food that is well-suited for the ketogenic diet. This often comes as a relief to many. After all, mayo is America's favorite condiment. Believe it or not, according to a recent in-depth analysis, mayonnaise sales more than double that of ketchup (\$2 billion versus \$800 million).⁴⁵

That said, nearly all store-bought mayo, which is made with soybean oil, is garbage. This is a problem because cheap, inferior refined vegetable oils, such as soybean oil, are packed with omega-6 fats. Overconsumption of omega-6 fats promotes inflammation, particularly when they are consumed in excess of omega-3 fats, which are considered to have an anti-inflammatory effect.⁴⁶

With that in mind, you have two better options when it comes to mayo. One, make your own at home using olive oil or avocado oil. In its simplest form, mayonnaise is a combination of oil, egg yolk (an emulsifying agent), and either vinegar or lemon juice. Your second option is to look for mayo at the store that is made only with a healthy oil, such as olive or avocado oil—no soybean, canola, or other junk oil. Our favorite is, hands down, Primal Kitchen Mayo, which is made with avocado oil and eggs from pasture-raised hens. They even have a Chipotle-flavored mayo. Yum!

5. Nuts and Seeds

Nuts and seeds are high-fat and (in most cases) low in carbs, making them great foods for the ketogenic diet. In general, nuts and seeds are rich in monounsaturated fats, essential fats, magnesium, zinc, folate, vitamin E, and other important micronutrients.

Here's a complete list of nuts and seeds, including calories and net carbs from Ketogenic Diet Resource:

Nuts and Seeds, dry roasted without salt, 1 ounce	Calories	Carb grams	Fiber grams	Net Carb	Protein grams
Almonds	161	6	3.1	2.9	6
Brazil Nuts	184	3.4	2.1	1.3	4
Cashews	155	9.3	0.9	8.4	4.3
Chestnuts, European	60	15	1.4	13.6	.9
Chia Seeds	139	12.4	10.7	1.7	4
Coconut, dried and unsweetened	185	6.6	4.6	2	2
Flax Seeds	150	8.1	7.6	.5	5
Hazelnuts	176	5	2.7	2.3	4
Madadamia Nuts	201	4	2.4	1.5	2
Peanuts (actually a legume)	166	6.1	2.3	3.8	6.7
Pecans	193	3.8	2.7	1.1	2.7
Pine Nuts	188	3.7	1	2.7	3.8
Pistachios	156	7.8	2.9	5.8	6
Pumpkin Seeds	163	4	1.8	2.2	8.5
Sacha Inchi Seeds (Inca peanut)	190	2.8	.6	2.2	9.4
Sesame Seeds	161	7.4	4.8	2.6	4.8
Sunflower Seeds	165	6.8	3.1	3.7	5.5
Walnuts	183	3.8	1.9	1.9	7

As you can see, you may want to be careful with certain nuts, such as chestnuts, cashews, and pistachios, which are higher in net carbs.

Studies show that folks who regularly eat nuts and seeds have lower body weights. And despite being calorie-dense, research shows that nut consumption doesn't lead to weight gain; in fact, most studies show that they lead to weight loss.

What you may not know is that the body does not efficiently absorb all the fat and calories from nuts and seeds. Instead, studies have shown that the body excretes up to 18% of the calories from nuts.⁴⁷ Eating nuts and seeds increases the release of important appetite-suppressing hormones, and believe it or not, the simple action of crunching and chewing on nuts and seeds can send signals of fullness to your body.

6. Butter, Ghee, Heavy Cream, and Sour Cream

Butter, ghee, and cream are all high in fat and low in carbs, making them keto-friendly. What about the saturated fat? What about it?

Remember what we mentioned above: It's now well-established and widely accepted that saturated fat is not associated with heart-related issues and other adverse health outcomes.¹⁶

What's even more interesting is that more and more studies are showing that dairy, especially full-fat dairy, is related to less belly fat and better markers of cardiometabolic health, including blood pressure, cholesterol, triglycerides, and glycemic control. Not only that, researchers believe that these better health outcomes may actually be brought on, at least in part, by dairy saturated fats.⁴⁸

Shocking, I know. When you're ready, go ahead and pick your jaw up off the floor. Add that cream to your coffee. Add some butter to your veggies. But when you do, just make sure that you choose butter and cream from organic, pasture-raised cows. Compared to conventional milk, research shows that organic milk contains significantly more omega-3 fats (over 50% more) and over 40% more conjugated linoleic acid (CLA).⁴⁹ CLA has been shown to reduce body fat (including belly fat), boost immunity, and promote a healthy inflammatory response.⁵⁰

Like coconut oil, dairy fat (which you'll be getting plenty of from these foods) is a natural source of MCTs.⁵¹ Remember, MCTs are quickly burned off as energy, and they're highly unlikely to be stored as fat. Even more, the body can readily convert MCTs to ketone bodies in the liver, making butter and cream even more attractive foods for a ketogenic lifestyle.

