

What Impact Does pH Have on Food and Nutrition?

acidity and alkalinity are measured on the pH scale, which ranges from 1 to 14, with 1 the most acidic, 14 the most alkaline, and 7 being neutral. Most foods have a pH below 7. The pH scale is important in home canning because low-acid foods—defined as having a pH above 4.6—do not contain enough acid naturally to prevent the germination and growth of the *botulinum* spores found on most fruits and vegetables that come in contact with soil (1).

Dietary intake influences the pH of the urine, demonstrating the kidney's role in the maintenance of homeostasis. Urinary pH is a recognized risk factor for some types of kidney stones (2). Prior to the use of medication to acidify or alkalize the urine, dietary modifications were commonly used. Designation of foods as either acid-ash or alkaline-ash is based on the ash that remains after the combustion of foods under laboratory conditions. Surprisingly, acidic foods like citrus fruits do not contribute to an acidic potential of food.

Meat, fish, poultry, eggs, cheese, and grains are the primary contributors of acid-ash. Alkaline-ash producing foods include fruits and vegetables except prunes, plums, and cranberries. While diet does influence the pH of the urine, equations to predict the effect of food on urine pH have been plagued with methodological issues related to the myriad of factors affecting renal excretion and urine production (3,4).

Changes to the body's serum pH are life-threatening events, and the body always tries to maintain the pH within a narrow range between 7.35 and 7.45. Bone has a protective role in maintaining systemic pH due to its capacity to provide minerals that act as a buffering system. Research indicates that an alkaline diet plays a role

in osteoporosis. According to the Position of the American Dietetic Association on vegetarian diets, the high potassium and magnesium content of fruits, berries, and vegetables with their alkaline ash makes these foods useful dietary agents for inhibiting bone resorption (5). But large, well-designed clinical trials on the effectiveness of the many claims made for the alkaline diet are lacking. Typically, these studies recommend more alkaline foods or more fruits, a message consistent with the *2005 Dietary Guidelines for Americans* or the Dietary Approaches to Stop Hypertension eating plan. Studies in this area are ongoing as researchers continue to investigate the scientific basis of the relationship between diet and acid-base homeostasis (6).

References

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5. Position of the American Dietetic Association: Vegetarian diets. *J Am Diet Assoc*. 2009;109:1266-1282.
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Additional Resources

The pH Miracle for Weight Loss

Robert O. Young, PhD, and Shelly Redford Young

Reviewed by Lalita Kaul, PhD, RD, LDN, American Dietetic Association Spokesperson, January 2007

<http://www.eatright.org/ada/files/PhMiracle.pdf>. Accessed August 12, 2009.

American Institute of Cancer Research

Cancer and Acid-Base Balance: Busting the Myth

<http://www.aicr.org/site/News2?page=NewsArticle&id=13441>. Accessed August 12, 2009.

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