UNIT 19 ISSUE IN WORKER SAFETY AND SECURITY

Structure

19.1 INTRODUCTION

In our previous unit, we have learnt about issues related to food borne infections and poisoning and different modes of disease transmission in food service institutions. Sanitation and hygiene plays a very crucial role in food service operations – storage, processing, preparation, holding, and waste disposal – which is the responsibility of every food service worker. Negligence on the part of the food handler can result in a large epidemic. Despite the ample information we have on microorganisms and effective measures in handling food, it is not effective because of lack of proper application. Many a time unskilled personnel are involved in the handling of food and these could be a major source of contamination. Therefore knowledge about sanitary practices must be the basis of all training programmes involving food handlers. The prime responsibility, as you would agree to break the chain of transmission of disease from carrier to food and from food to the consumer lies solely on the food handler. This important aspect has been covered in this unit. Also, we shall deal with training and education for food service workers. How training and education can aid in preventing disease out breaks? This is the focus on the unit. The sanitation regulations and standards, which you may recall have already been covered in Unit 14 in the Food Microbiology and Safety Course, (MFN-003) have been summarized here as well.

Objectives

After studying this unit, you will be able to:

- discuss the importance of personnel hygiene and good sanitary practices,
- identify safety issues and corrective measures to be taken for the worker, and
- design good training programmes in food safety for the food service worker.

19.2 PERSONAL HYGIENE AND SANITARY PRACTICES

You may be well aware of personal hygiene and sanitary practices as discussed in Unit 10 earlier in the Food Microbiology and Safety Course, (MFN-003). Hence, here we shall not go into much details but just touch upon these issues.

Personal hygiene is necessary for everybody but more so for the food handler because the health and well-being of hundreds of people is in his or her hands. A careless food handler could be responsible for the spread of an epidemic. It is, therefore the duty of every caterer, in fact the caterer is legally responsible for the wholesomeness of food supplied by him or her. It is also the moral obligation of every food handler to ensure that food is prepared and served hygienically. Sanitation codes call for a high degree of personal cleanliness for all employees in food establishments. An employees suffering from a disease that can be communicated by food or one who is a carrier of food brone disease, is not permitted to work till he/she is medically certified.

Workers can spread infection knowingly by working when they are ill and infect other workers and consumers directly or indirectly. Sometimes, healthy workers spread disease by cross-contamination. They carry microorganisms from an infected area to one that previously had no harmful microorganisms.

In some instances, the infected person does not show any visible signs or symptoms of the disease. Such persons are called *carriers,* as discussed in the last unit, and they unknowingly spread disease producing organism which they carry in their bodies. They are the most dangerous of all food handlers as it is very difficult to trace the source of infection in such cases.

Hence, it can be realized that food poisoning does not just happen, it is always caused and the cause is carelessness on the part of the human being. It is estimated that 50 per cent of all food handlers carry microorganisms that can be transmitted to food. For these reasons, personal hygiene is very necessary and should be practiced by every food handler. The worker should be in a state of good health and maintain a healthy health status and adopt good sanitary practices as highlighted in our subsequent discussion.

19.2.1 Health of Staff

A sick worker is not only a source of infection, but being unwell, is likely to take less care in handling food.

All staff employed in food preparation and service areas should be in a state of good health. Working in a catering establishment means working for long hours. The work may involve heavy physical exertion and mental tension and meal timings may be irregular. Worker may have to lift heavy loads, work in hot steamy kitchens and constantly be on their feet during working hours. They need to be active and alert. For this, both the body and the mind must be in the best possible health.

Good health is not only the absence of disease. It does not depend on the person's height and weight but means that both the body and mind are in excellent condition, free from illness or tension. It also means that a person is physically fit and mentally alert, capable of taking on spot decisions and handling crisis situations. He or she should be able to carry out routine work without any signs of undue fatigue and still have ample reserve energy for recreation or to meet an emergency, if required.

To achieve all this, it is necessary for the employer to ensure good health and safe working conditions for all employees by observing the following:

1) It is compulsory to have a detailed medical checkup at the time of recruitment. Recent history of any illness should be known before employing a worker. All food, service workers should be free from any infection that is likely to be transmitted.
2) Medical checkups every six months and a checkup following a severe illness, especially one related to the gastrointestinal tract, should be done. The cost for this should be borne by the employer.
3) Periodic deworming (six monthly) and necessary inoculation (typhoid, tetanus, etc.) should be ensured.
4) All illness should be reported to the management and ill workers should be kept away from food during that period.
5) Personal cleanliness of employees in terms of general appearance, uniforms, hands and fingernails, should be checked discreetly.
6) Restrooms and lockers used by employees should be inspected for cleanliness.
7) A nutritious and wholesome meal should be provided while on duly in a separate room designed for this purpose.
8) The work area should be planned in such a way that accidents like falls, cuts and burns are prevented from occurring while at work. The workers should also be trained in proper methods of work.
9) Work hours should be 48 hours a week. This may be in shifts.
10) A weekly off is compulsory.

The employer should realize the importance of good health and help the employee in maintaining it. Remember, good health and the right attitude towards work increases work efficiency and productivity and this in turn increases the profits of the establishments.

Personal appearance too is important as highlighted next.

Personal Appearance

A good personal appearance helps both the employee and the organization. It increases one's self confidence. It helps in promoting business by improving performance at work. It reflects on the standards set by the organization and customers know what to except.

It inspires customer confidence, makes them feel important and helps in attracting more customers. Good health and good personal appearance can be achieved by maintaining personal cleanliness both at home and at work.

Let us review the sanitary practices next.

19.2.2 Sanitary Practices

It must be evident to you by now that a food worker needs to be healthy and clean to prepare safe food. All employees at the food service operation need good personal hygiene. Personal hygiene refers to all conditions and measures necessary to ensure the cleanliness of a person's clothes and body. These measures are elaborated herewith.

Bathing

Workers must bathe daily as body is offensive and skin is the main breeding ground for bacteria. Use of good soap is important to wash away dirt, to emulsify secretions of the sebaceous glands and to make cleaning of skin easy. A good deodorant should be used after a bath and undergarments should be changed everyday.

Hair

Hair can be a breeding ground for bacteria found on the skin. Unclean hair causes dandruff and lice, and makes the scalp itch.

Running hands through hair or scratching the scalp is a common habit because of which *Staphylococci* present on the scalp may spread and hair may fall into food. The presence of hair in food is obnoxious and can be avoided if food handlers wear caps, scarves or nets. These would discourage the employee from touching their scalp and contaminating food.

A head covering helps to keep hair out of food, prevents contamination by *Staphylococci,* keeps hair free from kitchen grease and prevent long hair from getting entangled in machinery. Hair should be neatly tied if long. Hair length for men should be up to mid-ears. Hair should be shampooed regularly. Moustaches and beards should be clean and trimmed. Men without moustaches or beards should be clean shaven. Kitchen staffs are not permitted to grow beards.

Eyes

Eyes must be kept clean and washed frequently. Rubbing of eyes should be avoided. An employees suffering from sore eyes should not be allowed to work.

Teeth and Mouth

Teeth should be brushed regularly and thoroughly cleaned with a moderately hard brush. This should be done twice a day, i.e., first thing in the morning and last thing before retiring. Food particles get lodged in the teeth and cause decay. Deposition of tartar requires attention or teeth may loosen at the root. Tooth brushes must be kept clean and should be changed frequently. The tongue tends to get coated and can be cleaned with a tongue cleaner. The mouth should be rinsed well and gargling is a must after every meal. These habits ensure good dental health, prevent painful cavities and bed breath.

Hands

The hands are possibly the most unsafe serving equipment in the chain of infection in the entire food service operation. Bacteria flourish on the skin because of the ideal temperature conditions. Skin secretions provide food for growth and microbes get lodged in pores, crevices and possibly crack on the skin. The presence of *Staphylococcus* on the skin is dangerous for the food industry. In addition to the normal flora on the skin, inadequate hand washing could cause accumulation of microorganisms usually found in the bowels or those or those which could have been picked up from raw contaminated foods.

