

Middle and High School Curriculum

NUTRITION 101

LESSON FIVE ACID/ALKALINE BALANCE

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NUTRITION 101

LESSON 5

Acid/Alkaline Balance

INSTRUCTIONAL OBJECTIVES

Students may use the Cloze Note Taking or follow with Student Notes as you present the following information regarding "Acid/Alkaline Balance."

STUDENT-FRIENDLY OBJECTIVES

I will have a working knowledge of pH balance in my body.

HANDOUTS

- pH strip Activity Findings Chart
- Optional: Cloze Note Taking Handout and Student Notes

MATERIALS

- pH strips (30 strips. Vaxa's Litmus paper/pH Test Strips are considered by many to be the most accurate pH test strips available or Micro Essential Laboratory Inc., Brooklyn, N.Y. 11210 telephone 718.338.3618)

Suggested videos

- <http://www.youtube.com/watch?v=7ceJl2Cnz1w>
- <http://www.youtube.com/watch?v=7ceJl2Cnz1w>

OVERVIEW OF CONTENT

- Introduction to acidity and alkalinity in the body
- Review, Q&A, conclusion

DIRECT INSTRUCTIONS

Students may use either the **Cloze Note Taking** format or the **Student Notes** as you present the following information regarding "Acid/Alkaline Balance."

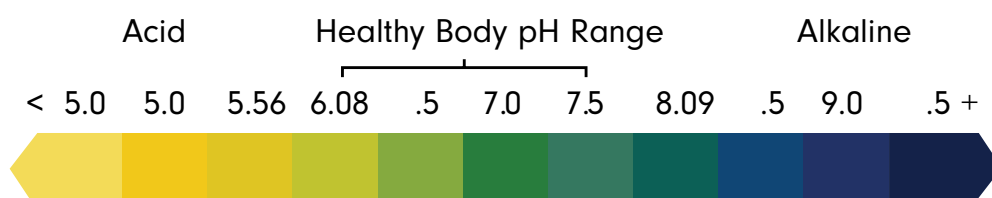
QUOTATION

"If you can't pronounce it, don't eat it." Common Sense

Why is this quotation just good common sense?

pH

pH refers to “potential of hydrogen” which indicates the measurement of hydrogens ions in a solution or the measurement of acidity or alkalinity of a solution. In this case, the acid- alkaline balance relates to the chemistry of the body’s fluids as measured by pH scale ranging from 0 to 14. A high pH number indicates less hydrogen ions and more oxygen, and thus alkaline, whereas, a low pH indicates the opposite. When a solution is neither acidic or alkaline, it will have a pH of 7.



For the chemist

Water (H_2O) ionizes* into hydrogen (H^+) and hydroxyl (OH^-) ions. When these ions are equal, the pH is a neutral 7. Acidity occurs when there are more H^+ ions than OH^- ions then the water. The opposite, OH^- ions outnumber the H^+ ions then the water, the pH is alkaline. The pH scale goes from 0 to 14 and is *logarithmic indicating a pH of 4.5 is 10 times more acid than 5.5, 100 times more acid than 6.5 and 1,000 times more acid than 7.5.

***Ionization** is the process of converting an atom or molecule into an ion by removing or adding charged particles.

***logarithmic** means that each step is ten times the previous.



Side note

Blood pH is approximately 7.365. The body works hard to keep this level. If it is lower, oxygen levels will decrease and metabolism will slow down - not a healthy situation.



Acidic and Alkalinity

ACIDITY IN THE BODY

When the body is more acidic than desirable, it gives rise to an internal environment that is much more susceptible to disease. An acidic environment is a breeding ground for (bad) bacteria, yeast, fungi, viruses and cancer may thrive in an acidic environment.

Acidic foods: White foods: bread, rice, sugar and soda pop, dairy, eggs, grains, and meat.

★ Side note

Sulfur and phosphorus, lower the alkalinity creating a more acidic environment.

ALKALINITY IN THE BODY

An alkaline internal environment allows for normal body function to occur (resist disease) and bacteria, viruses, yeast and cancer cannot live. When the body is more acidic, it will pull the alkaline minerals (calcium, magnesium and potassium) reserves to create an alkaline environment. Over time, with a poor diet, high stress life, and lack of exercise, the reserves may become too low for compensating.

Alkaline foods: Vegetables- eat a vast colorful array (especially green) and peas, beans, lentils, spices, herbs and seasonings, avocados, and seeds and nuts.

★ Side note

Calcium, magnesium and potassium help create an alkalinity in the body.

! Teacher's note

Discuss with the students how pulling nutrient reserves in the body could create a vicious cycle and lead to health problems (not eating enough calcium rich foods, therefore more acidic, so body pulls from calcium reserves to balance the alkalinity in the body. Less than optimal levels of calcium in the body may lead to weak bones and teeth).

★ Side note

The pH of food is not the sole contributor of an internal acidic environment. Stress (how you handle stress), lack of exercise, not laughing enough, drugs, alcohol, medications, sugars and smoke may also contribute to an acidic environment. The body has a natural acid-alkaline balance; however, these will throw off this balance, making the body more acidic.



Side note

A basic rule of thumb to follow to achieve and maintain pH balance is to eat 80% alkaline-forming foods and drinks and 20% acid-forming foods and drinks each day.



Interesting side note

Note that a food's acid or alkaline forming tendency in the body has nothing to do with the actual pH of the food itself. For example, lemons are very acidic; however, the end products they produce after digestion and assimilation are very alkaline so, lemons are alkaline forming in the body. Likewise, meat will test alkaline before digestion, but it leaves very acidic residue in the body so, like nearly all animal products, meat is very acid forming.

How to Test your pH

pH ranges will vary throughout the body; in general, the body wants to be more alkaline; however, the stomach prefers to be more acidic. Saliva will fluctuate during the day, but in general, should be more alkaline. Urine is a simple and reliable way to test you pH.

Instructions for pH findings

(pH strip **Activity Findings Chart** Handout)

Urine: Hold litmus strip in the flow for a second or two. Compare the color on the strip to the pH chart.



Side note

The first urine of the day may not be as accurate as the body has been detoxifying and metabolizing during the night which will be removed with the first trip to the bathroom. The second catch of the day, before meals or 2 to 3 hours away from food, will be more accurate. For the science enthusiast, test both.

Saliva: Wait 2 hours after eating or brushing your teeth. First, clean your mouth with saliva and then spit out. Next, place saliva on the litmus paper and compare the color on the strip to the pH chart.

It is best to track the readings over at least 3 days, and a few times a day.



ACTIVITY

Have the students test their pH levels for 3 days.

Have the students create a list of acidic foods and alkaline foods.

Discuss the results, their diets and how they can make changes.

SUMMARY ACTIVITY

Review general points of pH in the body, acid and alkalinity foods.

Lesson 6 presents: Food Diet

Present the following quotation to students at the conclusion of Lesson 5. There are to consider its meaning and prepare to make comments in a classroom discussion before beginning Lesson 6.

QUOTATION

"An apple a day keeps the doctor away."

Proverb

We have heard this so many times, but what is so important about an apple and its contributing to your health?