

Refractometers measure the refractive index of a liquid. Brix refractometers are calibrated based on the known refractive index of sucrose–water solutions of various strengths. Since alcohol has a higher refractive index than water, its presence in solution makes refractometry unreliable. Brix is used in wine production to assess the ripeness of grapes, predict the potential ethanol content of the wine, and to monitor the fermentation. Brix is also measured to determine the water content of honey; the sugar content of maple syrup; and the optimal time to pick sugarcane, tomatoes, and some fruits. In addition, it is used as a quality-control measure for products such as ketchup, soft drinks, and fruit juices. Brix can also be utilized to measure sugar content in urine, especially in monitoring or testing for diabetes.

It is rarely the case that the measured liquid is a sucrose in water solution, so the measured Brix is only an approximation of the actual sugar content of the liquid. Nevertheless, the measurement is useful for comparison and is often sufficiently close to the actual percent-by-weight of sugar to make the measurement acceptable.

Refractometry and hydrometry are relatively simple and inexpensive techniques for measuring Brix. As a fermentation nears completion, however, these tools are of little use. The light- and/or density-altering effects of alcohol, and the differences between a pure sucrose–water solution and a wine containing fructose, glucose, dissolved acids and other dissolved solids, and ethanol, are too great to overcome. More advanced and expensive techniques such as enzymatic analysis with UV spectroscopy, or infrared spectroscopy, give the wine producer a better understanding of the amount of unfermented, residual sugar in the wine.

See also FERMENTATION; HONEY; MAPLE SYRUP; SACCHARIMETER; SUGAR AND HEALTH; SUGARCANE; and SWEET WINE.

Ashurst, P. R., ed. *Chemistry and Technology of Soft Drinks and Fruit Juices*. 2d ed. Oxford: Blackwell, 2005.

Boulton, R. B., V. L. Singleton, L. F. Bisson, and R. E. Kunkee. *Principles and Practices of Winemaking*. New York: Chapman & Hall, 1998.

Matt Reid

**brownies**, small squares of rich chocolate cake, originally contained no chocolate. Molasses-based

recipes for individual cakes called brownies appeared in both *The Boston Cooking School Cook Book* (1896) and *The Sears, Roebuck Catalogue* (1897). In 1893 the Palmer House Hotel in Chicago featured a chocolate bar cookie with apricot glaze for the Columbian Exposition, and it is this cookie that the Palmer House claims was the first chocolate brownie. This brownie was envisioned as a smaller, lighter dessert to appeal to women; it is still served at the Palmer House today. Little evidence exists for the folklore that brownies were a culinary accident, resulting from missing baking powder in a fudge cake recipe. The origin of the cake's name is similarly uncertain, though the color of the bars may account for it, or they may have been named after a popular 1887 children's book about elves (aka brownies).

In 1904 and 1905 versions of the recipe using chocolate appeared in a number of community cookbooks in both the Midwest and New England, including a recipe for Bangor Brownies in cookbooks published in New Hampshire, Boston, and Chicago. Between 1904 and 1910, the amount of chocolate called for in recipes increased although molasses-flavored recipes called "brownies" still appeared as late as 1926. Blondies—vanilla or butterscotch brownies—made their debut in the 1950s, sometimes frosted with chocolate or studded with chocolate chips. British tray bakes (when chocolate) bear a distant resemblance to brownies, as do the no-bake Canadian Nanaimo bars. In the United States, 8 December is National Brownie Day.

See also BAR COOKIES; MOLASSES; NANAIMO BAR; and SMALL CAKES.

Zanger, Mark H. "Brownies." In *Oxford Encyclopedia of Food and Drink in America*, 2d ed., edited by Andrew F. Smith, pp. 220–222. New York: Oxford University Press, 2013.

Judith Hausman

## bubble gum

See CHEWING GUM.

**bubble tea** is a popular cassava-based beverage believed to have been created, or at least touted, in the early 1980s by Taiwanese entrepreneurs Liu Han Chieh, Tu Tsong-He, and/or Lin Hsui Hui. The tea