

Exercise walk-through

Biotechnology ■ 21.2

eXercise

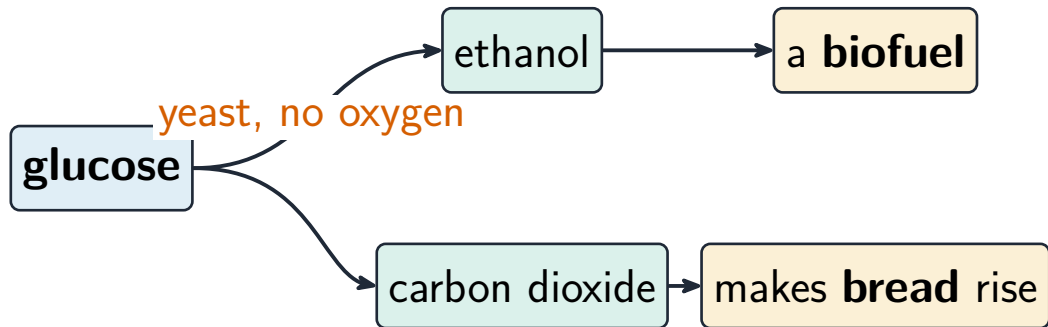
You must be able to

- describe how yeast makes ethanol and carbon dioxide
- give the uses of pectinase, washing-powder enzymes and lactase
- state the conditions controlled in a fermenter

Method — Yeast and fermenters

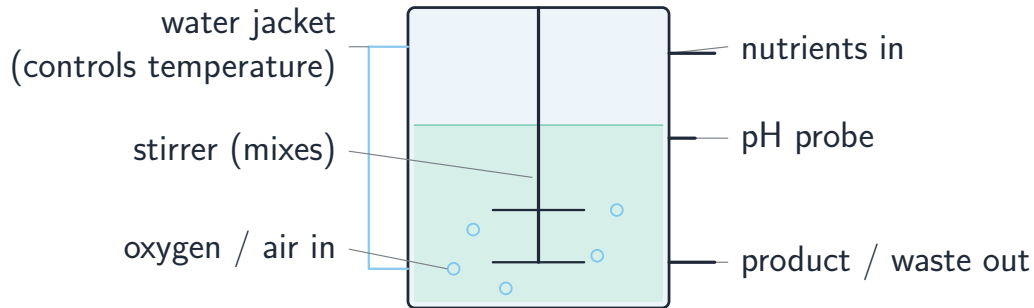
- **pectinase:** more/clearer fruit juice; **lactase:** lactose-free milk.

Method — Yeast and fermenters



Yeast $\rightarrow$ ethanol (biofuel) + CO (bread)

Method — Yeast and fermenters



A fermenter with controlled temperature, pH, oxygen, nutrients

Practice 2.1 ■ 2 marks

Name the two products yeast makes by anaerobic respiration.

Solution 2.1

Method: Yeast and fermenters

Worked steps

ethanol; carbon dioxide **B1** **B1**.

Practice 2.2 ■ 1 mark

State the use of pectinase.

Solution 2.2

Worked steps

it breaks down cell walls to release more (and clearer) fruit juice **B1**.

Exam-style 3.1 ■ 1 mark

Biological washing powders contain enzymes that:

- A** make stains
- B** digest stains at lower temperatures
- C** colour clothes
- D** kill bacteria

Solution 3.1

- A make stains
- B digest stains at lower temperatures
- C colour clothes
- D kill bacteria



Worked steps

- B. The enzymes digest stains, even at lower temperatures.

Exam-style 3.2 ■ 2 marks

A fermenter is used to grow microbes.

- (a) State two conditions that must be controlled in a fermenter.
- (b) Name one useful product made in a fermenter.

Solution 3.2

Method: Yeast and fermenters

Worked steps

- (a) any two of: temperature; pH; oxygen; nutrient supply; waste removal **B1** **B1**.
- (b) any of: insulin; penicillin; mycoprotein **B1**.