



“Present Status of Food Processing Industry in Central India: A study in Chhattisgarh”

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Abstract : Global Food habit is changing with change in life style for the last few decades. This change may be due to many factors like liberalization, dual family income, nuclear family, modern kitchen, time constraints and various other factors. The individuals and population is shifting for their food from fresh agri-product to processed food. This has given a new business opportunity with social uplift, various changes can be observed through the records available on food intake pattern. This study refers the status of food processing industry in central Indian population specially in Chhattisgarh state. Also highlight the techniques of processing the foods to make it consumable in easiest form for the consumers.

I. INTRODUCTION

Indian food habit is changing with change in life style for the last few decades. This change may be due to many factors like liberalization, dual family income, nuclear family, modern kitchen, time constraints etc. The cooking style and eating habits in India varies from north to south and from east to west. Due to everyday life pressure, these days people have a preference to smart, easy and short way of cooking in place of spending much time on cooking. Non-availability, poor availability or seasonal availability of raw materials to prepare spices and tiresome process, has influenced people to choose processed food products. There is no precise marketing strategy for these products. The product portfolio is very wide. There are many people migrating from one place to other for job and education and these people have find the processed food either ready to eat or ready to cook food for convenience eating rather than depending on restaurant. Most of the dual income people want to spend much less time on cooking because of less availability of time. During weekends they want to spend time with their family and day out, whereas in weekdays heavy work load and compel them to buy processed food. Other factors are availability of different flavors and dishes. This processed food brings range to their eating's and taste, all the above factors harmonize each other in driving processed food. India is becoming hub of many multinationals national and local manufactures for processed food sector. Due to raise in literacy levels, explosion of communication technology, people are

becoming more conscious of the foods they take and their decision is based on the health and wealth of resources available.

Numbers of heart and diabetic patients are increasing in India, These is because of much pressure given on lifestyle and food habits of peoples. Health conscious people are mostly well educated and can access to different information available. The female consumers show interest in knowing the level of calories, ingredients and certain product approval certificates before selecting the products, they are also weight conscious and they decide the products based on their consciousness. Often, house wives become the major dominant factors in deciding the food products for the whole family. They now go for purchasing high fiber, low calories and nutrition rich products for their family. Advertisements about these products are also becomes a major factor in decision making. Level of obesity is on the rise of Indian population and on one side consumers are becoming awareness of the food they intake and on the other side consumers are carried away by advertisements information and packaging style.

Food – Food Science – Processed Food – Food Processing

Food

Air, Water and Food are the base for any life and the foods clothes & shelters are the very basic needs of the human being. Food is very important for the regular function of the body and for a healthy development. Food is any substance, composed of carbohydrates, water, fats, proteins, vitamins and minerals that is either eaten or drunk by any animal, including humans, for nutrition or pleasure. (Introduction to food and food processing 2010). Food consists essentially of protein, carbohydrate, and fat used in the body of an organism to sustain growth, repair, and vital processes and to furnish energy. (www.britannica.com). Food comprises of carbohydrates, proteins, fats, enzymes, vitamins and minerals which are required for a healthy growth of our body. Our body cannot make all these nutrients. Hence, food is the only source to obtain these nutrients in a sufficient quantity. If we don't get these nutrients in

enough amount, then we may suffer from a number of health problems. So a balanced diet is always recommended which is defined as a diet containing carbohydrate, protein, fat, dietary fibres, vitamin & minerals in right proportion. Food may be of plant or animal kingdom.

Food Science

The technical and scientific aspects of food are known as Food science, which begins with harvest or slaughter, and ends with its consumption after cooking. This field is highly interdisciplinary which includes food microbiology, food chemical engineering, food biochemistry, and many others.

