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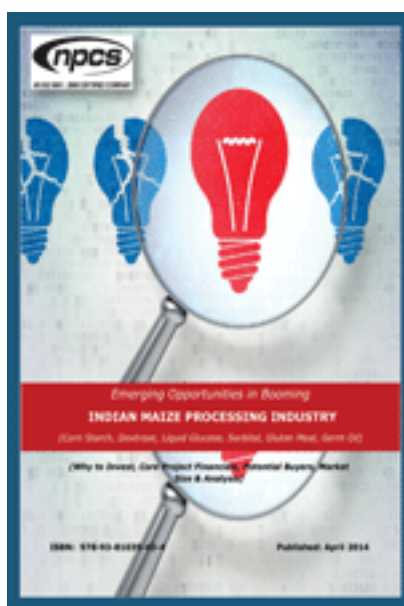
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Emerging Opportunities in Booming INDIAN MAIZE PROCESSING

INDUSTRY-Corn Starch, Dextrose, Liquid Glucose, Sorbitol, Gluten Meal, Germ Oil (Why to Invest, Core Project Financials, Potential Buyers, Market Size & Analysis)



Code:	ENI271
Format:	Paperback
Indian Price:	30000
US Price:	650
Pages:	
ISBN:	9789381039434
Publisher:	NIIR PROJECT CONSULTANCY SERVICES

The research report titled Emerging Opportunities in Booming INDIAN MAIZE PROCESSING INDUSTRY- Corn Starch, Dextrose, Liquid Glucose, Sorbitol, Gluten Meal, Germ Oil (Why to Invest, Core Project Financials, Potential Buyers, Market Size & Analysis) released by Niir Project Consultancy Services aims at providing a roadmap for investing into the sector by covering all the critical data required by any entrepreneur vying to venture into maize starch segment in India.

While expanding a current business or while venturing into new business, entrepreneurs are often faced with the dilemma of zeroing in on a suitable product/line. And before diversifying/venturing into any product, they wish to study the following aspects of the identified product:

- Good Present/Future Demand
- Export-Import Market Potential
- Raw Material & Manpower Availability
- Project Costs and Payback Period

We at NPCCS, through our reliable expertise in the project consultancy and market research field, have identified maize starch & allied products project, in the maize processing segment, which satisfies all the above mentioned requirements and has high growth potential in the Indian markets. And through this report we aim to help you make sound and informed business decision.

The report contains all the data which will help an entrepreneur find answers to questions like:

- Why I should invest in maize starch project?
- Who are the customers of the product?
- What will drive the growth of the product?
- What are the costs involved?
- What will be the market potential?

The report embarks the analysis by enhancing the basic product knowledge of the capitalist by stating details like product definition, product uses & application, by-products & related products and a general overview of the product market. In here, the report provides an overview of the maize starch market along with a snapshot of maize crop market in India. The report further enlightens the entrepreneur about the potential buyers of the product, Maize starch which will help him identify his customers and place his product correctly. It is followed by a detailed analysis & enumeration of various factors that makes the case for investing in the sector along with graphical representation and forecasts of key consumer data. The report further assesses the market potential of the product by listing import-export markets of maize starch & allied products, recent developments in the sector and by providing sector outlook and market size.

The report then turns the focus towards manufacturing side of maize starch & allied products. It provides project financials of a model project with specified product list and plant capacity along with excise and customs duty rates for maize starch for year 2013-14. It enumerates project information like raw materials required for manufacturing maize starch & allied products, manufacturing process, list of machinery and basic project financials. Project financials like plant capacity, costs involved in setting up of project, working capital requirements, payback period, projected revenue and profit are listed in the report. The above mentioned project details are for maize starch, sorbitol, dextrose, liquid glucose, vitamin C, germ oil and gluten feed plant. The report also provides key players in the segment with their contact details.

Starch Industry is often termed as 'Sunrise Industry' due to its high growth potential and omnipresence across various other industries. This report helps an entrepreneur gain meaningful insights into the sector and make informed and sound business decision.

Reasons for buying the report:

- This report helps you to identify a profitable project for investing or diversifying into by throwing light to

crucial areas like industry size, demand of the product and reasons for investing in the product

- This report provides vital information on the product like its definition, characteristics and segmentation
- This report helps you market and place the product correctly by identifying the target customer group of the product
- This report helps you understand the viability of the project by disclosing details like raw materials required, manufacturing process, project costs and snapshot of other project financials
- The report provides a glimpse of important taxes applicable on the product
- The report provides forecasts of key parameters which helps to anticipate the industry performance and make sound business decisions

Our Approach:

- Our research reports broadly cover Indian markets, present analysis, outlook and forecast for a period of five years.
- The market forecasts are developed on the basis of secondary research and are cross-validated through interactions with the industry players
- We use reliable sources of information and databases. And information from such sources is processed by us and included in the report

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1. OVERVIEW

Maize (Botanical name: *Zea Mays* L) is one of the oldest cultivated crops in the world. It is also one of the most important cereal crops globally and in India it is the third most important crop after rice and wheat.

