

The Alkaline Diet Myth: An Evidence-Based Review

By [Joe Leech, Dietitian](#) | April, 2016 | 435,732 views

The alkaline diet seems a bit too good to be true.

Proponents of this diet suggest that replacing acid-forming foods with alkaline foods can improve health.

They even claim that it can help fight serious diseases like cancer.

There are actually quite a few people who swear by this diet and claim miraculous results...

But is there any good evidence behind the alkaline diet? Let's have a look.

What is the Alkaline Diet?

The alkaline diet is also known as the acid-alkaline diet or alkaline ash diet.

It is based around the idea that the foods you eat can alter the acidity or alkalinity (the pH value) of your body.

Let me explain how that works...

When you metabolise foods and extract the energy ([calories](#)) from them, you are actually *burning* the foods, except that it happens in a slow and controlled fashion.

When you burn foods, they actually leave an ash residue, just like when you burn wood in a furnace.

As it turns out, this ash can be acidic or alkaline (or neutral)... and proponents of this diet claim that this ash can **directly** affect the acidity of your body.

So if you eat foods with acidic ash, it makes your body acidic. If you eat foods with alkaline ash, it makes your body alkaline. Neutral ash has no effect. Simple.

Acid ash is thought to make you vulnerable to illness and disease, whereas alkaline ash is considered protective. By choosing more alkaline foods, you should be able to "alkalize" your diet and improve health.



Food components that leave an acidic ash include **protein**, phosphate and sulfur, while alkaline components include calcium, magnesium, and potassium (1, 2).

Certain food groups are considered acidic, alkaline or neutral:

- **Acidic:** Meat, poultry, fish, **dairy**, eggs, grains and alcohol.
- **Neutral:** Natural fats, starches and sugars.
- **Alkaline:** Fruits, nuts, legumes and vegetables.

Bottom Line: According to proponents of the alkaline diet, the ash left from the burning of foods can directly affect the acidity or alkalinity of your body.

Regular pH Levels in the Body

When talking about the alkaline diet, it is important to understand the meaning of the pH value.

Put simply, the **pH value** is a measure of how acidic or alkaline something is.

The pH value ranges from 0 to 14:

- 0-7 is acidic.
- 7 is neutral.
- 7-14 is alkaline (alkaline is often called *basic*).



Many proponents of this diet suggest that people monitor the pH value of their urine using test strips, making sure that it is alkaline (pH over 7) and not acidic (below 7).

However... it's important to note that the pH value varies greatly within the body. Some parts are acidic, others are alkaline. There is no set level.

The stomach is loaded with **hydrochloric acid**, giving it a pH value between 2 and 3.5 (highly acidic). This is necessary to break down food.

On the other hand, human blood is **always** slightly alkaline, with a pH between 7.35 and 7.45.

The *blood* pH value falling out of the normal range is **very serious** and can be fatal if untreated. However... this **only** happens during certain disease states, and has absolutely nothing to do with the foods you eat from day to day.

Bottom Line: The pH value is a measure of how acidic or alkaline something is. Stomach acid is highly acidic, while blood is slightly alkaline with a pH value between 7.35 and 7.45.

Food Affects the pH of Your Urine, But Not Your Blood



It is critical for health that the pH of your blood remains constant.

If it were to fall outside of the normal range, your cells would stop working and you would die very quickly if left untreated.

For this reason, the body has many effective mechanisms to closely regulate the pH balance in your body. This is known as [Acid-Base Homeostasis](#).

Fortunately for us, these mechanisms make it near impossible for outside influences to change the pH value of the blood. If that wasn't true, we would surely be in trouble.

The fact is... food simply **can not change your blood pH**. Period.

However, food *can* definitely change the pH value of the urine, although the effect is somewhat unreliable (3, 4).

This is actually one of the main ways your body regulates blood pH... by excreting acids in your urine.

Eat a large steak and several hours later your urine will be more acidic as the body removes it from your system.

That being said, urine pH is actually a **very poor indicator** of overall body pH and general health. It can be influenced by many factors other than diet.

Therefore, even if you're using test strips and seeing that your urine has become alkaline, this has very little (if any) relevance to the alkalinity of your blood, or your overall health.

Bottom Line: The body tightly regulates blood pH levels and it is not possible to affect it via diet. However, diet can change the pH value of urine.

Acid-Forming Foods Do Not Cause Osteoporosis

Osteoporosis is a progressive bone disease characterized by a decrease in bone mineral content.

Osteoporosis is particularly common among postmenopausal women, and can drastically increase the risk of fractures.



Many alkaline diet enthusiasts believe that in order to maintain a constant blood pH, the body takes alkaline minerals (such as calcium) from your bones to buffer the acids from the acid-forming foods you eat.

According to this theory, acid-forming diets such as the standard **Western diet** will cause a loss in bone mineral density. This theory is known as the “acid-ash hypothesis of osteoporosis.”

The glaring problem with this theory, is that the function of the kidneys is completely ignored. Our kidneys are *fundamental* to removing acids and regulating body pH. It’s one of their main roles.

