

1 $\text{ATP} + \text{glucose} \rightarrow \text{ADP} + \text{glucose-6-phosphate}$

2 $\text{alanine} + \text{D-xylulose-5-phosphate} + \text{H}_2\text{O} + \text{NAD}^+ + \text{NADP}^+ \rightarrow \text{DHAP} + \text{glycine} + 2 \text{H}^+ + \text{NADH} + \text{NADPH} + \text{pyruvate}$

3 $2 \text{5,10-methenyl-THF} + \text{aspartate} + 4 \text{ATP} + \text{CO}_2 + 2 \text{glutamine} + \text{glycine} + 3 \text{H}_2\text{O} + \text{PRPP} \rightarrow 4 \text{ADP} + \text{fumarate} + 2 \text{glutamate} + 2 \text{H}^+ + \text{IMP} + 4 \text{Pi} + \text{PPi} + 2 \text{THF}$

4 $\text{ATP} + \text{glutamine} + 2 \text{H}_2\text{O} + \text{IMP} + \text{NAD}^+ \rightarrow \text{AMP} + \text{glutamate} + \text{GMP} + \text{H}^+ + \text{NADH} + \text{PPi}$

5 $\text{aspartate} + 2 \text{ATP} + \text{glutamine} + \text{H}^+ + \text{HCO}_3^- + \text{PRPP} + \text{ubiquinone[m]} \rightarrow 2 \text{ADP} + \text{CO}_2 + \text{glutamate} + 2 \text{Pi} + \text{PPi} + \text{ubiquinol[m]} + \text{UMP}$

6 $\text{ATP} + \text{glutamine} + \text{H}_2\text{O} + \text{UTP} \rightarrow \text{ADP} + \text{CTP} + \text{glutamate} + \text{Pi}$

7 $\text{glutamate} + \text{OAA} \rightarrow \text{AKG} + \text{aspartate}$

8 $\text{glutamine} + \text{H}_2\text{O} \rightarrow \text{glutamate} + \text{NH}_3$

9 $\text{glutamate} + \text{pyruvate} \rightarrow \text{AKG} + \text{alanine}$

10 $\text{aspartate} + \text{ATP} + \text{glutamine} + \text{H}_2\text{O} \rightarrow \text{AMP} + \text{asparagine} + \text{glutamate} + \text{PPi}$

11 $\text{glutamate} + \text{H}^+ + \text{NADH} \rightarrow \text{H}_2\text{O} + \text{L-glutamate 5-semialdehyde} + \text{NAD}^+$

12 $3\text{-phospho-D-glycerate} + \text{glutamate} + \text{H}_2\text{O} + \text{NAD}^+ \rightarrow \text{AKG} + \text{H}^+ + \text{NADH} + \text{Pi} + \text{serine}$

13 $\text{alanine} \rightarrow$

14 $\text{glutamate} \rightarrow$