EXPERIMENT 3  PREPARATION OF PICKLES AND CHUTNEYS, RELISHES AND SAUCES

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3.1 INTRODUCTION

Pickling is the result of fermentation by lactic acid-forming bacteria, which are generally present in large numbers on the surface of fresh vegetables and fruits. These bacteria can grow in an acid medium and in the presence of 8-10 % salt solution, whereas the growth of a majority of undesirable organisms is inhibited. Lactic acid bacteria are most active at 30°C, so this temperature must be maintained as far as possible in the early stage of pickle making. When vegetables are placed in brine, the brine penetrates into the vegetable tissues and soluble material present in them diffuses into the brine by osmosis. The soluble material includes fermentable sugars and minerals. The sugars serve as food for lactic acid bacteria that in turn convert the sugars into lactic and other acids. The acid brine thus formed acts upon vegetable tissues to produce the characteristic taste and aroma of pickle. Pickles are consumed as minor item in food to make meals more a) appetizing, b) digestive, c) antiseptic due to the presence of spices, d) supplying protective food as vitamins and minerals. The commercial varieties of pickles can be divided into five classes.

1. Fermented Pickle
2. Oil Pickle
3. Acid Pickle
4. Mustard Pickle
5. Brine Pickle

Out of five classes only first four are sold in form of finished pickle where as the last one mainly brine pickle is generally not sold for consumer but is kept for further processing to make other types of pickle.

Objectives

After going through this experiment, you should be able to:

- know the pickling processes by pickling the available fruits and vegetables;
- describe the methods of chutney, relishes and sauces; and
- explain the precautions during the processes of product making.
3.2 EXPERIMENT

3.2.1 Principle
Pickles and chutneys are prepared with salt, vinegar, oil or with a mixture of salt, oil, spices and vinegar.

3.2.2 Requirements

Raw materials, equipment and apparatus
1. Fruit/vegetable, sugar
2. Peeler
3. Juicer
4. Pulper
5. Filter cloth / sieve
6. Pans of suitable size
7. Heaters
8. Thermometer
9. Crown corking / capping machine
10. Corks / caps
11. Volumetric flask
12. Measuring cylinder
13. Weighing balance
14. Potable water

Chemicals and reagents
1. Hydrochloric acid
2. Citric acid / ascorbic acid
3. Potassium metabisulphite
4. Sodium benzoate

3.2.3 Procedure

a) Pickles and its Method of Preparation

Pickles are prepared with salt, vinegar, oil or with a mixture of salt, oil, spices and vinegar. The general process for the preparation and preservation of is as under:

1. Preservation with salt
Salt improves the taste, flavour and hardness of the tissues of vegetables and controls fermentation. Salt content of 15 % or above prevents microbial spoilage. This method of preservation is generally used only for vegetables which contain very little sugar and hence sufficient lactic acid cannot be formed by fermentation to act as preservative. However, some fruits like lime, mango, etc., are also preserved with salt. The preparation of some pickles is described below:

i) Lime pickle: Lime 1 kg, salt 200 g, red chilli powder 15 g, cinnamon, cumin, cardamom (large) and black pepper (powdered) each 10 g, clove (headless) 5 numbers.
ii) Mango pickle: Mango peeled and sliced 1 kg, salt 200 g, red chilli powder 109, asafoetida 5 g, fenugreek, black pepper, cardamom (large), cumin and cinnamon (powdered) each 109, clove (headless) 6 numbers.
2) **Preservation with vinegar**

A number of fruits and vegetables are preserved in vinegar whose final concentration, in terms of acetic acid, in the finished pickle should not be less than 2 %. To prevent dilution of vinegar below this strength by the water liberated from the tissues, the vegetables or fruits are generally placed in strong vinegar of about 10 % strength for several days before pickling. This treatment helps to expel the gases present in the intercellular species of vegetable tissue. Vinegar pickles are the most important pickles consumed in foreign countries. Mango, garlic, chillies, etc., are preserved as such in vinegar.

i) **Onion pickle:** Onions 1 kg, vinegar 1 litre, salt 250 g, red chilli powder 10 g, cardamom (large), black pepper, cumin (powdered) each 10 g, clove (headless) 5 numbers.

