

Evolution of Flour Mills in Kerala: Analyzing the Technical Advancement and Product Diversification through a Systematic Collection of Data

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Abstract:- In this study, an endeavor is made to investigate the product and process innovations in new-generation flour mills. The District Industry Centers (DIC) of Kerala's records were used to compile the information for the chosen product classes. Kerala's diverse culture and traditions fused innovative ideas with available ingredients to make a variety of tasty dishes. Grain flour and spices formed the major ingredient, which elevated the role of flour mills. The questionnaire approach was used to gather the data from each of these firms. According to a thorough research of patterns of product diversification among various categories, diversification of products happens across all market segments. One of the main responsibilities of every flour mill is ensuring quality and safety. To fulfil the requirements, enterprises expanded the production profile with grain flours, spices powder, and a blend of spices. By offering new varieties, the flour mill business might significantly boost output value; as a result, diversification also directly affects product development. The study analyzes product and process innovations in flour mills of Kerala as well as the methods to tackle their challenges.

Keywords:- Flour Mills, Product Diversification, Process Evolution, Dics.

I. INTRODUCTION

In the present world, flour mills are playing a crucial role in the busy life of a common man. The principle behind the working of a flour mill is that they combine traditional skills and available technologies to accomplish a basic goal, which is to produce a wide variety of flour. Cereal grains selected for the purpose are of great variety and include wheat, corn, oats, barley, millet, sorghum, and rye. The embryonic plant or seed consists of three parts: germ, endosperm, and bran. The process of separating these three components and reducing endosperm size is known as "flour milling. Flour is derived from a series of steps, which are as follows: grading the grain, grain purification, preparing the grain for grinding, grinding the grain, and processing the flour. Grains are graded on aspects like their physical properties and nutritional content. Each step of the purification process is carried out in such a way that no foreign matter ends up in the material. Grains are prepared for the grinding process by maintaining their moisture content through drying and conditioning. The end product of milling is tested for its taste, aroma, color, and nutritional aspects so that it attains optimal acceptability. Latest studies in the sector claim that the flour milling industry

could reach \$198.68 billion in the coming six years (by 2028) with a CAGR of 3.7%. The population in India is increasing at a sufficient rate, which has thereby increased the demand for flour. Flour, especially wheat flour, is a major ingredient in staple foods. The distribution of flour markets in the world is shown in Fig.1.

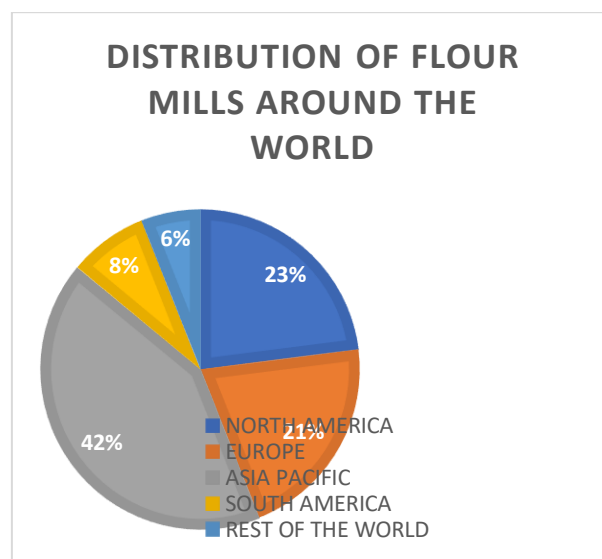


Fig 1:- Distribution of Flour Mills around the World

It is also brimming with nutritional benefits, which entice customers. The applications of flour include uses in confectionery, bakery, fast foods, feed, and others. Rice flour, due to its gluten-free nature, gains special attraction. The process by which a new product or service is developed, by enhancing the functional properties so that great acceptability can be attained is termed "product innovation." Some of the aims include reduced cost and time, increased quality, reduced risk, etc. The need for innovation is increasing day by day. The two major aspects that account for product innovation are tight competition and customer requirements. The innovation thereby developed has a direct impact on revenue, brand name, and customer loyalty. Consumer demand always keep on changing, in order to fulfill the requirements enterprises expanded the production profile with grain flours, spices powder, and blend of spices. Through the paper, we aim to showcase the trends or the evolution of processes and products manufactured in flour mills, in the last 10 years, starting in 2010, in the state of Kerala. Kerala, also known as "God's own country," is situated at the southern tip of India. With the diversity of culture and tradition embedded in the state, food

