        - The end result is the formation of 4 molecules of ATP, 2 molecules of NADH and 2 molecules of pyruvate (3-carbon)
- *Pyruvate* is the ionized form of pyruvic acid
- Once pyruvate is obtained, the next pathway is determined by the presence of oxygen
    - If oxygen is present, pyruvate enters the mitochondria and aerobic respiration occurs
    - If not, anaerobic respiration occurs in the cytoplasm
        - Later, pyruvate is converted to lactase in animals and ethanol and carbon dioxide in plants
- High levels of ATP in the cytoplasm will inhibit the first enzyme in the pathway by end-product inhibition
- The way of producing ATP in glycolysis is called *substrate-level phosphorylation*, because the phosphate group is transferred directly to ADP from the original phosphate-bearing molecule

The link reaction

- Pyruvate enters the matrix of the mitochondria via active transport
- *Link reaction* is the first process that occurs in the mitochondria, that is decarboxylation
- *Decarboxylation* is the removal of a carbon atom
- Pyruvate is decarboxylated and a 2-carbon acetyl group is formed
    - The removed carbon is released as carbon dioxide
- The acetyl group is oxidised by NAD^+ giving another NADH
- The acetyl group combines with coenzyme A (CoA) to form acetyl-CoA
- The link reaction is controlled by a system of enzymes
- Acetyl CoA enters the Krebs cycle to continue the aerobic respiration process
- Acetyl CoA can be produced from most carbohydrates and lipids
- Acetyl CoA can be synthesized into a lipid for storage purposes when ATP levels in the cell are high

Krebs cycle

- If cellular ATP levels are low, the acetyl CoA enters the Krebs cycle
    - The cycle is also called *tricarboxylic acid cycle* and is a cycle because it begins and ends with the same substance