Because our hands are in direct contact with food all the time, cross-contamination can occur and bacteria can be transferred to high risk foods. To prevent this, hands should be washed under the following conditions:

a) before beginning work and after a break,
b) before handling foods,
c) after eating or smoking a cigarette,
d) after using the toilet,
e) after touching infected or unsanitary areas of the body or combing hair,
f) after using a handkerchief, sneezing or coughing into the hands,
g) after handling raw foods, especially meat, fish and poultry,
h) after scullery or any cleaning operation after handling waste food or refuse, and
i) whenever they are dirty.

Hands should be washed with plenty of soap and water and preferably rinsed in running water. If soap tables are used, they should be kept dry. Liquid soap is more hygienic and economical to use. Washing hands with antiseptic soap and water reduces the load of *coliform* organisms and *Staphylococci* from the skin. But some *Staphylococci* still remain and this is the reason why foods which favour growth and which may not be heated before service, should not be touched by the fingers.

Hand washing should be done properly or it will not be effective. Hands must be dried thoroughly by using a roller towel, a hot air dryer or disposable paper towels. Frequent hand washing with soap and hot water can make the skin crack causing roughness. This can be prevented by wearing gloves or using a cream to keep them soft. Gloves are helpful as long as they are unbroken and cleaned well. The use of gloves is recommended while working with foods like sandwiches, cold cuts, pastries and salads. Plastic gloves must be changes frequently.

Cuts, burns and raw surfaces can harbour *Staphylococci.* These should be covered with a waterproof dressing. If the wound is infected, inflamed or pus is formed, the person should not be allowed to handle food. Even the smallest cut can harbour a large number of bacteria.

Food should be touched with bare hand only if absolutely necessary. Fingers must not be dipped into food to taste it or dipped in water being served. The use of tongs or spoons for handling or tasting food should be encouraged.

Fingernails

Fingernails are a frequent source of contamination or cross-contamination. They should be trimmed and kept clean. Long nails with ragged edges tend to harbour more germs. Nail polish should be avoided in production areas as it may mask accumulated dirt or it could chip and enter the food (some nail polishes are toxic). It has been observed that if nails are varnished, food handlers do not like using nail brushes or trimming their nails. Hence, use of nail polishes should be discouraged.

Jewellery

Any jewellery which comes into contact with food should not be worn. Finger rings can accumulate dirt, like dough accumulating in a ring while kneading, which could later enter the food. There is also danger of stones or small parts of rings, earrings and necklaces falling into food. Bangles and bracelets get heated soon and come in the way of work. Wrist watches should not be worn in the kitchen. They can fail off, wrist watch faces can break and glass can accidentally get into food. Also, the skin underneath remains moist and may harbour bacteria.

Feet and Footwear

As most of the jobs in catering establishments have to be performed standing, the feet or employees are subjected to extra stress and strain. Hence extra attention should be given to the feet. Feet should be washed and kept clean, especially between the toes. Socks should always be worn with shoes to keep away dirt and absorb perspiration. They should be washed daily. Shoes should be sturdy, clean, well polished and form a part of the uniform. They should be comfortable and well fitting with a low heel. Shoes are necessary for protection of the feet against falling objects and spills.

Habits

Good habits play an important role in maintaining good health. Once formed, they are difficult to break. Good habits grow by practice. Since man is a slave of his habits, care should be taken to form good habits and avoid bad ones, particularly the common ones listed herewith:

1) Smoking while preparing food can lead to contamination of the food and hence, is prohibited. Smoking may touch their lips or saliva could get transferred onto their fingers and could contaminate food. Smokers are also prone to cough which could contaminate food by droplet infection.
2) Unguarded cough and sneezes can disperse a number of bacteria in droplets of moisture from the nose, mouth and throat. This can contaminate food directly or indirectly.
3) Nose picking or fingering the nose may leave *Staphylococci* or other harmful bacteria on the fingers and should be avoided.
4) Avoid handling or shaking a dirty handkerchief near food. Paper or disposable handkerchiefs are a more hygienic substitute for cloth ones.
5) Avoid using a dish cloth to wipe perspiration or wipe hands after using the water closet (W.C.).
6) Avoid washing hands in sinks used for food preparation.
7) Avoid picking up bread, bread rolls, butter pats or ice cubes with bare hands. Use disposable gloves and tongs.
8) Do not touch food contact surfaces of crockery and cutlery.
9) Tasting food with fingers or with the same spoon repeatedly should be avoided.
10) Chewing gum or taking snuff should not be allowed in food preparation and service areas.
11) Leaving food uncovered for a long time should be avoided.
12) Blowing on paper or plastic bags to open them and on milk to keep cream from being poured should be avoided.

Besides the measures described above, the food handlers need to all ensure protective clothing as elaborated next.

Protection Clothing

All employees working in food establishments must wear a clean and appropriate uniform while on duty. The uniform should be such that it (a) protects the workers from external heat, grease and vapours from the work environment, (b) saves wear and tear of clothes of the employee, (c) protects the food from any bacteria present on the worker clothes. For this, it should be large enough to ensure that food will not come into contact with any clothes worm underneath.

The choice of uniform will very for different areas of work. It should be so designed that it helps the worker in his work and increases his efficiency. It should be light, comfortable, and durable and should be made from absorbent material. It should be easy to wash and must be laundered and changed daily. White or light colours are selected as stains show up readily on them and they need to be changed frequently. A review of the uniform specific for each operation i.e. kitchen, service etc. is presented next.

Kitchen Uniforms

The chief's uniform is white in colour, made of heavy duty cotton and includes the following:

1) a double breasted chef coat with full sleeves,
2) a large white apron tied around the waist,
3) a scarf around the neck,
4) a chef cap,
5) black and white checked trousers, and
6) shoes and socks

The double breasted chef coat with long sleeves and the apron protects the body and the same from hot splashes. The chef cap is perforated on top to allow circulation of air to the head. The cap prevents loose hair and dandruff from falling in food and absorbs perspiration from the forehead.

Dishwashers and butches need waterproof aprons made of rubber sheeting or canvas. Cleaners are not given white uniforms as they are difficult to maintain. Blue or khaki are suitable colours for them.

Service Uniforms

In the food service area, the colours of the uniform should blend with the colour scheme of the restaurant. Pastel shades suit most Indian complexions and the décor of the place better than bright gaudy coloures. Waiters should wear washable jackets and waitresses should wear light coloured wash and wear dresses or both could wear the traditional black and white service uniform with a tie or bow. Synthetic blends of fabric are easier to maintain than cotton and are permitted in the service area.

Uniforms most be worn properly and should be in a good state of repair. They must be provided by the employer, who also makes arrangements for their storage and washing. The employer should provide a suitable cloakroom with a full length mirror. Uniforms should only be worn while on duty. Each employee should have a locker to keep his or her uniform, personal clothes and uniforms. Clothes should be changed in the cloakroom only. There should be a sufficient number of uniforms always available. Only then can the employer question the employee about not being in proper uniform. Uniform pockets should not be stuffed with personal belongings like combs, wallets or other personal articles which may carry microorganisms.

Soiled clothing could harbour disease-producing organisms and also appear unappealing to the customers. Bacteria can grow in food stains and perspiration stains.

A well dressed, neat and clean staff creates a good impression. Clean protective clothing helps in boosting the staff morale by making them interested in their personal appearance and hygiene.

Finally rest, exercise and recreation of workers go a long way in ensuring safe food. Let us get to know how.

Importance of Rest, Exercise and Recreation

There should be a balance between the amount of work done and the rest, relaxation and sleep obtained. Rest and relaxation help in reviving the individual, lessens psychological and physical fatigue and motivates him or her to work. Fatigue reduces the capacity of an individual to work. The long work hours, split duty and night duty requires that workers get adequate amount of rest, relaxation and sleep to keep them active and alert at work.

The amount of sleep required by an individual varies from four to nine hours. On an average, person needs six to seven hours of undisturbed sleep to feel refreshed when he awakens. Lack of sleep increases tension, and makes a person irritable and aggressive.

