

[illegible]

The diagram illustrates the metabolic pathways for the production of n-Butanol and Ethanol from various sugars. The pathways are as follows:

- Glucose** is converted to **G6P**, which then proceeds to **6PGA** and **6GP**.
- Sorbitol** is converted to **F6P**, which proceeds to **G3P** and **PEP**.
- Glycerol** is converted to **DHAP**, which proceeds to **3HB** and **PEP**.
- PEP** is converted to **Pyruvate**, which can be reversibly converted to **OAA**.
- Pyruvate** is converted to **Acetyl-CoA**, which then proceeds to **Acetoacetyl-CoA**, **Butyryl-CoA**, and **Butyraldehyde**, ultimately leading to **n-Butanol**.
- Pyruvate** is also converted to **Acetaldehyde**, which leads to **Ethanol**.
- 6GP** is converted to **Ru5P**, which then proceeds to **Xu5P**, **GA3P**, **F6P**, **E4P**, **S7P**, and **R5P**, eventually leading to **1,4-Butanediol**.
- 6GP** is also converted to **Gluconate**, which then proceeds to **Succinate**, **SuCoA**, **4-Hydroxybutyrate**, **4-Hydroxybutyryl-CoA**, **4-Hydroxybutyraldehyde**, and **1,4-Butanediol**.
- Succinate** is also converted to **GLX**, which then proceeds to **ICIT**, **AKG**, and **CO₂**.
- OAA** is converted to **MAL**, which then proceeds to **FUM**, **Succinate**, and **ICIT**.
- ICIT** is converted to **CIT**, which then proceeds to **GLX**.