International Journal of Multidisciplinary Research and Development
Online ISSN: 2349-4182 Print ISSN: 2349-5979
www.allsubjectjournal.com
Volume 3; Issue 1; January 2016; Page No. 197-201

Studies on different methods of preserve preparation

[1] Madhav Kumar, [2] Amit Tiwari

[1] B.Sc. (Food Technology), Student BIT, Ranchi.

[2] Assistant Professor, BIT, Ranchi. Birla Institute of Technology, Ranchi-835215.

Abstract
A Preserve is made from properly matured fruit, by cooking it whole or in the form of large pieces in heavy sugar syrup, till it becomes tender and transparent. In its preparation not less than 45 kg of the fruit are used for every 55 kg of sugar, and cooking is continued till a concentration of at least 68% of soluble solids are reached. Fruit or Vegetable preserve containing 66% or more sugar do not ordinarily spoilage. Sugar absorbs most of the available water with the result that the latter is not available for the growth of microorganisms. Solution with high total solids have a very low water activity coefficient in regard to growth of micro-organisms. The Preserve can be made by several methods like cold process, hot process, vacuum process etc. In the cold process, sugar is placed in a tank and cold water is poured over it and stirred. The solution is then filterd through a thick flannel bag, muslin cloth, or fine brass wire gauze to remove impurities. Sometimes warm water is also added to facilitate the dissolving of the sugar. In the Hot Process, sugar and water are placed in a steam jacketed kettle, boiled and the scum removed. The syrup is clarified further by nitration. Steam helps to sterilize the syrup and to prolong its keeping quality. Previously amla is cooked with sugar syrup and T.S.S is raised to 70^{o}B.After some days if T.S.S drops below 65^{o}B again it is maintained.

Keywords: Preserve, Carrot, Sugar & KMS.

Introduction
Preserve or Murabba means the product, prepared from suitable, sound whole or cut grated fruits, rhizome or vegetables, appropriately prepared, suitable for the purpose, singly or in combination, by impregnating it, with nutritive sweeteners to a concentration adequate to preserve it. (Food Safety & Standards Authority of India, Act 2006 & Rule 2011). Freshly made preserve are wholesome and have an attractive appearance. When they are stored for a long period, their natural colour and flavor deteriorates on account of oxidative changes. They should be made only during the season, unless there are adequate facilities to keep the fruits so that they are available in the off-season also. Preserve made from frozen process are generally superior in colour and flavor to those made from fresh fruits stored at ordinary room temperature.

In general fruit and vegetable preserve are made from apple, amla, ber, carrot etc. it is made with sugar syrup as sugar concentration is high. It is based on the principle that it removes moisture as the process of osmotic dehydration. The transfer of sugar from syrup to amla and removal of moisture of fruits and vegetables to the syrup is driven by osmotic pressure. In general fruit should be washed thoroughly. If the fruit had been sprayed with Bordeaux or lead arsenate to check blight, it should be of the washed with dilute hydrochloric acid for especially when peel is not removed from the fruit for the preparation of fruit & the preserve. The fruit is first cooked slightly in water to make it soft enough to absorb sugar. Cooking of the fruit in syrup is rather difficult process, because the syrup is to be maintained at a proper degree of consistency so that it can permit to the entire body of the fruit without causing it shrink or toughen. If the fruit is cooked in heavy syrup straight away, its juice will be drawn out rapidly due to osmosis, with the result that it will shrink and there would consequently be very little absorption of sugar consequently is very little absorption of sugar subsequently.

Objectives
- ✓ To evaluate sensory qualities of prepared sample during storage.
- ✓ Comparatitve Study of cold & hot method of Preparation.
- ✓ Scope of value addition of fruits & vegitable.

