

Food Safety Management



Food Safety Management

Edexcel HND Assignment

Report

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Task 1

1.1 Discuss the controls required to prevent physical and chemical contamination of food.

Food safety management is extremely important to the general public as well as operatives in the food industry. Physical contamination occurs when there are foreign bodies present within the cooked product. Such foreign bodies generally include wood or glass fragments or at times even wire and metal. Consumers would be in danger of swallowing a harmful object and would also be in danger of cutting themselves, damaging their teeth or choking. The ingestion of such foreign bodies could also cause internal damage to the consumer leading to bodily harm.

The controls require that the gradual buildup of dirt and other contaminants be avoided in any area in which food preparation takes place. Therefore, all surfaces that come in contact with food should be washed and sterilized using the necessary cleaning agents. Such surfaces would include pantry tops, chopping boards and wash basins and the cooking utensils. Similarly all equipment used in the food preparation process should also be sterilized before being put to use. Additionally all waste holders too, require cleaning. Other surfaces would include the storage cupboards, walls, ceilings and windows need to be kept clean and sterile in order to ensure a high standard of food preparation.

Chemical contamination occurs when the presence of pesticides, cleaning agents or even poisonous fungi in large amounts work to affect the consumer. In addition, fuel and mineral oil as well as rodent bait can present themselves in the food leading to contamination. In order to prevent chemical contamination high quality prescribed fertilizers and pesticides must be used at all times during the raw material phase. These chemicals need to be used in proper quantities and by experienced personnel.

1.2 Compare the characteristics of food poisoning and food borne infections.

Food poisoning can be defined as “An acute illness, usually with symptoms of diarrhea and/or vomiting, nausea and abdominal pain, caused by the consumption of contaminated or poisonous food” (HACCP Handbook, 34). Food poisoning is generally caused by toxins that

occur naturally in the food such as poisonous fungi. Most toxins are heat resistant and therefore cannot be destroyed by the cooking process. Foodborne infections on the other hand, are caused by a microorganism in the food. The symptoms of foodborne infections may occur within a few hours or even in a few days. These may disappear after some hours but the individual may carry the germ for a few more days and has the ability to infect other people through poor hygienic practices.

The characteristics of food poisoning/foodborne infections include diarrhea, stomach cramps, vomiting, nausea, fever, headache and dizziness. These symptoms can present either simultaneously or they may gradually present and increase. What is significant however is that this is a serious condition brought on by poor food safety management and needs to be addressed

1.3 Discuss how food borne illness can be controlled.

Foodborne illness can be prevented through practical safety measures. Food handlers need to ensure that they maintain proper personal hygiene, especially remembering to wash their hands during the food preparation process. Secondly, the food preparation area and surfaces require precise cleanliness and disinfection. In addition to this, it must be noted that rodents, pets and other animals need to be kept away from this area. Proper storage systems are also necessary to avoid foodborne illness. Additionally, cleaning agents, pesticides and other chemicals too, need to be stored safely away from the raw and cooked food. Raw material should always be of high quality and must be obtained from a reliable and trustworthy location. Frozen food must be fully defrosted before the cooking process and individuals must ensure that the food is thoroughly cooked. Lastly, cooked food must not be left out for over four hours before consumption and left over food must always be packed and stored appropriately to ensure that bacteria and toxins do not build.

Task 2

2.1 Categorize the food spoilage agents that affect food.

Food spoilage can cause much harm to those who consume infected food products. Food spoilage can occur in three categories; microbial spoilage, autolysis and other factors such as infestation and low temperature. (<http://home.pacific.net.hk/~ppleung/Chem/spoilage.htm>)

Microbial spoilage occurs when microorganisms work to induce food spoilage. There are three common microorganisms that can have such an effect on food; Bacteria, Mold and yeast. As is commonly known, bacteria can grow in almost any condition in any place. They have the ability to change and adapt according to their environment. Mold grows in strand-like groups and is generally spread by air. They grow on high acid foods such as fruit, tomatoes and even jams and pickles. The presence of yeast can cause food spoilage in many food groups. Yeast too commonly thrives in high acid foods as it needs water and sugar to grow. Processing food at high temperatures can prevent its growth.

