Ministry of Food Processing Industries
Government of India

सत्यमेव जयते

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Reading Manual for Rose

Under PMFME Scheme

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Ministry of Food Processing Industries

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Abbreviations & Acronyms

Sr:No.	Abbreviations &Acronyms	Full Forms
1.	PM FME	Prime Minister's Formalisation of Micro Food Processing Enterprises Scheme
2.	PVDC	Poly Vinylidene Chloride
3.	PVC	Poly Vinyl Chloride
4.	PET	Polyethylene terephthalate
5.	PA	Polyamide
6.	PE	Poly Ethylene
7.	WVTR	Water Vapour Transmission Rate
8.	EVAL	Ethylene Vinyl Alcohol
9.	EVOH	Ethylene-vinyl alcohol copolymer
10.	HACCP	Hazard Analysis and Critical Control Point
11.	GAP	Good Agricultural Practices
12.	GMP	Good Manufacturing Practice
13.	SOP	Standard operating procedure
14.	FSSAI	Food Safety and Standards Authority of India
15.	FoSCos	Food Safety Compliance System
16.	FBO	Food Business Operator
17.	FLRS	Food Licensing and Registration System
18.	FSS	Food Set and Sound Nutrition
19.	PFA	Prevention of Food Adulteration
20.	GST	Goods and Services Tax
21.	MoFPI	Ministry of Food Processing Industries
22.	FPOs	Farmer Producer Organizations
23.	SHGs	Self Help Groups

CHAPTER - 1

INTRODUCTION

1.1 Industrial Overview:

Rose is one of the highest-selling flowers in International market. In the international market Rose is the highest selling Flower, as it is having good medicinal value. Roses have unique aroma and are available in various sizes, shapes and also in different colours. Rose petals have various medicinal properties which include stress and depression relief. The scientific name of the Rose is Rosa and belongs to the family Rosaceae genus Rosa, which include 200 different species and more than 18000 cultivars. Rose is a woody perennial flowering plant. Rose farming is the most profitable business for farmers. In India rose is grown in Karnataka, Tamil Nadu, Bihar, Uttar Pradesh, West Bengal, Maharashtra, Haryana, Gujarat, Punjab, Jammu and Kashmir, Madhya Pradesh and Andhra Pradesh are the major Rose farming states. Haryana stands 9th in the production of rose with a production of 0.32 tonnes as per the reports of National Horticultural Board.

1.2 Climate Conditions

Roses cannot grow well in humid climate. Temperature below 10°C will affect flowering and also develops blind shoots and bullheads. Rose plants needs to be exposed to sun rays, hence shady areas are not at all suitable for growing rose. The ideal temperature for the growth and good yield of Rose flowers is 18-30°C and for sowing temperature varies from 25-30°C.

1.3 Varieties of Roses

The popular rose varieties are as follows and are classified into 3 main groups:

1. Species Roses: They are also known as wild roses with five petals and are available in bright colors. They last a long time in winter. Some varieties of Species Roses are *Rosa rugose,* Banksiae, Multiflora, Foetida, etc.

2. Old Garden Rose: They are more attractive and scented, these grow very easily and are disease resistant and they also sustain well in winter. Some of its varieties include Moss Roses, Alba, Centifolia, Macrantha, Noisette, etc.

3. Modern Roses: They are most popular and are obtained from cross-breeding of hybrid tea and primrose and are available in various colors. Varieties of modern rose are Hybrid Tea Roses, Landscape Rose, Floribunda Rose, Yellow Permet Rose, Grandiflora Roses, American Pillar, Centifolia Rose, Polyantha, etc.

1.4 Harvesting

Economical yield for Rose plant is from the 2nd year of cultivation. Harvesting can be done by using sharp hand pruners and it is done when the colour of flower is fully developed and the first two petals of the flower start unfolding. Harvesting of flowers should be done early in the morning or late afternoon. After harvesting roses are placed in a container filled with freshwater having disinfectant and preservative. Flowers are then preserved in precooling chamber having 10-12°C for 12 hours. Then the flowers are graded based on the stem length and quality.

1.5 Medicinal Properties

Rose is having many medicinal properties. Anti–depressant, Anti- septic, Anti- Viral, Anti-Fungal, anti-spasmodic, aphrodisiac, astringent, Regulator of appetite and sedative, digestive stimulant, increases bile production, cleansing, astringent, deodorant, expectorant, anti–bacterial, kidney tonic, menstrual regulator, and anti-inflammatory. It is good for heart, Liver, uterus and stomach and also it is used to treat acne.

CHAPTER - 2

PROCESS AND MACHINERY REQUIREMENT

2.1 Overall Product description

Flowers especially rose provides opportunities to convert them into value added products from fresh flower to products like Rose Petal Jam, Rose syrup, Rose floral tea, Rose RTS, Rose Wine and Rose Water. It has both neutraceutical as well as pharmaceutical properties. The lifespan of cut rose flowers is very short. Shelf life of rose flower is up to one week longer after being cut. Hence processing is the only step to increase value of raw rose between harvesting and sale of final product. Any produce of farmer is considered value added when production of processed product is increased by labour and creativity. Since Rose is having more health benefits consumers are paying more attention to value added products when compared to raw roses. Rose value addition can be done in the following ways.

2.2 Product description on Gulkhand

Gulkhand is a sweet product made of rose petals. Rose petals of R. bourboniana and R. damascena are used for making Gulkhand. Rose petals and sugar are placed in wide mouthed steel pot or galvanised steel box. The jar or box is exposed to sun light for 3 to 4 weeks. Stir the conntents in the box with a wooden stick. When the process is over gulkhand in placed indoor in tightly closed containers. Gulkhand can be used for making snacks like Gulkhand Shahi Gujiya and Cakes.

Gulkhand is a highly nutritional product, as it reduces heat in the body as it is beneficial for heat related problems like tiredness, lethargy, itching, Raches and pains. ,It reduces eye inflammation and redness, It also stengthens teeth and gums.

2.3 Raw Materials for Gukhand making

Rose Petals: 1 kg

Sugar : 1.25- 2 kg

Silver foil/Cardamom seeds: 2 gm



2.4 Machineries Required for Gulkhand Making

Boiler, Piston Filling/ Pouch Filling Machine, Induction Cap Sealer.

Boiler

Piston Filling Machine

Pouch Filling Machine

Induction Cap Sealer

2.5 Flow chart for making Gulkhand

Harvest the fully open fresh flowers from fragrant varieties in morning between 5.00-7.00 AM

↓

Flowers are spread on sterilized clean floor for 12 hrs to reduce the moisture and for easy petals separation

↓

Petals(1.0 Kg) and sugar (1.250 - 2.0 Kg)are mixed by light pressure with wooden hammer in steel pot or galvanized steel box.

↓

Remove the rotten petals, anthers and pedicel with the help of fast speed blower. Petals are washed and slightly dried

↓

Keep the mixture in sun light at least for six hours / day for the soaking of sugars continue up to 30-45 days(3 to 4 weeks).

