



FOOD SAFETY AND STANDARDS
AUTHORITY OF INDIA

Inspiring Trust, Assuring Safe & Nutritious Food

Basic Food Safety Handbook / Manual for Food Manufacturers, Processors and Packers

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 –

Scope: The manual is designed for Food Business Operators small, medium and large scale food manufacturers, processors and packers.

This manual explains basic food safety and hygiene conditions to be followed by all the above entities in relation to all food, in consonance with the Act, including at the design stage as also at operational stage by individuals being Food Handlers.

Learning Outcome –

The desired learning 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 –

Section 16 (3) (h) of the Food Safety and Standards Act, 2006 states that “The Food Authority shall provide whether within or outside their area, training programmes in food safety and standards for persons who are or intend to become involved in food businesses, whether as food business operators or employees or otherwise”.

The establishment in which food is handled, processed and packed, by the food business operator and the persons handling them should conform to the sanitary and hygienic requirements, and food safety measures 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 and 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 –

(Taken from the Act mentioned below)

“Act” means the Food Safety and Standards Act, 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 thereunder

“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;

“Manufacture” means a process or adoption or any treatment for conversion of ingredients into an article of food, which includes any sub-process, incidental or ancillary to the manufacture of an article of food;

“Manufacturer ” means a person engaged in the business of manufacturing any article of food for sale and includes any person who obtains such article from another person and packs and labels it for sale or only labels it for such purposes;

“Package” means a pre-packed box, bottle, casket, tin, barrel, case, pouch, receptacle, sack, bag, wrapper or such other things in which an article of food is packed.

