
Alkaline Water: Miracle or Hoax?

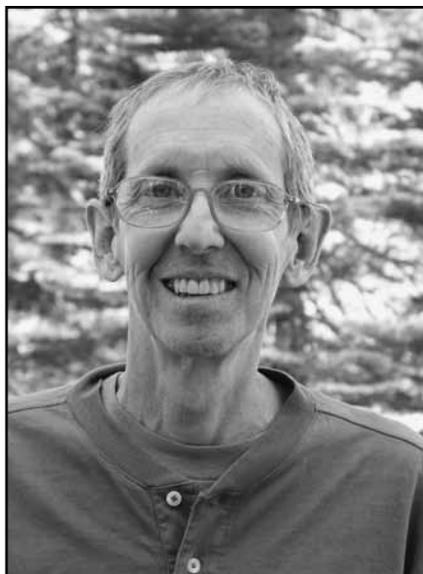
Carl Ferré

An alkaline-water craze has swept parts of the United States over the past few years. Many websites have appeared promising miracle cures for many diseases just by drinking alkaline water. These have been followed by articles from scientists who maintain that alkaline water is nothing more than an elaborate hoax to sell expensive machines and other products. This article examines the pros and cons of acid-alkaline theory in general and alkaline water in particular.

BACKGROUND

The origins of acid-alkaline theory date back to the 1800s with the study of the role of diet in the acidity of urine. Scientists observed that changing the diet of rabbits from herbivores (plant foods) to carnivores (animal foods) changed the rabbit's urine from more alkaline to more acid. This observation led to the burning of foods in test tubes to determine which foods are acid-producing and which are alkaline-producing. They theorized that eating more alkaline-producing foods than acid-producing foods could help reduce acid urine. This theory was never proven conclusively, however.¹

Today, scientists continue to study



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the role of foods on acid-alkaline balance in the human body. What is known about foods is that some have an alkaline-forming effect and others have an acid-forming effect. The exact nature of the effect is difficult to determine because the body has many buffer systems designed to keep the blood pH stable. The pH scale is a scale used to determine the acidity or alkalinity of any substance.

Herman Aihara became interested in acid and alkaline when George Ohsawa classified acid as yin and

alkaline as yang. Herman researched scientific books and based his theories on Arthur B. Guyton's *Textbook of Medical Physiology* and Walter B. Cannon's *Wisdom of the Body*. He published his conclusions in 1971 in a pamphlet entitled *Is Acid Yin: Is Alkaline Yang?* This work was later expanded to a full book in 1986 entitled *Acid and Alkaline*.² Here is a summary of his conclusions:

1. Foods that are high in protein, fat, and carbohydrates are acid-forming and foods that are high in minerals and to a lesser extent vitamins are alkaline-forming.
2. Foods that are high in sodium, potassium, calcium, and magnesium are alkaline-forming and foods that are high in phosphorus, chlorine, and sulfur are acid-forming.
3. Alkaline foods have an alkaline-forming effect while acid foods have either an acid-forming effect or an alkaline-forming one. Extensive tables of acid-alkaline effects of foods may be found in *Acid Alkaline Companion*.³
4. There are both yin acid-forming foods and yang acid-forming foods and both yin alkaline-forming foods and yang alkaline-forming foods.

- line-forming foods.
5. Prolonged overeating of acid-forming foods leads to many disorders.
 6. Most disorders, including cancer, thrive in an acidic internal environment.
 7. The optimum daily diet for health is eating slightly more alkaline-forming foods than acid-forming ones.

There are no scientific studies that conclusively prove or disprove Herman's acid-alkaline theories. Test-tube studies have shown growth of certain cancers in an acidic environment. Some scientists believe, however, that cancer growth produces the acidic environment and not the other way around. Herman would respond that regardless of what produced the acidic environment, changing it to a more alkaline condition is beneficial.

