# Are Low-Carbohydrate Diets Healthy?

If orange is the new black, then low-carb is the new low-fat. The hysteria about fat and how it "clogs" your arteries has died off and a new fad has taken its place – low-carbohydrate diets. This fad, on the other hand, has sufficient evidence to back it up.

The scientific literature on low-carbohydrate diets is seemingly endless and highly conclusive. Studies comparing low-fat diets to low-carbohydrate diets have even shown that low-carbohydrate diets pose no greater risk to cardiovascular disease than low-fat diets. Low-carbohydrate diets have also been found to be a healthy diet option for most people, especially those who:

- are overweight or obese
- are sedentary
- have epilepsy
- have certain forms of cancer
- have cardiovascular disease
- have polycystic ovarian syndrome (PCOS), fibroids or endometriosis
- have been diagnosed with type 1 or type 2 diabetes
- have a neurodegenerative disease like Alzheimer's or Parkinson's

A typical low-carbohydrate diet limits the daily intake of carbohydrates to between 60 and 130 grams. This is done by excluding or limiting most grains, legumes, fruits, breads, sweets, pastas and starchy vegetables from the diet and replacing them with meat, poultry, fish, eggs, non-starchy vegetables, nuts, and seeds. When we eat in this way, our bodies begin to change dramatically – especially for those who habitually eat plenty of carbohydrates with each meal.

# Why is it so Good for You?

Before you ditch carbohydrates to follow this fad, it is important to consider why so much good can come out of following a low-carbohydrate diet. The most important thing that these diets do is restrict your sugar intake tremendously. The modern diet is inundated with sugar, and many experts agree that this is making us sick more than any other factor. As the national consumption of sugar continues to increase, most consumers have no idea how much sugar they're getting on a daily basis. For most people, as soon as they start a low-carbohydrate diet their health improves tremendously just by cutting out all the excess sugar.

For example, two pieces of bread on a sandwich will have around 30 grams of refined carbohydrates, that small bag of potato chips has around 15 grams, and if you have a cup of "healthy" fruit juice with that, you will have over 75 grams of processed carbohydrates in one meal. This causes an unhealthy, unnatural spike in blood sugar that stimulates fat gain and inflammation. If you eat processed carbohydrates and starchy foods like this at every meal (most Americans do) then your body will be in a state of chronic inflammation, which leads to more fat gain and disease. On top of all that, excess sugar creates the perfect environment for fungus, parasites, and pathogenic bacteria to thrive and further deteriorate your health.

On the other hand, if you give yourself the simple rule of staying below 130 grams of carbohydrates per day, you will eat less high carbohydrate foods and have a higher chance of eating healthier lower carbohydrate and high fiber foods like leafy greens and other vegetables. To put it simply, the secret behind the success of low-carbohydrate diets is in the shift from eating refined foods to eating more plant foods. This is because vegetables and other plant foods have vitamins, minerals, antioxidants, and other components like

flavonoids that promote the health of our cells. In fact, vegetables help us deal with higher carbohydrate meals by reducing blood sugar spikes, lowering inflammation, and helping the cells use the excess carbohydrates as fuel. This is why demonizing carbohydrates is short-sighted. It is important to look at why things work rather than just following the propaganda of another diet fad.

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What many low-carbohydrate aficionados won't tell you, however, is that not all of the changes experienced on a low-carbohydrate diet are going to be positive. When carbohydrates are restricted, it is stressful for the body because you are forcing it to find another way to fuel itself. This can cause side effects, like nausea and headaches, that are commonly called the "keto flu". The lack of carbohydrates will also lead to fluid and mineral loss and hormonal changes that can cause health issues if the diet is not implemented correctly.

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# Fewer Carbohydrates Means More Stress

When you first start a low-carbohydrate diet, your body will look for more sugar to burn for fuel. Without getting enough carbohydrates from food, your blood sugar levels decrease and your body responds by increasing its cortisol levels.

Cortisol is a glucocorticoid hormone that is released by your adrenal glands to ensure you have enough energy to survive when food is scarce. When you have low blood sugar levels, your brain sends a signal to your adrenal glands to release cortisol. The cortisol binds to cells throughout your body to stimulate a process called gluconeogenesis, which is what your

body uses to convert protein and fat into sugar for fuel.

Eventually, the body will adapt by burning fat for fuel instead of protein – a process called ketosis. The body uses ketosis to preserve muscle mass and glycogen (the body's sugar stores) during times of carbohydrate and/or protein restriction. It will, however, take a couple of days for your to body enter ketosis, which will leave you feeling stressed, fatigued, and weak in the mean time.

After learning about this, low-carbohydrate diets start to lose their appeal because of the stressful burden they put on the body. Yet, research doesn't back up this belief. One specific study found that cortisol increase on a ketogenic diet (the lowest of low-carbohydrate diets) was insignificant when compared to the cortisol levels of people on a moderate and high-carbohydrate diet.

