UNIT 7 FOOD MANAGEMENT: QUALITY FOOD PRODUCTION — PLANNING AND CONTROL

Structure

7.1 INTRODUCTION

In our study so far, we have reviewed the menu planning and the purchasing, receiving, storage and issue operations involved in the food management of a food service establishment. Now in this unit we will focus on food production which is considered the core of the overall food service system.

When we think of quality food production under preplanned and controlled conditions, we think of other than own households, hotels, restaurants, lunch rooms, fast foods operations, catering services, schools, hospitals, institutional food services, industrial and military food services and vending machines. All these call for planning and control of entire system of food production and executing the same. Planning, we have already learnt, is pre-requisite for any system to succeed. Planning for food production would involve number of steps like storage facilities, storage of ingredients, and raw materials in a most hygienic condition, use of germ free implements, utensils, use of appropriate robes/aprons by the cook. Storage of finally cooked food will call for maintaining a particular temperature.

Another step in the process of food control is the use of standardized recipes, which helps to deliver a food product of same quality every time to the consumer and helps in forecasting ingredients requirements for food production. Also exercises like portion control and adoption of measures for safeguarding are inevitable steps for quality food production. The unit will explain all the steps required for production of quality food.

Objectives

After studying this unit, you will be able to:

- discuss the principles of food production,
- explain the system management for food production, including ingredients control, production forecasting/scheduling of recipes,

- describe the importance of standardization of recipes and portion control, and
- enumerate the quality control at all stages of food production to deliver safe food to the customer.

7.2 PRINCIPLES OF FOOD PRODUCTION

Many food service units follow various principles for production of food. Chronicled data suggest that even in bygone times certain principles for production of food were followed. It was based on number of people to be served or the type of occasion like a festival or wedding or for that matter for a patient who is ill. All these required special rules for producing food in a particular manner, ensuring taste, flavour and contentment of the customers. Comparing the older times from today makes the above rules no exception. Food is still produced in the same manner for different occasions yet with a new range of special techniques. Today many food service systems have been established which are classified into four main categories which include:

- Traditional
- Commissary
- Ready-Prepared
- Assembly/Serve

These systems vary with respect to the degree of processing required on purchased items, methods of production, holding and distribution. There may be many differences in the type of operation, but basic similarities exist in the provision of food to customers. Let us review these food service systems.

Traditional

Food production in traditional systems involves the procurement of ingredients to be processed, cooked and served within individual food service units. These operations often maintain separate production centers such as baking, entrée preparation and cold food production areas, cooking area, frying area etc. within the units.

Commissary

Commissary systems involve production of food items in a central facility. Menu items are partially or completely processed then held frozen, chilled, or heated for distribution to satellite centers for final preparation and service.

Ready Prepared

Ready prepared food service systems have been developed in response to increasing labour costs and a critical shortage of skilled food production personnel.

The increased availability of highly processed or fully prepared products has lead to the development of *assembly/serve* systems.

Production planning you would notice begins with the menu and the production forecast. We will study about these aspects next under the section food production systems management.

7.3 FOOD PRODUCTION SYSTEMS MANAGEMENT

A major focus of food service management is the development and maintenance of procedures that predict and control the functions of the production systems. Key components of food service management system are:

i) Selection of appropriate menus and its recipes including ingredients used, and

ii) Forecasting production and its scheduling.

Let us review these components now.

7.3.1 Menu

Production planning as mentioned above starts with the menu. Quantities of food to prepare are based on the predicted number of servings needed and the portion size to be offered based on the menu. As described earlier in Unit 5, menu is a list of food products offered by the food service operation to the consumer. It is the foundation from which other function of the system is based. In the initial stages of planning a food service operation, the menu guides the selection and layout of equipment. In operation, the menu we have already seen controls other subsystems such as purchasing, storage, production and service.

Menus are classified according to frequency of use and degree of choice. Within this classification, menus are described as fixed (static), cyclic or single-use. These menus offer the consumer no choice or limited choice. Depending upon the particular food service operation, the classification may fall in more than one category. These types of menus have already been described in detail in Unit 5 earlier; hence we shall not dwell on the types of menu here. But certainly, menu is the focal point of all activities, particularly the production operation in a food service unit.

Next, let us study about the ingredient control.