Some of the sub-disciplines of food science include:

- Food Processing - The set of techniques and methods used to transform raw food ingredients into more convenient consumable food or to transform food into other forms of food for final consumption by human beings or animals.
- Food Safety - The cause, prevention and statement dealing with food bear illness
- Food Microbiology - The study of interactions between micro-organisms and foods
- Food Preservation – The study of food preservation
- Food Engineering - The industrial processes for manufacturing food
- Product Development - The invention and modification of new food products
- Food Sensory Analysis - The study on perception for food by the consumers.
- Food Chemistry - The chemical composition of food and the involvement of the molecules in chemical process.
- Food packaging - The study of how packaging for preserving food and its distribution
- Food Technology - The scientific and technological aspects of food
- Food Physics - The physical aspects of foods (such as viscosity, creaminess, and texture)

Processed Food Processed Food also known as Convenience Food is commercially prepared food for ease of consumption. (Jean Anderson 1995). Products designated as processed food are often offered as in two broad ways ready-to-eat food and ready to cook food (Convenience Foods, 2009). Processed foods have also been described as foods that have been created to "make them more appealing to the consumer." (Fatty Acids in Foods and their Health Implications, 2013). Convenience (processed) foods and fast foods are similar, because both of them are for saving time in the preparation of food. Both typically cost more money and less time compared to home cooking from scratch. (Ensminger, 1994).

Food Processing

Food processing is the set of systematic method and technique used to transform raw food ingredients into

consumable food items or to transform food into other forms for consumption. Food processing usually takes clean, harvested crops or slaughtered and butchered animal products and uses these to produce attractive, marketable and often long shelf-life food products. (www.wikipedia.org). Food processing is a way or technique implemented to convert raw food stuff into well-cooked and well preserved eatables which are nutritious and easy to cook food products. Food processing is a way or technique implemented to convert raw food stuff into well-cooked and well preserved eatables. All these methods are used by food processing industry to give out processed or preserved foods for our daily consumption. Food processing involves any type of value addition to agricultural or horticultural produce and also includes processes such as grading, sorting and packaging which enhance shelf life of food products.(www.niir.org)

Food processing is having its connections with prehistoric ages when basic processing technique included slaughter, fermenting, drying, preservation with salt, and various types of cooking (such as roasting, smoking, steaming, and oven baking).

In 19th and 20th century the modern food processing was largely developed to serve armed forces needs. In 1809 Nicolas Appert invented a vacuum bottling technique that would supply food for French troops, and this contribute to the development of tinning and then canning by Peter Durand in 1810. Although initially expensive and somewhat hazardous due to the lead used in cans, canned goods would later become a staple around the world. Pasteurization, discovered by Louis Pasteur in 1862, was a significant advance in ensuring the micro-biological safety of food.

In the 20th century, there is a rise in consumer's social order in developed countries (including the United States) contribute to the growth of food processing with such advances as spray drying, juice concentrates, freeze drying and the introduction of artificial sweeteners, coloring agents, and preservatives such as sodium benzoate. In the late 20th century products such as dried instant soups, reconstituted fruits and juices, and self cooking meals were developed.

The food processing sector is highly fragmented industry, it widely comprises of the following sub-segments:

- Fruits and Vegetables processing
- Milk processing
- Alcoholic Beverages processing
- Meat and Poultry processing
- Sea Food processing
- Grain and Cereals Processing
- Packaged Food
- Convenience Food
- Packaged Drinks

A large number of entrepreneurs in food industry are small in terms of their production and operations, and are largely concentrated in the unorganized segment.

Foods is Processed to prevent, reduce, and eliminate infestation of food with microbes, insects or other vermin, to prevent microbial growth or toxin production by microbes, or reduce these risks, to stop or slow deteriorative chemical or biochemical reactions, to maintain and/or improve nutritional properties of food, to increase storage stability or shelf life of food, to make food more palatable and attractive and finally to make foods for special groups of people.

The Food is Processed for-

- Preservation – Salting, Fermenting, Pickling, Canning, Pasteurizing etc.
- Food Safety – Heating, Refrigerating, Freezing, Fermenting, Drying, Salting etc.
- Variety – Modifying, Flavor, Texture, Aroma, Color, Form etc.
- Convenience - Convenience food, Fast food
- Fortification – adding essential minerals and vitamins
- Preserving nutrients – Canning, Freezing

Benefits of Food Processing

Huge production of food is cheaper in comparison to unit production of meals from raw ingredients. Therefore, a large profit potential exists for the manufacturers and suppliers of processed food products. The food industry offers products that fulfill diverse needs for convenience. Some other benefits of food processing are toxin removal, preservation, easing marketing and distribution tasks, and increasing food consistency. Food processing increases seasonal availability of many foods. Processing enables transportation of delicate perishable foods across long distances. Makes many kinds of foods safe to eat by deactivating spoilage and pathogenic micro-organisms. Modern processed food also improves the quality of life for people with allergies, diabetics, and other people who cannot consume some common food elements. Food processing can also add extra nutrients. Processed foods are often less at risk to early spoilage than fresh foods and are better suited for long transportation from the source to the consumer.

