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Understanding Acid Base Balance in the Human Body

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See how to maintain a healthy pH with what you eat. Your body regulates pH of what you take in and what you bring out. Believe it or not, pH plays a large factor in quality of your health and well-being.

What is pH?

Acid base balance in the human body is essential for all living organisms. pH stands for potential hydrogen, and is defined as the Negative logarithm of the concentration of hydrogen ions. pH is measured on a pH scale ranging from 0 to 14. 0 is considered highly acidic, while a pH of 14 is very basic, and a pH of 7 is neutral.

Since [pH is measured on a log scale](#), this means a pH of 9 is ten times more basic than a pH of 8. This alone gives you an idea of how important acid base balance in the human body is.

Factors that Affect Levels in the Body

The average pH in human blood is about 7.4, and narrowly ranges from 7.35 to 7.45. A slight change outside of this range can be devastating to cells and the entire body. Normal day to day activity affects our pH on a continual basis. This includes the air we breathe, the food we eat, and our urine that is excreted. Something as simple as washing your hands affects the pH on your skin.

Diet, however, plays a major role in acid base balance in the human body. A healthy diet should consist of about 75% alkaline foods such as vegetables, fruits and non animal proteins. The other 25% of a healthy diet includes acidic foods such as animal proteins (meat), grains, and dairy products.

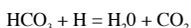
How the Body Regulates pH

There are three important mechanisms the body uses to regulate PH. The first is a chemical buffer, the second line of defense is the respiratory system, and last, is the urinary system. These three mechanisms work together to keep body pH within that narrow range.

Chemical Buffers

The most important chemical buffer is Bicarbonate (HCO₃). The body uses bicarbonate to perform a chemical reaction with strong acids and bases on a regular basis. For reference, look at the simplified equation below.

The H ion binds to the hydrogen, leaving the reaction with water and CO₂, which can easily be eliminated by breathing and urination. This reaction can also be reversed, if more H⁺ ions are needed to be released into the blood and make it more acidic. The kidneys aid in this process by releasing Bicarbonate when it is needed.



Respiration

Another vital component to acid base balance is respiration. Our lungs regulate how much CO₂ is in our blood. This is important because it can reverse the above reaction and combine with water to form bicarbonate. If a person were to breathe in and out at a rapid rate or hyperventilate, this would decrease the amount of CO₂ in the blood, thus reducing the amount of Bicarbonate.

With less Bicarbonate, there will be less H⁺ ions in the blood, and pH will rise. However, this is a short fix for pH balance.

Kidneys

The kidneys are the third and final component to acid base balance in the body. They can absorb more acids or bases as needed to keep the body at homeostasis or normal. Since our bodies tend to produce more acids, and we tend to have more acidic diets, urine is slightly acidic to get rid of some of it. Recall that the kidneys can also produce more bicarbonate when needed.

Stay Healthy!

Now you can see how tightly acid base balance is regulated in the human body. The lungs, kidneys, and chemical buffers in the body work together to regulate even the slightest pH change causes by our normal day to day activity. pH balance is becoming more and more important in our daily lives with regards to diet.

Health Care Providers, Dieticians and Naturopaths alike all agree that is important to keep a well balanced diet with plenty of fruits and vegetables to maintain healthy acid base balance and give the body a bit of a break when it comes to acid base regulation.

Sources:

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