

# An Economical Approach Towards 1,3 Propanediol Production

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**Abstract** The rising need for alternative fossil fuels has led to the emergence of biofuel industries. As a consequence, a substantial amount of glycerol is being produced as a byproduct, accounting for nearly 10% of the total biofuel/biodiesel produced. This glycerol can be biologically transformed into various value added products such as 1,3-propanediol, ethanol, propionic acid, citric acid, lactic acid and poly-3-hydroxybutrate of which 1,3-PD possesses numerous industrial applications. It is extensively used in the production of aromatic polyesters, cosmetics, biomedical and in the food industry.

In the present study *Lactobacillus reuteri* is being used for the production of 1,3-PD. It has a higher tolerance to 1,3-PD and is also a GRAS organism due to which there is wide acceptability for the product from this organism as compared to its counterparts.

The current scenario of 1,3-PD production uses complex media such as MRS which is not economically suitable. India is the largest milk producer country in the world, accounting for 70% of the total milk produced. According to literature, approximately 9 litres of whey is produced from 10 litres of milk for every kilogram of cheese produced. Further processing of whey is done to achieve high protein levels resulting in the by-product, whey permeate. The present work demonstrates the production of 1,3-PD from inexpensive medium like whey permeate supplemented with glycerol.

Batch fermentation studies were carried out to understand the capability of this bacterium to produce 1,3-PD. We initially monitored the production capability of *L. reuteri* using MRS media along with glycerol. The same was tested using whey permeate along with yeast extract and glycerol. Using whey permeate for 1,3-PD production seems to be promising as it is cost effective in comparison to MRS media.

**Keywords :** 1,3 Propanediol, *Lactobacillus reuteri*, whey permeate