LIQUID GLUCOSE AND INVERT SUGAR SYRUP

LIQUID GLUCOSE or Corn Syrups are purified concentrated aqueous solution of polysaccharides obtained from partial (controlled) hydrolysis of maize starch.

The solids are composed of various carbo-hydrates; dextrose, maltose and higher-polysaccharides. The different carbohydrate profiles combined with various available solid levels give Liquid Glucose its unique application functions.

INVERT SYRUP (invert sugar syrup) is pale coloured sweetener prepared by the acid hydrolysis / enzymatic hydrolysis of a solution of white refined sugar. Invert Syrup contains equal proportions of the invert (reducing) sugars: glucose and fructose. It has wide application and is particularly useful where high concentrations of invert sugars are required. The crystal-inhibiting characteristics and humectant properties (retention of moisture) means that the shelf life of many products can be extended by the use of Invert Syrup in product formulations. It has a high degree of sweetening power relative to sucrose.

Both corn syrup Invert sugar syrups have identical functional properties, the main property being prevention of crystallization of sugar. The main difference is degree of sweetness. Corn syrup is less sweet. Other functional properties of the products are:

Keep food products soft and fresh.
Does not crystallise on storage.
Excellent food preservative.
Provide body and cohesiveness.
Prevent crystallisation of sucrose in combined syrups.
Emulsion stabilizer.
Freezing point depressant

Proposal:

Considering good growth potential of food products industry Apitco recommends investment in a unit that can produce Liquid glucose / Invert syrup using the enzyme conversion process. Combining the two products together can provide the advantage of coping with changes in Sugar prices.

Product mix

Liquid glucose 5000 Tons per year
Invert Sugar syrup 5000 Tons per year

Market

The main end uses of Liquid glucose and invert syrup are:

Candy confectionery and sweet making

Major ingredient of hard boiled candies.
Conjunction with sugar for flavoured candies, chocolates manufacture.
Glucose biscuits
Jams, jellies, chewing gums and canned fruits
Syrups for pies in bakery
Ice creams

Extensively popular in sweet manufacturing business as it prevents crystallization and used to the level of 30% - 40%. Being non-crystalline it produces homogeneous confectionery.

Pharmaceuticals

For cough syrups and vitamin based tonics, $S0_2$ free liquid glucose is used to provide mild sweetness and body consistency. It makes principal ingredient for cough lozenges and acts as granulating agent for tablet coating.

Flavouring

Flavouring and moistening agent in chewing tobacco.
Flavouring and preservative in mouth freshening formulation.
Improves the keeping quality of tobacco.
Substitute for Honey

The main market to concentrate is Indian sweets and ice-cream. It is possible to develop a niche market of premium sweets / ice creams using corn syrup and invert syrup.

Manufacturing process:

Manufacturing process for corn syrup and Invert syrup are identical in many aspects. The main process is hydrolysis. In case of corn syrup the starting material is starch / corn grits and for invert syrup Sugar cane juice / sugar. Hydrolysis step is followed by purification, and concentration.

Technology:

Corn grits to corn syrup technology is now available. This reduces investment and pollution problems. Invert sugar syrup technology is available from NRDC.

Plant and Machinery:

The main plant and machinery consists of hydrolysis plant (Tubular reactor), Filters, Ion exchange units, Evaporators and Storage tanks. Utility equipment includes boiler and cooling towers. Entire plant and machinery is available indigenously.

Raw materials:

Main raw materials required are, Maize grits, Sugar (low grade) or sugar cane juice and enzymes. The enzymes may have to be imported.

Utilities:

Utilities required are power, water and steam.

Project cost:

10,000 Ton per year capacity plant is estimated to cost Rs. 8 crores.

Turnover and profitability:

Turn over will be Rs. 16 crores @ 80 % capacity utilization. Net profit margins will be about 8 %.

Suggested location:

Any sugar cane growing area in A.P.

Entrepreneur profile:

This is a working capital intensive project, suitable for financially strong entrepreneurs.

Apricot's consultancy:

Technology tie-up
Market survey