

Food fuels and the three energy systems

The three energy systems

Energy for muscular contractions is produced anaerobically or aerobically via three energy systems including:

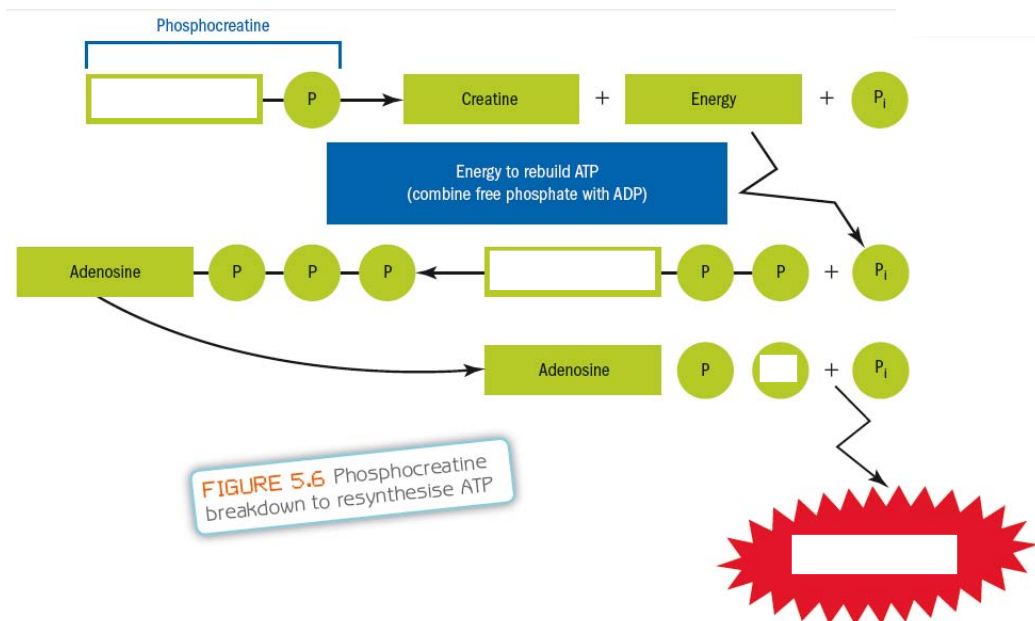
- 1.
- 2.
- 3.

All systems never work in isolation, instead all work together via the process of interplay to supply energy and rebuild ATP.

Which of the three systems is the predominant energy system used is dependent on:

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ATP-PC System



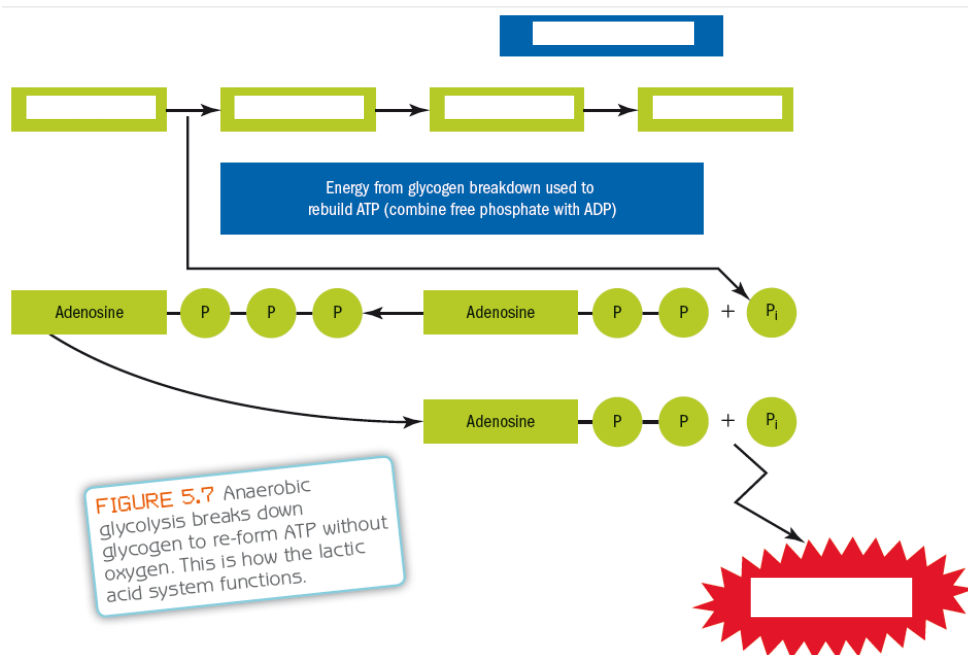
ATP-PC System

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- Provision of most rapid source of ATP, due to the short chemical reaction and the ready availability of PC in the muscles
- Limited amounts of PC in muscles- more intense the activity, the faster PC stores are utilised
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- Once PC is depleted at the muscle, ATP must be resynthesised from another substance (glycogen) via anaerobic glycolysis