The kidneys produce **bicarbonate** ions that neutralize acids in the blood, a sustainable process which enables the body to tightly regulate blood pH (5).

Our respiratory system is also involved in controlling blood pH. When bicarbonate ions from the kidneys bind to acids in the blood, they form carbon dioxide (which we breathe out) and water (which we pee out).

The bones are actually not involved in this process **at all**.

Another problem with the acid-ash hypothesis, is that it ignores one of the main drivers of osteoporosis, a loss in the protein **collagen** from bone (6, 7).

Ironically, this loss of collagen is strongly linked with *low levels* of orthosilicic **acid** and ascorbic **acid** (Vitamin C) in the diet (8).

Looking at **the research**, zero observational studies have found a relationship between dietary acid and bone density or fracture risk. In fact, there is not even a relationship between urine pH and bone health (9, 10, 11).

Contrary to popular belief, high protein diets (acid forming) are actually linked with healthier bones (12, 13, 14).

This area of research is not definite by any means, but it does suggest that animal protein, the most acid-forming food of all, is actually beneficial for bone health.

Looking at clinical trials (real science), many large reviews have concluded that acid-forming diets have no impact on calcium levels in the body (15, 16, 17).

If anything, they improve bone health by increasing calcium retention and activating the IGF-1 hormone, which stimulates repair of muscle and bone (18, 19).

This reinforces the studies that link a high protein (which happens to be acid forming) intake with **better bone health**, NOT worse.

Bottom Line: The research does not support the idea that acid-forming diets are harmful for bone health. Protein, an acidic nutrient, seems to be beneficial.

What About Acidity and Cancer?

The most comprehensive review available on the relationship between “diet-induced” acidosis and cancer concluded that there is no direct link (20).

Despite this evidence, many still argue that cancer only grows in an acidic environment and can be treated or *even cured* with an alkaline diet.

But this idea is flawed for several reasons.

First and most importantly, as mentioned earlier, food **can not** influence blood pH (4, 21).

Secondly, even if we assume that food could dramatically alter the pH value of blood or other tissues, cancer cells are not restricted to acidic environments.

In fact, cancer grows in normal body tissue which has a slightly alkaline pH of 7.4. Many experiments have confirmed this by successfully growing cancer cells in an alkaline environment (22).

And while tumors grow *faster* in acidic environments, the tumors actually create this acidity themselves. It **is not** the acidic environment that creates the cancer, it is the cancer that creates the acidic environment (23).

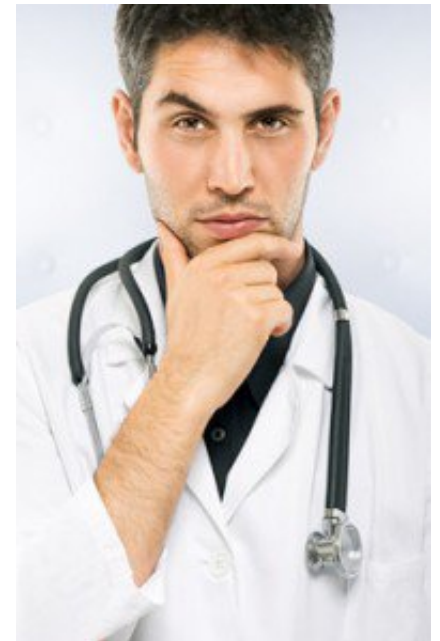
Bottom Line: Current research shows that there is absolutely no link between an acid forming diet and cancer. Cancer cells also grow in alkaline environments.

Can We Learn Anything From Ancestral Diets?

Looking at the acid-alkaline theory from both an evolutionary and scientific perspective reveals a lot.

One study estimated that 87% of pre-agricultural humans ate alkaline diets (24).

This was the basis for many of the arguments behind the alkaline diet.



However, Weston A Price's studies of the Masai and Inuit people was among the first scientific clues that a net-acid diet had little to no impact on overall health.

These indigenous populations maintained superb health despite diets based heavily on animal foods.

More recent research estimated that half of pre-agricultural humans ate net alkaline forming diets, while the other half ate net acid forming diets (25).

This seems more realistic considering that our ancestors lived in vastly different climates with access to different foods. In fact, acid forming diets were more common as people moved further north of the equator, away from the tropics (26).

So despite the fact that around half of hunter-gatherers were eating a net acid forming diet, modern diseases of civilization were virtually non-existent (27).



Take Home Message

Unlike many other strange diets, the alkaline diet is actually quite healthy.

It encourages a high consumption of [fruits](#), vegetables and healthy plant foods, while restricting [processed](#) junk foods.

However, the claims about the *mechanism* behind the diet are NOT supported by evolutionary evidence, human physiology or **any** reliable study in humans.

Acids are actually some of the most important building blocks of life... including amino acids, fatty acids and your DNA (deoxyribonucleic *acid*).

The alkaline diet is healthy because it is based on real and unprocessed foods. It has **absolutely nothing** to do with being acidic or alkaline. Period.