3) **Preservation with oil**

The fruits or vegetables should be completely immersed in the edible oil. Cauliflower, lime, mango and turnip pickles are the most important oil pickles.

i) **Mango pickle:** Mango pieces 1 kg, salt 150g, fenugreek (powdered) 25g, turmeric (powdered) 15 g, nigella seeds 15g, red chilli powder 10g, clove (headless) 8 numbers, black pepper, cumin, cardamom (large), aniseed (powdered) each 15g, asafoetida 2g, mustard oil 350 ml (just sufficient to cover pieces).
b) Chutney and its Method of Preparation

- The method of preparation of chutney is similar to that for jam except that spices, vinegar and salt are added.
- The fruits/vegetables are peeled, sliced or grated, or cut into small pieces and cooked in water until they become sufficiently soft.
- The quality of a chutney depends to a large extent on its cooking which should be done for a long time at a temperature below the boiling point.
- To ensure proper thickening, cooking is done without a lid even though this results in some loss of volatile oils from the spices.
- Chopped onion and garlic are added at the start to mellow their strong flavours. Spices are coarsely powdered before adding.
- Vinegar extract of spices may be used instead of whole spices. Spice and vinegar are added just before the final stage of cooking, because prolonged boiling causes loss of some of the essential oils of spices and of vinegar by volatilization.
- In mango and apricot sweet chutneys, where vinegar is used in large quantity, the amount of sugar added may be reduced because vinegar itself acts as a preservative.
- The chutneys are cooked to the consistency of jam to avoid fermentation. Some of the common recipes for preparation of chutney are given below.

1. Sweet mango chutney

Mango slices or shreds 1 kg, sugar 1 kg, salt to taste, onions (chopped) 50g, garlic (chopped) 15g, ginger (chopped) 15g, red chilli powder 10g, black pepper, cardamom (large), cinnamon, cumin, aniseed (powdered) 10g each, clove (headless) 5 numbers and vinegar 170 ml.
2. **Apple chutney**

Apple slices 1 kg, sugar 750 g, dried dates (chopped) 100g, salt to taste, raisins 50g, ginger (chopped) 15g, red chilli powder 10g, black pepper, cardamom (large), cinnamon, cumin, aniseed (powdered) 10g each, clove (headless) 5 numbers, onions (chopped) 250g, garlic (chopped) 15g, and vinegar 200 ml.

3. **Apricot chutney**

Apricot slices 1 kg, sugar 1 kg, salt to taste, onions (chopped) 50g, garlic (chopped) 10g, ginger (chopped) 20g, red chilli powder 10g, black pepper, cardamom (large), cinnamon, cumin, aniseed (powdered) 10g each, clove (headless) 5 numbers and vinegar 150 ml.
c) **Relish**

Relish is a semi solid or vinegar extract prepared by mixing fruit or vegetable pulp and used in making food more flavourful and relishing. It can also include the sauces and chutney.

In the preparation of relish mayonnaise comes fore most. The next comes is mustard paste and third one is spice vinegar.

### Mayonnaise

<table>
<thead>
<tr>
<th>Recipes</th>
<th>Preparation</th>
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<tbody>
<tr>
<td>1kg Salad oil</td>
<td>Egg yolk and oil is beaten together and kept aside spiced vinegar is taken and mixed with the mixture of oil and egg yolk. Add sugar to the mixture. Gum tragacanth can be used as stabilizer in immulsion.</td>
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<tr>
<td>100g egg yolk</td>
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<tr>
<td>1 kg vinegar spiced</td>
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<tr>
<td>100 g sugar</td>
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<td>Sod. Benzoat 200 ppm</td>
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**Mustard paste**

The mustard paste is prepared by mixing mustard powder with spiced vinegar to make a smooth paste. It is preserved with 0.05% BHA and 250ppm sodium benzoat.

Spiced Vinegar is nothing but malt vinegar infused with spices and herbs. Whole spices are put in a muslin bag and suspended for 3-4 days. After that it is simmered and spiced oils are added.

**d) Sauces**

Sauces are made from fruit/vegetable pulps, flavoured with vinegar and spices. There are two types of sauces namely 1) Thin sauces and 2) Thick sauces.

**Thin sauces:** Thin sauces are those where the flavour of spices, grains, fruits, vegetables are extracted in Vinegar. The most popular in this category are a) Worestershire Sauce, b) Soya Sauce, c) Walnut Ketchup.

**Thick sauces:** Thick sauces are those where spices, vinegar, sugar and starch are mixed with fruit and vegetable pulps. They are concentrated to desired consistency. Thick sauces are generally prepared from tomatoes or from vegetables.

**Vinegar:** It is one of the ingredient used in pickles its types are given in Annexure I.

### 3.2.4 Observation

Determine TSS, acidity and salt.

### 3.2.5 Result

TSS, acidity and salt = %
3.3 PRECAUTIONS

- All equipment used in the preparation of fruit juices and squashes should be rust and acid proof.

- Copper and iron vessels should be strictly avoided as these metals react with fruit acids, and cause blackening of the product.

- The spices should be free from foreign matter and microbial contamination.