For the human body to function properly and remain in good health, it must not only be rested but exercised regularly as well. The amount of exercise required depends on the nature of the job done. An active waiter or cleaner needs lesser exercise than a desk manager who spends long hours in his office.

Exercising regularly in fresh air is necessary for people working under pressure, rush, heat and odd working hours. Exercise helps to (a) promote good health by improving

circulation and respiration, (b) maintains muscle tone and promotes digestion, (c) keeps skin clean and (d) maintains efficiency of the nervous system.

It keeps the individual fit and healthy with no extra fat. Exercise could be in the form of walking, jogging, cycling, swimming or yoga.

Some form of recreation is necessary in a person's leisure time. Recreation is necessary for a healthy mind. The choice of recreation varies from individual to individual. What may be work for one person may be recreation for another. Recreation helps in breaking the monotony, frustration or dislike for one's job. It helps in refreshing the mind, just like exercise refreshes the body.

Adequate rest, exercise and recreation are essential for both physical and psychological fitness.

Let us next get on to the sanitation training and education for food service workers.

19.3 SANITATION TRAINING AND EDUCATION FOR FOOD SERVICE WORKERS

The employer should check that all employees have a clean and tidy personal appearance and follow sanitary practices while handling food. All employees should observe healthy habits. They should be particular about their appearance and should be in clean and comfortable uniform. Special attention also needs to be focused on training all employees in safe food practices. Let us get to know more about this crucial and important function in any food service set-up.

19.3.1 Sanitation Training and Education

In the industry today, special attention needs to be focused on training all employees, directly or indirectly concerned with food, in safe food practices. In most instances, it has been observed that the managers are busy with other matters like running the food service establishment and proprietors may not be inclined to spend time and money on training employees.

This training is, however, necessary for the following reasons:

1) The incidence of food borne illness is on the rise.
2) It is the legal responsibility of the management to serve clean, wholesome food.
3) Most of the employees have no formal training either before or at the time of recruitment and have picked up the job from an older worker to whom they have been assigned.
4) In this industry, the labour turnover rate, as well as, job change rate is very high.
5) Very few establishments have an inbuilt, well-structured sanitation programme.
6) Professionally trained food service personnel are not available or do not have the time in their job. Training in sanitation should thus go on side by side and should begin as soon as an employee joins duty.

An ideal situation would be one where it is mandatory for every food handler to complete a course in sanitary food handling. This programme should be a continuous one. But this may not always be feasible as some proprietors may object because of high training expenses, as well as, high employee turnover. In such cases, to begin with, all managers should be trained and they would train workers. This would cut down on training expenses but would put pressure on the already over burdoned managers.

Let us next have a look at the advantages of the training programme in terms of both-employer and employee.

Advantages of the Training Programme

For the employer

1) labour turnover will be reduced,
2) employees will need lesser supervision,
3) increased food production,
4) need for skilled employees will be partly fulfilled,
5) working conditions will improve, and
6) reduction in cases of food borne illness.

For the employee

1) chances of advancement in position,
2) greater sense of security,
3) job satisfaction,

Being aware of the cost-factor of training programmes, as well as, its advantages, let us now move on to understanding that who all among the employees must be considered for training and why.

19.3.2 Who should be Trained?

For a food sanitation training programme to be successful, all employees should be involved right from the job management down to the person doing the most menial job.

Every person should understand the importance of his or her role in the overall sanitation programme and how a simple act of carelessness on the part of one employee can affect the health of a large number of people or wipe out the efforts of other employees. For example, if cleaned, sanitized and properly stored glassware is mishandled by the service personnel, the efforts of the dishwashing team would be all in vain.

The basic principles underlying food sanitation should be made clear to all employees. Only when a person understands the importance of following certain guidelines for completing a job, will the task become interesting, it will also make the employee feel responsible for the job.

Once the management has decided upon employees training, careful thought and considerable action is required to carry it out. If the task of training a new employee is given to an experienced but untrained older employee, the chances that the new employee will pick up all work training is not enough, it needs to be implemented continuously. Such training programmes need to be conducted all round the year, both for new and experienced employees.

Now, let us see what a training programme must include.

19.3.3 What a Training Programme should Include?

The training programme should include issues related to personal, food and environmental hygiene. Instructions and training material should be specifically related to the catering industry. To make it interesting, posters on hygiene should be distributed free of cost to all employees.

For a training programme to be really effective, it must be carefully planned, well executed, continually monitored and evaluated.

Let us list down the steps in planning and implementing a training programme.

Steps in Planning and Implementing a Training Programme

The training programme should be planned after

1) listing the objectives of the programme,
2) preparing the content,
3) identifying the group,
4) selecting the trainer,
5) preparing or procuring training material,
6) planning the training schedule,
7) conducting the training,
8) motivating the trainees, and
9) evaluating the programme through written tests and actual performance.

Training workers in safe food practices will cost the management both time and money, as workers and trainers will stay away from work for some time; learning resources like films slides, posters and handouts have to be procured and a professional trainer may also be needed. However, in the long run, this training is beneficial as it helps cut down on:

1) losses incurred due to visibly spoiled food
2) loss of reputation on account of:
   a) outbreak of food borne illness,
   b) presence of hair, insect dropping or body parts or any other filth in food served,
   c) unhygienic service of food, and
   d) dirty toilets.
3) financial loss if licence is suspended.

Most workers belong to the lower socioeconomic group and may have studied till primary school only. They may have language problems and difficulties in reading and writing. They usually have no formal training and for them chances of promotion are bleak. Because of this ground, they do not understand the importance of sanitation.

Because of low chances of promotion, low pay scales, inconvenient long work hours, working break shift or on holidays and the temporary nature of some jobs, the employee turnover is high. There is a frequent need to train new employees about their job. Training in sanitation should thus go on side by side and should begin as soon as an employee joins duty.

An ideal situation would be one where it is mandatory for every food handler to complete a course in sanitary food handling. This programme should be a continuous one. But this may not always be feasible as some proprietors may object for a training programme to be really effective; it must be carefully planned, well executed, continually monitored and evaluated.

The managers should maintain a separate file for every employee and regularly record performance, appearance, absenteeism, etc. Good records should be recognizes and appreciated. If such systems are followed, it will encourage employees to practice good work habits.

The next sub-section focuses on employment practices.

19.3.4 Employment Practice

For any employment, a certificate indicating state of general health, past medical history and sometimes, result of medical examination is required by the management prior to appointment. Employees handling food or working in the kitchen or dishwashing area need to furnish additional information.

The information on past illness should be filled in by the health authority and the questionnaire should be signed by the employee. Apart from the other information required, the questionnaire should record past history of typhoid, paratyphoid, dysentery, diarrhoea and tuberculosis. Any regarding boils, skin rash or discharge from eyes or nose, etc, is to be noted. Place and date of visit abroad should also be noted.

The employee should be given to understand that this information is needed not only to safeguard the customer but also to check whether the employee needs any special treatment for his or her own protection. It should also be explained that rejection on medical grounds is quite uncommon. After they are recruited, they will be medically examined every six months.

Next, let us study about HACCP – a food safety control system that is used by many food industries, you may be already aware of it. Let us read the following and refresh our memory.

19.4 HAZARD ANALYSIS AND CRITICAL CONTROL POINT (HACCP)

The provision of safe food to the customer is the responsibility of the management. In order to ensure that food served is safe, it is necessary to establish a food safety control system. The HACCP approach is one management technique that may be useful to caterers. It is mainly used to guarantee microbiology safety of foods. A detail review on HACCP– a food safety control system is already presented in the Food Microbiology and Safety Course (MFN-003). Look up Unit 13 of the course now.

You would recall studying that *hazard analysis* is the identification of all ingredients, stages in process, environmental features and human factors that can lead to hazards for the customer. The risks and likelihood of them occurring is estimated.

Critical control points (CCP) are *the points at which control is essential to guarantee that potential hazards do not become actual hazards*. HACCP is a location, a practice, procedure or a process which, if not controlled, could result in an unacceptable safety risk. The term CCP draws attention to the fact that not all hazards are necessarily critical to the safety of the end product.