↓

After that add various ingredients like silver foil and cardamom seeds

↓

Pack the product in clean glass jars or sealed in silver lined plastic bags- 0.5 to 1.0 kg

↓

Corking and pasteurizing the botles at 82° C

↓

Cooling and storing the product

2.6 Product description on Rose Syrup

Different kinds of value added products are nowadays formulated and marketed by the companies and are mostly with synthetic colour. These synthetic colours and flavours are carcinogenic and may cause allergens. For this reason, consumers are increasingly interested in natural sources with high anthocyanin contents for manufacture of products . Rose Syrup is made from the extracts of rose flower petals by adding sugar into it. This syrup can be stored for a long time and can used making rose milk, cakes and marshmallows.

2.7 Raw materials for Rose Syrup making

Rose Petals: 1 kg

Sugar: 1.5 kg

2.8 Machineries Required for Rose Syrup making

Hot Air oven, Piston Filling Machine, Boiler

Hot Air Oven

2.9 Flow Chart for making Rose Syrup

Collect fresh rose petals

↓

Washing in clean tap water

↓

Addition of sugar and petals to the glass jar and application of the lid

↓

Keeping in room temperature for 2 days

↓

Shaking the contents occasionally

↓

Keeping the jars in hot air oven at 70° C for 1 hour

↓

Filtering contents through a muslin cloth

↓

Filling the contents to clean glass bottles

↓

Corking and pasteurizing the bottles at 82° C

↓

Cooling and storing the product

2.10 Rose Sugar Syrup (Low cost indigenous Method)

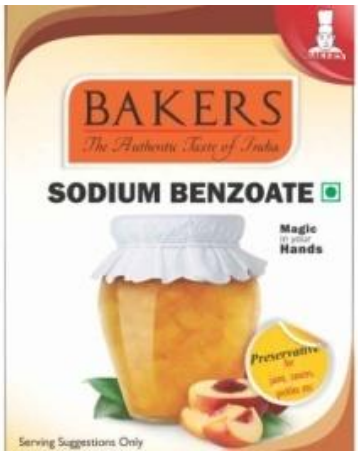
Raw Materials for Rose Sugar Syrup (Low cost indigenous Method)

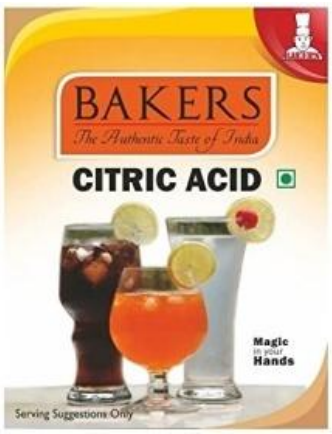
Rose Petals: 1 kg

Sugar: 1.5 Kg

Citric Acid: 15 gm

Sodium Benzoate: 3 gm



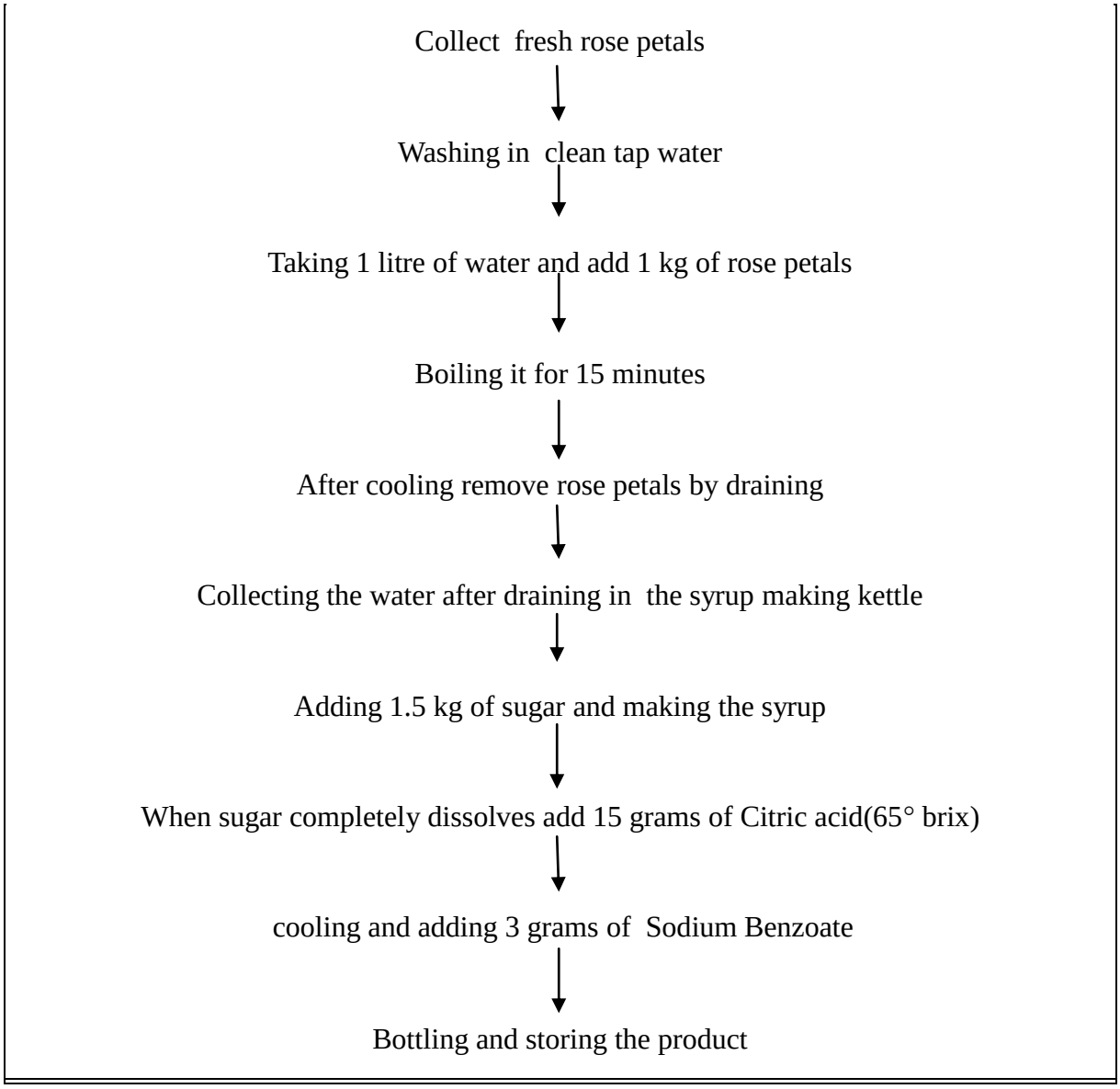


2.11 Machineries Required (For low cost Rose syrup making):

Sugar Syrup Kettle, Piston Filling Machine

Sugar Syrup Kettle

2.12 Flow Chart for making Rose Sugar Syrup (Low cost indigenous Method)



2.13 Product description on Rose Petal Tea

Rose petals are used to make rose tea which is rich in Vitamin C and Compounds that helps to reduce stomach problems like diarrhoea and bladder infection. It also contains astringent and tannin that helps to control bleeding.