7.3.2 Ingredient Control

Basic to production planning is the menu which determines the food/ingredients to be purchased. Food service operations today have a wide variety of options in selection of products. Items may arrive as ingredients, semi prepared products, or ready-to-serve products. Ingredients control actually begins with the forecasting, purchasing, receiving and storing of foods and continues through preparation and production, the control of the ingredients supports the major goals of the product consistency and cost control.

Two major approaches to ingredient control are common in food service operations. These include:

1) In traditional production systems, employees in production areas are often responsible for all processes, relating to the preparation of specific items. For this each employee must be trained in the proper use of measuring and processing equipment and ingredient handling.

2) An alternative to this approach is training staff specially assigned to the processes of ingredient control. With this approach, designated areas may be utilized for these procedures. This approach may involve arrangement in the kitchen or development of a separate room or area designed for ingredient preparation and distribution.

The organization of an ingredient control room or area requires consideration of location, equipment and procedures. A location between storage and production areas facilitates the efficient flow of materials from ingredients or production. Refer to Table 7.1, which gives the list indicating the major equipments needed of an ingredient control area.

Table 7.1: List of the major equipments needed for an ingredient control area

Control Area	Storage Function
Storage	Dry Refrigerated Frozen
Processing	Can opener Cutting board Knives Mixer Food chopper
Measuring	Scales Measuring cups Measuring spoons Ladles
Distributing	Various size containers Lids Steam table pans Sheet pans Carts
Others	Waste disposal Water supply

Selection of appropriate menus and its recipes including ingredient control, we have read so far are essential components in food production systems management. Determining the quantities of menu items to be prepared and foods to be purchased or requisitioned from the store room is the function of production forecast which is a vital component for the food production system management. Let us review this component next.

7.3.3 Production Forecasting

We begin our study by first understanding what we mean by production forecasting. *Production forecast is the prediction of the food needs* (for a day or far a stated period) *of the food service unit.* In other words, forecasting is the basis for determining quantities of menu item to be prepared and foods to be purchased. It is not only vital to production planning, but it serves as a basis for purchasing and providing data for budgeting.

Production forecasting models are popular tools in projecting demand in food service operation. With the increased availability of computer equipment, the use of more sophisticated techniques is possible. A basic premise of these models is the reliance on historical data and usage of records. The assumption is that future needs will be similar to the past? The goal of evaluating usage is to analyze patterns or trends in the records.

The most common forecasting methods are *time series analysis*, which are helpful in projecting short-term needs. The least complicated procedure is the *moving average*, useful for projecting needs for an individual item. The process involves maintaining usage data for some time period say 5 to 10 days.

The first step in this process involves taking the average for the time period to determine the first data point. The second data point is determined by omitting the first usage point and determining the average usage for the next 5 - 10 days period. An example of the usage data with reference to usage of potatoes is illustrated in Table 7.2.

Table 7.2: Moving average method for estimating demand for potatoes

Day	Pounds of Potatoes	Average
1	120	
2	90	
3	105	
4	100	
5	115	106 (days 1 - 5)
6	110	104 (days 2 - 6)
7	105	107 (days 3 - 7)
8	95	105 (days 4 - 8)
9	120	109 (days 5 - 9)
10	115	109 (days 6 - 10)

In Table 7.2, you may have notices that the process begins with the recording of usage of potatoes for 5 days. The first average is calculated by adding the usage for each of 5 days and dividing by 5 (i.e.120 + 90 + 105 + 100 + 115 = 530/5). The first average data is 106 pounds. The second average is calculated by average use of potatoes for day 2 through 6. The second data point is 104 pounds. This procedure is repeated with each succeeding 5-day usage period.

Evaluation of the moving average shows less change than is shown in the individual usage patterns. Use of average data values facilitates the ability of purchasing and production systems to plan for future needs. This technique would be most suited for those operations that utilized a fixed menu, since usage records would be more frequent and patterns more easily identified. However, this technique could be altered for those operations using cyclic menus, since the same items would repeat, and historical data could be maintained and evaluated.

With adequate forecasting being the framework for deciding amounts to be produced, a food service unit can hence requisition for purchase. It is always kept in mind as to how many individuals or people will the food service establishment cater to and that itself is the basis for determining quantities to be produced. Most big establishments use computer based programmes for determining amounts to be produced.

Thus we have seen how forecast is the basis for determining quantities of menu items to be prepared or purchased or for that matter requisitioned from the store. Next, let us move on to another important component in food production systems management i.e. production scheduling.