The second category of food spoilage agents is autolysis. Autolysis can occur through enzymes and oxidation by air or moisture. Enzymes can be explained simply as the proteins present in all plant and animal life forms. Enzymes promote the growth of raw foods and therefore if raw food is not used within a time frame, it tends to spoil. Oxidation refers to the amount of moisture in the air. Bacteria and other microorganisms generally require water in order to survive and thus moisture must be removed.

Other factors that act as spoilage agents are infestation and low temperature. Infestation occurs in the form of small insects such as bugs, weevils, moths, worms and other rodents. Low temperature refers to when the internal structure of food gets damaged by improper storage in lower temperatures.

2.2 Discuss the methods of food preservation.

The process of food preservation helps to prolong the shelf life of raw and cooked food items. It does this by changing the structure of the food item in such a way that prevents the growth of bacteria and deters other food spoilage agents. The main and most common methods of

preservation are drying, freezing, processing in high heat, smoking, refrigerating, adding chemical preservatives, adding salt or sugar and ionized radiation. (<http://healthyeatingclub.com/info/articles/food-proc/food-pres.htm>)

The drying of foods can occur in multiple ways. For example, some fruits and vegetables and even meats can be dried in the sun. Food items can also be dried in the freezer or even spray dried. The purpose of this method is to reduce the water content in the food item and thus to make the atmosphere inhospitable to bacteria. Freezing food items works in much the same manner. The low temperature levels ensure that bacteria cannot develop on the food item. It also ensures the lack of water content which is necessary for bacterial growth. Processing in high heat destroys many forms of bacteria thus making the food item safe for consumption. Canning is another form of high heat processing where foods are canned and sealed in order to prevent bacterial growth. Smoking refers to the process whereby the food item is dried by means of smoke. Many types of meat are preserved in this manner. Refrigeration is one of the most common means by which people prolong the shelf life of food items. By lowering the temperature, refrigeration slows the bacterial growth process. It does not stop the growth however. Chemical preservatives are used in many food items people purchase from stores. These chemicals destroy all forms of bacteria and significantly prolong shelf life. Adding salt or sugar is preservation method used for years. This method protects the food by increasing or decreasing the acidity of the food products thus ensuring that bacteria cannot grow in that environment. It also works to reduce the water content of those food items. Lastly, iodized radiation is the process by which food items are exposed to high energy electrons or gamma rays through which bacteria and other spoilage agents are destroyed.

2.3 Evaluate the effectiveness of food preservation methods.

Food preservation needs to occur in an organized and timely manner to ensure the safety and wellbeing of consumers.

Firstly, the method of drying consists of removing the water content present in the food items by means of sun drying, freeze drying or spray drying. Significantly, this method produces a concentrated form of the food item. It is advantageous however, in that it retains most of the products' nutrients except for vitamin c and thiamin. It is also effective in that drying obstructs the growth of microorganisms as well the autolytic enzymes that can cause food

spoilage. Freezing works in much the same manner as drying, where the water content is removed from the food item. While this prevents the growth of bacteria it also retains most of the nutrients, as no changes are made to the structure of the item. The problem with this method however is that great care must be taken with its storage as unintended or inappropriate defrosting or thawing can cause rapid spoilage. Smoking is another method whereby the water content of the food item is removed. However, the smoking process needs to be done with great care as food may become cross contaminated and spoil due to mishandling. Smoked foods have also been associated with cancer in some countries.

High heat processing is another effective method of food preservation. Pasteurization also falls into this category of food preservation whereby the items are heated until the microorganisms are destroyed. This method is quite effective as it destroys microorganisms while at the same time removing the water content of the food items. However, the heating process can eliminate the food's nutrients. The canning method is where food is cooked and then stored in sterilized vessels that are then also heated to induce sterilization. This method works by destroying bacteria through the process of heat. However, some water soluble nutrients may be lost in the cooking process. Refrigeration is a method whereby the spoilage of food can be slowed down through the low temperature. This ensures that microorganisms do not rapidly grow. However, refrigeration is undoubtedly a temporary method as food can still spoil with time.

