

# RESPIRATION

## What You Need to Know

### Respiratory substrates and Respiratory Quotient (RQ)

- The use of different respiratory substrates and the determination, calculation and interpretation of **RQ**.
- RQ should be considered with reference to **lipid, protein and carbohydrate**

### Biochemistry of Respiration

- The release of energy from carbohydrate by **aerobic respiration**.
- The production of ethanol or lactate and the **regeneration of NAD in anaerobic respiration**
- **How much detail do you need to know?**
  - **Glycolysis** involved the **oxidation of glucose to pyruvate** with the net gain of **ATP** and **reduced NAD**
  - **Acetylcoenzyme A** is produced from pyruvate and coenzyme A in the **link reaction**
  - Acetylcoenzyme A combines with 4-carbon molecule to produce a 6-carbon molecule in the **Krebs cycle**
  - In a series of oxidation-reduction reactions, the Krebs cycle generates **reduced coenzymes and ATP** by substrate-level phosphorylation and **carbon dioxide is lost**.
  - Oxidative phosphorylation leads to **aerobic generation of ATP via a chain of electron carriers**
  - Aerobic respiration is more **efficient** than anaerobic respiration in terms of **ATP production**
  - The roles of the **cytoplasm** and of the **mitochondria** in these processes.

### The role of ATP

- ATP as an **immediate source of energy** in **active transport, glycolysis, photosynthesis and other metabolic processes**.