**NAME: TAKERHI RITA RUKEWHE**

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**ASSIGNMENT**

**TITLE:** CA2
**COURSE TITLE:** FOOD AND CATERING STUDIES
**COURSE CODE:** TEM 418

**QUESTIONS**
QUESTION 1- Explain food studies as a subject of study and outline the relevance of food and catering studies to events management professional.

QUESTION 2: Discuss various heating techniques used in a food processing plant with appropriate examples.

QUESTION 3: Discuss in details the major types of food preservation techniques commonly employed by the food processing companies

**ANSWERS**

**Question 1**

**Explain food studies as a subject of study**

Food Studies is the critical examination of [food](https://en.wikipedia.org/wiki/Food) and its contexts within science, art, history, society, and other fields. It is distinctive from other food-related areas of study such as [nutrition](https://en.wikipedia.org/wiki/Nutrition), [agriculture](https://en.wikipedia.org/wiki/Agriculture), [gastronomy](https://en.wikipedia.org/wiki/Gastronomy), and [culinary arts](https://en.wikipedia.org/wiki/Culinary_arts) in that it tends to look beyond the mere consumption, production, and aesthetic appreciation of food and tries to illuminate food as it relates to a vast number of academic fields. The field of food studies is quite broad, as it covers multiple food-related issues and topics like the history of food and **agriculture**, **nutrition**, food law, and food politics.

**The relevance of food and catering studies to events management professional includes;**

A large part of planning an event revolves around the food to be served to the attendees. The process of figuring out how many people to prepare food for and deciding what foods to serve is difficult enough, but then having to prepare and serve the food can make things even more stressful. This is what makes caterers who studied food and catering so important to events management professionals. Often times, great food can help make an event even more memorable.

## Make Planning Simpler

Planning an event is time consuming. An event management professionals have a million things to think about such as guest lists, invitations, venues, timelines, entertainment, décor and food. Food logistics are difficult to understand, especially if there’s no experience doing it. Caterers will deal with this for you. Not having to cook or serve will alleviate some stress and allow the event professional to focus on other things while they take care of this. A great caterer ensures that your event is fully stocked, and that your guests are well taken care of.

1. Leave it to the Professionals

Just like in anything else, experience is important. Preparing or planning food for an event should be left to the professionals. Catering is no easy task and shouldn’t be expected to be done by anyone who hasn’t done it before. Caterers with experience in the type of event been planned will help an event succeed. They know how to treat the food to ensure it is handled correctly and safely the entire day. Experienced caterers will cater to the theme and to the attendees. Not everyone has the same food needs or preferences which is why catering companies are great. They provide the versatility needed to adapt many plates to fit diverse wants and needs.

1. Presentation is Important

food must be stunning in a way that it not only tastes terrific but also looks terrific. Caterers can make the presentation of the meal correspond with the event theme. By having a catering company, an event management professional will be able to leave a lasting impression. With a million things going on before and during the event, it’s great to have a catering company pay attention to the small details of the food and beverage options that will make the event even more memorable.

## Invest in Catering

Food can make or break any event. Save time, worry less, and make a good impression by investing in a catering company. The versatility that is offered will help your events succeed, regardless of the theme. Quality catering from an experienced company will show the attendees that you care and have amazing taste – no pun intended.

1. **It all goes back to the basics of hospitality**

The idea of hospitality goes back to biblical times, when people would open their homes to guests — even strangers — and break bread. The idea of sharing a meal led to shared conversations, shared ideas, shared fellowship.

