Autobrewery Syndrome

# Introduction:

Autobrewery syndrome occurs when yeasts or bacteria in the gastrointestinal tract ferment the glucose in carbohydrates, producing large amounts of ethanol:

C6H12O6 🡪 2 C2H5OH + 2 CO2

Patients with this syndrome display symptoms of intoxication without actually consuming alcohol and typically report eating a high-sugar, high-carbohydrate diet. Symptoms include vomiting, dizziness, loss of coordination, and chronic fatigue. Many patients experience the same social difficulties that can occur with drinking, including arrests for DUI. Once diagnosed, autobrewery syndrome can be treated with an antibiotic that is specific to the offending strain, probiotics to restore healthy gut microbiota, and a low-carbohydrate diet.

# Activity:

1. Starch is a glucose polymer, which means it contains many connected units of glucose. How many moles of glucose did a patient consume when eating a 175-gram potato? A potato is 20.0% starch.
2. How many liters of carbon dioxide were produced by the 175-gram potato? 1 mol of gas = 22.4 L.
3. How many grams of ethanol were produced by the 175-gram potato?
4. How many milliliters of ethanol were produced? The density of ethanol is 0.789 g/mL.
5. A standard serving of alcohol is 1.5 ounces. How many servings of alcohol were produced by the potato? 1 ounce = 30 mL
6. Blood alcohol content (BAC) is defined as grams of alcohol per 100 mL of blood. The legal limit in most states is a BAC of 0.08, which is 0.08 grams of alcohol/100 mL of blood. What is the maximum BAC possible for the patient who consumed the 175-gram potato? Average blood volume is 5.0 L.
7. What mass of potato could someone with autobrewery syndrome eat and remain under the legal limit?