7.3.4 Production Scheduling

Scheduling production is an extension of the production forecast. Projections based on the expected number of portions of given menu items are the next step in ensuring appropriate amounts of food are prepared. *Schedules define the amount of each item to be prepared, time sequence, expected and actual yield, additional instructions, and employee assignments.* An example of a format for scheduling production is presented in Figure 7.1.

Thus we have seen that once the amount has been determined and recipe is known the next step is to requisition for supplies and scheduling of food preparation. This requires careful planning in order to extract the best skillful job for the employee without exhausting the staff members. Scheduling should also account for lesser holding time and fast doling out of food, with original quality in terms of taste, flavour and texture to be retained. As we know, that before serving the food, a number of processes are followed such as:

- Pre-preparation like cutting, peeling, blanching etc.
- Cooking of food
- Holding
- Serving

Production Schedule Sheet

Date:
Meal:
Unit:

Item/Recipe	Quantity Needed	Actual Produced	Time Schedule	Leftover	Comments

Additional Instructions:

Figure 7.1: Production schedule sheet

Care has to be taken to see that all scheduling for each recipe to go through these processes is planned well in advance. Dividing the recipes into a number of stages helps planning easier as well saves time. Schedules need to be planned well in advance. So, let us now see as to how production scheduling is carried out.

Often production is scheduled using a production work sheet, which is a checklist of items in detail to be produced. It clearly mentions the time of preparation of a particular recipes for the current day's menu, as well as, lists down various other pre-preparation instructions needed to be carried out in advance as you may have already noticed in the production schedule sheet shown in Figure 7.1. Sometimes special instructions for a dish are also mentioned in this worksheet for example serving instructions for a particular dish say for pasta items, dessert etc. Often recordings for amount of food prepared, used and leftover are also carried out. Scheduled worksheet can be made for individual employers or a common worksheet can be distributed to a food service department. In large organizations this type of scheduling is particularly essential to food preparation, as it requires managing of a huge staff and coordination between each department. Thus, worksheet for scheduling requires careful planning. However meeting requires careful planning. However meeting at various intervals on a regular basis can effectively take out confusions and guess work from the scheduling.

The discussion so far focused on the components basic to food production system management. We hope you have got a good insight into how production planning, forecast and scheduling are vital to the successful production of high-quality food. To recapitulate what you have learnt so far, we suggest you answer the questions included in the check your progress exercise 1. On successfully answering the questions move on to the next section which deals with production control.

Check Your Progress Exercise 1

1) List the four food service systems.

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2) List the two key components of food service management system.

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3) Distinguish between production forecasting and production scheduling.

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It is the responsibility of the individual or the management of a food service establishment to serve high quality food. This responsibility starts with production planning, forecasting and scheduling. Next, the management is responsible for setting of standards and ensuring that employees are aware of them. This is the production control tool available in the food service operation. Let us review the production control system next.

7.4 PRODUCTION CONTROL

Production control involves a number of steps adopted to maintain the quality, standard and required quantity of the final food product. These steps not only translate into monetary savings and prevent indiscriminate use, but also help in the upkeep of maintenance and standard of a food establishment. An important tool for production control is the use of standardized recipe. In this section we shall get to know about standardized recipes and their use in production control and also highlight the steps involved in recipe adjustment for portion size or total yield.

We begin our study with standardized recipe.

7.4.1 Use of Standardized Recipes

It is extremely essential for food service establishments to standardize recipes in order to maintain quality and to remove guess wok out of food preparation. *A standardized recipe can be termed as a recipe which gives consistently the same result every time it is used.* It gives the amount of ingredients to be used and the procedure to make the dish. It also specifies the yield, number of portions and the size of portion. An example of a standardized recipe of urad dal vada is given in Figure 7.2.

Urad Dal Vada

Yield: 100 vadas
Portion size: 2 vadas
No. of servings: 50

Ingredients	**Amount**
Black gram dal	2 kg
Ginger	100 g
Green chilli	50
Oil	1 kg

Method:

1) Soak dal for 8 - 10 hours.
2) Grind to a smooth, fluffy paste with minimum of water.
3) Drop a little mixture into a bowl of water. If the mixture floats, it is ready for frying. Otherwise, grind more.
4) Add chopped ginger, green chilli and curry leaves. Add these along with salt to the batter.
5) Use a standard ladle to portion out the batter. Make a small round. Press in the center.
6) Heat oil. Fry to a golden brown colour. Serve hot 2 vadas per plate with coconut chutney and sambar.