Maize, also known as corn, is a versatile crop grown over a range of agro climatic zones. In fact the suitability of maize to diverse environments is unmatched by any other crop and even every part of the maize plant has economic value: the grain, leaves, stalk, tassel, and cob can all be used to produce a large variety of food and non-food products. As it has yield potential far higher than any other cereal, it is sometimes referred to as the miracle crop or the 'Queen of Cereals'. Additionally maize can be grown in all seasons viz; Kharif (monsoon), post monsoon, Rabi (winter) and spring.

Maize has varied uses in India, varying from feed to industrial products. The crop is primarily, more than 50%, used for poultry feed, nearly one-fifth used for human consumption (Food) and the rest is used in breweries as well as for industrial products. But the most useful product of maize is 'Starch' which is derived by wet milling processing of maize and has varied uses and widespread applications.

Figure 1 Consumption Pattern of Maize in India

Source: Directorate of Maize Research

Although starch can be produced from a number of sources like Corn (maize), sorghum, grain wheat, rice, potato, tapioca, arrow root, grains of barley, rye, oat and millets, yet Corn, rice and tapioca are the major sources in India.

1.1 Product Definition

Starch is a high polymeric carbohydrate with the molecular formula $(C_6H_{10}O_5)_n$ where n varies from a few hundred to over one granules, usually made up of both a linear polymer (amylose) and a branched polymer which dissolves in hot water. Starch is found as the reserve carbohydrate in various parts of plants and is enzymatically broken down to glucose to other carbohydrates according to the metabolic needs of the plants.

Starch is broadly divided into two types- natural and modified. Natural starches also known as unmodified starches or simply starches are further classified into cereal and root starches depending upon its sources.

Figure 2 Classification of Starch

Source: NPCS Research

Natural Starches

Starch occurs naturally in the plants and its percentage varies with the plant and also in different parts of the same plant. Corn (maize) sorghum grain wheat, rice, potato, tapioca, arrow root and sago are among the important sources of natural starches.

Modified Starches

Modified starch, also called starch derivatives, is prepared by physically, enzymatically, or chemically treating native starch, thereby changing the properties of the starch. Starches are modified to enhance their performance in different applications. Starches may be modified to increase their stability against excessive heat, acid, shear, time, cooling, or freezing; to change their texture; to decrease or increase their viscosity; to lengthen or shorten gelatinization time; or to increase their visco-stability.

1.2 Product Uses & Applications

Starch is used extensively in a plethora of forms serving numerous industries. Some of them are listed below:

- As an adhesive in textile industry
- As a thickener in food industry

- For increasing paper strength in paper industry
- As a filler in pharmaceutical industry
- For manufacture of glucose and dextrose
- For manufacture of modified starch

1.3 By-Products of Corn Starch

Corn starch is derived by wet milling process of maize. During the wet milling process, other than starch, the following products are produced:

- **Concentrated Steep Liquor:** It is a mixture of soluble proteins, amino acids, carbohydrates, organic acids (e.g., lactic acid), vitamins and minerals. It is used as a nutrient for microorganisms in the production of enzymes, antibiotics, and other fermentation products. It is sometimes combined with other ingredients in corn gluten feed and widely used in complete feeds for dairy and beef cattle, poultry, swine, and pet foods. It may also be sold separately as a liquid protein source for beef or dairy rations.
- **Gluten:** Corn Gluten is used as a supplement in animal feeds, dog food and fish food.
- **Germ Oil & Cake:** Germ oil is mainly used in cooking, where its high smoke point makes it valuable frying oil. It is also a key ingredient in some margarine. Germ cake is used as livestock feed ingredients.

Maize starch can be further processed and modified to manufacture the following:

- Liquid Glucose
- Dextrose Monohydrate
- Dextrose Anhydrous
- Sorbitol
- Dextrine (Yellow & White)

NIIR Project Consultancy Services (NPCS) is a reliable name in the industrial world for offering integrated technical consultancy services. Its various services are: Pre-feasibility study, New Project Identification, Project Feasibility and Market Study, Identification of Profitable Industrial Project Opportunities, Preparation of Project Profiles and Pre-Investment and Pre-Feasibility Studies, Market Surveys and Studies, Preparation of Techno-Economic Feasibility Reports, Identification and Selection of Plant and Machinery, Manufacturing Process and or Equipment required, General Guidance, Technical and Commercial Counseling for setting up new industrial projects and industry. NPCS also publishes various technology books, directory, databases, detailed project reports, market survey reports on various industries and profit making business. Besides being used by manufacturers, industrialists and entrepreneurs, our publications are also used by Indian and overseas professionals including project engineers, information services bureau, consultants and consultancy firms as one of the input in their research.

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