Some studies have linked osteoporosis to acidic diets. However, again there is no conclusive proof in scientific journals that acidic diets cause osteoporosis. In *Modern Nutrition in Health and Disease*,⁴ Maurice Shils concludes, as Herman did, that alkaline-forming foods contain more sodium, potassium, calcium, and magnesium while acid-forming foods contain more phosphorus, chlorine, and sulfur.

THEORY GONE WILD

Other writers and lay researchers have expanded on Herman's acid-alkaline theories in recent years. Some suggest/promise miracle-type cures by eating an 80/20 diet (80 percent alkaline-forming foods and 20 percent acid-forming foods) or by drinking high-alkaline-pH water. Scientists continue to maintain that there is no value in high-alkaline diets or drinking alkaline water and advise against such actions.

There is a direct correlation between diet and the call for more alkaline-forming foods and drinks. High-alkaline diets have increased over the

years as the typical American diet has become more acid-forming through the eating of more acidic meat-and-sugar foods, the consumption of more acid-forming chemicals added to all foods, and the introduction of GMO (genetically modified) foods.

The allegation that many websites use scare tactics and misguided statements to sell expensive items appears to be true. Claims abound but most can be countered with a minimum of knowledge. One case in point involves blood pH. There is a misconception propagated on some websites that eating food or drinking water changes blood pH immediately and directly. This simply is not true.

In the early 1950s, Swan and Pitts conducted an experiment⁵ in which they gave dogs 14,000,000 nanomoles per liter of acid. They then measured the change in the dogs' pH and found the change was a mere 36 nanomoles per liter toward the acid side. They concluded that ingesting large quantities of acid-forming foods is okay because the body's buffer systems can take care of it.

Acid-alkaline theorists maintain that while the change in blood pH is minimal, the large amount of acid has a profound effect in the extraordinary things the body has to do to counter the excess acid. This effect is compounded with the over-consumption of acid-forming foods day after day, month after month, and year after year. Still, dietitians do not recommend high alkaline diets. That said, is there a chance that alkaline diets and water have some value?

ALKALINE WATER

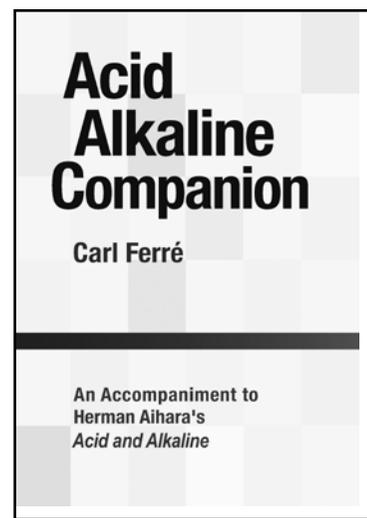
The use of alkaline water machines grew out of acid-alkaline dietary theory. Websites selling these machines tout them as health-producing and as cures for various diseases.⁶ Scientists call alkaline water a complete hoax. Kangen Water[®] serves as an excellent example to study the claims made by alkaline-water enthusiasts.

There are three parts to the Kan-

Acid Alkaline Companion

presents a clear explanation of acid and alkaline theory, how to tell one's current condition, and numerous tables of the acid-forming or alkaline-forming effects of various foods. Also included are lifestyle factors that contribute to or help neutralize excess acidity.

NEW BOOK



**\$15.00 plus \$2.50 shipping
= \$17.50**

Many foods in a typical modern diet are highly acid forming and contribute greatly to declining health. Most diseases, including cancer, thrive in an acidic internal environment. The solution is simple: Eat more alkaline-forming foods and less acid-forming ones.

This book tells you how!

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gen Water® machines, currently selling for \$4,000 to \$6,000. The first part is a water filter. This filter removes unwanted substances from tap water and is a useful component. People who already have an adequate water filter don't need this part of the machine, however.

