

How Understanding Buffers and pH Balance Can Help Us Make Informed Nutritional Decisions

By Rachel Lichti

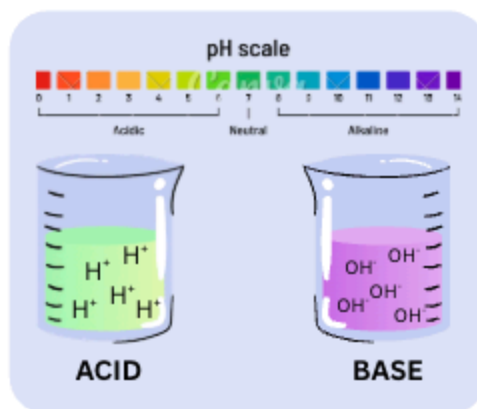
What is a pH Value and What is a Buffer?

A **pH value** is a number between 0 and 14 on the pH scale which is used to quantify the acidity or basicity of a substance. An acidic substance, such as vinegar, is a substance that releases protons or hydrogen ions (H^+) into solution and decreases the solution's pH value (MedicineLibreTexts, 2019). A basic or alkaline substance, such as soap, is a substance that releases hydroxide ions (OH^-) into solution and increases the solution's pH value (MedicineLibreTexts, 2019). There are other ways to define acids and bases, but the above definition is called the **Arrhenius definition** (ChemistryLibreTexts, 2020).

Buffers are a combination of an acid and a base which help prevent the pH of a substance from changing (Shaw & Gregory, 2022). Buffers are important in our bodies as they work to neutralize the harmful effects of excess acid (H^+ ions) in our system (Shaw & Gregory, 2022).

The Nature of Science

Science helps us make choices about what we eat to fuel our bodies. This means it is important that scientific concepts are communicated to the public accurately, clearly, and in a way that can be understood by everyone. When science is not communicated carefully, it can lead to misinformation and cause people to make choices that are not based on solid scientific evidence or even cause people to make choices that are unhealthy.

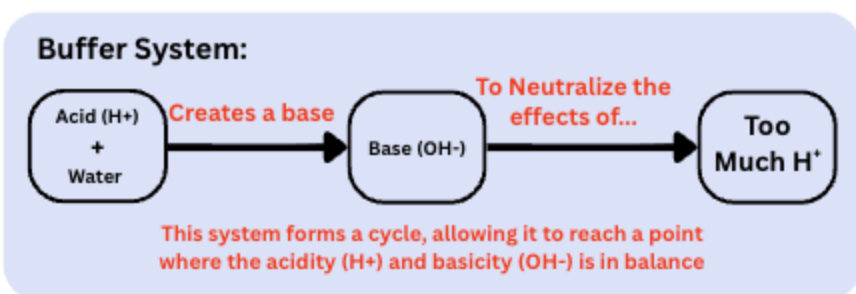


Why This Matters

The misguided belief that a certain diet called [the alkaline diet](#) can lower the body's pH level and help cure cancer (Collins, 2025) is an example of why science, such as how buffers work in our body to maintain our pH balance, must be communicated carefully to the public. Understanding that [eating foods on the basic or alkaline side of the pH scale doesn't change our internal pH](#), thanks in part to buffers (Collins, 2025), means that we can avoid falling for nutritional misinformation surrounding things like the alkaline diet.

Discussion Point

Use this poster as a discussion point to talk about misinformation in science. Have students come up with other examples of scientific misinformation or unawareness that cause society to make poor or unhealthy decisions.



Collins, K. (2025, March 17). Does the Alkaline Diet Cure Cancer? American Institute for Cancer Research. <https://www.aicr.org/resources/blog/does-the-alkaline-diet-cure-cancer/>

Chemistry LibreTexts. (2020, December 14). 11.1: Acids and Bases in Water. Chem.libretexts.org. chem.libretexts.org/Courses/Monterey_Peninsula_College/CHEM_30A%3A_Introduction_to_Chemistry_for_Health_Sciences/11%3A_Acids_Bases_and_Buffers/11.01%3A_Acids_and_Bases_in_Water

MedicineLibreTexts. (2019, February 18). 2.4: Acids and Bases. [med.libretexts.org/Bookshelves/Anatomy_and_Physiology/Human_Anatomy_and_Physiology_Preparatory_Course_\(Liachovitzky\)/02%3A_Introduction_to_Anatomy_and_Physiology_Chemical_Building_Builds/2.04%3A_Acids_and_Bases](https://med.libretexts.org/Bookshelves/Anatomy_and_Physiology/Human_Anatomy_and_Physiology_Preparatory_Course_(Liachovitzky)/02%3A_Introduction_to_Anatomy_and_Physiology_Chemical_Building_Builds/2.04%3A_Acids_and_Bases)

Shaw, I., & Gregory, K. (2022). Acid–base balance: A review of normal physiology. *BJA Education*, 22(10), 396–401. doi.org/10.1016/j.bjae.2022.06.003

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