Sources of Glucose for Glycolysis

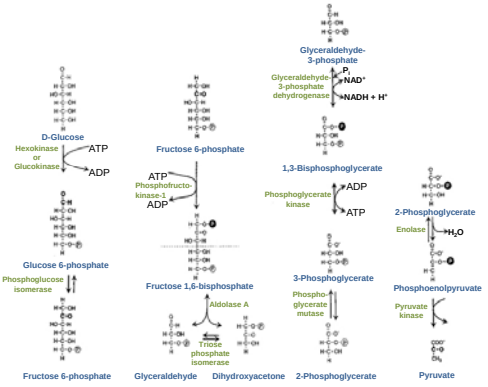
- Sugars & starch from diet
- Breakdown of stored glycogen from the liver
- Recycled glucose (from lactic acid or amino acids or glycerol)

Key Points

- **Definition:** glucose $C_6 \rightarrow$ 2 pyruvate C_3
- **Location:** cytosol
  (10 soluble enzymes)
- **Tissues:** all tissues
- **Functions:** 'energy' trapping
  (ATP synthesis)

  intermediates for fat synthesis
  intermediates for amino acid

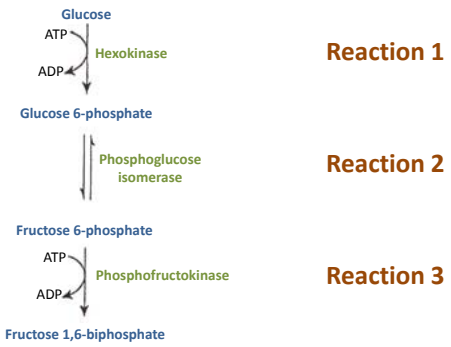
Summary Diagram of the Glycolysis Pathway



The 10 Reactions of Glycolysis can be grouped into 4 Stages:

- **Activation (using up ATP)**
- **Splitting the 6 C sugar into half**
- **Oxidation (removing 2H atoms)**
- **Synthesis of ATP**

Activation stages of glycolysis

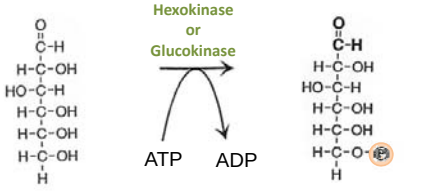


Reaction 1

Reaction 2

Reaction 3

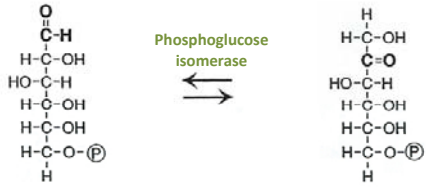
Reaction 1



D-Glucose

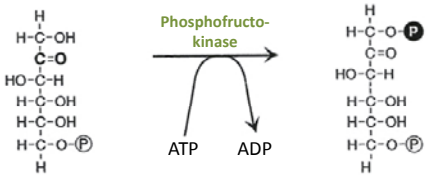
Glucose 6-phosphate

Reaction 2



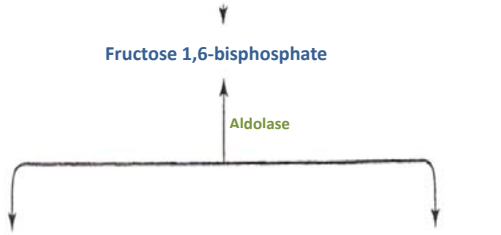
Glucose 6-phosphate — Fructose 6-phosphate

Reaction 3

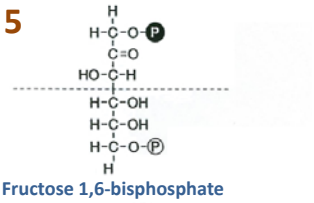


Fructose 6-phosphate — Fructose 1,6-biphosphate

Splitting of 6C Sugar to 3C Units



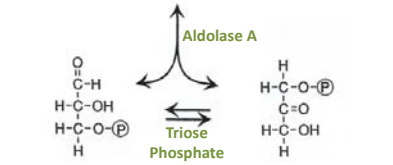
Reactions 4 & 5



Fructose 1,6-bisphosphate

Reaction 4

Reaction 5

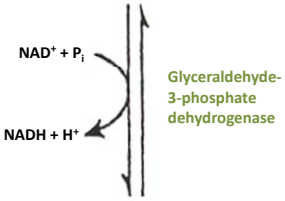


Glyceraldehyde 3-phosphate — Dihydroxyacetone phosphate

Oxidation step

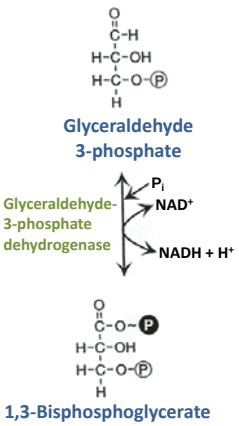
Reaction 6

Glyceraldehyde
3-phosphate

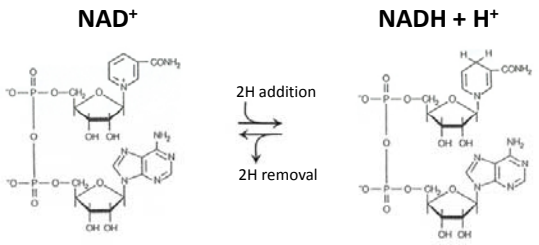


1,3-Bisphosphoglycerate

Reaction 6

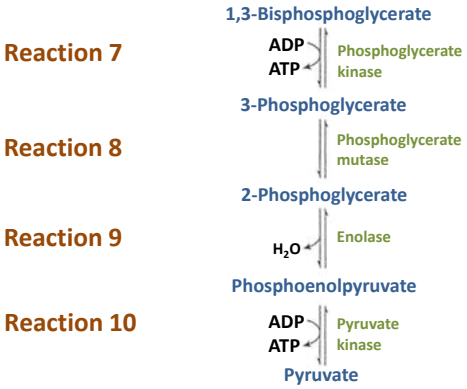


Role of NAD as H atom acceptor

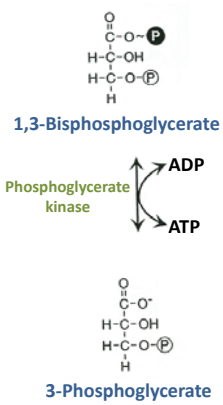


NAD = Nicotinamide Adenine Dinucleotide

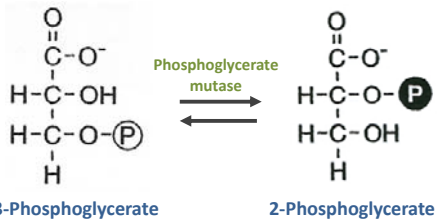
ATP synthesis stages



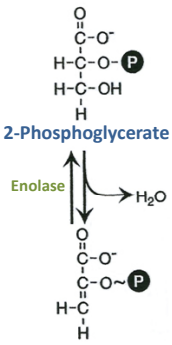
Reaction 7



Reaction 8 - Isomerisation



Reaction 9



Reaction 10