2.14 Raw Materials for making Rose Petal Tea

Rose

2.15 Machineries Required for Rose Petal Tea making

Freezer

Freezer

2.16 Flow Chart for making Rose Petal Tea

Collecct rose flowers which are not treated with pesticides

↓

Flowers were brought to the laboratory within 3 hours after picking

↓

Petals were detached and are spread in a thin layer on a plastic net

↓

Petals are dried in the shade at room temperature (25 °C to 27 °C).

↓

The air-dry material was stored in hermetically closed plastic containers in a freezer at –20 °C and stored

2.17 Product description on Rose Petal Wine

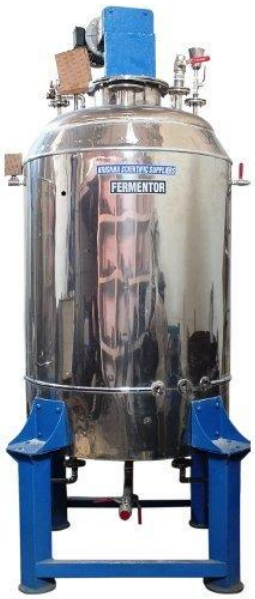
Wine is an important traditional beverage in most of the countries. Also, wine is getting popular in countries like India. Although wine has a wide range of types, the process of wine making contains mainly addition of sugar and then yeast for fermentation. This process also includes addition of cloves, black pepper and cardamom. The addition of the compounds has increased some nutrients and it also show good effect on health. It also provides antioxidants that fight infection and protect cells against free radicals, which might effectively play a role in combating cancer and other diseases and promote longevity, It also help protect against heart disease and harmful inflammation.

2.18 Raw Materials Required for making Rose Petal Wine

1. Rose petals - 400-500gms
2. water - 5-6 litres
3. Cloves- 6-7 pieces
4. Black Pepper/ Cardamom pods- 6-7 pieces
5. Lemons - 2
6. Sugar - 1kg
7. Wine Yeast - 70-100gms.

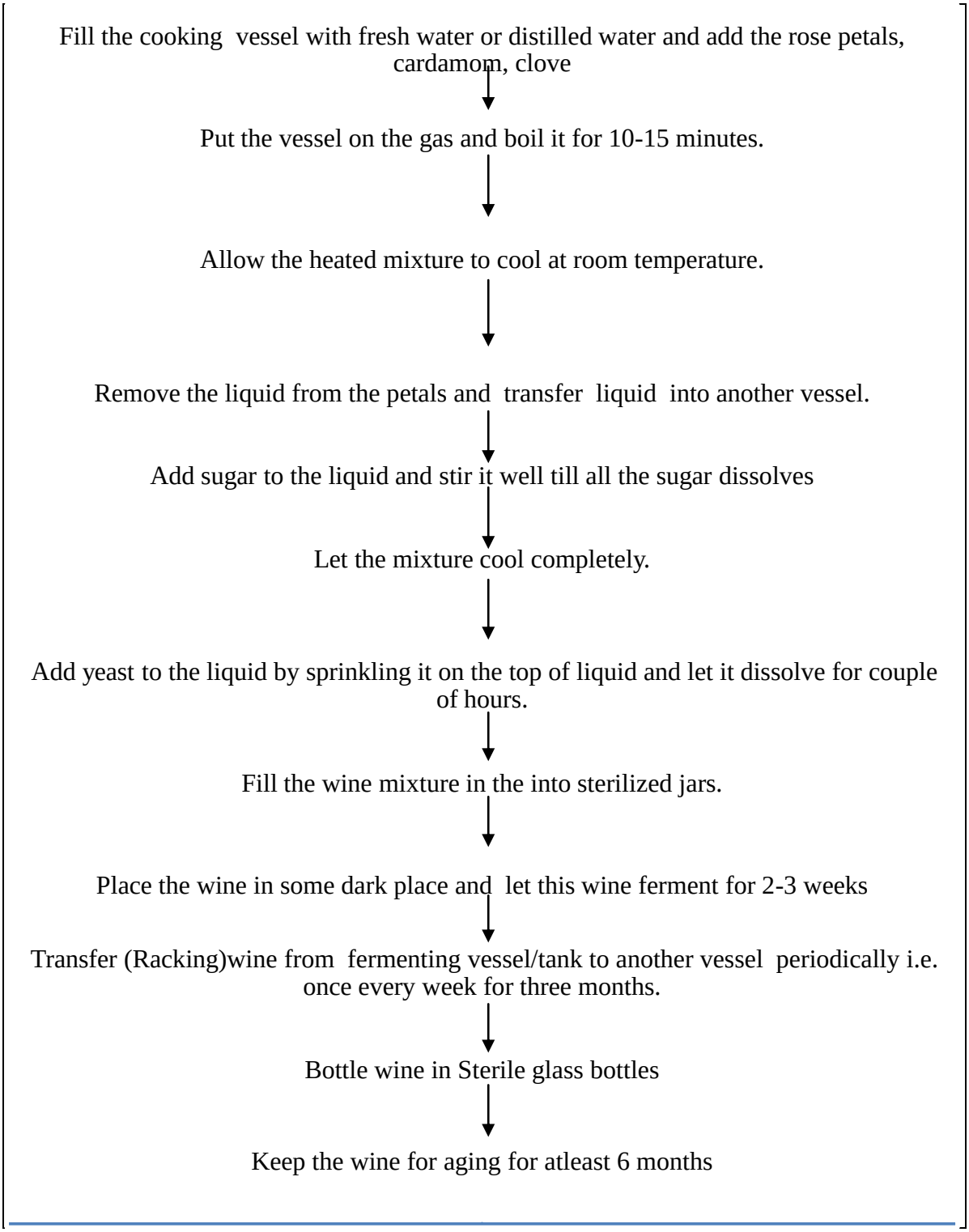
2.19 Machineries Required for making Rose Petal Wine

Fermentation Tank, Piston Filling Unit.



Wine Fermenting tank

2.20 Flow Chart for making Rose Petal Wine



2.21 Product description on Rose Water

Rose water is a liquid made from water and rose petals. It is used as a perfume due to its sweet scent and also have medicinal and culinary values. The antioxidants in rose water protect the cells in the skin against damage. It also has anti-inflammatory properties so it can help soothe the skin and get rid of redness, Rose water is also having anti-aging properties so that reduces the appearance of lines and wrinkles. Rose water can be used as an eye drop to reduce eye problems. Rose water has antiseptic and antibacterial properties, which mean it can help wounds heal faster. Rose Water can be made by two methods by laboratory equipment Instrument using distillation equipment with a water condenser and by Kitchen Equipment Instruments:

Laboratory equipment Instrument: distillation equipment with a water condenser

Laboratory equipment Instrument

2.22 Flow Chart for making Rose water with laboratory Instruments

Cut the petals into strips and place them in a distillation flask with water

↓

Turn on the condenser and heat the flask at mild temperature

↓

Gather the distillate into a receiving flask

↓

first three fractions are collected and the receiving flask change every sixth minute as Different compounds may have different boiling points in which case the more vaporisable distils first

2.23 Kitchen equipment Instruments:

- A large steel pot with a lid and a configuration built at its base which allows the distillate receiving cup to be placed above water surface in the centre of the pot;
- flat-bottomed ceramic or stone cup turned upside down or a square tile can be used.
- A small cup is also needed for collecting the distillate and some ice is needed for the cooling.