Limitation of Food Processing

In general, fresh food is processed through washing, cutting and simple kitchen preparation, may be expected to contain a higher proportion of naturally-occurring vitamins, fiber and minerals than an equivalent product processed by the food industry. Many essential minerals are destroyed by heat and or processing therefore processed food sometimes have a lower content of minerals than fresh ones. Food processing can lower the nutritional value of foods, and introduce hazards not encountered with naturally-occurring products. Processed foods often include food additives, such as

flavorings and texture-enhancing agents, which may have little or no nutritive value, or unhealthy. Preservatives and chemicals added or created during processing to extend the 'shelf-life' of commercially-available products, may cause adverse health effects. Use of low-cost ingredients that imitate the properties of natural ingredients (e.g. cheap chemicals or vegetable) cause severe health problems. Processed foods often have a higher ratio of calories to other essential nutrients than unprocessed foods, a phenomenon referred to as "empty calories". So-called junk food, produced to satisfy consumer demand for convenience and low cost, are most often mass-produced processed food products. Because processed food ingredients are often produced in high quantities and distributed widely amongst value-added food manufacturers, failures in hygiene standards in 'low-level' manufacturing facilities that produce a widely-distributed basic ingredient can have serious consequences for many final products. The addition of harmful chemicals for preservation and flavor have been known to cause cancer.

Degrees of Food Processing

Food Processing can be done at various stages as per processing involved first one is Minimally processed foods – Washed, Peeled, Sliced, Juiced, Frozen, Dried, Fermented, Pasteurized the second is Semi Processed foods – Milled, Refined, Crushed, Exposed to chemicals and the final one is Highly processed foods – Baked, Fried, Smoked, Toasted, Puffed, Shredded, Artificially flavored, Artificially colored, Sprayed with vitamins

Food Processing aims at for increasing the shell life of the food, making the food more healthier, making the food more hygienic and making the food preparation more efficient. The processed

food can be broadly categorized into two categories - Ready To Eat Food (RTE) and Ready To Cook Food (RTC).

Ready To Eat Food (RTE)

The processed food which is ready for direct consumption without any further processing. e.g. Bread, Potato Chips, Jam, and many more. Ready to Eat foods are food products that require no further processing to ensure their safety.

Ready To Cook Food (RTC)

The processed food which requires further processing before consumption. E.g. Frying Snacks, Papad, Masalas, Pohas, Processed Grains and Cereals etc.

Food Processing Industry an Overview

The Global Scenario

The market size of global food, beverage and tobacco products was estimated to be US \$ 4,140.3 billion in 2005. The size of the global market was around US \$ 3660 billion in 2005 (not considering tobacco industry which constitutes about 11%) and was estimated to grow to US \$ 4320 billion in 2010. Global market for the

processed foods follows the economic power of the countries. Developed economies show more inclination towards processed foods due to higher income levels. Rapid urbanization and rising income levels in the developing economies create the demand for processed foods. Low income levels and poor economic growth of the least developed countries create the demand for basic staples and carbohydrates.

The market can be classified into four major segments depending on the level of processing and maturity of the market-

- The Developed Countries like USA, Japan and Australia demand highly organic and functional foods whose preparation involves high technology.
- The Eastern European Countries strives for quality and hygiene factors.
- The Developing countries like India and Latin America focus primarily on snacks, prepared meals and processed meat.
- Carbohydrates still constitute the major food in the least developed markets. Most of the least developed countries are net importers of food. (Deloitte, 2009)

The Indian Scenario

With potential of being the biggest in the world India next to China is the world's second largest producer of food and processed food products. India is having the biggest consumption category, with spending on food accounting for nearly 21% of India's GDP and with a market size of \$181 billion. The Indian domestic food market is expected to grow by nearly 40% of the current market size to \$258 billion by 2015 and \$344 billion by 2025 (World of Food India, 2011; Merchant, 2008).

