

12.3 Anaerobic respiration

Name: _____ Class: _____ Date: _____

Total: 20 marks

KEY WORDS anaerobic respiration 无氧呼吸 • lactic acid 乳酸 • oxygen debt 氧债 • liver 肝脏
• heart rate 心率

Objective

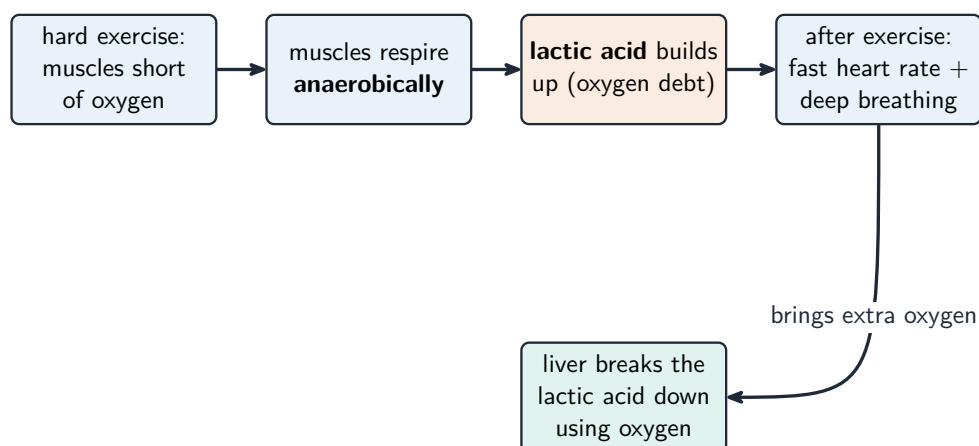
Build the skills to answer exam questions on **anaerobic respiration** 无氧呼吸 — the equations in yeast and muscle, and the **oxygen debt** 氧债.

You must be able to:

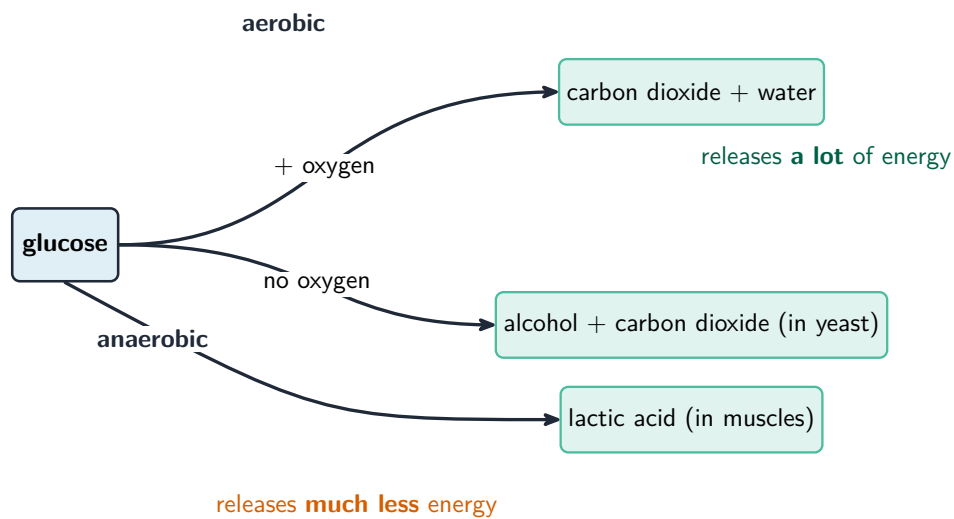
- write the anaerobic equations for yeast and for muscle
- compare the energy released with aerobic respiration
- explain the oxygen debt and how it is repaid

1 Worked examples

■ Anaerobic respiration & oxygen debt



Anaerobic respiration: no oxygen, much less energy



Anaerobic respiration compared with aerobic

- **yeast:** glucose → alcohol + carbon dioxide.
- **muscle:** glucose → lactic acid → an **oxygen debt** (extra O₂ needed later).

2 Practice

2.1 Write the word equation for anaerobic respiration in yeast. [2]

2.2 Name the substance that builds up in muscles during hard exercise. [1]

3 Exam-style questions

3.1 Compared with aerobic respiration, anaerobic respiration releases: [1]

A	B
C	D

- A more energy
- B much less energy
- C the same energy
- D no energy

3.2 During a sprint the muscles respire anaerobically.

(a) Write the equation for anaerobic respiration in muscle. [1]

(b) Explain what is meant by an oxygen debt. [2]

3.3 Describe how the oxygen debt is repaid after exercise. [2]

3.4 A runner sprints 400 m. For several minutes after finishing, she continues to breathe deeply and quickly.

(a) Write the word equation for anaerobic respiration in muscle, and the word equation for anaerobic respiration in yeast. [2]

(b) Explain why her muscles respire anaerobically during the sprint. [3]

(c) Explain what the oxygen debt is and why she keeps breathing deeply after stopping. [4]

(d) State **two** reasons why anaerobic respiration cannot replace aerobic respiration in the long term. [2]