Lastly, butter is the best dietary source of butyric acid, also referred to as butyrate, which has numerous health benefits.⁵² For instance, butyrate (which is also produced when healthy gut bacteria ferment dietary fibers) serves as a major source of fuel for the immune cells in the gut. Also, butyrate stimulates the body to release key appetite-suppressing hormones, and butyrate may even help protect the brain.

Simply put, butter is back, baby!

7. Full-Fat Cheese, Greek Yogurt, and Cottage Cheese

Basically, everything that was mentioned above applies to full-fat cheese, full-fat Greek yogurt, and full-fat cottage cheese. Notice the emphasis on "full-fat." Since you're going to need to be eating a lot of fat, you'll not want to skimp by going with low-fat or skim dairy products.

And why would you want to? Remember, people who eat more full-fat dairy, such as cheese and yogurt, have been shown to have healthier body weights and carry less belly fat.⁵³ Also, when you choose organic, full-fat dairy from pasture-raised cows, you'll get the additional benefits of healthier fats, such as more omega-3s and CLA.

Then there's the bonus of MCTs and short-chain fatty acids, like butyrate, that support gut health and immune function.⁵⁴

That being said, be careful with these foods, particularly yogurt and cottage cheese. While they're very good sources of protein, remember that the ketogenic diet is not a high-protein diet; it's a moderate-protein diet, so you don't want to go overboard.

Also, yogurt and cottage cheese also contain carbs. As we've mentioned several times, the number one rule of the keto club is don't talk about the keto club. All kidding aside, the number one rule of the ketogenic diet is keep carbs to a bare minimum. A half-cup serving of full-fat Greek yogurt contains about 5 grams of carbs (and 14 grams of protein) while a half-cup serving of full-fat cottage cheese contains about 4 grams of carbs (and 13 grams of protein).

And it should go without saying that you should only choose plain versions of Greek

yogurt and cottage cheese. None of the flavored or fruit-on-the-bottom garbage with added sugars.

8. Eggs

Eggs have been touted as "nature's perfect food," "one of the healthiest foods on the planet," "nature's multivitamin," and most simply, "incredible!" You can add to that list "one of a ketogenic dieter's best friends." Eggs contain virtually zero carbs, and they contain healthy fats, and they are a good source of high-quality protein.

Eggs are also packed with a variety of vitamins and minerals. They also contain some "bonus" nutrients, including choline, lutein, and zeaxanthin. These nutrients boost brain health and cognitive function, eye health and vision, and heart health. For example, choline has been shown to boost the body's production of brain-derived neurotrophic factor (BDNF), which is a very important growth factor for the brain and central nervous system, and it plays a key role in cognitive function, mood, and mental health.

Meanwhile, lutein and zeaxanthin have been referred to as "natural sunglasses" due to their ability to shield the eyes from potentially damaging UV rays. Speaking of which, lutein has also been shown to act as a "natural sunscreen," protecting the skin in a similar fashion.⁵⁵

When you go shopping for eggs, have you ever asked, "What did the chickens eat?" You should. After all, the ol' saying, "you are what you eat," applies to animals too. Just like dairy, it's best to choose eggs from pasture-raised hens, which have been shown to have $2\frac{1}{2}$ times more omega-3 fats and less than half the ratio of omega-6 to omega-3 fats as conventional eggs.⁵⁶

9. Bacon

You probably saw this one coming from a mile away. Bacon is a good fit for the ketogenic lifestyle because it is moderate in both fat and protein.

There are a couple things to watch for when it comes to choosing bacon, so you'll want to read the nutrition labels carefully. For instance, store-bought bacon is often cured with

sugar. It's not necessarily a lot of sugar, but since you'll be watching your carbs very closely, you'll want to avoid unnecessary, added sources such as this.

Go ahead, have bacon with your eggs. Put a couple slices of bacon on a burger with cheese. Just don't go hog wild—cheesy pun intended...and there's another one. There are better sources of fat, and you'll want to make sure that you balance your fats overall, getting a good mix of saturated, monounsaturated, and polyunsaturated fats. You'll be able to do that by choosing a variety of foods from our list.

10. Cold-water Fatty Fish

Cold-water fatty fish are the best dietary sources of the all-important omega-3 fatty acids DHA and EPA, which are well-known for supporting:

- Heart health^{57–59}
- Brain health, cognitive function, and mood^{60–65}
- Eye health and vision^{66–68}
- Skin health^{69,70}
- Immune function⁷¹
- Metabolic function and body composition^{72–74}
- Promoting a healthy inflammatory response⁷⁵

Recent research has shown that DHA and EPA may also have anti-aging properties. In fact, diets rich in these omega-3s can protect, and in some cases, lengthen telomeres, which are a key marker of aging (longer is better). Even more, research shows that supplementation with EPA and DHA increases the activity of telomerase, which is an enzyme that maintains, lengthens, and restores telomeres.^{76–78}

Pretty cool stuff, right?