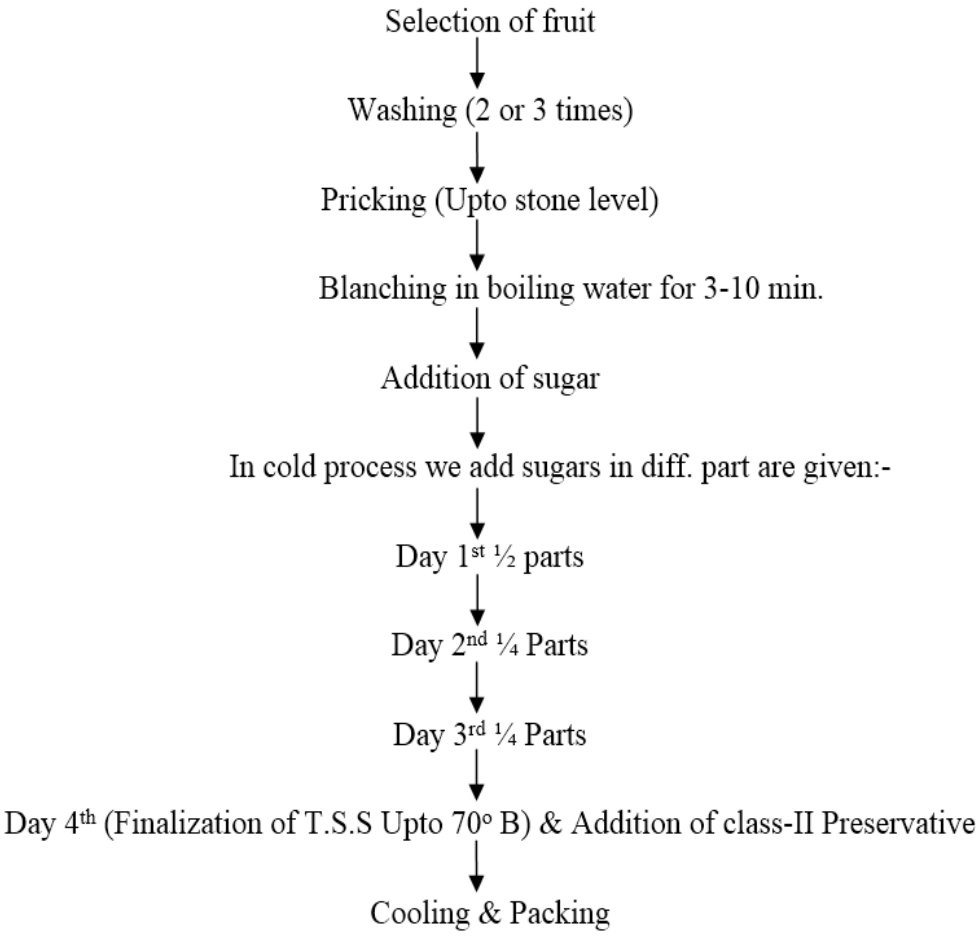
Material and Methods
The experiment **"Studies on different methods of preserve Preparation"** was carried out at the student research laboratory in Department of Food Processing Technology in Birla Institute of Technology, Ranchi. Details of experimental techniques to be employed during the course of investigation were as followes.

Procurement and purchasing of the raw materials:
- **Carrot** - Carrot was purchased from the local market of Ranchi city.
- **Amla –** Amla was purchased from the local markert of Ranchi city.
- **Sugar** - Sugar was purchased from the local shop of Ranchi city.
- **KMS** – KMS was purchased from Thermo Fisher Scientific India Pvt. Ltd.

