EXPERIMENT 5 PRIMARY AND MINIMAL PROCESSING

Structure

5.1 INTRODUCTION

In India, perishable fresh fruit and vegetables are marketed immediately after harvesting without primary processing and adequate packaging. On the other hand, in the developed countries, most of the fruits and vegetables after harvesting are transported to packing stations for primary processing. They are then trimmed, sorted, graded, unit packed and marketed. In our country, because of the absence of primary processing, a lot of inedible material is transported to the market and finally to the homes of consumers where they end up in the garbage bin. Primary processing is therefore, necessary to streamline the marketing of fresh horticultural produce to urban markets. The solid wastes originating from horticultural crops in metro cities can create drainage problems and cause water logging, as well as invite stray animals near garbage dumps. These bio wastes also deteriorate very rapidly causing unhygienic conditions and increasing atmospheric pollution and provide a breeding ground for insects, pests and rodents. Minimally processed fruits and vegetables are cleaned, peeled, cut, sliced, packaged and/or lightly processed. These foods are in great demand because of their convenience. All fruits and vegetables need not be minimally processed. It is very often not convenient for the consumer with a small family to purchase commodities like pineapple, jackfruit, watermelon, pumpkin, ashgourd, yam, etc. Therefore if it is suitably sliced, peeled and packed consumer will be more inclined to buy it. In metro cities minimally processed vegetables like primary processing can solve one of the greatest problems of garbage disposal.

All fruits and vegetables need not be minimally processed. It is very often not convenient for the consumer with a small family to purchase commodities like pineapple, jackfruit, watermelon, pumpkin, ashgourd, yam, etc. If the vegetables are available in ready to cook form a large number of workingwomen in metro cities will be greatly benefited.

Objectives

After studying and performing this experiment, you should be able to:

- demonstrate the techniques of primary processing of fruits and vegetables and show how the solid wastes originating from fruits and vegetables can

be utilized in the farmers field thereby reducing cost of transport and the city garbage; and

- explain with practical demonstration of techniques of minimally processed fruits and vegetables and highlight its advantages.

5.2 EXPERIMENT

5.2.1 Principle

There is little difference in principle between primary and minimal processing. Primary processing is applicable in some fruits and vegetables, which carries lots of inedible/unmarketable part from the field to the market. Therefore, the main principle of primary processing is to eliminate the inedible parts without inflicting any damage to the main edible part. While minimally processed fruits and vegetables are cleaned, peeled, cut, sliced, packaged and/or lightly processed. One should keep in mind that while supplying minimally processed vegetable the maintenance of quality and hygiene must be of topmost priority.

5.2.2 Requirements

- Preparation table having stainless steel sheet or aluminum top.
- Stainless steel peeling, coring and pitting knives.
- Stainless steel washing tanks, constant supply of potable water.
- Electric fan / blower / drying arrangement.
- Packaging in polyethylene pouches, small plastic crates, CFB boxes.
- Pouch sealing machine.
- Shrink wrap/cling films, small cardboard tray/bamboo basket/perforated plastic container.
- Refrigerated storage/ walking coolers.
- Stainless steel pretreatment tanks.
- Laboratory facilities.

5.2.3 Procedure

Both the primary processing and minimal processing can be explained properly by giving example of a particular fruit or vegetables.

Primary processing

Cauliflower

- Procure cauliflower immediately after harvest
- Remove the inedible outer leaves and stems by cutting them with sharp knife without inflicting any damage to the edible curd
- The curds can be either wrapped in plastic film or kept as such in plastic crates for shipment in the market.
- The leaf and stem portions eliminated can be used as cattle feed or any other value added products.

Banana

- Harvest mature banana bunches carefully without causing any damage to banana fingers.
- Separate the banana hands from the bunch with help of a sharp knife.
- If facilities available wash the hands wax and dry them.
- Put the banana hands individually in plastic bag and place them in the crates for shipment.
- The banana stems left out can be used as value added product.

Minimal processing

- Select good quality fruits and vegetables for this purpose.
- Peel the fruits and vegetables and cut them into convenient pieces.
- Place them into appropriate containers or pouches for marketing.
- Some pre-treatments are recommended varies from commodity to commodity should be followed strictly.
- Transport and store the minimally processed under refrigerated condition.

5.2.4 Observations

It is advisable to maintain strict hygienic condition of the place and equipment. Strict vigil on the quality of primary and minimally processed fruits and vegetables are to be carried out. Yield of primary and minimally processed fruits and vegetable is to be recorded.

Shelf life or marketable life can be observed by determining the quality both in terms of microbial and organoleptic quality.

5.2.5 Calculations

The yield of the finished product and weight loss during storage should be determined.

$$\text{Primary processed produce \%} = \frac{\text{Weight of primary processed produce}}{\text{Weight of the original fresh produce}} \times 100$$

$$\text{Minimally processed produce \%} = \frac{\text{Weight of minimally processed produce}}{\text{Weight of the original fresh produce}} \times 100$$

$$\text{Waste \%} = \frac{\text{Weight of waste}}{\text{Weight of the original fresh produce}} \times 100$$

Sensory evaluation = Experienced assessors randomly selected should evaluate overall acceptability, colour, texture and flavour/odour. Attributers are to score on five point hedonic scale of excellent, 1; good 2; fair 3; poor, 4; and very poor, 5.

5.2.6 Result

Yield and wastage expressed as Percent (w/w).

Quality assessment is reported on Hedonic scale.

5.3 PRECAUTIONS

- Handle only freshly harvested horticultural produce for this purpose.
- Care must be taken to see that surface moisture from the finally prepared material before packaging should be removed.
- Once the primary/minimally processed fruits and vegetables are prepared and packed it should straight away go to refrigerated store.
- Keep rejects such as peel, seeds/stones or any other vegetable parts carefully for processing into a value added products and not thrown as garbage.