



COLLEGE OF HORTICULTURE
V.C.S.G. UTTARAKHAND UNIVERSITY OF HORTICULTURE &
FORESTRY
BHARSAR, PAURI GARHWAL, UTTARAKHAND - 246 123

Horticulture work experience - 101/102/103

SUBMITTED TO – ER. TEJAS BHOASLE

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COMPONENT: INDUSTRIAL TRAINING FROM

CENTRE FOR TECHNOLOGY AND
DEVELOPMENT



Introduction

- The Centre for Technology and Development (CTD), is a unit of Society for Economic and Social Studies (SESS). It is an independent non-profit organization working in the field of sustainable rural development through science and technology application.

□ Location

- CTD (Field Station), Sahaspur, Dehradun (Uttarakhand), was established on 1995. Low cost fruit and vegetable processing unit, Sahaspur , Dehradun (Uttarakhand), was established under AICP on low cost processing and preserat on of Horticultural produce (1996).

History

CTD(field station), Sahaspur, Dehradun(Uttarakhand), was established on 1995. Low cost fruits and vegetables processing unit, Sahaspur was established under AICP on low cost processing and preservation of horticultural produce(1996).

Manager- Mr. P. Bhandari

Secretary – Mr. D. Raghunandan

Operation manager – Mr. Vinod Uniyal

Production manager – Mr. Subodh Pundir



OBJECTIVE

- To know in detail about mass production of various horticulture produce.
- To skill in the application of theory to practical work situations.
- Internship will increase a student sense of responsibility and good work habits
- To build a good communication skill with group of workers and learn to learn proper behavior of corporate life in industrial sector.

Main activities :

- Promotion and handhondling of Micro and Small Enterprises
- Natural resource management
- Manufacture of FARMER's FOOD PRODUCT
- Regd. With KVIB, UCOST-TRC
- Empanelled Udyami Mitra Under Ministry of MSME, Govt. Of India

Products

- Squashes
- Ready to serve (RTS) drinks
- Murabba
- Pickle
- Jam
- Marmalade
- Guava cheese
- **Other minor products**
- Wild apricot oil
- Almond oil
- Cannabis oil
- Reetha shampoo
- Fibre



Production

Products	Production
squash	15-20 ton/ yr.
jam	7-11 ton/ yr.
marmalade	3-4 ton/ yr.
murabba	2-3 ton /yr.
R.T.S	8-12 ton/ yr.
pickle	6-8 ton/ yr.
Guava cheese	0.5 – 1 ton/yr.



Equipments and Machines used in processing

1. Pulper
2. Kettle(100 and 200 L)
3. Homonizer
4. Bottle Filling Machines
5. Boiler (250 Lt.)
6. Fibre unit
7. Wild apricot oil expression
8. Plant extraction unit

IMPORT AND EXPORT

IMPORT (RAW MATERIAL)

- LOCAL AREAS
- UTTARKASSHI
(HARSHIL, NAUGAON)
- PAURI (THALISAIN)
- TEHRI (RANI CHAURI)
- DEHRADUN LOCALY

EXPORT (PROCESSED PRODUCT)

- DEHRADUN LOCAL AREA
- DELHI (NOIDA, GURGAON)
- PAURI (PAITHANI)
- NEW TEHRI
- NARENDRANAGAR
- RISHIKESH

ANNUAL TURNOVER – 33 LAKH (2016-17)

Pulper 16 and 32 mesh



Kettle



Homonizer



Bottle filling machine



Automatic bottle filling machine



2 bottles filling machine

Boiler



**ENERGY
MANAGEMENT**
इस बॉयलर को
सौर तापन प्रणाली
पर आधारित
वाटर हीटर
(क्षमता 200 ली.)
से जोड़कर ऊर्जा
का संरक्षण किया
जा रहा है।
सहयोग: U-COSI





Refractometer



Hot Gun

Oil expression



Other equipment's used:

Stamper



Plastic Sealer



METHODS OF FOOD PRESERVATION

A) PHYSICAL METHODS

- Refrigeration - preserved at a temperature of 0⁰ to 5⁰C.
- Freezing - Temperature of -18⁰C to -40⁰C for preservation.
- Pasteurization - Foods are heated at boiling water temperature higher.
- Sterilization - Foods are held at a temperature higher than 100⁰C .
- Drying and dehydration - Remove the moisture.

