FOOD SAFETY AND STANDARDS AUTHORITY OF INDIA

Inspiring Trust, Assuring Safe & Nutritious Food

Training Manual
Food Safety Supervisor Course
Advance (Level 2) Manufacturing

PREFACE

Training of food handlers is a pre-requisite for ensuring food safety and the same is also mandated in the FSS Act, 2006. Food Safety and Standards Authority of India (FSSAI) has set up Food Safety Training & Certification (FoSTaC) ecosystem to ensure widespread and effective delivery of training to food businesses across the value chain. This ecosystem will train and certify the Food Safety Supervisor from each Food Establishment as it is envisaged to make this a regulatory requirement.

The manual is designed to train the personnel that can be designated as Food Safety Supervisors in the manufacturing sector. This manual details the requirements on food safety & hygienic practices to be followed by Food Business Operators engaged in the manufacturing sector. It is based on the Schedule 4 requirements of FSS (Licensing & Regulation of Food Businesses) Regulation, 2011 along with the industry best practices. It has been designed according to the flow of operation in the manufacturing industry for ease of understanding of the Food Safety Supervisors. This one-in-all manual is supplemented by a Tutor Guide along with the visuals, specific to the food industry for facilitating the trainers.

It is hoped that this manual will serve a wider purpose of training the Food Safety Supervisors and will also be useful to the food handlers in implementing the hygiene requirements in the food production premises.

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TUTOR GUIDE

Disclaimer: The content of this handbook/ manual is only for training and capacity building purpose, and is not intended to substitute applicable law, which may be referred to separately.

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Welcome to the manual –

The manual is designed for medium to large scale food manufacturers, processors & packers.

This manual explains General Requirements on Hygienic and Sanitary Practices to be followed by all Food Business Operators engaged in Food service establishments, as per Food Safety & Standard Act, 2006.

This manual presents bare minimum requirements of Food Safety and Hygiene to be followed by Food Business Operators along with Industry best practices.

Learning Outcome –

The objective of this manual is to train the personnel that can be designated as Food Safety Supervisors in the Food Manufacturing units, about food safety and hygiene requirements which are to be followed in their businesses. The Food Safety Supervisors (FSS) may interpret these requirements according to the size and type of their establishment.

The desired outcome of this manual is better understanding of food safety and hygiene requirements and high standards of food safety in the food industry.

What the law says –

The establishment in which food is handled, processed & packed, by the food business operator and the persons handling them should conform to the sanitary and hygienic requirement, food safety measures and other standards as specified below. It shall also be deemed to be the responsibility of the food business operator to ensure adherence to necessary requirements.

In addition to the requirements specified below, the food business operator shall identify steps in the activities of Food businesses, which are critical to ensure food safety, and ensure that safety procedures are identified, implemented, Maintained and reviewed periodically

In India, the mandatory sanitary & hygiene requirements for food business operators are –

"Part II of Schedule 4"of Food Safety and Standards (Licensing & Registration of Food Businesses) Regulations, 2011 (http://www.fssai.gov.in/home/fss-legislation/fss-regulations.html) under Food Safety & Standard Act, 2006 (http://www.fssai.gov.in/home/fss-legislation/food-safety-and-standards-act.html)

Definitions –

"Act" means the Food Safety and Standards Act, 2006 (Act 34 of 2006)

"Rules" means the Food Safety and Standards Rules, 2011.

"Adulterant" means any material which is or could be employed for making the food unsafe or sub-standard or misbranded or containing extraneous matter.

"Consumer" means persons and families purchasing and receiving food in order to meet their personal needs.

"Contaminant" means any substance, whether or not added to food, but which is present in such food as a result of the production (including operations carried out in crop husbandry, animal husbandry or veterinary medicine), manufacture, processing, preparation, treatment, packing, packaging, transport or holding of such food or as a result of environmental contamination and does not include insect fragments, rodent hairs and other extraneous matter;

"Food" means any substance, whether processed, partially processed or unprocessed, which is intended for human consumption and includes primary food to the extent defined in clause (zk) genetically modified or engineered food or food containing such ingredients, infant food, packaged drinking water, alcoholic drink, chewing gum, and any substance, including water used into the food during its manufacture, preparation or treatment but does not include any animal feed, live animals unless they are prepared or processed for placing on the market for human consumption, plants, prior to harvesting, drugs and medicinal products, cosmetics, narcotic or psychotropic substances :

"Food Authority" means the Food Safety and Standards Authority of India established under section 4;

"Food business" means any undertaking, whether for profit or not and whether public or private, carrying out any of the activities related to any stage of manufacture, processing, packaging, storage, transportation, distribution of food, import and includes food services, catering services, sale of food or food ingredients;

"Food business operator" in relation to food business means a person by whom the business is carried on or owned and is responsible for ensuring the compliance of this Act, rules and regulations made there under

"Hazard" means a biological, chemical or physical agent in, or condition of, food with the potential to cause an adverse health effect;

"Food safety" means assurance that food is acceptable for human consumption according to its intended use;

"Food safety audit" means a systematic and functionally independent examination of food safety measures adopted by manufacturing units to determine whether such measures and related results meet with objectives of food safety and the claims made in that behalf;

"Food Safety Management System (FSMS)" means the adoption Good Manufacturing Practices, Good Hygienic Practices, Hazard Analysis and Critical Control Point and such other practices as may be specified by regulation, for the food business;

"Food Business Operator" in relation to food business means a person by whom the business is carried on or owned and is responsible for ensuring the compliance of the Act, rules and regulations made there under

PART I

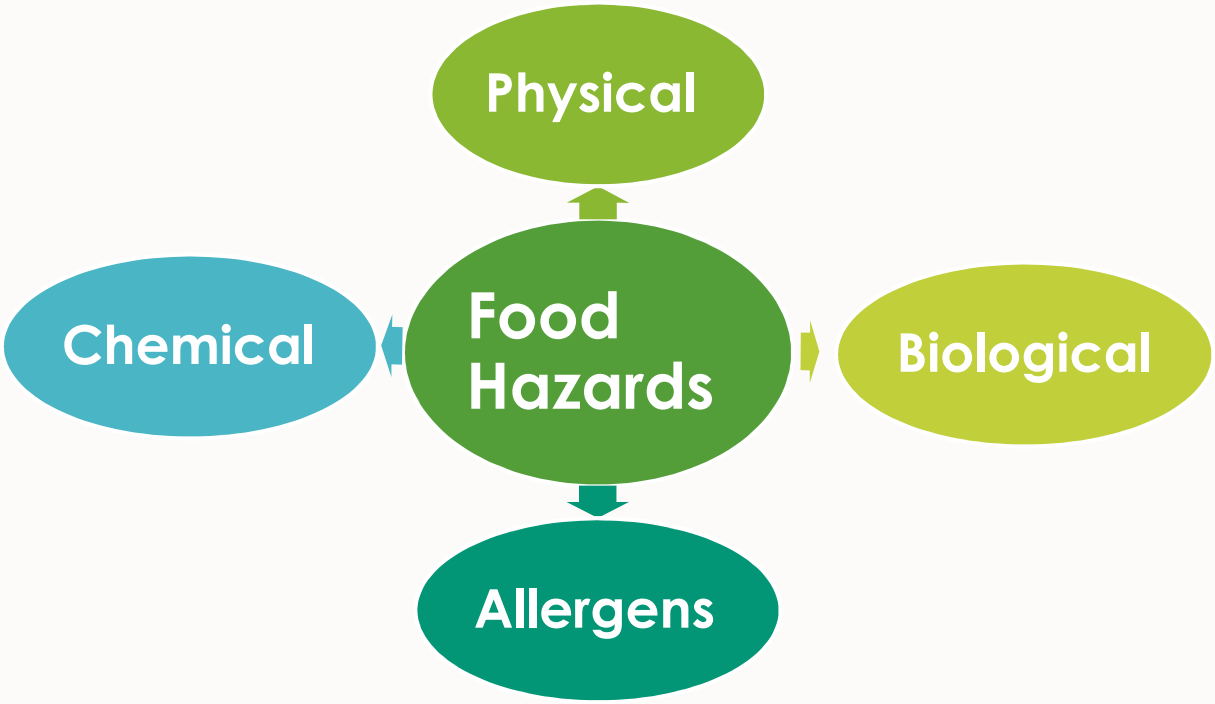
INTRODUCTION TO FOOD SAFETY

1.1 FOOD SAFETY& FOOD SAFETY HAZARDS

i. **Food Safety** means assurance that food is acceptable for human consumption according to its intended use.

ii. **Food Safety Management System** means the adoption of Good Manufacturing Practices, Good Hygienic Practices, Hazard Analysis and Critical Control Point and such other practices as may be specified by regulation, for the food business.

iii. **Food Safety Hazard** means biological, chemical or physical agent in food, or condition of food, with the potential to cause an adverse health effect. There are majorly four types of hazards -



a. Physical Hazards

Any foreign object (inanimate) found in the food or a naturally occurring object (metal, hard plastic), that poses a hazard is called a 'Physical Contamination or Hazard'.

Common Physical Hazards include:

- Glass
- Chipped pieces from equipment
- Metal shavings from equipment's, cans, foils etc.
- Stapler pins
- Blades
- Plastic or chipped pieces of disposables
- Lint and threads
- Band- aids
- Hair
- Finger nails
- Jewellery pieces

b. Chemical Hazards

Naturally occurring and process induced chemical substances that can cause a food borne illness are called a 'Chemical Contaminant or Hazard'.

Natural Chemical Contaminants include:

- Biological toxins
- Mycotoxins (aflatoxin, ochratoxin etc.)

Process Induced Chemical Contaminants include:

- Toxic metals in the processing set up or supply chain
- Pesticides, Colorants
- Cleansing products and sanitizers
- Equipment lubricants
- Chemical Food Additives, Preservatives
- Packaging materials-migration of residues from packaging material to oil.
- Adulteration with other oils or mineral oil

c. Biological Hazards

Biological hazards are organisms, or substances produced by organisms, that pose a threat to human health. They are a major concern in food processing because they cause most food borne illness outbreaks.

Major biological hazards include –

- **Bacteria** ex: *Salmonella spp., Enterohaemorrhagic Escherichia coli, Listeria monocytogene*s, *Staphlococcus aureus*, *Clostridium botulinum*,
- **Yeast &Mold** ex: *Candida, Aspergillus* sp., *Helicosporium*

Biological Hazards causes -

1. **Food Borne Infections –** This result when a person consumes food containing pathogens; which grow in the human intestine and cause discomfort or disease. Typical symptoms of a 'food borne Infections' do not appear immediately.
2. **Food Borne Intoxications -** This result when a person consumes food containing toxins in it; that cause discomfort or disease. Typical symptoms of a 'food borne Intoxication' appear quickly. **Food Borne toxin** are mediated infections, that result when a person consumes food containing toxins produced by the pathogens in it; which grow in the human intestine and produce toxins that cause discomfort or disease.

Conditions favouring growth of Microorganisms

FAT TOM

Conditions	Definition
Food	Food borne Microorganisms draw nutrients from Potentially hazardous foods
Acidity	Food borne Microorganisms grow well between the pH range of most foods
Temperature	Microorganisms grow well between the temperature range of $5^{o}C$ – $60^{o}C$, most commonly known as the 'Danger Zone'
Time	Microorganisms need sufficient time to grow; when exposed to the 'Danger Zone'
Oxygen	Microorganisms require oxygen in free or combined state; to favor their growth
Moisture	Microorganisms require moisture to grow and is measured in the form of 'Water Activity (Aw)'

d. Allergens *(Informative purpose)*

An **allergen** is normally, any harmless substance that causes an immediate allergic reaction in a susceptible person. Food allergens are almost always proteins although other food constituents, such as certain additives, are known to have allergenic (allergy-causing) properties.

Food allergy is a potentially serious immune response to eating or otherwise coming into contact with certain foods or food additives.

A food allergy occurs when the immune system:

- Identifies a particular food protein as dangerous and creates antibodies against it
- The next time the individual eats that food, immune system tries to protect the body against the danger by releasing massive amount of chemicals including Histamine
- Histamine is a powerful chemical that can cause a reaction in the respiratory system, gastrointestinal tract, skin or cardiovascular system.
- In the most extreme cases, food allergies can be fatal. Although any food can provoke an immune response in allergic individuals, a few foods are responsible for the majority of food allergies.

The following foods and ingredients are known to cause hypersensitivity and shall always be declared:

1. Cereals containing gluten; i.e., wheat, rye, barley, oats, spelt or their hybridized strains and products of these;
2. Crustaceans and products of these;
3. Eggs and egg products;
4. Fish and fish products;
5. Peanuts, soybeans and products of these;
6. Milk and milk products (lactose included);

7. Tree nuts and nut products; and
8. Sulphite in concentrations of 10 mg/kg or more."

Source:*http://www.foodallergens.info/Legal/CODEX.html*

Fig 1.1 – Food Allergens

Handling Allergens

1. Raw Material –

a. Review the labels of incoming raw materials for the appropriate allergen information or any changes.
b. Tag each case/pallet/bag, etc. as appropriate of raw materials to ensure the allergen is clearly called out as the materials are stored and used in your facility.
c. Handle appropriately any damaged containers of allergens to minimize cross-contamination at receipt.

2. Store –

a. Store allergenic ingredients or products separately to prevent minimize cross-contamination.
b. Using clean and closed containers.

c. Designating separate storage areas for allergenic and non-allergenic ingredients and/or products. When segregated storage is not possible, use other methods such as not storing allergens over non-allergens, storing like allergens (peanuts and peanut butter) together, etc.
d. Using and documenting clean up procedures for spills or damaged containers of allergens.
e. Using dedicated pallets and bins.

3. During production –

a. Ensure the traffic patterns of raw materials, packaging supplies, and employees are limited during the production of allergen containing products and do not lead to cross-contact.
b. If possible, have dedicated processing equipment and containers to prevent allergen cross-contact.
c. Declare allergens on labels, for all product, including rework, and intermediate products.

4. Sanitation –

a. Have standardized procedures for sanitation operations (SSOP's) and ensure they are followed.
b. Use appropriate cleaning methods (vacuum, soap and water wash, appropriate chemicals).
c. Ensure adequate lighting in the proper locations (including flashlights to check inside equipment)
d. Specify employee practices - hand washing at appropriate times (for example after handling a product that contains allergens, such as peanuts); proper hand washing procedures; clean clothing/aprons.

1.2 FOOD SPOILAGE

Food spoilage means that the original nutritional value, texture, flavour of the food are damaged, the food become harmful to people and unsuitable to eat.

Major reasons for food spoilage are –

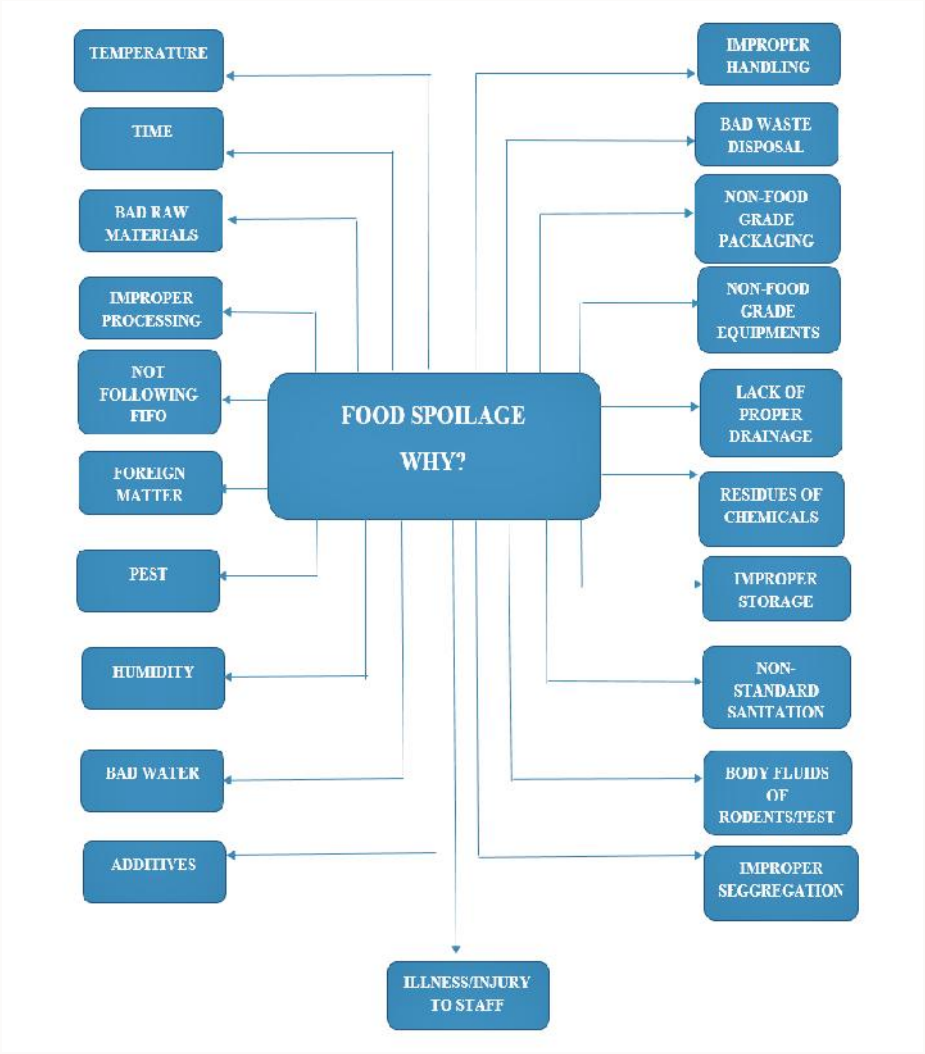


Fig 1.2 Food Spoilage Major Reasons

1. **Foreign matter:** Human hair, stapler, metal particles, fabric, plastic, alkali etc. are big threats to food safety and can cause food spoilage. Anything that is not considered as food or food substance is considered as foreign matter.
2. **Lack of proper drainage:** Improper drainage leads to clogged drains and accumulation of waste water in the processing area which attracts pests and microorganisms and can lead to food contamination.
3. **Non- food grade equipment:** Use of equipment's that are made of non-food grade material can lead to food contamination. It is therefore important to use food grade equipment's and vessels in the processing unit.

4. **Improper handling:** Unclean hands, wrong selection of equipment and packing in unsuitable material could result in food safety issues.
5. **Improper processing:** Deviating from the Standard Operating Protocols (SOP's) during production can lead to major changes in the end product. Correct temperature, Correct time and understanding the process steps is essential to ensure food safety and quality.
6. **Residues of chemicals:** Chemicals come into contact with food as crop contaminants then later in the process of sanitizing voluntarily by our process. The next involuntary entry of chemicals into food can be through residues of equipment or utensil sanitation operations. The presence of these residues can have adverse consequences on the consumer health. It is therefore essential to restrain the entry of chemical residues in the food production process.
7. **Non-standard sanitation:** Sanitation must be based on strict guidelines of either historical data or validation. If chemicals are used in less or more quantity or in an unverified process or method, sanitation will fail to achieve proper results giving way for food to become unsafe.
8. **Improper raw materials:** Raw material selection must be based on strict scientific reference and frequent sampling. The raw materials should always be sourced from certified and approved vendors.
9. **Additive:** Additives of any nature like essence, flavors etc. can spoil food if not used in the right quantity. Unauthorized additive also must not be used.
10. **Water:** Water is involved in food process in various stages from washing to soaking then involved in either directly food production as an ingredient or in some in-direct manner as steam. It is also important for washing and sanitation operations. Potable water should conform to the specifications of IS 10500:2012.
11. **Improper storage:** Storage must not only be done by FIFO (First In First Out) or FEFO (First Expiry First Out) method but also properly segregated and with required ventilation. Right combination of duration, temperature ventilation and segregation defines a good storage. Any deviation in one of these could result in food becoming unsafe.
12. **Illness/Injury to staff:** Food safety is very much dependent on the food handler's personal behavior and health status. A person with cough, cold, open wound, itching and any illness which is of an irritable nature tends to make him handle things without washing his hands after touching the body. The most common danger to food safety is from cough and cold and open wounds for food handlers. Procedures should be in place and followed at all times for cases of illness and injury of the staff.
13. **Improper segregation:** Appropriate segregation of RM, equipment, tools and final product is important to ensure consumer safety.
14. **Humidity:** Humidity is a major cause that promotes microbial growth, and rancidity. Appropriate humidity levels should be identified and maintained as per the final product in the processing unit.
15. **Temperature:** Temperatures of processing, holding, storing, transporting, are all important factor in food being safe.
16. **Time:** No raw material, or product should be held beyond designated shelf life.
17. **Non-food grade packing:** Intermediate and final product should be packed only in food grade packing material to ensure food safety.
18. **Pest:** Care must be taken to plant pest control devices and other forms of controls to ensure that they are highly restricted from either getting into product or contaminating product resulting in food safety issues.