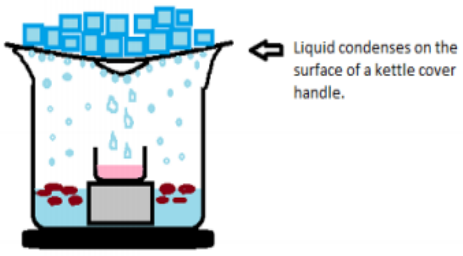
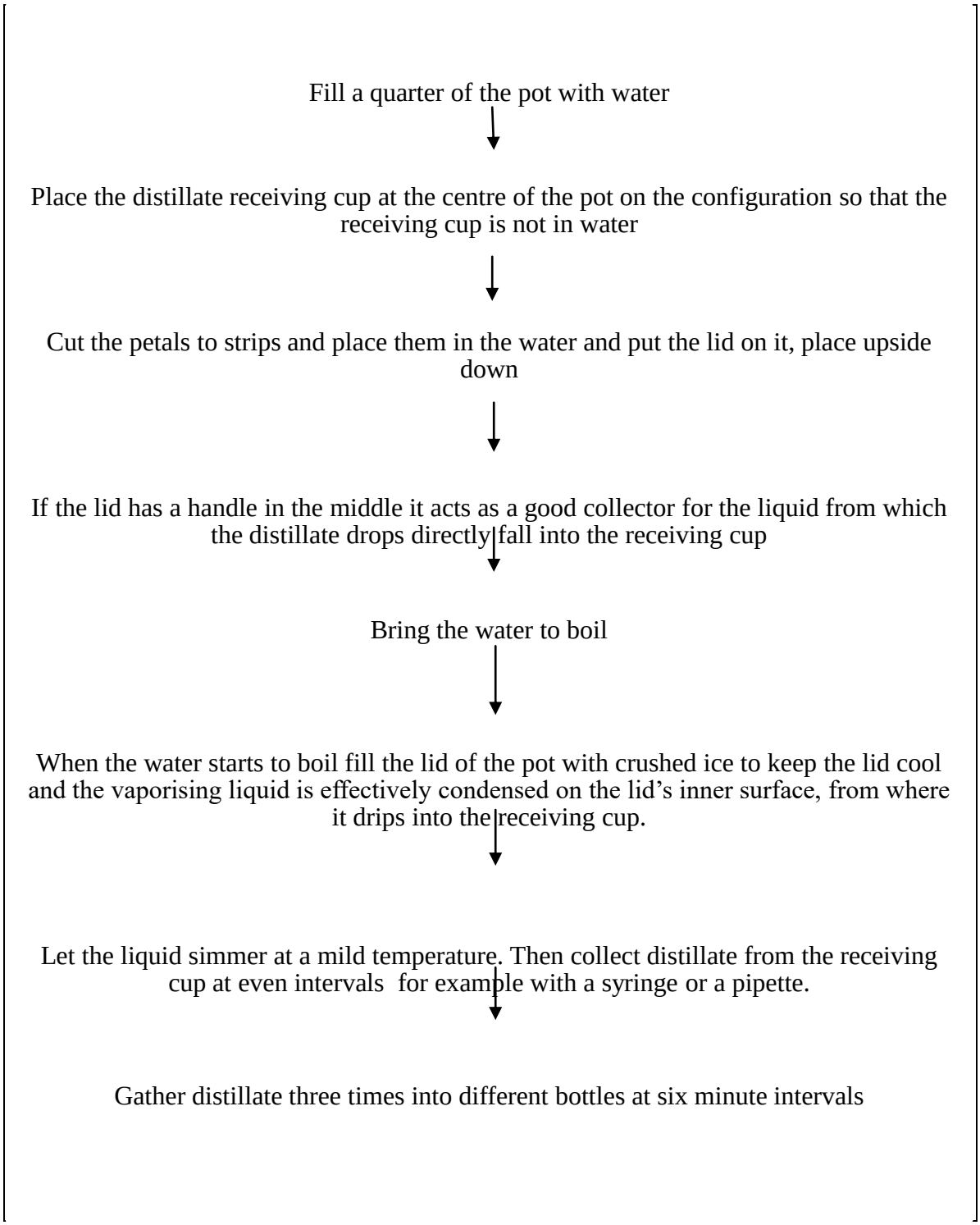


Figure 1. Rose water distillation with kitchen equipment.

2.24 Flow Chart for making Rose water with Kitchen Instruments



CHAPTER- 3

PACKAGING

3.1 Functions of packaging

- It should have ability to protect content from spoilage and Spillage.
- It should prevent insect infestation and insect damage.
- It should be economical, easily available and easy disposal.
- It should confirm with food laws.
- It should offer Protection against environmental conditions- moisture barrier.
- It should offer protection against microorganisms- oxygen barrier.
- It should have strength properties to withstand mechanical hazard during. .transportation and storage.
- It should have good printability.

3.2 Types of Packaging

There are two types of packaging, Primary packaging and Secondary packaging

3.2.1 Primary Packaging

Primary packaging is the packaging where the product is in direct contact with the packaging and is sometimes referred to as a consumer unit. . The main purpose of this packaging is to contain, protect and/or preserve the finished product, particularly against contamination. This is the first layer containing the finished product. This type of packaging is often intended for the end consumer. In addition to make it easier for consumers to handle products and also it makes the products look more attractive and appealing and can be used for communication purposes to convey printed information about the products to consumers.

3.2.2 Secondary Packaging

This type of packaging is used outside of primary packaging to group a certain number of products to create a stock-keeping unit. It facilitates the handling of smaller products by collecting them into a single pack. Secondary packaging also provides supplementary protection to help maintain the integrity of the primary packaging. In addition, it can serve as a shipping container for small shipments, making it highly useful in e-commerce. Secondary packaging is frequently made up of multiple components . It may also be customized to make a product easily identifiable in the warehouse setting.

Tertiary Packaging

Often referred to as transit packaging, this type of packaging is used to group larger quantities to transport them from production facility to point of sale. During this stage, products are handled as distribution units. This type of packaging makes it easier to transport heavy loads safely and securely. In addition to helping prevent damage, it consequently facilitates the handling, storage and transport of goods. An example of tertiary packaging is a stretch-wrapped pallet containing a quantity of cardboard boxes (secondary packaging) which enable efficient product shipping.

3.3 Material of Packaging

In addition to cellulose and Aluminium foil, a very large amount of polymeric materials is used for packaging products. Paper boards and metal containers are also used for such purposes. While a range of packaging materials are available, the ultimate option of the packaging depends on the appropriate shelf life, the efficiency of the packaging machine, and the cost that is purely based on the market segment targeted by the manufacturer. The most common choice of packaging medium is plastic (usually flexible) as it offers the requisite safety and preservation, resistance to grease, physical strength, machinability, and printability. Plastics that are lighter in weight are also the most preferred material for the packaging of flour. There are changing trends in the packaging of Flour. Plastic films and their laminates are increasingly used due to better properties and aluminium laminates due to price and better flex crack properties. Plastic packaging products that can be used are described below.

