

**Paper Code and Title: H06QF Quantity Food Production**

**Module Code and Name: H06QF17 Food Production**

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### Component – I

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### Component-I (B) Description of Module

<b>Items</b>	<b>Description of Module</b>
Subject Name	Home Science
Paper Name	Quantity Food Production
Module Name	Food Production
Module ID	H06QF17
Pre-requisites	Hotel and Food Service Management
Objectives	Understand the food production sub system Prepare a production schedule and Forecast the quantity to be prepared and adjust the quantity of a recipe
Keywords	Food production, Portion control

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## **QUANTITY FOOD PRODUCTION**

### **FOOD PRODUCTION**

#### **1. INTRODUCTION**

Food production is an important element in a food service operation. The expectations of a customer can be satisfied only through tasty and good food which in turn can be achieved through food production. Hence the heart of any food service operation is the food production department.

#### **2. LEARNING OBJECTIVES**

- Understand the food production sub system
- Prepare a production schedule and
- Understand the various methods of food production.

Production in the generic sense is the process by which the products are created. In the context of food service, production is the managerial function of converting raw ingredients into menu items that are served to customers after going through various preparation techniques. To define food production it can be said that, it is the preparation of menu items in the needed quantity and in the desired quality at a cost appropriate to the particular operation.

The food production is not mere cooking and serving. It involves planning and controlling ingredients, production methods, food quality, labour and energy consumption. It is highly important that food production planning should be integrated with other managerial functions like organizing and controlling for a smooth flow of business.

#### **3. WHY SHOULD FOOD COOKED**

Food is cooked for the three primary reasons.

- Destruction of harmful microorganism, thus making food safer for human consumption.
- Increased digestibility.

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- Change and enhancement of flavor, form, color, texture and aroma.

Cooking at proper temperatures can destroy pathogens. The amount of heat required to kill a particular microorganism depends on such factors as time, method, type of food and type and concentration of the organisms. Adequate cooking is a major factor in foodservice sanitation, but proper handling before and after cooking is critical. Many foods become digestible as a result of cooking. The aesthetic quality of food can be enhanced by cooking.

The quality of any cooked food depends primarily on the following four variables.

- Type and quality of raw materials.
- Recipe and formulation for the product.
- Expertise of production employees and techniques used in preparation.
- Method and duration of holding food items in all stages from procurement through service.

## **4. STEPS IN FOOD PRODUCTION**

### **4.1 PRODUCTION DECISIONS**

The primary objective of production planning is transforming all the resources into outputs. The secondary objectives are deciding the product characteristics, service quality, cost control, labor control and the delivery process. Planning involves decision making. Decisions based on the necessary quantities to be produced, the quality standards to be maintained and the cost of the food product are to be made every day in food service operations. The planning decisions must be made within the existing facilities and cannot be changed every now and then. For example in a hospital the number of patients may increase or decrease but the capacity of equipment in the dietary department does not change. So in order to meet the demands or surplus, the production manager should make necessary decisions to maintain a smooth flow of the production process.

The secondary objective of production is to decide the characteristics of the product or menu items for example whether limited menus in a coffee shop or a fixed menu in school food service.

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## **4.2 PRODUCTION FORECASTING**

The art and science of estimating the future events is forecasting and it is a function of food production. Forecasting should be directed towards achieving customer's satisfaction and also be concerned with preventing overproduction and underproduction. Needless to say, overproduction and underproduction creates extra costs. In case of over production managing leftover foods can be troublesome because they can lead to food safety issues and customers may be dissatisfied. On the other hand underproduction may involve labor costs because making the same product in small quantities a number of times is heavy on the labour side. Not only the labour cost is high but customers will be disappointed if the food quantity is less or is unavailable. Hence good forecast is essential to help in a smooth transition from the present to the future output.

For effective forecasting, good production records are important. Production record should include date and day of the week, hour of service, special events/ holidays, menu prepared, quantity of each item prepared and quantity of each item served. Many chefs and cooks can guess the production schedule accurately especially if the customers and the menu offered is static but when it is vice versa guessing does not always work. For this a scientific method of forecasting is needed and there are various methods of forecasting modules available.

## **4.3 PRODUCTION SCHEDULING**

Production Scheduling is defined as the sequencing of events based on time required by the food service operations to produce a meal. Production scheduling has two stages, one the planning stage and the second, the action stage. In the planning stage the production required is converted into the items to be prepared and distributed to supervisors of different sections. For example if for a dinner 200 servings of a main dish and a soup is ordered the main dish goes to the supervisor of the main production and the soup goes to the soup kitchen. In the second stage that is the action stage supervisors assume responsibilities by preparing a production schedule.

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The production schedule, also called as the production worksheet activates the menu and the production process. It is a form which may be used manually or in a computer. The basic information like unit, production date and meal should be included. Additional information like preparation, time schedule, menu items, over and under production, quantity to prepare, substitutions, actual yield, pre-preparation and special instruction are included. The production schedule is posted on a bulletin board and is available for the employee to understand what food items he should prepare. A variant of production scheduling is batch cooking. In this method the total quantity of menu items is divided into smaller quantities and then cooked.