B) CHEMICAL METHODS

- **Salt** - concentration of 15-20 % .
- **sugar** - Any product containing 65% or more sugar can be kept in good condition
- **Vinegar** - vinegar containing acetic acid and it turns the medium . Food material containing 1-5% acetic acid solution can be kept fresh for longer period.
- **Potassium metabisulphite and sodium benzoate** - These chemicals are used for preservation of foods, Juices, Squash, RTS, Nectar, Sauces, Ketchup etc.
- **Fermentation** - Decomposition of carbohydrate by micro-organism or enzyme into organic acid or alcohol is termed as fermentation. Vinegar and pickle are very common products of acetic acid and lactic acid fermentation respectively.

Squash



It is concentrated beverage prepared from juice offruits after mixing it with strained sugar syrup and preservative. As F.P.O specifications, squash contain 25% fruit juice and 40-50% total soluble solids. It also possoses, 1.0 % acid and 350 ppm sulphur dioxide or 600 ppm sodium benzoate. It is diluted before serving. Suitable fruits: - Orange ,mango, plum ,jamun, muskmelon, watermelon, litchi ,bael ,lemon ,mint burassh, guava, and juicy fruits.

Preparation of making Squashes

- Mint squashes
- Burans squashes
- Litchi squashes



Burans squash

Burans pulp:	300kg
Water:	350lit
Sugar:	450 kg
Citric acid:	8k g
Color:	90 g raspberry
Flavor:	100 ml raspberry
Sodium Benzoate:	40 gm



Ingredient
For 1000 kg lot



Process

Selection of fresh & fully opened flower



Removal of anther and stigma from the flower



Boil the anther less and stigma less flower

{cooked about 30 min. }



Extract & Sieve the cooked flower juice through muslin cloth



Leave the extract juice from the flower for cool

{about half an hour}



Preparation of syrup

(Mixing of sugar + water + citric acid and heated just to dissolve the mixture



Straining of syrup for removal of dirt



Mixing the prepared cool syrup with juice



Addition of preservative

(4 g sodium benzoate / liter squash)



Addition of edible color and flavor



Filling in sterilized bottles



Capping



Storage

Mint squash



Ingredient
For 1000 kg lot

Mint pulp:	300kg
Water:	350lit
Sugar:	450 kg
Citric acid:	8k g
Color:	90 g raspberry
Flavor:	100 ml raspberry
Sodium	40 gm
Benzoate:	



Process

Selection of fresh MINT leaves



Boil the leaves

{cooked about 30 min. }



Extract & Sieve the cooked f juice through muslin cloth



Leave the extract juice for cool

{about half an hour}



Preparation of syrup

(Mixing of sugar + water + citric acid and heated just to dissolve the mixture)



Straining of syrup for removal of dirt



Mixing the prepared cool syrup with juice



Addition of preservative

(4 g sodium benzoate / liter squash)



Addition of edible color and flavor



Filling in sterilized bottles



Capping



Storage

Litchi squash

- Ingredients . For 1000kg

litchi pulp:	300kg
Water:	350lit
Sugar:	450 kg
Citric acid:	8k g
Color:	90 g raspberry
Flavor:	100 ml rose white
Sodium Benzoate:	40 gm

