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A study on Food Preservation and Food Storage

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Abstract – In this modern world, consumption of packaged food is very high.Hence it is essential to sustain packaged food products with quality. Quality includes edible condition, structure, smell and non toxic nature at this juncture, food preservation is very essential to keep the packaged food as a quality one. In this paper, factors that influence food spoilage, necessity of food preservation and storage and various methods of food preservation and food storage in the field of refrigeration is studied.

Key Words: Food spoilage, food preservation, food storage, refrigeration

1.Introduction

The technology of refrigeration is widely used in the following fields.

- Domestic
- Commercial
- Industrial
- Marine
- Transport

In this paper, we discuss food preservation and storage.

1.1 Food preservation

Food preservation is the process in which, the properties of food like

- Colour
- Smell
- Physical Structure
- Nutrient value

Are maintained in such a way that, it is fit for edible.

1.2 Necessity of food preservation

Food items are to be preserved for the following reasons

- To maintain edibleness
- To ensure safety
- To maintain quality
- To maintain physical structure of food
- To avoid food material to become toxic
- To maintain nutrients and calorific value of food
- For transportation

2. Food spoilage

Food spoilage is the process which changes the food product to undesirable or unacceptable for consumption. Food product is deemed to be spoiled when there is change in natural colour, smell, physical structure and taste.

2.1 Food spoilage agents

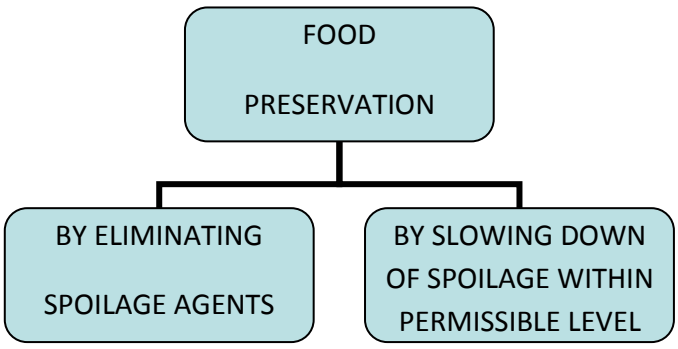
The food spoilage agents are classified as follows

- Enzymes
- Micro-organisms like Bacteria, Yeast and Molds
- pH level
- Organic nature of food
- Temperature
- Air quality
- Humidity
- Nutrient properties
- Ingredient properties

3. Methods of food preservations

Food preservation methods are shown in the chart-1

Chart-1



3.1 By eliminating spoilage agents

One of the most common method is dehydration. In this method the spoilage agents like water, moisture is eliminated. The traditional method used for this is drying under sun light.

3.2 By slowing down of spoilage within permissible level

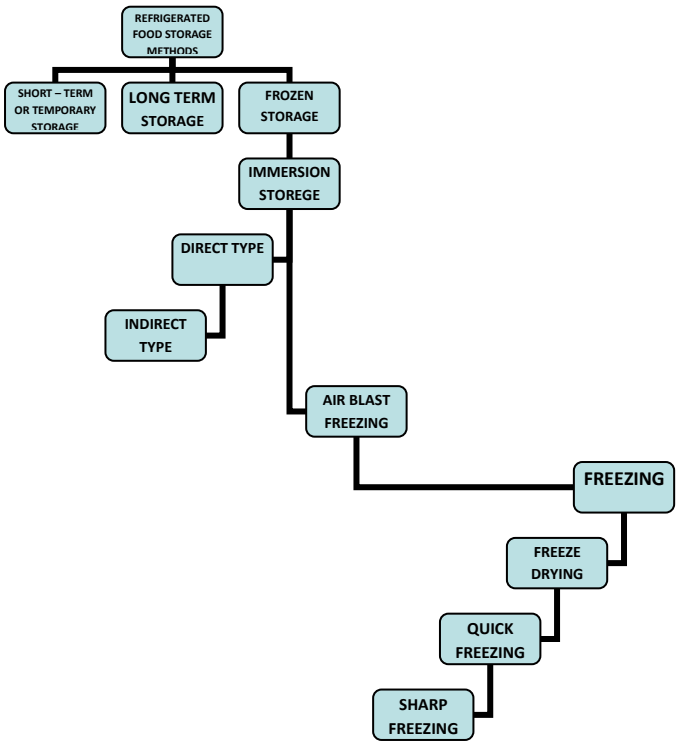
In this method, the spoilage agents are not eliminated from the food product. Instead their reaction rate of spoilage is slowed down within permissible level. Some of such process are listed below

- Heat processing like boiling
- Freezing
- Chemical preservation like pickling

4. Methods of food storage under refrigeration

Food products are stored under controlled environment [refrigerated] in order to extend its shelf life and fitness for consumption. Food products can be stored temporarily or long term or frozen. Food storage methods are shown in the chart-2

Chart-2



4.1. Food storage under refrigeration

Short-term storage:

If the food materials are stored under refrigeration up to 72 hours is termed as short-term storage. This is also called as temporary storage.

Long-term storage:

If the food materials are stored under refrigeration more than 72 hours is termed as long-term storage.

Frozen storage:

Frozen storage is a long-term storage and is done in the following conditions as shown in Table-1.

Table-1

Temperature	Humidity
Thermostatically at or below -10 degree C or 14 degree F Or Thermostatically between 2 degree C - 8 degree C or 36 degree F -46 degree F	25%

Immersion storage:

This is the method in which the food products are frozen rapidly by immersing them into low temperature refrigerant liquids like sodium chloride, propylene glycol and brine solutions.

This storage method has two types

- immersion freezing-contact type
- immersion freezing- indirect contact type

Immersion freezing-contact type:

In this the food products are frozen by direct contact with refrigerant liquid and is suitable for small quantities. Fruits, vegetables, meat and fish can be stored by using this method.

Immersion freezing- indirect contact type:

In this the food products are frozen by indirect contact with refrigerant liquid. The food products are kept over a metal plate, which is cooled by refrigerant liquid. This is also called as plate freezers.

Air blast freezing:

In this method, the food products are cooled by directing or blasting of very low temperature air circulated at high velocity through a large duct often called as tunnel. The direction of air supply is opposite to the direction of movement of food products that are moving over the conveyor. The temperature and air velocity is shown in the following table-2

Table-2

Temperature	Air velocity
-20 degree C to -40 degree C	20 m/min to 120 m/min

Freezing or freeze drying:

This is the process in which, the food products are frozen and water is removed by sublimation under vacuum.

Slow or sharp freezing:

In this the food products are stored in a cooled storage space and is allowed to cool slowly. This is a slow process that takes place from 3 hours to 3 days.

Quick freezing:

This is the process in which, the food products are cooled immediately by directing a very low temperature air with high velocity. The food products are frozen within 30 minutes.

5. CONCLUSIONS

On reading this paper one can easily get an idea about food quality, preservation techniques, methods of food preservation, its necessity, agents of food spoilage and various storage using refrigeration technology is studied. This paper gives an overall view on food preservation and storage methods. This paper is written in lucid manner, which will be useful for students studying diploma in refrigeration and air conditioning.

REFERENCES

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Author Photo