#### **4.4 INGREDIENT CONTROL**

Ingredient control is a major component of quality and quantity control in the production subsystem. The process of ingredient control begins with purchasing, receiving and storage of foods. There are two major aspects of ingredient control which is ingredient assembly and use of standardized recipes. The ingredient assembly can take place in an ingredient room. The concept of ingredient room dates back to 1950s when Flack in 1959 was the first to implement a central ingredient room and was successful in reducing labour costs.

The ingredient room is an ingredient assembly area designed to measure ingredients and be transmitted to various sections like main production, soup kitchen, salad kitchen, beverage area and so on. It is usually situated between the storage and the production area. It can be small limited to measuring dry ingredients or a room with facilities for preparation and store room. It can have a large refrigerator, a measuring scale and a work table for assembling and other necessary equipments.

The ingredient assembly can be carried out in a centralized room. The primary function of the ingredient room is to coordinate pre-preparation measuring and weighing of the ingredients to meet daily production needs and advanced preparation needs for future meals. The ingredients for each recipe are weighed, measured, packed and labeled.

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When computers are used a consolidated ingredient list based on individual ingredients or total ingredients needed for the production area can be obtained. If an operation does not have an ingredient room then the production employees are delegated work in obtaining supplies, weighing and measuring ingredients every day which may be time consuming. so an ingredient room is advantageous.

#### **4.5 PRODUCTION OF RECIPES.**

A recipe is a formula by which the weighed and measured ingredients are combined in a specific procedure to meet predetermined standards. It is actually a written communication tool which is passed from the food service manager to the production employees. A recipe is an excellent quality and quantity control tool as it helps to set standards. Once a recipe is tried and tested many times it becomes a standardized recipe and always gives the same results. The detail of standardization is given in another module.

Quantity food production involves a complex set of variables which are important in controlling costs. The adoption of cooking methods is important which in turn depends on the menu a particular food service operation decides. Food is cooked for the reasons of destroying harmful microbes, to improve digestibility and enhance the palatable quality of the food. There are various methods of production and based on the menu, equipment and human resource available a food service operation can adopt either a single or combination methods.

Many different processes are involved in production of food service. Preparation can be simple like serving a simple fruit or could be complex like baking or combining many production methods. As we are aware basically heat is employed to cook food. Heat transfer can be in four ways ó Conduction, convection, radiation and induction. Conduction ó is by transferring of heat through direct contact. Heat is transferred from a heat source either gas or electricity through a cooking vessel to food. Grilling, boiling, frying are examples of conduction. Convection is the distribution of heat by the movement of liquid or vapour which can be either natural or forced. For example in deep frying, oil is the liquid in motion which transfers heat to the food product. The third type is radiation which pertains to the generation of

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heat energy within an object. Infrared and microwaves are the two types of radiation followed in cooking. Broiling is the familiar example of infrared cooking. In a broiler an electric or ceramic equipment is heated by a gas flame and it becomes hot to emit infrared radiation which cooks the food. Microwaves have very short wavelength and are generated by an electromagnetic tube. Microwaves penetrate into the food and agitate the water or fat molecules resulting in a friction which creates heat which in turn cooks the product. The fourth type of heat transfer is Induction. Induction is the use of electrical magnetic fields to excite the molecules on cooking surfaces. Induction heating is fast and the burner has no open flame.

The heat used for production can be by moist heat or dry heat. If the heat is conducted by dry air, hot metal or hot fat the cooking is done by dry heat method.

#### **4.5.1 MOIST HEAT METHOD**

Most common moist heat methods are boiling, broiling, simmering, stewing, poaching, blanching, braising and steaming. To boil, simmer, stew or poach means to cook a food in water or a seasoned liquid. The high temperature toughens the proteins of meat, fish and eggs and the rapid movement breaks the delicate foods.

##### ***BOILING***

Boiling is the cooking of foods by just immersing them in water at 100<sup>0</sup> C and maintaining the water at that temperature till the food is tender. Boiling as a method of cooking is generally used in combination with simmering and other methods as in the preparation of curries, soups, stews and foods cooked in sauces.

##### ***BROILING***

This is a dry heat method which uses direct or radiant heat from gas flames, charcoal or individual electric units. Meat is usually broiled and relatively tender and thicker cuts are the most suitable for broiling.

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### ***SIMMERING***

When food is cooked at temperature just below boiling point of the liquid in which they are immersed, the process is known as simmering. When food has to be cooked for a long time like in stews or stock preparation.

### ***STEWING***

This is a gentle method of cooking in a pan with a tight fitting lid using small quantities of liquid to cover only half the food.. The food above the liquid is thus cooked by steam generated within the pan. The liquid is brought to boiling point and then the heat is reduced to maintain the cooking at simmering temperature. Stewing is therefore a slow cooking method taking from 2 to 4 hours depending on the nature and volume of foods being stewed .

### ***POACHING***

Poaching is cooking in small amount of liquid that is hot but not actually bubbling.

