



**An
Endeavour to enhance
Natural Food**

Quality Processed Food



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The diverse climate of North East is suitable for producing all types of Horticulture Crops. In fact for more than 80% of small holding farmers, horticulture crops are the main source of higher income, employment and nutrition. With the increasing importance of horticultural crops it producers are aware and are improving the economic status by adapting the horticulture crops. Keeping this in view a food processing unit had been under the Directorate of Horticulture and Food Processing. This is however one and only food processing unit in the entire North East and a part of the Horticulture growth center which started functioning in 20th of Feb'2016 with two other units mainly the Mushroom and Tissue culture units. The Food Processing Unit aims at enhancing the quality food products and to impart training to different participants to make them aware of the nutritional value of the varied food products.

The most important aspects of the food processing unit is to eliminate synthetic additives from all food products by introducing low fat, low salt and sugar free in all food products. Many innovative techniques have been developed for food processing around the world to uplift the food market keeping it safe and flavorful.

Vision 2015 Action Plan:

The Ministry of Food Processing Industries (MOFPI) has formulated a vision 2015 Action Plan that includes trebling the size of the food processing, raising the level of processing of the perishable food products from 6% to 20%, increasing the value addition from 20% to 35% and enhancing Indians share in food processing industry as viewed in the present scenario as in the past as follows:

- 1) To extend the period during which food remains whole (the shelf life) by preservation techniques which inhibit micro biological and biochemical techniques, allowing time for sales and home storage.
- 2) To increase variety in diet by providing a varieties of food with attractive colours, flavours, aromas and textures.
- 3) To provide nutrient for health.
- 4) To generate income for the manufacturing company and shareholders.

- 5) All food processing involves a combination of procedures to achieve the intended changes in the raw material. Each of these units operation has a specific identifiable and predictable effect on food and the combination of sequence of operation determines the nature of the main product.

The market for processed food is changing and consumers no longer require a shelf life of several months at ambient temperature for a majority of foods.

Changes in life style and invented ownership of freezers, microwave, ovens are reflected in demand for food that are convenient to prepare. There is an increasing demand for food that most closely resemble the original raw material and have a "healthy" and "Natural image" and have fewer synthetic additives or have under gone fewer changes during processing.

Such Horticulture Food Processing Unit has a solid view and responded to those pressures by reducing on eliminating synthetic additives from products and substituting them with "Natural and nature equivalent" alternatives and by introducing low fat, sugar free and low salt in all food products.

Introduction:

Food processing is a scientific and technological activity, covering a broader area then food preparation and cooking. It involves the application of scientific principles to slow down the natural processes of food decay caused by microorganisms enzymes in the food or environmental factores such as heat, moisture and sun light and so preserve the food. Much of the knowledge is known traditionally and is put into practice by experience and information handed down the generation. In most developed countries is also a method of generating employment to family incomes.

There is an importance of improving food processing that is done in home to meet family income for daily needs. Improving, food processing involves methods of business planning, work organization, marketing and quality assurance that are likely to be unfamiliar to traditional processes, but which are essential to ensure a successful and profitable production.

✓ What is Food Processing:

It is a procedure in which food is prepared for consumption. People often use this term as refer specifically to making packaged foods, but technically anything which transform raw ingredients into something else is a form of food processing ranging from grilling vegetation in the backyard to making television dinners.

There are several purposes is food processing. The most basic theme is to prepare food which is palatals. This can include processing ingredients which are safe to eat raw, flavouring food to make them more interesting and making dishes which comply with cultural and religious norms.

The processing food is also usually intended to make food nutritious and can also include retinitis like food fortification in which vitamins and minerals are added to food during processing to increase the nutritional value.

Food processing is a way and technique implemented to convert raw food stuff into well cooked, well preserved eatables for human. Good quality constituents are used by food processing industry to manufacture easy to cook food products. Following are some of the techniques and methods used to convert food to processed food.