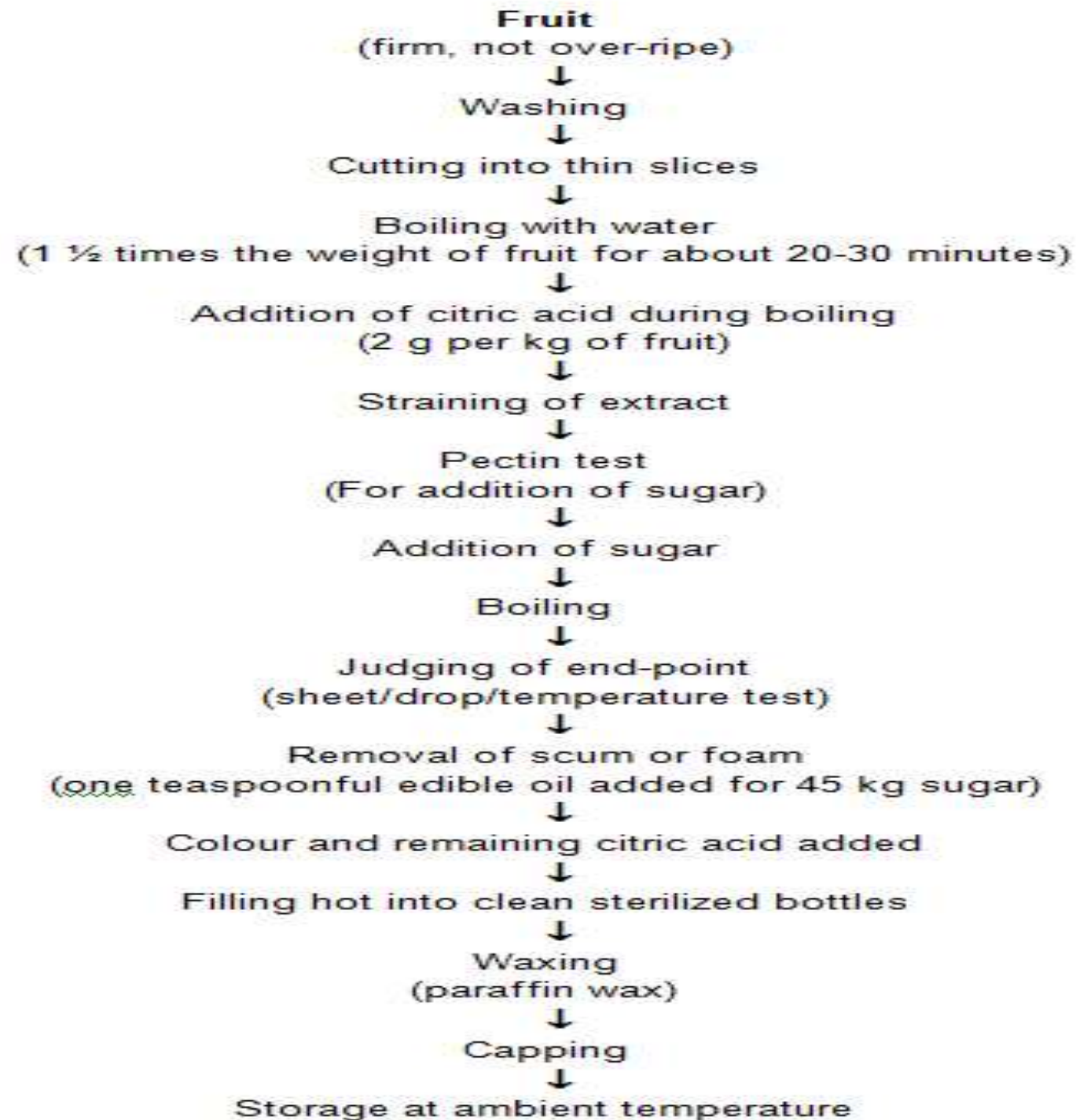




Process:

- Extraction of pulp into a container
- Straining of pulp through a coarse of muslin cloth to discard seeds
- Preparation of syrup
- (Mixing of sugar + water + citric acid and heated just to dissolve the mixture)
- Straining of syrup for removal of dirt
- Mixing the prepared syrup with pulp
- Addition of preservative
- (4gm. KMS)
- Addition of edible colour and flavour
- Straining of the prepared squash with muslin cloth
- Filling in sterilized bottles
- Capping
- Storage

JAM Marmalade







Guava cheese

- Mixing of fruit pulp along with sugar and butter along with some citric acid to give it a sour taste results in the formation of fruit cheese, its denser than jam and preserved by high quantity of sugar.
- **F.P.O specification for making cheese:**
- **FRUIT CONTENT: 45%**
- **T.S.S : 75° BRICKS**
- **ACIDITY: 0.2 – 0.7 %**
- **PRESERVATIVE : SO₂ 40 PPM OR BENZOICACID 200 PPM**
- **COLOUR: Permitted food colour**



Ingredients

- Guava : 2kg
- Sugar: 750 gm
- Salt: 2gm
- Butter: 100 gm



Guava cheese.



Process:

Selection of fresh and healthy fruits



Washing of fruits and cutting into small pieces.



Boiling of fruit pieces in water



Putting of boiled pieces in the pulper machine to obtain pulp



(Mixing of sugar + butter in the pulp.



Cook the mixture with continue stirring until a thick consistency is formed.



Now add salt and colour to the mixture.