### ***BLANCHING***

Blanching of food is done by dipping the food in boiling water for varying periods of time (5 Seconds to 2 minutes) depending on the texture of the food to remove the skin or peel without softening the food. Blanching is also done by pouring enough boiling water on the food to immerse it for some time and immediately immersing it in cold water. This method helps to maintain good texture while improving the colour and flavor of the food. In addition the peels can be easily removed to improve digestibility, eliminate enzyme and microbial activity and make it safe for consumption in salads or pudding

### ***BRAISING***

Braising involves cooking food in a small amount of liquid usually after browning in it.



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## ***STEAMING***

This is the most common as well as the most desirable method of cooking fruits and vegetables. The texture, color flavor and nutrients of fruits and vegetables are better preserved when they steamed. Steam-jacketed kettles or steamers may be used for quick steaming. Perforated pans that allow the steam to circulate around the food product are desirable for use in steaming.

### **4.5.2 DRY HEAT METHOD**

Dry heat cooking methods include roasting, grilling and broiling, toasting, baking, sautéing frying

#### ***ROASTING***

This is a method in which the food is brought in contact with direct heat from a flame or any source of radiant heat. Roasting may be carried out using three types of equipment.

##### **(i) SPIT ROASTING-**

Spit roasting is done by using Spit or deep iron rectangular tub containing live coal on which meat pieces are skewed together and rotated at intervals using wooden handles on the skewers. Kebabs and barbequed foods are cooked using this method of roasting.

##### **(ii) OVEN ROASTING**

Electric or mud oven is used for these type of dry heat cooking mostly used for making tandoor and roasting of meat. It involves preheating of oven at 425<sup>0</sup>C placing the meat in it letting it brown for 5-10 minutes and cooking at moderate temperature 350<sup>0</sup>C - 375<sup>0</sup>C till tender. This method will help retain moisture and flavor due to even heat penetration and cooking.

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(iii) PAN OR POT ROASTING

In this method, roasting is done using heavy pan with enough fat coating the pan base where the food is roasted to brown the sides and then covered with a tight lid and food is cooked in slow fire till tender. The principle underlying this method of cooking is that sealing of food surfaces through coagulation of surface proteins helps retain moisture and flavor of the food.

To establish good production control Time and temperature elements are closely related in cooking and keeping accurate time and temperature control is critical to produce high quality products. Yield is the amount of products which results at the end of the production process. Yield is usually expressed as definite weight, volume of serving size. In addition to losses during preparation, cooking losses may occur and the yield may be decreased. Handling losses may occur not only during production but also during portioning before service.

#### **4. PORTION CONTROL**

Portion control is one of the essential controls in production of foods in quantity. Serving the same size to each customer is portion control. Portion control is one of the important controls in production of food.

To achieve good portion control the following steps could be practiced

1. Foods purchased should be according to specifications which will yield the expected number of servings.
2. Standardized recipes should be followed
3. Employees should know about the portion control utensils
4. A portion control guide can be used
5. Standard sized utensils can be used.

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#### **4. NUTRIENT LOSSES DURING COOKING**

Moist heat lead to relatively greater loss of nutrients than dry methods of cooking but some of the nutrients are more stable than others as far as heat , temperature and time of cooking are concerned. Proteins, fats and carbohydrates are not lost in day to day cooking of foods but in vegetables which contain higher moisture, water soluble vitamins are lost due to destruction by heat or loss through leaching in the cooking water. Adding of salt in cooking water while soaking or leaching leads to loss of these vitamins. Losses due to oxidation and evaporation occur more often when vegetables are peeled and cut and kept for a long time before cooking. The size of the pieces determines the degree of losses. The cooking time and amount of liquid are important factors in nutrient retention. Repeated washing of rice leads to loss of thiamine and nicotinic acid. Vitamin C is lost as it gets easily oxidized while Vitamin A is stable to heat and cooking by moist heat does not affect these nutrients

Dry heat methods are destructive especially shallow frying or roasting due to air exposure as compared to deep frying where oxidative losses are reduced. Nutrient can be retained using methods that can enhance the nutritive content of the food and prevent losses during preparation and cooking. Loss of nutrients during cooking can be prevented by using minimum amount of water. Cooking vegetables by sautéing in little fat or oil and allowing to steam in their own moisture on low heat till tender can help in retention of nutrients. Spices may be added before the steaming process. Increasing the acidity of foods by addition of tamarind or lemon juice helps to preserve vitamins. Cooking with lids closed for a short period of time can also prevent oxidative loss of nutrients. It is therefore important to ensure that food preparation methods make the nutrients easily available for absorption through improved digestibility of the food prepared for example sprouting or germination of legumes and pulses can enhance the nutritive content of the food and improve digestibility and absorption. Fermentation of foods enhances nutrient content of the food and combination recipes such as cereals and pulses cooked together increase the nutritive value of the meal.

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## 5. SUMMARY

Based on food production only the entire functions of a food service revolve. Careful production planning is important for managing food production in large scale.