Lets have a look at some of the examples of CCPs. Examples of CCPs include:

1) Inspection of goods on delivery and before use include temperature checks where applicable.
2) Separate storage and handling of ingredients and the finished product.
3) Correct temperature ranges for refrigerated and frozen goods.
4) Cleaning procedures for equipment and utensils.
5) Cross contamination with other menu items in process.
6) Personnel hygiene and health standards.

Let us specifically learn about the use of HACCP in food service and/or catering.

Use of HACCP in Catering

The most important aspects to be considered are:

1) handling and storage procedures from delivery to service of the menu items,
2) holding times and temperature,
3) cooling times, and
4) personnel training.

Now that we have refreshed our memories about food safety and control points, let us discuss few aspects about work place safety.

19.5 WORK PLACE SAFETY

Food service establishments should be safe to work in. A safe and clean establishment increases productivity and profits. Not only should customers be protected from food borne illnesses, but in the interest of both customer and employees, premises should be safe and it is the foremost duty of the management to ensure safety at the work place.

Prevention of accidents and sanitation are closely related in the sense that accidents may result in food contamination. The food service manager should realize that accidents do not just happen, they are caused. They can very often be prevented from happening by practicing proper work habits.

An accident can thus be defined as is an *unintended event which results in injury, loss or damage.* It may or may not result from human error.

19.5.1 Why Accidents should be Prevented?

Accidents have a direct or indirect effect on individual and the establishment. Let us have a look at what these effects are,

A) *Direct effect of accidents*

1) *Injury*: Accidents result in injury which can cause much pain and absenteeism from work. Unattended wounds may become a source of infection. For the uninjured workers and customers it creates tension and anxiety.

2) *Expenditure*: Accidents are expensive. Workers must be covered by medical insurance through Employees State Insurance Scheme (ESIS) and disability compensation is required for employees injured on the job.

Frequent accidents will result in additional expenditure to the management.

B) *Indirect effect of accidents*

1) Damaged or broken material.

2) Reduced efficiency, if area is accident-prone, workers try to avoid accidents work slowly; other staff will be engaged in attending to the injured, cleaning up the mess, doctors visits and investigations.

3) Work schedule and routine is upset: work is completed in hurry and hygienic aspect tends to get overlooked in an attempt to just complete the job.

4) Injured workers may have to stay away from work and need to be replaced, resulting in training of new employees or being staffed.

5) Accidents lower morale: frequent accidents indicate that management is not concerned about the customers and employees welfare.

6) Accidents spoil reputation.

7) Accidents can result in fines or imprisonment: under the Occupational Safety and Health Act, the food service operator may face legal action.

Next, let us find out how accidents take place.

19.5.2 How Accidents Take Place?

The *Human Factor* (The Careless, Negligent and Slack Food Handler) is the prime suspect.

In a vast majority of cases, it has been noticed that people are responsible for most of the accidents as they are the ones who create unsafe conditions. They ignore wiring where insulation has worn off, leave cupboard doors and drawers open, block passages with equipment, are not particular about protective clothing, leave spills on the floor unmopped, and do not remove accumulated grease on filters.

They may be careless, for example:

1) Pick up broken glass with bare hands
2) Ignore operating instructions on equipment
3) Lift very heavy loads alone
4) Do not use safety devices on grinders and slicers

They may be inattentive, for example,

1) bump into other people,
2) drop heavy items or spill hot liquids on their own feet,
3) close doors and drawers on their own fingers and squash them,
4) rush with arms full and minds elsewhere on wet greasy floors,

Besides the human factor the work place may be unsafe as highlighted next.

The Unsafe Work Place

The layout be badly planned or conditions in the kitchen may be conducive to unnecessary accidents. The unsafe work place may also be created by negligence on part of the employees.

Unsafe surrounding are created by the following:

1) steep, narrow, dark stairways,
2) unnecessary steps,
3) clogged floor drains,
4) narrow aisles caused by furniture equipment wrongly arranged in heavy traffic areas,
5) ladders to short to reach uppermost shelves so boxes are used instead,
6) unprotected meat slicer blades,
7) doors opening onto corridors,
8) knives left lying around, and
9) handles of pots and pans protruding onwards.

What are the types of accidents that might occur in food service establishments? Let us have a look at them.

19.5.3 Types of Accidents

Accidents occurring in food service establishments are classified into the following categories:

1) Cuts and lacerations
2) Burns and scalds
3) Falls and collisions
4) Fires
5) Electrical shock
6) Back strain

Let us discuss each of these briefly.

1) *Cuts and Lacerations*: Cuts and lacerations are skin breaks caused by: (a) careless handling of knives, food slicers, choppers, mixers, broken glass, etc. by untrained employees during the rush hour, (b) by sharp edges of badly designed equipment, and (c) by following incorrect practices such as catching knives as they fall, leaving them in the dishwater, in sinks or washing them in the dishwashing machine or using blunt knives which need a lot of pressure to cut with.

2) *Burns and Scalds*: Burns and scalds are the second most common accidents in the kitchen. They results in injury of varying degrees of severity. They are caused by contact with: (a) hot surfaces of grills, ovens, griddles, burners, etc. (b) hot water or steam from boilers and steamers, (c) spillage or splashes from hot food or drink, (d) hot fat from frying pans, woks, deep fat fryers and (e) by using defective equipment like loose handles on utensils, faulty tongs. etc.

3) *Fall and Collision*: Workers are generally in a hurry during peak hours of business, carrying things to and fro and items which can obstruct vision.

Workers may (a) slip and fall on floors made of slippery material – floors can be made slippery because of grease, fruit and vegetables peels and water on the floor- or workers footwear may have slippery soles, (b) fall from a height while trying to reach for things – they may climb on unsafe boxes, chairs, shelves and rickety ladders (c) collide with other people, equipment furniture, etc. damaging it, as well as, hurting themselves or (d) trip and fall if shoe gets stuck in torn carpets or matting, fall over a loose tile or hole in the floor, miss an unseen step, trip over trailing power cables.

Objects (a) stacked at a height or stored on a rickety shelf in a dangerous position on the shelf may land on someone's head, (b) objects precariously placed can be dropped by clumsy people, or (c) objects placed in passageways may make people trip and fall.

Falls and collisions result in bruises, bumps, sprains or fractures.

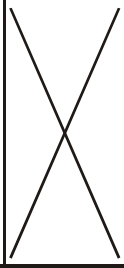
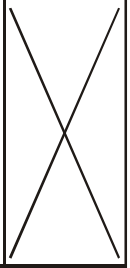
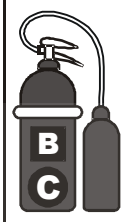
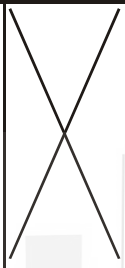
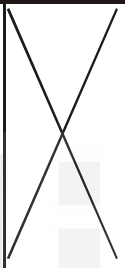
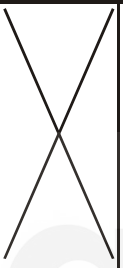
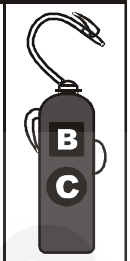
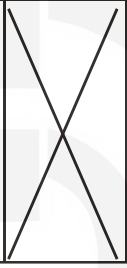
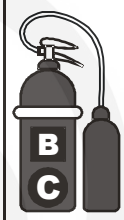
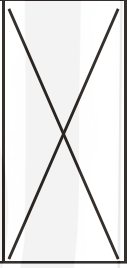
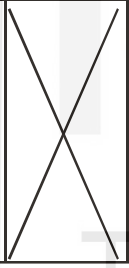
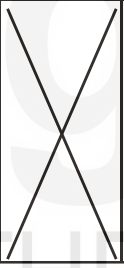
4) *Fires*: Maximum numbers of fires are reported from the food industry. They damage buildings, equipment and provisions and result in death or injury to people. Of all the fires occurring, one-third are of electrical origin caused by faulty wiring, operation and placement of equipment, overloaded circuits, old worn-out wiring, overheating and burning of motors due to insufficient ventilation.