PART I

INTRODUCTION TO FOOD SAFETY

Food Safety & Food Safety

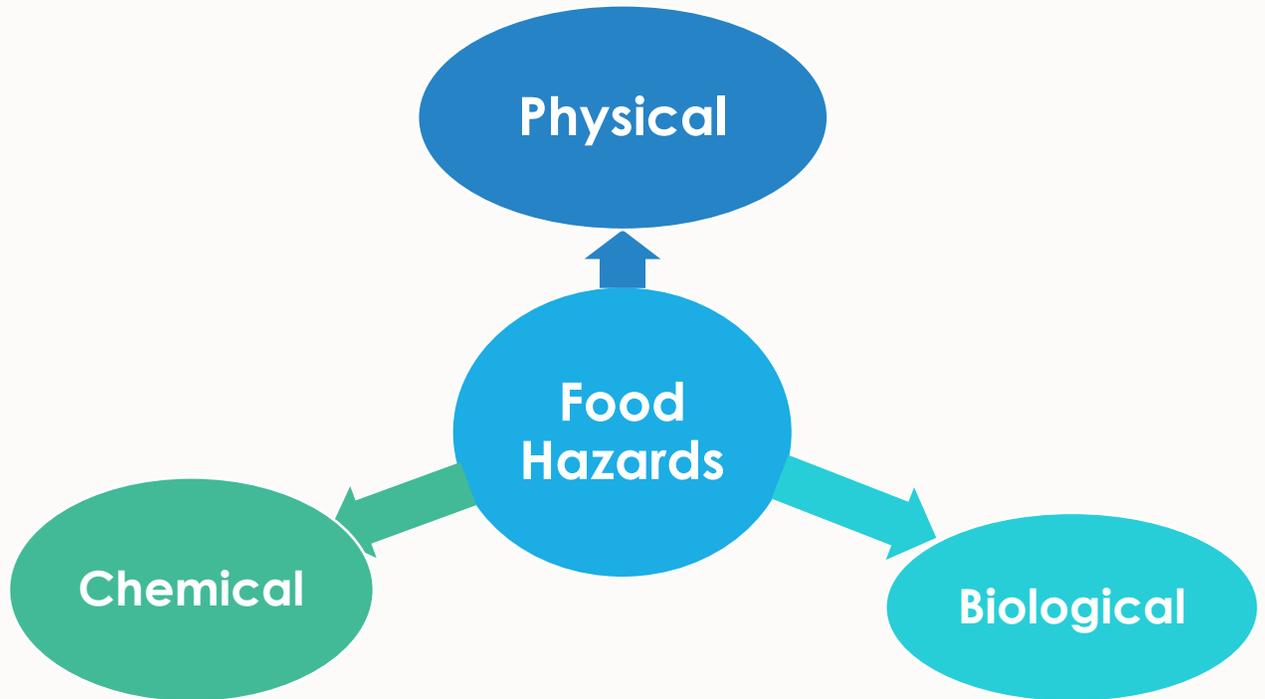
Hazards

Food spoilage

FOOD SAFETY& FOOD SAFETY HAZARDS

Basics in relation to certain hazards

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 -



1. Physical Hazards

Any foreign object (inanimate) found in the food or a naturally occurring object (metal, hard plastic), that can cause a food borne illness is called a 'Physical Hazard'.

Common Physical Hazards include:

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

- Insects and other pests

2. Chemical Hazards

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

Natural Chemical Contaminants include:

- Mycotoxins

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

3. 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 monocytogenes, Staphylococcus aureus, Clostridium botulinum,
- **Yeast & Mold** ex: Candida, Aspergillus sp, Helicosporium

Biological Hazards cause the following -

1. **Food Borne Infections**—This occurs when a person consumes food containing pathogens; which grow in the human intestine and cause discomfort or disease. Typical symptoms of a 'food borne infection' do not appear immediately.
2. **Food Borne Intoxications** - This occurs 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.

4. Physical-Biological Hazard

These are the hazards coming from biological creatures like flies, worms, cockroaches' weevils, caterpillars and so on, whether in live or dead form.

Conditions favouring growth of Microorganisms

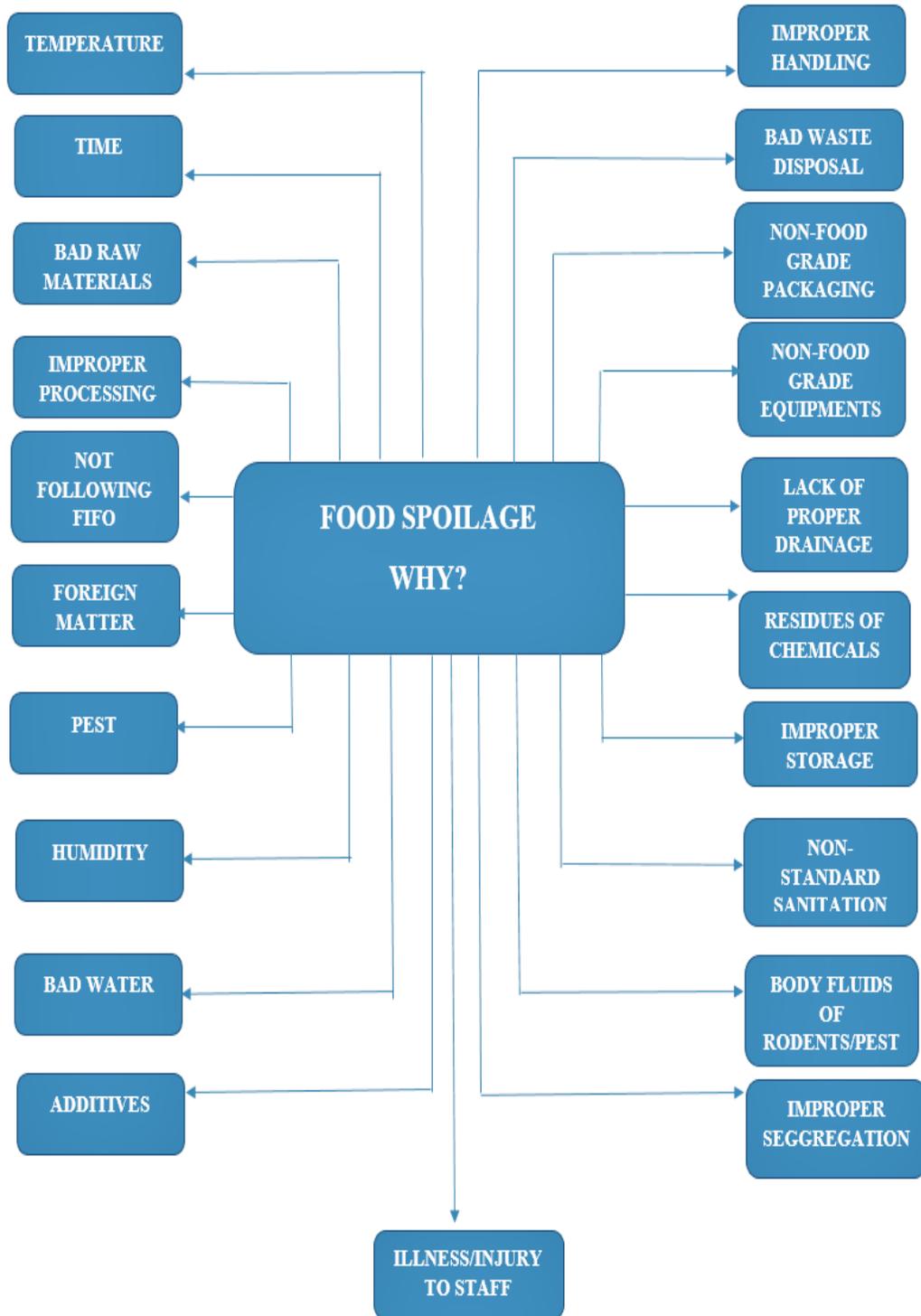
Easy to remember: "FAT TOM"