The second part of the machine involves electrolysis. In this process, the machine separates tap water into acid water and alkaline water by dissociating the water molecules and collecting the positively charged ions at one terminal and negatively charged ions at another. Chemists maintain that electrolysis doesn't work in water without enough minerals in the water to provide conductivity.⁷

The chemical formula for water is H₂O and water does have the ability to dissociate into OH⁻ (hydroxyl ions, alkaline-forming) and H₃O⁺ (often referred to as H⁺, hydroxonium ions, acid-forming). However, water associates faster than it dissociates. Thus, the dissociated alkaline water, assuming electrolysis works, returns to its original state after a short period of time. Even if the electrolyzed alkaline water lasts until it is consumed, it doesn't survive the time in the stomach where the pH is around 2.0 (100,000 times more acid than a neutral pH of 7.0). The only way to make alkaline water that will last beyond the digestive juices in the stomach is to add alkaline minerals. This is where the third part of the Kangen Water® system surfaces.

In addition to buying a \$4,000 to \$6,000 machine, owners of the machine buy and add packets of mineral salts containing sodium, potassium, calcium, and magnesium. This action adds to the amount of alkaline minerals one is ingesting and has some effect on acid-alkaline balance. The questions at this point are: How much effect does adding alkaline minerals have and Is this effect beneficial to one's health?

HEALTH CLAIMS

One claim made by sellers of Kangen Water® machines involves alkaline water given to patients at a hospital in Japan. Patients who drank alkaline water reported positive effects and amazing recoveries. Assuming alkaline water is part of the reason for their successes, it is reasonable to conclude that the alkaline minerals in the alkaline water counterbalanced to some extent the likely highly acidic diet the hospital was feeding them. In this case, taking in more alkaline-forming minerals did help. Of course, scientists dismiss this story as anecdotal and not supported by proper scientific studies.

Another claim is the idea that the alkaline-water machine makes the water more digestible or absorbable by forming it into smaller hexagonal rings. This claim appears to be false. Hexagonal rings of water molecules have never been observed. The human body has been hydrated by water molecules moving about freely in liquid water since the beginnings of human existence. The notion that a machine can physically alter nature's water into hexagonal rings for better absorption is completely made up, according to water chemists.

Other claims for alkaline water are that it promotes healthy weight loss, boosts the immune system, neutralizes free radicals, slows the aging process, and detoxifies and cleanses the colon. There is no scientific evidence to support any of these claims. In fact, in some cases the opposite is true. Water that has been alkalized contains hypochlorites and these are oxidizing agents.⁸

The slogan of Kangen Water® sellers is: "Change your water—change your life."⁹ The implication is that drinking tap water is bad or harmful. The pH of most drinking water in the United States is between 6.9 and 7.1 (7.0 is neutral) and is perfectly healthy to drink provided toxins are removed with a water filter. In fact, most water

in the western United States is already slightly alkaline. No water district delivers even moderately acidic water because over time it would destroy their pipes at considerable expense for the district. While the slogan is a good one, there is a better way to counter excess acidity.

A BETTER WAY

Alkaline-water machines appear to offer simplistic answers to problems that are made up at best. Most are sold by multilevel marketing schemes that allow the manufacturers to avoid making any claims directly. People who buy and later sell the machines repeat claims found on other websites, and the myths proliferate.

The alkaline-water machines that add alkaline minerals to the water do have some value as it adds to one's overall alkaline-forming intake. However, it's much easier and cheaper to make water more alkaline by adding a pinch (5 to 7 grains) of sea salt. Note that sea salt with magnesium and other alkaline-forming minerals is needed—table salt does contain alkaline-forming sodium, but this is countered by acid-forming chloride and iodine added to keep the salt from caking.

If an alkaline-water machine is used, it is important to remember that the body has to deal with excesses on either side. For example, consuming too many alkaline minerals can lead to imbalances. To be safe, it is best not to drink water on a consistent basis with a pH of over 8.0 (over 10 times more alkaline than neutral).