- ✓ 1) Preservation Process: This includes heating or boiling destroy microorganisms, oxidation, dehydration, osmotic inhibition freezing a sort of cold pasteurization which destroy pathogen.
- ✓ 2) Drying : This is probably the most ancient method used by humans to preserve or process their food. It is the most common technique to preserve or process cereals like maize, oats, rice, barley, rye etc.
- ✓ 3) Vacuum packs: in this method food is packed in air tight bags and bottles in a vacuum area. This method is used in processing the food in an air tight environment. It does not provide oxygen needed by germ specially bacteria to survive. This then prevent food from getting rotted. Other methods include salting, sugaring pickling used in case of fruit preservation.

✓ OBJECTIVES:

Food processing is carried out to achieve the following objectives-

- a) For the purpose of storage and transport
- b) To protect from contamination
- c) To increase shelf life
- d) To make it attractive for the consumers

For appropriate processing of food many criteria need to be taken into account. This includes the ability of the microorganisms and pests to invade and grow on foods and the chemical instability and biological activity of food when promoting food processing. Each programme should have clearly defined objectives. These can be broadly characterized as

- i) Those that are likely to result in improved nutritional status or better food security and
- ii) Those that are likely to improved individual income as national incomes.

Different approaches are needed when promoting processing to increase food security or nutritional status compared to those that are unused to establish for support small processing enterprises for income generation.

History of Food Processing:

Food processing dates back to the pre- historic ages when crude processing incorporated fermenting sun drying, preserving with salt and various types of cooking such as roasting, smoking, steaming and oven baking. Such basic food processing involves chemical enzymatic changes in the basic structures in the natural form as well as to build a barrier against surface microbial activity that causes rapid decay.

Modern Food Processing technology developed in the 19th 20th Century in different parts of the world to serve military needs. Pasteurization developed by Lois Pasteur in 1864 improved the quality of processed food. In the 20th century, World War II , the space race and the rising consumer society in developed countries contributed to the growth of food processing. With some advanced techniques such as spray drying and introduction of artificial

sweeteners, colours and preservatives such as sodium benzoate. Food processing companies marketed their products especially forwards middle class, working wives and mothers. Processors utilized the perceived value of time to appeal to the post war population and this same appeal contributes success of convenience food today.

✓ **Benefits and Drawback:**

Benefits of food processing include toxin removal, preservation, easing marketing and distribution tasks and increasing food consistency. It enables transportation of perishable foods along long distances and makes many foods safe to eat by deactivating spoilage and pathogenic microorganisms.

It reduces the incidence of food borne disease. Fresh materials are more likely do to harbor pathogenic microorganism such as (salmonella).

The extremely varied modern diet is only possible on a wide scale became of food processing.

The act of processing can often improve the taste of food significantly. Mass production of food is much cheaper overall then the individual production of meals from raw ingredients. Therefore, large profit potential units for manufacturing and suppliers of processed food.

Processed food freed people from the engagement of time involved in preparing and cooking "natural" and "unprocessed food". The increase is free time allow people much more choice in life style then previously allowed. In many families, adults are working away from home and therefore, there is little time for the preparation of food based on fresh ingredients. The food industry offer products that fulfill many different needs eg. fully prepared ready to eat meals that can be heated up in a microwave within a few minutes.

Modern food processing also improves the quality of life for people with allergies, diabetes and other. People who cannot consume some common elements, food processing also add extra nutrients such as vitamins.

The ministry of Food Processing industries decided to launch new centrally sponsored schemes titled "National Mission" on Food Processing (FP) w.e.f. 1st April 2012 in co-operation with State Government during the 12th Five year plan. This aimed at ensuring better outreach of various schemes/ programs of the Ministry and provides more flexibility to suit local needs.

✓ **Effects of Food Processing:**

All food manufacturers should make safe food so that consumers are not at risk. That is not only microbiological risks but also pesticides and other harmful materials that can get into the food and lower the quality. Consumers consider eating quality as the main factors when buying food and food should fit with traditional eating habits and cultural expectation of texture, flavour, taste, colour and appearances. For some foods, nutritional quality (e.g. Protein content, vitamins and minerals etc.) is an important consideration.