In the economic development of India the food processing industry has great importance. The Indian government is giving importance and supporting food processing industry as a result of which the industry is growing with good figures. (A Manual for Entrepreneurs: Food Processing Industry, 2011).

The food processing activity provides imperative linkage between industry and agriculture. This industry is one of the most important industries in terms of production, consumption, exports and growth scenario. The government has added it in a priority sector, with a number of financial reliefs, subsidies and incentives, to promote commercialization and value addition to agricultural produce, for minimizing wastage, generating employment and export growth. (www.niir.org)

In developing countries like India, the share of the processed food products is low compared to that in the developed markets. non-processed food account for nearly 50% of the share. High value added products account for only 18% of the total share in India. The total size of the Indian food industry was around US \$ 220 billion in 2005. of that, primary processed food was around US \$70 billion and the value added segment was

US \$40 billion. The remaining share is accounted by non-processed food (commodity based). Annual growth rate of the industry is around 9~12%. Employs around 2 million people (as of 2005) (Deloitte, 2009).

Chhattisgarh the Growing state of INDIA

Chhattisgarh rose on India's horizon on 1st November 2000. With the formation of new State, Government of Chhattisgarh has adopted Policies to catalyze development & encouraged balanced regional growth. Due to abundant availability of natural resources & conducive investment environment rapid industrialization is taking place. Chhattisgarh is amongst the only five states in India to grow faster (GSDP-8.4%) than the national average (7.9%) during the 11th plan (2007-11) . Strong input base: Agriculture & allied activities contributed 21% to GSDP in 2010-11. Excellent growth in the sector: The overall agriculture production has increased by an outstanding 44% in just one year between 2010 and 2011. Large resource base: Chhattisgarh has over 43% of its total geographical area under agriculture cultivation. Leading Producer: Known as the rice bowl of central India, Chhattisgarh is the largest producer of rice in central India. The state has received a national award- "Krishi Karman Award" for highest productivity in the year 2010-11. Major industries in the state are power, mining, cement, steel, thermal power plants and Rice Mills. Major producer of Maize, Cereals and pulses in the country. (www.nmfpchhattisgarh.in)

Demographics - Chhattisgarh, in Central India, is 17th in terms of population and 10th in terms of area. It has 27 districts and Raipur is the capital. The table below gives major demographic indicators and their comparison with pan-India statistics-

Infrastructure Overview - Roads The twelve National Highways connecting the state together constitute 2289 km of roads in the state. The State Highways and major district roads account for another 15779 km. Railways The state has the highest freight loading capacity in the country and one-sixth of Indian Railway's revenue comes from Chhattisgarh. The length of rail network in the state is 1,187 km. Airports The state has two domestic airports; one at Raipur and the other at Bilaspur. Power As of January 2013, Chhattisgarh had a total power generation installed capacity of 5,624.61 MW.

Production Base/Resource Mapping

The total production of agri-commodities (food grains, pulses, oil seeds etc) in 2010-11 stood at 75.8 lakh MT, with paddy alone constituting for 80 percent of this produce. When it is Horticulture Prominent fruits grown in the state include mango, litchi and papaya. Total production of fruits in 2010-11 was 14 lakh MT. Major vegetables grown in the state are potato, onion, tomato, cauliflower, cabbage and brinjal. Total production of vegetables in 2010-11 stood at 41.48 lakh MT. Chhattisgarh has a livestock population of 1.28 crore of

which 65 percent is cattle population. Total fish production in the state was 158669 MT in year 2008-09. Sericulture, Lac culture and production of medicinal plants & herbs are the other areas, where the state has a growth potential.

Status of Chhattisgarh's Food Processing Industry

“Chhattisgarh, among the fastest growing & emerging states of India, is enriched with natural resources. About 80% population of the State depends on the Agriculture and Agro based activities. Net Agricultural crop area in the State is 47.70 Lac Hectares. There are total 32.55 Lac farmer-families in the State. After formation of the State, production of the Food grains, Pulses, Oilseeds etc. is on constant rising trend. During the Year 2010-11 production of the Rice was 61.59 Lac Metric Ton and of other Cereals (Corn and Wheat) was 3.12 Lac Tone, Pulses 5.35 Lac Tone and of Oilseeds, it was 2.13 Lac Tone. In addition among Fruits and Vegetables sufficient quantity of Tomato, Papaya, Chili, Cashew nuts etc. are also produced”.(Agro & Food Processing Industries Policy – 2012).