Remove the mixture from the steam when T.S.S reach 75° bricks)



Spread mixture in a plate for 12- 24 hours



When mixture get cooled cut it into small pieces with the help of knife and wrap in butter paper



labelling Capping



Storage

PICKLE

- The preservation of food in common salt or in vinegar is known as pickling.
- Fruits are generally preserved in sweetened and spiced vinegar, while vegetables are preserved in salt.
- Pickles are prepared with salt, vinegar, oil or with a mixture of salt, oil, spices and vinegar.

Process of preparation of following pickle :

- a) Mango pickle
- b) MIXED PICKLE
- c) Mushroom pickle

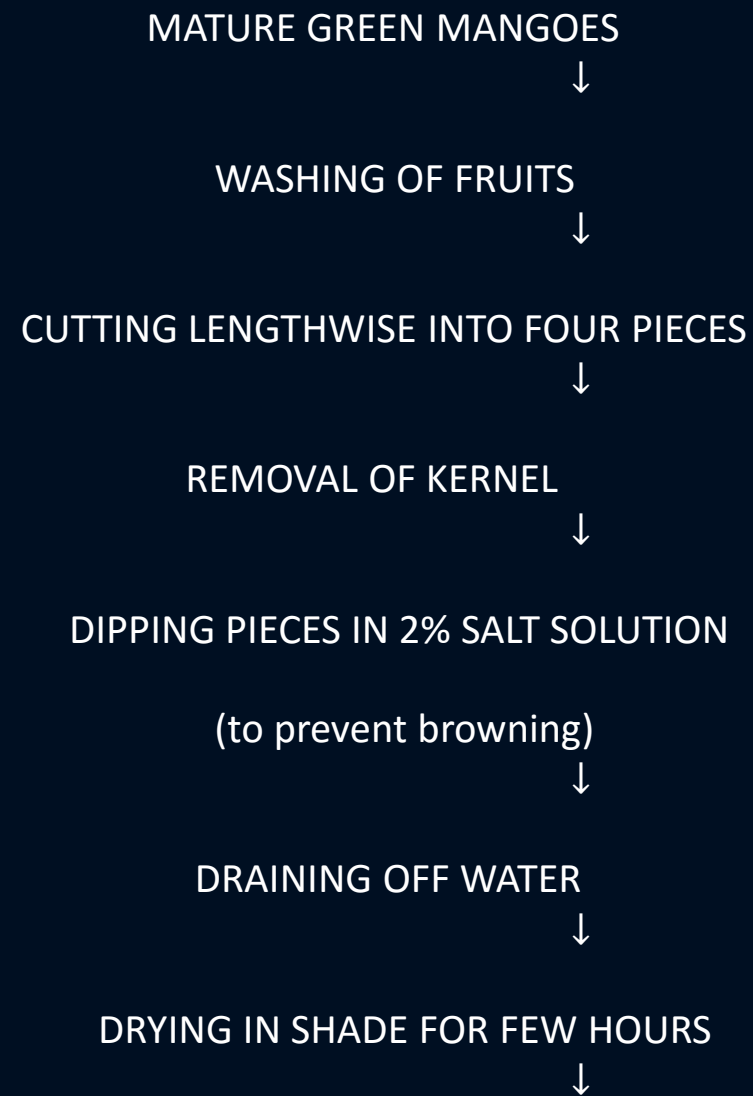
MANGO PICKLE

□ INGREDIENTS

- Mango pieces : 1kg
- Salt : 150gm
- Fenugreek(powdered) : 25gm
- Turmeric(powdered) : 15g
- Red Chilli powder : 10gm
- Clove(headless) : 8 numbers
- Black pepper, Cumin, Cardamom(large), Aniseed(powdered) each : 15gm
- Asafoetida : 2gm
- Mustard oil : 350ml



FLOW-SHEET FOR PROCESSING OF MANGO PICKLE



HEATING OF OIL



COOLING



MIXING SPICES IN A LITTLE OIL



MIXING WITH PIECES



FILLING IN THE JAR



KEEPING IN THE SUN FOR A WEEK



PRESSING THE MATERIAL

(to remove air)