19. **Body fluids of rodents/pests:** Contamination may be caused by body fluids like urine, fecal matter of rodents, reptiles, pests, nocturnal animals and birds present in the storage yard, marketing yard, transportation etc.
20. **Improper waste disposal:** Waste is an outcome of process but often present very close to the process region. If it is not disposed in a hygienic manner it can breed pest and micro-organisms which are a threat to food safety.

1.3 ACTIVITY- 1

1. **Food Hazards can be present in food when reduced to an acceptable level**. True/False

2. **Equipment Lubricant is**
   a. Physical Hazard
   b Chemical Hazard
   c. Biological Hazard
   d. Allergen

3. **Chemical Hazard can come from**
   a. Toxic metals in the processing set up, packaging materials.
   b. Pesticides, Colorants, Food Additives, Preservatives
   c. Cleansing Products, Sanitizers
   d. Equipment lubricants, adulteration with oils
   e. All of the above.

4. **Food Borne ..... result when a person consumes food containing pathogens.**
   a. Infection
   b. Intoxication

PART II

LOCATION, LAYOUT & FACILITIES

2.1 LOCATION & SURROUNDINGS

Manufacturing / processing / packaging premises shall be located away from sources of pollution like open drains, garbage yards, industries that emit fumes or gases and dense vegetation.
In order to avoid contamination from external sources such as odor, pests, dust etc., appropriate measures shall be taken to protect the processing area from environmental contamination.
Processing area shall not have direct access to any residential area.

Well Guarded Entrance of the Plant

Demarcation of the area

Fig.2.1 Illustrative of plant surrounding

2.2 LAYOUT & DESIGN OF FOOD ESTABLISHMENT PREMISES

a) Outside the food production premise

Layout & Design of the food production unit should be uni directional to prevent backward flow of materials during processing. This is required in order to prevent cross contamination.

Fig.2.2 Premises with tarred and concrete to avoid dust

Fig.2.3 Plant entrance with hygiene station

Fig.2.4 Clearly defined walkways

Fig.2.5 Vegetation growth near premises

Fig.2.6 Stagnant water near the surroundings

b) Inside the food production premise

1. Floors, ceilings and walls of the establishment must be made of impervious material. They should be smooth and easy to clean with no flaking paint or plaster and maintained in a sound condition to minimize accumulation of dirt, condensation & growth of moulds

Fig.2.7 Clean, durable, impervious to moisture

Fig.2.8 Cracks allow bacteria and moulds to accumulate.

Fig.2.9 Fungal growth on the walls

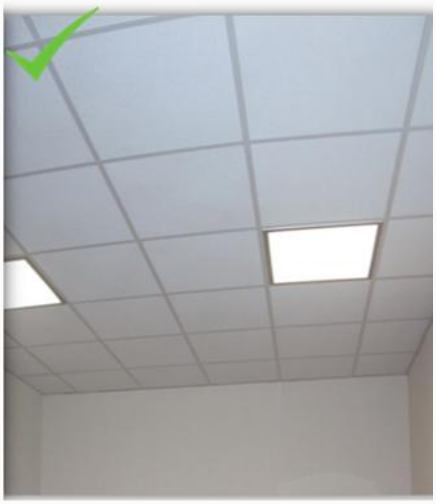


Fig.2.10 Ceiling made of impervious material

2. The doors in the establishment shall be made of smooth and non-absorbent surfaces and they shall be easy to clean and disinfectant. Doors can be fiited with automatic closing spring, strip or air curtain.

Fig 2.11 PVC Strip curtains

Fig.2.12 Automatic closing spring door

Fig 2.13 Air curtain

3. The floor shall have adequate and proper drainage with appropriate slope and they should be easy to clean and disinfect. The drainage shall flow in a direction opposite to the direction of food preparation area to avoid contamination.

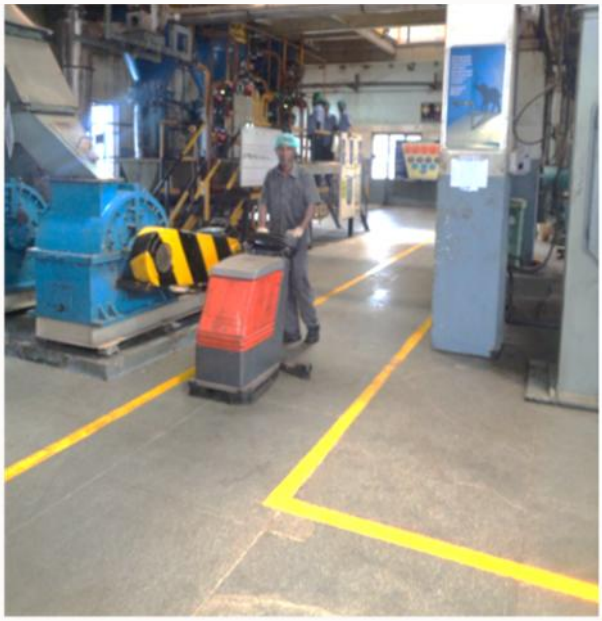


Fig.2.14 Special stone flooring to avoid slippery and easy cleaning with machines to improve hygiene

Fig.2.15 Epoxy and smooth flooring in operation, easy for cleaning and avoids dust and microbial contamination

4. The drains should be covered to prevent insects and rodents from entering the processing area.

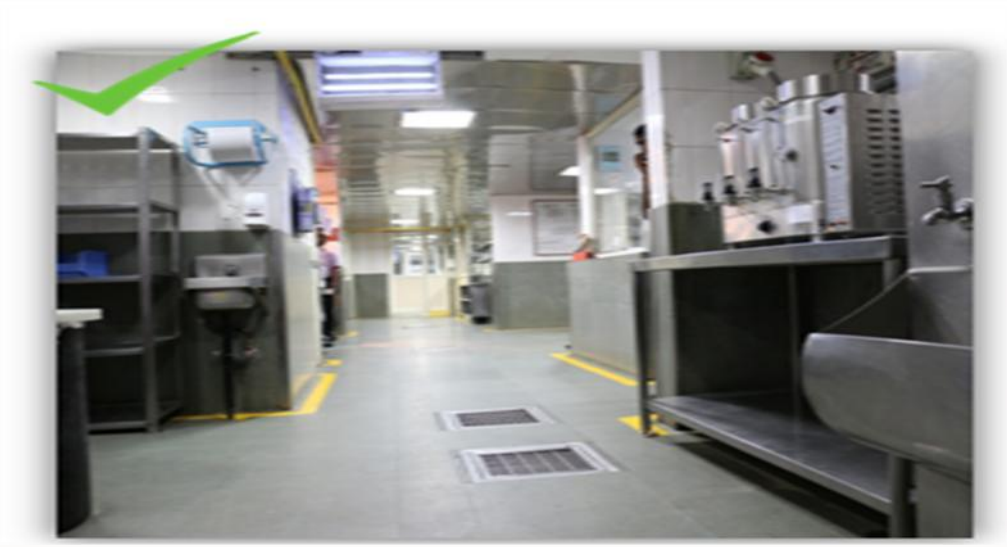


Fig.2.16 Floors should be sloped to ensure easy drainage

Fig.2.17 Drains should be covered to prevent insects and rodents

Fig 2.18 Floor with proper drainage

5. The windows, doors & all other openings to outside environment in the establishment shall be well screened with wire-mesh or insect- proof screen to protect the premise from pests. The doors shall be fitted with automatic closing springs to keep them closed at all times and also the mesh should be easy to remove & clean to avoid accumulation of dust & dirt.

Fig.2.19 Netlons and mesh in window to avoid pest entry

Fig.2.20. Pavers blocking the premises

2.3 EQUIPMENT & CONTAINERS

During preparation / handling / processing / storage of food products like flour, sugar, dairy based products, spices, bakery ingredients, dry fruits, cereals & grains, oilseed, refined oil, etc. certain equipment's e.g. scoops, spoons, cooking vessels, containers, tanks, silos, hoppers, pipes, packaging machines, filters, etc. come into contact with food. All these food contact surfaces shall be:

- õ made up of non-corrosive / rust free material
- õ smooth, free from any grooves
- õ easy to clean and maintain
- õ non-toxic and non-reactive
- õ of food grade quality

Generally, food grade stainless steel or galvanized iron material is preferred as it complies with the above requirements.

Fig.2.21. Rust free/ non corrosive coating of equipment's

- All the equipment's used during food preparation, handling &packaging (if any) shall be designed, located and fabricated to facilitate easy cleaning and shall be kept away from impure air and dust.
- Every utensil or container containing food products shall at all times be either provided with a properly fitted cover/lid or with a clean gauze net or other material of texture sufficiently fine to protect the food completely from dust, dirt and flies and other insects.
- No utensil or container used for the manufacturing of food items shall be kept in any place in which such utensil or container be contaminated and thereby render the food noxious.
- All equipment shall be kept clean, repaired and maintained in sound condition all the time.
- All measuring instruments / equipment like temperature gauges, pressure gauges, weighing balances, etc. shall be calibrated periodically for correct measurement.

Fig.2.22 Equipments should be easy to clean

Fig.2.23 Covered storage containers

2.4 FACILITIES

a) **Water Supply:** Water used in cleaning of equipment's / containers / cooking vessels shall be potable and shall not introduce any hazards or contaminate the food products. Clean and safe water storage facilities shall be provided. Steam, if used for heating of any food material shall be generated from potable water. If non-potable water is used anywhere in cleaning of containers / areas which are not in use for food processing / handling / storage, then the concerned pipeline shall be identified as such or differentiated from potable water.

Fig.2.24 Colour coding of water pipes to avoid contamination

Fig.2.25 Routine cleaning of water storage tanks

b) **Drainage and waste disposal:** Waste generated during processing like spillage of products, bleaching earth, spent wash, de-gummed oil, ash from boiler, etc. shall be collected regularly and such collected waste shall be stored in such a manner that it will not contaminate the food process and storage area inside / outside the environment of the premises. Waste generated in processing area shall be collected in dustbins and dustbins shall be provided with lid, identified to a specific area and cleaned regularly.

Collected waste shall periodically be handed over to a local waste-collecting body or disposed of in an appropriate manner that will not cause any hazards.

An Effluent treatment plant if required shall be set up as per the Environment Pollution Control Board.

Fig.2.26 If required waste water disposal system/effluent treatment plants hall be put in place.

Sr. No.	Material	Dustbin Colour	SYMBOL
1	Oily Cotton Waste	Red	
2	Paper	Green	
3	Plastic Jars, Sampling Bottles	Blue	
4	Plastic Bags	Yellow	
5	Polish Filter	Grey	
6	Food Waste	Orange	
7	Glass Bottles	Black	

Fig.2.27 Example of waste categorization with dedicated containers

c) **Personnel facilities and toilets**: Personal facilities include hand washing and drying system with potable water supply, adequate and separate lavatories and changing facilities. Hand wash

facilities shall be provided with hot or cold running water with self-closing / or elbow operated tap, soap solution, hand drying system / towel and disinfectant. Adequate number of separate clean toilets for males and females, refreshment rooms and changing rooms shall be provided at suitable locations and these shall not have direct access to the process / storage area.

To generate awareness in food handlers, display boards for 'Do and Don't', personal hygiene, personal behaviour and good manufacturing practices shall be put up at prominent places with pictorial information and instructions in an understandable language or the local language.

Fig.2.28 Hand-wash stations

Fig.2.29 Locker room

Fig.2.30 Appropriate signages in the factory

d) **Air quality and ventilation system** shall be designed and constructed so that air does not flowfrom contaminated areas to clean areas. Ventilation is especially important at workstations devoted to raw-material handling, processing, storage, etc.

Fig.2.31Proper Ventilation Systems

e) **Lighting :**Adequate lighting facility shall be provided to enable the food handlers to operate in a hygienic manner. Lighting shall be protected / covered to prevent contamination due to accidental breakages.

Fig.2.32 Proper lighting facility in the work area

Fig.2.33 Covered lights in the production area

Fig 2.34. All lights in the process and packaging halls should be covered with shatter proof material to prevent any accidental contamination of product from shattered glass of lights

2.5 ACTIVITY-2

1. **The layout of the production facility should allow …… Movement of food product**.
2. **The walls of the production facility should be**
    a) Devoid of cracks
    b) Impervious
    c) Smooth
    d) All of the above
3. **Routine maintenance and repair of equipment's and containers is important**. True/False
4. **Water used for cleaning of equipment's, containers and cooking vessels should be** ……..

PART III

CLEANING AND MAINTENANCE OF EQUIPMENT

3.1 Cleaning & Sanitation of equipment and premises

3.2 Preventive & Corrective Maintenance

3.3 Activity 3

3.1 Cleaning & Sanitation of Equipment and Premises

Detailed cleaning program shall be developed indicating specific areas to be cleaned, cleaning frequency, procedure, equipment, cleaning material and method

Fig.3.1 Visualization for cleaning material

Kamishibai Board for maintaining HK

Fig.3.2 Hanging of flexible pipes for ease of cleaning

- Equipment and containers that come in contact with food products and used for its handling, storage, processing & packaging shall be made of corrosion free materials which do not impart any toxicity to the food material and should be easy to clean and /or disinfect (other than disposable single use types). MS (Mild Steel powder coated) Tanks and pipelines should be preferably avoided and replaced with SS (Stainless Steel).
- Equipment and utensils used in the food product manufacturing shall be kept at all times in good order and repair and in a clean and sanitary condition. Such utensil or container shall not be used for any other purpose.
- Equipment shall be so located, designed and fabricated that it permits necessary maintenance and cleaning functions as per its intended use and facilitates good hygiene practices inside the premise including monitoring and audit.
- Appropriate facilities for the cleaning and disinfecting of equipment's and instruments and wherever possible cleaning in place (CIP) system shall be adopted.
- CIP (cleaning in place) facilities can be adopted for cleaning and disinfecting of equipment and instruments. For cleaning of disassembled equipment, utensils and containers, a separated and identified cleaning area shall be provided with adequate potable water supply, drainage system and cleaning agents.
- Equipment and containers for waste, by-products and inedible or dangerous substances, shall be specifically identifiable and suitably constructed.

- Containers used to hold cleaning chemicals and other dangerous substances shall be identified and stored separately to prevent malicious or accidental contamination of food.
- If required, a waste water disposal system / effluent treatment plant shall be put in place.
- All items, fittings and equipment's that touch or come in contact with food must be kept in good condition in a way that enables them to be kept clean and wherever necessary, to be disinfected.
- Lubricants and heat transfer fluids shall be food grade where there is a risk of direct or indirect contact with the product.

Fig.3.3 Illustrative of fixtures and equipment's in the manufacturing plant

Sanitation and Maintenance of Establishment Premises

Template for Cleaning/Sanitation Program

Item	Frequency	Equipment and Chemicals	Methods	Responsible Person
Structure				
Floors	End of each day or as frequently as required	Brooms, damp mop, brush detergent and sanitizer	1. Sweep the area 2. Apply detergent and mop the area 3. Use scrub for extra soil 4. Rinse thoroughly with water 5. Remove water with mop	
Walls, window and ceiling	Monthly or as required	Wiping cloth, brush and detergent	1. Remove dry soil 2. Rinse with water 3. Apply detergent and wash 4. Rinse with water 5. Air dry	
Food Contact Surfaces				
Work Tables and sinks	After use	Wiping cloth, detergent and sanitizer	1.Remove food debris and soil 2.Rinse with water 3.Apply detergent and wash 4. Rinse with water 5. Apply sanitizer 6. Air dry	

Fig.3.4 Example of a cleaning/sanitation template

Dos and Don'ts

1. Never store chemicals near food, food storage areas or any tools or equipment that will touch food. Keep them under lock in a designated area only for cleaning tools and chemicals.
2. Never leave chemicals on or near a food preparation area. That includes on top of counters, stoves, etc.
3. Do not store chemicals above food prep areas, kitchen sinks or drain boards.
4. Store chemicals in their originally labelled containers and make sure they are closed properly.
5. Never use food storage containers to store, transport or mix chemicals.
6. Always read the instructions on the label before use, even if it's a product you use regularly. You don't want to accidentally use the product in the wrong area or use it incorrectly.
7. Use safety posters or graphics to warn employees about chemical safety precautions. In businesses where language barriers could be a problem, create materials that are either bilingual or use pictures that don't require further descriptions.
8. Always spray chemicals holding the spray nozzle away from you.
9. Never mix two different chemicals together.
10. Always wear protective gloves and goggles when recommended.

3.2 Preventive & Corrective Maintenance

Preventive maintenance programmes shall be in place.

1. The preventive maintenance programmes shall include all devices used to monitor and/or control food safety hazards
2. Corrective maintenance shall be carried out in such a way that production on adjoining lines or equipment is not at risk of contamination
3. Maintenance requests which impact product safety shall be given priority.
4. Temporary fixes shall not put product safety at risk. A request for replacement by a permanent repair shall be included in the maintenance schedule.
5. Lubricants and heat transfer fluids shall be food compatible where there is a risk of direct or indirect contact with the product.
6. The procedure for releasing maintained equipment back to production shall include clean up, sanitizing, where specified in process sanitation procedures, and pre-use inspection.
7. Local area PRP requirements shall apply to maintenance areas and maintenance activities in process areas.
8. Maintenance personnel shall be trained in the product hazards associated with their activities

Fig 3.5 Allocated nuts, screws and bolts boxes in the facility to manually count them before and after the process in order to prevent their entry in food.

3.3 ACTIVITY-3

1. **Equipment and containers for waste, by-products and inedible or dangerous substances, shall be specifically identifiable and suitably constructed**

   True/False.

2. **Cleaning chemicals must be stored at**

   a) In allocated containers

   b) Away from food storage and food processing areas.

   c) Both a & b

   d) None of the above

3. **Mention two preventive measures to control foreign material entering into the food chain.**

PART IV

PEST CONTROL

4.1 Pest Control

4.2 Monitoring & Detection

4.3 Major Pests

4.4 Activity 4

4.1 PEST CONTROL

A pest is any living organism that causes damages or discomfort, or transmits or produces diseases.

1. The establishment shall have a nominated person to manage pest control activities and/or deal with appointed expert contractor.
2. Pest management programmes shall be documented and shall identify target pests, and address plans, methods, schedules, control procedures and, where necessary, training requirements.
3. Programmes shall include a list of chemicals which are approved for use in specified areas of the establishment to be get listed in agreement.
4. Food establishment, including equipment and building shall be kept in good repair to prevent pest access and to eliminate potential breeding sites. Holes, drains and other places where pests are likely to gain access shall be kept in sealed condition or fitted with mesh / grills / claddings or any other suitable means as required and animals, birds and pets shall not be allowed to enter into the food establishment areas/ premises.
5. Food materials shall be stored in pest-proof containers stacked above the ground and away from walls.
6. Pest infestations shall be dealt with immediately and without adversely affecting the food safety or suitability. Treatment with permissible chemical, physical or biological agents, within the appropriate limits, shall be carried out without posing a threat to the safety or suitability of food. Records of pesticides / insecticides used along with dates and frequency shall be maintained.
7. Animals, birds and pets shall not be allowed to enter into the food establishment areas/ premises.
8. In order to control the settlement of pests in the surroundings (i.e. not to provide them place of refuge and feed resources) it is necessary to maintain a non-attractive environment which includes:
   -Isolated storage of unutilised materials, pallets and machines, without contact with the walls and buildings.
   - Design and maintenance of external spaces, including:
   -Elimination of holes and spaces in waste land with high vegetation.
   -Regular cutting of grass lawns
   -The elimination of stagnant water.
   -The absence of rags, papers, plastic films and other detritus abandoned on the ground.
9. Tidying and cleaning of technical buildings (machine shop, boiler room, refrigeration rooms, electrical cabinets) to avoid rodent settlement.
10. Mosquito nets at window and suitable screens on access doors.
11. Rigorous management of waste containers, which include:
    -Frequent cleaning so as not to attract insects.
    -Storage in a clean and easily available washing area equipped with a source of water and floor drainage system for waste water.
    -Keeping them closed (to prevent use as a feed source by all types of pests).