3.3.1 Polypropylene- Polypropylene films have better clarity than polyethylene and they are superior machinability due to stiffness. Lack of good saleability has been a problem; however, PVDC and vinyl coating have been used to overcome this problem. Some varieties of PP have been specially developed for twist-wrap applications as they have the ability to lock in position after twisting.

3.3.2 Poly Vinyl Chloride (PVC)- PVC is a stiff and clear film having a low gas transmission rate. PVC can be used as small wraps, bags, and pouches. PVC when co-polymerized with polyvinylidene chloride is known as Saran. Since it is a costly material, it is only used as a coating to obtain barrier properties and heat salability.

PVC film is also used for twist wraps, as it has twist retention properties and is excellent on high-speed machines.

3.3.3 Polyesters (PET) and Polyamide (PA) - Polyethylene terephthalate film has high tensile strength, gloss, and stiffness as well as puncture resistance. It has moderate WVTR but is a good barrier to volatiles and gases. To provide heat seal property, PET is normally laminated to other substrates. Nylons or polyamides are similar to PET but have high WVTR. ends as well. Hanging bags have a pre-cut hole that makes it easier for them to hang from hooks so that they can be seen in an attractive way.

3.3.4 Pillow bags - A pillow bag is another typical type of package. The bags are named for their shape, which is like a cushion. They are found lying flat on grocery store shelves in the grocery store and were known to carry the items.

3.3.5 Gusseted Poly Bags- Gusseted bags are often called flat-bottom bags because they feature a tucked in pleat that's been pressed flat. It allows the bag to expand for greater carrying capacity and to keep the shape of a box if necessary. These types of poly bags can be heat sealed, tied, stapled, or taped shut. They're the perfect poly bag for anyone looking to get more flour in a single bag.

3.3.6 Flexible Pouches- Flexible pouches are a perfect way to carry most packaged items. They can be made with zipper-seal closures, which tend to keep the inside contents fresh for use. Flexible pouches offer amazing printing capabilities, so you can add your attractive product branding to the pouch itself. Many pouches stand up on their own, which helps you improve your shelf appearance.

3.4 Packaging Materials for Rose Products

3.4.1 Bulk Packaging

Women plastic bags which may be laminated or provided with a lose liner bag and multiwall paper sacks with a plastic liner bag.. The plastic based or carton alternate packaging materials are used to overcome the contamination problems associated with jute. Moreover, plastic bags/liners also help in retaining the quality of the rose packed inside for a longer time.

3.4.2 Glass Containers

Bottles/Jars are commonly used for packing Rose Gulkhand, Rose Wine, Rose Water and dried Rose Petals. The glass used for food packaging is soda-lime glass.. Most bottles and jars are tailor-made specifically for one product or one manufacturer. Closures for glass containers are more standardized. Glass containers can be reused or recycled. Eliminates the risk of potentially harmful chemicals found in some plastics that can leach into food.

3.4.3 Flexible Packaging

Flexible packaging is a means of packaging products through the use of non-rigid materials, which allow for more economical and customizable options. Flexible packaging is used for packing Rose Gulkhand, and Dried Rose tea petal. It is a relatively new method in the packaging market and has grown popular due to its high efficiency and cost-effective nature.

This packaging method uses a variety of flexible materials, including foil, plastic, and paper, to create pouches, bags, and other pliable product containers. Flexible packages are particularly useful in industries that require versatile packaging, such as the food and beverage, personal care, and pharmaceutical industries. Flexible packaging is a solution that businesses turn to for a variety of reasons. For starters, it's a less-expensive material, but it also offers great durability and product protection. Polyester and BOPP materials used for lamination is necessary 10 or 12 µ thick. PVDC, EVOH and EVAL based materials have high barrier properties. There are three types of flexible pouches Centre Seal Formation, Three sides seal formation and Four Sides seal formation.

Centre Seal Formation

Three Side Seal Formation

Four Side Seal Formation

3.4.4 Composite Containers

Composite container is also used for packaging of Rose tea powder. The containers are round and the body(side wall) is made of PE coated foil laminated spirally wound paper. The top and bottom ends of the container may be made from metal or plastic. The inner face is coated with plastic film or a combination of film and aluminum foil- This ensure optimum barrier properties against moisture and oxygen.

3.4.5 Craft Packaging

Currently very popular material in food packaging. Craft packaging is used for packing Rose Gulkhand, and Dried Rose tea petal . It is made by sulphate pulping process.

Poly amide or polyamine resin is used to coat or laminate to improve barrier properties. Has good strength, printability and appearance. Other advantages are its low cost, wide availability and low weight.

3.4.6 Pet Bottles

Pet bottles are clear, shiny transparent and unbreakable. Good barrier properties. 100 % recyclable. Low permeability of moisture and air. Different shapes are are available PET bottles have advantages over glass. Unbreakable and light weight but also more attractive.They have better gas barriers and are still cost-effective. PET are commonly used for packing Rose Gulkhand, Rose Wine, Rose Water and dried Rose Petals

3.4.7 Carton Box

Liner carton filling material is also known as duplex box packing material and it is used for packing Rose tea petal. Provides good protection and barrier properties. eature straight tuck closure that allows easy loading and extraction. Die cut windows can be added on special request. Made from durable material to preserve the freshness of contents packaged within. Best for packaging food items such as soups, and other recipe mixes. Can be printed in a design and color of your choice.

3.5 Packaging machineries for dehydrated products

Automatic Filling Machine

Fully Automatic Filling Machine

3.6 Packaging Machineries for bottle Filling

Semi Automatic Filling Machine

Automatic Filling Machine

CHAPTER – 4

FOOD SAFETY AND FSSAI STANDARDS

4.1 HACCP Sketch for Rose Products

4.1.1 HACCP Sketch for Gulkhand

Process	Hazard Analysis	Corrective Action
Receiving	Damage Insect Pest Attack Temperature Withholding time	Discard defective Pest control (GAP) Controlling temperature(GMP's,SOP's)
Sorting and Grading	Damage Hygiene	Discard defective Personal Hygiene (GMP's) Hand Wash (SOP's)
Washing	Contact time Temperature Non portable source Recontamination of dirty water	Cleaning Practice Controlling temperature(GMP's,SOP'S) Municipal Water Certification Filtering
Soaking	Operation carelessness Microbial Growth Cleanliness of galvanised box	Proper Handling Staff hygiene Proper handling
Packing and Corking	Contamination from temperature due Contaminated Packages	Staff hygiene Corked sanitizing Discard defective
Pasteurizing	Vegetative Pathogens Boiler Additives	Maintaining temperature 82° fixed time for 30 minute
Cooling	Microbial growth due	Fixed temperature

	to careless operations	Proper handling
Labelling	Contamination from temperature and environment	Proper Handling Staff hygiene
Storage	Visual Interpretation Improper condition	Maintain clean facility Maintain temperature Proper handling
Documentation	Reviewing the daily activity after completion to verify the steps are correctly followed	Maintain all records for at least two years Maintain Thermal Processing log