Hot fat in deep fat-fryers reaches its flash point and bursts into flames. Grease accumulated in filter traps on walls catches fire very fast.

Burning cigarette butts discard carelessly in trash or near inflammable material may smolder unnoticed for hours before bursting into flames. A leak in the gas pipeline or cylinder can cause serious fires. The severity of a fire is increased by:

1) inadequate fire protection equipment like extinguishers, blankets, alarms,
2) outdated fire extinguishers,
3) employees not trained in their use,
4) poor housekeeping practices,
5) over crowding, and
6) exits not clearly marked.

A large number of electrical gadgets are used nowadays. If these are not handled carefully, they can seriously shock unwary users. Figure 19.1 depicts the various kinds of fire and the relevant extinguisher that must be used.

KIND OF FIRE		APPROVED TYPE OF EXTINGUISHER						
Decide the class of fire you are fighting... ↓	...then check the columns to the right of that class →	Match up proper extinguisher with class of fire shown at left						
		Foam (solution of aluminum sulphate and bicarbonate of soda)	Carbon Dioxide (carbon dioxide gas under pressure)	Soda Acid (bicarbonate of soda and sulphuric acid)	Pump Tank (plain water)	Gas Cartridge (water expelled by carbon dioxide gas)	Multi-purpose Dry Chemical	Ordinary Dry Chemical
A	Class A Fires use these extinguishers → Ordinary combustibles • wood • paper • cloth, etc.							
B	Class B Fires use these extinguishers → Flammable liquids, grease • gasoline • paints • oils, etc.							
C	Class C Fires use these extinguishers → Electrical equipment • motors • switches, etc.							

Source: Adapted from National Institute of Occupational Safety and Health Chart

Figure 19.1: Approved type of extinguishers

Electrical appliances pose a hazard, if:

1) they are poorly maintained, wires are exposed, plugs are missing, etc.,
2) improperly earthed,
3) placed in damp or wet areas near the sink, on the drain board or handled with wet hands, and
4) operator stand in a pool of water or without footwear.

Lifting heavy, awkward items alone or in a faulty position can injure the muscles of the back and the spinal cord.

A vast majority of all accidents in food service establishments can be avoided by practicing good habits and keen foresight on the part of all employees.

The food service managers should plan out work to be done to reduce haste. A well-planned layout eliminates physical hazards. The entrance and exit should be clearly marked and doors should be kept shut. The management should ensure that fire extinguishers are provided in all areas where fires can occur and a well stocked first aid box is available in an accessible area. At least some employees should be trained in giving first aid.

Workers should be trained in good safety habits and constant supervision should be provided to ensure safe working conditions and to eliminate faulty practices. Safe working and good work habits go hand in hand.

Some safe work habits are highlighted herewith.

Safe working habits

1) Keep all surfaces clean and dry.
2) Mop up spills immediately.
3) Use protective clothing.
4) Follow operational instructions on equipment.
5) Keep appliances in good condition.
6) Check for earthing, cover glass bulbs with shields.
7) Avoid shortcuts to save time.
8) Work in well lit, well ventilated rooms.
9) Keep drawers and cupboards shut.
10) Report illness immediately.
11) Clean, treat and dress wounds with protective water poof dressing.
12) Practice personal hygiene.

Let us next move on to precautions that must be followed to prevent outbreak of accidents.

19.5.4 Precautions to Prevent Accidents

To prevent accidents from happening, the following precautions should be taken:

1) *Cuts and lacerations*
   a) While carrying a knife, hold the point down and keep the sharp edge away from the body.
   b) When cutting, use a chopping board, hold material correctly and cut away from the body.
   c) Sharpen knives when they become blunt. Blunt knives are more dangerous as material slips away while cutting or more pressure needs to be used.
   d) Do not catch a falling knife, move away, let it fall and then pick it up.
   e) Knives should not be washed in the dishwasher or left soaking in detergent solution in the dishwashing sink.
   f) While chopping meat, do not rest your left/free hand on the meat block but place hand behind the knife.
   g) Do not cut frozen meat; the knife blade may slip.
   h) Concentrate on your work and follow instructions while operating appliances.
   i) Handle broken glassware with care.
   j) Open tin cans with a cutter only, to prevent jagged edges. Do not open bottle caps by putting it in the mouth.
   k) Use proper shears for opening packets/boxes and not teeth or hands.
   l) Use safety guards. For example if coconut scraper attached to wet masala grinder is not in use, keep it covered.
   m) Smoothen out and seal all sharp edges or rough corners on equipment.
   n) Keep fingers out of mincing machine when in use.
2) *Burns and scalds*
   a) Store highly inflammable material carefully.
   b) Place equipment on a non-combustible base.
   c) Do not bend over open flames.
   d) Use protective clothing made of cotton or fire resistant material.
   e) Use padded gloves or dry dusters to pick up hot items as wet or damp clothes transmit heat faster and cause burns.

f) Do not put frozen, wet items in the deep fat fryer.
g) Keep level of fat-in deep fat fryer not more than two-thirds full.
h) Check taps of all burns and boilers.
i) Train all employees on use of fire extinguishers, through fire drills.
j) Ensure that steam condenser pipes are kept free to prevent hot steam build-up in equipment.

3) *Falls and collisions*
a) Provide adequate lighting.
b) Keep floors clean, dry and grease-free.
c) Mop up spills at once.
d) When mopping or polishing floors, put up sign boards.
e) On wet floors, use duckboards or non-skid mats.
f) Floors, flooring and stairs should be well maintained. Torn carpets, loose tiles, broken floors, loose steps, loose electrical wires, or any other obstruction should be attended to at once.
g) Matting and carpeting should be well laid.
h) Use a step-ladder which is tall enough to reach for material kept at a height.
i) Arrange all material to be stored at a height, safely on a sturdy shelf.
j) Keep traffic lines clean, dry and free from obstruction.
k) While carrying large items, do not let it block your view.
l) Have self-closing doors with transparent glass at eye level.
m) Take care of your head and prevent bad bumps while bending down and getting again.

4) *Shock*
a) Place electrical appliances in a safe place.
b) Check earthing of all equipments.
c) Ensure proper wiring and installation. Change old, frayed wiring.
d) Use all safety devices provided.
e) Do not change blades of the mixer without switching off electricity.
f) Do not clean electrical appliances unless plug is removed from the socket.
g) Do not misuse appliances, follow the instructions given.
h) Allow skilled workers to operate complicated machinery.
i) Long loose hair or flowing clothing can get caught in equipment.

It is thus quite obvious that accidents occur because of two main reasons: (a) unsafe conditions already existing in the surrounding which can be greatly minimized, and (b) unsafe conditions created by the food handlers through ignorance, carelessness, negligence and faulty habits which can be corrected through continuous supervision and training.

Now in the last section of this unit we shall review sanitation regulations and standards. But before that let us recapitulate what we have learnt so far. Answer the questions included in the check your progress exercise 1.

Check Your Progress Exercise 1

1) It is necessary for the employer to ensure good health and safe working conditions for all employees. What measures should the employer observe for the same?

.....

.....

2) All employees at the food service operation need good personal hygiene. Elaborate on the statement giving examples.

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.....

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3) In the industry today, special attention needs to be focused on training all employees. Discuss the significance of training workers.

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19.6 SANITATION REGULATIONS AND STANDARDS

Food quality, as you would have realized by now, is a major determinant of ensuring patronage of any food service organization. A safe, wholesome food of excellent quality ensures clientele and customer satisfaction providing maximum profits. In this section, we shall look at the various standards that have been outlined to make sure quality food is being served to customers. Also we shall look into the aspect of adulteration what is it? How does it affect us? What are the laws and standards that have been enforced to prevent malpractice of adulteration? You may recall reading about the food regulations and standard in the Food Microbiology and Safety Course, (MFN-003) in Unit 14. The concept of adulteration has also been covered in Unit 8 in the same course. It would be a good idea to supplement the information given here in this unit with the detail review provided in Unit 8 and 14 of the MFN-003 course. Let us then begin our study now.

