Preservation of Different Food Varities Using Conventional Techniques

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Abstract-*Food preservation involves preventing the growth of bacteria, fungi(such as yeasts), or other micro-organism (although some methods work by introducing benign bacteria or fungi to the food), as well as slowing the oxidation of fats that cause rancidity. Food preservation may also include processes that inhibit visual deterioration, such as the enzymatic browning reaction in apples after they are cut during food preparation*

Keywords-Canning, Food, Pasteurization, Preservation Spoilage

I. INTRODUCTION

The main objective of fruit and vegetable processing is to wholesome, safe, nutritious and acceptable food to consumer throughout the year. Fruit and vegetable processing projects also aim to replace import of products such as squashes, jams, tomato sauces, pickles, etc., besides earning foreign exchange by exporting finished or semi-processed products. sometimes even established fruit and vegetable canning factories or small/medium scale processing centers suffer huge loss due to erratic supplies. Because the growers may like to sell his produce in the open market for table purpose or the produce may not be of good enough quality for processing even through it is adequate for table use and this result in grave underutilization of processing capacities.

Practically any fruit and vegetable can be processed, but some importantfactors are the demand for a particular fruit or vegetable in the processed form: the quality of the raw material, i.e. whether it can stand processing and regular supplies of the raw materials. For example, a particular variety of fruit which may be excellent to eat fresh is not necessarily good for processing. Processing requires frequent handling, high temperature and pressure. Many of the ordinary table varities of tomatoes, for instance, are not suitable for making paste or other processed products. A particular mango or pineapple variety may be very tasty at the table, but when it goes to the processing centre it fail to stand up to the processing requirements due to variations in its quality, size , maturity, variety and so on. Even when a variety is suitable, it is not reliable for processing unless regular and large supplies are made available. An important processing centre or a factory cannot be planned to depend only on seasonal gluts; although it can take care of the gluts, it will not run economically unless regular supplies are guaranteed.

II. RESEARCH ELABORATIONS

About a half dozen methods for the freezing of foods have been developed. One, described as the plate, or contact, freezing technique, was invented by the American inventor Charles Birdseye in 1929. In this method , food to be frozen is placed on a refrigerated plate and cooled to a temperature less than its freezing point. Alternatively, the food may be placed between two parallel refrigerated plates and frozen. Another technique for freezing foods is by immersion in very cold liquids. At one time, sodium chloride brine solutions were widely used for this purpose. A 10% brine solution, for example, has a freezing point of about 21OF (-6oC), well within the desired freezing range for many foods. More recently, liquid nitrogen has been used for immersion freezing. The temperature of liquid nitrogen is about -320Of (-195.5Oc), so that foods immersed in this substance freeze very quickly.

In many cases, foods are actually cooked prior to their being packaged and stored. In other cases, cooking is neither appropriate nor necessary. The most familiar example of the latter situation is pasteurization. During the 1860S, the French bacteriologist Louis Pasteur discovered that pathogens in foods could be destroyed by heating those foods to a certain minimum temperature. The process was particularly appealing for the preservation of milk since preserving milk by boiling is not a practical approach. Conventional methods of pasteurization called for the heating of milk to a temperature between 145 and 149oF for a period of about 30 minutes, and then cooling it to room temperature. In a more recent revision of that process, milk can also be “flash-pasteurized” by raising its temperature to about 160oF for a minimum of 15 seconds, with equally successful results. A process known as ultra-high-pasteurization uses even higher temperature, the order of 194-266oF, for periods of a second or more.

After heating has been completed , the top of the container is sealed. In home canning procedures, one way of sealing the (usually glass) container is to place a layer of

melted paraffin directly on top of the food. As the paraffin cools, it forms a tight solid seal on top of the food. Instead of or in addition to the paraffin seal, the container is also sealed with a metal screw top containing a rubber gasket. The first glass jar designed for this type of home canning operation, the Mason jar, was patented in 1858.

Material and Methodology

1. Traditional techniques

- Drying
- Cooling
- Freezing
- Boiling
- Heating
- Salting
- Sugaring
- Smoking
- Pickling
- Lye
- Canning
- Jellying
- Jugging
- Burial

2. Curing

- Fermentation

3. Industrial/modern techniques

- Pasteurization
- Vacuum packing
- Artificial food additives
- Irradiation
- Pulsed electric field electroporation
- Modified atmosphere
- Nonthermal plasma
- High-pressure food preservation
- Biopreservation
- Hurdle techniques

III. PASTEURIZATION OF MILK

Heat treatment that kills some but not all microorganisms, usually at temperatures below 1000 C, in known as pasteurization. It is employed in products whose quality would be adversely affected by higher temperatures. It is often used in conjunction with other methods of preservation, such as cold storage, refrigeration, or drying. Pasteurization was devised by Pasteur to prevent spoilage of wine and beer. It was later applied to the disease –producing bacteria in milk. It is now widely used in the dairy and food industries.

Mushrooms are the fleshy fungi which constitute a major group of lower plant kingdom. The mushroom is a common fungal fruit body that produces basidiospores at the tip of clublike structures, called basidia, which are arranged along the gills of the mushroom. Beneath the mushroom, in the soil, is the mold colony itself, consisting of a mat of interwined hyphae, sometimes several feet in diameter. The mushroom first appear as white tiny balls consisting of short stem and a cap (pileus), which begin to open up like an umbrella.

