The term pH refers to acidity of a product. Much like there is a scale to measure heat (temperature), there is also a scale to measure acidity in food. The pH scale ranges from 0 to 14. A value of 7 is assigned to something whose acidity is neutral. Any values below 7 are considered acidic, while values larger than 7 are basic (or alkaline).

In scientific terms, the pH scale actually measures the concentration of positively-charged hydrogen ions $\left[H^+\right]$ and negatively-charged hydroxyl ions $\left[-OH\right]$ that are present in a sample. When the concentration of hydrogen ions increases, so does the acidity. pH is measured using a logarithmic scale, meaning that each change in a whole number represents a tenfold change in $\left[H^+\right]$ concentration. For example, a sample with a pH of 3.0 has ten times the concentration of $\left[H^+\right]$ ions as a sample with a pH of 4.0, and a one-hundred times the concentration of $\left[H^+\right]$ than a sample with a pH of 5.0. Therefore, small changes in pH measurements actually represent large changes in $\left[H^+\right]$ concentration (and therefore, acidity). For this reason, it is important to get accurate pH readings of any food product tested.

In general, the pH of a product will determine which microorganisms are capable of growing in it and hence which method of processing is needed. Most microorganisms are able to survive and grow in pH environments between 4.6 and 9. Most food items are naturally acidic, meaning their pH values are less than 7. As the pH values decrease (become more acidic), the microorganisms have a more difficult time surviving and growing. Therefore, the acidity of a food product is often used as a means of preservation and a way to keep food safe for consumption.

There is one important pH value to know in regards to food safety, and that value is pH 4.6. At a pH of 4.6, Clostridium botulinum, the bacteria that causes the deadly disease botulism, is prevented from growing and forming deadly toxin. The pH value 4.6 is the dividing line between foods that are safely processed in a boiling water canner vs. a pressure canner. Foods with a pH greater than 4.6 require pressure canning.

When a food item is comprised solely or mainly of ingredients with a pH of 4.6 or lower, we refer to those food items as an acid food. Acid foods include apples, peaches, strawberries, lemons and most other fruits.

When the pH of a food item is greater than 4.6, that food is referred to as a low-acid food. Low acid foods include most vegetables and meats.

When food items contain some ingredients whose pH is greater than 4.6, but the overall pH of the food is 4.6 or less, that food item is called an acidified food. Acidified foods have a pH of 4.6 or less due to the addition of acid or acid foods to low acid ingredients. Examples of acidified foods are "pickled" products such as dill pickles, sauerkraut, pickled beets and pickled jalapeno peppers.
Always use a science based, tested recipe when home canning foods. An excellent resource for recipes is the USDA National Center for Home Food Preservation at http://nchfp.uga.edu/.

Information from:
- National Center for Home Food Preservation, http://nchfp.uga.edu/

Barbara Brown, Food Specialist, Oklahoma Cooperative Extension Service

Oklahoma State University, in compliance with Title VI and VII of the Civil Rights Act of 1964, Executive Order 11246 as amended, Title IX of the Education Amendments of 1972, Americans with Disabilities Act of 1990, and other federal laws and regulations, does not discriminate on the basis of race, color, national origin, gender, age, religion, disability, or status as a veteran in any of its policies, practices or procedures. This includes but is not limited to admissions, employment, financial aid, and educational services.

Issued in furtherance of Cooperative Extension work, acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, Robert E. Whitson, Director of Oklahoma Cooperative Extension Service, Oklahoma State University, Stillwater, Oklahoma. This publication is printed and issued by Oklahoma State University as authorized by the Vice President, Dean, and Director of the Division of Agricultural Sciences and Natural Resources and has been prepared and distributed at a cost of 000 cents per copy.