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°C – 60°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)'

FOOD SPOILAGE

Food spoilage occurs when the original nutritional value, texture and/or flavour of the food are affected or degraded, and the food become harmful to people and unsuitable to eat.

Major reasons for food spoilage are -



Include or add these further points for *Food Spoilage Why ?* in blocks :

- 1) Non GMP / Non Sanitary equipment design
- 2) Non compatible cleaning chemicals
- 3) Un safe physical and chemical product composition
- 4) Under cooking
- 5) Expired shelf life
- 6) Use of non food grade chemicals and lubricants,
- 7) Un hygienic surroundings

Also, delete “Bad” appearing from the Raw Materials box above.

Delete “Bad” from the Water box above, and just say “Water Quality” instead.

1. **Foreign matter:** Human hair, stapler, metal particles, fabric, plastic, glass pieces, 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:** A drain in a food processing area must have proper slope to ensure no back flow and should be smooth-surfaced and easy to clean, preventing re-entry of pests from a common drain.
3. **Non- food grade equipment:** There are many types of equipment that are used in food processing, and it is essential that non-corrosive, non-migrating food grade material such as Stainless Steel is used for the equipment in order to prevent metal contamination, chemical contamination and ensure food safety.
4. **Improper handling:** Unclean hands, wrong selection of equipment and packing in unsuitable material could result in food safety issues.
5. **Improper processing:** Wrong process methods can lead to major changes in end product. Right temperature, right time, proper additives and understanding process steps is essential to ensure food safety.
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. It is important to ensure thorough washing is done before equipment is taken into production.
7. **Poor 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. **Raw materials:** Raw material selection must be based on strict scientific reference and frequent sampling.

9. **Additive:** Additives of any nature like essence, flavors etc. can spoil food if not used in the right quantity. Unauthorized additives 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 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.
13. **Improper segregation:** Where certain food products contain allergens, the appropriate segregation of RM, equipment, tools and final product is important to ensure consumer safety,
14. **Humidity:** Humidity is a major cause for enabling microbial growth, and rancidity. Food zones must have lower than 65 % humidity to ensure food safety.
15. **Temperature:** Temperatures of processing, holding, storing, transporting, are all important factors in food being safe.
16. **Time:** No raw material or finished product should be held beyond designated shelf life.
17. **Non-food grade packing:**Intermediate and final product should be packed only in acceptable packing material to ensure food safety.
18. **Pest:** Care must be taken to plan 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.
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.
19. **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.

