

## **Fermentation Unit Objectives: by the end of this unit, students will be able to...**

- Explain the role of ATP in the cell and explain how it is produced from ADP and  $P_i$ .
- Explain how a cell can use ATP Synthase to produce ATP.
- Explain how a cell can use pyruvate to produce ATP.
- Explain the role that oxygen plays in the production of ATP.
- Explain the difference between a prokaryotic cell and a eukaryotic cell.
- Compare and contrast cellular respiration and fermentation.
- Explain how glycolysis relates to cellular respiration and fermentation.
- Compare and contrast prokaryotic and eukaryotic organisms.
- Explain why it is necessary for yeast cells to convert pyruvate into acetaldehyde and then ethanol.
- Summarize the role played by  $NAD^+$  in glycolysis and fermentation.
- Diagram the conversion of sugar into ethanol by showing each intermediary molecule that is created in order to produce ethanol.
- List the benefits of fermenting food.
- Identify and list fermented products.
- Compare and contrast wet milling and dry milling and explain how each can be used to produce ethanol.
- Summarize the organs, steps, and processes used by the body to break down alcohol that has been consumed.
- Explain how fast alcohol can be processed by the body.
- Identify the class of drugs in which alcohol is categorized through the impact that it has on the body.
- Explain the connection between alcohol consumption and the risk of sexual assault through statistics and a comparison between how alcohol affects men and women differently.
- Define each of the following: a. Binge drinking b. Alcohol abuse c. Substance dependence d. Tolerance e. Withdrawal
- Describe the outcome that occurs as a result of the impact of alcohol on each of the following structures: parietal lobe, cerebellum, amygdala, hippocampus, primary motor cortex, premotor cortex, and endolymph/semicircular canals.
- Summarize three ways in which alcohol consumption results in increased urination and water loss.
- Explain how alcohol's inhibition of the production of glutamine, a natural stimulant, results in increased fatigue.
- Identify and list chronic problems associated with long-term alcohol abuse.