

What If Scenarios....ATP Production

	Situation	Response														
1	After glycolysis, only 1 molecule of pyruvate enters the mitochondrial matrix. Assume one glucose enters glycolysis.	<p>G PO KC</p>	<table border="1"> <thead> <tr> <th>HE</th> <th>ATP</th> </tr> </thead> <tbody> <tr> <td>2 NADH →</td> <td>2</td> </tr> <tr> <td>1 NADH →</td> <td>3</td> </tr> <tr> <td>3 NADH →</td> <td>6</td> </tr> <tr> <td>1 FADH₂ →</td> <td>2</td> </tr> </tbody> </table>	HE	ATP	2 NADH →	2	1 NADH →	3	3 NADH →	6	1 FADH ₂ →	2	<p>21 ATP total</p>		
HE	ATP															
2 NADH →	2															
1 NADH →	3															
3 NADH →	6															
1 FADH ₂ →	2															
2	The inner mitochondrial membrane is disrupted such that it no longer controls what enters/exits the matrix. Assume one glucose enters glycolysis.	<p>G PO KC</p>	<table border="1"> <thead> <tr> <th>HE</th> <th>ATP</th> </tr> </thead> <tbody> <tr> <td>2 NADH →</td> <td>2</td> </tr> <tr> <td>2 NADH →</td> <td>0</td> </tr> <tr> <td>6 NADH →</td> <td>0</td> </tr> <tr> <td>2 FADH₂ →</td> <td>0</td> </tr> <tr> <td></td> <td>2</td> </tr> </tbody> </table>	HE	ATP	2 NADH →	2	2 NADH →	0	6 NADH →	0	2 FADH ₂ →	0		2	<p>4 ATP total</p>
HE	ATP															
2 NADH →	2															
2 NADH →	0															
6 NADH →	0															
2 FADH ₂ →	0															
	2															
3	NADH dehydrogenase is removed from the ETC. Assume one glucose enters glycolysis.	<p>G PO KC</p>	<table border="1"> <thead> <tr> <th>HE</th> <th>ATP</th> </tr> </thead> <tbody> <tr> <td>2 NADH →</td> <td>2</td> </tr> <tr> <td>2 NADH →</td> <td>0</td> </tr> <tr> <td></td> <td>2</td> </tr> <tr> <td>6 NADH →</td> <td>0</td> </tr> <tr> <td>2 FADH₂ →</td> <td>4</td> </tr> </tbody> </table>	HE	ATP	2 NADH →	2	2 NADH →	0		2	6 NADH →	0	2 FADH ₂ →	4	<p>8 ATP total</p>
HE	ATP															
2 NADH →	2															
2 NADH →	0															
	2															
6 NADH →	0															
2 FADH ₂ →	4															
4	Cytochrome oxidase complex is removed from the ETC. Assume one glucose enters glycolysis.	<p>G PO KC</p>	<table border="1"> <thead> <tr> <th>HE</th> <th>ATP</th> </tr> </thead> <tbody> <tr> <td>2 NADH →</td> <td>2</td> </tr> <tr> <td>2 NADH →</td> <td>0</td> </tr> <tr> <td></td> <td>2</td> </tr> <tr> <td>6 NADH →</td> <td>0</td> </tr> <tr> <td>2 FADH₂ →</td> <td>0</td> </tr> </tbody> </table>	HE	ATP	2 NADH →	2	2 NADH →	0		2	6 NADH →	0	2 FADH ₂ →	0	<p>4 ATP total</p>
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2 FADH ₂ →	0															