has grown to occupy a prominent position in people's minds. Religions and traditions have had a significant impact on Kerala cuisine. The geographic situation of the state near the coast of the sea helped with great trade relations, which played a significant role in the cuisine and its evolution. The people of the state fused their innovative ideas with the ingredients available, which led to a wide variety of tasty dishes. The rich soil of the state is blessed to cultivate coconut trees, plantains, rice, tapioca, and spices (pepper, vanilla, cardamom, clove, cinnamon, nutmeg, ginger, and turmeric). Rice, with its great production and social acceptance, became a staple food and gave rise to rice-derived dishes. Rice-derived dishes include Appam, Dosa, Idli, Idiyappam (rice noodles), and Puttu (a steamed dish made of powdered rice). Rice has been consumed with a varied number of curries and side dishes, which comprise sambar, pulishery, rasam, chutney, avial, thoran, pachadi, etc. The above-mentioned ingredients are infused with a fusion of spices for the desired taste. From the above pattern of consumption, it could be concluded that rice powder and spices play a vital role in the lives of common people. Flour mills play an important role here. History claims that the flour mills were started in the 1980s. People's hectic work schedules aided the growth of flour mills in Kerala.

II. PRODUCT AND PROCESS INNOVATIONS IN FLOUR MILLS

People have very little time to do a lot of work in their daily lives in our fast-paced environment. Utilizing ready-to-cook food products helps them do their job more rapidly since it takes less time, uses less energy, etc., to perform a task. The market for the processing of grains has enormous growth potential, and businesses that do so in and are proliferating under fierce rivalry. It will be highly challenging for businesses to thrive in the market unless they lower their manufacturing cost. Flour mills preferred strategies to fight it out through product diversification (Product Innovation). Spices and grain flour are crucial ingredients in commercial food processing and catering technologies. However, if they are prepared, assembled, or stored incorrectly, they might endanger customers. For the purpose of preparing a typical breakfast, flour might be considered a key element.

A. Product Innovations in flour mills

It is clear that the innovation potential for this particular category of goods lies in the development of flours based on cereal, spice blends, curry powders, puffed or flaked cereals, malted goods, health mixes, dry nuts, and other edible oils. There are various directions that new trends in grains and spices point. The first step is to more thoroughly remove all non-plant components. Products with lower salt and sugar content as well as those without added monosodium glutamate have started to appear on the market. Additionally, several producers have discontinued include gluten containing components and created new goods using millet-based ingredients. Flour mills have responded to market signals and introduced product improvements in cereal-based powders, curry powders, spice blends, and oils as a result of rising customer knowledge.

B. Classification

The products of flour mills that are being sold in the markets of kerala can be classified as follows. Kerala's high level of diversity led to a diverse production profile. The people of Kerala exhibited remarkable acceptance of the items on the following list.