-Not filling them in to excess to avoid overflowing and dropping of food waste on the ground.
-A waterproof design and easy to clean and disinfect.
-Frequent removal of waste from production area.

Fig 4.1 Some of the potential sources of pest entrance

4.2 Monitoring and detection

Pest-monitoring programmes shall include the placing of detectors and traps in key locations to identify pest activity. A map of detectors and traps shall be maintained. Detectors and traps shall be designed and located so as to prevent potential contamination of materials, products or facilities.

Fig 4.2 Pest control methods used in the industry

4.3 The Major Pest includes – *(Informative purpose)*

1. Cockroaches
2. Rodents (mice, rats, squirrels etc.)
3. Flies
4. Stored product pests (Flour beetle, sawtooth grain beetle, cigarette beetle, Indian meal moth etc.)

1. Cockroaches

Cockroaches are active mostly at night. They prefer places that are warm (26^{o}C or higher) and moist (55% humidity or higher, which is another reason to keep relative humidity at or below 50%). Cockroaches like to hide in cracks and crevices and they frequently take advantage of "free rides" in delivery boxes, bags and personal items. Cockroaches leave coarse pepper-like fecal droppings, as well as fecal smears that dry on surfaces. Other signs of cockroach activity are the presence of egg cases under and inside drawers, cabinets, equipment and other hiding areas.

Critical areas for Cockroaches

Cockroaches are attracted to spilled food and water or beverages. Equipment, such as packaging machines need to be checked carefully. Inspect and clean all food preparation equipment and surfaces. Remove scraps from drains.

Chemical Control of Cockroaches

Crack and crevice treatment and spot treatment

- Target use of insecticides to reduce amount used
- Avoid contaminating food, preparation surfaces and equipment
- Apply insecticides after business hours

2. Rodents

Rodents mainly include rats and mice (usually mice are the more common problem). They damage/contaminate food and property. The rodents can spread diseases through their feces and urine or by contact with surfaces. Rodents nest outdoors in areas hidden by tall grass, landscaping, "clutter" or down in sewers.

Control of Rodents

i. Rodents Traps

Mechanical traps are the best choice for indoor rodent control. Lethal traps include sticky traps and regular snap traps. Mechanical rodent traps include "live traps". Traps must be checked daily and rodents or their carcasses removed as soon as possible.

ii. Rodent Baiting

Poison baits can be used only outdoors. Keep track of rodent feeding activity on these baits. Placement is critical. Rodents prefer to travel along walls, so place the stations where rodents are likely to find them. One important point to remember: if you bait in public areas (i.e., accessible to people or animals), then you must place the baits in a secure bait station

3. Flies

"Filth flies" are the most common fly problems associated with food-handling facilities. They include house flies and the green, blue or coppery colored blow flies commonly seen around garbage cans.

Fruit flies are found near damaged or discarded fruits and vegetables. Drain flies breed in floor/sink drain, as well as the drip lines for air conditioners, freezers and ice-makers. Fungus gnats can also be found where indoor plants are overwatered.

Sanitation is very important to fly control and prevention. Keep food preparation areas clean and dry.

Control of Flies

Lights traps are helpful indoors and outdoors to trap flies. They should be mounted preferably 4-6 feet off the ground, but out of the way of employee activities. Indoors, place these traps where they will *not* be visible from outside. Otherwise, they might attract flies to the building. Bulbs should be replaced yearly and the replacement date noted on the trap.

4. Stored product pest

Important pests in food service are those that attack stored foods. The Indian meal moth (a small moth with coppery-colored wings) is probably the most common stored products pest.

Flour and grain beetles are other important stored product pests. All of these insects attack a wide variety of food products.

Fig.4.3 The 4D Approach of pest control

4.4 ACTIVITY-4

1. **Some signs of rodent infestation include:**
    a. Droppings, holes, runways, gnawing marks, feet marks
    b. Small eggs cases
    c. Tuft of Hair in various places
    d. Larvae in Flour and Sugar

2. **Which of the following methods help in pest control?**
    a. Covered drains, screened windows, door closers
    b. Food Containers with tight lids
    c. Cleaning food spillage as it happens
    d. All of the above
3. **Some basic steps for Pest Control are:**
    a. Insect Screen Windows & Air / Strip Curtains for Doors
    b. Check for Pest Trails and Signs and take actions
    c. Keep Scrap Yard& Food Preparation Areas Clean
    d. All of the above

PART V

PERSONAL HYGIENE

5.1 HEALTH STATUS

No personnel suffering from a disease shall be allowed to enter into any food handling area. Any person suffering from a disease shall immediately report illness to the management and medical examination of a food handler shall be carried out immediately.

All personnel shall be medically examined once in a year and a record signed by a registered medical practitioner shall be maintained. All the personnel shall be compulsorily inoculated against the enteric group of diseases and a record shall be maintained. In case of an epidemic, all workers are to be vaccinated irrespective of the scheduled vaccination. Medical examination to be concluded –

1. Physical examination
2. Eye Test
3. Skin examination
4. *Compliance with schedule of vaccine to be inoculated against enteric group of diseases
5. Any test required to confirm any communicable or infectious disease which the person suspected to be suffering from on clinical examination

Note - * Vaccine to be inoculated against enteric group of diseases, shall be decided by the medical practitioners according to the list as declared by the municipal corporation of that area.

Fig 5.1 Health check up by medical practioners

An illustrative Performa is shown below and it can be downloaded from www.fssai.gov.in

PERFORMA FOR MEDICAL FITNESS CERTIFICATE FOR FOOD HANDLERS

(FOR THE YEAR .....)

(See Para No. 10.1.2, Part- II, Schedule - 4 of FSS Regulation, 2011)

It is certified that Shri/Smt./Miss..... employed with M/s....., coming in direct contact with food items has been carefully examined* by me on date ..... Based on the medical examination conducted, he/she is found free from any infectious or communicable diseases and the person is fit to work in the above mentioned food establishment.

Name and Signature with Seal
of Registered Medical Practitioner /
Civil Surgeon

***Medical Examination to be conducted:**

1. Physical Examination
2. Eye Test
3. Skin Examination
4. Compliance with schedule of Vaccine to be inoculated against enteric group of diseases
5. Any test required to confirm any communicable or infectious disease which the person suspected to be suffering from on clinical examination.

5.2 BEHAVIOURAL & PERSONAL CLEANLINESS

Personal cleanliness of food handlers is the most important link in preventing foodborne illness. These personal hygiene habits shall become a part of their behaviour.

1. All food handlers shall wear suitable clean protective clothing, head covering, face mask, gloves and footwear.
2. Food handlers shall always wash their hands with soap and clean potable water, disinfect their hands and then dry with hand drier or clean cloth towel or disposable paper.
3. Food handlers shall always wash their hands at the beginning of food handling activities immediately after handling raw food or any contaminated material, tools, equipment or work surface, where this could result in contamination of other food items or after using the toilet.
4. No Food handlers shall be engaged in smoking, spitting, chewing, sneezing or coughing over any food and eating in food preparation and food service areas.
5. The food handlers should trim their nails and hair periodically.
6. Food Handlers shall avoid certain hand habits such as scratching nose, running finger through hair, rubbing eyes, ears and mouth, scratching beard, scratching parts of bodies etc. When unavoidable, hands should be effectively washed before resuming work after such actions.
7. Street shoes inside the food preparation area should not be worn while handling & preparing food.
8. Food handlers should not handle soiled currency notes/cards to avoid cross contamination.

Fig.5.2. General Hygiene & Health of Food Handlers

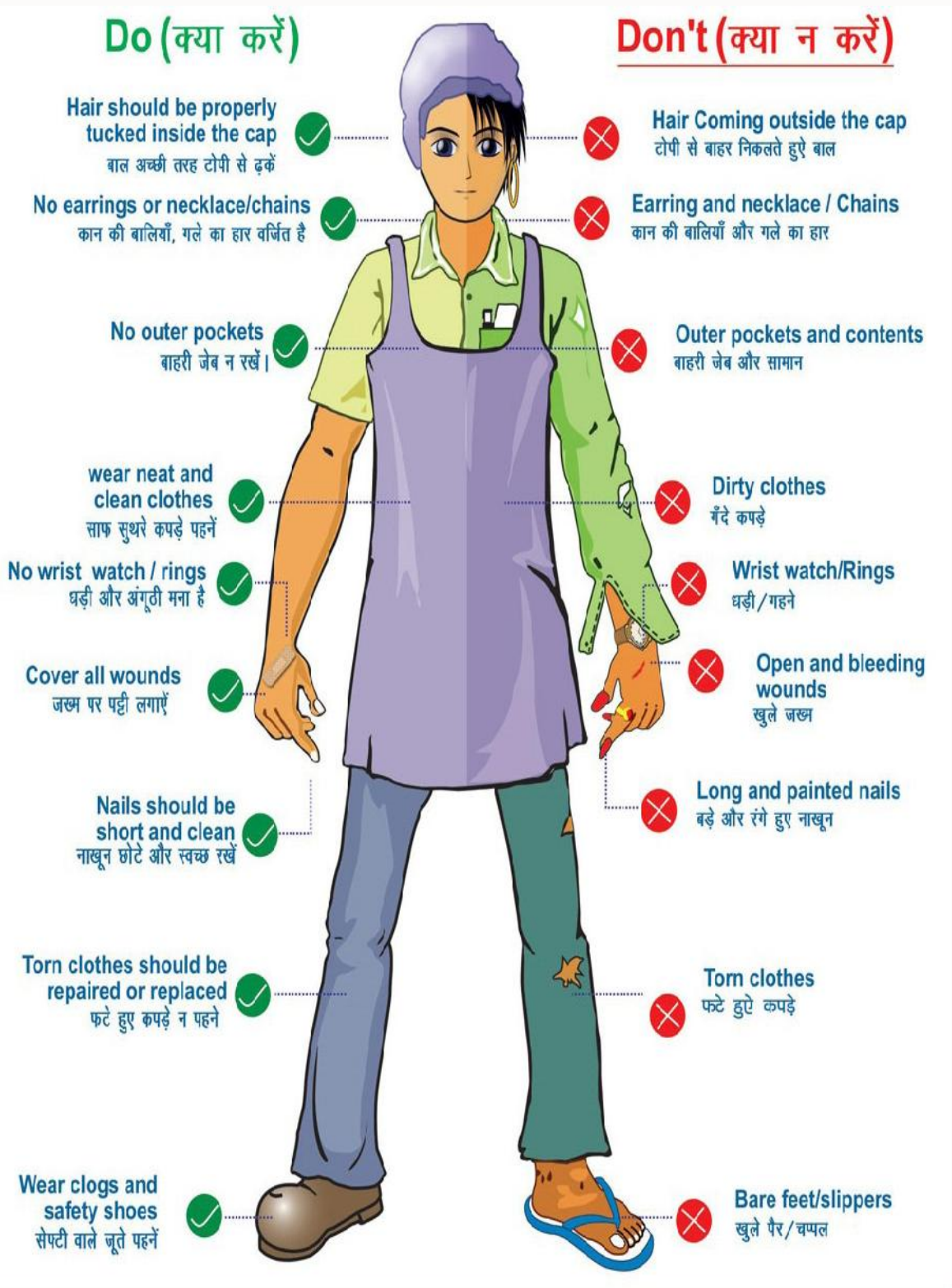


Fig 5.3 Basic requirement for personal hygiene.

Fig 5.4. When to wash hands

Fig.5.5 Procedure for washing hands

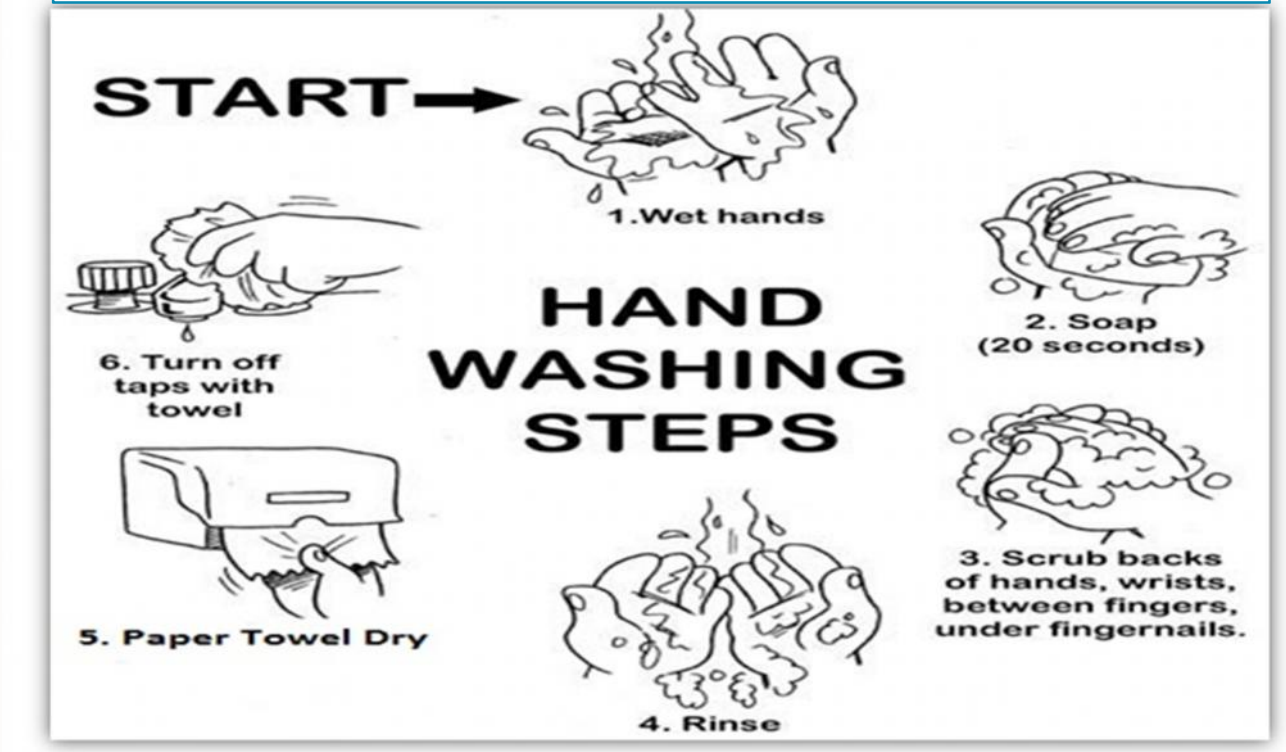


Fig.5.6. How to wash hands properly.

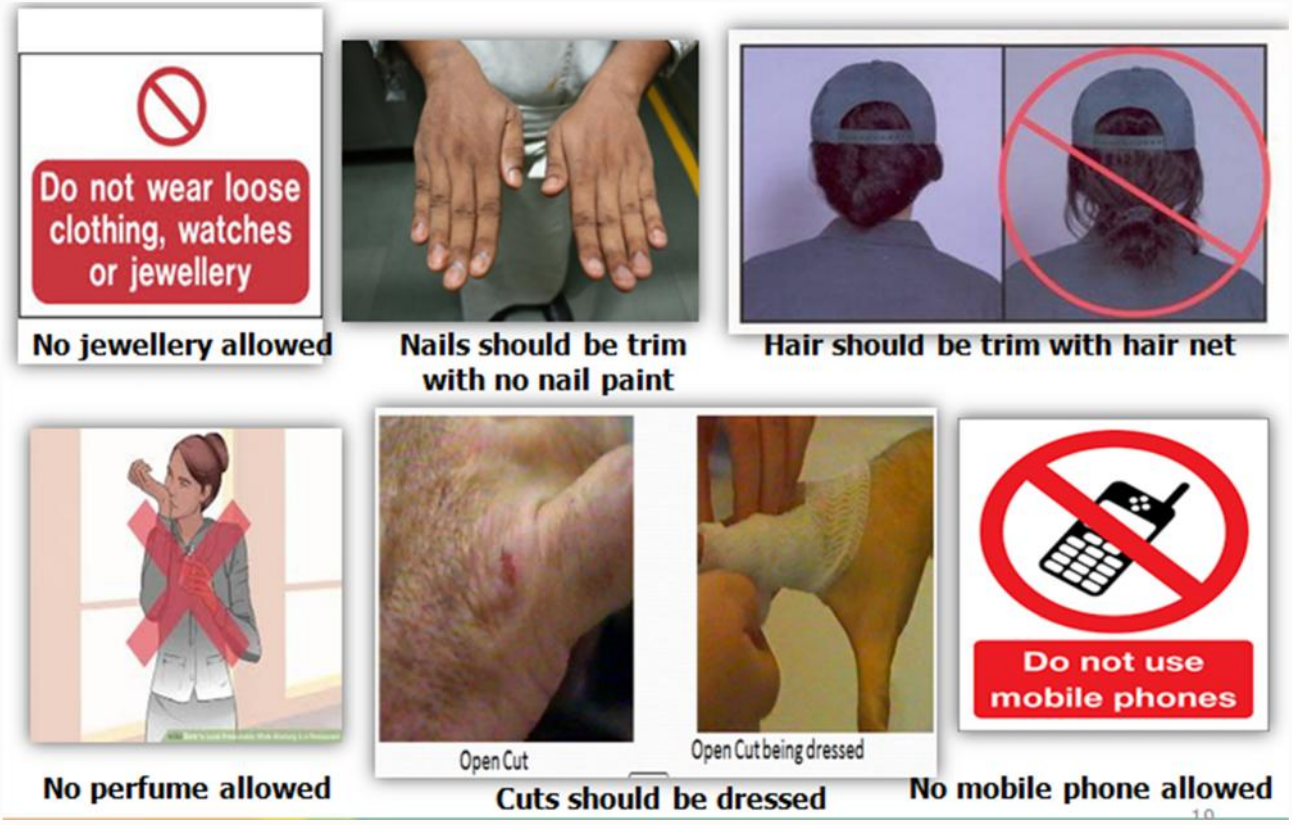


Fig.5.7. Good Behavioural practices for food handlers

5.3 Visitor Management

1. Generally, visitors should be discouraged from going inside the food handling areas.
2. Visitors when entering food manufacturing, cooking, preparation and storage or handling areas shall wear protective clothing, footwear.
3. Visitors shall adhere to the personal hygiene provisions as mandate for food handlers.

Fig.5.8 Visitor management protocols to be practiced

Activity 5

1. Any person suffering from a disease, shall immediately report illness or to the management and does not resume work. True/False
2. Only specific personnel shall be compulsorily inoculated against the enteric group of diseases. True/False
3. Visitors shall adhere to the personal hygiene provisions as mandate for Food handlers. True/False
4. Street shoes are allowed inside the food preparation area while handling & preparing food. True/False
5. All food handlers shall wear suitable clean protective clothing, head covering, face mask, gloves and footwear. True/False

PART VI

FOOD OPERATION AND CONTROL

6.1 Procurement of raw materials

While procuring and receiving the raw material, the food handler shall ensure that -

1. Raw materials shall be purchased from reliable and known suppliers. As per Condition of license, every manufacturer, distributor or supplier selling an article of food to manufacturing shall give either separately or in the bill, cash memo or label a warranty in Form E. i.e. Form of Guarantee.
2. It shall conform to all the Regulations and standards laid down under the Food Safety& Standard Act, 2006.
3. Records of raw materials & source of procurement shall be maintained in a register for inspection.
4. All raw materials should be checked for visible deterioration & off- odour and for any foreign matter.
5. If material is received in tankers (for e.g. milk, oil, water, etc.), it should be checked for seal integrity and mostly dedicated tankers shall be used.
6. No raw material or ingredient thereof shall be accepted if it is known to contain parasites, undesirable micro-organisms, pesticides, veterinary drugs or toxic items or decomposed or extraneous substances, which would not be reduced to an acceptable level by normal sorting and/or processing.
7. Raw materials should be purchased in quantities that correspond to storage/preservation capacity of the establishment.
8. Packaged raw material must be checked for 'expiry date'/ 'best before'/ 'use by date, packaging integrity and storage conditions.

An illustrative copy of Form E is displayed below. The food handler can download the same from Food Safety & Standards (Licensing & Registration of Food Businesses) Regulations, 2011(Refer Regulations 2.1.14(2)).http://www.old.fssai.gov.in/Portals/0/Pdf/Food%20safety%20and%20Standards%20(Licensing%20and%20Registration%20of%20Food%20businesses)%20regulation,%202011.pdf

FORM E

Form of Guarantee

(Refer Regulation 2.1.14(2))

Invoice No. _____ Place:_____

From: _____ Date:_____

To: _____

Date of sale	Nature and quality of article/brand name, if any	Batch No or Code No.	Quantity	Price
1	2	3	4	5

I/We hereby certify that food/foods mentioned in this invoice is/are warranted to be of the nature aqnd quality which it/ these purports/purported to be.