PART II

PERSONAL HYGIENE

Health status

Behavioural & Personal

Cleanliness

Visitors

HEALTH STATUS

Employee Illness Do's and Don't's

- Do call the person in charge at the food service facility when ill with diarrhea, vomiting, jaundice, or fever with sore throat.
- Do not work in the food facility while ill with these symptoms.
- Do not work in food facility for 24 hours after symptoms of diarrhea or vomiting have gone.
- Do not handle food with an infected boil, cut, burn, or sore on the hand or wrist. Food may be handled if the injury is covered with a clean bandage and a latex-free glove.

Facts that must be known to prevent Foodborne Illness

Foodborne illness is an illness resulting from eating contaminated food.

Food contaminated with organisms (germs) does not always look, smell or taste different from non-contaminated food.

Symptoms vary and may include diarrhea, vomiting, fever, cramping and nausea.

Depending on the cause, symptoms may develop in a few minutes to several days. Some symptoms may last several days and can result in death.

Foodborne illness is caused by organisms (germs), chemicals, or toxins.

Five major mistakes that often cause foodborne illness:

Inadequate handwashing

Employees working while they are ill

Cross contamination

Inadequate cooking temperatures

Inadequate temperature control (allowing foods to be in the danger zone)

Personnel suffering from a disease should not be allowed to enter into any food handling area. Any person suffering from a disease shall immediately report illness or to the management and medical examination of a food handler shall be carried out immediately.

All personnel shall be made 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

*Compliance with schedule of vaccine to be inoculated against enteric group of diseases. Enteric diseases are infections caused by viruses and bacteria that enter the body through the mouth or intestinal system, primarily as a result of eating, drinking and digesting contaminated foods or liquids. Cholera, typhoid fever, salmonella and Escherichia coli, or E.coli, infections are some of the most common enteric diseases. Stomach pain, diarrhea, nausea and vomiting are the typical side effects of enteric diseases.

4. 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.



Health check up by medical practitioners

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.

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 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.
2. 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.
3. 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.
4. The food handlers should trim their nails and hair periodically.
5. 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.
6. Street shoes inside the food preparation area should not be worn while handling or preparing food; alternately, street shoes may be worn only after adequate cleaning or cover protection.
7. Food handlers should not handle soiled currency notes/cards to avoid cross contamination.

Basic requirements for personal hygiene – See the following image for guidance :

Do (क्या करें)

- Hair should be properly tucked inside the cap** ✓
बाल अच्छी तरह टोपी से ढकें
- No earrings or necklace/chains** ✓
कान की बालियाँ, गले का हार वर्जित है
- No outer pockets** ✓
बाहरी जेब न रखें।
- wear neat and clean clothes** ✓
साफ सुथरे कपड़े पहनें
- No wrist watch / rings** ✓
घड़ी और अंगूठी मना है
- Cover all wounds** ✓
जखम पर पट्टी लगाएँ
- Nails should be short and clean** ✓
नाखून छोटे और स्वच्छ रखें
- Torn clothes should be repaired or replaced** ✓
फटे हुए कपड़े न पहने
- Wear clogs and safety shoes** ✓
सेफ्टी वाले जूते पहनें

Don't (क्या न करें)

- ✗ **Hair Coming outside the cap**
टोपी से बाहर निकलते हुए बाल
- ✗ **Earring and necklace / Chains**
कान की बालियाँ और गले का हार
- ✗ **Outer pockets and contents**
बाहरी जेब और सामान
- ✗ **Dirty clothes**
गंदे कपड़े
- ✗ **Wrist watch/Rings**
घड़ी/गहने
- ✗ **Open and bleeding wounds**
खुले जखम
- ✗ **Long and painted nails**
बड़े और रंगे हुए नाखून
- ✗ **Torn clothes**
फटे हुए कपड़े
- ✗ **Bare feet/slippers**
खुले पैर/चप्पल



Below is the procedure for how to properly wash hands and when to wash hands.

