

Differences Between Buffers & Alkalizers



Dairy cattle nutritionists use two primary types of feed additives to manage ruminal pH. These could be classified into two large groups — those that act directly on rumen pH and those that do so indirectly.

Direct-action feed additives can simply stabilize ruminal pH (called buffer products in animal science but referring to buffering agents in chemistry) or neutralize any excess acid produced during the fermentation process (alkalizer products). By definition, a buffering agent is a material that, when present in aqueous solution, creates a buffer solution that resists to changes in pH when a strong acid or base is added. In contrast, an alkalizer, produces alkaline elements to neutralize excess acids and is very effective in raising rumen pH and milk-fat percentage. [1]

Buffer

The most common dairy cow buffer product is sodium bicarbonate, which has a pKa of 6.25 and, therefore, would stabilize ruminal pH at around 6.25.[2] Buffer products are added naturally through the rumen epithelium (coupled with VFA absorption) and saliva. As an example, the contribution of saliva and of rumen epithelium to bicarbonate flow into the rumen of cattle fed a high roughage or high concentrate diet were 4.01 and 4.25 kg/d, respectively.[3]

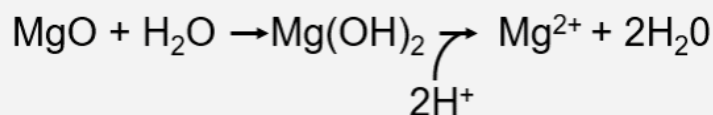
pHix-up: a Potent Alkalizer Specially Designed to Achieve Optimal Rumen pH

An ideal solution to aid cows' natural ability to stabilize ruminal pH is pHix-up. When biological buffers fail to maintain rumen pH within desired parameters, pHix-up neutralizes acids and raises the ruminal pH to an ideal level.

With its unique formula, pHix-up provides this neutralizing power in accordance with the pH of the solution — meaning, under physiological conditions, it will always raise rumen pH to an ideal level that will not exceed physiological value (a possible problem with other alkalizer products).

Finally, since pHix-up contains a specific blend of selected magnesium oxide sources, it acts throughout a set time period by combining both fast- and long-acting capabilities — which results in additional protection throughout the period between feedings.

This is the chemical-reaction formula that explains how pHix-up neutralizes acids produced during the fermentation process:



[1] Erdman, R. A. (1988). Dietary buffering requirements of lactating dairy cow: A review. *Journal of Dairy Science*, 71: 3246–3266.

[2] Ibid.

[3] Dijkstra, J., et al. (2012). Ruminal pH regulation and nutritional consequences of low pH. *Animal Feed Science and Technology*, 172: 22–33.