**QUESTION 2:**

**The various heating techniques used in a food processing plant with appropriate examples includes;**

* Mild processes – Blanching, Pasteurisation.
* More severe processes – Canning, Baking, Roasting, Frying.
1. BLANCHING

The primary purpose of blanching is to destroy enzyme activity in fruit and vegetables. It is not intended as a sole method of preservation, but as a pre-treatment prior to freezing, drying and canning. Other functions of blanching include:

• Reducing surface microbial contamination

• Softening vegetable tissues to facilitate filling into containers

• Removing air from intercellular spaces prior to canning

 1.1 Blanching and enzyme inactivation

Freezing and dehydration are insuffcient to inactivate enzymes and therefore blanching can be employed. Canning conditions may allow suffcient time for enzyme activity. Enzymes are proteins which are denatured at high temperatures and lose their activity. Enzymes which cause loss of quality include Lipoxygenase, Polyphenoloxidase, Polygaacturonase and Chlorophyllase. Heat resistant enzymes include Catalase and Peroxidase

1.2 Methods of Blanching

Blanching is carried out at up to 100°C using hot water or steam at or near atmospheric pressure. Some use of fluidised bed blanchers, utilising a mixture of air and steam, has been reported. Advantages include faster, more uniform heating, good mixing of the product, reduction in effluent, shorter processing time and hence reduced loss of soluble and heat sensitive components.

There is also some use of microwaves for blanching. Advantages include rapid heating and less loss of water soluble components. Disadvantages include high capital costs and potential diffculties in uniformity of heating.

* Steam Blanchers: This is the preferred method for foods with large cut surface areas as lower leaching losses. Normally food material carried on a mesh belt or rotatory cylinder through a steam atmosphere, residence time controlled by speed of the conveyor or rotation. Often poor uniformity of heating in the multiple layers of food, so attaining the required time-temperature at the centre results in overheating of outside layers.
* Individual Quick Blanching (IQB) involves a first stage in which a single layer of the food is heated to suffcient temperature to inactivate enzymes and a second stage in which a deep bed of the product is held for suffcient time to allow the temperature at the centre of each piece to increase to that needed for inactivation. The reduced heating time (e.g. for 10 mm diced carrot, 25 s heating and 50 s holding compared with 3 minutes conventional blanching) results in higher energy effcienciess For small products es gs peas, sliced or diced carrots), mass of produce blanched per kg steam increases from 0.5kg for conventional steam blanchers to 6-7kg for IQB.
* Hot Water Blanchers; Includes various designs which hold the food in hot water (70 to 100°C) for a specified time, then moves it to a dewatering/cooling section. In blanchers of this type the food enters a slowly rotating drum, partially submerged in the hot water. It is carried along by internal flights, residence time being controlled by the speed of rotation. Pipe blanchers consist of insulated tubes through which hot water is circulated. Food is metered into the stream, residence time being controlled by the length of the pipe and velocity of the water. The blancher-cooker has three sections, a preheating stage, a blanching stage, and a cooling stage. As the food remains on a single belt throughout the process, it is less likely to be physically damaged. With the heat recovery incorporated in the system, 16 to 20 kg of product can be blanched for every kg of steam, compared with 0.25 to 0.5kg per kg stream in the conventional hot water blanchers. 2.3
1. **PASTEURIZATION**

2.1 Purpose of Pasteurization

Pasteurization is a relatively mild heat treatment in which food is heated to <100CIt is widely used throughout the food industry and is frequently employed as a CCP in various HACCP plans. As a unit operation in food processing it can be used to destroy enzymes and relatively heat sensitive micro-organisms (e.g. non spore forming bacteria, yeast and moulds). In this regard is it used to extend shelf life by several days e.g. milk or months e.g. bottled fruit. The severity of treatment and resulting extension of shelf life is determined mostly by pH of the food. In low acid foods (Ph<4.5) the main purpose is destruction of pathogenic bacteria, while below pH 4.5 the destruction of spoilage microorganisms or enzyme deactivation is usually more important. The extent of heat treatment required is determined by the D value (Decimal reduction time or time to reduce numbers by a factor of 10 or 90% of the initial load) of most heat resistant enzyme or micro-organism which may be present. In terms of checking the effectiveness of the process, alkaline phosphatase is a naturally occurring enzyme in raw milk with a similar D value to heat-resistant pathogens and so is routinely used as an indicator of adequate pasteurisation. If phosphatase activity is found, it is assumed that pasteurisation is inadequate. Pasteurization is normally used for the destruction of all disease causing organisms (e.g. pasteurization of milk) or the destruction or reduction in the number of spoilage organisms in certain foods e.g. vinegar