How to wash hands



How to wash hands



When to wash your hands

After Using the Toilet, Urinal or anytime you visit the restroom for any reason

Before and After Handling or Preparing any Food Item

Before and After handling raw meats, raw poultry or other raw foods

After Sneezing, Coughing or Scratching Any Part of Your Body

Before Serving Food, Beverages, Setting or Waiting Tables

After Handling a Tissue or Handkerchief

After Cleaning, Washing Dishes or Bussing Tables

After Touching Your Face, Hair, Clothes or Any Part of Your Body

Employees are required to wash your hands BEFORE beginning work, BEFORE working with foods and AFTER any activity that could contaminate the food and equipment you are working with.

After Eating, Drinking and After Breaks

After Smoking, Chewing Gum or Chewing

Before Putting Gloves on, or Anytime You Take Gloves Off

1.6

General Hygiene & Health of Food Handlers



Food handlers should NOT EAT CHEWING GUM OR PAN MASALA in food handling area



Food handlers should NOT EAT OR TASTE FOOD in food handling area



Staff with cough and sneezes must NOT HANDLE FOOD, alternatively must wear a face mask

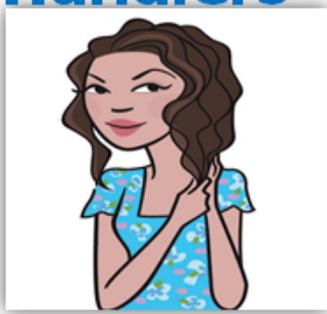
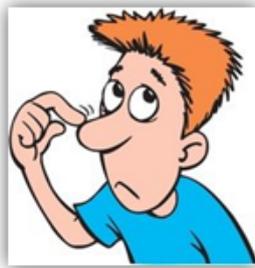


SPITTING is prohibited in food handling area



DO NOT SMOKE

General Hygiene & Health of Food Handlers



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.





No jewellery allowed



Nails should be trim with no nail paint



Hair should be trim with hair net



No perfume allowed



Open Cut



Open Cut being dressed

Cuts should be dressed



No mobile phone allowed

VISITORS

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 and footwear.
3. Visitors shall adhere to the personal hygiene provisions as mandated for food handlers.



Visitor policy shall be documented



Visitor shall be given visitor card with restricted entry



Visitor shall wear protective clothing & footwear and shall adhere to food safety provisions as mandate.

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PART III

FOOD OPERATION AND CONTROL

Location and Surroundings

Procurement of Raw Material

Food Safety Guidelines for Production Process

Storage of Food Products (Raw & Finished)

Cleaning & Sanitation

Pest Control

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.

- 1. Layout and design** of Food manufacturing units shall be unidirectional to avoid from raw material, intermediate product and finished product. The material movement should be done in one direction only (no backward flow), to prevent crosscontamination.
- 2. 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.
- 3. Food Contact Surfaces :** All the food contact surfaces shall be :
 - a. made up of non-corrosive / rust free material
 - b. smooth, free from any grooves
 - c. easy to clean and maintain
 - d. non-toxic and non-reactive
 - e. of food grade quality
- 4. Water Supply:** Water used in cleaning of equipments / 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.

