IDX 10 [Biology][S]
Study Guide Issue #3
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THE KREBS CYCLE

- Stage 1: citric acid production
- 2 pyruvic acid -> 2 acetyl CoA + 2NADH + 2CO2
- 2 Acetyl CoA -> 2 citric acid
- Stage 2: energy extraction
- 2 citric acid -> 6NADH + 2FADH2 + 4CO2 + 2ATP
- Total net yield: 2pyruvic acid -> 2ATP + 8NADH + 6FADH2 + 6CO2

ETC AND ATP SYNTHESIS

- use high energy electron carried by NADH and FADH2 from glycolysis and krebs cycle to form ATP
- This process if called chemiosmosis - the cell uses the potential energy from charge difference built up as a result of electron transport
- high energy electrons released by NADH and FADH2 are passed along electron transport chain, As e- transport down the ETC, their energy is used to pump H+ across the inner membrane, H+ diffuse back across inner membrane through ATP synthase and cause it to rotate. The rotation of ATP synthase cause ADP and P to form ATP
- Total net yield: release 32 or 34 ATP. (NADH = 3ATP, FADH2 = 2ATP)

ALCOHOLIC FERMENTATION

- Step 1: glucose + 2NAD+ -> 2 pyruvic acid + 2ATP + 2NADH
- Step 2: 2 pyruvic acid + 2NADH -> 2 alcohol + 2CO2 + 2NAD+
- Help produce bread, beer, and wine

LACTIC ACID FERMENTATION

- Step 1: glucose + 2NAD+ -> 2 pyruvic acid + 2ATP + 2NADH
- Step 2: 2 pyruvic acid + 2NADH -> 2 NAD+ + 2lactic acid
- In bacteria (cheese, yogurt)

OXYGEN DEBT

- Cells require extra O2 to break down the lactic acid (by-product) built