

# Edexcel (B) Biology A-level

## 5.5 - Anaerobic respiration

### Flashcards

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# What is anaerobic respiration?



# What is anaerobic respiration?

Partial breakdown of hexose sugars (glucose) in oxygen-deprived conditions to produce a limited ATP yield.



# What happens during anaerobic respiration in animals?



What happens during anaerobic respiration in animals?

only glycolysis continues

reduced NAD + pyruvate



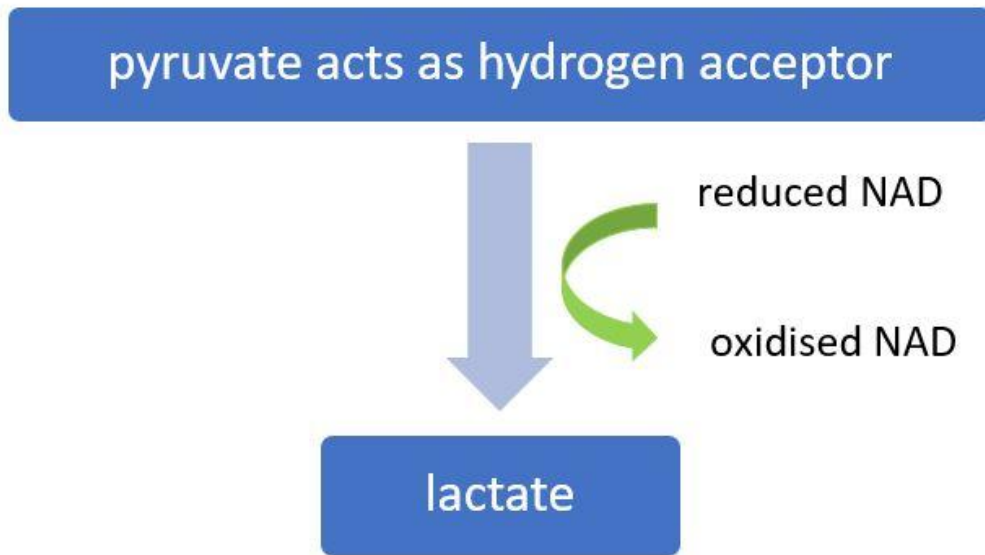
oxidised NAD (for further glycolysis) + lactate



Draw a flowchart to show how lactate is produced in anaerobic respiration.



Draw a flowchart to show how lactate is produced in anaerobic respiration.



What happens to the lactate produced in anaerobic respiration?





What happens to the lactate produced in anaerobic respiration?

Transported to liver in bloodstream. Oxidised to pyruvate by lactate dehydrogenase. Involves conversion of NAD to reduced NAD.

Enters link reaction in liver cells or is converted to glycogen.



# How does lactate affect muscle contraction in mammals?



How does lactate affect muscle contraction in mammals?

Acidic, so decreases pH.

Results in muscle fatigue.



What happens during anaerobic respiration in some microorganisms e.g. yeast and some plant cells?



What happens during anaerobic respiration in some microorganisms e.g. yeast and some plant cells?

Only glycolysis continues.

Pyruvate is decarboxylated to form ethanal.

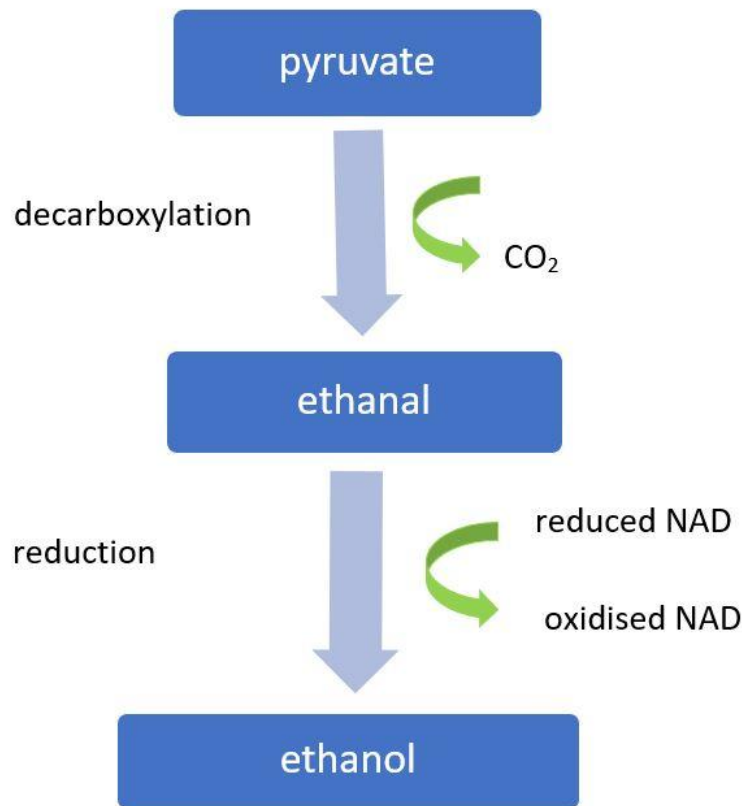
Ethanal is reduced to ethanol using reduced NAD to produce oxidised NAD for further glycolysis.



Draw a flowchart to show how ethanol is produced during anaerobic respiration.



Draw a flowchart to show how ethanol is produced during anaerobic respiration.



What is the advantage of producing ethanol / lactate during anaerobic respiration?





What is the advantage of producing ethanol/ lactate during anaerobic respiration?

Converts reduced NAD back into NAD so glycolysis can continue.



What is the disadvantage of producing ethanol during anaerobic respiration?



What is the disadvantage of producing ethanol during anaerobic respiration?

Dissolves cell membranes so cells die when concentration is above 12%.



Compare the ATP yields per molecule of hexose sugar from aerobic and anaerobic respiration.



Compare the ATP yields per molecule of hexose sugar from aerobic and anaerobic respiration.

Aerobic  $\approx$  38 in ideal conditions

Anaerobic = 2 from glycolysis



Explain the principle behind using a respirometer.



Explain the principle behind using a respirometer.

Pressure changes in the boiling tube due to  $\text{CO}_2$  production (anaerobic experiments) or  $\text{O}_2$  consumption (aerobic experiments) cause a drop of coloured liquid to move.



What is the purpose of sodium hydroxide solution in a respirometer set up to measure the rate of aerobic respiration?





What is the purpose of sodium hydroxide solution in a respirometer set up to measure the rate of aerobic respiration?

- Absorbs  $\text{CO}_2$  so that there is a net.
- Decrease in pressure as  $\text{O}_2$  is consumed.



How could a student calculate the rate of respiration using a respirometer?



How could a student calculate the rate of respiration using a respirometer?

- Volume of  $O_2$  produced or  $CO_2$  consumed/  
time  $\times$  mass of sample.
- Volume = distance moved by coloured  
drop  $\times (0.5 \times \text{capillary tube diameter})^2 \times \pi$ .

