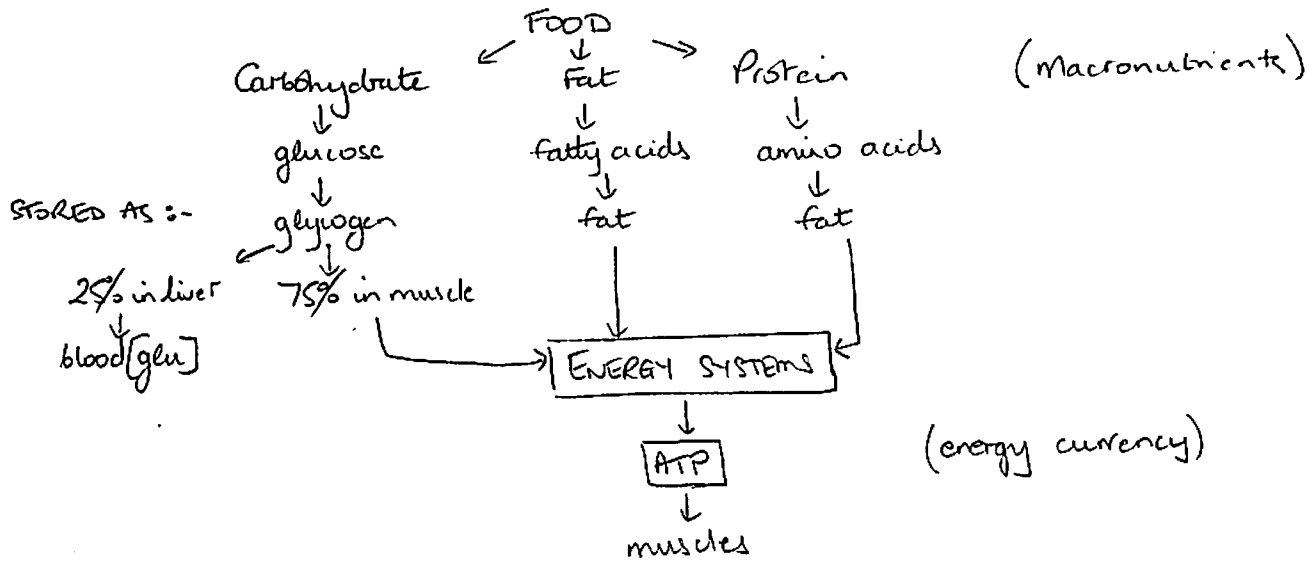
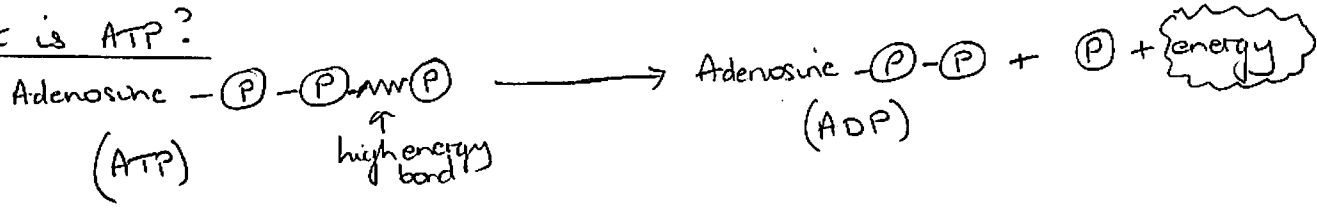


# ENERGY SYSTEMS & PERFORMANCE

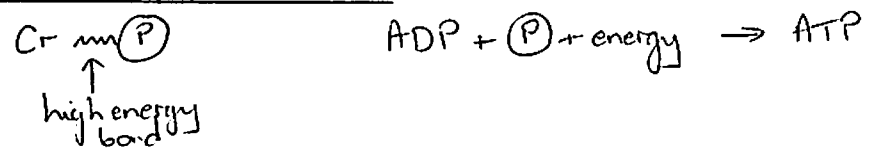


What is ATP?



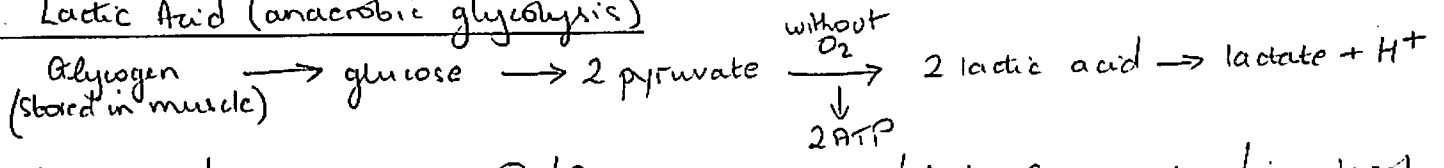
## Energy Systems

### 1. Creatine Phosphate Cr-P



Store of Cr-P in muscle cell in cytosol  
 Anaerobic / Immediate / Short-lived 10-15secs / No waste products  
 Takes 2-3 mins to regenerate  
 Produce 1g/day in liver/kidneys and eat 1g/day.  
 Can supplement up to 3g/day in studies, higher doses cause liver/kidney damage

### 2. Lactic Acid (anaerobic glycolysis)



Anaerobic / Slower than Cr-P / faster than aerobic / lasts few minutes / in cytosol.  
 Waste products lactate  $\rightarrow$  fuel  
 $H^+$   $\rightarrow$  limit lactic acid system, cause vomiting

### 3. Aerobic system

With  $O_2$ , in mitochondria.  
 Glucose + fatty acids used together  $\xrightarrow{+O_2}$  Krebs cycle  $\rightarrow$  ATP

1 molecule glucose  $\rightarrow$  32 ATP.  
 Slow / Very efficient / for exercise lasting longer than a few minutes to hours long  
 Waste products  $CO_2 + H_2O + \text{heat}$   
 Uses a mixture of glucose / FAs, if glucose  $\downarrow$ , uses amino acids.

# HEART RATE and BLOOD LACTATE vs. POWER