Signature of the manufacturer/Distributor/Dealer

Name and address of

Manufacturer/Packer

(in case of packed article)

License No. (wherever applicable)

Fig.6.1 Display of Cleaning Status on Tankers and lock & key system provided for Food Defence.

6.2 STORAGE OF RAW MATERIALS & FOOD

After receiving and accepting the raw material, there comes the need of storage. The storage facilities shall be designed and constructed to avoid cross - contamination during storage, permit adequate maintenance and cleaning and shall avoid pest access and accumulation. Cold Storage facility shall be provided for food that requires being stored below 5°C.

While designing the storage room, segregation shall be there for raw, processed, packaging, rejected, returned or recalled food items, allergen material & distinguishably marked and secured products (hardware & cleaning chemicals). The storage area for raw food shall be separate from the area of work-in-progress, processed, cooked and packaged products. Also, the containers made of non-toxic materials shall be provided for storage of raw materials, work-in-progress and finished / ready to serve products.

While procuring and receiving the raw material, the food handler shall ensure that -

1. Storage instructions over food packaging should be followed.
2. Temperature and humidity requisite for respective food materials / products shall be maintained, to enhance shelf life.
3. FIFO (First In First Out) & FEFO (First Expire First Out) stock rotation system as applicable, shall be followed in storage areas, work-in-progress and processed/cooked or packaged food products.
4. The food materials shall be stored on racks / pallets, well above the floor level and away from the wall.

Fig 6.2 Personal Protective Equipment's used for material handling

Fig.6.3 Dedicated Storage Tanks

Fig.6.4 Open hose pipe (chances of cross contamination)

Fig 6.5. Closure of the Hosepipe when not in use

Fig 6.6. Material storage on Pallets

Fig 6.7 Separate storage Area for Expired/damaged material

Fig 6.8. Colour coding for easy identification of Quality Status

Fig.6.9. Storage of raw materials and food

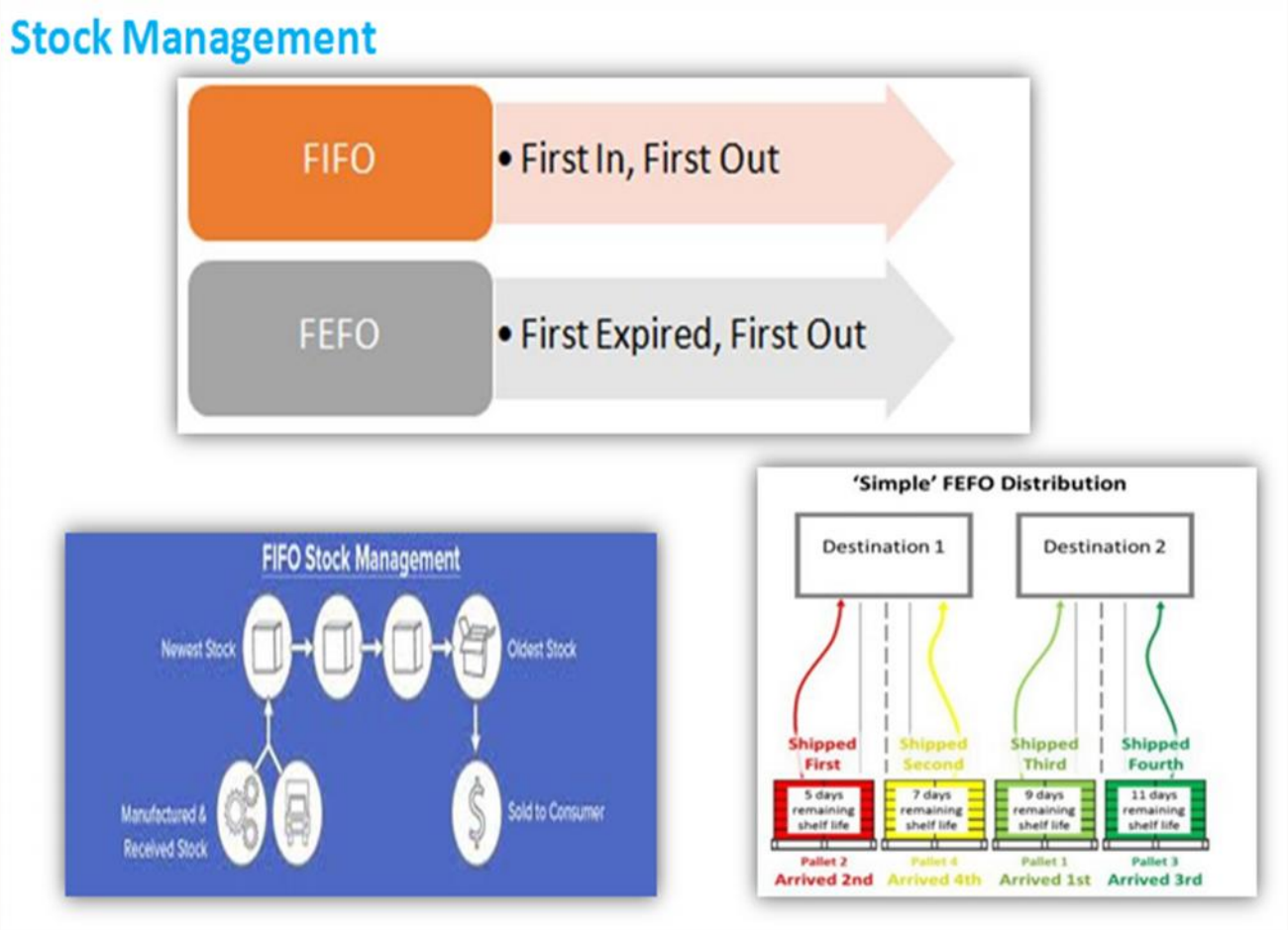


Fig.6.10. Stock Management

- Sorting of raw materials shall be carried out wherever necessary.
- When storage is necessary, this should be in weather proof, ventilated rooms which are protected against birds, insects and rodents.

6.3 Production

A detailed food safety plan & hygiene requirement to be followed for the manufacturing / processing of different food products listed in the table given below is provided in the respective annexures.

Sr. No.	Category of Food Product	Annexure Number
1	General Category	Annex. 01
2	Milk and Milk Products	Annex. 02
3	Fats and Oils	Annex. 03
4	Confectionary Products	Annex. 04

5	Bakery Products	Annex. 05
6	Meat & Meat Products	Annex. 06
7	Fish & Fish Products	Annex. 07
8	Egg& Egg Products	Annex. 08
9	RTE (Ready to Eat) Savouries	Annex. 09
10	Catering & Food Service Establishments	Annex. 10
11	Fruit and Vegetable Processing	Annex. 11
12	Warehouse	Annex. 12
13	Transporter	Annex. 13
14	Retail Establishments	Annex. 14

6.4 PRODUCT PACKAGING

Product packaging prevents contamination, allows food to be transported easily and extends shelf life. Packaging also provides a surface for labelling and identification of products. Packaging materials also need to ensure that food is not contaminated from substances that could migrate from the packaging into food.

The food packaging material shall conform to all the Regulations and standards laid down under the Food Safety & Standard Act, 2006. For primary packaging, only Food grade packaging materials are to be used. The packaging materials or gases where used, shall be non-toxic and it shall not pose a threat to the safety and suitability of food. The packaging material should be free from contamination from physical, chemical & biological hazard.

Packaging- General Requirements

1. A utensil or container made of the following materials or metals, when used in the preparation, packaging and storing of food shall be deemed to render it unfit for human consumption: -

(*a*) Containers which are rusty
(*b*) Enamelled containers which have become chipped and rusty
(*c*) Copper or brass containers which are not properly tinned
(*d*) Containers made of aluminium not conforming in chemical composition to IS: 20 specifications for Cast Aluminium and Aluminium Alloy for utensils or IS: 21 specifications for Wrought Aluminium and Aluminium Alloy for utensils.

2. Containers made of plastic materials used as appliances or receptacles for packing or storing food articles, whether partly or wholly, should conform to the following Indian Standards Specification viz.: —

(*i*) IS: 10146 (Specification for Polyethylene in contact with foodstuffs)
(*ii*) IS: 10142 (Specification for Styrene Polymers in contact with foodstuffs)
(*iii*) IS: 10151 (Specification for Polyvinyl Chloride (PVC), in contact with foodstuffs)

(*iv*) IS: 10910 (Specification for Polypropylene in contact with foodstuffs)
(*v*) IS: 11434 (Specification for Ionomer Resins in contact with foodstuffs)
(*vi*) IS: 11704 Specification for Ethylene Acrylic Acid (EAA) copolymer
(*vii*) IS: 12252 - Specification for Poly alkyleneterephathalates (PET)
(*viii*) IS: 12247 - Specification for Nylon 6 Polymer
(*ix*) IS: 13601 - Ethylene Vinyl Acetate (EVA)
(*x*) IS: 13576 - Ethylene Metha Acrylic Acid (EMAA)
(*xi*) Tin and plastic containers once used, shall not be re-used for packaging of edible oils and fats

Provided that utensils or containers made of copper though not properly tinned, may be used for the preparation of sugar confectionery or essential oils and mere use of such utensils or containers shall not be deemed to render sugar confectionery or essential oils unfit for human consumption.

6.5 Approved Additives

There are various additives being used in different categories of food products. FSSAI has listed down all these additives which are approved in different food products respectively along with their limits of use.

Details regarding the same can be obtained from the following link:
(http://www.fssai.gov.in/home/Food-Safety-and-Standards-Regulations/Food-Safety-and-Standards--Food-Product-and-Standards-and-Food-Additives--Regulation--2011.html)

6.6 ACTIVITY-6

1. **For Primary Packaging (e.g. Packaging where Food, Ingredient, Additives come in direct contact) only food grade packaging material must be used?**
   a. True
   b. False

2. **Food Packaging ensures the following**
   a. Protection to prevent contamination.
   b. Protection from damage.
   c. Accommodate required labelling as per Food Safety Act, Rules, Regulations.
   d. All of the above

3. **A good practice in Purchase Management is**
   a. Buying fresh looking Raw materials.
   b. Buying the most expensive Raw materials.
   c. Evaluating Vendors on set criteria and then buying from these approved vendors.
4. **A good Storage Practice is**
   a. Arranging the cartons and stacking them to 7.5 ft.
   b. Arranging the cartons and keeping them 1.5 Ft away from the walls and above the floor
   c. Arranging the cartons and keeping them 3cms above the ground

PART VII

TRANSPORTATION

7.1 Transportation

7.1 Transportation

- Transportation vehicles, tankers, conveyances, and containers shall be maintained in a state of good repair, cleanliness, and condition consistent with requirements given in relevant specifications.
- Where the same vehicles, conveyances, and containers are used for food and non-food products, cleaning shall be carried out between loads & No petroleum or hazardous chemicals tankers shall be engaged for Food items transportation.
- Bulk containers shall be dedicated to food use only. Where required by the organization, bulk containers shall be dedicated to a specified material.
- Bulk tankers, deliveries tankers shall be sealed with plastic / metal seals with numbered seals & thread or lead seals should be restricted.

Conveyances and / or containers used for transporting / serving foodstuffs shall be **non-toxic**, **kept clean** and **maintained in good condition** in order to protect foodstuffs from any contamination.

Fig 7.1 Vehicle inspection before loading

Fig 7.2. Multilayer Tarpaulin to protect from water and dust.

Fig.7.3 Food Transportation

PART VIII

MANAGEMENT and SUPERVISION

8.1 Management & Supervision

8.1 MANAGEMENT & SUPERVISION

A detailed Standard Operating Procedure (SOP) for the processing of food as well as its packing, dispatch and storage shall be developed. A standard operating procedure, or SOP, is a living document showing technical instructions of how to perform a routine or repetitive task. SOPs aim to achieve efficiency, quality output and uniformity of performance, while reducing miscommunication and failure to comply with establishment requirements. The SOP should be based on 5W's & 1H (i.e. why, when, what, where, who & how)

A good standard operating procedure –

- ✓ Should provide all information necessary to perform a task
- ✓ It is usually specific to the equipment used for the procedure
- ✓ Should be detailed
- ✓ Should be standalone
- ✓ Should provide quality information
- ✓ Should provide references

The technical managers and supervisors shall have appropriate qualifications, knowledge and skills on food hygiene principles and practices.

As per the condition of FSSAI license – The Food Business Operator shall employ at least one technical person to supervise the production process. The person supervising the production process shall possess at least a degree in science with Chemistry/ Bio-chemistry/ Food and nutrition/ Microbiology or a degree or diploma in Food Technology/ Dairy Technology/ Dairy Microbiology/ Dairy chemistry/ Dairy engineering/ Oil technology/ Veterinary science / Hotel management & technology or any degree or diploma in any other discipline related to the specific requirement of the business from a recognized university or institute or equivalent.

It should be ensured that SOPs help handle, store, process, prepare and display the food products safely and correctly and that the lot or batch can be easily traced and recalled if necessary.

PART IX

FOOD TESTING

9.1 Food Testing Facilities

9.2 Sampling of Food Products

9.3 Testing Requirements for Food Products

9.1 FOOD TESTING FACILITIES

A well-equipped laboratory for physical, microbiological and chemical analysis shall be in place inside the premise of establishment. In case of any suspicion or possible contamination, food materials shall be tested before dispatch by the Food Business Operator.

If there is no in house laboratory facility, then regular testing shall be done through an accredited lab notified by FSSAI. In case of complaints received and if so required, the company shall voluntarily do the testing either in the in-house laboratory or an accredited lab or lab notified by FSSAI. As per the condition of FSSAI license – Food Business Operator shall ensure testing of relevant chemical and/or microbiological contaminants in food products in accordance with these regulations as frequently as required on the basis of historical data and risk assessment to ensure production and delivery of safe food through own or NABL accredited /FSSA notified labs at least once in six months.

7.2 SAMPLING OF FOOD PRODUCTS

Sampling refers to the statistical process of selecting and studying the characteristics of a relatively small number of items from a relatively large population of such items, to draw statistically valid inferences about the characteristics about the entire population.

Scale of Sampling

a. Lot**:** All the containers in a single consignment of one type and grade of material drawn for a single batch of manufactures shall constitute the Lot.

b. Gross Sample: The general procedure for taking a gross sample is to draw a no. of portions from the bulk quantity or a no. of portions from all or several packages and, mix them thoroughly. Representative portions of the gross sample shall be transferred to air tight containers of suitable size for the test samples.

c. Gross sample from bulk quantities: shall be drawn in quantities of not less than 2 kg per 2000kg or less.

d. Gross sample from small packages: when sampling from drums, barrels, etc. the packages from which the samples are drawn shall be selected at random from the lot. The following schedule is recommended for the no. of packages to be sampled:

Number of Packages in the Lot	Number of packages to be sampled
1 to 4	Each package
5 to100	At least 20% with a minimum of 4 packages
More than 100	At least 10% with a minimum of 20 packages

General Precaution in Sampling

- All sampling instruments should preferably be made of Stainless steel.
- All sampling apparatus should be clean and dry when used.
- Samples should not be taken in an exposed place.
- Samples should be stored in a manner that they are protected from light, temperature fluctuation and other abnormal conditions.
- Sample containers should be filled such that the air space above the liquid level should be 5 to 10% of the capacity of the sample container.

9.3 TESTING REQUIREMENTS FOR FOOD PRODUCTS

The testing requirements for different types of food material is listed down in the Food Safety & Standards (Food Product Standards) Regulation, 2011 (http://www.fssai.gov.in/home/food-standards/fss-regulations.html)

The basic quality parameters testing can be done at the site lab of the FBO, whereas parameters requiring sophisticated lab infrastructure and higher analytical expertise can be outsourced to FSSAI recognized / NABL accredited labs.

a. Adulteration – The Need to Test

Ensuring the authenticity of food has been a problem for eras. Wherever there is a commodity that commands a quality in the market and has either high value or high-volume sales, some people may be tempted to profit from illegal activity. Food fraud usually involves misleading

the purchaser as to the true nature, substance or quality of the goods demanded; thus, food standards and labeling are breached. The offence can take the form of adulteration, which generally involves the dilution of a commodity with less expensive materials. A cheaper food may also be represented as if it were a food of greater value.

Source

- http://www.fssai.gov.in/Portals/0/Pdf/15Manuals/SAMPLING.pdf
- **http://agmarknet.nic.in/adulterants.html**http://www.fssai.gov.in/Portals/0/Pdf/15Manuals/OILS AND FATS.pdf

b. Contaminants and toxins

Safety Parameters CONTAMINANTS

It is provided under the conditions of license as per FSSR licensing and registration regulations that every FBO shall ensure that his food product is tested for relevant chemical and microbiological contaminants **through FSSA notified / NABL accredited or own laboratory at least once in six months**.

The list of contaminants & toxins is given in detail under the Food Safety & Standards (Contaminants, Toxins & Residues) Regulation, 2011 on the following link:

(http://www.fssai.gov.in/home/food-standards/regulations/contaminants-toxins-and-residues.html)

PART X

TRAINING

10.1 Training

10.1 Training

1. All food handlers shall be aware of their role and responsibility in protecting food from contamination.
2. Food handlers shall have the necessary knowledge and skills which are relevant to food processing / manufacturing, packing, storing and serving.
3. All food handlers shall be trained in food hygiene and food safety aspects along with personal hygiene requirements.
4. Periodic assessments of the effectiveness of training, awareness of safety requirements and competency level shall be made.
5. Training programmes shall be routinely reviewed and updated wherever necessary.

PART XI

AUDIT, DOCUMENTATION & RECORDS

AUDIT, DOCUMENTATION & RECORDS

1. A periodic audit of the whole system according to the SOP shall be done.
2. Appropriate records of raw material receipt, stock of existing RM, production, storage, distribution, service, laboratory test results, cleaning and sanitation, pest control and product recall shall be kept.
3. The records shall be retained for a period of one year or till the shelf-life of the product, whichever is more.

List of records as mandated under Part 2 of Schedule 4 of Food Safety & Standards (Licensing & Registration of Food Businesses) Regulation, 2011

S. No.	Section	Section Name	Clause	Requirement
1	Part 2 Section 4	Facilities	4.1.3	Water storage tanks shall be cleaned periodically and records of the same shall be maintained in a register.
2	Part 2 Section 5	Food operations and controls	5.1.3	Records of raw materials, food additives and ingredients as well as their source of procurement shall be maintained in a register for inspection.
3	Part 2 Section 8	Audit, documentation and records	8.2	Appropriate records of food processing / preparation, production / cooking, storage, distribution, service, food quality, laboratory test results, cleaning and sanitation, pest control and product recall shall be kept and retained for a period of one year or the shelf-life of the product, whichever is more.
4	Part 2 Section 9	Sanitation and maintenance of establishment premises	9.1.1	A cleaning and sanitation programme shall be drawn up and observed and the record thereof shall be properly maintained, which shall indicate specific areas to be cleaned, cleaning frequency and cleaning procedure to be followed, including equipment and materials to be used for cleaning. Equipment used in manufacturing will be cleaned and sterilized at set frequencies.
5	Part 2 Section 9	Sanitation and maintenance of establishment premises	9.2.3	Pest infestations shall be dealt with immediately and without adversely affecting the food safety or suitability. Treatment with permissible chemical, physical or biological agents, within the appropriate limits, shall be carried out without posing a threat to the safety or suitability of food. Records of pesticides / insecticides used along with dates and frequency shall be maintained.
6	Part 2 Section 10	Personal hygiene	10.1.2	Arrangements shall be made to get the food handlers / employees of the establishment medically examined once in a year to ensure that they are free from any infectious,

				contagious and other communicable diseases. A record of these examinations signed by a registered medical practitioner shall be maintained for inspection purpose.
7	Part 2 Section 10	Personal hygiene	10.1.3	The factory staff shall be compulsorily inoculated against the enteric group of diseases as per recommended schedule of the vaccine and a record shall be kept for inspection.
8	FSS Regulation	Condition of license	8	Maintain daily records of production, raw materials utilization and sales separately
9	FSS Regulation	Condition of license	14	The manufacturer/importer/distributor shall buy and sell food products only from, or to, licensed/registered vendors and maintain record thereof.