4.1.2 HACCP for Rose Syrup

Process	Hazard Analysis	Corrective Action
Receiving	Damage Insect Pest Attack Temperature Withholding time	Discard defective Pest control (GAP) Controlling temperature(GMP's,SOP's)
Sorting and Grading	Damage Hygiene Poor cleaning of conveyers	Discard defective Personal Hygiene (GMP's) Hand Wash (SOP's)
Washing	Contact time Temperature Non portable source Recontamination of dirty water	Cleaning Practice Controlling temperature(GMP's,SOP'S) Municipal Water Certification Filtering Controlling temperature(GMP's,SOP'S)

Storing	Operation carelessness Microbial Growth Temperature	Proper Handling Staff hygiene
Heating	Vegetative Pathogens Boiler Additives	Maintaining temperature 70° fixed time for 1 hour
Filtering	Operation carelessness Microbial Growth	Proper Handling Staff hygiene
Packing and Corking	Contamination from temperature due Contaminated Packages	Staff hygiene Corked sanitizing Discard defective
Pasteurizing	Vegetative Pathogens Boiler Additives	Maintaining temperature 82° fixed time for 30 minute
Cooling	Microbial growth due to careless operations	Fixed temperature Proper handling
Labelling	Contamination from temperature and environment	Proper Handling Staff hygiene
Storage	Visual Interpretation Improper condition	Maintain clean facility Maintain temperature Proper handling
Documentation	Reviewing the daily activity after completion to verify the steps are correctly followed	Maintain all records for at least two years Maintain Thermal Processing log

4.1.3 HACCP for Rose Syrup (Low cost Method)

Process	Hazard Analysis	Corrective Action
Receiving	Damage Insect Pest Attack Temperature Withholding time	Discard defective Pest control (GAP) Controlling temperature(GMP's,SOP's)
Sorting and Grading	Damage Poor Hygiene Poor cleaning of conveyers	Discard defective Personal Hygiene (GMP's) Hand Wash (SOP's)
Washing	Contact time Temperature Non portable source Recontamination of dirty water	Cleaning Practice Controlling temperature(GMP's,SOP'S) Municipal Water Certification Filtering Controlling temperature(GMP's,SOP'S)
Boiling	Vegetative Pathogens Boiler Additives	Maintaining the boiling time till the syrup reach brix 65°
Preservation	Bad Taste Chemical Composition	Check the amount and expiry Check the suitability
Filtering	Operation carelessness Microbial Growth	Proper Handling Staff hygiene
Boiling	Vegetative Pathogens Boiler Additives	Maintaining temperature and time
Cooling	Microbial growth due to careless operations	Fixed temperature Proper handling
Preservation	Bad Taste Chemical Composition	Check the amount and expiry Check the suitability

Packing and Corking	Contamination from temperature due Contaminated Packages	Staff hygiene Corked sanitizing Discard defective
Labelling	Contamination from temperature from environment	Proper Handling Staff hygiene
Storage	Visual Interpretation Improper condition	Maintain clean facility Maintain temperature Proper handling
Documentation	Reviewing the daily activity after completion to verify the steps are correctly followed	Maintain all records for at least two years Maintain Thermal Processing log

4.1.4 HACCP Steps for Rose Floral Tea

Process	Hazard Analysis	Corrective Action
Receiving	Damage Insect Pest Attack Temperature Withholding time	Discard defective Pest control (GAP) Controlling temperature(GMP's,SOP's)
Sorting and Grading	Damage Hygiene Poor cleaning of conveyers	Discard defective Personal Hygiene (GMP's) Hand Wash (SOP's)
Washing	Contact time Temperature Non portable source Recontamination of dirty water	Cleaning Practice Controlling temperature(GMP's,SOP'S) Municipal Water Certification Filtering Controlling

		temperature(GMP's,SOP'S)
Drying	Operation carelessness Microbial Growth Vegetative Pathogens	Proper Handling Staff hygiene Maintaining temperature 25° to 27° in shade at room temperature
Packing	Contamination from temperature due Contaminated Packages	Staff hygiene Corked sanitizing Discard defective
Labelling	Contamination from temperature from environment	Proper Handling Staff hygiene
Storage	Visual Interpretation Improper condition	Maintain clean facility Maintain temperature at -20° Proper handling
Documentation	Reviewing the daily activity after completion to verify the steps are correctly followed	Maintain all records for at least two years Maintain Thermal Processing log

4.1.5 HACCP Steps for Wine

Process	Hazard Analysis	Corrective Action
Receiving	Damage Insect Pest Attack Temperature Withholding time	Discard defective Pest control (GAP) Controlling temperature(GMP's,SOP's)
Sorting and Grading	Damage Poor Hygiene Poor cleaning of	Discard defective Personal Hygiene (GMP's) Hand Wash (SOP's)

	conveyers	
Washing	Contact time Temperature Non portable source Recontamination of dirty water	Cleaning Practice Controlling temperature(GMP's,SOP'S) Municipal Water Certification Filtering Controlling temperature(GMP's,SOP'S)
Filling ingredients	Poor Hygiene Operation carelessness Bad Taste	Personal Hygiene(GMP's) Proper Handling Check the amount of raw materials
Boiling	Vegetative Pathogens Boiler Additives	Maintaining time 15 minutes
Cooling	Microbial growth due to careless operations	Fixed room temperature Proper handling
Preservation	Bad Taste	Check the amount Check the suitability
Fermenting	Bad Taste Microbial growth	Maintain the storage period Stall hygiene
Racking	Microbial Growth Careless operations Defective receiving	Staff hygiene Proper handling Discard defective
Filtering	Operation carelessness Microbial Growth	Proper Handling Staff hygiene
Packing and Corking	Contamination from temperature due Contaminated Packages	Staff hygiene Corked sanitizing Discard defective
Labelling	Contamination from temperature and	Proper Handling Staff hygiene

	environment	
Storage	Visual Interpretation Improper condition	Maintain clean facility Maintain storage time for aging Proper handling
Documentation	Reviewing the daily activity after completion to verify the steps are correctly followed	Maintain all records for at least two years Maintain Thermal Processing log

4.1.6 HACCP for Rose Water(Laboratory Equipments)

Process	Hazard Analysis	Corrective Action
Receiving	Damage Insect Pest Attack Temperature Withholding time	Discard defective Pest control (GAP) Controlling temperature(GMP's,SOP's)
Sorting and Grading	Damage Poor Hygiene Poor cleaning of conveyers	Discard defective Personal Hygiene (GMP's) Hand Wash (SOP's)
Washing	Contact time Temperature Non portable source Recontamination of dirty water	Cleaning Practice Controlling temperature(GMP's,SOP'S) Municipal Water Certification Filtering Controlling temperature(GMP's,SOP'S)
Cutting	Hygiene Cleaning and Sanitizing	Proper Cleaning and sanitizing (GMP's,SOP's)
Boiling	Vegetative Pathogens Boiler Additives	Maintaining temperature