Figure 7.2: Standardized recipe for urad dal vada

The development and use of standardized recipes comprises one of the most important tools available to food service operations to control costs and ensure product consistency and quality. Consistent duplication of a food item is achieved with an accurate record of ingredients, amounts and methods of combining ingredients and cooking. It is important that recipes be standardized for individual facilities since variation exists with equipment and temperature controls. The process of standardization recipes results in instruction that have been tested in a specific operation with equipment and procedures that will be used in the production of the item. Recipes are tested for quality, quantity procedures, time, temperature, equipment and yield. Items should be tested and results recorded until the product characteristics match the needs of the operation.

The importance of using standardized recipes is highlighted herewith.

Standardization of Recipes:

- Promotes uniform quality of foods produced.
- Promotes uniform quantity of foods produced, saves time for cooks, managers, or dietitians.
- Saves money for controlling waste and regulating inventories.
- Simplifies costing of menu items.
- Simplifies the training of new cooks.
- Introduces a feeling of job security and satisfaction for food service workers.

In the cook-chill and cook-freeze systems, special recipes are required for many items due to changes that occur in storage. Flavour changes are common, especially in frozen items. The use of different ingredients or modifications of storage time and temperature can be helpful in controlling these changes.

Now that we have an idea about what is a standardized recipe and its importance, next let us get to know how to develop a standardized recipe.

7.4.2 Developing a Programme for Recipe Standardization

Selecting a basic format for recipe is an important first step in developing procedures for recipe standardization. A block arrangement or format is helpful in developing the recipe. Let us get to know this format.

A block *format* is generally used in quantity food service operations. This method of portraying information categorizes the needed ingredients with amounts and procedures in visual "blocks" across columns.

Information included in the recipe should also be determined for use in each operation. Certain information is essential, regardless of the form in which the recipe is written. Generally, a recipe includes the following information:-

- Name of item or recipe title
- Total yield, portion size, and number of portions.
- Ingredients by count, weight, and/or measure.
- Procedures for combining ingredients.
- Cooking or baking equipments, temperature, and time.
- Portioning information.

Look at Figure 7.2 which presents a standardized recipe for urad dal. Check to see whether the recipe contain the information presented above. Standard recipes should be maintained in the format given below. It should include:

- Recipe title entered on top either centrally or on top right or left hand corner as shown in Figure 7.2.
- Yield and portion size should be indicated either in weight or count or numbers or volume.
- For baked items, baking time and temperature should be indicated on top so that preheating of oven and scheduling of baking can be planned without reading the entire recipe.
- Ingredients and quantities should be given. The names of ingredients should be consistent in all recipes. It is not right to use the term refined wheat flour in one place and *maida* in another place.
- The directions for preparation should be clear and concise. The directions should be divided into logical steps. Basic procedures should be uniform in all recipes. For example, white sauce is used for cream soups, baked vegetables and meat dishes. The procedure followed should be same for all recipes.
- Electrical equipments, if used, the timing and speed should also be indicated.
- Instructions for portioning of foods should also be clear.

A recipe is considered standardized only when it has been tried and adapted for use in a particular situation or in a given food service operation. A recipe may be obtained from many sources, however you may have to adjust and standardize for use in a particular situation. Let us understand how recipe is adjusted next.

Recipe Adjustment

Another important component of recipe is the development of recipes that produce an appropriate number of portions for the operation. Food service operation may obtain recipes from a number of sources. Home recipes, published quantity recipes, or those prepared in the operation for which no written record exists are all examples of recipes that require adjustments.

Two common methods of recipe adjustment can be used. These include:

A) Factor Method

B) Percentage Method

Let us review these methods.

A) *Factor Method*

To specify adjusting recipes, it is recommended that all ingredients even liquid be indicated by weight whenever possible. Using weight measurements is generally more accurate, especially with dry ingredients, which can easily pack down in a volume measure. Various conversion tables are available for converting all fractions (if they exist) to ounce, portions of a pound. The following 4 steps and example detail the factor method for recipe adjustment.

Example: The basic recipe yields 100 portions; production of 370 portions is needed.

