
The Ketogenic Diet

What is the ketogenic diet?

This diet should also be known as the **eat a lot of vegetables** diet. The ketogenic diet is a very specific way of eating in order to change your basic energy metabolism by dramatically lowering your blood sugar and insulin levels. When insulin levels decline, the body goes through a process called “ketogenesis” where it begins to produce “ketones.” When ketones reach a level above 0.5mmol/L in the blood, the body is said to be in a state of “ketosis”.

When in ketosis, the body feels different. A general feeling of wellbeing occurs as leptin resistance decreases and endorphin sensitivity increases, hunger signals decrease in general, energy levels stay consistently elevated, and many symptoms of illness improve. Ketones are powerful messengers that reduce inflammation, protect cells against toxicity, and stimulate mitochondrial energy production making more energy available for all cellular functions.

The ketogenic diet is made up of:

- 80% of the calories from fat
- 15-20% of calories from protein (the amount of protein eaten is limited to your individual goal)
- 0-5% of calories from carbohydrates

The ketogenic diet limits protein

This makes it different from the “atkins diet” which is low carbohydrate as well, but consists of higher amounts of protein. Protein can be converted into sugar through the process of gluconeogenesis, and protein must be limited to achieve ketosis in most patients. Athletes may already be in a state of ketosis and may not require much reduction in protein or carbohydrates, and require different changes to the diet to optimize athletic performance.

The general ketogenic diet structure

- Unlimited fats and oils, taken with each meal and in between meals for snacking
- Moderate protein based on individual needs, approximately 0.4 grams per pound of ideal body weight.
- Meats, dairy, and eggs are sometimes encouraged on this diet but are not necessary for adequate calories. Dairy and eggs are very common allergens and may be prohibited based on your individual need.
- Limit carbohydrates to less than 50g of refined carbohydrates at first, and then less than 25g as needed to achieve adequate ketosis. Calculate carbohydrate amounts by taking the total carbohydrate count of foods and subtract dietary fiber, which is not absorbed.
- Drink lots of water to avoid dehydration which occurs easily as the body first enters ketosis. This may feel like the flu with headache and dry mouth, and is called the “keto flu.” If this occurs be sure to drink 2 cups of water with 1/4 teaspoon sea salt every 2 hours until you are rehydrated.

What to expect when you start?

You may notice immediate weight loss of 5-10lbs, which is usually water weight. As the body enters fat burning mode you may only lose weight if you have excessive weight. Cancer patients may actually prevent weight loss with this diet. Then you will start to notice an improvement in energy and general feeling of wellbeing.

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Benefits to Ketones:

- Reduce chronic inflammation through immune overactivation (called NLRP3 inflammasome)
- Stimulate mitochondria energy production
- Increase mitochondria density in cells
- Reduce anxiety by increasing brain levels of GABA
- Protects against oxidative stress from stress and toxicity
- Reduces insulin resistance
- Reduces nerve overactivation (hyperexcitability)
- Enhances longevity

Conditions that the ketogenic diet can improve:

- Pain due to inflammation and neurological damage
- Excessive inflammation anywhere in the body
- Autoimmune diseases such as psoriasis and multiple sclerosis
- Seizures
- Cancer progression, recurrence, and cachexia (cancer related muscle weight loss)
- Insulin resistance, diabetes, and metabolic syndrome
- Acne
- Cardiovascular disease
- Athletic endurance
- Neurodegenerative diseases: alzheimer's disease, parkinson's disease, A.L.S.
- Other neuro-inflammatory disorders: autism, multiple sclerosis, migraines
- Psychiatric illness: anorexia nervosa, depression, bipolar, schizophrenia, ADHD
- Mitochondrial diseases: chronic fatigue, fibromyalgia
- Anxiety disorders
- Hormone disorders such as polycystic ovarian syndrome
- Traumatic brain injury
- Insomnia and sleep deprivation
- Mental performance

To start the diet calculate your protein goal based on your ideal body weight in pounds and multiple it by 0.4 grams. A 130lbs protein goal would be $130 \times 0.4 = 52g$. For a carbohydrate goal, start to reduce your carbohydrate intake to less than 50g per day, and continue to decrease if your body does not enter ketosis within 1 week.