19.6.1 Control of Food Quality

In our discussion so far we have focused on the personal hygiene, sanitary practices and work place safety to ensure safe food to the customers. The next issue which is important for food service operators is to have a good sound knowledge of all legislations and regulations at the national and international level to ensure food safety. Let us get to know about them. We begin with the food standards.

Food Standards

To protect people from health hazards because of adulteration, it is necessary to impose control and check over the quality of food available to consumers. Standards are *yardsticks established by an authority for measuring quantity, weight or quality.* This system ensures that each food stuff is what it proposes to be or what its label claims it to be and assures uniformity. National standards are set to safeguard the consumers health and ensure fair food trade practices. In 1963, the FAO and WHO established a commission for setting up international food standards.

Codex alimentarius are *International standards set by FAO and WHO for all the principal foods whether processed, semi-processed or raw.* It includes standards regarding food hygiene, food additives, pesticide residues, contaminants, labeling and presentation and methods of analysis and sampling.

A codex standard may be accepted by a country entirely or with more stringent requirements for trade and distribution of food within its territory. The Indian standards are described herewith.

The Food Safety and Standards Authority of India (FSSAI) has been established under the Food Safety and Standards Act, 2006 which is a consolidated statue related to food safety and regulation in India. This act repealed all the other food acts/orders existed in the system. You may recall reading about the following orders/acts:

- Prevention of Food Adulteration Act (PFA), 1954
- Fruit Products Order, 1955
- Meat Food Products Order, 1973
- Vegetable Oil Products (Control) Order, 1947
- Edible Oil Packaging (Regulation Order, 1988
- Solvent Extracted Oil, De-Oiled Meal and Edible Flour (Control) Order, 1967
- Milk and Milk Products order, 1992.

Now, FSSAI has laid down regulations known as Food Safety and Standards Regulations, 2011, that summed up all the food laws in a single boundary and has been called as ONE NATION ONE FOOD LAW. These are enumerated herwith;

1) **Food Safety and Standards (Food Products Standards and Food Additives) Regulations, 2011:** Different food product standards have been established under this regulation for different parameters according to locality. For example, raw buffalo's milk in Delhi should contain 6% and 9% (minimum percent) milk fat and milk solids not fat respectively. Likewise, different food products with different designations (milk; raw, pasteurized, boiled, flavored, sterilized) have been standardized. Also, the lowest possible levels of food additives in different food products have been defined and all the food business operators shall confine to these limits.

2) **Food Safety and Standard (Packaging) Regulations, 2018:** Whole list of type of packaging material for different food products have been mentioned. Packaging material should be hygienic, free from cuts, marks, pinholes etc. Newspaper or any such material should not be used for food wrapping or storing. They have also standardized the printing inks as it shall conform to IS: 15495 (Indian Standard Printing Ink for Food Packaging)

3) **Food Safety and Standards (Fortification of Foods) Regulations, 2018:** Adding micronutrients to the food can serve the purpose of improving food quality or nutritional status by correcting or reducing one or more deficiency state of population of a specific group. FSSAI has made it mandatory that every manufacturer who is fortifying any food item shall give an undertaking of quality assurance of that particular food along with steps followed in fortification. The authority has also laid down all the parameters and limits for specific nutrients to be added in a food product.

   For example, levels and source of nutrients for fortified salt, fortified oils, fortified milk, fortified wheat flour, fortified refined flour and fortified rice is given in document which you may refer for further information from the link given at the end of this section. You may also refer to Unit 12 MFN-006; Public Nutrition; for food fortification.

4) **Food Safety and Standards (Organic food) Regulations, 2017:** A manufacturer cannot manufacture, sale, offer for sale, pack, sell, market or import any organic food product without following the requirements laid down in this regulation. According to FSSAI, all the organic food products advanced for sale shall follow all the applicable provisions of any of the systems/programmes made for organic food products notified by food authority from time to time. Some examples of such programmes are National Programme for Organic Production (NPOP) and

Participatory Guarantee System for India (PGS-India). Apart from this labeling of organic foods shall carry a certification mark of any of above mentioned system along with organic logo of Food Safety and Standard Authority.

5) **Food Safety and Standards (Food or Health Supplements, Nutraceuticals, Food for Special Dietary Purpose, Functional Food and Novel Food) Regulation, 2016:** This regulation has specified all the rules, provisions or limits of specific product need to be taken care of in manufacturing health supplements, nutraceuticals or functional foods. It is mentioned that all the capsules, tablets or syrups shall comply with the quality standards and requirements as specified in Indian Pharmacopoeia, British Pharmacopoeia or United States Pharmacopoeia. (A Pharmacopoeia is an official published catalogue that contains list of medicinal drugs along with their effects and directions of use). Apart from this, an important consideration is whatever the quantity of nutrient is added to the food should be in accordance to recommended dietary allowances given by Indian Council of Medical Research, if not specified by international food standards body; Codex Alimentarius Commission.

6) **Food Safety and Standards (Prohibition and Restriction of sale) Regulation, 2011:** FSSAI has prohibited or restricted some food articles which can pose adverse health effects for the benefit of the population. For example, they have put a restriction on the sale of *Khesari Dal or Lathyrus sativus* and their products. It has also prohibited the sale of skimmed milk as only "milk", curd or dahi which is not prepared from boiled, pasteurized or sterilized milk, milk with added water, turmeric containing any added foreign substance, mixture of two or more edible oils as "an edible oil" and many more.

7) **Food Safety and Standards (Contaminants, toxins and residues) Regulation, 2011:** According to this regulation, FSSAI has explained the limits of all the toxins, residues, metal contaminants and insecticides/pesticides to be used for specific food product. For example, arsenic (metal contaminant) should not exceed by 0.1 parts per million (ppm) by weight in milk; aflatoxin (a crop contaminant) should have a limit of 30µg/kg in any food article; and tolerance limit of D.D.T. (insecticide) in carbonated water is 0.001 mg/kg.ppm.

8) **Food Safety and Standards (Import) Regulation, 2017:** There are so many food products which are imported to India and it is important to check these products thoroughly to prevent any health hazards. Therefore, no person shall import any food article without import license from central licensing authority. Refer to Unit 2, section 2.5.2 for details of central licensing authority. Shelf life of products should be at least 60% at the time of import.

9) **Food Safety and Standards (Alcoholic Beverages) Regulation, 2018:** FSSAI has recommended the limits of alcohol content in different types of alcoholic beverages as whiskey, rum, fenny, perry, fruit wine, beer, brandy etc.

10) **Food Safety and Standards (Licensing and Registration of Food Business) Regulation, 2011:** All the small scale food business operators have to register themselves and all large scale food business operators need to obtain a valid license under FSSAI, according to this regulation. Details of this regulation have already been discussed in Unit 2, section 2.5 of this book. You may refer to these regulations.

In addition to above mentioned regulations, there are some more regulations for laboratory and sampling analysis, food recall procedure, approval for non-specified food and food ingredient, food safety auditing, advertising and claims and lastly, recognition and notification of laboratories. You may refer to link https://www.fssai.gov.in/cms/food-safety-and-standards-regulations.php or visit FSSAI official website for more detailed information of all the regulations.

Now that we have studied "Regulations laid down by FSSAI", let us move towards the voluntary standards.

b) *Voluntary Standards*

Under voluntary standards too, we have a set of food standards. These include BIS and AGMARK, you surely would have heard about them or perhaps even learnt about them. Let us look at them.

1) *Bureau of India Standards(BIS)*: The BIS has formulated Indian standards for processed foods with respect to raw material, hygiene, packing and labeling. Manufacturers who comply with the standards laid down by BIS can obtain Indian Standards Institute (ISI) mark. However, certain items like additives, food colours, vanaspati, milk powder, condensed milk and packaging containers need compulsory certification.