STEP 1: Divide the desired yield by the known yield of the basic recipe. The resulting figure of 3.7 i.e.,

370/100 = 3.7 *is called the factor.*

STEP 2: Multiply all recipe ingredients and the total recipe volume by the factor of 3.7 as shown.

Ingredients	100 Portions	Factor	370 Portions
Dry chilly beans	6.00 lb	× 3.7	22.20 lbs
Canned tomatoes	6.375 lb	× 3.7	23.5875 lbs
Chilly powder	0.25 lb	× 3.7	0.925 lbs

STEP 3: Since it may be difficult for employees to interpret decimal amounts, reconverting these decimal units into pounds/ounces or quarts/cups may be desired.

Ingredients	370 Portions	Conversion from Decimal
Dry chilly beans	22.20 lbs	22 lbs 3½ oz.
Canned tomatoes	23.5875 lbs	23 lbs 9½ oz
Chilly powder	0.925 lbs	14½ oz

STEP 4: The adjustment ingredients may be in odd or unusual amounts and may require rounding. Basic guidelines for rounding have been calculated to be within the limits of error normally introduced in the handling of ingredients in the preparing quantity foods.

The sample recipe ingredients would be rounded in the following manner.

Ingredients	370 Portions	Rounded Amount
Dry chilly beans	22 lbs 3½ oz	22 lbs 4 oz
Canned tomatoes	23 lbs 9½ oz	23 lbs 10 oz
Chilly powder	14½ oz	14½ oz

Note: 1lbs = 0.4535 kg or 454 g; 1oz = 28.3495 g

Hope having gone through the example above would have given you a good idea of using the factorial method for recipe adjustment. Next, we shall review the percentage method.

B) *Percentage Method*

This method requires the conversion of ingredients to weights and the computation of the percentage of each ingredients of the total weight. Adjusting the ingredients for portion size or total yield is a simple process. The following step-by-step instructions describe recipe adjustment with the percentage method.

STEP 1: Convert all ingredients from measure or pounds and ounces to tenths of a pound. Make desired equivalent ingredient substitutions, such as frozen whole eggs for fresh or powdered milk for liquid.

STEP 2: Total the weight of ingredients in a recipe after each ingredient has been converted to weight in the edible portion (EP). The recipe may show both AP (as purchased) and EP weights, but the edible portion is used in determining the total portion weight.

Example: The weight of carrots or celery should be weighed after cleaning and peeling.

STEP 3: Calculate the percentage of each ingredient in the recipe in relation to the total weight using the formula given herewith.

Formula

$$\frac{\text{Individual ingredient weight}}{\text{Total weight}} \times 100 = \text{Percentage of each ingredient}$$

STEP 4: Check the ratio of ingredients. The ingredients should be in proper balance before going further.

STEP 5: Establish the weight needed to give the desired number of servings, which will be in relation to pan size, portion weight, or equipment capacity.

Example includes the following:

- Total weight must be divisible by the weight per pan.
- A cookie may weigh 0.14 lb/serving, therefore 0.14 times the number of desired servings equals the weight needed.
- Recipe total quantities should be comparable with the mixing bowl capacity.

STEP 6: Cooking or handling loss must be added to the weight needed and may vary from 1 to 30%, depending on the product.

The formula for adding handling loss to a recipe is as follows:-

100% handling loss = Yield %

(Yield %) (Total quantity) = Desired yield

$$\text{Total quantity} = \frac{\text{Desired yield}}{\text{Yield \%}}$$

Let us understand this with the help of an example.

Example: Yellow cake has a 1% handling loss. Desired yield is 80 lb of batter for 600 servings.

100% – 1% = 99% or 0.99

0.99 of total quantity = 80 lb

$$\text{Total quantity} = \frac{80 \text{ lb}}{0.99}$$

Total quantity = 80.80 lb of ingredients for 80 lb available batter.

STEP 7: Multiply each percentage number by the total weight to give the exact amount of each ingredient needed. After the percentages of each ingredient have been established, any number of servings can be calculated and the ratio of ingredients to the total will be the same. As in the factor method, one decimal place in a recipe is shown unless the quantity is less than one pound in which case 2 places are shown.

Thus using this step-by step percentage procedure we can adjust the ingredients for portion size or total yield.

The discussion so far focused on standardized recipes and its usage in food production operation to predict the quality, quantity and portion cost of the menu. Next, we shall study about the safeguards in food preparation and cooking.