Receiving	Microbial growth due to careless operations	Fixed temperature Proper handling Follow correct collection protocol
Cooling	Microbial growth due to careless operations	Fixed temperature Proper handling
Packing and Corking	Contamination from temperature due Contaminated Packages	Staff hygiene Corked sanitizing Discard defective
Labelling	Contamination from temperature from environment	Proper Handling Staff hygiene
Storage	Visual Interpretation Improper condition	Maintain clean facility Maintain temperature Proper handling
Documentation	Reviewing the daily activity after completion to verify the steps are correctly followed	Maintain all records for at least two years Maintain Thermal Processing log

4.1.7 HACCP for Rose Water (With Lichen Equipments)

Process	Hazard Analysis	Corrective Action
Receiving	Damage Insect Pest Attack Temperature Withholding time	Discard defective Pest control (GAP) Controlling temperature(GMP's,SOP's)
Sorting and Grading	Damage Poor Hygiene Poor cleaning of conveyers	Discard defective Personal Hygiene (GMP's) Hand Wash (SOP's)

Washing	Contact time Temperature Non portable source Recontamination of dirty water	Cleaning Practice Controlling temperature(GMP's,SOP'S) Municipal Water Certification Filtering Controlling temperature(GMP's,SOP'S)
Boiling	Vegetative Pathogens Boiler Additives	Maintaining temperature
Receiving	Microbial growth due to careless operations	Fixed temperature Proper handling Follow correct collection protocol
Cooling	Microbial growth due to careless operations	Fixed temperature Proper handling
Packing and Corking	Contamination from temperature due Contaminated Packages	Staff hygiene Corked sanitizing Discard defective
Labelling	Contamination from temperature from environment	Proper Handling Staff hygiene
Storage	Visual Interpretation Improper condition	Maintain clean facility Maintain temperature Proper handling
Documentation	Reviewing the daily activity after completion to verify the steps are correctly followed	Maintain all records for at least two years Maintain Thermal Processing log

4.2 Introduction to FSSAI:

The Food Safety and Standards Authority of India (FSSAI) has been established under Food Safety and Standards, 2006 which consolidates various acts & orders that have hitherto handled food-related issues in various Departments. The FSSAI is responsible for setting standards for food so that there is one body to deal with and no confusion in the minds of consumers, traders, manufacturers, and investors. The Act aims to establish a single reference point for all matters relating to food safety and standards, by moving from multi-level, multi-departmental control to a single line of command.

Highlights of the Food Safety and Standard Act, 2006-

Various central Acts like Prevention of Food Adulteration Act, 1954 , Fruit Products Order , 1955, Meat Food Products Order , 1973, Vegetable Oil Products (Control) Order, 1947,Edible Oils Packaging (Regulation)Order 1988, Solvent Extracted Oil, De- Oiled Meal and Edible Flour (Control) Order, 1967, Milk and Milk Products Order, 1992 etc will be repealed after commencement of FSS Act, 2006.

The Act also aims to establish a single reference point for all matters relating to food safety and standards, by moving from multi- level, multi- departmental control to a single line of command. To this effect, the Act establishes an independent statutory Authority – the Food Safety and Standards Authority of India with head office at Delhi. Food Safety and Standards Authority of India (FSSAI) and the State Food Safety Authorities shall enforce various provisions of the Act.

Establishment of the Authority-

Ministry of Health & Family Welfare, Government of India is the Administrative Ministry for the implementation of FSSAI. The Chairperson and Chief Executive Officer of Food Safety and Standards Authority of India (FSSAI) have already been appointed by Government of India. The Chairperson is in the rank of Secretary to Government of India.

4.3 FSSAI Registration & Licensing Process:

According to Section 31(1) of Food Safety and Standards (FSS) Act, 2006,Every Food Business Operator (FBO) in the country is required to be licensed under the Food Safety & Standards Authority of India (FSSAI).

As per FSS (Licensing & Registration) Regulations, 2011, Licenses and Registrations are granted to FBOs in a 3 tier system

- Registration - for petty FBOs with annual turnover less than Rs 12 lakhs
- State license - for medium-scale food manufacturers, processor and transporters
- Central License - for large-scale food manufacturers, processor and transporters

FSSAI registration is done online on the FSSAI website through Food Safety Compliance System (FoSCoS)

- FoSCoS has replaced the Food Licensing and Registration System (FLRS).
- Petty food business operators are required to obtain FSSAI Registration Certificate
- "Petty Food Manufacturer" means any food manufacturer, who manufactures or sells any article of food himself or a petty retailer, hawker, itinerant vendor or temporary stall holder (or) distributes foods including in any religious or social gathering except a caterer;

or

- Other food businesses including small scale or cottage or such other industries relating to food business or tiny food businesses with an annual turnover not exceeding Rs. 12lakhs and/or whose production capacity of food (other than milk and milk products and meat and meat products) does not exceed 100 kg/ltr per day

Any person or entity that does not classify as a petty food business operator is required to obtain an FSSAI license for operating a food business in India.

FSSAI License - two types - State FSSAI License and central FSSAI License

Based on the size and nature of the business, the licensing authority would change.

- Large food manufacturer/processors/transporters and importers of food products require central FSSAI license

- Medium-sized food manufacturers, processor and transporters requires state FSSAI license.
- License period: 1 to 5 years as requested by the FBO.
- A higher fee for obtaining FSSAI license for more years.
- If a FBO has obtained the license for one or two years, renewal may be done, no later than 30 days prior to the expiry date of the license.

4.4 Food Safety & FSSAI Standards & Regulations:

4.4.1 FSSAI Specifications for Rose Syrup or Sharbath

Minimum percentage of fruit juice in the final product -25%(Min), Total soluble solids - 65%(Min), Acidity expressed as citric acid- 3.5%(Max).

4.4.2 FSSAI Specifications for Rose Tea

1	Total Ash (m/m)	Not less than 4.0 percent and not more than 8 percent
2	Water soluble ash	Not less than 45.0 percent of total ash
3	Alkalinity of water soluble ash expressed as KOH (m/m)	Not less than 1.0 percent and not more than 3 percent
4	Acid insoluble ash (m/m)	Not more than 1.0 percent
5	Water extract	Not less than 32.0 percent
6	Crude Fibre	Not more than 16.5 percent

4.4.3 FSSAI Specifications for Rose Wine

The tolerance limit for ethyl alcohol content for upto 20%abvshall be + 0.3(-0.5 for upto 90 ml pet bottle), and for more than 20%aby it shall be +1.0(-1.5for upto 90 ml pet bottle of the declared strength. In case of wine the tolerance limit shall be + 0.5.

Food Safety

Part I - General Hygienic and Sanitary practices to be followed by Petty Food Business Operators applying for Registration

Sanitary and hygienic requirements for food manufacturer/ processor/handler

The place where food is manufactured, processed or handled shall comply with the following requirements:

1. The premises shall be located in a sanitary place and free from filthy surroundings and shall maintain overall hygienic environment. All new units shall set up away from environmentally polluted areas.

2. The premises to conduct food business for manufacturing should have adequate space for manufacturing and storage to maintain overall hygienic environment.