2) *Agricultural Produce (Grading and Marketing) Act 1937 (Agmark)*: Agmark provides standards for grading and marking agriculture commodities. The consumer is assured of the quality as per standards laid down. The standards/grades are based on physical and chemical characteristics, intrinsic and acquired during processing or otherwise. Agricultural and allied commodities are graded 1,2,3, and 4 or Special, Good, Fair and Ordinary.

   Manufacturers who comply with the standards laid down by *Directorate of Marketing and Inspection,* put an Agmark label on their product. Complying with these standards is not compulsory.

Let us briefly review what do we mean by adulteration and misbranding and what are its economic and health related implication on consumers.

19.6.2 Adulteration and Misbranding

Adulteration of food consist of a large number of practices such as mixing other food or non-food items, substitution, extraction, concealing the quality, selling decomposed food, misbranding or giving false information on the labels and addition of poisonous or toxic substances to food.

Food adulteration has an economic significance and with increasing prices, the unscrupulous traders indulge in adulteration to exploit people. Some forms of adulteration are injurious to health, for example, addition of argemone oil to mustard oil. The consumer looks for dealers who supply food at a lower rate, ignorant of the fact that the cheaper substitute may be adulterated. The consumer may be attracted by apparent improvements in colour, taste and aroma caused by using compounds which are banned by law. Consumption of adulterated food leads to ill health and food poisoning.

A food is said to be *adulterated if it has any ingredient which is injurious to health*.

A food is said to be adulterated if :

1) It contains any poisonous or deleterious substance which may render it injurious to health (unless naturally present in less than harmful level).

2) It bears or contains any added poisonous or added deleterious substance which is unsafe.

3) It contains in while or in part any filthy, putrid or decomposed substance, or if it is otherwise unfit for consumption.

4) It has been prepared, packed or held under unsanitary conditions.

5) It is, in whole or in part, the product of a diseased animal or of an animal which has died otherwise than by slaughter.

6) If its container is composed, in while or in part, of any poisonous or deleterious substance which may render the contents injurious to health.

Some simple tests for detecting common adulterants in food are summarized in Table 19.2.

Table 19.2: Some simple tests for detecting common adulterants in food

Sl. No.	Food Stuff	Adulterant	Test
1)	Asafoetida	Scented and coloured resin or gum	Pure asafoetida dissolves in water to form a milky white solution.
2)	Bajra	Grains infested with ergot fungus	Infested grains will have an off taste and will float on water.
3)	Betelnut power (supari)	Saw dust and artificial colour	Saw dust will float in water and added colour will dissolve in water.
4)	Bura sugar	Washing soda	Gives effervescence with hydrochloric acid if washing soda is present; if dissolved in water, soda will turn red litmus blue.
5)	Cardamom	Essential oil is removed and pods are coated with talcum power	Talcum can be rubbed off the pods; on tasting, if there is hardly any aromatic flavour, it indicates removal of essential oil.
6)	Chilli powder	Saw dust and artificial colour	Saw dust will float in water and added colour will dissolve in water.
7.	Cinnamon	Cassia bark	Thick bark with less aroma than pure cinnamon, which is thin, shows adulteration.
8.	Cloves	Oil may be removed	If oil is removed, cloves appear shrunken in appearance.
9.	Coconut	Any other oil	Refrigerate oil in a bottle. Pure coconut oil solidifies leaving the adulterant as a separate layer.
10)	Coffee	Chicory	Shake a small sample in cold water, coffee will float while chicory will sink and stain the water brownish.
11)	Coriander power	Powdered horse dung	When powder is soaked in water, horse dung will flat.
12)	Cumin seeds	Grass seeds coloured with charcoal dust	If rubbed in hands, finger will turn black.
13)	Edible oil	Argemone	A reddish brown precipitate is formed when oil and hydrochloric acid are gently mixed with ferric chloride solution if argemone is present.
14)	Ghee (pure)	Vanaspati	Dissolve a large pinch of cane sugar in 10 ml concentrated hydrochloric acid. Add 10 ml of melted ghee and shake thoroughly for two minutes. Allow it to stand for 10 minutes. If vanaspati is present, aqueous layer will turn red.
15)	Groundnut Oil	Cotton seed oil	Mix 2.5 ml of oil/fat with 2.5 ml Halphens reagent. Lightly screw cap and heat in boiling water for 30 minutes. The test is positive if a rose colour is obtained.
16)	Mustard seeds	Argemone seeds	Visual examination, small black seeds resembling mustard but not uniformly smooth or round are visible under a magnifying glass.

17)	Peppercorns	Dried papaya seeds	Visual examination
18)	Pulses (whole)	Insects, larvae	Grains float on water and unpleasant odour and taste is seen.
19)	Pulses (split and dehusked)	Kesari dal and metanil yellow	Visual examination reveals wedge shaped dal and on addition of concentrated hydrochloric acid, yellow dal turns magenta red.
20)	Saffron	Dried, coloured and scented maize fibres	Genuine saffron is tough. Maize fibres break easily and dissolve in water giving instant aroma of saffron.
21)	Sago	Sand and talcum	Gritty feel in mouth; pure sago swells on burning leaving very little ash.
22)	Semolina	Iron filings	Pass magnet through semolina. Iron filings will cling to it.
23)	Tea dust	Used tea leaves which have been dried	Sprinkle dust on wet white filter paper. Spots of yellow; pink and red appearing powdered and coloured on paper indicate artificial colouring.
24)	Turmeric powder	Metanil yellow colouring	If metanil yellow is present, a magenta colour develops when conc. HCl is added to a solution of turmeric powder.

Apart from this, Food Safety and Standards (Food Product Standards and Food additives) Regulations, 2011, gave a whole list of amount of desired moisture, milk fat, solids not fat, micronutrients in infant formulas, along with their recommended sources, according to locality. Regulations have also mentioned the following criteria:

- What should be the texture of a food article?
- How a food article should be packed?
- What should be the source of a particular nutrient?
- Definitions of food articles, example srikhand.
- Designations of a food article, for example: full fat milk, skimmed milk, toned milk, double toned milk.

Now, can you suggest what measures can we adopt to prevent food adulteration. Prepare a list and tally your responses with the list presented herewith.

Prevention of Food Adulteration

1) Purchase food from authorized dealers only. Children should be discouraged from purchasing sweets, kulfis and ice creams from hawkers as they are likely to contain harmful colour and artificial sweeteners.

2) Before purchasing processed food items like masala powders, canned foods, bottled preserves, etc. check the expiry date and Agmark/ISI mark/ FPO licence.

3) Always ask for a cash or credit memo for all purchase. It helps the consumer in filing a complaint, if necessary.

4) Destroy labels on empty tins, cartons and bottles before selling them to scrap dealers as they are likely to be misused for repacking spurious and adulterated food stuffs.

5) Keep drugs, preservatives and detergents away from food stuffs to prevent accidental adulteration.

6) Always purchase food articles in sealed, intact packages.

7) Insist on Agmark, ISI mark or FPO licence.

In our discussion so far we have reviewed adulteration and specified the measures which can be adopted to prevent adulteration. Now let us also understand what we mean by the term misbranding.

Misbranding: A food is misbranded if its labeling is false or misleading in any particular. A food is deemed to be misbranded if it contains a chemical preservative, which is not stated on the label. The term chemical preservative means any chemical which, when added to food, tends to prevent or retard deterioration but does not include common salt, sugar, vinegar, spices or oils extracted from spices or substances added by wood smoke.

With this we end our study of issues in worker safety and security.

Check Your Progress Exercise 2

1) What do the following abbreviations stand for:

   a) UHTS: .....

   b) HACCP: .....

   c) FSSAI: .....

2) Design an effective training programme for cooks and service personnel working in a A grade restaurant.

   .....

   .....

   .....

3) Differentiate between adulteration and misbranding giving examples.

   .....

   .....

19.7 LET US SUM UP

In this unit we learnt about the issues linked to worker safety and security. We learnt that personal hygiene and good sanitary practices are necessary for everybody but more so for the food handler because the health and well-being of hundreds of people is in her/his hand. In this context, therefore, the various hygiene and sanitary measures to be adopted by the workers were enumerated. The role of safe work place was further highlighted. The presence of pests, their body parts or droppings in food served will not only result in contamination and spread in disease but can ruin the reputation of any catering establishment. This aspect was emphasized in the discussion on pest control.