Food processors should understand the composition of their food because it enables them to predict the differences that take place during processing, the expected shelf life of the product and the type of microorganisms that can grow in it. This criteria is used to prevent food spoilage. This unit addition to processing food, secondary processing alters their eating quality. A good example is cereal grain where primary processing is done by drying and milling flour which remain inedible. Secondary processing is used to produce a wide varieties of bakery products (snacks foods, partridges, biscuits, pizzas, burgers, patties, pastries, breads, buns etc.) each having an attractive flavor, texture and colours. Food that has an attractive appearance, color and taste are more likely to sell well and at a higher price. It is therefore, in the interest of the processing procedure to find out what it is that consumer like about a product using market assessment and ensure that the products meet their requirement.

Performance parameters in food processing:

When designing processes for the food industry the following performance parameters are to be taken into account.

Hygiene: Measured by no. of microorganisms per ml of finished products. The Energy

Efficiency: Measured by ton of steam per ton of sugar produced.

Labour used: measured by number of working hours.

Minimization of Waste: measured by percentage of peeling loss during peeling of potatoes.

Trends in modern Food Processing:

The following trends are to be observed in modern food processing. They are –

- 1) Health: Reduction of fat content in the final product by using baking instead of deep frying in all food products.
Maintaining the natural taste of the products by using less artificial sweetener that was used before.
- 2) Hygiene: The rigorous application of industry and govt. endorsed standard to minimize possible risks and hazards. For this the international standard had been adopted as HACCP(Hazard analysis and critical control point).
- 3) Efficiency: Rising energy costs leads to increasing usage of energy saving technologies eg. frequency converters on electrical drives, heat insulation in the laboratory building and heated vessels and energy systems.

De- agglomerating batter mixes in food processing:

Problems often occur during preparation of batter mixes because flour and other powdered ingredients tend to form lumps or agglomerates resulting in a lumpy batter. If lumpy batter is used to enrobe products it causes an unsatisfactory appearance with misshapen or oversized products. This can force production to a standstill. Using a high shear in-line mixer in place of conventional agitator or mixer can quickly solve problems of agglomeration. With dry ingredients a single pass through self-pumping inline mixer adds a high shear to batter which de-agglomerates the mix, resulting in a homogenous smooth batter. With a consistent smooth batter the final product appearance is improved, the effectiveness and hygiene of the re-circulation

system is increased at a better yield of raw material is achieved. By increasing overall product quality the amount of raw materials needed is thereby lowering manufacturing cost and increased shelf life is achieved by creating and maintaining an emulsion often by adding a food substitute.

Scale of operation:

When operating as a business food processing can take place at any scale from a single person upward i.e. from homoscale & small scale.

Home Scale Processing:

Food that are intended for household consumption are usually processed by individual families or small groups of people working together. Many of the world's multinational food units started from single person to family working from home. In developing countries home scale processors aims to generate extra income to meet all the family requirements. When this becomes successful many later expand production and develop first into micro or small scale operation.

Characteristically home scale processors cannot afford specialized food processing equipment's and rely on domestic utensils such as cooking and stoves for their production.

Types of village Food Processing:

Category of persons	Examples of types of processors
Heating to destroy enzymes and micro organisms	Boiling, balancing, roasting, grilling, pasteurization baking
Removing watefrom food	Drying, concentration by boiling filtering
Removing heat from food	Cooling, chilling
Increasing acidity of foods	Fermentation, adding citric acid or vinegar
Using chemicals to prevent enzymes and microbial activity	Salting, striping, adding chemicals preservatives such as sodium meta bi sulfide or sodium benzoate
Excluding air, light moisture and micro organism pests	Packaging

Scale of Commercial Food Processing:

Home (on household scale)	No employee, litter or no capital investment
Micro scale(Cottage)	Less than 5 employees
Small scale	5-15employees
Medium Scale	16-30
Large Scale	More than 50 employees

Myths and Facts

1) Myths: Processed food offers no benefit.

Facts: Food processing makes many foods available that we could not otherwise eat.

Without Food Processing we certainly could not buy a variety of food products we see at Super Market and Store shelves. Food processing enables year round availability of food that have limited growing season. Processing extends the shelf life of foods: pizzas and straw berry cheese cake are the examples of nutrition food that are readily available.