Table: Milk Pasteurizing Temperatures

|  |  |
| --- | --- |
| Temperature  | Time |
| 63°C  | For 30 min (low temperature long time LTLT) |
| 72°C  | For 15 sec (primary high temperature short time, HTST method) |
| 89°C  | For 1.0 sec |
| 90°C  | For 0.5 sec |
| 94°C  | For 0.1 sec |
| 100°C  | For 0.01 sec |

 These temperatures are equivalent and are suffcient to destroy the most heat sensitive of the non-spore-forming pathogenic organisms. Milk pasteurization temperatures are also suffcient to destroy all yeasts, moulds, gram negative bacteria and many gram positive. The two groups of micro-organisms that survive pasteurisation temperatures used in milk are:

Thermoduric: organisms that can survive exposure to relatively high temperatures but do not necessarily grow at these temperatures e.g. Streptococcus and Lactobacillus.

Thermophilic: organisms that not only survive relatively high temperatures but require high temperatures for their growth.

2.2 Method for Pasteurizing

There are number of basic methods of pasteurization widely used in the industry.

* Batch (holding) Method In this method every particle (e.g. milk) must be heated to at least 63°C and held for at least 30 minutes, however this is not used commercially these days.
* High-Temperature-Short-Time (HTST) In this method the heating of every particle of milk to at least 72°C and holding for at least 15 seconds. Carried out as a continuous process. Ultra Heat Treatment (UHT) a sterilisation treatment, can also be performed using higher temperatures and shorter times e.g. 1 s at 135°C

Pasteurization of packaged foods

Some liquid foods (e.g. beer and fruit juices) are pasteurized after filling into containers. Hot water is normally used if the food is packaged into glass, to reduce the risk of breakage due to thermal shock. Maximum temperature between the container and the liquid are 20°C for heating and 10°C for cooling. Metal and plastic containers may be pasteurized using steam-air mixtures or hot water. Pasteurisers may be batch or continuous. A simple batch type may be a water bath in which crates of the food are heated to a pre-set temperature, and then cooled by draining and adding cold water. A continuous version may convey containers through a hot water batch followed by a cold water bath. Steam tunnels may also be used with the advantage of faster heating, resulting in shorter residence time and smaller equipment. Temperatures in the heating zones may be controlled depending on the amount of air present. Acid products such as fruit or acidified vegetables like beetroot can be pasteurized in a retort.

1. Sterilisation

Unlike pasteurized products where the survival of heat resistant microorganisms is accepted, the aim of sterilization is the destruction of all bacteria including their spores. Heat treatment of such products must be severe enough to inactivate/kill the most heat resistant bacterial microorganisms, which are the spores of Bacillus and Clostridium. Food products filled in sealed containers are exposed to temperatures above 100°C in pressure cookers. Temperatures above 100°C, usually ranging from 110-121°C depending on the type of product, must be reached inside the product. Products are kept for a defined period of time at temperature levels required for the sterilization depending on type of product and size of container. If spores are not completely inactivated, vegetative microorganisms will grow from the spores as soon as conditions are favourable again. Favourable conditions will exist when the heat treatment is completed and the products are stored under ambient temperatures. The surviving microorganisms can either spoil preserved food or produce toxins which cause food poisoning. Amongst the two groups of spore producing microorganisms Clostridium is more heat resistant than Bacillus. Temperatures of 110°C will kill most Bacillus spores within a short time. In the case of Clostridium temperatures of up to 121°C are needed to kill the spores within a relatively short time. These sterilization temperatures are needed for short-term inactivation (within a few seconds) of spores of Bacillus or Clostridium. These spores can also be killed at slightly lower temperatures, but longer heat treatment periods must be applied.