The larger question of whether or not consuming more alkaline-forming foods and drinks than acid-forming ones is beneficial to one's health is reserved for a future article. For now, let's assume that Herman Aihara's conclusions are useful for creating a healthy life. Even if the claims of alkaline-water enthusiasts are proven in the future to be true, a better solution to balancing acid and alkaline is through a change in diet.

The easiest, cheapest, and most

thorough way to counter the effects of highly acid-forming foods is to reduce their intake. Highly acid-forming foods include meat, refined sugar, sugar products, and alcohols. Reducing these foods and replacing them with more whole grains (slightly acid-forming) and plenty of alkaline-forming fresh vegetables and sea salt yields a diet that is more balanced in regard to acid and alkaline. Anyone eating such a diet would have no reason to buy an alkaline-water machine.

Lastly, acid-alkaline balance is only one factor in determining a healthy way of eating. While the body needs both acid-forming and alkaline-forming foods for a healthy life, eating too little protein and/or fat over a period of time just to balance acid and alkaline can lead to a multitude of problems. Maurice Shils in *Modern Nutrition in Health and Disease* concludes that eating a diet with as near a neutral pH is best. This view is very near to Herman Aihara's thinking and

is a commonsense approach to acid-alkaline balance.

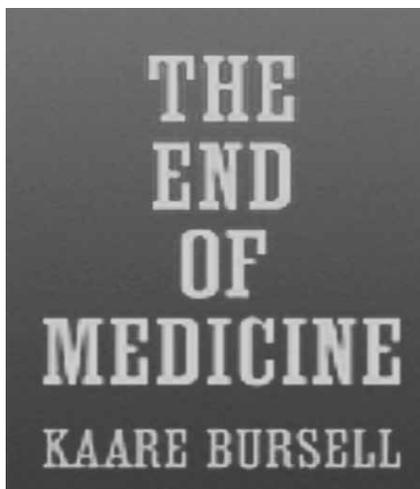
NOTES

1. See "Alkaline Diet in Wikipedia." http://en.wikipedia.org/wiki/Alkaline_diet.
2. Aihara, Herman. *Acid and Alkaline*. Chico, George Ohsawa Macrobiotic Foundation, 1986. Print
3. Ferré, Carl. *Acid Alkaline Companion*. Chico, George Ohsawa Macrobiotic Foundation, 2009. Print.
4. Shils, Maurice E. *Modern Nutrition in Health and Disease, 10e*. Philadelphia, Lippincott Williams and Wilkins, 2005. Print. Parts of this book may be read at <http://books.google.com>.
5. Brandis, Kerry. *Acid-base Physiology*. Online book. http://www.anaesthesiamcq.com/AcidBaseBook/ab2_2.php#ref.
6. Search for "Kangen Water" and

many websites appear. Here is one: <http://kangenwater-alkalinewater.com>. Web.

7. Lower, Stephen. "Ionized and alkaline water: Snake Oil of Tap." <http://www.chem1.com/CQ/ionbunk.html>. Nov 2012. Web. Stephen Lower is a retired faculty member from the Department of Chemistry at Simon Fraser University.
8. For further explanations of the credibility of these claims, see <http://skeptoid.com/episodes/4139>. Web.
9. Another Kangen Water website: <http://www.return2origin.info>. Web.

Carl Ferré is author of Essential Guide to Macrobiotics and Acid Alkaline Companion, editor of Macrobiotics Today, and director of the French Meadows Summer Camp.



“A Macrobiotic Classic” – Michael Bauce; “Brilliant” – Christine DeRocher; “The Finest Book on Natural Healing I have read in 25 years of Chiropractic Practice” – JB Vaughan DC; “Learnt more in the first 20 pages than I have in two years of study” - student ; “I read your book very hungrily as your perception is so clear and rarely have I come across the understanding and intelligence that shines through in your writing. In that way, your book felt like a friend, a much needed friend, so thank you.-Penelope Bjorksten”; “The End of Medicine” is a beautiful book, in my opinion one of the more important books about macrobiotics written since Ohsawa” – Isobel Carr

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