Sauerkraut is prepared in must western countries. It is a fermented and preserved form of cabbage. The shredded cabbage is mixed with salt (approximatelly at 2.5 % concentration) and packed anaerobically. High salt concentration promotes leakage of sugars from the cabbage while reducing the water activity. As the growth of the lactic acid bacteria occurs, the PH is lowered. At this conc. PH the putrifying bacteria cannot grow. In this way, sauerkraut can be preserved for long sauerkraut is nutritious as well as delicious.

One of the most common methods for preserving foods today is to enclose them in a sterile container. The term “canning” refers to this method although the specific container can be glass, plastic, or some other material as well as a metal can, from which the procedure origionally obtained its name. The basic principle behind canning is that a food is sterilized, usually by heating, and then placed within an air-tight container. In the absence of air, no new pathogens can gain access to the sterilized food. In most canning operations, the food to be packaged is first prepared in some way-cleaned, peeled, sliced, chopped, or treated in some other way- and then placed directly into the container.

IV. RESULT AND DISCUSSION

Production of spawn for white botton mushroom (Agaricus brunnescens syn. A. bisporus)

Results

Appearance of silky whitish growth completely covering the grain indicates the preparation of spawn of white button mushroom.

A. Storage of spawn

1. Store the spawn, if not needed immediately, at 0-40C in a refrigerator for a maximum period of 6 months. Spawn, if

stored at low temperature, should be allowed to attain room temperature before being used for spawning the compost.

B. Transportation of spawn

2. Transport the spawn in refrigerated vans after its purchase or at night when the temperatures are low, as higher temperature(above 32oC) is detrimental to mushroom mycelium.

EXPERIMENT NO.-1

MICROBIOLOGICAL ANALYSIS OF FOOD PRODUCTS

Result

Examine the plates for the presence of 30 to 300 colonies. Count them and calculate the accurate bacterial population by multiplying the number of colonies with dilution factor. If there is metallic sheen on the EMB agar, it indicates the presence of E. coli and it demonstrates the possibility of faecal contamination in food.

EXPERIMENT NO.-2

DETECTION OF BACTERIA IN SPOILED TINNED FOOD

Result

The presence of spore and cells of Gram-stained bacteria indicates the bacteriological food spoilage. The tinned food con also be made spoiled by artificial inoculation with clostridium thermosaccharolyticum, Clostridium sporogenes, Bacillus stearothermophilus or E.coli. EXPERIMENT NO.-3

QUANTITATIVE ANALYSIS OF MILK BY STANDARD PLATE COUNT (SPC) METHOD

Results

The microscopic appearance gives type and arrangement of bacterial cells. Count the number of bacterial colonies per Petridishes, take average of three plates and estimate CFUs per ml of milk.

EXPERIMENT NO.-4

ENZYMATIC TEST OF MILK BY METHYLENE BLUE REDUCTASE TEST

Results

The following selection criteria should be considered while examining the milk sample.

If milk is reduced within 30 minutes = Very poor quality
If reduction occurs within 90 to 120 minutes = Poor quality
If reduction occurs between 120 to 360 minutes = Fair
If reduction occurs between 6 to 8 hours = Best quality of milk.

EXPERIMENT NO.-5

DEMONSTRATION OF MICROBIAL PRODUCTION OF CURD

Results

Record observations after making the negative stained preparation of the smear from freshly prepared curd.

EXPERIMENT NO.-6

PRESUMPTIVE TEST FOR COLIFORMS IN BUTTER

Results

Count the number of bacterial colonies in sample and record the result. Counts of coliforms exceeding 10 organisms of sample can be considered to constitute a improper pasteurization of cream or contamination or defective handling during manufacturing resulting in poor quality of butter. Dilution blank is prepared by taking 1 ml of the sample to 99 ml water of dilution blank , shake and mix well.

DISCUSSION-

The variety of methods for food preservation which can be employed depends upon the food and what can be done with it without alterning its desirable character. Methods o preservation are in use since many centuries even when there was no knowledge of decay of foods and the success or failure of the methods. Modern method of food preservation employ elaborate refinements of the primitive processes, but are based on three general principles : (1) elimination of sources of contamination, (2) inhibition of the growth of unwanted microorganisms, and (3) destruction or removal of microorganisms already present in the food. The various methods employed for the preservation of food involve the use of (1) low temperature, (2) high temperature, (3) dehydration,

(4) high osmotic pressure, (5) chemical preservatives, and (6) radiations.

V. CONCLUSION

Food safety is a scientific discipline describing handling, preparation, and storage of food in ways that prevent foodborne illness.This includes a number of routines that should be followed to avoid potentially severe health hazards. In this way food safety often overlaps with food defense to prevent harm to consumers. The tracks within this line of thought are safety between industry and the market and then between the market and the consumer. In considering industry to market practices, food safety considerations include the origins of food including the practices relating to food labeling, food hygiene, food additives and pesticide residues, as well as policies on biotechnology and food and guidelines for the management of governmental import and export inspection and certification systems for foods. In considering market to consumer practices, the usual thought is that food ought to be safe in the market and the concern is safe delivery and preparation of the food for the consumer.

Food can transmit disease from person to person as well as serve as a growth medium for bacteria that can cause food poisoning. In developed countries there are intricate standards for food preparation, whereas in lesser developed countries the main issue is simply the availability of adequate safe water, which is usually a critical item. In theory, food poisoning is 100% preventable. The five key principles of food y\hygiene, according to WHO, are:

1. Prevent contaminating food with pathogens spreading from people, pets, and pests.
2. Separate raw and cooked foods to prevent contaminating the cooked foods.
3. Cook foods for the appropriate length of time and at the appropriate temperature to kill pathogens.
4. Store food at the proper temperature.
5. Do use safe water and raw materials.

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