

Biotechnology *Checklist*

Living Factories (* = Credit outcomes)

1. Biotechnology is the use of **living organisms** (mostly microorganisms) in **manufacturing processes**.
2. **Yeast** is a **single celled fungus** which can use sugar as food.
- 3*. **Anaerobic** respiration does not involve oxygen. Less energy is released from food and different products are formed.

aerobic - glucose (sugar) + oxygen \longrightarrow carbon dioxide + water + energy

anaerobic - glucose (sugar) \longrightarrow alcohol (ethanol) + carbon dioxide + energy

4. During **fermentation**, yeast converts sugar to alcohol and carbon dioxide. This is used in **brewing** and **baking**.
5. In **batch processing** all reactants are placed in a large vessel and left for the products to form. The products then have to be separated from the enzymes (or microorganisms) and the unreacted raw materials.
6. Batch processing is used by commercial brewers to carry out fermentation on a large scale. Yeast grows best at pH 7 and 10°C - 18°C. Other microorganisms are kept out.
7. In beer making the source of the sugar is **maltose** from germinating **barley** grains. The sugar is extracted by the process of **malting**.
8. Yoghurt and cheese are made by using special bacteria to ferment **lactose** (the sugar in milk) into **lactic acid** which makes the milk **curdle**.