Further the unit focused on sanitation training and education. It is the duty of the management to train all employees, directly or indirectly concerned with food, in safe food practices. It should keep a check on training is implemented. All programmes must be monitored and evaluated.

To control food quality, and to prevent adulteration and misbranding of food various standards have been laid down for different commodities. This was finally presented in the unit. The legislation that most directly affects the food handler is the PFA Act 1954 and Rules 1955 which have been modified and updated from time to time.

19.8 ANSWERS TO CHECK YOUR PROGRESS EXERCISES

Check Your Progress Exercise 1

1) Refer to sub-section 19.2.2, which presents the measures necessary for the employer to ensure good health and safe working conditions for all employees. Read the measures carefully and write the answer on your own.

2) All employees at the food service operation need good personal hygiene. Personal hygiene refers to all conditions and measures necessary to ensure the cleanliness of a person's clothes and body. These measures are elaborated in sub-section 19.2.2. Read these measures and write the answer in your own words giving examples.

3) Training of workers is necessary for the following reasons:

   - The incidence of food borne illness is on the rise.
   - It is the legal responsibility of the management to serve clean, wholesome food.
   - Most of the employees have no formal training either before or at the time of recruitment and have picked up the job from an older worker to whom they have been assigned.
   - In this industry, the labour turnover rate, as well as, job change rate is very high.
   - Very few establishments have an inbuilt, well-structured sanitation programme.
   - Professionally trained food service personnel are not available or do not have the time in their job.

Check Your Progress Exercise 2

1) a) Food Product Order

   b) Hazard Analysis Critical Control Point

   c) Food Safety and Standard Authority of India

2) Answer the question based on your understanding of the topic.

3) Adulteration of food consist of a large number of practices such as mixing other food or non-food items., substitution, extraction, concealing the quality, selling decomposed food, misbranding or giving false information on the labels and addition of poisonous or toxic substances to food. A food is misbranded if its labeling is false or misleading in any particular aspect.

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Annexure-1

Form 'A'

Application for Registration/Renewal of Registration under Food Safety and Standards Act, 2006

Photograph of the Applicant

Kind of business:

- ☐ Permanent/Temporary Stall holder
- ☐ Hawker (Itinerant/Mobile Food Vendor))
- ☐ Home based canteens/dabba wallas
- ☐ Petty Retailer of snacks/tea shops
- ☐ Manufacturer/Processor
- ☐ Re Packer
- ☐ Food stalls/arrangements in Religious gatherings, fairs etc.
- ☐ Milk producers (who are not member of dairy co-operative society)/milk vendor
- ☐ Dhaba
- ☐ Fish/meat/poultry shop/seller
- ☐ Other(s), please specify: .....

a) Name of the Applicant/Company: …….....

b) Designation

- ☐ Individual
- ☐ Partner
- ☐ Proprietor
- ☐ Secretary of dairy co-operative society
- ☐ Others (Please specify)

c) Proof of Identity of application .....

[*Note: Please submit a copy fo photo ID like Driving License, Passport, Ration Card or Election ID card*]

d) Correspondence address : .....

.....

Tel.No ..... Mobile No. .....

Fax No.: ..... Email : .....

[*Note: In case the number(s) are a PP or common number(s), please specify the name of the contact person as well*]

e) Area of Location where food business is to be conducted/Address of the premises .....

.....

f) Description of the food items proposed to be Manufactured or sold:

.....

S.No.	Name of Food category	Quanity in Kg per day or M.T. per annum

Please attach separate sheet if required

g) Total Annual turnover from the food business, if existing alongwith any supporting document(s) showing proof of income (**In case of renewal*) .....

.....

h) In case of new business - intended date of start : .....

i) In case of seasonal business, state the opening and closing period of the year: .....

j) Source of water supply

Public supply Private supply Any other source

k) Whether any electric power is used in manufacturing of the food items:

☐ Yes

☐ No

If yes, please state the exact HP used or sanctioned Electricity load: ……

l) I/We have forwarded a sum of Rs. ..... towards registration fees according to the provision of the Food Safety and Standards (Licensing and Registration) Regulation, 2011 vide:

☐ Demand Draft No. (Payable to .....)

☐ Cash

(Signature of the Applicant)

Annexure-2

Form 'B'

Application for License/Renewal of license under Food Safety and Standards Act, 2006

Kind of business (Please tick more than one, if applicable):

- ☐ Manufacturing/Processing including sorting, grading etc.
- ☐ Milk Collection/chilling
- ☐ Slaughter House
- ☐ Solvent extracting unit
- ☐ Solvent extracting plant equipped with pre cleaning of oil seeds or pre expelling of oil
- ☐ Solvent extracting and oil refining plant.
- ☐ Packaging
- ☐ Relabeling (manufactured by third party under own packing and labeling)
- ☐ Importing
- ☐ Storage/Warehouse/Cold Storage
- ☐ Retail Trade
- ☐ Wholesale Trade
- ☐ Distributor/Supplier
- ☐ Transporter of food
- ☐ Catering
- ☐ Dhabha or any other food vending establishment
- ☐ Club/canteen
- ☐ Hotel
- ☐ Restaurant
- ☐ Other(s), please specify: .....

1. Name of the Company/Organization: .....
2. Registered Office Address : .....
3. Address of Premise for which license is being applied .....
4. Name and/or designation, qualification and address of technically qualified person in charge of operations as required under Regulation .....

   Name :

   Qualification:

   Address:

   Telepnone Number(s)

   Mobile No.:

   Email:

   Photo Identy card no and expiry date :

5. Name and/or designation, address and contact details of person responsible for complying with conditions of license (if different from 4 above).

   Name:

   Address:

   Telephone Number(s)

   Mobile No.

   Email:

   Photo Identity card no and expiry dae

6- Correspondence address (if different from 3 above)

7 Tel.No ..... Mobile No. .....

Fax No.: ..... Email : .....

8. Food items proposed to be manufactured:

S.No.	Name of Food item	Quantity in Kg per day or M.T. per annum

If required attach separate sheet

If already having valid license-mention annual quantity of each food category manufactured during last three years

9. Installed Capacity food product wise (per day) ……..

10. For Dairy units

i) Location and installed capacity of Milk Chilling Centers (MCC)/Bulk Milk Cooling Centers (BMCs)/ Milk Processing Unit/Milk Packaging Unit in litres owned or managed by the applicant.

S.No.	Name of Food Item	Quantity in Kg per day or M.T. Per annum

If required attach separate sheet

ii) Average Quantity of milk per day to be used/handled in

a. In lean season ……

b. In flush season ……..

iii) Milk products to be manufactured and their manufacturing capacity (tones/year)

1) ……..

2) ……..

3) ……

11. For Solvent Extracted Oil, De oiled meal and Edible Flour

i) Details of proposed business

Name of Oil bearing material	From seed or nut or cake	Solvent-Extracted Oil, De oiled meal and Edible Flour						Vegetable Oil
		Crude	Neutralized & Bleached	Neutrilized Meal	Refined	De Oiled	Edible Flour	

If already having valid license-mention annual quantity of each product manufactured during last three years

ii) Name and address of factory or factories used by the miller or solvent extractor for processing oil bearing material produced or procured by him, or for refining solvent extracted oil produced by him.

.....

.....

12. Sanctioned electricity load or HP to be used .....

13. Whether unit is equipped with an analytical laboratory .....

If yes the details thereof: .....

14. In case of renewal or transfer of license granted under other laws as per provision to Regulation 5(1)* – period for which license required (1 to 5 years): .....

15. I/We have forwarded a sum of Rs. ..... towards License fees according to the provision of the Food Safety and Standards Regulations, 2011 vide.

Demand Draft No. (payable to ……..)

(Signature of the application/authorized signatory)

*Refer to FSSAI website for regulation 5(1)