PART XII

PRODUCT INFORMATION AND CONSUMER AWARENESS

PRODUCT INFORMATION & CONSUMER AWARENESS

All packaged food products shall carry a label and requisite information as per provisions of FSS Act, 2006 and Regulations made there under. (Please refer http://www.fssai.gov.in/home/fss-legislation/fss-regulations.html)

Manner of Declaration

General Conditions

- Any information / pictorial device / graphic matter on label shall not be in conflict with the regulations
- Declarations shall be legible, conspicuous, clear, bold and in contrast to the background color

Height of Numerical in the Declaration-

Sr. No.	Net Qty.	Minimum Ht. of numeral
1	Up to 50 g/ml	1 mm
2	Above 50 g/ml up to 200 g/ml	2 mm
3	Above 200 g/ml up to 1 kg/L	4 mm
4	Above 1 kg/L	6 mm

Principal Display Panel (PDP)

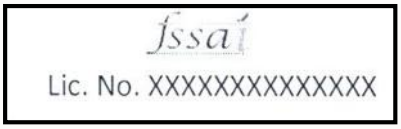
- All information required under the regulation shall be given on the PDP of the package / container which shall be
  - Grouped together and given at one place (applicable for pre-printed information also)
  - Online information / those not pre-printed shall be grouped together in another place

Labelling General Requirement –

Every pre-packaged food shall carry a label containing information as required hereunder unless otherwise provided, namely -

a. The particulars of declaration required under these Regulations to be specified on the label shall be in English or Hindi in Devanagari script; Provided that nothing herein contained shall prevent the use of any other language in addition to the language required under this regulation.
b. Pre-packaged food shall not be described or presented on any label or in any labelling manner that is false, misleading or deceptive or is likely to create an erroneous impression regarding its character in any respect.
c. Labels in pre-packaged foods shall be applied in such a manner that they will not become separated from the container.

d. Contents on the label shall be clear, prominent, indelible and readily legible by the consumer under normal conditions of purchase and use.
e. Where the container is covered by a wrapper, the wrapper shall carry the necessary information or the label on the container shall be readily legible through the outer wrapper and not obscured by it.
f. License number shall be displayed on the principal display panel in the following format



Labelling of Pre-packaged Foods

In addition to the General Labelling requirements specified above every package of food shall carry the following information on the label, namely -

- Name of the food
- List of ingredients in descending order
- Nutritional information
- Declaration regarding veg or non-veg
- Declaration regarding food additives
- Name and complete address of manufacturer or packer
- Net content by weight or volume
- Date of Manufacture / Packing
- Lot / Code / Batch identification
- Best Before Date
- Instructions for use
- Importer details and Country of origin for imported products

All the contents provided on the label must be clear, prominent, indelible and legible.

A label or the primary pack of a food article must carry the following declarations -

1. The name of the food, which includes the trade name or description of the food in the package. It should be provided in bold type, clear and in distinct contrast with the background.
2. The ingredient or list of ingredients - Ingredient listing must carry a proper title namely “Ingredients” and the ingredients must be listed in descending order of prominence in product composition.
3. Nutrition information - must be declared on the label in numerical terms per 100 gm or 100 ml or per serving of the food. The information must include energy value (kcal), protein (gm), carbohydrate (along with sugar) and fat (gm), saturated fat, trans-fat, minerals and vitamins in metric units, nutrient for which a claim is made.
   When claim is made on amount or type of fatty acid or amount of cholesterol, the amount of SFA, MUFA, and PUFA (in gm), trans-fat (in gm) and cholesterol (in mg) needs to be declared.

4. If any food additives are used, the class title of the food additive along with the INS number as given in the rules must be given.
5. The vegetarian logo consisting of green-coloured filled circle within a square with green outline shall be declared on the package. This logo must appear close to the brand name and the dimensions must be as follows -

Sr. No.	Area of Principal display panel	Minimum size of diameter	Minimum size of the side of square
1	Up to 100 sq.cm	3 mm	6 mm
2	Above 100 sq.cm. upto 500 sq.cm.	4 mm	8 mm
3	Above 500 sq.cm. upto 2500 sq.cm.	6 mm	12 mm
4	Above 2500 sq.cm.	8mm	16mm

6. Name and address of the manufacturer and complete address of the manufacturing unit/premises
7. Where the manufacturer is not the packer the name and complete address of the packer must be printed on the label.
8. Every Manufacturer and Packer address must carry the valid License number, with prefix: License No.
9. The Manufacturer License No. should be mentioned in the FSSAI logo

   For products manufactured at company plants, License No. would be that of the company manufacturing unit.
   For products manufactured at third party location, License No. would be the company marketer's License No. and the manufacturing license of the manufacturing / packing unit.

   For products manufactured / packed at third party location, name and address of manufacturing / packing company as well as of the company on whose behalf it is manufactured / packed shall be included on the label.

10. The net quantity of the contents of the package - the net content must be expressed in terms of standard units of weight or measure. Area above and below the declaration must be free of printed information by a space equal to at least the height of the numeral and the area to the right and left by a space of at least twice the height of the numeral.
11. In case of a food enriched with a mineral / vitamin or protein, quantity of such enriched nutrient shall be mentioned.
12. The category of the food.
13. The words "proprietary food" in case the food is proprietary.
14. Best Before date - the shelf life must be indicated with the words "BEST BEFORE …. MONTHS FROM PACKAGING / MANUFACTURE" (as appropriate).
15. A distinctive batch number with the prefix Lot / Batch / Code No.
16. The date / month of manufacture / packaging of the product along with year to be specified.

17. The retail sale price of the package of food must be declared in the format “MRP Rs. XX inclusive of all taxes”.
18. Name, address, telephone number and the e-mail address if available of the person or office to be contacted in case of consumer complaints.
19. Height of the letter for all the declarations has to be minimum 1 mm.

Nutritional information –

Nutritional information is not necessary in case of raw agricultural foods / drinking water / single ingredients and bulk food.
When a claim is made on the amount or type of fatty acid or the amount of cholesterol, the amount of saturated fatty acids, monounsaturated fatty acids and polyunsaturated fatty acids in gm and cholesterol in mg should be declared. Along with this, the amount of trans-fatty acids in gm should also be stated.

Nutrition Information	
Amount per 100g of product	
Energy	# kcal
Protein	# g
Carbohydrates Sugars	# g
Fat	# g
Saturated fatty acids	# g
Polyunsaturated fatty acids	# g
Monounsaturated fatty acids	# g
Trans fatty acids	# g
Cholesterol	# mg

PART XIII

Food Safety Management System

13.1 Introduction to FSMS

13.2 FSMS Plan

13.1 Introduction of FSMS:

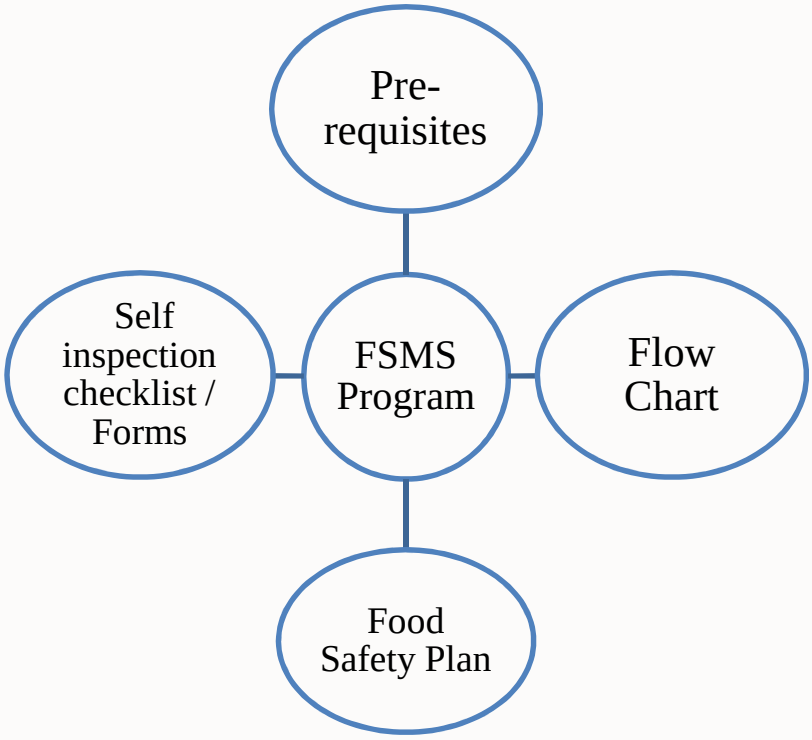
A Food Safety Management System (FSMS) is a network of interrelated elements that combine to ensure that food does not cause adverse human health effects. These elements include programs, plans, policies, procedures, practices, processes, goals, objectives, methods, controls, roles, responsibilities, relationships, documents, records, and resources.

The purpose of FSMS is to ensure the manufacture, storage, distribution and sale of safe food

There are five basic key elements of Food Safety Management System which are as follows:

- Good Practices/ PRPs
- Hazard Analysis /HACCP
- Management Element / System
- Statutory and regulatory requirements
- Communication

Structure of the FSMS Program:

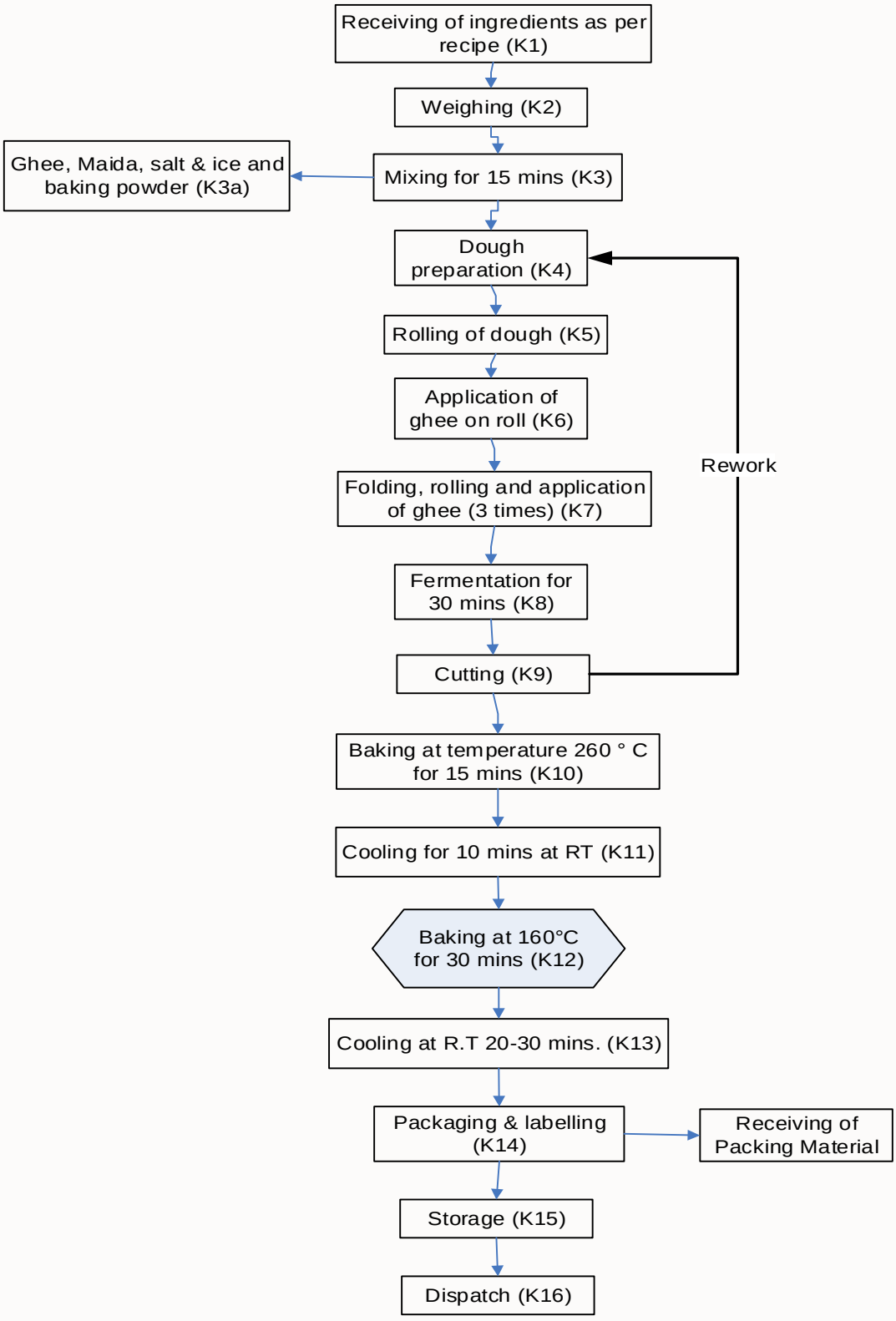


Self-Inspection Checklist:

This is the first part to be taken care of while preparing a FSMS Plan. The Self-inspection checklist shall cover all the requirements given in Schedule 4 – Part 2 of this handbook. The compliance to the Schedule 4 requirements needs to be inspected by individual FBO with the help of this checklist ***(Ref. Manual of FSMS, FSS Act 2006 on FSSAI Website)*** to check whether the Food Safety Management System is in place &whether all the licensing conditions are complied.

Flow Chart:

- A flow chart is a list of the different steps involved in processing of Edible oil
- Writing a flow chart is the second part of your FSMS
- This is an example of Khari (Baked Product) Processing:



FSMS Plan:

Every manufacturing / processing unit should submit a Food Safety Management System Plan.

It has to be developed based on Schedule – 4 of Food Safety and Standards Regulation, 2011 as given further in this handbook, in which general hygienic and sanitary practices to be followed by food business operators have been elaborated.

Along with sanitation and maintenance of establishment premises, personal hygiene of workers as well as personal cleanliness is also to be ensured by the FBO's.

The food safety plan shows:

- ***Hazard*** - What problems could happen
- ***Control measures*** - What you do to stop problems
- ***Critical Limits*** - What are the critical limits set for each control measure
- ***Monitoring method*** - How do you make sure that what you are doing stops the problem
- ***Corrective Action*** - What you do if something goes wrong
- ***Records*** - What records you keep

This has to be done for every step identified in your flowchart. FBO will need to complete a food safety plan as the third part of the FSMS.

Sample FSMS Plan for any Food Product Processing:

Operational Step	Hazard	Control Measure	Critical Limit	Monitoring Method	Corrective Action	Responsibility	Record

Problems can be caused by various physical, chemical & microbiological hazards. Sometimes allergens may also be considered as hazard to the product depending on the end product characteristics.

The above given example of FSMS Plan needs to be prepared / customized on the basis of process criticality and product characteristics. It will be different for each process and industry for which guidance of a Food Safety Expert is essential, who can help you in reviewing your PRPs, preparing flow chart, considering the probable hazards occurring at each step and preparing the FSMS Plan which is suitable for your industry.

ANNEXURES

01: General Category

No	Area	Observation
1.	**LOCATION AND LAYOUT OF FOOD ESTABLISHMENT**	
	a) The factory is ideally located away from industries which are emitting harmful gases, obnoxious odour, chemical etc.	
	b) The nature of ceiling roof is of permanent nature (Iron sheet/Asbestos sheet/ R.C.C).	
	c) The floor of building is cemented, tiled or laid in stone/ pakka floor.	
	d) The production area walls are smooth, made with impervious material up to a height of not less than five feet and the junction between the walls and floors are curved.	
	e) The premises of the factory is adequately lighted and ventilated, properly white washed or painted.	
	f) Provision for disposal of refuse and effluents is available.	
	g) The food production/ food service area provided with adequate drainage facility.	

	h) In case cooking is done on open fire, proper outlets for smoke/ steam etc, like chimney, exhaust fan etc are installed and the fans installed at a suitable height.	
	i) Doors are provided with automatic door closer.	
	j) Doors, Windows and other openings are fitted with net or screen to prevent insects etc.	
	k) Antiseptic/ disinfectant foot bath is provided at the entrance.	
	l) Sufficient number of latrine and urinals for worker are provided and located outside the processing hall.	
	m) All the machinery is installed in such a manner which may allow continuous flow of production and do not occupy more than 50% of the total production and permits hygienic production and easy movement.	
2.	**EQUIPMENT AND FIXTURES**	
	a) Equipments kept clean, washed, dried and free from moulds and fungi.	
	b) No such Container/ Vessel/ Equipment's in use likely to cause metallic contamination.	
	c) The table tops used for food preparation are made of close joint and impervious material.	
	d) The equipment's are made of stainless steel /galvanised iron/ non corrosive materials.	
	e) Appropriate facilities for the cleaning and disinfecting of equipment's and instruments and preferably cleaning in place (CIP) system are adopted; wherever necessary.	
3.	**STORAGE SYSTEMS**	
	a) Appropriate arrangement for storage of food & food ingredients provided and adequately segregated and labelled.	
	b) Systems to adequately maintain time- temperature control at the time of storage.	
	c) Raw material, food additives and ingredients, wherever applicable are conforming to regulations laid down under the act.	
	d) Containers used for storage are made of non-toxic material.	
	e) Cold Storage facility, wherever necessary/ provided.	

4.	**PERSONAL HYGIENE**	
	a) Suitable aprons, head cover, disposable gloves & footwear are provided.	
	b) Adequate facilities for toilets, hand wash and footbath, with provision for detergent/bactericidal soap, hand drying facility and nail cutter are provided.	
	c) No person suffering from any infection or contagious disease.	
	d) Arrangements are made to get the staff medically examined once in six months to ensure that they are free from infectious, contagious and other diseases.	
	e) The staff working in such factory are inoculated against the enteric group of disease and vaccinated.	
	f) No employee of such factory who is suffering from a hand or face injury, skin infection or clinically recognizable infectious disease.	
5.	**WATER SUPPLY**	
	a) Adequate supply of potable water.	
	b) Appropriate facilities for safe & clean storage of water.	
	c) The water is examined chemically and bacteriologic ally by a NABL Accredited laboratory.	
	d) Ice and steam wherever in use during processing is made from potable water.	
	a) Identifying marks have been applied to the pipelines for easy identification of potable and non-potable water.	
6.	**PEST CONTROL SYSTEM**	
	a) Treatment with permissible chemical, physical or biological agents within the permissible limits are carried out.	
	b) Adequate control measures are in place to prevent insect and rodents from the processing area.	
7.	**CONVEYANCE AND TRANSPORTATION**	
	a) Conveyance & transportation of food being done in an appropriate state of cleanliness, particularly if the same vehicle has been used to carry non-food items.	

	b) The conveyance and transportation are provided with temperature control system.	
	8. CLEANING AND MAINTENANCE	
	a) Cleaning and sanitation programme is drawn up, observed and the record of the same is properly maintained.	
	b) Food preparation areas are cleaned at regular intervals, with water, and detergent and with the use of a disinfectant.	
8.	**OPERATIONAL FEATURES**	
	a) The source and standards of raw material used are of optimum quality and as per Regulation and standards laid down under the Act.	
	b) Test report from own or NABL accredited/ FSSAI notified labs regarding microbiological contaminants in food items are available.	
	c) Arrangements for monitoring Temperature & Relative Humidity	
9.	**DOCUMENTATION AND RECORDS**	
	a) Records of daily production, raw material utilized and sales are available.	
	b) A periodic audit of the whole system according to the Standard Operating Procedure conducted regarding Good Manufacturing Practices/Good Hygienic Practices (GMP/	
	c) Appropriate records of food processing/ preparation, food quality, laboratory test results, pest control etc. for a period of 1 year or the shelf -life of the product; whichever	
	d) Records of sale and purchase that the food product sold to registered/licensed vendor and raw material purchased from registered/ licensed supplier.	
	e) Recall plan.	
11.	**PRODUCT INFORMATION AND CONSUMER AWARENESS**	
	a) All packaged food products carrying label and requisite information as per Regulations are made.	
12.	**TRAINING**	
	a) Food production personnel and production floor managers/ supervisors underwent appropriate food hygiene training.	

Sample Flowchart:

Please prepare in accordance with process steps followed in your Operation

Sample FSMS Plan

Please prepare based on Hazard Analysis (Guidance available in Section 2 and 3 of Reference Document)

FSMS Plan Format:

Operational Step	Hazard	Control Measure	Critical Limit	Monitoring Method	Corrective Action	Responsibility	Record
1.							
2.							
3.							