7.5 SAFEGUARD IN FOOD PRODUCTION

The prime aim of all food service establishments is to maintain a good food standard, as well as, quality day after day. Quality is associated with consumer acceptance and spells monetary gains for the food service establishment. Quality maintenance in food can be brought about by buying quality merchandise from a reliable wholesaler. Also, once the food has been cooked, regular food tasting by food experts should be carried out in order to maintain standard. In order to maintain microbiological and physical standards, the concept of HACCP (Hazard Analysis Critical Control Points) has been used in the food industry and food service system. You may recall studying about HACCP as an effective food safety assurance system in the Food Microbiology and Safety Course (MFN-003) in Unit 13.

Many food establishments often get their food evaluated whenever a new recipe is tried out. Also many a different laboratory checks for quality and microbial check are carried out to maintain quality standards. Sensory evaluations, both subjective and objective methods are also utilized for determining flavour, texture, odour, mouthfeel etc. for consumer acceptance of food. We have covered these various sensory evaluation methods in the Principles of Food Science Course (MFN-008) in Unit 14 under the unit title New Product Development. We suggest you look up this unit now and revise your understanding of this topic. Here we will further elaborate on the quality control measures in food production.

7.5.1 Quality Control in Food Preparation and Cooking

The kitchen is the main domain of the chef or kitchen manager and consequently he/she is responsible for quality control in food preparation and cooking that takes place in the kitchen. One area in which the chef must take full initiative is the pre-meal evaluation. All food items that are prepared for the serving line or otherwise for customer consumption must be quality evaluated prior to serving. This responsibility might lie with the cook responsible for cooking the recipe, the chef, or some knowledgeable individual(s) appointed by the management. It is a most important quality assurance responsibility that can not be neglected.

The chef or the kitchen manager, in carrying out these quality assurance responsibilities must perform certain functions. These include:

1) He/she must ensure that cooks are following the standard recipes to the letter.
2) He/she should frequently check spices and other additive ingredients to determine whether they have maintained desired characteristics.
3) It is his or her responsibility to make sure that adequate scales, measuring devices, and proper cooking utensils are available, and
4) The chef has the important responsibility of ensuring that all kitchen personnel meet personal hygiene required and are dressed properly.

Other sanitation measures are highlighted hererwith.

Sanitation

Sanitation quality assurance is everyone's responsibility. Poor sanitation can reduce the overall quality of a food service establishment in many years i.e. it is very important to control the quality of sanitation in a restaurant in addition to the quality of the food being served.

The National Sanitation Foundation (NSF) recommends the following considerations, when purchasing new food service equipments:

- Equipments should be easy to assemble, remove and to clean.
- All materials should be non-toxic and impart no significant odour, colour or taste to the food.
- Internal corners should be rounded of without the use of solder.
- All surfaces should be smooth and free of pits, crevices, ledges, inside threads and shoulders, bolts and rivets.
- Coating materials, especially those on food-contact surfaces, should resists cracking and dripping.
- Waste and waste liquids should be easily removed.

Measures for controlling microbial quality of food are discussed next.

7.5.2 Controlling Microbiological Quality of Food

The goal of sanitation programme in a food service operation is to protect the customer from food borne illnesses. Various possibilities for contamination of food before it is purchased, including contaminated equipments, infected pests and animals, untreated sewage, unsafe water and soil have been outlined. After the food is purchased contamination can occur in storage, preparation and service.

According to *Ryser* and *Mart* (1989), food handlers must take appropriate precautions to prevent cross contamination between raw meat, poultry, seafood etc. Information related to time-temperature control and critical control points need to be considered. A brief review follows.

Time – Temperature Control

Contamination can be reduced by time, temperature control in the storage, production and service of foods. Growth of harmful organisms can be slowed or prevented by refrigeration or freezing. Organisms can be destroyed by sufficient heat.

It is important to note that the microorganism in general, flourishes at temperature between 40°F and 140°F. This temperature range is identified as the "*Food Danger Zone*", because bacteria multiply rapidly in it. The longest period that food may safely remain in this zone is for 4 hours, although food should not be in the 60°F to 100°F range longer then two hours.

Suggested temperature as applied to potentially hazardous food, are those of 40°F and below 140°F and above. Both time and temperature are important in handling food to preserve microbiological quantity.