Testing your ketones to modify your diet

Because everyone has unique metabolic needs, the best way to determine if you are in ketosis is to measure your blood or urine every morning. This way you can track what you ate the previous day to determine if you had too much protein. Always take your blood measurement BEFORE taking any ketone supplements. Ketone supplements elevate your blood levels of ketones for up to 8 hours.

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Testing instructions:

Our recommendation is to measure your fasting blood sugar and ketones every morning before any foods or calorie containing beverages are consumed. The best device is the Precision Xtra Blood Glucose & Ketone Monitoring System, available online. You must purchase the ketone test strips separately from the blood glucose strips (which are not included with the device).

Your protein goal is approximately: _____

Your carbohydrate goal is less than: _____

What type of fats make up the ketogenic diet?

Eating fats and oils may seem difficult, but once you get the hang of it you will probably feel much better and be motivated to continue. There is a big difference in the types of fats available. To begin with, fresh oils are much more beneficial than oxidized oils. Fats also can be saturated, monounsaturated, polyunsaturated, or trans fats. Hydrogenated oils and trans fats are typically synthetically modified fats and are detrimental to our health.

Examples of **saturated fats** can be found in meats, eggs, dairy, coconut oil, palm oil, and cocoa butter. These fats are understood to:

- Elevate HDL cholesterol and reduces LDL cholesterol levels
- Maintain bone density
- Boost the immune system
- Support healthy production of cortisol and testosterone

Examples of **monounsaturated fats** are found in olives/olive oil, avocado/avocado oil, macademia nut, and bacon fat. These fats have been shown to:

- Increase HDL
- Lower blood pressure
- Lower heart disease risk
- Reduce insulin resistance and “belly fat”

Examples of **polyunsaturated fats** are found in fish oils, cod liver oil, olive oil, flax oil, walnuts, sesame oil, chia seeds, nut oils, and avocado oil. These fats are especially beneficial as they:

- Reduce inflammation of blood vessels, autoimmune disorders, and allergies
- Help with cellular membrane function for all hormones
- Improve neurological function

Trans-fats are rarely found in nature, but those that are considered healthy are found in grass fed animal products and grass-fed dairy products. Hydrogenation prolongs the shelf-life of oils, but creates **synthetic trans-fats** which are dangerous because they are known to raise LDL levels and reduce HDL levels, and promote inflammation in the gut and the blood vessels. Avoid both hydrogenated and partially hydrogenated oils such as found in fast foods and margarine.

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<i>Ideal Foods (eat unlimited amounts)</i>		
Ketogenic foods	Neutral foods	Sweeteners
<ul style="list-style-type: none"> • Avocados • Coconut butter • Cocoa butter • Coconut oil and MCT oil (from coconut) • Olive oil • Avocado oil • Low protein and carbohydrate nuts: macadamia nuts • Egg yolk • Animal fats such as cod liver oil • Cream • Veganaise • Dairy-free cream cheese • Olives • Pepperoni • Bacon • Udo's 3-6-9 oil • Hemp hearts • Yogurts, always unsweetened • Sardines, wild planet (packed in olive oil) 	<ul style="list-style-type: none"> • Vegetables such as: spinach, cabbage, kale, celery, chard, collard greens, bok choy, lettuce, radicchio, brussels sprouts, broccoli, asparagus • Seaweed snacks • Ghee • Sauerkraut • Meat jerky, unsweetened 	<ul style="list-style-type: none"> • Stevia • Erythritol • Monk fruit • Xylitol
<i>Moderate Foods (count these towards your daily total)</i>		
<ul style="list-style-type: none"> • Meats • Nuts, seeds, and butters: pecans, walnuts, almonds • Almonds • Dairy-free cheeses such as chao cheese 	<ul style="list-style-type: none"> • Vegetables such as beets, carrot, cucumber, onions, bell peppers, zucchini, cauliflower, sweet potato 	<ul style="list-style-type: none"> • Beans such as chickpeas, beans, lentils • Fruits such as blubberies, strawberries, raspberries, cherries, cranberries, mulberries, bananas
<i>Strictly limit these foods</i>		
<ul style="list-style-type: none"> • Breads • Crackers • Chips • Rice • Refined sugars • Potatoes 	<ul style="list-style-type: none"> • Wheat • Corn • Sweet vegetables such as carrots, beets, cucumbers • Ketchup with added sugars 	<ul style="list-style-type: none"> • Cashews • Soft drinks • Alcoholic beverages, including hard liquor • Fruit juices