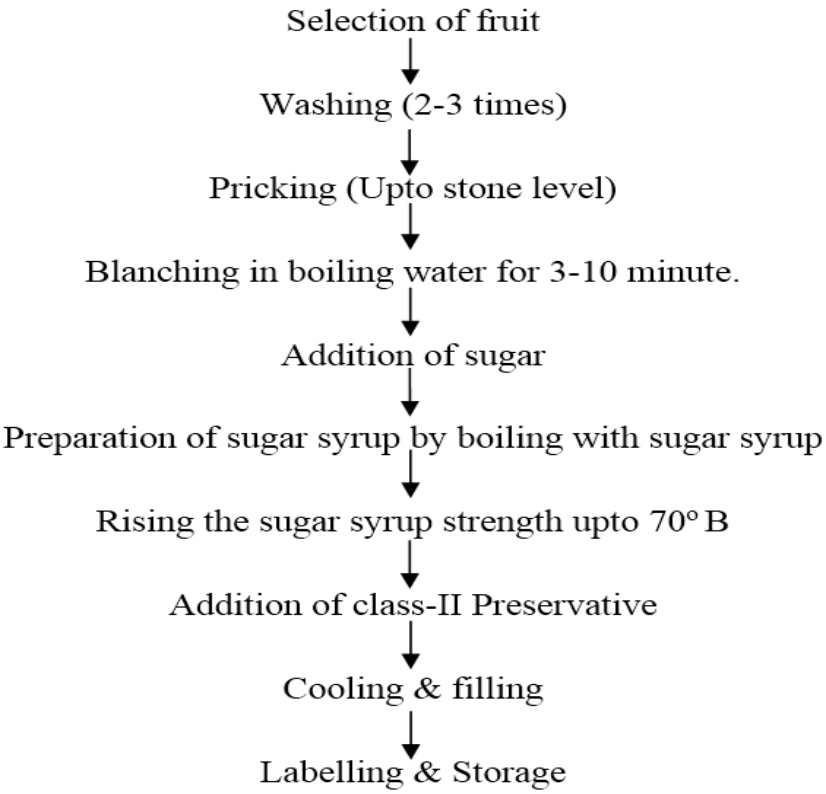
The basic principle in the method is to keep the sugar solution at 60^{o}c in a tank and allow air to flow into it in the form of fine bubbles through a perforated tube.

Equipment required in the preparation of preserve
A concentration system for sugar solution integral with unit, with or without external pipe line, thereby making the unit highly compact.

Cold Process



Hot Process



Methodology

Preliminary Processing

- ✓ The fruit should be washed properly.
- ✓ The preliminary treatment varies with the variety of fruit taken.

The fruit is first cooked slightly in water to make it soft enough to absorb sugar

Cooking In Syrup

There are three ways of cooking the fruit in syrup:-

- ✓ Open Kettel One Period Process
- ✓ Open Kettel Slow Process

Open Kettel One Period Process: The syrup in which the fruit is cooked should be low sugar content. Boiling should be continued with gentel heating until the syrup becomes sufficiently thick. Final concentration of sugar should not less than 68^{o} B.

Open Kettel Slow Process: Fruit is cooked till it becomes tender. Sugar equal to half the weight of the fruit, is then boiled and then allowed stand for 24hrs.During this fruit gives excess of water & resulting sugar becomes 37^{o}-38^{o}B.More sugar added strength raise to 68^{o}B.It is then left for 3to4 days. Finally, the strength of sugar syrup is raised to 70^{o}B.

Results and Discussion

The present investigation "Studies on different methods of preserve preparation" was planned and carried out in Department of Food Processing Technology in Birla Institute of Technology, Ranchi. Average values of TSS as well as sensory parameters like Colour, Texture, Flavour, & Taste of experimental samples are as follows:

Reading of sensory parameters

Table: 1.1: Sensory parameters of preserve decorded on Date: 4-3-2012

S. No.	Sensory parameters	Amla preserve		Carrot preserve	
		Cold process	Hot process	Cold process	Hot process
1.	Color	Whitish yellow	Dark golden colour	Dark Red with yellow pith (visible)	Light Red
2.	Flavour	Natural	Natural cooked	Natural	Natural cooked
3.	Texture	Normal Texture	Short Texture & Soft	Normal	Normal with soft shrinkage
4.	Test	Natural	Natural	Natural	Natural

Table: 1.2: Sensory parameters of preserve decorded on Date: 6-3-2012

S. No.	Sensory parameters	Amla preserve		Carrot preserve	
		Cold process	Hot process	Cold process	Hot process
1.	Color	Whitish yellow	Dark golden colour	Dark Red with yellow pith (visible)	Light Red
2.	Flavour	Natural	Natural cooked	Natural	Natural cooked
3.	Texture	Normal Texture	Short Texture & Soft	Normal	Normal with soft shrinkage
4.	Test	Natural	Natural	Natural	Natural