3. The premises shall be clean, adequately lighted and ventilated and sufficient free space for movement.

4. Floors, Ceilings and walls must be maintained in a sound condition. They should be smooth and easy to clean with no flaking paint or plaster.

5. The floor and skirted walls shall be washed as per requirement with an effective disinfectant the premises shall be kept free from all insects. No spraying shall be done during the conduct of business, but instead fly swats/ flaps should be used to kill spray flies getting into the premises. Windows, doors and other openings shall be fitted with net or screen, as appropriate to make the premise insect free The water used in the manufacturing shall be potable and if required chemical and bacteriological examination of the water shall be done at regular intervals at any recognized laboratory.

6. Continuous supply of potable water shall be ensured in the premises. In case of intermittent water supply, adequate storage arrangement for water used in food or washing shall be made.

7. Equipment and machinery when employed shall be of such design which will permit easy cleaning. Arrangements for cleaning of containers, tables, working parts of machinery, etc. shall be provided.

8. No vessel, container or other equipment, the use of which is likely to cause metallic contamination injurious to health shall be employed in the preparation, packing or storage of food. (Copper or brass vessels shall have proper lining).

9. All equipments shall be kept clean, washed, dried and stacked at the close of business to ensure freedom from growth of mould/ fungi and infestation.
10. All equipments shall be placed well away from the walls to allow proper inspection.
11. There should be efficient drainage system and there shall be adequate provisions for disposal of refuse.
12. The workers working in processing and preparation shall use clean aprons, hand gloves, and head wears.
13. Persons suffering from infectious diseases shall not be permitted to work. Any cuts or wounds shall remain covered at all time and the person should not be allowed to come in direct contact with food.
14. All food handlers shall keep their finger nails trimmed, clean and wash their hands with soap, or detergent and water before commencing work and every time after using toilet. Scratching of body parts, hair shall be avoided during food handling processes.
15. All food handlers should avoid wearing, false nails or other items or loose jewellery that might fall into food and also avoid touching their face or hair.
16. Eating, chewing, smoking, spitting and nose blowing shall be prohibited within the premises especially while handling food.
17. All articles that are stored or are intended for sale shall be fit for consumption and have proper cover to avoid contamination.
18. The vehicles used to transport foods must be maintained in good repair and kept clean.
19. Foods while in transport in packaged form or in containers shall maintain the required temperature.
20. Insecticides / disinfectants shall be kept and stored separately and `away from food manufacturing / storing/ handling areas.

4.5 Labelling Standards(Regulation 2.5 of FSS)

Labelling requirements for packaged food products as laid down in the Part 2.4 of the Prevention of Food Adulteration (PFA) Rules, 1955, and the Standards of Weights and

Measures (Packaged Commodities) Rules of 1977, require that the labels contain the following information:

1. Name, trade name or description
2. Name of ingredients used in the product in descending order of their composition by weight or volume
3. Name and complete address of manufacturer/packer, importer, country of origin of the imported food (if the food article is manufactured outside India, but packed in India)
4. Nutritional Information
5. Information Relating to Food Additives, Colors and Flavors
6. Instructions for Use
7. Veg or Non-Veg Symbol
8. Net weight, number or volume of contents
9. Distinctive batch, lot or code number
10. Month and year of manufacture and packaging
11. Month and year by which the product is best consumed
12. Maximum retail price

Provided that — (i) the nutritional information may not be necessary, in case of foods such as raw agricultural commodities, like, wheat, rice, cereals, flour, spice mixes, herbs, condiments, table salt, sugar, jaggery, or non –nutritive products, like, soluble tea, coffee, soluble coffee, coffee-chicory mixture, packaged drinking water, packaged mineral water, alcoholic beverages or flour and vegetables, processed and pre- packaged assorted vegetables, flours, vegetables and products that comprise of single ingredient, pickles, papad, or foods served for immediate consumption such as served in hospitals, hotels or by food services vendors or halwais, or food shipped in bulk which is not for sale in that form to consumers.

Wherever applicable, the product label also must contains the following

The purpose of irradiation and license number in case of irradiated food. Extraneous addition of colouring material.

Non-vegetarian food – any food which contains whole or part of any animal including birds, fresh water or marine animals, eggs or product of any animal origin as an ingredient, not including milk or milk products – must have a symbol of a brown color-filled circle inside a

brown square outline prominently displayed on the package, contrasting against the background on the display label in close proximity to the name or brand name of the food.

Vegetarian food must have a similar symbol of green color-filled circle inside a square with a green outline prominently displayed.

All declarations may be: Printed in English or Hindi on a label securely affixed to the package, or Made on an additional wrapper containing the imported package, or Printed on the package itself, or May be made on a card or tape affixed firmly to the package and bearing the required information prior to customs clearance.

Exporters should review the Chapter 2 of the "FSS (Packaging and Labelling) Regulation 2011" and the Compendium of Food Safety and Standards (Packaging and Labelling) Regulation before designing labels for products to be exported to India. FSSAI revised the labelling Regulation and a draft notification to that effect was published on April 11, 2018, inviting comments from WTO member countries and the comments received are under review and the publication date remains unknown.

According to the FSS Packaging and Labelling Regulation 2011, "pre-packaged" or "pre packed food" including multi-piece packages, should carry mandatory information on the label.

CHAPTER 5

OPPORTUNITIES FOR MICRO/UNORGANIZED ENTERPRISES

5.1. PM-FME Scheme:

Ministry of Food Processing Industries (MoFPI), in partnership with the States, has launched an all India centrally sponsored "PM Formalisation of Micro Food Processing Enterprises Scheme (PM FME Scheme)" for providing financial, technical and business support for up-gradation of existing micro food processing enterprises. The objectives of the scheme are :

I. Support for capital investment for up-gradation and formalization with registration for GST, FSSAI hygiene standards and UdyogAadhar;
II. Capacity building through skill training, imparting technical knowledge on food safety, standards & hygiene and quality improvement;
III. Hand holding support for preparation of DPR, availing bank loan and up-gradation;
IV. Support to Farmer Producer Organizations (FPOs), Self Help Groups (SHGs), producers cooperatives for capital investment, common infrastructure and support branding and marketing.[i]

References

http://apeda.in/agriexchange/India%20Production/India_Productions.aspx?cat=Floriculture&hscode=1036

https://www.agrifarming.in/rose-farming-income-cost-profit-project-report

https://dfr.icar.gov.in/Content/Pdf/National%20Advisory-Floriculture-PDF.pdf

https://www.researchgate.net/publication/316479625_Development_and_economics_of_artificial_additives_free_rose_syrup_from_desi_rose/link/5b0e63ebaca2725783f24042/download

https://www.thepharmajournal.com/archives/2017/vol6issue6/PartC/6-6-9.pdf

https://www.researchgate.net/publication/227635524_Rose_Petal_Tea_as_an_Antioxidant-rich_Beverage_Cultivar_Effects

https://krishikosh.egranth.ac.in/displaybitstream?handle=1/5810094128

https://pdfs.semanticscholar.org/e461/373c529453c955c27bd194495c746cd03d77.pdf