Chemical preservatives are one of the most common forms of food preservation. This method is extremely effective in that it manages to retain all the food items nutrients while at the same time preventing microbial growth. However, some people prove to be allergic to some chemicals used in the preservation process and this needs to be taken into consideration. Lastly, ionized radiation works well with food items such as spices, and some fruits whereby bacteria can be destroyed without losing the original taste of the foods. However, some foods can still lose nutrients with time.

Task 3

3.1 Discuss the key steps in a temperature control system.

Food temperature control is extremely important in order to preserve the quality of the food items. A temperature control system contains a few key stages. These are storage, defrosting, preparation, cooking, cooling, re-heating, plating and transport. (http://www.falkirk.gov.uk/services/development/food_and_safety_regulation/food_safety/PDFs/temperature_control.pdf)

Food should ideally be stored in a chilled environment, either refrigerated between 2-8 C or frozen at minus 18 C or less, in order to prevent spoilage. When defrosting, frozen foods should always be defrosted in the refrigerator and allowed to gradually thaw. Additionally all food must be thoroughly defrosted before use. During the preparation process, food must not be kept at room temperature for longer than needed. Food items should ideally be cooked to above 75 C while some meats require additional heat in order to be cooked thoroughly. Food should be at least 63 C hot during the service. If food is to be transported, it should be done so in frozen or refrigerated containers and must be delivered as soon as possible.

3.2 Summarize methods for the safe storage of food.

Food items need to be stored safely in order to ensure the well-being of the consumer. Care needs to be taken in the cleaning and sterilization of the storage shelves, cupboards and other surfaces and regular checks need to be carried out to ensure that pests and other rodents are kept away from these areas.

The most common method of safe storage for food is through freezing. Most raw meats and fish need to be stored between 2-5 C and care should be taken to ensure that these food items are kept away from other items such as vegetables and fruits to ensure that the aroma's do not mix and that there is no cross contamination. The packaging must be properly done and the foods must be rotated around the freezer in order to ensure freshness. It must be ensured that these items are not unintentionally defrosted. Much maintenance goes into this storage process in order to ensure that the equipment is efficient and in proper working order to prevent unintentional thawing. Raw and cooked foods should be kept separated and no warm food should be placed in chilled storage.

Items that do not require refrigeration need to be stocked and stored. They must be kept away from the walls and floors. The most important facet in this process is keeping in check the

expiry dates and the storage instructions. Foods such as sugar, salt, spices etc. need to be kept in a dry place away from pests and other infestations. This food needs to be packaged and covered properly for this purpose.

Chemicals need to be stored properly away from the food items to avoid contamination. Cleaning agents and other detergents need to be of high quality. Personal hygiene is equally important in this respect. Individuals handling the stored food items should have washed and disinfected their hands to prevent contamination.

3.3 Evaluate the importance of personal hygiene in the control of food contamination.

Individuals working in the food industry have an obligation towards the consumer to ensure the best of service. Personal hygiene for individuals who work with food is important in order to avoid food poisoning and food contamination. Any person who works in the food industry has to ensure the wellbeing of the consumer, reputation, the business and industry. There are specific laws that indicate how such individuals must conduct themselves in the preparation of food and how to manage their hygiene in their duties. Bacteria may be spread in many ways through the lack of personal hygiene. Individuals touching their nose, hair, mouth or clothes can transfer germs from themselves to the food being prepared. It is also important to ensure that such individuals do not cook when they are ill as this would increase the chances of infection. (http://www.health.vic.gov.au/foodsafety/downloads/hygiene_personal.pdf)

3.4 Evaluate cleaning and disinfection as a process supporting safe food production.

Cleaning and disinfection is crucial to safe food production as it is one of the most important factors preventing food contamination and thus preventing foodborne illness. The cleaning process has to occur regularly and according to a proper schedule. Such a schedule would ensure that the process occurs frequently and that the food items are safe from contamination. It is important to note that not only the food items but also the individuals handling the food items as well as all surfaces that directly or indirectly come into contact with the food needs to be cleaned and sterilized. Such cleansing would prevent microbial, chemical and physical

hazards that can contaminate food. Chemicals (detergents), warm water and physical action are required to comply with the laws regarding cleaning and disinfection in the food preparation process.