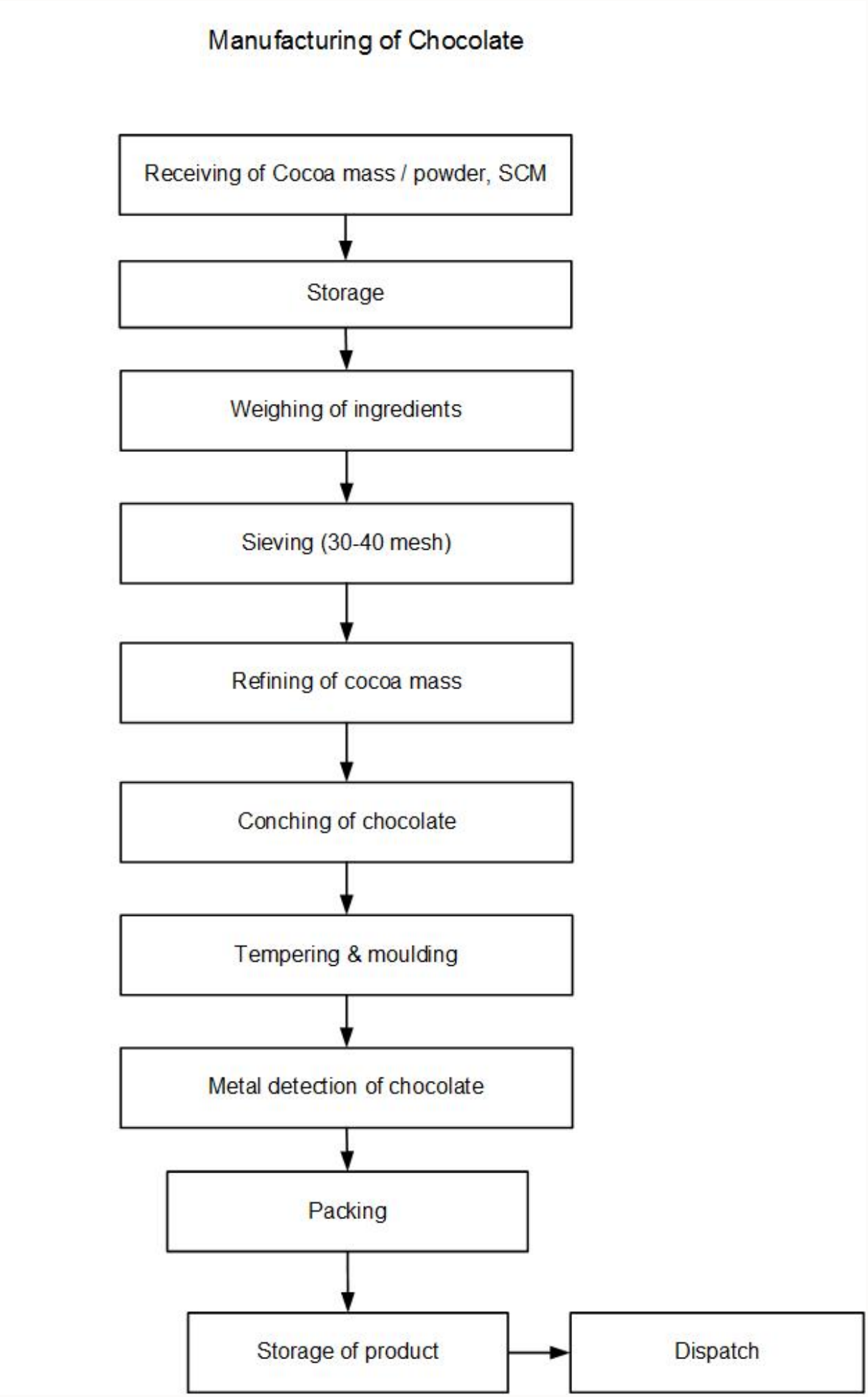
02: Confectionery Products

Sr. No.	Area	Status
1	**LOCATION AND LAYOUT OF THE ESTABLISHMENT**	
A	The Food service establishment is ideally located away from industries which are emitting harmful gases, obnoxious odour, chemical etc.	
B	The Food preparation area walls are smooth, made with impervious material up to a height of not less than five feet and the junction between the walls and floors are curved.	
C	The premises of the food outlet is adequately lighted and ventilated, properly white washed or painted.	
D	Food preparation/ cooking/frying area is equipped with chimney with appropriate suction capacity depending upon kitchen size to avoid smoke	
E	The preparation/ processing/ cooking should be adequate to eliminate and reduce hazards to an acceptable level which might have been introduced at the raw food level.	
2	**EQUIPMENT AND FIXTURES**	
A	Work surfaces, and equipments are thoroughly cleaned before the preparing of food starts and after it has been used	
B	The equipments are made of stainless steel /galvanised iron/ non corrosive materials.	
C	Appropriate facilities for the cleaning and disinfecting of equipments and instruments and preferably cleaning in place (CIP) system are adopted; wherever necessary.	
D	All electrical wires, boards and panels are adequately secured and in a clean state	
E	Any glass fixture including tubelights is appropriately secured with an unbreakable high temperature resistant material	
3	**STORAGE SYSTEMS**	
A	Appropriate arrangement for storage of food & food ingredients provided and adequately segregated and labeled	
B	Containers used for storage are made of non toxic material.	
C	Storage temperature and humidity is maintained as appropriate	
D	Stock Rotation is followed	
4	**PERSONAL HYGIENE**	
a	Food handlers must wear suitable clean clothes and where necessary, shall wear head cover, apron, mask mouth and use gloves etc	
B	Avoidance of unhygienic practices such as chewing tobacco, touching face, mouth, ear or other body parts, Spitting, sneezing, coughing by food handler.	
c	Adequate facilities for toilets, hand wash and footbath, with provision for detergent/bactericidal soap, hand drying facility and nail cutter are provided	

D	Arrangements are made to get the staff medically examined once in six months to ensure that they are free from infectious, contagious and other diseases.	
E	All food handlers are inoculated against the enteric group of micro-organisms	
6	**WATER SUPPLY**	
a	Adequate supply of potable water.	
B	Appropriate facilities for safe & clean storage of water.	
c	The water is examined chemically and bacteriologic ally by a NABL Accredited laboratory at a defined frequency and whenever the potential for contamination or an epidemic is identified.	
D	Ice and steam wherever in use during processing is made from potable water.	
7	**PEST CONTROL SYSTEM**	
a	Treatment with permissible chemical, physical or biological agents within the permissible limits are carried out.	
b	Adequate control measures are in place to prevent insect and rodents from entry into the processing area.	
c	The area has proper mesh and fly catchers at appropriate locations to prevent pest entry.	
8	**CONVEYANCE AND TRANSPORTATION AND HANDLING OF FOOD**	
a	The vehicle/transportation used to carry cooked/prepared/processed food is clean and not used to carry anything else.	
b	The conveyance and transportation are provided with temperature control system.	
9	**CLEANING AND MAINTENANCE**	
a	Cleaning and sanitation program is drawn up, observed and the record of the same is properly maintained. The schedule include: • Area needs to be cleaned • Frequency of cleaning • Method of cleaning	
10	**OPERATIONAL FEATURES**	
A	The source and standards of raw material used are of optimum quality and as per Regulation and standards laid down under the Act.	
B	Test report from own or NABL accredited/ FSSAI notified labs regarding microbiological contaminants in food items are available.	
11	**AUDIT/ DOCUMENTATION AND RECORDS**	
a	Records of daily production, raw material utilized and sales are available.	
B	Appropriate records of food processing/ preparation, food quality, laboratory test results, pest control etc. for a period of 1 year or the shelf-life of the product; whichever is more.	
12	**PRODUCT INFORMATION AND CONSUMER AWARENESS**	
a	All packaged food products carrying label and requisite information as per Regulations are made.	

13	**TRAINING**	
a	Food handlers and production floor managers/ supervisors underwent appropriate food hygiene training.	

Sample Flowchart for Chocolate Manufacturing



Sample FSMS Plan for Biscuit manufacturing

Operational Step	Hazard	Control Measure	Critical Limit	Monitoring Method	Corrective Action	Responsibility	Record
Raw material and packaging material incoming	Physical (dirt, stone particles woodchips in flour/sugar) Chemical (toxins, mycotoxins from wheatflour, pesticides from raw materials) Microbiological (high microbiological load of raw materials, presence of pathogenic bacteria)	Supplier guarantee specifications established by quality assurance department of plant Relative humidity of the store to be maintained FIFO system should be established	As per FSSA 2006 and company internal specifications	Supplier guarantee certificate is visually confirmed Monitor temperature and humidity of storage	Reject materials if not accompanied by supplier guarantee.	Store manager	Supplier Guarantee Store Temperature logs
Tempering	Microbiological (presence of pathogenic bacteria after heat treatment because of an inadequate heating process)	Temperature and tempering period should be controlled during process	Temperatures should reach specified levels	Temperature and tempering time should be checked	f adequate temperature is not provided, re-repeat the heating process or discard product	Production	Time – temperature records Microbiologic al analyses results
Metal detector	Physical (presence of metal particles in final product)	Control is done by metal detectors	Final product should be free of metal contaminants	Presence of metal particles should be checked	Rejection of the product having metal contamination	QA/QC	Periodically calibration results and certificates of metal detectors

03: Egg and Egg Products

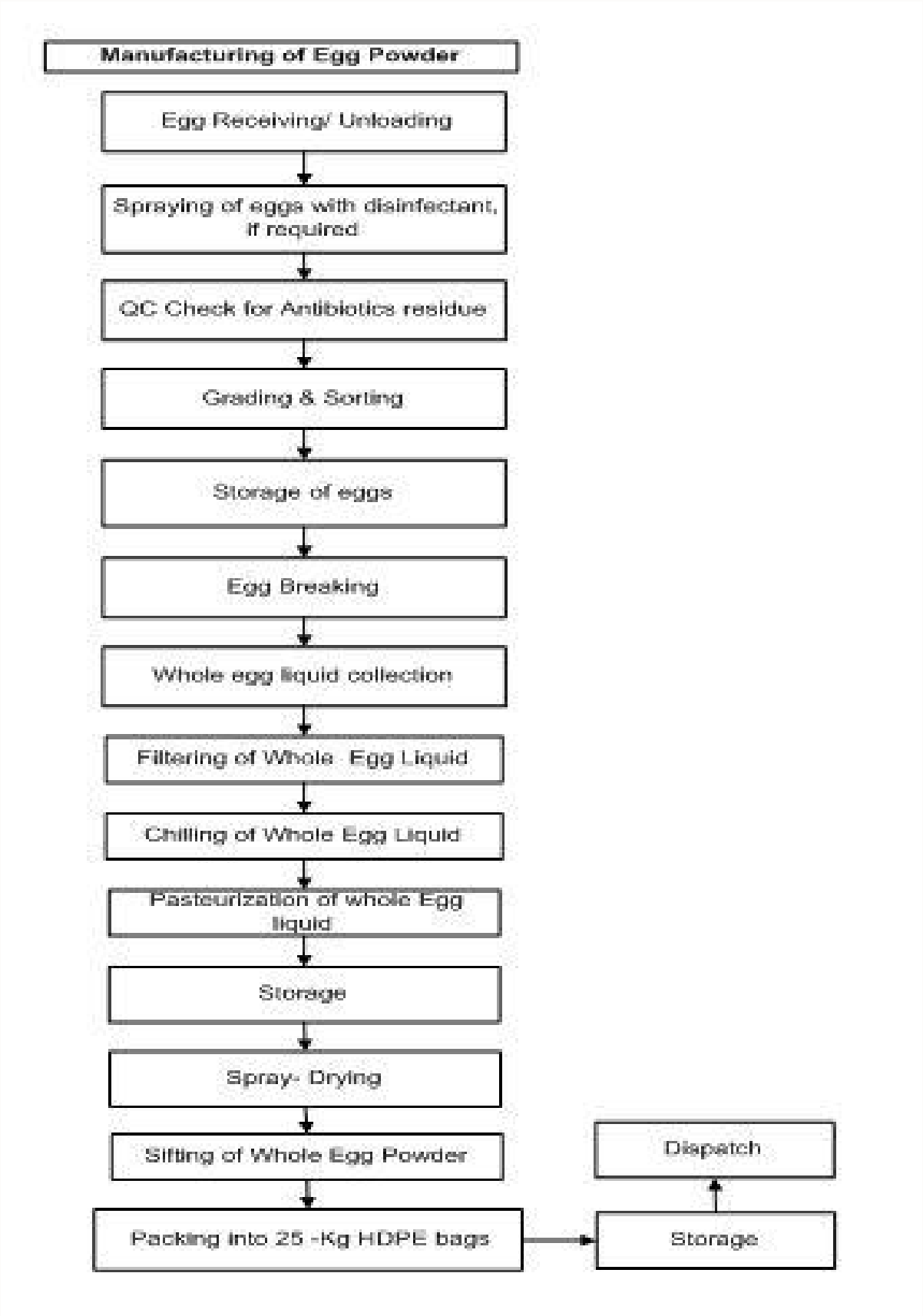
Sr. No.	Particular/ Point of inspection	Observation
1	**LOCATION AND LAYOUT OF FOOD ESTABLISHMENT**	
a.	The factory is ideally located away from industries which are emitting harmful gases, obnoxious odour, chemical etc.	
b.	The nature of ceiling roof is of permanent nature (Iron sheet/ Asbestos sheet/ R.C.C).	
c.	The floor of building is cemented, tiled or laid in stone/ pakka floor.	
d.	The production area walls are smooth, made with impervious material up to a height of not less than five feet and the junction between the walls and floors are curved.	
e.	The premises of the factory is adequately lighted and ventilated, properly white washed or painted.	
f.	Provision for disposal of refuse and effluents is available.	
g.	The food production/ food service area provided with adequate drainage facility.	
h.	In case cooking is done on open fire, proper outlets for smoke/ steam etc, like chimney, exhaust fan etc are installed and the fans installed at a suitable height.	
i.	Doors are provided with air curtain/strip curtain & automatic door closer.	
j.	Doors, Windows and other openings are fitted with net or screen to prevent insects etc.	
k.	Windows are fitted with insect proof screen/mesh & are maintained cleaned.	
l.	Antiseptic/ disinfectant foot bath is provided at the entrance (not applicable if internal & external shoes are separate).	
m.	Sufficient number of latrine and urinals for worker are provided and located outside the processing hall.	
n.	All the machinery is installed in such a manner which may allow continuous flow of production and permits hygienic production and easy cleaning & maintenance.	
2.	**EQUIPMENT AND FIXTURES**	
a	Equipment's kept clean, washed, dried and free from Molds and fungi.	
b	No such Container/ Vessel/ Equipment's in use likely to cause metallic contamination.	
c	The table tops used for food preparation are made of close joint and impervious material.	
d	The equipment's are made of stainless steel /galvanized iron/ non corrosive materials as permitted by the product characteristics.	
e	Appropriate facilities for the cleaning and disinfecting of equipment's and instruments and preferably cleaning in place (CIP) system are adopted; wherever necessary.	

3.	**WATER SUPPLY**	
a	Adequate supply of potable water is available.	
b	Appropriate facilities for safe & clean storage of water.	
c	The water is examined chemically and bacteriologic ally by a FSSAI approved NABL Accredited laboratory.	
d	Ice and steam wherever in use during processing is made from potable water.	
e	Identifying marks have been applied to the pipelines for easy identification of potable and non-potable water.	
f	Waste disposal is done efficiently & there is no waste accumulation.	
g	Lighting fixtures are protected in all departments/areas	
4.	**PERSONAL HYGIENE**	
a	Suitable aprons, head cover, disposable gloves & footwear are provided.	
b	Adequate facilities for toilets, hand wash and if required footbath, with provision for detergent/bactericidal soap, hand drying facility and nail cutter are provided.	
c	Arrangements are made to get the staff medically examined once in six months to ensure that they are free from infectious, contagious and other diseases.	
d	The food handlers are inoculated against the enteric group of disease and vaccinated.	
e	No employee permitted in process who is suffering from a hand or face injury, skin infection or clinically recognizable infectious or contagious disease.	
f	Do's & don'ts for the workers is placed in prominent place in local language	
g	Smoking & spitting is not permitted in the food process/handling areas.	
5.	**FOOD OPERATIONS & CONTROL**	
a	Raw Egg is stored & handled in clean place to prevent any kind of contamination	
b	Raw Egg is cooled at temperature of 4 ^{0}C or lower and maintained at that temperature until further processed.	
c	Facilities for hygienic handling and protection of raw materials and of non – packed or non-wrapped products during loading and unloading, transport and storing including cooling facilities are provided.	
d	Proper facilities for cleaning and disinfecting of tanks used	
e	Appropriate arrangement for storage of food & food ingredients provided and adequately segregated, labelled & stock rotation system followed.	
f	Raised platform with sides and top sufficiently protected to prevent contamination.	

g	Systems to adequately maintain time- temperature control at the time of storage as per the product requirements.	
h	The source and standards of raw material, food additives, ingredients & packaging material wherever applicable are conforming to regulations laid down under the act.	
i	The cans/ containers used for storage and transportation of egg and egg products are not made up of mild steel metal and plastic material.	
j	Separate cold storage facility available for egg & egg products.	
k	Equipment are equipped with temperature indicator. All specific process controls/temperatures are maintained & recorded	
l	The receiving section is away from the processing area to prevent contamination.	
m	Separate area is provided for packaging of various products under satisfactory hygienic conditions	
n	Conveyance & transportation of food being done in an appropriate state of Cleanliness.	
o	Valid weight & measure certificates for weighing scales and weights from a Designated Authority are available	
p	Pallets are made of non-absorbent material provided on the floor for keeping egg products	
q	The products are properly stacked on pallets at least one feet away from wall.	
r	Details of vehicles used for transportation of products are maintained in stipulated format.	
6.	**AUDIT/ DOCUMENTATION AND RECORDS**	
a	Adequate documented system SOPs is in place for core processes like procurement, storage, processing, packing, etc.	
b	Records of daily production, raw material utilized and sales are available.	
c	A periodic audit of the whole system according to the Standard Operating Procedure conducted regarding Good Manufacturing Practices/Good Hygienic Practices (GMP/ GHP) system.	
d	Appropriate records of food processing/ preparation, food quality, laboratory test results, pest control etc. for a period of 1 year or the shelf-life of the product; whichever is more.	
e	Records of sale and purchase that the food product sold to registered/ licensed vendor and raw material purchased from registered/ licensed supplier.	
f	A documented recall plan is available & traceability is implemented to assure effectiveness of recall plan.	
7.	**FOOD TESTING FACILITY**	
a	Raw egg testing facility/Parameters available at reception. Is in-house laboratory is available for testing of egg & egg products.	
b	Test report from own or NABL accredited/ FSSAI notified labs regarding microbiological contaminants in food items are available.	
8.	**CLEANING AND MAINTENANCE**	

a	Cleaning and sanitation program is documented, implemented and the record of the same is properly maintained.	
b	Food preparation areas are cleaned at regular intervals, with water, and detergent and with the use of a disinfectant.	
c	The egg receiving area is equipped with cleaning facilities	
d	Approved waste water disposal system is hygienically operated.	
9.	**PEST CONTROL SYSTEM**	
a	Treatment with permissible chemical, physical or biological agents within the permissible limits are carried out.	
b	Adequate control measures are in place to prevent insect and rodents from the processing area.	
10.	**PRODUCT INFORMATION AND CONSUMER AWARENESS**	
a.	All packaged food products carrying label and requisite information as per Regulations are made.	
11.	**TRAINING**	
a.	Food production personnel and production floor managers, supervisors, food handlers undergone appropriate food hygiene training & records maintained.	
b.	Training programs are reviewed & scheduled to meet the hygiene compliance by food handlers.	

