

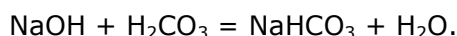
Blood Buffers & Aging

When a person drinks alkaline water which is high in alkalinity, or a cola drink which is high in acidity, the blood pH value does not seem to change much. The reason is that in blood there are two types of buffers to regulate and maintain the blood pH value to within a very narrow range of 7.38 and 7.41.

One is an acid buffer, carbonic acid (H_2CO_3), which is the combination of water and carbon dioxide. ($\text{H}_2\text{O} + \text{CO}_2 = \text{H}_2\text{CO}_3$). The other is an alkaline buffer, bicarbonate, usually potassium bicarbonate (KHCO_3) or sodium bicarbonate (NaHCO_3).

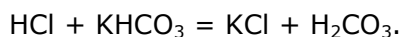
The way these buffers work is as follows:

If the blood gets an infusion of alkaline substance, such as sodium hydroxide (NaOH), the blood pH tends to go up. Then the acid buffer reacts with NaOH .



High pH sodium hydroxide is changed to almost neutral sodium bicarbonate, which is an alkaline buffer, plus water. Note that the acid buffer is reduced and the alkaline buffer is increased.

If the blood gets an infusion of acid substance such as hydrochloric acid (HCl), the blood pH tends to go down. Then the alkaline buffer reacts with HCl .



Low pH hydrochloric acid is changed to almost neutral potassium salt plus carbonic acid, which is an acid buffer. In this case, the alkaline buffer is reduced and the acid buffer is increased.

An infusion of alkaline or acid solution does not change the pH value of the blood; what changes is the amount of alkaline buffer or acid buffer. As long as the human body is alive, these buffers maintain a blood pH value constant. When it is said that the body becomes acid in the aging process, it means that the alkaline buffer, bicarbonate, is decreasing and the acid buffer is increasing.

It is now scientifically proven by Dr. Lynda Frassetto of the University of California, San Francisco that older people have a lower number of bicarbonates in the blood. ¹⁾ Analyzing graph B, Figure 2 of her paper, one can see that the bicarbonate density of the human being remains fairly constant until the

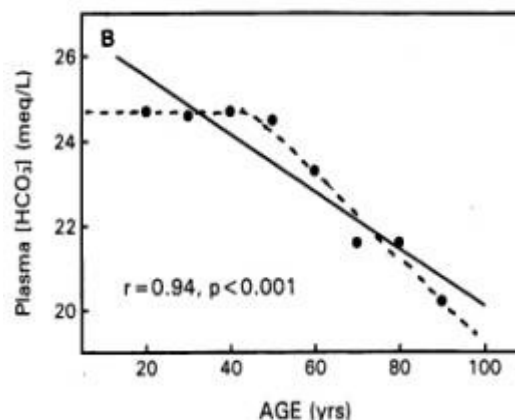


Figure 2, graph B of
Reference 1 document
Dotted line added by Sang Whang

age of 45 and linearly decreases about 18% by the time one reaches 90 years old. In general, adult degenerative diseases such as diabetes and high blood pressure start to appear at the age of 45 and up and gradually worsen approaching the age of 90 and up. Dr. Frassetto attributes the reduction of bicarbonates in the blood, as we age, to

generations of modern American diets She also points out in another paper that the average diet today is high in sodium and low in potassium, contrary to the original genetic makeup of the human body²⁾.

It is this reduction of bicarbonates in the blood that affects blood flow and makes it difficult to manage the continuous outpour of acid, making it difficult to eliminate acid waste from the body and thereby developing many acid-induced degenerative diseases such as blood clots, acid reflux, heart disease, osteoporosis, gout, diabetes, high blood pressure, kidney disease, cancer, strokes, etc. Alzheimer's disease is nothing but a slow acidification of the brain. All these diseases are caused by systemic acidosis, which means insufficient bicarbonates in the blood.

When we think of health, we think of diet and exercise, neither of which adds bicarbonates to the blood stream. Food supplements, raw foods, vitamins, herbs, antioxidant, detoxification, massage, chelation, acupuncture, magnetic devices, oxygenated water, Pi water, etc. seem to help some people some of the time, but they fall short of hitting the mark when it comes to increasing bicarbonates in the blood. Weight control by diet and exercise as well as wrinkle removal may maintain a youthful appearance; however, appearance can be deceiving. The blood inside the body still ages as long as the bicarbonates in the blood is diminishing.

Drinking alkaline water adds bicarbonates to the blood stream indirectly through the stomach. When the stomach fluid pH is raised by drinking alkaline water, above 4.5, the stomach walls produce hydrochloric acid, which is interjected into the stomach to bring down the stomach pH value to below 4.5. The chemical formula for the production of hydrochloric acid by the stomach is:



In order to produce hydrochloric acid, the stomach also produces sodium bicarbonate that goes into the blood stream. If potassium salt is used, potassium bicarbonate goes into the blood stream. AlkaLife[®] is an alkaline concentrate to make alkaline water. Two drops into ordinary drinking water (6 to 8 oz) changes the water to high pH alkaline water. AlkaLife[®] contains a patented ratio of potassium and sodium hydroxides to maintain the proper mineral ratio in the body. This ratio happens to agree with Dr. Frassetto's opinion given in her second paper.

In Reverse Aging I mention that the accumulation of acid is the aging process and that the reduction of acid is reverse aging. Allow me to modify that statement: the decline of bicarbonates in the blood stream is the aging process and, conversely, the increase of bicarbonates in the blood stream is reverse aging.

Everybody may think the reduction of bicarbonates in the blood is an unavoidable result of aging; however, I have discovered that the reduction of bicarbonates in the blood is the primary cause of physiological aging. By adding bicarbonates to the blood, we can delay the aging process and prevent age related adult degenerative diseases. And there is no effective way to add bicarbonates to the blood and maintain the proper mineral balance of potassium and sodium other than drinking alkaline water

Bicarbonates are the primary substance for life and the basic element of nutrition.

1) Journal of Gerontology: BIOLOGICAL SCIENCES, 1996, Vol. 51A. No. 1, B91-B99

2) European Journal of Nutrition, Vol. 40, Number 5 (2001). ©Steinkopff Verlag 2001