At a minimum, it's a good idea to eat fatty fish at least twice a week. ⁷⁹ Here are some of our favorite cold-water fatty fish:

- Anchovies
- Sardines

- Herring
- Salmon
- Mackerel

Oysters are also a great source of DHA and EPA, but believe it or not, they contain carbs.

11. Beef

Beef is a staple of the ketogenic diet. That said, if you've been conditioned to go for leaner cuts of meat, now's the time to choose fattier cuts. For instance, instead of lean ground beef or ground sirloin, choose 80/20 or 85/15 ground beef.

Beef is far more than fat and protein, however; it's packed with a bunch of vitamins and minerals, including vitamins B12 and B6, selenium, zinc, niacin, choline, iron, and riboflavin. B12 energizes the brain and plays a key role in eliminating potential neurotoxic compounds (homocysteine) that can negatively affect brain health and cognitive function.

Just like eggs and dairy, when you buy meat, it's a good idea to get the best quality that you can afford. You see, meat from organic pasture-raised animals contains about 50% more omega-3 fatty acids than conventional meat products.⁸⁰ And while all beef contains CLA, grass-fed beef has been shown to contain considerably more.⁸¹ That's a bonus if you're looking to drop fat and tone up.

12. Poultry

Like beef, poultry, especially fattier cuts like thighs and legs, is a staple of the ketogenic diet. Like beef, eggs, and dairy, it's a good idea to invest in the highest quality poultry that you can afford. Just like the nutritional content of eggs is influenced by the hen's diet, the meat is as well. In other words, pasture-raised chicken is going to have a slightly healthier nutritional profile than chicken from conventional birds.

Like beef, poultry is more than fat and protein. For instance, chicken also provides vitamins B3, B6, and B12, selenium, phosphorus, and pantothenic acid. Chicken is also

a good source of choline. Like B12, choline plays an important role in helping the body neutralize potentially toxic compounds that are linked to poor cognitive function and declining brain health.

Another advantage of poultry is that it's incredibly diverse, and you'll find a ton of delicious keto recipes including chicken. Seriously, there are hundreds of them from stuffed chicken to bacon-wrapped chicken to jerk chicken to chicken pot pie and more!

13. Coffee

Coffee is low-carb, so it's a natural fit for the ketogenic diet. You'll just want to avoid adding carbs in the form of sugar. However, you can add heavy cream, coconut oil, or even butter if that's your cup of tea...or coffee. Speaking of tea, that's keto-approved too. Despite an undeserved bad reputation in certain circles, coffee is associated with numerous health benefits. For instance, regular coffee consumption is associated with reduced risk of type 2 diabetes and certain neurodegenerative diseases, such as Alzheimer's and Parkinson's. Coffee consumption is also associated with reduced risk of cardiovascular disease.

Along with coffee comes caffeine, which helps boost metabolism, increase alertness, boost energy levels, improve mental and physical performance, make physically demanding tasks seem easier, and more. It should go without saying, however, that you need to pay attention to your caffeine tolerance. Some people are slow caffeine metabolizers, and the downside (e.g., jitters) outweigh the potential benefits.

14. Berries

Berries? We don't need no stinkin' berries! Generally speaking, it's a good idea to avoid carb-containing foods like fruits, starchy vegetables, grains, and legumes when following the ketogenic diet. However, once adapted to the ketogenic diet, which may take weeks (and for some folks, months), then many find that they can include small amounts of certain carb-containing foods while still maintaining ketosis.

Berries are well-known for their many potential health benefits. They're packed with dark-colored polyphenols that serve as powerful antioxidants that can also help promote

a healthy inflammatory response. Among fruits, they have a relatively low amount of net carbs, so they are typically the first to be introduced.

Here's a summary of net carbs per 100-gram serving (3 ½ ounces) of some popular berries:

Per 100g (3.5 oz)	Total carbs (g)	Fibre (g)	Net Carbs (g)	Calories
Blackberries	10	5	5	43
Strawberries	8	2	6	33
Raspberries	12	6	6	53
Gooseberries	10	4	6	44
Currants (red and white)	14	4	10	56
Blueberries	14	3	11	57
Cherries (sweet)	16	2	14	63

Putting It All Together

Now that you have a handle on the ketogenic diet, you might be wondering what a "day

in the life of keto" might look like. So, we thought we'd share some meal ideas. Just remember, there are tons of great keto resources and delicious recipes. For instance, check out our blog where we will be posting great-tasting keto recipes, and also check out Ketogenic.com, which is a premier resource for all things keto.