Sample Flowchart for Egg Powder Production



Sample FSMS Plan for Egg Powder Production

Operational Step	Hazard	Control Measure	Critical Limit	Monitoring Method	Corrective Action	Responsibility	Record
Filtration and transfer	Presence of shells in the product or other foreign particles : product free from foreign bodies and shells	• Use of grills in the reception tanks • Using filters (or anything equivalent), • preferably self-cleaning • Filters with a mesh size of max 1mm (diameter) • Use of magnet • Procedure for control glass and hard plastics, particularly : glass minimization, • check-list, immediate action in case of broken glass or hard plastic • Place filter for liquid egg products at the end, just as the product is filled into packaging. • This position ensures any contamination from pump seals is captured. • It will need to be checked daily for damage prior to cleaning.	Presence and integrity of the filter (preliminary qualified)	Visual check of filter. After each cleaning or before each day of production	**Immediate actions :** Change of the filter Treatment of the non-conformity : Stop the batch and new filtration **Corrective actions** Re-qualification of the filtration (material, maintenance…)	QA/QC	Filter maintenance records
Heat treatment and cooling	To avoid contamination by the treatment system (heating, recovery and cooling sections) To avoid the recontamination by non treated product decrease the microbial levels and eliminate possible pathogenic bacteria	• Regular checking of surface integrity (plates, gaskets…) • Use of only food approved chemicals for equipment which could be in contact with liquid eggs or egg products : lubricant, cooling fluids, oil • The use of previously established and validated heating regimes taking into account the nature and properties of the treated product • Calibration of the equipment for heat treatment (temperature and pressure for instance) • Recycling of inadequately treated product • Thermal insulation of the holding tubes, to limit the heat loss • Continuous control of temperature and flow rate	Company Specifications for Time/temperature chart of the heat treatment	Recording Thermometer Flowmeter	Recycling of product Adjustment of hot water Temperature Insulation, treating again or removing the non-conforming egg products	QA/QC	Temperature logs
Drying of egg products	Microbial contamination	• The use of previously established and validated processes taking into account the nature and properties of the treated product	Company specifications for Humidity of the powder	Each batch or more	Adjust the outlet air temperatures and/or egg product flow	QA/QC	Dryer Logsheet

		• The drying equipment must be cleaned and disinfected (tubes and towers) • Regular inspection program of tower and other parts (cracked parts and cool parts) Inlet air filtration • Regular cleaning program for filters • Avoid humidity during powder transfer			Have defined procedures for treating non-conforming products Repair the drying equipment if defective		
Packaging	Contamination with vegetative pathogens	Packaging Environment to be controlled Packaging material quality	Company Specifications	Hygiene verification Packaging material quality checks	Reject lots not complying with specifications or revalidate process requirements	QA/QC	Plant Hygiene checklist Incoming Material test records

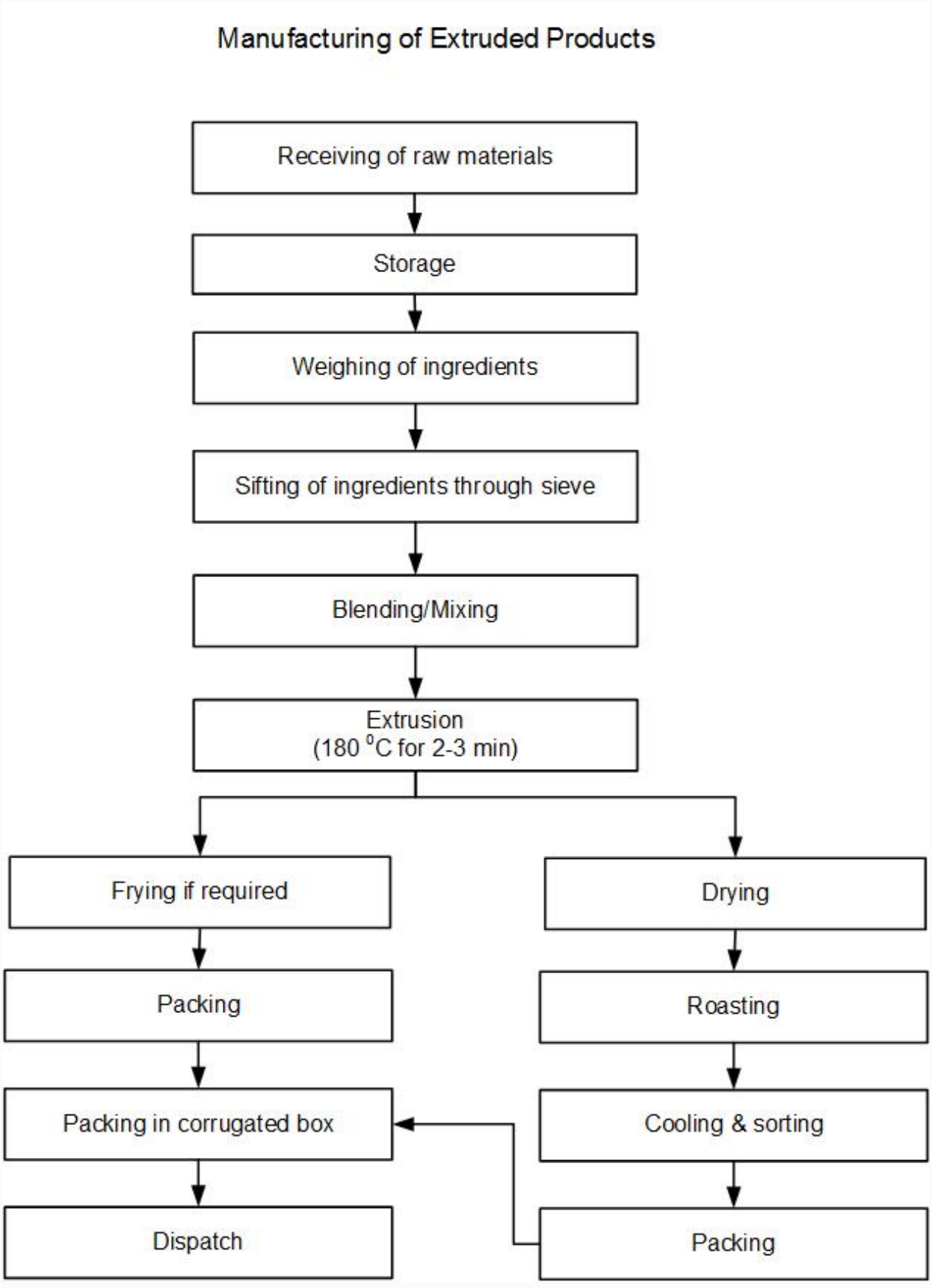
04: Ready to Eat Savouries

Sr. No	Area	Status
1	**LOCATION AND LAYOUT OF THE ESTABLISHMENT**	
A	The Food service establishment is ideally located away from industries which are emitting harmful gases, obnoxious odour, chemical etc.	
B	The Food preparation area walls are smooth, made with impervious material up to a height of not less than five feet and the junction between the walls and floors are curved.	
C	The premises of the food outlet is adequately lighted and ventilated, properly white washed or painted.	
D	Food preparation/ cooking/frying area is equipped with chimney with appropriate suction capacity depending upon kitchen size to avoid smoke	
E	The preparation/ processing/ cooking should be adequate to eliminate and reduce hazards to an acceptable level which might have been introduced at the raw food level.	
2	**EQUIPMENT AND FIXTURES**	
A	Work surfaces, chopping boards and equipments are thoroughly cleaned before the preparing of food starts and after it has been used	
B	Separate chopping boards and knives for raw fruit/ vegetables/meat/poultry and ready-to-eat food are used	
C	The equipments are made of stainless steel /galvanised iron/ non corrosive materials.	
D	Appropriate facilities for the cleaning and disinfecting of equipments and instruments and preferably cleaning in place (CIP) system are adopted; wherever necessary.	
E	All electrical wires, boards and panels are adequately secured and in a clean state	
F	Any glass fixture including tubelights is appropriately secured with an unbreakable high temperature resistant material	
3	**STORAGE SYSTEMS**	
A	Appropriate arrangement for storage of food & food ingredients provided and adequately segregated and labeled	
B	Containers used for storage are made of non toxic material.	
C	Storage temperature and humidity is maintained as appropriate	
D	Stock Rotation is followed	
4	**PERSONAL HYGIENE**	
a	Food handlers must wear suitable clean clothes and where necessary, shall wear head cover, apron, musk mouth and use gloves etc	
B	Avoidance of unhygienic practices such as chewing tobacco, touching face, mouth, ear or other body parts, Spitting, sneezing, coughing by food handler.	
c	Adequate facilities for toilets, hand wash and footbath, with provision for detergent/bactericidal soap, hand drying facility and nail cutter are provided	

D	Arrangements are made to get the staff medically examined once in six months to ensure that they are free from infectious, contagious and other diseases.	
E	All food handlers are inoculated against the enteric group of micro-organisms	
6	**WATER SUPPLY**	
a	Adequate supply of potable water.	
B	Appropriate facilities for safe & clean storage of water.	
c	The water is examined chemically and bacteriologic ally by a NABL Accredited laboratory at a defined frequency and whenever the potential for contamination or an epidemic is identified.	
D	Ice and steam wherever in use during processing is made from potable water.	
7	**PEST CONTROL SYSTEM**	
a	Treatment with permissible chemical, physical or biological agents within the permissible limits are carried out.	
b	Adequate control measures are in place to prevent insect and rodents from entry into the processing area.	
c	The area has proper mesh and fly catchers at appropriate locations to prevent pest entry.	
8	**CONVEYANCE AND TRANSPORTATION AND HANDLING OF FOOD**	
a	The vehicle/transportation used to carry cooked/prepared/processed food is clean and not used to carry anything else.	
b	The conveyance and transportation are provided with temperature control system.	
9	**CLEANING AND MAINTENANCE**	
a	Cleaning and sanitation programme is drawn up, observed and the record of the same is properly maintained. The schedule include: • Area needs to be cleaned • Frequency of cleaning • Method of cleaning	
10	**OPERATIONAL FEATURES**	
A	The source and standards of raw material used are of optimum quality and as per Regulation and standards laid down under the Act.	
	Meat, poultry, fish and other non-veg products are only sourced from licenced / authorized vendors.	
B	Test report from own or NABL accredited/ FSSAI notified labs regarding microbiological contaminants in food items are available.	
11	**AUDIT/ DOCUMENTATION AND RECORDS**	
a	Records of daily production, raw material utilized and sales are available.	
B	Appropriate records of food processing/ preparation, food quality, laboratory test results, pest control etc. for a period of 1 year or the shelf-life of the product; whichever is more.	

12	**PRODUCT INFORMATION AND CONSUMER AWARENESS**	
a	All packaged food products carrying label and requisite information as per Regulations are made.	
13	**TRAINING**	
a	Food handlers and production floor managers/ supervisors underwent appropriate food hygiene training.	

Sample Flowchart for Extruded Snacks



Sample FSMS Plan for Extruded Snacks

Operational Step	Hazard	Control Measure	Critical Limit	Monitoring Method	Corrective Action	Responsibility	Record
Raw material and packaging material incoming	Physical (dirt, stone particles woodchips in vegetables) Chemical (toxins, mycotoxins from wheatflour, pesticides from raw materials) Microbiological (high microbiological load of raw materials, presence of pathogenic bacteria)	Supplier guarantee specifications established by quality assurance department of plant Relative humidity of the store to be maintained FIFO system should be established	As per FSSA 2006 and company internal specifications	Supplier guarantee certificate is visually confirmed Monitor temperature and humidity of storage	Reject materials if not accompanied by supplier guarantee.	Store manager	Supplier Guarantee Store Temperatur e logs
Washing vegetables	Physical (non-removal of dirts because of an inadequate washing programme) Chemical (contamination from low quality water, presence of chlorine after an inadequate rinsing) Microbiological (contamination of microorganisms, especially pathogens from low microbiological quality water)	Washing and sanitation as per established SOPs Residue chlorine amount of vegetables should be under the upper limits given in specifications	50-125 ppm active chlorine is adequate for elimi- nating the microbial risks of vegetables. For very dirty raw materials 1-5 ppm active chlorine should be added to the final rinsing water	Check the amount od chlorine used for washing process Verify washing is as per SOP	Re-wash the vegetables in case of an inadequate washing If the residue chlorine is high, re-rinsing should be performed If chemical and microbiological attributes of water are not being matched with the standards, water should be treated before using in the manufacturing line	QA	Chlorine certificates and specificatio ns Washing effectivenes s test results
Heating (Boiling , pasteurization, frying, cooking)	Microbiological (presence of pathogenic bacteria after heat treatment because of an inadequate heating process)	Temperature and boiling period should be controlled during process	Product Core Temperatures should reach specified levels	Temperature and time should be checked	f adequate temperature is not provided, re-repeat the heating process or discard product	Production	Time – temperature records Microbiolo gic al analyses results
Metal detector	Physical (presence of metal particles in final product)	Control is done by metal detectors	Final product should be free of metal contaminants	Presence of metal particles should be checked	Rejection of the product having metal contamination	QA/QC	Periodically calibration results and certificates of metal detectors

05: Fruit Processing

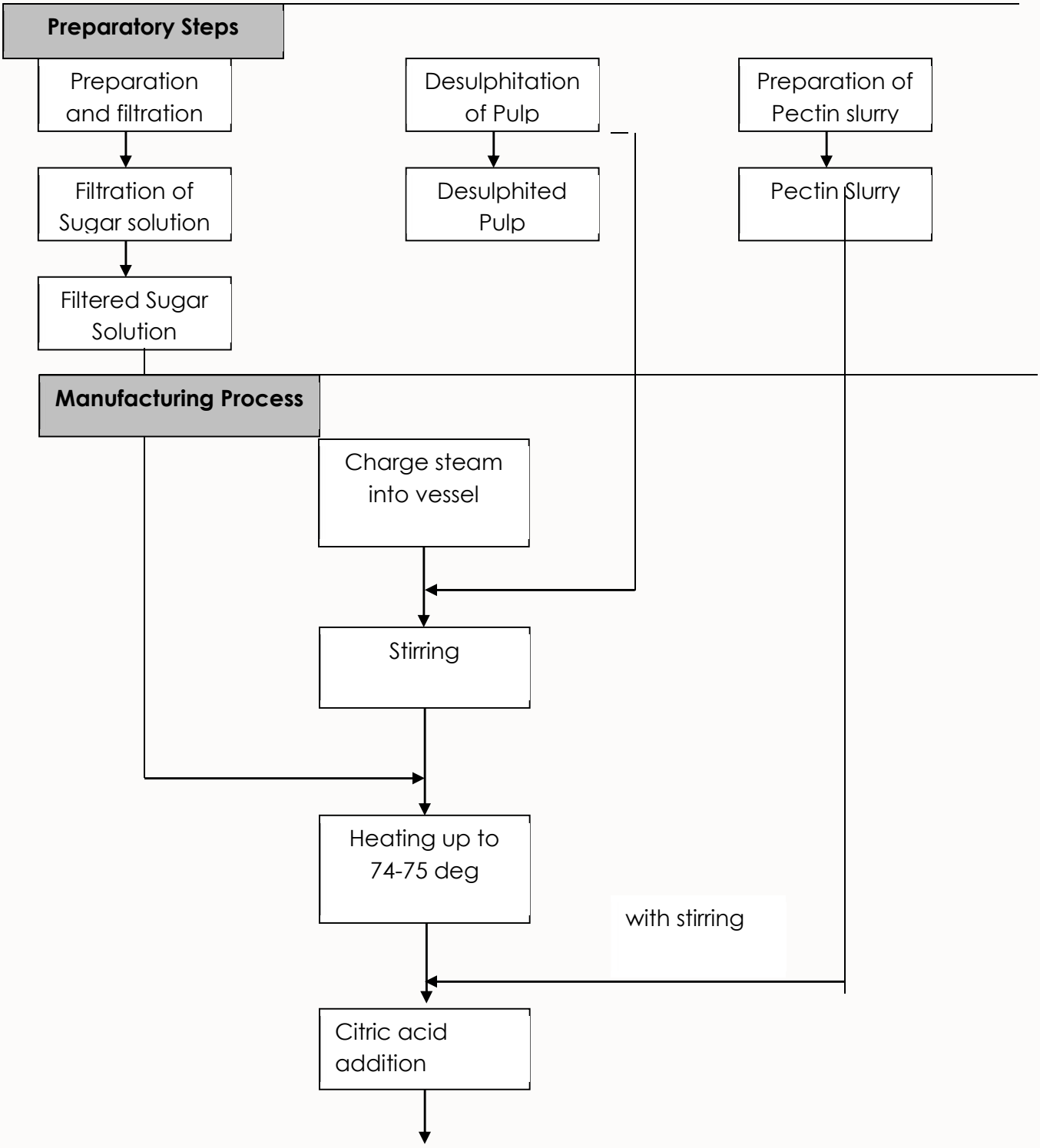
S.No.	Particular/ Point of inspection	Observation
1	**LOCATION AND LAYOUT OF FOOD ESTABLISHMENT**	
a)	The factory is ideally located away from industries which are emitting harmful gases, obnoxious odour, chemical etc.	
b)	The nature of ceiling roof is of permanent nature (Iron-sheet/ Asbestos sheet/ R.C.C).	
c)	The floor of building is cemented, tiled or laid in stone/pakka floor.	
d)	The production area walls are smooth, made with impervious material upto a height of not less than five feet and the junction between the walls and floors are curved.	
e)	The premises of the factory is adequately lighted and ventilated, properly white-washed or painted.	
f)	Provision for disposal of refuse and effluents is available.	
g)	The food production/ food service area provided with adequate drainage facility.	
h)	Incase cooking is done on open fire, proper outlets for smoke/steam etc., like chimney, exhaust fan etc. are installed and the fans installed at a suitable height.	
i)	Doors are provided with air curtain/strip curtain & automatic door closer.	
j)	Doors, Windows and other openings are fitted with net or screen to prevent insects etc.	
k)	Windows are fitted with insect proof screen/mesh & are maintained cleaned.	
l)	Antiseptic/ disinfect and foot bath is provided at the entrance (not applicable if internal & external shoes are separate).	
m)	Sufficient number of latrine and urinals for worker are provided and located outside the processing hall.	
n)	All the machinery is installed in such a manner which may allow continuous flow of production and permits hygienic production and easy cleaning & maintenance.	
2.	**EQUIPMENTANDFIXTURES**	
a)	Equipment's kept clean, washed, dried and free from moulds and fungi.	
b)	No such Container/Vessel/Equipment's in use likely to cause metallic contamination.	
c)	The table tops used for food preparation are made of close joint and impervious material.	
d)	The equipments are made of stainless steel/galvanized iron/noncorrosive materials as permitted by the product characteristics.	
e)	Appropriate facilities for the cleaning and disinfecting of equipments and Instruments and preferably cleaning-in-place (CIP) system are adopted; Wherever necessary.	
3.	**WATER SUPPLY**	

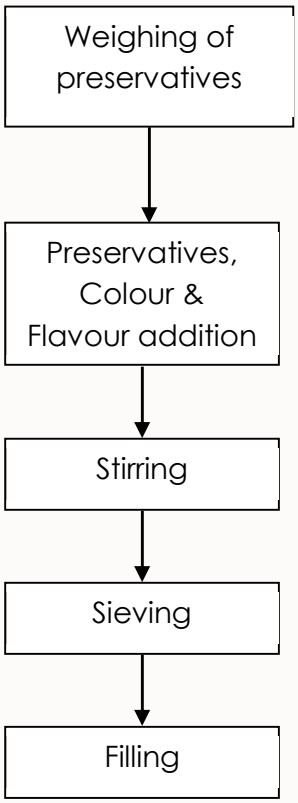
a)	Adequate supply of potable water is available.	
b)	Appropriate facilities for safe & clean storage of water.	
c)	The water is examined chemically and bacteriologically by a FSSAI approved NABL Accredited laboratory.	
d)	Ice and steam wherever in use during processing is made from potable water.	
e)	Identifying marks have been applied to the pipelines for easy identification of potable and non-potable water.	
f)	Waste disposal is done efficiently & there is no waste accumulation.	
g)	Lighting fixtures are protected in all departments/areas	
4.	**PERSONAL HYGIENE**	
a)	Suitable aprons, head cover, disposable gloves & footwear are provided.	
b)	Adequate facilities for toilets, hand-wash and if required footbath, with provision for detergent/bactericidal soap, hand drying facility and nail cutter are provided.	
c)	Arrangements are made to get the staff medically examined once in six months to ensure that they are free from infectious, contagious and other diseases.	
d)	The food handlers are inoculated against the enteric group of disease and vaccinated.	
e)	No employee permitted in process who is suffering from a hand or face injury, skin infection or clinically recognizable infectious or contagious disease.	
f)	Do's & don'ts for the workers is placed in prominent place in local language	
g)	Smoking & spitting is not permitted in the food process/handling areas.	
5.	**FOOD OPERATIONS & CONTROL**	
a)	Raw Egg is stored & handled in clean place to prevent any kind of contamination	
b)	Raw Egg is cooled at temperature of 4 ^{0}C or lower and maintained at that temperature until further processed.	
c)	Facilities for hygienic handling and protection of raw materials and of non–packed or non-wrapped products during loading and unloading, transport and storing including cooling facilities are provided.	
d)	Proper facilities for cleaning and is infecting of tanks used	
e)	Appropriate arrangement for storage of food & food ingredients provided and adequately segregated, labeled & stock rotation system followed.	
f)	Raised platform with sides and top sufficiently protected to prevent contamination.	
g)	Systems to adequately maintain time- temperature control at the time of storage as per the product requirements.	
h)	The source and standards of raw material, food additives, ingredients& packaging material wherever applicable are conforming to regulations laid down under the Act.	

i)	The cans/containers used for storage and transportation of egg and egg products are not made up of mild steel metal and plastic material.	
j)	Equipment are equipped with temperature indicator. All specific process controls/temperatures are maintained & recorded	
k)	The receiving section is away from the processing area to prevent contamination.	
l)	Separate area is provided for packaging of various products under satisfactory hygienic conditions	
m)	Conveyance & transportation of food being done in an appropriate state of Cleanliness.	
n)	Valid weight &measure certificates for weighing scales and weights from a Designated Authority are available	
o)	Pallets are made of non-absorbent material provided on the floor for keeping egg products	
p)	The products are properly stacked on pallets at least one foot away from wall.	
q)	Details of vehicles used for transportation of products are maintained in stipulated format.	
6.	**AUDIT/DOCUMENTATION AND RECORDS**	
a)	Adequate documented system SOPs is in place for core processes like procurement, storage, processing, packing, etc.	
b)	Records of daily production, raw material utilized and sales are available.	
c)	A periodic audit of the whole system according to the Standard Operating Procedure conducted regarding Good Manufacturing Practices/Good Hygienic Practices (GMP/GHP) system.	
d)	Appropriate records of food processing/ preparation, food quality, laboratory Test results, pest-control etc for a periodof1yearor the shelf-life of the product; whichever is more.	
e)	Records of sale and purchase that the food product sold to registered/ Licensed vendor and raw material purchased from registered/licensed supplier.	
f)	A documented recall plan is available & traceability is implemented to assure effectiveness of recall plan.	
7.	**FOOD TESTING FACILITY**	
a)	Raw fruit/vegetable testing facility/Parameters available at reception. Is in-house laboratory is available for testing of fruits and vegetables.	
b)	Test report from own or NABL accredited/FSSAI notified labs regarding microbiological contaminants in food items are available.	
8.	**CLEANING AND MAINTENANCE**	
a)	Cleaning and sanitation program is documented, implemented and the record of the same is properly maintained.	
b)	Food preparation areas are cleaned at regular intervals, with water, and detergent and with the use of a disinfectant.	
c)	The fruit receiving area is equipped with cleaning facilities	
d)	Approved waste water disposal system is hygienically operated.	

