Preliminary processing methods, conversion and preservation operation

Module- 7

Lec- 7

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**Food and Food Processing**

- Food is any substance, usually composed of carbohydrates, fats, proteins and water, that can be eaten or drunk by an animal or human for nutrition or pleasure.
- Items considered food may be sourced from plants, animals or other categories such as fungus or fermented products like alcohol.
- Food processing is the set of methods and techniques used to transform raw ingredients into food or to transform food into other forms for consumption by humans or animals either in the home or by the food processing industry.
- Food processing typically takes clean, harvested crops or slaughtered and butchered animal products and uses these to produce attractive, marketable and often long life food products. Similar process are used to produce animal feed.

**History of Food Processing**

- Food processing dates back to the prehistoric ages when crude processing incorporated slaughtering, fermenting, sun drying, preserving with salt, and various types of cooking (such as roasting, smoking, steaming, and oven baking).
- Evidence for the existence of these methods exists in the writings of the ancient Greek, Chaldean, Egyptian and Roman civilizations as well as archaeological evidence from Europe, North and South America and Asia.
- Modern food processing technology in the 19th and 20th century was largely developed to serve military needs. In 1809 Nicolas Appert invented a vacuum bottling technique that would supply food for French troops, and this contributed 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, World War II, the space race and the rising consumer society in developed countries contributed 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 such as MRE food ration were developed.

**Food Processing Methods**

- Removal of unwanted outer layers, such as potato peeling or the skinning of peaches.
- Chopping or slicing e.g. diced carrots.
- Mincing and macerating
- Liquefaction, such as to produce fruit juice
- Fermentation e.g. in beer breweries
- Emulsification
- Cooking, such as boiling, broiling, frying, steaming or grilling
- Deep frying
- Baking
- Mixing
- Addition of gas such as air entrainment for bread or gasification of soft drinks
- Drying
- Pasteurization
- Packaging
- Canning
- Irradiation
- Freezing
Figure 1 different types of food processing methods

Chocolate production

Potato Processing
Foods and Beverages

- **Foods**


- **Beverages**

Fruits & Vegetable Products

- **Raw mangoes**: Pickle, spread, candy, chunda, preserve, amchur, chutney, beverages
- **Ripe mangoes**: Pulp, (canned/aspetic) concentrate, juices, RTS, nectar, squash, crush, punch, jam, meva, bar, leather, toffee, mango burfee.
- **Pomegranate**: Juice, concentrates (Anarrub) nectar, squash, crush, syrup/sherbat, purch, carbonated beverage, jelly, wine, anardana, anargoli/churn chutney, dalimbmanuka
- **Sweet orange**: Juice, concentrate marmalade, squash, cordial, segments candy, peel candy, segment preserve, wine, crush, punch, toffee, bar canned segment.
- **Jamun**: Pulp, juice, syrup, jam, jelly squash, spread, bar toffee, wine, vinegar, powder, flake.

- **Aloevera**: Pulp, juice, squash, powder, wine, syrup gel, jelly, cosmetic products, oil, shampoo, powder, etc.
- **Aonla/Amla**: Juice, RTS, chayvanprash
- **Ginger**: Juice, RTS, dried ginger
- **Tamarind**: Concentrate, powder, slaps/block, pulp, syrup jam, jelly, sauce
- **Banana**: Wafers/chips, puree, juice, powder, vinegar, banana kig, snacks (chivada) jam, starch, fibre
- **Custard apple**: Frozen, pulp, flakes, ice-cream, milk snakes, basundi, rabadi, toffee, seed: oil and cake. Grape raisin
Fruit & Vegetable Based Industries in India

- Integrated fruit and vegetable processing unit.
- Dehydrated fruits & vegetable unit.
- Chips/ wafer unit -Banana/ potato / topioca.
- Fruit bar, leather & toffee unit.
- Pickles, sauce, ketchup, chutney & soups.
- Fruit candy, preserve, glazed fruits.
- Herbal candy.
- Fruit jam, jelly, marmalade, fruit cheese, fruit butter
- Frozen fruits & vegetables & pulp.
- Aseptic packaging of fruit pulp.
- Fruit beverages unit.
- Carbonated fruit beverages, herbal juices & beverages
- Pectin manufacture.
- Citric acid production.
- Wheat grass juice.
- Herbal tea
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