Rice being a prominent agriculture produce, the state has more than 600 rice mills. Food processing parks in PPP mode have been proposed to be set up by the state government. In addition, 10 production clusters have been identified for setting up of processing plants. The state government has also established 25 production units for value added services such as grading, processing, waxing, extraction and distillation. These units include - 4 cashew processing units, 1 banana grading and waxing plant, 1 fruit & vegetable grading unit, 4 grading units for tomato and potato, 12 distillation units for aromatic crops, 3 aloe vera juice/gel extraction units.

Mega Food Parks (under Mega Food Parks Scheme): Ministry of Food Processing Industries (MoFPI), under its Mega Food Parks Scheme, has accorded In-principle approval to two Mega Food Park projects in Raipur district.

Cold Chain Projects: MoFPI has so far sanctioned one cold chain project in the state under its “Scheme for Cold Chain, Value Addition and Preservation Infrastructure”.

Industrial Policy 2009-14 of Government of Chhattisgarh covers automatic agricultural implements, tractor-based agricultural implements, sericulture, horticulture, bio-fertilizer, floriculture, pisciculture etc. under agro sector and food processing & agro based industries (excluding Rice mill) and has given this sector a priority sector status. In addition to this, a separate ‘Agro & Food Processing Industries Policy-2012 has been formulated. The Policy emphasizes a cluster approach and entrepreneurship development for the food processing.

Chhattisgarh State Industrial Development Corporation (CSIDC) plays a key role in industrial development of the state, both in terms of policy formulation and

infrastructure development. CSIDC is also the state level nodal agency for National Mission on Food Processing and for the schemes of Ministry of Food Processing Industries (MoFPI) in the state. Chhattisgarh State Agricultural Marketing Board is the nodal agency for agricultural marketing related initiatives in the state. State Investment Promotion Board also facilitates entrepreneurs in grounding of their projects in the state.

CONCLUSION

In Chhattisgarh, the food processing sector is in growing phase. It needs to tap the market by developing suitable marketing strategies which should be capable of succeeding over the competition with regard to existing products as well as new products. Here the study on such a subject till now is unexplored. So, there is a need for conducting an exhaustive study to review the present level of operation of existing food processing units and to devise suitable strategies for entrepreneurs to enjoy a feasible market share

The food processing entrepreneurs are not only the sellers or retailers but often the manufacturers of the products. They are responsible for product development and manufacture. Marketing mix is the tool by which one could strategically position the product in the market. The positioning will depend on how different one's product is than others in terms of attractiveness for a particular customer group. It may include the various aspects of product, price, place (distribution) and promotion.

Winning companies are those that meet customer needs economically and conveniently and with effective communication. (Marketing Management. Philip Kotler, 2000). Marketing Strategies based on marketing mix will be developed for small entrepreneurs in food processing sector. Based on raw material availability in the state, the following process able activities hold potential in the state. The list is investigative and may not be treated as thorough.

1. Rice - Rice milling, puffed rice, beaten rice, rice flour, starch
2. Potato - Chips, Flakes, Powder, Fries, Starch etc
3. Cauliflower, Okra, Chilly - Fresh cut, Frozen and assorted products
4. Papaya, Banana - Puree, Juice, concentrate, jelly, jam, chips
5. Tomato - Puree, Juice, concentrate, ketchup, sauce etc.
6. Guava - Juice, concentrate, Fruit drinks, frozen halves, candies
7. Berry (Ber), Aonla - Juice, candy, Powder
8. Mango - Pickle, Aam Papad, Chutney, Candy, dried mango powder

9. Garlic, Chilly, Ginger, Turmeric, Coriander and Fenugreek - Whole packaging, powder, paste and ingredient to other foods
10. Cashew - Cashew nut processing, cashew snacks, sweets and many more

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