Two typical forms of sterilised product are:

 • In package sterilised, in which product is packed into containers and the container of product is then sterilised e.g. canning, some bottled products, retort pouches

 • UHT or Aseptically processed products in which the product and the package is sterilised separately then the package is filled with the sterile product and sealed under specific conditions e.g. long life milk, tetrapack or combibloc fruit juices and soups etc.

**QUESTION 3**

**The major types of food preservation techniques commonly employed by the food processing companies include:**

**1) Pasteurisation** is a process of heat treatment of milk, beer and some other beverages. It requires sufficient holding time to assure the thermal destruction of pathogens and organisms responsible for spoilage, without altering the nutritional value. It involves heating the food to a specific temperature for a specific time and then cooling rapidly.

Pasteurisation kills most but not all of the microorganisms present. It is a very useful method when more rigorous heat treatment could harm the quality of the product, as in the case of milk, and when the aim is to kill only the pathogens that are not very heat-resistant.

The temperature applied and the holding time of pasteurisation vary with the equipment available and the type of food product. In milk pasteurisation, the time-temperature combination is selected on the basis of the thermal death time of the most resistant pathogens (TB bacilli) that may be present in raw milk, and the maximum temperature and time at which the taste, palatability and nutritive value of milk are maintained. Normally milk is pasteurised at 62.8°C for at least 30 minutes or at 71.7°C for at least 15 seconds, or, if using ultra-high temperature (UHT), at 135°C for 1–2 seconds. UHT milk is sterilised, meaning all forms of life are destroyed. This extends its storage time but does affect the taste.

**2) Blanching** is a mild pre-cooking operation which can reduce the bacterial load on vegetables by 90%. It means the application of boiling water or steam for a short time. It wilts some bulky vegetables and prevents discolouring of others. It cleans peas of the moist and sticky material around them. Blanching vegetables prior to canning, freezing or drying helps to remove soil, insects and microorganisms, and destroys or slows the action of enzymes. It sets the green colour and generally facilitates dicing, peeling and packing.

**3) Canning** is one of the most widely used modern methods of processing and preserving food. It involves the careful preparation of food packed into a sealed tin, glass or plastic container which is subjected to defined high temperatures (above 100ºC) for an appropriate period of time, and then cooled. Following the thermal (heat) processing, the sealed container must be cooled immediately to a temperature of about 38ºC to prevent unnecessary adverse effects of heat on the texture, flavour or colour of the food.

The canning method involves the following steps: sterilising the food to be canned, packing it in sterile, air-tight stainless metal, glass or plastic containers, and then hermetically sealing (i.e. with a complete, airtight seal) the containers to prevent contamination during handling and storage. In the heat process, all vegetative bacteria are destroyed and spores cannot grow. Any can that is damaged or swollen should not be used. A swollen, bulging can indicates that gas is being produced on the inside and demonstrates there is microbial activity in the food, so it would not be safe to eat.

**4) Chilling** involves reducing food temperatures, but only to approximately -1ºC. Refrigerators for cold storage/chilling are normally used at 0ºC to +8ºC for preservation of a wide variety of food products

**5) Freezing**of food, when carried out properly, is one of the best methods of preserving foodstuffs in as nearly natural a state as possible. Freezing preserves the storage life of foods by slowing down enzyme reactions and the growth of microorganisms. A low storage temperature of at least -12°C is important if prolonged storage life is desired without losing flavour. Needless to say, freezing foods to preserve them is only possible with a freezer and reliable power supply.

Vegetables with a high moisture content do not freeze well because cellulose (in plant cell walls) tends to be broken down by enzymes regardless of the rate of freezing, making the vegetables soft. Therefore, for such food items, blanching to destroy enzyme activity is required prior to freezing.

6) Drying: This is a dehydration process by which the water/moisture content of the food is removed or decreased. Pathogenic and other bacteria cannot multiply in the absence of water. Most tend to die in foods that have been dehydrated to a moisture content of 10–20% of weight. Drying, however, may not kill spores. Drying also achieves food preservation by inactivating enzymes.

