<table>
<thead>
<tr>
<th>Pathway</th>
<th>Glycolysis</th>
<th>Citric Acid Cycle</th>
<th>Oxidative Phosphorylation</th>
<th>Fatty Acid Cycle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site</td>
<td>cytoplasm</td>
<td>mitochondria</td>
<td>mitochondria</td>
<td>mitochondria</td>
</tr>
<tr>
<td>Start</td>
<td>Glucose</td>
<td>Acetyl-CoA</td>
<td>NADH or FADH₂; H⁺, O₂</td>
<td>Fatty Acid</td>
</tr>
<tr>
<td>Activation</td>
<td>2 ATP</td>
<td></td>
<td></td>
<td>2 ATP - once per fatty acid</td>
</tr>
<tr>
<td>End</td>
<td>2 Pyruvates</td>
<td>2 CO₂</td>
<td>NAD⁺, FAD, H₂O</td>
<td>Acetyl-CoA</td>
</tr>
<tr>
<td>Energy Production</td>
<td>2 NADH, 2 ATP (~ 6 ATP after ET)</td>
<td>3 NADH, FADH₂, GTP (~ 12 ATP after ET)</td>
<td>FADH₂ = 2 ATP in ET NADH = 3 ATP in ET NADH produced in cytoplasm yields 2 ATP</td>
<td>NADH, FADH₂ or (~ 5 ATP per cycle after ET) # cycles = (# C's in fatty acid / 2) - 1</td>
</tr>
</tbody>
</table>

**Pyruvate**

* Aerobic: occurs in mitochondria
  Pyruvate → Acetyl-CoA + CO₂
  NADH (~ 3 ATP after ET)
  *Acetyl-CoA enters the Krebs Cycle*

* Anaerobic: occurs in cytoplasm
  Pyruvate + NADH → Lactate + NAD⁺
  no ATP produced; makes NAD⁺ needed for glycolysis to continue
  *Part of the Cori Cycle at right*

  *Anaerobic (yeast)*
  Pyruvate → ethanol + CO₂
  2 ATP

**Cori Cycle: Glucose → Glucose**

* The first half of the cycle occurs in many different tissues (like muscle) when lactate is formed from glucose during oxygen debt.

  *Glucose → 2 Lactates*
  *Provides: 2 ATP from glycolysis*

  *The second half of the cycle converts lactate back into glucose. This takes place in the liver when plenty of oxygen (and energy) is available.*

  *2 Lactates → Glucose*
  *Uses: 4 ATP, 2 GTP, 2 NADH (net cost is ~ 10 ATP)*

**Glycerol (from fat)**

Glycerol is converted to dihydroxyacetone phosphate by oxidation and phosphorylation.

  *Glycerol → Dihydroxyacetone phosphate*

  *glycerol is activated by using 1 ATP and the reaction produces 1 NADH (~ 2 ATP after ET - 1 ATP activation = 1 ATP)*

  *Dihydroxyacetone phosphate is then broken down in the second half of the glycolysis pathway*

  *Dihydroxyacetone phosphate → pyruvate*
  *making 2 ATP and 1 NADH (~ 4 ATP after ET)*