Metabolism

(a) Without regulation of enzymatic activity, the pathway will simply cycle back and forth.

Enzyme 1
A \[ \rightarrow \] B
Enzyme 2
No net synthesis of substance A or B

(b) Fed-state metabolism under the influence of insulin

\[
\begin{align*}
\text{glucose} & \quad \rightarrow \quad \text{GLYCOGEN} \\
\text{GLYCOGEN} & \quad \rightarrow \quad \text{glycogen}
\end{align*}
\]
Net glycogen synthesis

(c) Fasted-state metabolism under the influence of glucagon

\[
\begin{align*}
\text{GLUCOSE} & \quad \rightarrow \quad \text{glycogen} \\
\text{glycogen} & \quad \rightarrow \quad \text{GLUCOSE}
\end{align*}
\]
Net glucose synthesis

Homeostatic Control

(a) Fed state: insulin dominates

- Glucose oxidation
- Glycogen synthesis
- Fat synthesis
- Protein synthesis

(b) Fasted state: glucagon dominates

- Glycogenolysis
- Gluconeogenesis
- Ketogenesis