Procurement of raw materials

1. No raw material or ingredient thereof shall be accepted by an establishment if it is known to contain parasites, undesirable micro-organisms, pesticides, veterinary drugs or toxic items, decomposed or extraneous substances, which would not be reduced to an acceptable level by normal sorting and/or processing
2. All raw materials, food additives and ingredients, wherever applicable, shall conform to all the Regulations and standards laid down under the Act
3. Records of raw materials, food additives and ingredients as well as their source of procurement shall be maintained in a register for inspection
4. All raw materials should be checked & cleaned physically thoroughly
5. Raw materials should be purchased in quantities that correspond to storage/preservation capacity
6. Packaged raw material must be checked for 'expiry date'/ 'best before'/ 'use by' date, packaging integrity and storage conditions
7. Receiving temperature of potentially high risk food should be at or below 5 °C
8. Receiving temperature of frozen food should be -18 deg C or below.

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](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 and 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)

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 and frozen food is to be stored at -18 deg C and below. .

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.

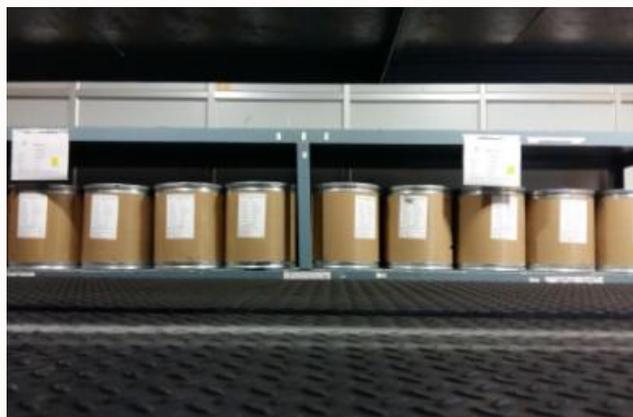
While procuring and receiving the raw material, the food handler shall ensure that -

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 as per stack height norms, well above the floor level and away from the wall.

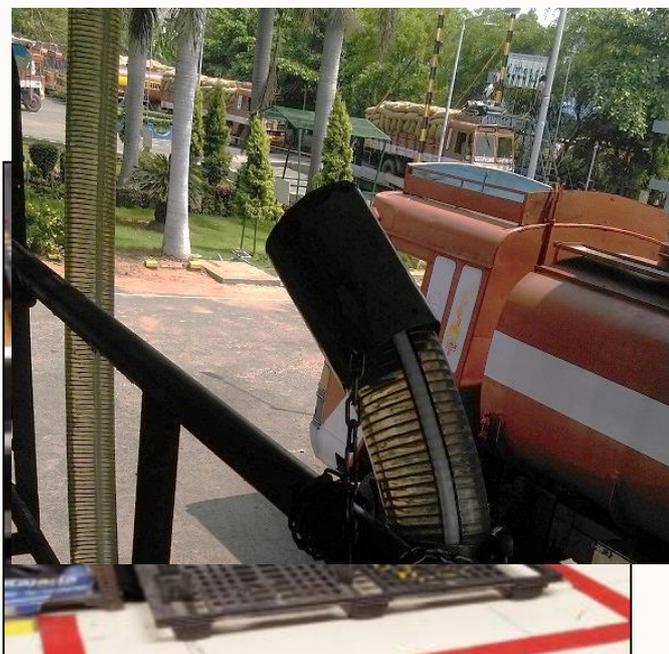




Material storage on Pallets



Colour coding for easy identification of Quality Status



Separate storage Area for Expired/damaged material

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.

Food Safety Guidelines for the Production Process

Maintain the upmost standards when properly handling food products for consumers. Anything from airborne debris to facility moisture can form harmful bacteria that could ultimately affect the end product.

There are ways to prevent contamination and cross contamination in processing facilities. Here are five tips to keep food facilities safe:

1. Keep ramps and carts clean

The food contact surfaces where food is handled and processed through the various stages of processing should be kept clean and hygienic at all times.

The carts, trolleys and other transport medium in which food is transported from one zone to another within the food production premise must be kept clean and sanitized. It is recommended to dedicate allotted carts/trolleys for transportation of raw materials/semi finished products/finished products and packaging materials.



2. Color code cleaning equipments and cleaning aids

Cleaning aids and equipments used in the food production premise must be color coded as per the different zones in the food production area.