Drying or evaporation methods have been applied to nearly every kind of watery food, including milk. Although the loss in vitamins and nutritional value is usually minor, some foods change physically and chemically, and are sometimes altered in natural colour and flavour. Other dried products do not compare favourably with their fresh counterparts due to difficulties in reconstitution, i.e. adding water to return the food to its original form.

#### 7)  Fermentation and pickling

Not all microorganisms are bad. Certain microorganisms are necessary in the preparation and preservation of many foods and beverages. Essentially, **fermentation** (a controlled microbial action) is a process of anaerobic or partially anaerobic oxidation of carbohydrates that produces acids and alcohol. It is one of the oldest methods of food preservation. In fermentation, food preservation is achieved by the presence of acid or alcohol, which creates unfavourable environmental conditions for decomposing and other undesirable bacteria.

Foods commonly processed and preserved by fermentation methods are milk and milk products, beef, vinegar, drinks like beer and wine, and pickled fruits and vegetables. Pickling is the process of preserving food by anaerobic fermentation either in brine (salt solution) or in an acid solution, usually vinegar. The concentrations of the pickling agents and the time needed for pickling are determined by the type of food. Fermented and/or pickled food products are semi-perishable and must be protected from moulds, which are able to attack the acids and permit the invasion of spoilage organisms.

8)**Chemical preservation**

It has been customary to classify chemicals incorporated into food for preservation purposes as ‘intentional additives’. Additives used at food industry level include vitamins, mould inhibitors, bactericides, emulsifiers, minerals, food colouring, synthetic flavours and sweeteners. Chemicals that get into food accidentally are referred to as ‘unintentional additives’. They include the unavoidable residues of agricultural chemicals, pesticides or antibiotics.

There are several traditional methods of food preservation used at the household level that can be classed as chemical methods. Substances such a sugar, salt, vinegar, spices and wood-smoke are generally regarded as safe and natural preservatives. Salting, sugaring and smoking are all methods of **curing** foods. Curing is a general term that covers all these types of food preservation.

**9) Salting** is the addition of salt (sodium chloride or NaCl) to food for the purpose of preservation. The growth of microorganisms is inhibited by the salt, which has the effect of drawing water out of the bacterial cells so they become dehydrated and die. In this manner, salt, in combination with other measures, acts as a preservative in many foods such as butter, cabbage, cheese, cucumber, meat and fish. It also gives a desired flavour to the food. Salting can be done by rubbing adequate quantities of dry salt into foods, or by immersion, where the food item is soaked in a concentrated salt solution (i.e. brine). For effective preservation, the concentration of the brine solution has to be maintained above 18%. This is approximately one cupful of salt to five cups of water.

**10) Sugaring**refers to the action of sugar in food preservation. It is similar to the action of salt in that it depends on the removal of water. In concentrations of at least 65%, sugar solution is widely used as a sweetening and preserving agent. However, care is needed because at low concentrations, sugar solution can support the growth of microorganisms. It has been found that microorganisms rarely survive in solutions above 20–25% sugar concentration.

**11) Smoking** is one of the oldest methods used to improve the quality of food and is commonly used to preserve meat and fish. The smoking process involves exposing food to smoke from burning or smouldering wood or other plant material. It partially preserves the food by surface drying, i.e. removing moisture from the surface of the food, but it is not a reliable method of preservation unless combined with some other method such as salting or drying.

Smoking is used to lengthen the shelf life of perishable food items. This effect is achieved by exposing the food to smoke from burning plant materials such as wood. Most commonly subjected to this method of food preservation are meats and fish that have undergone curing. Fruits and vegetables like paprika, cheeses, spices, and ingredients for making drinks such as malt and tea leaves are also smoked, but mainly for cooking or flavoring them. It is one of the oldest food preservation methods, which probably arose after the development of cooking with fire.

12) Spices also have some uses in food preservation because they tend to inhibit the growth of staphylococci and other bacteria. However, they have a very limited application because they often get contaminated themselves by a number of bacteria.

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