C. Diversification pattern in flour mills

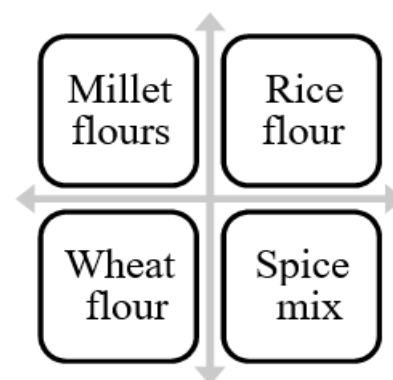


Fig 2:- Diversification pattern in flour mills

D. Diversification of Spice mix and Curry powders

Sl. No	Products	Ingredients
1	Coriander Powder	Coriander seeds
2	Chilli Powder	Chillies
3	Cumin Powder	Cumin seeds
4	Pepper Powder	Black pepper
5	Sambar Powder	Coriander, red chilli, cumin, Mustard, Black pepper, Fenugreek, Ginger, Salt, Dehydrated curry leaves
6	Rasam Powder	Coriander seeds, Cumin seeds, red chillies, tuvar dal, turmeric, asafoetida
7	Turmeric Powder	Turmeric
8	Garam Masala	Cumin, Coriander, Cardamom, Black pepper, Cinnamon, Clove, Nutmeg
9	Biryani Masala	Cumin, nutmeg, clove, black pepper, cashmiri chilli, salt, Cardamom, Coriander, Bay leaves, Turmeric, Cinnamon
11	Pickle Powder	Turmeric powder, Mustard seeds, Fenugreek, Dry red chillies, Asafoetida, Salt
12	Noodles Masala	Garlic powder, Onion powder, Corn starch, ginger powder, amchoor powder, garam masala powder, Black pepper, Fennel seeds
13	Chicken Masala	Dry Red Chillies, Coriander, Cumin, Fennel, Maida, Rice flour, Salt, Cinnamon, Cloves, Bay leaf, Star Anise, Cardamom, Turmeric powder

14	Egg Masala	Chilli, Coriander, Black pepper, Fennel, Turmeric, Ginger, Cumin, Cardamom, Nutmeg, Salt.
15	Crab Masala	Chilli powder, Sunflower Oil, Coriander Powder, Salt, cumin powder turmeric Powder, Mustard
16	Omelette Masala	Garam masala, Green chillies, Coriander leaves, Tomato powder, Turmeric, Onion powder

Table 2: List of products and Ingredients

It is to be noted that in masala category the spices processing industry introduced new variants concurrently as in the case of pure spices. Further the spices processing industry remains dynamic throughout the period of analysis by continuing the process of diversification. The demand for organic spice powders and cereal flours is increasing along with environmental consciousness. Herbs and spices are produced to a higher standard in two ways: first, by using creative packaging for this class of food goods, and second, by using better raw materials. Polypropylene is being used more frequently in the packing of grain flour. The instructions for handling the packaging after the product has been used are also included on the labels. However, there is an increasing need for basic materials derived from organic sources. Although there are not many certified spice plantations, flour millers should make sure that the raw materials used to make grain flours and spice powders originate from the cleanest crops.

A. Process Evolutions In flour mills

Evolution can be defined as a long-term process of progressive change. Therefore, by understanding process evolution, we could comprehend the progressive development of the machinery and processes used in flour mills. The history and development of PILOTSMITH INIDA PVT. LTD., a leading manufacturer of food processing machines, were investigated in relation to the study of process evolution in Kerala, and it was discovered to be a significant development. In the 1950s, people used to grind their grains on stones because that was the way they had always done it. Both a fixed stone and a moving stone were involved. The grains were manually ground between the two stones. The hand stone was another name for the movable stone. Hullers eventually took its place. They were constructed from cast iron and mild steel. Diesel engines were used to power them. They were used to automate the procedure and provided a comparatively high level of efficiency. Later, people began employing motors to power machines, where a single motor powered many machines, utilising interchangeable belts. The friction (friction stone grinder) or plate grinder eventually replaced the motorised pounding machine used to powder grains. Pulverizers and hammer mills first appeared in the 1980s. They were simple to use and guaranteed high sanitary standards. By creating the "Uruli roaster," which was powered by kerozene, in 1991, the Pilot (India) considerably enhanced the flour milling industry. The roaster's vessel was constructed from aluminium. This device had a significant financial impact on the mill workers. Before it was released, people used manual stirring and wood burners for heat to accomplish the task of roasting. The introduction of the uruli roaster reduced labour and time while increasing efficiency. The flour milling industry is thriving in the current environment thanks to a wide range of milling equipment and machineries, including cleaning and grading equipment (chilli cleaner, sifters, destoner with aspirator, and rice washer), size reduction equipment (hammer mill, lump breaker, hygro clear mill, pulverizer, double stage mill), roasting and drying equipment (uruli roaster, sautiner,

