Wednesday, 4 January 2017

Biology

Respiration - Anaerobic

- Anaerobic respiration is the incomplete breakdown of glucose and produces lactic acid
- Anaerobic respiration takes place in animal, plant and some microbial cells in conditions of low oxygen or absence of oxygen, such as: 1) plant roots in waterlogged soil 2) bacteria in puncture wounds 3) human cells during vigorous cells
- Anaerobic respiration releases less energy per glucose molecule than aerobic respiration because glucose is only partially broken down.
- Glucose → Lactic Acid + Energy
- $C_6H_{12}O_6$ → $2C_3H_6O_3$ + ATP
- STAGES:
- 1) During hard exercise, oxygen supply is insufficient to meet energy demands so anaerobic respiration starts taking place in addition to aerobic respiration.
- 2) The anaerobic respiration produces lactic acid which accumulates in the muscles.
- 3) If muscles are subjected to long periods of vigorous activity, they stop contracting efficiently, causing fatigue.
- 4) The build-up of lactic acid requires extra oxygen to break it down. This is called excess post-exercise oxygen consumption or EPOC (or oxygen debt)
- 5) Blood through through the muscles removes the lactic acid, relieving fatigue.
- Glucose → Ethanol + Carbon Dioxide + Energy
- $C_6H_{12}O_6$ → C_2H_6OH + $2CO_2$ + ATP
- This can be called fermentation, used to make alcoholic drinks and to make bread (CO_2) as the carbon dioxide causes the dough to rise.
- Products made from the outputs of respiring micro-organisms are biogas, bread and alcohol.
- Sometimes cells need a lot of oxygen very quickly e.g. exercise. To produce this energy, mitochondria in the muscle cells combine oxygen and glucose as fast as they can to provide energy to muscle contraction. A lot of oxygen is needed so we breathe deeper and faster to get oxygen into the blood, the heart beats faster to get the oxygen round the body to the muscle cells. With continued exercise, eventually a limit is reached and oxygen cannot be supplied any faster but energy is still needed. The