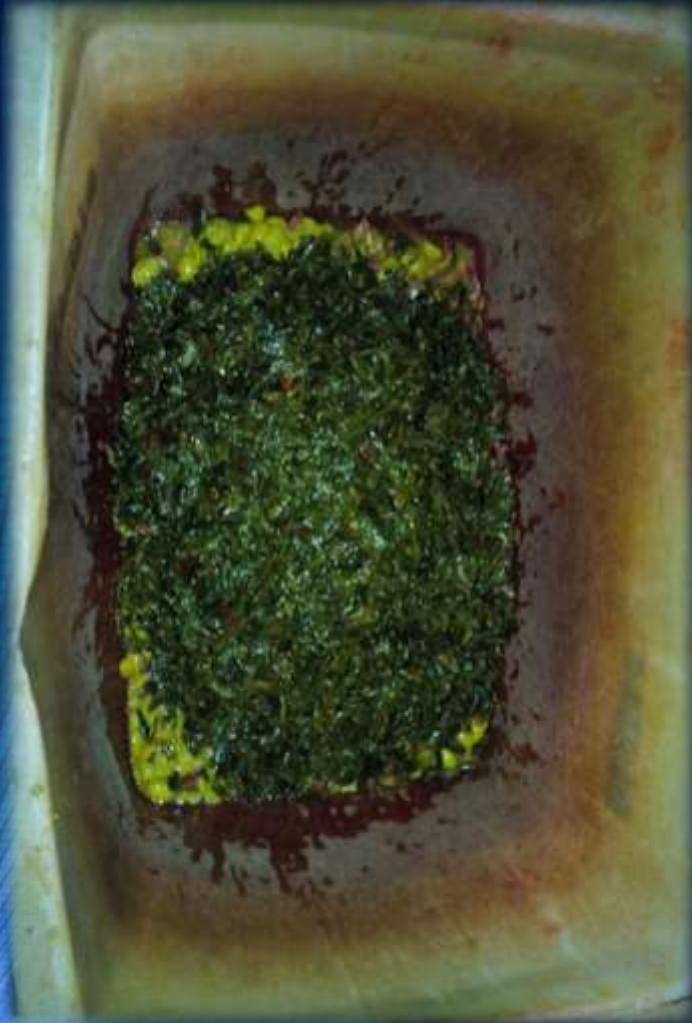


ADDITION OF REMAINING OIL



STORAGE

MIXED PICKLE



□ INGREDIENTS

- Mango pieces : 400gm
- Lime : 300gm
- Chilli : 300gm
- Fenugreek(powdered) : 25gm
- Turmeric(powdered) : 15gm
- Red Chilli powder : 10gm
- Clove(headless) : 8 numbers
- Black pepper, Cumin, Cardamom(large), Aniseed(powdered) each : 15gm
- Asafoetida : 2gm
- Mustard Oil : 350ml

□ **Procedure** - MIXED MATURE FRUITS (mango, lime, chilly) + NEXT STEP SAME AS MANGO PICKLE.

Process of preparation of mushroom pickle

1. Mushroom 2kg

2. Washing with water and after that dip in 1% solution of KMS for 2-5 minutes.

3. Cutting- After washing the cutting of mushroom takes place into 4-5 pieces respectively.

4. Boiling- The boiling of mushroom should be done in salty water because to remove the harmful organism present in the mushroom .

5. Drying- After boiling the mushrooms spray 10gm of salt over the mushrooms and kept place in cool and hygienic place for at 12-24 hours.



JAM



- ❖ Jam is a product made by boiling fruit pulp with sufficient sugar to a reasonably thick consistency, firm enough to hold the fruit tissues in position.
- ❖ Jam contains 0.5-0.6 per cent acid and invert sugar should not be more than 40 per cent.

PREPARATION OF APPLE JAM

□ INGREDIENTS

- Apple pulp : 1kg
- Sugar : 0.75-1.00kg
- Citric Acid : 1-3gm
- Water : 100-200ml
- Pectin : 12gm
- Sodium benzoate : 1gm
- Flavour : 2ml

FLOW-SHEET FOR PROCESSING OF APPLE JAM

FIRM RIPE APPLE FRUITS



WASHING OF FRUITS



PEELING OF FRUITS



EXTRACTION OF PULP

(seed and core is remove



ADDITION OF SUGAR

(if necessary water is added)



BOILING

(with continuous stirring)