oven, eco roaster, drum roaster), blending(ribbon blender, v blender, mass mixer, double cone blender), expellers and automatic packing and sealing machines. The aforementioned developments significantly contributed to the expansion of the flour mill industry as a whole by saving time and fostering the economy. In Kerala, the number of flour mills is rapidly rising as a result of their promising future. PILOTSMITH INDIA PVT. LTD., headquartered in Thrissur, has made significant contributions to the improvement of Kerala's flour mills. In order to deliver services at international standards with friendly interaction and trials, Red 2 Green Industrial Sciences Pvt. Ltd., a sister company of Pilotsmith, was introduced. By encouraging the younger generation to create a flour mill as a food factory, the company popularised the idea of a "flour mill food factory," using the surplus resources produced in the surrounding areas to guarantee safe food at a reasonable cost. Pilotsmith India Pvt. Ltd. remains a leading machine manufacturer with a wide array of services provided.

III. CHALLENGES

To be an entrepreneur calls for great challenges and how you overcome them measures the degree of success. Constant challenges and finding their solutions lead to our mental growth. From the entrepreneurs of Kerala, we were able to identify the following where the major challenges;

1) *Investment deprivation*: Of all the problems, a lack of money or capital continues to be the biggest. Without adequate funding, thousands of great ideas would not have been able to reach the market. Another issue is that, despite having a great vision, people lack the confidence to invest their money out of fear of losing it.

2) *Less educated about loans*: To solve the challenges with investment, the government is providing multiple subsidies through a variety of schemes. Even though the government is doing a great job of raising awareness through DICs, most people are still not aware of them.

3) *Lack of business management skills*: Even if you possess financial backing and a great idea, a lack of productional knowledge and abilities could jeopardise everything. As a result, there is a development where many people are taking training sessions and short courses to expand their knowledge.

4) *Poor state of infrastructure*: The key areas include a paucity of well-maintained infrastructure, frequent power failures, and inadequate transport systems. It depends on where the factory or mill is located. Additional costs are incurred to address these issues, which lowers the profit.

5) *Inadequate marketing tactics*: The density of flour mills in Kerala is rising quickly, prompting the deployment of marketing approaches to increase sales. Product cleanliness and quality of itself could create a brand name. In Kerala, one might observe additional forms of advertising, offers, and other attractions.

➤ *How to tackle these challenges*

How to handle challenges differs depending on the individual. However, the government developed a programme that would assist businesses in overcoming the aforementioned obstacles. A programme funded by the government called the Prime Ministers Formalization of Micro Food Processing Enterprise Scheme (PMFME), is intended to help small businesses overcome obstacles. Unorganized micro food processing units require substantial hand-holding support for entrepreneurship, technology, credit, and marketing throughout the supply chain, necessitating improve recognition of the state government for better outreach. The connection between a business and a customer is what is meant by marketing. Social media marketing, product placement, and affiliated marketing are a few examples of contemporary marketing techniques. Although developing effective marketing plans requires creativity, putting them into practise is still challenging, which highlights the significance of training your employees (staffing expertise). Avoiding bad press from the public is quite difficult. So, make an effort to prevent such spread before it's too late. Customers compare prices as their initial point of comparison when it comes to products. Therefore, maintaining a reasonable price in relation to the competition is always vital. Any segment's survival will always depend on having a thorough understanding of the market.

IV. CONCLUSION

According to a comprehensive research of patterns for product diversification under several categories, product diversification is occurring across all flour mill sectors. Therefore, diversification has a direct impact on the creation of new products. The flour mill sector has the potential to significantly raise the value of production via the introduction of new variations. The primary causes of this excellent development are the sharp increase in demand for Ready To Cook items for domestic use and the availability of adequate raw materials. This makes a great scope. The leading causes of the significant growth of this product and process diversification are health conscious lifestyles, food patterns, established distribution shop, and globalization. Innovation-driven continual product improvement is one of the potential business models for flour mills. The writers of this study focused on product and process innovations in flour mill food factories. In order to raise the quality of flour mills, it is necessary to increase the knowledge of millers as a resource of the organization, increase cooperation with scientific and administrative departments.

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