Table 1.3: Sensory parameters of preserve decorded on Date-12-3-12

S. No.	Sensory parameters	Amla preserve		Carrot preserve	
		Cold process	Hot process	Cold process	Hot process
1.	Color	Whitish yellow golden color	Dark golden colour	Dark Red with yellow pith (visible)	Light Red
2.	Flavour	Natural	Natural cooked	Natural	Natural cooked
3.	Texture	Normal Texture	Short Texture & Soft	Normal	Normal with soft shrinkage
4.	Test	Natural	Natural	Natural	Natural

Table 1.4: Sensory parameters of preserve decorded on Date- 17-3-12

S. No.	Sensory parameters	Amla preserve		Carrot preserve	
		Cold process	Hot process	Cold process	Hot process
1.	Colour	Whitish yellow golden colour	Dark golden colour	Dark red	Light red
2.	Flavour	Natural	Natural cooked	Natural	Natural cooked
3.	Texture	Normal Texture	Short Texture & Soft	Normal	Normal with soft shrinkage
4.	Test	Natural	Natural	Natural	Natural

Table 1.5: Sensory parameters of preserve decorded on Date-19-3-12

S. No.	Sensory parameters	Amla preserve		Carrot preserve	
		Cold process	Hot process	Cold process	Hot process
1.	Colour	Whitish golden colour	Dark golden colour	Dark red	Light red
2.	Flavour	Natural	Natural cooked	Natural	Natural cooked
3.	Texture	Normal Texture	Short Texture & Soft	Normal	Normal with soft shrinkage
4.	Test	Natural	Natural	Natural	Natural

Table 1.6: Sensory parameters of preserve decorded on Date-21-3-12

S. No.	Sensory parameters	Amla preserve		Carrot preserve	
		Cold process	Hot process	Cold process	Hot process
1.	Colour	Whitish golden color	Dark golden colour	Dark red	Light Red
2.	Flavour	Natural	Natural cooked	Natural	Natural cooked
3.	Texture	Normal Texture	Short Texture & Soft	Normal	Normal with soft shrinkage
4.	Test	Natural	Natural	Natural	Natural

Table 1.7: Sensory parameters of preserve decorded on Date-22-3-12

S. No.	Sensory parameters	Amla preserve		Carrot preserve	
		Cold process	Hot Process	Cold process	Hot process
1.	Colour	Whitish golden color	Dark golden colour	Dark red	Light Red
2.	Flavour	Natural	Natural cooked	Natural	Natural cooked
3.	Texture	Normal Texture	Short Texture & Soft	Normal	Normal with soft shrinkage
4.	Test	Natural	Natural	Natural	Natural

Table 1.8: Sensory parameters of preserve decorded on Date-23-3-12

S. No.	Sensory parameters	Amla preserve		Carrot preserve	
		Cold process	Hot process	Cold process	Hot process
1.	Colour	Whitish yellow colour	Slightly Blackish colour	Dark Red	Light Red
2.	Flavour	Natural	Natural cooked	Natural	Natural cooked
3.	Texture	Normal Texture	Short Texture & Soft	Normal	Normal with soft shrinkage
4.	Test	Natural	Natural	Natural	Natural

Table 1.9: Sensory parameters of preserve decorded on Date-28-3-12

S. No.	Sensory parameters	Amla preserve		Carrot preserve	
		Cold process	Hot process	Cold process	Hot process
1.	Colour	Whitish yellow with golden color	Slightly Blackish color	Dark Red	Light Red
2.	Flavour	Natural	Natural cooked	Natural	Natural cooked
3.	Texture	Normal Texture	Short Texture & Soft	Normal	Normal with soft shrinkage
4.	Test	Natural	Natural	Natural	Natural

Table 2: Sensory parameters of preserve decorded on Date-2-3-12

S. No.	Sensory parameters	Amla preserve		Carrot preserve	
		Cold process	Hot process	Cold process	Hot process
1.	Colour	Whitish yellow with golden color	Slightly Blackish colour	Dark Red	Light Red
2.	Flavour	Natural	Natural cooked	Natural	Natural cooked
3.	Texture	Normal Texture	Short Texture & Soft	Normal	Normal with soft shrinkage
4.	Test	Natural	Natural	Natural	Natural