Activity:

List some sports that the ATP-PC system would be the predominant energy system in

Anaerobic glycolysis system



Anaerobic glycolysis system

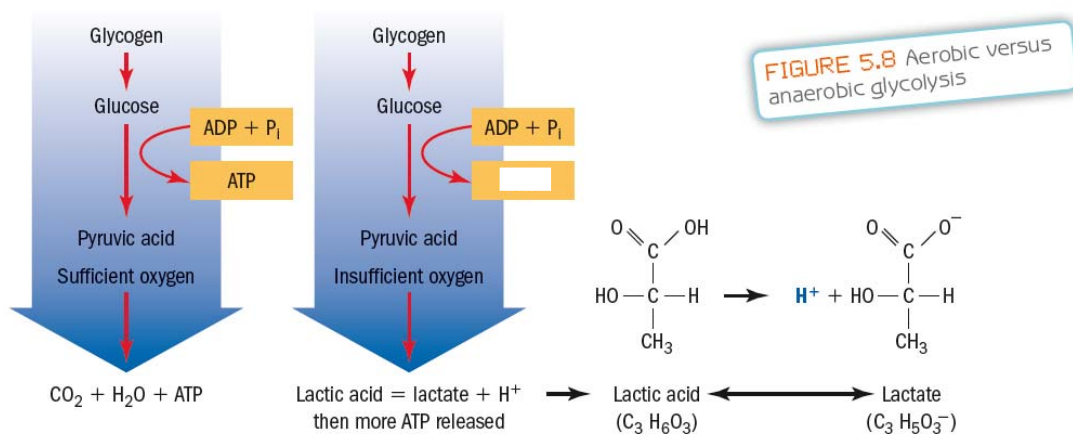
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- Supplies energy from the start of intense exercise, with peak power between 5-15 seconds, however system continues to contribute ATP until it fatigues at 2-3 minutes
- Provides twice as much energy for ATP resynthesis as ATP-PC system, it increases its ATP contribution if performance intensity exceeds the lactate inflection point
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What is lactate inflection point?

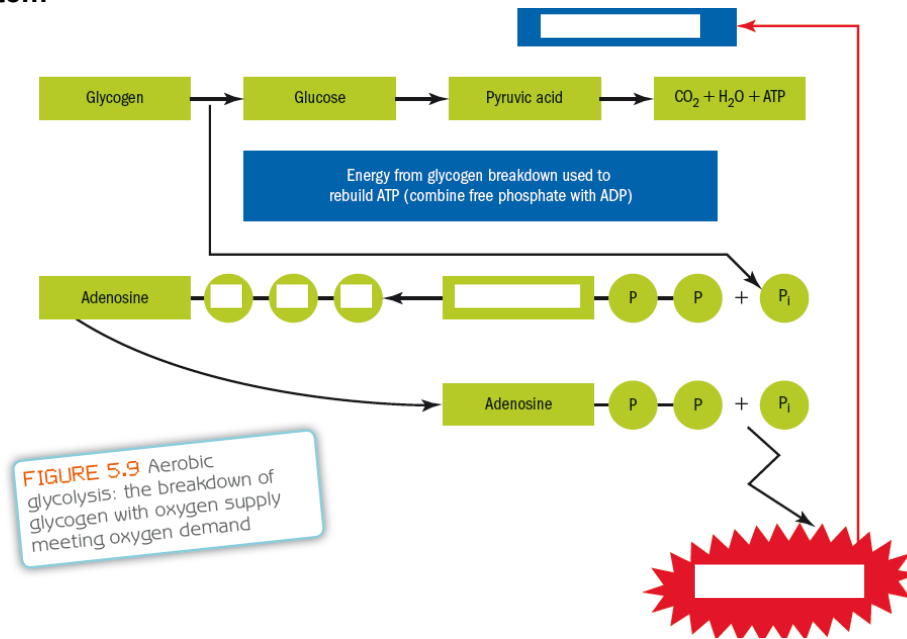
Activity

List some sports that the anaerobic glycolysis system would be the predominant energy system in

Aerobic versus anaerobic glycolysis



Aerobic system



Aerobic system

- Slowest system to contribute towards ATP resynthesis, involves many complex reactions to release energy
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Activity

List some sports that the aerobic system would be the predominant energy system in