[Note that these are just some general meal ideas. You can adjust portions of food to meet your macronutrient and calorie needs.]

Breakfast:

- Scrambled eggs with heavy cream and onions and bacon
- Omelet with avocado, peppers, onions, and ground beef
- Full-fat Greek yogurt with chia seeds
- Breakfast sausage with a hard-boiled egg, asparagus, and butter

Lunch:

- · Chicken thigh on mixed greens salad with olive oil and vinegar
- Baked salmon with cauliflower sautéed in butter and a mixed greens salad with feta cheese and olive oil vinaigrette

Hamburger patty with cheese and bacon and roasted zucchini squash

Dinner:

- Ribeye with mushroom cream sauce and broccoli
- Pulled pork with shredded cabbage (mixed with mayo) and greens salad
- Chicken thighs with pesto and cream cheese and roasted asparagus

Snacks

- Avocados (e.g., celery sticks with guacamole)
- Nuts and seeds
- Full-fat cheese
- Hard-boiled eggs
- Dehydrated meat, poultry, or fish (i.e., jerky)

For meals, the simplest advice is this:

- Choose one of the protein sources we listed above.
- Top with one (or more) of the fats that we listed above.
- Add a vegetable(s), such as dark green leafy veggies, cruciferous veggies (like broccoli, cauliflower, Brussels sprouts, cabbage, etc.), asparagus, cucumbers, celery, mushrooms, and zucchini.

Bring Home the Bacon

Now you're ready to join the legions who've gone keto. You've got all the information and resources you need to get started with the ketogenic diet, including the top foods to make sure you're successful. Remember, the ketogenic diet is a high-fat, very-low-carbohydrate diet. When in doubt, eat more fat!

We'd love to hear more about your experiences with the ketogenic diet, and if you have any questions, please come visit us on our BioTrust Blog. While you're there, check out some of our keto recipes.

One last thing...the ketogenic diet can be a very, very powerful tool that can help people live longer, healthier lives. We highly encourage you to share this valuable information with the people who matter most to you. It can be a game-changer!

References:

- Wheless JW. History of the ketogenic diet. *Epilepsia*. 2008;49 Suppl 8:3-5. doi:10.1111/j.1528-1167.2008.01821.x.
- Paoli A, Rubini A, Volek JS, Grimaldi KA. Beyond weight loss: a review of the therapeutic uses of very-low-carbohydrate (ketogenic) diets. *Eur J Clin Nutr.* 2013;67(8):789-796. doi:10.1038/ejcn.2013.116.
- 3. Moreno B, Bellido D, Sajoux I, et al. Comparison of a very low-calorie-ketogenic diet with a standard low-calorie diet in the treatment of obesity. *Endocrine*. 2014;47(3):793-805. doi:10.1007/s12020-014-0192-3.
- 4. Johnstone AM, Horgan GW, Murison SD, Bremner DM, Lobley GE. Effects of a high-protein ketogenic diet on hunger, appetite, and weight loss in obese men feeding ad libitum. *Am J Clin Nutr.* 2008;87(1):44-55.
- Dyson PA, Beatty S, Matthews DR. A low-carbohydrate diet is more effective in reducing body weight than healthy eating in both diabetic and non-diabetic subjects. *Diabet Med J Br Diabet Assoc.* 2007;24(12):1430-1435. doi:10.1111/ j.1464-5491.2007.02290.x.
- 6. Brehm BJ, Seeley RJ, Daniels SR, D'Alessio DA. A randomized trial comparing a very low carbohydrate diet and a calorie-restricted low fat diet on body weight and cardiovascular risk factors in healthy women. *J Clin Endocrinol Metab*. 2003;88(4):1617-1623. doi:10.1210/jc.2002-021480.
- 7. Bueno NB, de Melo ISV, de Oliveira SL, da Rocha Ataide T. Very-low-carbohydrate ketogenic diet v. low-fat diet for long-term weight loss: a meta-analysis of randomised controlled trials. *Br J Nutr.* 2013;110(7):1178-1187. doi:10.1017/S0007114513000548.
- 8. Tobias DK, Chen M, Manson JE, Ludwig DS, Willett W, Hu FB. Effect of low-fat diet interventions versus other diet interventions on long-term weight change in adults: a systematic review and meta-analysis. *Lancet Diabetes Endocrinol*. 2015;3(12):968-979. doi:10.1016/S2213-8587(15)00367-8.
- 9. Gibson AA, Seimon RV, Lee CMY, et al. Do ketogenic diets really suppress appetite? A systematic review and meta-analysis. *Obes Rev Off J Int Assoc Study Obes*. 2015;16(1):64-76. doi:10.1111/obr.12230.