Table 2.1: Sensory parameters of preserve decorded on Date-4-3-12

S. No.	Sensory parameters	Amla preserve		Carrot preserve	
		Cold process	Hot process	Cold process	Hot process
1.	Colour	Whitish yellow with golden syrup	Slightly Blackish	Dark Red	Light Red
2.	Flavour	Natural	Natural cooked	Natural	Natural cooked
3.	Texture	Normal Texture	Short Texture & Soft	Normal	Normal with soft shrinkage
4.	Test	Natural	Natural	Natural	Natural

Table 2.2: Sensory parameters of preserve decorded on Date-6-3-12

S. No.	Sensory parameters	Amla preserve		Carrot preserve	
		Cold process	Hot process	Cold process	Hot process
1.	Colour	Whitish yellow with golden sugar syrup	Slightly Blackish	Dark Red	Light red
2.	Flavour	Natural	Natural cooked	Natural	Natural cooked
3.	Texture	Normal Texture	Short Texture & Soft	Normal	Normal with soft shrinkage
4.	Test	Natural	Natural	Natural	Natural

Table 2.3: T.S.S Recording during storage

S. No.	Date	Amla Preserve		Carrot Preserve	
		Cold Process	Hot Process	Cold Process	Hot Process
1.	4-3-2012	70^{O}B	70^{0}B	70^{0}B	70^{0}B
2.	6-3-2012	68^{0}B	68^{0}B	68^{0}B	68^{0}B
3.	12-3-2012	68^{0}B	68^{0}B	68^{0}B	68^{0}B
4.	17-3-2012	68^{0}B	68^{0}B	68^{0}B	68^{0}B
5.	19-3-2012	66^{0}B	67^{0}B	68^{0}B	67^{0}B
6.	21-3-2012	66^{0}B	67^{0}B	68^{0}B	67^{0}B
7.	23-3-2012	66^{0}B	67^{0}B	68^{0}B	67^{0}B
8.	28-3-2012	65^{0}B	67^{0}B	68^{0}B	65^{0}B
9.	2-3-2012	65^{0}B	67^{0}B	68^{0}B	65^{0}B

T.S.S (Total Soluble Solids) in Preserve

- Making Preserve with sugar syrup, due to osmotic dehydration the sugar gets penetrate in fruits & vegetables.
- Fruits & Vegetables pieces losses moisture in sugar syrup, due to this T.S.S reduces.
- Sugar also acts as preservative in Preserve.
- After some days T.S.S gets constant.

Conclusion

In the cold process, sugar is placed in a tank and cold water is poured over it and stirred. The solution is then filterd through a thick flannel bag, muslin cloth, or fine brass wire gauze to remove impurities. Sometimes warm water is also added to facilitate the dissolving of the sugar.

In the Hot Process, sugar and water are placed in a steam jacketed kettle, boiled and the scum removed. Previously the fruit is cooked with sugar syrup and T.S.S is raised to 70^{o}B.After some days if T.S.S drops below 65^{o}B again it is maintained. Thus it can be concluded that the preserve prepared from cold method is better in terms of overall consistency than the preserves prepared from hot method.

References

1. Adam WB. Annual Report. Fruit & Vegetables Preservation Res. Stat., Campedn, 1941, 14.
2. Amin HD, Bhatia BS. IV Nutritive Value of products or organoleptic quality of products. Fd sci 1962; 11:82-84.
3. Anand JC. Rentention of added vitamin C in amla preserve. Indian Fd Pckr 1970; 24(6):19-20.
4. Barker BTP, Grove O. Sulphur Dioxide as a preservative for fruits. J Pomol Hort. Sci 1925; 5:50s.
5. Bhatia BS. Jack –Fruit preserve, candy, chutney and dried bulb Indian Fd Pckr 1955; 9(11):7-9.
6. FSSAI, Food Safety & Standards Authority of India Food Safety and Standards Regulations, 2011, 2009, 435-436.