

Aerobic and Anaerobic Respiration

RESPIRATION

It is the chemical breakdown of food in the cells of organisms. This process releases energy which the organisms use to carry out body functions needed for survival. There are two types of respiration:

1. Aerobic respiration
2. Anaerobic respiration



Aerobic Respiration: this is the complete breakdown of food (glucose) in the presence of oxygen. This type of respiration releases carbon dioxide, water and energy (2880KJ per glucose molecule). This takes place in the mitochondria.

Anaerobic Respiration: the incomplete breakdown of glucose into alcohol and lactic acid without the presence of oxygen. It releases a small amount of energy.

Explanation:

Glucose → carbon dioxide alcohol energy (210KJ per glucose molecule).

Anaerobic Respiration in Yeast

During strenuous exercise our bodies use up oxygen and it cannot be replaced at the rate at which it is being removed. This creates an oxygen debt in the muscles that are being used. Hence we tend to breathe faster, deeper and harder to restore the oxygen that was lost. The glucose is broken down to a substance called lactic acid with no other waste product. This respiration takes place in the cytoplasm.

Glucose → lactic acid energy (150KJ per molecule).

Industrial Uses of Anaerobic Respiration

There are many industries that rely on alcoholic fermentation which is carried out by yeast. These beverages are beers, wines and spirits.

Yeast is also used in the baking industry because one by-product of anaerobic respiration is carbon dioxide. This is used to make dough rise. Anaerobic bacteria are cultured specially to make cheeses and yoghurts. The lactic acid will add the flavour.