- Paoli A, Bosco G, Camporesi EM, Mangar D. Ketosis, ketogenic diet and food intake control: a complex relationship. *Front Psychol.* 2015;6. doi:10.3389/ fpsyg.2015.00027.
- 11. Nymo S, Coutinho SR, Jørgensen J, et al. Timeline of changes in appetite during weight loss with a ketogenic diet. *Int J Obes 2005*. April 2017. doi:10.1038/ijo.2017.96.
- 12. Yancy WS, Foy M, Chalecki AM, Vernon MC, Westman EC. A low-carbohydrate, ketogenic diet to treat type 2 diabetes. *Nutr Metab.* 2005;2:34. doi:10.1186/1743-7075-2-34.
- 13. Feinman RD, Pogozelski WK, Astrup A, et al. Dietary carbohydrate restriction as the first approach in diabetes management: Critical review and evidence base. *Nutrition*. 2015;31(1):1-13. doi:10.1016/j.nut.2014.06.011.
- Murray AJ, Knight NS, Cole MA, et al. Novel ketone diet enhances physical and cognitive performance. FASEB J Off Publ Fed Am Soc Exp Biol. August 2016. doi:10.1096/fj.201600773R.
- 15. Reger MA, Henderson ST, Hale C, et al. Effects of beta-hydroxybutyrate on cognition in memory-impaired adults. *Neurobiol Aging*. 2004;25(3):311-314. doi:10.1016/S0197-4580(03)00087-3.
- Lawrence GD. Dietary fats and health: dietary recommendations in the context of scientific evidence. Adv Nutr Bethesda Md. 2013;4(3):294-302. doi:10.3945/ an.113.003657.
- 17. Volek JS, Phinney SD, Forsythe CE, et al. Carbohydrate restriction has a more favorable impact on the metabolic syndrome than a low fat diet. *Lipids*. 2009;44(4):297-309. doi:10.1007/s11745-008-3274-2.
- Santos FL, Esteves SS, da Costa Pereira A, Yancy WS, Nunes JPL. Systematic review and meta-analysis of clinical trials of the effects of low carbohydrate diets on cardiovascular risk factors. *Obes Rev Off J Int Assoc Study Obes*. 2012;13(11):1048-1066. doi:10.1111/j.1467-789X.2012.01021.x.
- Hession M, Rolland C, Kulkarni U, Wise A, Broom J. Systematic review of randomized controlled trials of low-carbohydrate vs. low-fat/low-calorie diets in the management of obesity and its comorbidities. *Obes Rev Off J Int Assoc Study Obes*. 2009;10(1):36-50. doi:10.1111/j.1467-789X.2008.00518.x.
- 20. Redman LM, Ravussin E. Caloric Restriction in Humans: Impact on Physiological, Psychological, and Behavioral Outcomes. *Antioxid Redox Signal*. 2011;14(2):275-287. doi:10.1089/ars.2010.3253.

- Heilbronn LK, de Jonge L, Frisard MI, et al. Effect of 6-Month Calorie Restriction on Biomarkers of Longevity, Metabolic Adaptation, and Oxidative Stress in Overweight Individuals: A Randomized Controlled Trial. *JAMA*. 2006;295(13):1539. doi:10.1001/jama.295.13.1539.
- 22. Paoli A, Bianco A, Damiani E, Bosco G. Ketogenic Diet in Neuromuscular and Neurodegenerative Diseases. *BioMed Res Int.* 2014;2014. doi:10.1155/2014/474296.
- 23. Narkar VA, Downes M, Yu RT, et al. AMPK and PPARδ Agonists Are Exercise Mimetics. *Cell.* 2008;134(3):405-415. doi:10.1016/j.cell.2008.06.051.
- 24. Burke LM. Re-Examining High-Fat Diets for Sports Performance: Did We Call the "Nail in the Coffin" Too Soon? *Sports Med Auckl Nz.* 2015;45(Suppl 1):33-49. doi:10.1007/s40279-015-0393-9.
- 25. Burke LM, Kiens B. "Fat adaptation" for athletic performance: the nail in the coffin? *J Appl Physiol Bethesda Md* 1985. 2006;100(1):7-8. doi:10.1152/japplphysiol.01238.2005.
- 26. Noakes T, Volek JS, Phinney SD. Low-carbohydrate diets for athletes: what evidence? *Br J Sports Med.* 2014;48(14):1077-1078. doi:10.1136/bjsports-2014-093824.
- 27. McCleary SA, Sharp MH, Lowery RP, et al. Effects of a ketogenic diet on strength and power. *J Int Soc Sports Nutr.* 2014;11(1):P41. doi:10.1186/1550-2783-11-S1-P41.
- 28. Rauch JT, Silva JE, Lowery RP, et al. The effects of ketogenic dieting on skeletal muscle and fat mass. *J Int Soc Sports Nutr.* 2014;11(1):P40. doi:10.1186/1550-2783-11-S1-P40.
- Wilson JM, Lowery RP, Roberts MD, et al. The Effects of Ketogenic Dieting on Body Composition, Strength, Power, and Hormonal Profiles in Resistance Training Males. J Strength Cond Res. April 2017. doi:10.1519/JSC.000000000001935.
- 30. Anderson JC. Measuring breath acetone for monitoring fat loss: Review. Obes Silver Spring Md. 2015;23(12):2327-2334. doi:10.1002/oby.21242.
- 31. Phinney SD. Ketogenic diets and physical performance. *Nutr Metab.* 2004;1(1):2. doi:10.1186/1743-7075-1-2.
- 32. Trepanowski JF, Kroeger CM, Barnosky A, et al. Effect of Alternate-Day Fasting on Weight Loss, Weight Maintenance, and Cardioprotection Among Metabolically Healthy Obese Adults: A Randomized Clinical Trial. *JAMA Intern Med.* May 2017. doi:10.1001/jamainternmed.2017.0936.