For example one color should be used to clean sanitized food contact surfaces, while a different color should be used for nonfood contact surfaces, a third color should be used to clean surfaces with raw products and the last color should only be applied for floor drain cleaning. Using this technique will help in adhering to Good Manufacturing Practices and also help in minimizing cross contamination from different areas of the food production unit.

3. Clean all equipments and machinery

Cleaning of various machineries and equipments in the production facility as per the cleaning schedule is important. Regular and timely cleaning and maintenance of the machines and equipments reduces the chances of cross contamination during the production process. Specific cleaning procedures for products containing allergens should be adhered to at all times.

4. Ensure workers are healthy

When workers are healthy and safe the chances of contamination is further limited. Employees must maintain appropriate personal hygiene and follow the necessary cleanliness guidelines as laid down by the management at all times. Washing their hands at regular intervals and wearing clean clothes are some of the important steps that need to be adhered to by the workers.

5. Cleaning & Sanitation

	It takes more than soap and water to keep a food business clean and safe. You will likely be using detergents and sanitizers.
Follow These Important Rules	Know what the directions say for using chemicals. Read the labels and talk to your manager about when to use them and how much to use. Be sure you understand and follow the directions!
	Keep chemicals away from food and clean equipments. If chemicals must be stored in the same room, be sure they are stored in specifically marked area.

	Can you read the labels? Are they easy to see? If they are not, ask your manager to re-label them so that everyone can read them.
	Keep all chemicals in the bottles or boxes they come in. If you put them in a different container, label them clearly.
Follow the cleaning directions for each piece of equipment	Wash them in hot soapy water Rinse them in clean hot water Sanitize them with freshly prepared sanitizer



Pest Control

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

The Major Pests include

- Cockroaches
- Rodents (mice, rats, squirrels etc.)
- Flies
- Stored product pests (Flour beetle, sawtooth grain beetle, cigarette beetle, indianmeal moth etc.)

General guidelines for Pest Control:

1. The establishment shall have a nominated person to manage pest control activities and/or deal with appointed expert contractor.
2. The 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.
3. Food materials shall be stored in pest-proof containers stacked above the ground and away from walls.
4. 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.
5. Animals, birds and pets shall not be allowed to enter into the food establishment areas/ premises.
6. 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.
7. Tidying and cleaning of technical buildings (machine shop, boiler room, refrigeration rooms, and electrical cabinets) to avoid rodent settlement.
 8. Mosquito nets at window and suitable screens on access doors; alternately, the use of air curtains and electrical insect killers.
 9. 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.

Part IV

Packaging and Distribution

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.

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) Enameled containers which have become chipped and rusty
- (c) Copper or brass containers which are not properly tinned
- (d) Containers made of aluminum not conforming in chemical composition to IS: 20 specifications for Cast Aluminum and Aluminum Alloy for utensils or IS: 21 specifications for Wrought Aluminum and Aluminum 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 alkylene terephthalates (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.

Transportation

- Transportation vehicles, tankers, conveyances, and containers shall be maintained in a state of 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 and 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. Vehicles used for transportation should have an FSSAI transport license.



Vehicle inspection before loading



Multilayer Tarpaulin to protect from water & duct.

Documentation and Records - Legal and Organizational Requirements

Documentation

1. Following licenses shall be available at Manufacturing Location
 - FSSAI License/Registration as applicable under the Act
 - Municipal Corporation License /Trade License/ License under Shops & Establishments Act. / NOC from Gram panchayat
 - Legal Metrology Registration as required

2. Annual returns to be filed before 31st May of every year as per the regulations made under the Act.

Labeling

Pre-packaged foods should be labelled in accordance with the Food Safety and Standards Regulations. At every stage, pre-packaged products should be checked for proper labelling and compliance with mandatory provisions.

Training:

All personnel including new employees, temporary employees and contract persons shall be trained for their roles and responsibilities and all procedural requirements

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.