Processing provides food safety by a variety of methods for example heating to a sufficiently high temperature (1800 in an oven) which destroys harmful bacteria, certain additives keeps prevent fats going off (rancid) and prevent the growth of funguses and bacteria.

Convenience is another benefit of food that have been processed.

2) Myths: Processed food is not as nutritious as fresh food.

Fact: Many processed food are just as nutritious or in some cases even more nutritious than fresh food that have been stored depending on the manner in which they are processed.

Frozen vegetables are usually processed within a few hours of harvest. There is little nutrient loss in the freezing process, so frozen vegetables retain their high vitamins and minerals contents (frozen baby corn, mushrooms, cheese used in the preparation of pizzas). In contrast fresh vegetables are picked transported in market. It can take days and even weeks before they reach the dinner table and vitamins are gradually. He lost over time, no matter how carefully vegetables are stored and transported.

3) Myths: The additives in processed food are not necessary.

Facts: Food Additives play an important role in preserving the freshness, safety, taste, appearance and texture of processed food. Food additives are added for particular purposes, whether it is to ensure food safety or to maintain food quality during the shelf life of the product. For example, anti-oxidants prevent fats and oils from becoming rancid while preservatives prevent or reduce the growth of microbes (eg. Mould in bread).

Conclusion:

Food processing uses the creative potential of the processor to convert basic raw materials into varieties of tasty attractive products that provide asserters in the diets of consumers.

Food processors take raw vegetables or marine materials and transform them into edible products through the application of labour, machinery, energy and scientific knowledge.

Raw fruits, vegetables and uncooked meats are preserved by cold storage, refrigeration which slows down the micro-organism and delays deterioration. Cold storage and refrigeration will preserve only raw foods for only a few weeks at most. If food is to be preserved for a longer period, it must undergo special treatment such as freezing or heating. The science of preserving food for more than a few days is called food processing. Since microorganisms need water to grow, drying the food slows down the rate at which it spoils. Today food processors provide a diet richer and more varied than ever before.

Many governments promote the development of small scale food processing enterprises because

- ◆ They have the potential to create significant levels of employment.
- ◆ Increase food security for growing urban population as well as rural families
- ◆ Produced products that can substitute for imported foods or have export potential, thus help reduce balance of payments problems and thereby improve the overall prosperity of the country.

Recipes of some processed food :

1) Bread :

- i) Maida
- ii) Sugar
- iii) Salt
- iv) Milk Powder
- v) Calcium powder
- vi) Yeast
- vii) Oil
- viii) Vanilla Powder



2) Cake :

- i) Maida
- ii) Sugar
- iii) Egg
- iv) Salt
- v) Cake margarine
- vi) Baking powder
- vii) Milk powder
- viii) Orange/vanilla/lemon



3) Pizza:

- i) Maida
- ii) Sugar
- iii) Salt
- iv) Yeast
- v) Vanilla powder
- vi) Milk powder
- vii) Oil
- viii) Gluten
- ix) Improver
- x) Water



4) For topping

- i) Mushroom
- ii) Baby corn
- iii) Capsicum
- iv) Onion
- v) Tomato
- vi) Butter
- vii) Mazrella Cheese
- viii) Pizza Sauce



Role of yeast in Bread Preparation:

The purpose of any leavener is to produce gas that makes bread rise. Yeast does this by feeding on sugars in flour and expelling carbon dioxide in the process.

There are about 160 known species of yeast, *Saccharomyces cerevisiae* commonly known as bread yeast or baker's yeast is one of the most often used in the kitchen. Yeast is tiny just one gram holds about 25 billion cells. Fortunately yeast can use its own enzymes to break down more complex sugars.

When it comes to bread making gluten is an important element. It helps to strengthen the bread dough. So it can hold more gas created by the yeast. The more dough is kneaded the more gluten it will form. Yeast assists in the kneading procedure by creating the bubbles which allow for more protein to convert to make more gluten.

Yeast formation not only adds air bubbles, but also favours, as it breaks down the tasteless large starchy molecules into smaller sweet sugars. The creating of ethyl alcohol also adds to the flavor of the bread.