- 33. Accurso A, Bernstein RK, Dahlqvist A, et al. Dietary carbohydrate restriction in type 2 diabetes mellitus and metabolic syndrome: time for a critical appraisal. *Nutr Metab.* 2008;5:9. doi:10.1186/1743-7075-5-9.
- 34. St-Onge M-P. Dietary fats, teas, dairy, and nuts: potential functional foods for weight control? *Am J Clin Nutr.* 2005;81(1):7-15.
- 35. Nagao K, Yanagita T. Medium-chain fatty acids: Functional lipids for the prevention and treatment of the metabolic syndrome. *Pharmacol Res.* 2010;61(3):208-212. doi:10.1016/j.phrs.2009.11.007.
- 36. Assunção ML, Ferreira HS, dos Santos AF, Cabral CR, Florêncio TMMT. Effects of dietary coconut oil on the biochemical and anthropometric profiles of women presenting abdominal obesity. *Lipids*. 2009;44(7):593-601. doi:10.1007/s11745-009-3306-6.
- 37. Liau KM, Lee YY, Chen CK, Rasool AHG. An open-label pilot study to assess the efficacy and safety of virgin coconut oil in reducing visceral adiposity. *ISRN Pharmacol.* 2011;2011:949686. doi:10.5402/2011/949686.
- 38. St-Onge M-P, Ross R, Parsons WD, Jones PJH. Medium-chain triglycerides increase energy expenditure and decrease adiposity in overweight men. *Obes Res.* 2003;11(3):395-402. doi:10.1038/oby.2003.53.
- 39. St-Onge M-P, Bosarge A. Weight-loss diet that includes consumption of medium-chain triacylglycerol oil leads to a greater rate of weight and fat mass loss than does olive oil. *Am J Clin Nutr.* 2008;87(3):621-626.
- 40. Nosaka N, Maki H, Suzuki Y, et al. Effects of margarine containing medium-chain triacylglycerols on body fat reduction in humans. *J Atheroscler Thromb*. 2003;10(5):290-298.
- 41. Kasai M, Nosaka N, Maki H, et al. Effect of dietary medium- and long-chain triacylglycerols (MLCT) on accumulation of body fat in healthy humans. *Asia Pac J Clin Nutr.* 2003;12(2):151-160.
- 42. Han JR, Deng B, Sun J, et al. Effects of dietary medium-chain triglyceride on weight loss and insulin sensitivity in a group of moderately overweight free-living type 2 diabetic Chinese subjects. *Metabolism.* 2007;56(7):985-991. doi:10.1016/j. metabol.2007.03.005.
- 43. Brehm BJ, Lattin BL, Summer SS, et al. One-Year Comparison of a High-Monounsaturated Fat Diet With a High-Carbohydrate Diet in Type 2 Diabetes. *Diabetes Care*. 2009;32(2):215-220. doi:10.2337/dc08-0687.