3.5 Asses the problems associated with pest control in food premises.

Pests pose a huge threat to the food preparation process. They spread illness and germs and are also carriers of contagious and dangerous diseases. They can also contaminate food and promote food spoilage which can be damaging both to the food producer as well as the consumer. Apart from the food, pests can also surfaces that come into contact with food. The presence of pests can also cause loss of business and reputation as consumers would not be inclined to purchase food items from a place infested with insects. Additionally, a food premises that contains an infestation of pests faces prosecution in accordance with the food hygiene regulations act.

(http://www.cieh.org/uploadedFiles/Core/Policy/Publications_and_information_services/Policy_publications/Publications/Pest_control_food_industry.pdf) Thus windows and doors should be secured to avoid the presence of insects. Food, water and other forms of sustenance must be cleared away to deter insects. Additionally, detergents and fumigation methods can also be used to destroy pest infestations.

3.6 Justify the need for hygienic design and construction of food premises.

Designing a premises fit to be used in the preparation of food is a formidable and responsible challenge. Although the size and specifications of such a premises depends on the nature of the business, room should be made for proper storage facilities, for the preparation and cooking of food, for the service, for the washing as well as for waste disposal. It would also require additional space for staff facilities. The design of this area is important as it facilitates an efficient service and can help immensely in the production of safe and nutritious food. The work should flow continuously from one process to the next and a hygienic design for the premises ensures that this can be accomplished without the risk of food poisoning. For example, raw and cooked foods should be kept apart so as to avoid cross contamination. Thus it is important to keep the storage and cooking areas separately. Similarly, cleaning agents and detergents should also be stored safely away from the food items.

3.7 Justify the importance of training as a quality assurance mechanism.

Much of the lapses that occur in the food industry are a result of inadequate knowledge or training on the part of food handlers. Training is increasingly important to ensure the proper storage, preparation, handling and serving of food to consumers. Individuals who go through this training also have a deeper understanding of hygiene and how to make the environment safe for the food preparation process. It also gives them the opportunity to learn how to operate mechanisms and equipment needed in the food process. Such training should occur both on a theoretical as well as practical level. After learning the theories, handlers should also be given on the job training in order for them to hone their skills. As the food industry is constantly evolving, such training programs should occur on a regular basis so that handlers can always be knowledgeable of the latest methods and regulations pertaining to the food industry. Such contentious actions would reduce the likelihood of mistakes on the part of the handlers as well as ensuring that laws and regulations are known and upheld. (<http://www.totalqualityassuranceservices.com/importance-of-food-quality-assurance-systems>)

Task 4.1

4.1 Produce a food hazard risk assessment.

- Identify the Hazards–Physical Hazards such as dirt, wood, glass and stone fragments that may cause food spoilage. Chemical hazards such as pesticides, cleaning chemicals and fungi may cause foodborne illnesses. Microbial hazards such as bacteria, virus or mold can also be harmful.
- Decide who might be harmed and how – Asses the safety of the staff as well as their training. All staff should be properly trained in hygienic measures as well as in food

handling. Secondly, consumer welfare must be considered where all food items must be of a high standard in order to ensure the wellbeing and satisfaction of the customer.

- Evaluate the risks and decide on precautions – all food hazards must be avoided and removed as far as possible. For example, if a particular cleaning agent is proving unhealthy; other cleaning agents must be considered. All systems and equipment must be fully functional to avoid mishaps and regulations set out by the government must be followed in order to provide the best and safest service.
- Record your findings and implement them – the decisions taken during the earlier phase must be implemented strictly, in order to fall in line with the proper preparation methods.
- Review the risk assessment and update regularly – as mentioned earlier, the food industry is constantly evolving and this requires that all assessments be frequently updated in keeping with the latest advancements.