Critical Control Points

A step at which control can be applied and is essential to prevent or eliminate a food safety hazard or reduce it to an acceptable level is the critical control point. *Bauman* (1974) defines critical control points as those steps in production processing in which loss of control would result in unacceptable safety risks. Nine critical control points have been identified. These are:

1) Food Procurement
2) Food Storage
3) Food Packaging
4) Pre Processing
5) Meat Processing
6) Food Storage Following Heat Processing
7) Meat Processing of Pre Cooked Menu Items
8) Food Product Distribution
9) Service of Foods

These are points in a food's production – from its raw state through processing and shipping to consumption by the consumer – at which the potential hazard can be controlled or eliminated.

With a review of quality control measures we end our study of food production planning and control.

Check Your Progress Exercise 2

1) Why is production control important in the food service operation?

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2) What is a standardized recipe? Why is it an important tool in production control?

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3) Name two common methods for recipe adjustments.

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4) List any three recommendations of NSF for purchasing new food service equipments.

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5) What are critical control points? List any four critical control points in a food production operation.

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7.6 LET US SUM UP

Production of quality food is a necessity, because people today eat at number of places outside their house. In today's fast life food services have gained an importance. Production of quality is guaranteed only when kitchen is in hygienic conditions and utensils and crockery are free of germs. In this unit we learnt about the different aspects related to production management and control.

Standardized recipes and portion control, we learnt, are pre requisites of production planning. In food service operation use of standardized recipe is a must. Recipe even though standardized, must have provisions for adjustment, for which different methods are followed.

Quality food production has a system, which includes forecasting, scheduling and menus. A menu is a list of food products offered. Menu also controls others sub-systems such as purchasing, storage, production and service. Ingredient control is a very important factor in total food production activity. It is ensured with the help of necessary equipments and storage area.

Production forecasting and production scheduling have to follow established system for their proper utility. For preparation and cooking of quality food, certain well-defined quality control measures are undertaken. These include sanitation and time temperature control. This unit focused on these measures. Certain critical control steps in the process of food production were also highlighted. These critical points which are 9 in number are the ultimate determinants in preparation and service of quality food.

7.7 GLOSSARY

Additives : a substance especially a chemical one added in small quantities to something else.

Contamination : to make impure or bad by mixing in impure, dirty or poisonous matter.

Chef : a skilled, usually male cook, especially the chief cooks in a hotel or restaurant.

Cook-Chill System : in this system, items are prepared and chilled in bulk. Foods are portioned and plated as much as a day before being served.

Cook-Freeze System : in this system items are stored frozen for 14 - 190 days. With both cook freeze and cook chill processes, menu items receive final heating just before service.

Expedite : to make a plan or arrangement go faster.

Sanitation : the use of means for protecting public health by removing and treatment of waste.

7.8 ANSWERS TO CHECK YOUR PROGRESS EXERCISES

Check Your Progress Exercise 1

1) The four types of food service systems are traditional, commissary, ready-prepared and assembly serve.

2) The two key components of food service management system are:
   - Selection of appropriate menus and its recipes including ingredients used, and
   - Forecasting production and its scheduling.

3) Production scheduling defines the amount of each item to be prepared, time sequence, expected and actual yield, additional instructions and employer assignments whereas forecasting models are popular tools in projecting demand in food service operations.

Check Your Progress Exercise 2

1) Production control is important for food production operation because it helps to maintain the quality, standard and required quantity of the final food product. It not only translate into monetary savings and prevent indiscriminate use, but also help in the upkeep of maintenance and standard of a food establishment.

2) A standardized recipe can be termed as a recipe which gives consistently the same result every time it is used. It gives the amount of ingredients to be used and the procedure to make the dish. It also specifies the yield, number of portions and the size of portion.

It serves as an important production control tool as it promotes uniform quantity and quality of food produced, saves time for cooks, managers, or dietitians, saves money for controlling waste and regulating inventories, simplifies costing of menu items and training of food service workers.

3) The two important method for recipe adjustments are the factor method and percentage method. The percentage method requires the conversion of ingredients to weights and the computation of percentage of each ingredients of total weight. forms the basis of this method of recipe adjustment.

4) Look up sub-section 7.5.1 for the recommendations and answer the question on your own.

5) Critical control points are those steps in production processing in which loss of control would result in unacceptable safety risks.

   Look up sub-section 7.5.2 for the list of critical control points in a food production operation.