- 44. Paoli A, Cenci L, Grimaldi KA. Effect of ketogenic mediterranean diet with phytoextracts and low carbohydrates/high-protein meals on weight, cardiovascular risk factors, body composition and diet compliance in Italian council employees. *Nutr J.* 2011;10:112. doi:10.1186/1475-2891-10-112.
- 45. Ferdman R, King R. Ketchup isn't the king of American condiments. Mayonnaise is. January 2014. http://qz.com/172019/ketchup-isnt-the-king-of-american-condiments-mayonnaise-is/.
- 46. Bosma-den Boer MM, van Wetten M-L, Pruimboom L. Chronic inflammatory diseases are stimulated by current lifestyle: how diet, stress levels and medication prevent our body from recovering. *Nutr Metab.* 2012;9(1):32. doi:10.1186/1743-7075-9-32.
- 47. Levine AS, Silvis SE. Absorption of Whole Peanuts, Peanut Oil, and Peanut Butter. *N Engl J Med.* 1980;303(16):917-918. doi:10.1056/NEJM198010163031605.
- 48. Drehmer M, Pereira MA, Schmidt MI, et al. Total and Full-Fat, but Not Low-Fat, Dairy Product Intakes are Inversely Associated with Metabolic Syndrome in Adults. *J Nutr.* 2016;146(1):81-89. doi:10.3945/jn.115.220699.
- 49. Średnicka-Tober D, Barański M, Seal CJ, et al. Higher PUFA and n-3 PUFA, conjugated linoleic acid, α-tocopherol and iron, but lower iodine and selenium concentrations in organic milk: a systematic literature review and meta-and redundancy analyses. *Br J Nutr.* 2016;115(6):1043-1060. doi:10.1017/S0007114516000349.
- 50. Pariza MW. Perspective on the safety and effectiveness of conjugated linoleic acid. *Am J Clin Nutr.* 2004;79(6 Suppl):1132S-1136S.
- 51. Marten B, Pfeuffer M, Schrezenmeir J. Medium-chain triglycerides. *Int Dairy J.* 2006;16(11):1374-1382. doi:10.1016/j.idairyj.2006.06.015.
- 52. Bourassa MW, Alim I, Bultman SJ, Ratan RR. Butyrate, neuroepigenetics and the gut microbiome: Can a high fiber diet improve brain health? *Neurosci Lett.* 2016;625:56-63. doi:10.1016/j.neulet.2016.02.009.
- 53. Crichton GE, Alkerwi A 'a. Whole-fat dairy food intake is inversely associated with obesity prevalence: findings from the Observation of Cardiovascular Risk Factors in Luxembourg study. *Nutr Res.* 2014;34(11):936-943. doi:10.1016/j. nutres.2014.07.014.

- 54. Astrup A, Rice Bradley BH, Brenna JT, Delplanque B, Ferry M, Torres-Gonzalez M. Regular-Fat Dairy and Human Health: A Synopsis of Symposia Presented in Europe and North America (2014–2015). *Nutrients*. 2016;8(8). doi:10.3390/nu8080463.
- 55. Grether-Beck S, Marini A, Jaenicke T, Stahl W, Krutmann J. Molecular evidence that oral supplementation with lycopene or lutein protects human skin against ultraviolet radiation: results from a double-blinded, placebo-controlled, crossover study. *Br J Dermatol.* September 2016. doi:10.1111/bjd.15080.
- 56. Karsten HD, Patterson PH, Stout R, Crews G. Vitamins A, E and fatty acid composition of the eggs of caged hens and pastured hens. *Renew Agric Food Syst.* 2010;25(1):45-54. doi:10.1017/S1742170509990214.
- 57. Kris-Etherton PM, Harris WS, Appel LJ. Fish Consumption, Fish Oil, Omega-3 Fatty Acids, and Cardiovascular Disease. *Circulation*. 2002;106(21):2747-2757. doi:10.1161/01.CIR.0000038493.65177.94.
- 58. Bradberry JC, Hilleman DE. Overview of Omega-3 Fatty Acid Therapies. Pharm Ther. 2013;38(11):681-691.
- 59. Lee JH, O'Keefe JH, Lavie CJ, Marchioli R, Harris WS. Omega-3 fatty acids for cardioprotection. *Mayo Clin Proc.* 2008;83(3):324-332. doi:10.4065/83.3.324.
- 60. Morris MC, Evans DA, Bienias JL, et al. Consumption of fish and n-3 fatty acids and risk of incident Alzheimer disease. *Arch Neurol.* 2003;60(7):940-946. doi:10.1001/archneur.60.7.940.
- 61. Hibbeln JR, Ferguson TA, Blasbalg TL. Omega-3 fatty acid deficiencies in neurodevelopment, aggression and autonomic dysregulation: opportunities for intervention. *Int Rev Psychiatry Abingdon Engl.* 2006;18(2):107-118. doi:10.1080/09540260600582967.
- 62. Parker G, Gibson NA, Brotchie H, Heruc G, Rees A-M, Hadzi-Pavlovic D. Omega-3 fatty acids and mood disorders. *Am J Psychiatry.* 2006;163(6):969-978. doi:10.1176/appi.ajp.163.6.969.
- 63. Osher Y, Belmaker RH. Omega-3 fatty acids in depression: a review of three studies. *CNS Neurosci Ther.* 2009;15(2):128-133.
- 64. Stonehouse W, Conlon CA, Podd J, et al. DHA supplementation improved both memory and reaction time in healthy young adults: a randomized controlled trial. *Am J Clin Nutr.* 2013;97(5):1134-1143. doi:10.3945/ajcn.112.053371.