ADDITION OF CITRIC ACID



JUDGING THE END-POINT BY FURTHER
COOKING UPTO 105°C OR 68-70% TSS

OR BY SHEET TEST



FILLING HOT INTO STERELIZED BOTTLES



COOLING



CAPPING



STORAGE AT AMBIENT TEMPERATUR

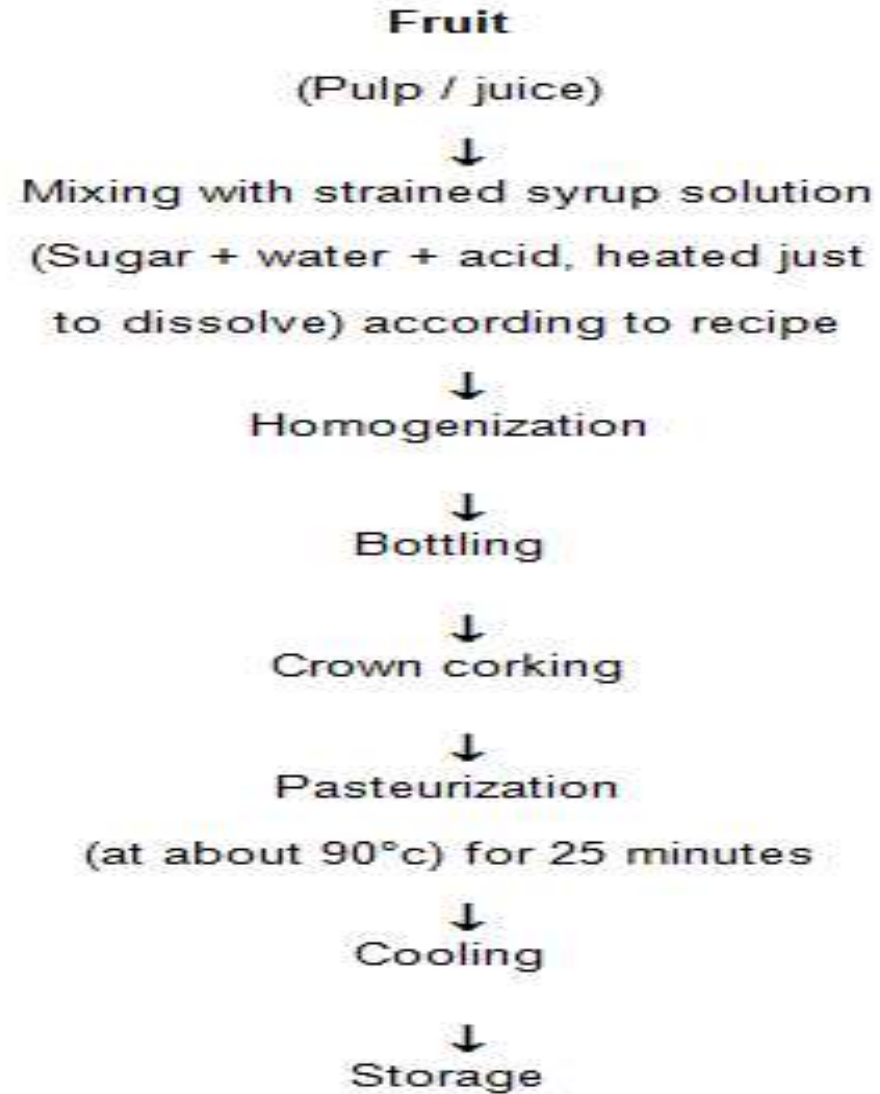
Sheet or flake test

- ❖ In this test a small portion of jam is taken out during boiling, in a spoon or wooden ladle and cooled slightly. It is then allowed to drop. If the product falls off in the form of a sheet or flake instead of flowing in a continuous stream or syrup it means it means that the end point has been reached and the product is ready otherwise boiling should be continued till the sheet test is positive

READY-TO-SERVE (RTS)

- This is a type of fruit beverage which contains at least 10 per cent fruit juice and 10 per cent total soluble solids besides about 0.3 per cent acid.
- It is not diluted before serving; hence it is known as ready-to-serve (RTS).

FLOW-SHEET FOR PROCESSING OF LITCHI RTS



Filling



Labeling AND Packaging



Loading of packed products



Marketing



Exhibition



सीटीडी फील्ड स्टेशन सहसपुर, फोन : 9456



THANK YOU

The background is a dark blue gradient. On the right side, there is a complex, glowing structure composed of many thin, curved lines that form a grid-like pattern. This structure curves and spirals, creating a sense of depth and movement. The lines are illuminated from within, giving them a bright blue, almost white glow at their inner edges, which fades into the dark blue background.

Bharsar students

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