9.	**PEST CONTROL SYSTEM**	
a)	Treatment with permissible chemical, physical or biological agents within the permissible limits are carried out.	
b)	Adequate control measures are in place to prevent insect and rodents from The processing area.	
10.	**PRODUCT INFORMATION AND CONSUMER AWARENESS**	
a)	All packaged food products carrying label and requisite information as per Regulations are made.	
11.	**TRAINING**	
a)	Food production personnel and production floor managers, supervisors, food handlers under gone appropriate food hygiene training& records maintained.	
b)	Training programs are reviewed & scheduled to meet the hygiene compliance by food handlers.	

Sample Flowchart for Jam Manufacturing Process




Weighing of preservatives
Preservatives, Colour & Flavour addition
Stirring
Sieving
Filling

Sample FSMS Plan for Jam Manufacturing Process

Operational Step	Hazard	Control Measure	Critical Limit	Monitoring Method	Corrective Action	Responsibility	Record
Desulphitation of Pulp	Due to high residual SO2 content	• Monitor TSS (Brix) of desulphited pulp	TSS of desulphited pulp as defined	TSS of desulphited pulp with hand refractometer at the end of desulphitation of the lot on site	Further boiling of the pulp to bring it to desired TSS	Production personnel	Desulphitation Log sheet
Weighing of preservatives for batch preparation	Chemical hazard: due to excess preservative Biological hazard: Multiplication of microbes due to low preservative content	• Weighing preservative on electronic balance at the time of issuing preservatives for every lot	Specifications in SOP	Calibration of weighing balance Random cross verification of preservative quantities weighed for a batch	Recalibrate the balance	Production	log sheets
Filling (in bottles)	Inadequate vacuum due to lower temperature of jam at filling stage resulting in spoilage due to microbial growth	• Monitor temperature of the batch at the end of every lot filling •	Minimum temperature of jam as per specification in SOP	Vacuum in jam bottles for minimum vacuum specified Calibration of vacuum gauge Calibration of thermometer	Mixing of fresh jam lot to the batch and recheck the temperature	Production	Filling Log sheet

Tutor Guide

CONTENTS

Introduction for tutors

This tutor guide is intended for trainers who will train the Food Safety Supervisors (FSS) in General Food Manufacturing. There are multiple training partners and different trainers associated for training, thus making it necessary that all training partners provide the trainers with a standard framework, so that the deviation in imparting training is minimal. This guide provides tutors with the course ethos, methodology, outline of program structure, session plans and other relevant details on the delivery of the Food Safety Supervisor Training. This guide is restricted information and may be issued as controlled copies only to those personnel authorized to deliver the course.

Course Ethos

The design of the course is based on the assumption that the tutor's role is that of a mentor and coach, rather than simply a lecturer. The tutor is encouraged to use accelerated learning techniques which involve delegates and accommodate multiple learning styles. Adjustments in course methods and delivery may be made to accommodate the needs of the delegates, local circumstances, or unforeseen situations. However, tutors are responsible for ensuring that all activities, topics and learning objectives are satisfactorily covered.

The course is designed to run with a maximum of thirty delegates with one tutor. Practical exercises will be used throughout the course to allow delegates to utilize knowledge of general hygiene and food safety and develop the skills required to implement the same in the manufacturing establishment.

Tutor Qualifications

Only qualified, certified and authorized tutors who have attended the appropriate train-the-trainer session and hold the following minimum qualification may deliver this course:

1. Should be a Minimum graduate in science/food technology/food science/chemistry/biology/micro biology subjects having 5 years' experience in food safety aspect in Indian food context.
2. If graduate in other streams minimum 7 years' work & implementation experience in the food manufacturing industry.

Learning Objectives

The course is designed to equip participants (Food Safety Supervisor category personnel) with the knowledge and skills to enable them to implement correct food safety and hygiene requirements in manufacturing establishments and to also cascade the same to the food handlers of his business operations.

Course Conduct

It is recommended that tutors source the latest version of Food Safety and Standards Act, Rules & Regulations along with latest version of **"Training Manual Food Safety Supervisor Course Advance (Level 2) Manufacturing".**

Group Work

Some of the exercises and activities are designed to be undertaken individually or in groups of 3-4 delegates as small group activities provide opportunities for more reflective members of the group to participate. Where possible, try to select groups with a range of experience levels to give learners the opportunity to learn from each other. As applicable, juggle roles within groups so all delegates obtain a range of learning opportunities.

Assessment

At the end of the 8 hours training, there will be 30 minutes' competency based assessment. The assessment consists of written examination along with continuous evaluation of the interaction/contribution /presentations during the sessions.

Each trainee has to successfully pass the assessment. If the trainee fails the assessment, they are required to reappear for the assessment.

Session breakup

S. No.	Session	Duration (Minutes)
1	Part 1 – Inauguration & Introduction to food safety	45
2	Part 2 - Location, Layout & Facilities	30
3	Part 3 – Cleaning and Maintenance	30
4	Part 4- Pest Control	15
5	Part 5 – Personal Hygiene	30
6	Part 6 – Food Operation and Controls	30
7	Part 7- Food Transportation, Storage, Distribution	30
8	Part 8- Management and Supervision	30
9	Part 9- Food Testing	15
10	Part 10- Training	30
11	Part 11- Audit , Documentation & Records	30
12	Part 12- Product Information and Consumer Awareness	15
13	Part 13 – Food Safety Management System Plan	90
15	Examination	30
16	Feedback & Closing Remarks	30

Programme of the Training

Time	Topic
09:00 – 09:45	Part 1 – Inauguration and Introduction to food safety
09:45 – 10:15	Part 2 - Location, Layout & Facilities
10:15 – 10:45	Part 3 – Cleaning and Maintenance
10: 45- 11: 00	Tea Break

11:00 – 11:15	Part 4- Pest Control
11:15 – 11:45	Part 5 – Personal Hygiene
11:45 - 12: 15	Part 6 – Food Operation & Control
12:15 –12: 45	Part 7- Food Transportation, Storage & Distribution
12: 45 – 13: 15	Lunch
13:15 – 13:45	Part 8- Management and Supervision
13:45 – 14:00	Part 9- Food Testing
14:00 – 14:30	Part 10- Training
14:30 – 15:00	Part 11- Audit , Documentation & Records
15:00 – 15:15	Part 12- Product Information and Consumer Awareness
15:15 – 15:30	Tea Break
15: 30 – 17: 00	Part 13 - Food Safety Management System Plan
17:00 – 17:30	Examination
17:30 – 18:00	Feedback Collection & Closing Remarks

SESSION PLANS

INAUGURATION

S. No.	Inauguration	Proposed Duration: 15 minutes
1.	Contents	-Trainer inaugurates the training session, - Introduces himself & requests all trainees to do the same -Sets the background of the Training by explaining the overall program objectives of learning and cascading the same down the line in their own companies
	Learning Outcome	The FSS will - Learn about the importance of food safety & hygiene requirements to be followed by Food Safety Supervisor in Manufacturing establishment, - will obtain and introduction to each other - gain an overview of the expectations on the course from other FSS in the group.
	Examples	Industry based examples on importance and effectiveness of GHP, GMP and cascaded training
	Mode of training	Briefing by Faculty and Collective views of the participants
	Corresponding Activity	Introduction and Expectations from participants

PART I – INTRODUCTION TO FOOD SAFETY

S. No.	Introduction to Food Safety	Proposed Duration: 30 Minutes
1.	Contents	This part covers key terminologies, FSMS Program based on FSSA & Schedule 4, General introduction to food safety and food safety hazards, Introduction to Allergens and Allergen handling including Food Handler and Consumer Responsibilities.

	Learning Outcome	The FSS will learn about physical, chemical, biological hazards that are needed to be controlled, allergen handling and major reasons behind unsafe food.
	Examples	Industry based examples on key responsibilities of food handlers and consumers as per slides/ handbook
	Mode of training	Lecture/ discussion using slides & handbook and Activities
	Activity	- 2 Activity Sheet's on Hazards & Food borne illness - 1 Activity sheet on Allergens

PART II – LOCATION, LAYOUT & FACILITIES

S. No.	Location, Layout, Facilities	Proposed Duration: 30 minutes
2.	Contents	This part covers general requirements for location & surroundings for manufacturing establishments, what should be the layout & design of food establishment premises and Equipment and Containers. This part also covers facilities like water supply, Drainage & Waste Disposal, Personal Facilities and Toilets, Air Quality, Ventilation and lighting required for providing a safe & hygienic environment.
	Learning Outcome	The FSS will learn about the checks needed to make for ensuring that the surrounding and facilities are hygienic before food preparation and handling starts.
	Examples	Industry based examples on the contents for ease of understanding
	Mode of training	Lecture/ discussion using slides & handbook
	Activity	-

PART III – CLEANING AND MAINTENANCE OF ESTABLISHMENT

S. No.	Cleaning and Maintenance	Proposed Duration: 30 minutes
3.	Contents	This part covers Cleaning, Sanitation and Maintenance of Equipment's and Facility.
	Learning Outcome	The FSS will learn how to develop a robust establishment cleaning and equipment maintenance program which are key to manufacturing safe food.
	Examples	Industry based examples for ease of understanding
	Mode of training	Lecture/ discussion using slides & handbook
	Activity	Ask application related questions on what was covered /Request participants to share examples of good practices related to the cleaning ,sanitation, preventive maintenance of establishments and equipment's

PART IV – PEST CONTROL

S. No.	Pest Control	Proposed Duration: 15 Minutes
4.	Contents	This part covers steps to be taken when pests are sited, pesticide applications and use of baits and traps.
	Learning Outcome	The FSS will learn about general pest control activities, its impact on Food Safety and various methods to prevent and control birds and other pests
	Examples	Industry based examples for ease of understanding
	Mode of training	Lecture/ discussion using slides & handbook
	Activity	Facilitate a discussion on How 4D's (Deny Entry, Deny Food, Deny Home and finally Destroy) are an important principle in Pest Management

PART V – PERSONAL HYGIENE

S. No.	Personal Hygiene	Proposed Duration: 30 minutes
5.	Contents	This part covers monitoring of health status, maintenance of personal cleanliness through personal behaviour and protective clothing and maintenance of personal hygiene policy for visitors as well.
	Learning Outcome	The FSS will learn about how monitoring of health status, maintenance of personal cleanliness through personal behaviour and protective clothing and policy for visitors need to be ensured to ensure an environment of food safety & hygiene requirements
	Examples	Industry base examples for ease of understanding
	Mode of training	Lecture/ discussion using slides & handbook
	Activity	At least 4 Activity slides on Personnel Hygiene (at the end of this module)

PART VI – CONTROL OF OPERATIONS

S. No.	Control of Operations	Proposed Duration: 30 minutes
6.	Contents	This part covers requirements involved in Procurement & Storage of Raw material, Production and Packaging and the concept of Approved additives.
	Learning Outcome	The FSS will learn about: -checks on food safety requirements related to Raw Material (RM), Ingredients and Additives. -precaution for Storage of RM, Packaging Material, Work in Process & Finished Goods. -importance of FATTOM in Process Control, Packaging, Distribution - how to find out Approved Food Additives and Microbiological standards
	Examples	Industry based examples for ease of understanding
	Mode of training	Lecture/ discussion using slides & handbook

	Activity	Facilitate FSS to mention good practices on food safety & hygiene requirements followed for Procurement & Storage of various kinds of Raw material

PART VII – FOOD TRANSPORTATION, STORAGE, DISTRIBUTION

S. No.	Food Transportation, Storage, Distribution	Proposed Duration: 30 minutes
7.	Contents	This part covers hygienic requirements for Transportation, Storage and Distribution related to Food Business Operations.
	Learning Outcome	The FSS will learn about: -Hygienic Requirements for Food Transportation Vehicles -Importance of hygiene requirements in the Distribution and Supply Chain .
	Examples	Industry based examples for ease of understanding
	Mode of training	Lecture/ discussion using slides & handbook
	Activity	Facilitate FSS to develop a recording format for Vehicle Cleaning

PART VIII – MANAGEMENT AND SUPERVISION

S. No.	Management & Supervision	Proposed Duration: 30 minutes
8.	Contents	This part covers the need of Management and Supervision of Food Safety Management systems through: -Trained Manpower -Standard Operating Procedures for uniform understanding of following specified parameters in process steps - Maintenance of process related records
	Learning Outcome	The FSS will learn about -Topics and methods to train the food handlers on an ongoing basis - Key aspects (e.g. 5W + 1H & PDCA) to be covered when writing SOPs - Some Typical Record templates
	Examples	Industry base examples for ease of understanding
	Mode of training	Lecture/ discussion using slides & handbook
	Activity	Facilitate FSS to discuss a training plan for food handlers including contract workers for their unit

PART IX – FOOD TESTING

S. No.	Food Testing & Analysis	Proposed Duration: 30 minutes
9.	Contents	This part covers Sampling and Testing Procedure followed by the Authority for Food Business operations.
	Learning Outcome	The FSS will learn: -How the Food Authority with collect the sample for analysis and testing
	Examples	Specific clarifications sought by FBOs to be addressed on Food Testing requirements and others
	Mode of training	Lecture/ discussion using slides & handbook
	Activity	-

PART X - TRAINING

S. No.	Training	Proposed Duration: 30 minutes
10.	Contents	This part covers Training , Retraining, Importance of reviewing Training effectiveness and Training records
	Learning Outcome	The FSS will learn about -Training Responsibilities of FBOs - Importance of Refresher Training - Key topics of Training -Periodic Assessment of Training effectiveness and Training records
	Examples	Industry based examples on training methodology and need to train contractual workers for ease of understanding
	Mode of training	Lecture/ discussion using slides & handbook
	Activity	Facilitate FSS to identify Training Course Content for Food Handlers in Processing area.

PART XI – AUDIT, DOCUMENTATION & RECORDS

S. No.	Audit, Documentation and Records	Proposed Duration: 30 minutes
11.	Contents	This part covers the What & How of Internal Audits and need for key Records to be maintained
	Learning Outcome	The FSS will learn about: -Audit Program planning criteria -Important Documentation and Record keeping requirements
	Examples	Industry based examples on Audit Programs for ease of understanding
	Mode of training	Lecture/ discussion using slides & handbook
	Activity	Facilitate Discussion on identifying list of Records that need to be maintained by FBOs

PART XII – PRODUCT INFORMATION & CONSUMER AWARENESS

S. No.	Product Information and Consumer Awareness	Proposed Duration: 15 Minutes
12.	Contents	This Part covers elements to be addressed for Batch Identification , Product Information and Labelling requirements for Pre-packaged food & consumer awareness.
	Learning Outcome	The FSS will learn -How batch identification will lead to easy shelf life tracking, product traceability and Recall -How adequate information in the label as per FSSA makes information accessible to each person in the food chain to enable them to handle, store, process, prepare and display food products safely.
	Examples	Industry based examples of labels for ease of understanding
	Mode of training	Lecture/ discussion using slides & handbook
	Activity	Facilitate Group work on Practical analysis of label in a sample of packaged food product

PART XIII – FSMS PLANNING

S. No.	FSMS Planning	Proposed Duration: 90 Minutes
13.	Contents	This Part covers: -Elements of a FSMS Program - What are Process Steps -Developing Process Flow Diagrams - Developing FSMS Plan - FSMS through 7 Principles - Risk Assessment and Identifying CCPs - Critical Limits -Monitoring Systems -Corrective Actions -Verification Procedure -Documentation and Record Keeping
	Learning Outcome	The FSS will learn how to develop flow diagrams for purpose of preparing a Hazard Identification Table and a HACCP Plan for preparing a Food Safety Plan
	Examples	Industry based example on developing a Hazard Identification table and understanding what CCPs, Critical Limits, Monitoring Systems, Corrective Actions, Verification Procedure, Documentation and Record Keeping
	Mode of training	Lecture/ discussion using slides & handbook & activities
	Activity	Facilitate a Group exercise on collectively developing a sample Flow Diagram, Hazard Identification Table and a HACCP PLAN

SESSION PLAN XIV: PRACTICAL ACTIVITY SESSIONS

S. No.	Activity Sessions	Proposed Duration: Integrated in the respective sessions
14.	Contents	This part covers several practical Activity sessions in the classroom on food safety & hygiene requirements to be followed in food manufacturing as mentioned in the respective sessions
	Learning Outcome	The FSS will be facilitated by the faculty to interactively analyse and learn about hands-on implementation of food safety & hygiene requirements related to Schedule 4 sections on Sanitary and Hygienic Practices
	Mode of training through Activities	Questionnaires on slides, Faculty facilitated Group Work on Board, Group Discussions triggered by Questions from faculty, Best Practices sharing from participants would be the various methods of Accelerated leaning adopted for the purpose
	Activity	At least 4 Activities during the course on Hazards, How food becomes Unsafe, Personal Hygiene and FSMS Planning

SESSION PLAN XV: ASSESSMENT OF PARTICIPANTS

S. No.	Examination	Duration: Continuous Evaluation during the Course and 30 minutes Written Examination
15.	Contents	This part covers: -Assessment of FSS on presentation/ interaction, contribution during the course: 10 - Assessment of FSS on written examination: 20 marks
	Session Outcome	-The FSS will be assessed, scored, declared passed/failed and provided with FOSTAC Certificate on successful completion of the course. -The Evaluation process will take 3 weeks

SESSION PLAN XVI: FEEDBACK SESSION & CLOSING REMARKS

S. No.	Feedback Session & Closing Remarks	Proposed Duration: 30 minutes
16.	Contents	This part covers: -Briefing by faculty on certification of successful candidates. Unsuccessful candidates will be required to reappear for the exam. -The Faculty will close the training session with remarks on Business Continuity through Food Safety Practices and the importance of cascading the Training to their own food handlers

		including maintenance and contractual workers working in Food business operations - Capture Participants' Feedback for further Improvement of the Course
	Outcome	-The FSS will be certified as Qualified FoSTaC Food Safety Supervisors on successful completion of the course -Such Qualified FoSTaC Food Safety Supervisors will further train food handlers in their own units