- 65. Witte AV, Kerti L, Hermannstädter HM, et al. Long-chain omega-3 fatty acids improve brain function and structure in older adults. *Cereb Cortex N Y N 1991*. 2014;24(11):3059-3068. doi:10.1093/cercor/bht163.
- 66. SanGiovanni JP, Chew EY. The role of omega-3 long-chain polyunsaturated fatty acids in health and disease of the retina. *Prog Retin Eye Res.* 2005;24(1):87-138. doi:10.1016/j.preteyeres.2004.06.002.
- 67. Stough C, Downey L, Silber B, et al. The effects of 90-day supplementation with the omega-3 essential fatty acid docosahexaenoic acid (DHA) on cognitive function and visual acuity in a healthy aging population. *Neurobiol Aging*. 2012;33(4):824. e1-3. doi:10.1016/j.neurobiolaging.2011.03.019.
- 68. McCusker MM, Durrani K, Payette MJ, Suchecki J. An eye on nutrition: The role of vitamins, essential fatty acids, and antioxidants in age-related macular degeneration, dry eye syndrome, and cataract. *Clin Dermatol.* 2016;34(2):276-285. doi:10.1016/j.clindermatol.2015.11.009.
- 69. Cosgrove MC, Franco OH, Granger SP, Murray PG, Mayes AE. Dietary nutrient intakes and skin-aging appearance among middle-aged American women. *Am J Clin Nutr.* 2007;86(4):1225-1231.
- 70. Schagen SK, Zampeli VA, Makrantonaki E, Zouboulis CC. Discovering the link between nutrition and skin aging. *Dermatoendocrinol*. 2012;4(3):298-307. doi:10.4161/derm.22876.
- 71. Gurzell EA, Teague H, Harris M, Clinthorne J, Shaikh SR, Fenton JI. DHA-enriched fish oil targets B cell lipid microdomains and enhances ex vivo and in vivo B cell function. *J Leukoc Biol.* 2013;93(4):463-470. doi:10.1189/jlb.0812394.
- 72. Logan SL, Spriet LL. Omega-3 Fatty Acid Supplementation for 12 Weeks Increases Resting and Exercise Metabolic Rate in Healthy Community-Dwelling Older Females. *PLOS ONE*. 2015;10(12):e0144828. doi:10.1371/journal.pone.0144828.
- 73. Abbott KA, Burrows TL, Thota RN, Acharya S, Garg ML. Do ω-3 PUFAs affect insulin resistance in a sex-specific manner? A systematic review and meta-analysis of randomized controlled trials. *Am J Clin Nutr.* 2016;104(5):1470-1484. doi:10.3945/ajcn.116.138172.
- 74. Jeromson S, Gallagher I, Galloway S, Hamilton D. Omega-3 Fatty Acids and Skeletal Muscle Health. *Mar Drugs.* 2015;13(12):6977-7004. doi:10.3390/md13116977.

- 75. Allaire J, Couture P, Charest A, et al. DHA is more potent than EPA in attenuating cardiometabolic risk in men and women: a randomized double-blind, placebo-controlled crossover trial. *FASEB J.* 2016;30(1 Supplement):130.1-130.1.
- 76. Kiecolt-Glaser JK, Epel ES, Belury MA, et al. Omega-3 fatty acids, oxidative stress, and leukocyte telomere length: A randomized controlled trial. *Brain Behav Immun*. 2013;28:16-24. doi:10.1016/j.bbi.2012.09.004.
- 77. Farzaneh-Far R, Lin J, Epel ES, Harris WS, Blackburn EH, Whooley MA. Association of marine omega-3 fatty acid levels with telomeric aging in patients with coronary heart disease. *JAMA*. 2010;303(3):250-257. doi:10.1001/jama.2009.2008.
- 78. Farzaneh-Far R, Lin J, Epel E, Lapham K, Blackburn E, Whooley MA. Telomere length trajectory and its determinants in persons with coronary artery disease: longitudinal findings from the heart and soul study. *PloS One.* 2010;5(1):e8612. doi:10.1371/journal.pone.0008612.
- 79. Kris-Etherton PM, Grieger JA, Etherton TD. Dietary reference intakes for DHA and EPA. *Prostaglandins Leukot Essent Fatty Acids*. 2009;81(2-3):99-104. doi:10.1016/j.plefa.2009.05.011.
- 80. Średnicka-Tober D, Barański M, Seal C, et al. Composition differences between organic and conventional meat: a systematic literature review and meta-analysis. *Br J Nutr.* 2016;115(6):994-1011. doi:10.1017/S0007114515005073.
- 81. Daley CA, Abbott A, Doyle PS, Nader GA, Larson S. A review of fatty acid profiles and antioxidant content in grass-fed and grain-fed beef. *Nutr J.* 2010;9(1):10. doi:10.1186/1475-2891-9-10.