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Another concern with low-carbohydrate diets is that they may cause a buildup of excess ammonia in the body that is caused by burning protein for fuel. Theoretically, this ammonia buildup will lead to kidney and brain damage, however, in case studies done on patients with genetic defects that reduced their ability to process ammonia, the ketogenic diet was well tolerated and still effective. Other studies were done on healthy individuals who were on the ketogenic diet for 6 months or less, and there was no evidence of kidney damage.

It is also important to understand the effects that cortisol has on your mineral levels. When cortisol is released (like it is during carbohydrate restriction), it prevents cells from releasing sodium and increases the rate of potassium excretion. This can lead to constipation, fatigue, and weakness – three of the most common side effects caused by a low-carbohydrate diet (and chronic stress in general). The small increase in cortisol release, however, is not solely

responsible for the increased mineral and water needs that people have on a low-carbohydrate diet.

Carbohydrates, carbon dioxide, and thyroid function are intimately connected.

# How Low-Carbohydrate Diets Cause Mineral Loss and Fluid Loss

Low-carbohydrate diets act as a diuretic in many ways that are much more potent than the effects that cortisol have on potassium levels. This is why studies address dehydration as the most common early-onset complication of a ketogenic diet. Let’s explore why this is the case by learning about the two powerful mechanisms that give low-carbohydrate diets their diuretic effect.

## Insulin and Sodium are Intimately Linked

Insulin is a hormone that lowers our blood sugar when it is too high. Its main job is to get the sugar into cells before it causes problems. Insulin also acts on the kidney to promote sodium reabsorption.

Insulin levels tend to be much lower in people who are on low-carbohydrate diets, which is part of the reason why low-carbohydrate diets are beneficial for people with diabetes and obesity. Unfortunately, this is also the reason why low-carbohydrate diets have a strong diuretic effect. The lower levels of insulin lead to more sodium loss. The sodium will then draw more fluid into the kidney for excretion. This is unlikely to lead to low levels of sodium, especially if you

have salt on your food. But if you have symptoms like nausea, headaches, confusion, and fatigue that aren't going away after restricting carbohydrates, it is best to increase your unrefined salt and water intake.

# The Relationship Between Water, Glycogen, and Ketones

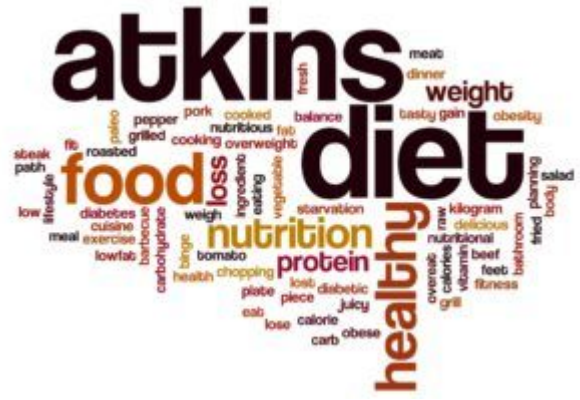
Humans are designed to handle short periods of starvation with some assistance from liver and muscle glycogen – the storage form of sugar in the body. Once we start a low-carbohydrate diet, our body tends to rely on glycogen for energy. For each gram of glycogen used, twice this amount is lost in the water. This is because glycogen (as well as all other carbohydrates) retain and attract water.

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Once the body is in ketosis, it is finally able to spare glycogen, but the water loss still continues. This is because the ketones that are created from burning fat will attract more water to the kidneys for excretion.

When you are on a low-carbohydrate diet, you will have lower insulin and glycogen levels and higher ketone levels. This will cause your body to retain much less water and fewer minerals than it did before. This is why it is essential to maintain adequate fluid and mineral intake, especially in the beginning of a low-carbohydrate diet.

Fluid and mineral loss, however, are not the only things to consider when you restrict carbohydrates. When the body finally adapts to a low-carbohydrate diet, many changes occur that can lead to unexpected side effects.




# The Longterm Problems Caused by Low-Carbohydrate Diets: Carbon Dioxide and Thyroid Function

Dehydration and mineral depletion are the main culprits for the short-term side effects that are common with low-carbohydrate diets. With some extra water, salt, mineral supplementation, and vegetable intake, these side effects are likely to disappear. After your body adapts to carbohydrate restriction, however, other changes will arise that may cause issues.

## Ketosis and Low Carbon Dioxide Levels

When we burn fat as our primary source of fuel, carbon dioxide levels in the body drop. One study confirms this fact of biochemistry by finding that ketogenic diets led to a significant reduction in carbon dioxide output compared to a Mediterranean diet. The researchers even suggest the ketogenic diet as a potential treatment for respiratory issues like Chronic Obstructive Pulmonary Disease. Yet this doesn’t mean that lowering carbon dioxide levels is a good thing for

everyone. Carbon dioxide is essential for maintaining health – it isn't a waste product.

