15.1: Introduction to Alcohol

Skills to Develop

- Explain the impacts of excessive alcohol intake (both acutely and chronically) on health.

Alcohol is both a beverage providing some sustenance and a drug. For thousands of years, alcohol has been consumed in a medicinal, celebratory, and ritualistic manner. It is drunk in just about every country and often in excessive amounts. Alcohol is a psychoactive drug. A psychoactive drug is any substance that crosses the blood-brain barrier primarily affecting the functioning of the brain, be it altering mood, thinking, memory, motor control, or behavior. Alcohols in chemistry refer to a group of similar organic compounds, but in beverages the only alcohol consumed is ethanol. Ethanol is an organic compound that contains a hydroxyl (OH) group. It is the byproduct of yeast fermentation of sugars, like maltose, in an anaerobic environment.

The Behavioral Risk Factor Surveillance System survey reported that more than half of the adult US population drank alcohol in the past thirty days (Centers for Disease Control and Prevention. “Alcohol and Public Health.” Last updated March 5, 2012. http://www.cdc.gov/alcohol/). The 2015 National Survey on Drug Use and Health (NSDUH) estimated that 86.4% of people 18 and older drank at some time during their life and 70.1% reported they drank in the last year. Of the total population who drank alcohol, approximately 7 percent drank heavily, while 26.9 percent of people ages 18 or older reported they engaged in binge drinking at some point in their life. Binge drinking (as defined by the National Institute on Alcohol Abuse and Alcoholism) is when men consume five or more drinks, and when women consume four or more drinks, in two hours or less (Centers for Disease Control and Prevention. “Alcohol and Public Health.” Last updated March 5, 2012. http://www.cdc.gov/alcohol/). Alcohol in excess is detrimental to health; however, since its beginnings, it has been suspected and promoted as a benefit to the body and mind when consumed in moderation. In the United States, the Dietary Guidelines define moderate alcohol intake as no more than one drink per day for women and up to two drinks per day for men (US Department of Agriculture and US Department of Health and Human Services. “Alcoholic

**Figure \(\PageIndex{1}\):** One-half ounce of hard liquor.

Beer, wine, and hard liquor are the alcohol types familiar to most people and each contains pure ethanol in different amounts. Beer and wine will give the amount of alcohol in a percent based on volume. So if a beer is labeled as 5.9% alcohol that means a 12 ounce can contain 0.71 ounces of alcohol. On average, one can of beer contains about 15 grams of ethanol which does not seem like much except it will take the liver approximately one hour to metabolize and clear that amount.

**Example \(\PageIndex{1}\): Beer 12 fluid ounces**

Alcohol % varies. If alcohol content is 5.0% by volume:

$$\text{(12 ounces of beer)} \times \left(29.5735 \frac{\text{milliliters}}{\text{ounce}}\right) \times \left(0.05 \frac{\text{milliliters}}{\text{milliliters}}\right) \times \left(0.789 \frac{\text{grams}}{\text{milliliters}}\right) \approx 14 \text{ grams of alcohol}$$

1. 29.5735 is the conversion factor for ounces to grams
2. 0.05 is the percent alcohol
3. 0.789 is the density of alcohol

The ethanol content of hard liquor is stated as proof which is half the percentage of alcohol. So, one ounce of hard liquor is 30 grams of ethanol or 200 proof or 100% alcohol.

**Discussion Starters**

1. Weekends seem to be the time to party on campus. How many people do you know that drink? How much do they drink and why?
References