4.2 Complete a food safety control system

In order to protect the health and safety of the consumers, it is essential to have an effective food controlling systems. At the same time these food safety control systems are essential in ensuring that the goods provided to international market are up to the required level of quality and safety. When considering about the food safety in international context, the “*White Paper on food safety*” issued by the European Union in 2000 can be identified one of the significant components. At the same time, “*Codex Alimentarius Commission*” is also committed to develop the standards related to food safety and control and to mitigate the risk associates with the food safety. In most of the countries, the main responsibility in relation to this food safety may be laid down on a centralized authority body such as “*National Food Safety Authority*”. Some of the tasks of these authorized bodies are to enforce food safety control procedures, offering scientific advices, risk assessment and risk communication (The responsibility of the government in order to protect the customers from food safety hazards). Under the scope of food safety, it should include not only food safety and technical advices but also other aspects such as environmental protection/sustainability and animal welfare. A

proper food safety control system should be a combination of both the food safety requirements of the governmental authorized bodies and other “*Private food safety control systems*”. These Private Food Control systems can be divided into two major components.

- Private control over the quality schemes and private criteria
- Private control over the official standards and procedures

In order to convince the customers the reliability on the food safety control system of a certain organization, it is better to make that food safety control system certified by a renovated accredited institutional body such as *International Standard Organization (ISO)*.

For any of the food safety control system, it should ensure that it covers all the safety aspects of the foods provided under that. Some of those aspects are:

- **Microbiological safety**- This ensures that the goods are free from *Pathogenic Organism* and have produced under the proper hygienic practices.
- **Chemical safety**- Goods should be free from any harmful chemicals.
- **Physical safety**- Goods should be physically up to the required standard.
- **Honestly presenting**- Goods should not be adulterated, advertised in a misleading manner and include any inferior raw materials.

4.3 Devise a food safety guide for legislative compliance

In the UK context, there are many legislative requirements related with the food safety. Any of the organizations which are operating in the food industry should be in line with those legal requirements. The “*Food Control System*” which is operated under the *Ministry of Healthcare* is one of such kind of regulatory body. At the same time there is a Food Advisory Committee (FAC) in UK which was established under the Food Act 1990 for regulating this industry (This act was amended in several times). During the last few years, UK is in the process of amending/revising the existing rules and regulations which are in

relation to the food safety to be in accordance with the guidelines of the “*Codex Alimentarius Commission*” for ensuring that the rules and regulations are scientific-based and risk-based.

When considering the legislative requirements in UK food safety industry, there are number of rules and certificate schemes that an organization in that industry to be followed. Some of the certificate schemes are *Good Manufacturing Process (GMP)*, *Good Agricultural Practices (GAP)*, *Good Hygienic Practices (GHP)*, *Good Veterinary Practices (GVP)*, and *Hazard Analysis and Critical Control Point (HACCP)*. But, in relation to some certificate schemes, there are some goods (*Essential goods/Specific goods*) that are essential to get those certificates for producing and selling those goods. At the same time, in the global context, there is a major legislative certificate scheme under the International Standard Organization, which is referred as *ISO 22000*.

In order to be complied with the above mentioned rules and regulations of the legislative authorities, the following guide will be helpful in practice.

- Ensure that the organization has the required staff with appropriate skills and knowledge- For this purpose, the organization should satisfy the followings.
 - Educate the staff regarding the food safety and hygienic factors
 - Giving appropriate training for the staff
 - Create a set of rules, regulation and code of practice in relation to ensuring the food safety
 - Recruiting qualified employees
- Identify the risks in relation to food safety
- How to handle the food safety within the organization effectively and efficiently
- Ensure that the organization has the required resources (Machines, tools, hygienic environment, proper inventory system) for food safety systems
- Who are the responsible parties for food safety and their level of accountability towards the food safety

If any of the organization which is in the food industry can put the above mentioned guidelines into action, then it will not be a difficult to be in line with the legislative requirements in relation to food safety both locally and internationally.

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