Carbon dioxide helps us use oxygen more efficiently, dilate blood vessels, and protect cells from damage. It also aids vitamin K in helping us with blood clotting, bone and teeth mineralization, growth, energy utilization, and hormonal health. Does this mean that only people with respiratory issues should be on a low-carbohydrate diet?

After looking through the research, it's easy to find a clear answer – at least for the short-term. No studies on low-carbohydrate or ketogenic diets reported any complications related to lower carbon dioxide levels. This is due to the fact that the body has a powerful buffer system that keeps your blood pH and carbon dioxide at healthy levels. The long term effect of having slightly lower than normal carbon dioxide levels, however, is not known.

To find out if having lower carbon dioxide levels will cause problems in the long term, we can look to the biochemistry to find clues. Without sufficient carbon dioxide to dilate blood vessels, we rely on nitric oxide, which can inhibit enzymes necessary from energy production. In the long-term, this may contribute to the metabolic diseases like diabetes and obesity that low-carbohydrate diets are used to fix. The decrease in carbon dioxide levels may also lead to more inflammation and disease in the long-term, due to the decrease in protection and vitamin K activation.

If having lower levels of carbon dioxide concern you then breathe into a paper bag – seriously. By breathing into a paper bag for one to two minutes you will increase your carbon dioxide levels. This was actually shown to promote blood flow through the tiny blood vessels of the retina, so it is likely to cause positive changes throughout your body as well.

Even if you don't feel comfortable breathing into a paper bag,

your body still has the ability to adapt to having lower carbon dioxide levels especially if you take slow gentle breaths in and out your nose throughout the day. The type of food you eat also can shift your oxygen and carbon dioxide levels slightly. For example, you may notice that you can breathe easier after eating a healthy salad than after eating a burger with fries.

If you do experience negative side effects from restricting carbohydrates, however, it will most likely be caused by dehydration and mineral loss. Occasionally, the side effects can persist due to the impact that low-carbohydrate diets have on thyroid health.

## Low-Carbohydrate Diets and Thyroid Health

Carbohydrates, carbon dioxide, and thyroid function are intimately connected. When there are adequate levels of glucose and glycogen in our liver, the production of T3, a thyroid hormone, increases. When T3 is released, it stimulates development, growth, metabolism of almost every cell of the body.

When there are lower levels of glycogen and sugar in the liver, epinephrine, norepinephrine, and cortisol are secreted from the adrenal glands to regulate heart rate, body temperature, and mobilize energy instead of thyroid hormone. If this becomes the primary strategy for energy production, it will lead to muscle loss, impaired brain function, and excess organ stress.

To prevent your thyroid from crashing on a low-carbohydrate diet, it is important to consume enough calories from fat and protein. This will give your body enough fuel so that it can spare its glycogen, maintain thyroid function, and save you from unnecessary stress. If you are still feeling sluggish and

tired after eating plenty of fat and protein, it is best to increase your carbohydrate intake by having black beans, sweet potatoes, or other starchy whole foods with your dinner.

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# The Take-Away

In the same way that we have adapted to a diet that has carbohydrates, our bodies have the ability to thrive when carbohydrates are restricted as well. The body can use carbohydrates, proteins, and fat for fuel depending on what is available to it, but it is important to realize that each source of fuel creates different effects in the body. By understanding these effects and what is behind them, you can find a diet that works for you at this particular time in your life.

Low-carbohydrate diets cause you to lose vital minerals and fluids, which can lead to fatigue, weakness, headaches, dehydration, constipation, and diarrhea. This is why it is important to increase your water, salt, and mineral intake when you are on a low-carbohydrate diet.

Long-term side-effects are much rarer, but you may still experience fatigue and weakness that aren’t linked to mineral loss or dehydration. If this is the case then it is important to check your thyroid function, eat more vegetables, and have some starchy plant foods with dinner.

In general, you will experience little to no side effects if you have enough fat, protein, salt, water, fiber, vitamins, and minerals in your diet. The simplest way to do this is by eating plenty of non-starchy vegetables– like leafy greens and cruciferous vegetables, a moderate amount animal products from animals that live a healthy life on an organic pasture, and

only raw and minimally processed whole foods. In fact, if you follow these rules, you won't even have to count carbohydrates.

**Recommend Reading:**

- *Gluten, Candida, Leaky Gut Syndrome, and Autoimmune Diseases*
- *Detox Cheap and Easy Without Fasting – Recipes Included*
- *How to Detoxify and Heal the Lymphatic System*
- *Holistic Guide to Healing the Endocrine System and Balancing Our Hormones*
- *How to Cure Lyme Disease and Virtually Any Other Bacterial Infection, Naturally*

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