NATIONAL OPEN UNIVERSITY OF NIGERIA

SCHOOL OF MANAGEMENT SCIENCES

COURSE CODE: HPM 238

COURSE TITLE: FOOD AND BEVERAGE PRODUCTION II

HPM 238
FOOD AND BEVERAGE PRODUCTION II

Course Developer /Writer	Adesuyan A.J.
Course Editor/ Co-ordinator	Martha Oruku National Open University of Nigeria 14/16 Ahmadu Bello Way Victoria Island Lagos.
Programme Leader	Onwe, O.J. National Open University of Nigeria 14/16 Ahmadu Bello Way Victoria Island Lagos.

NATIONAL OPEN UNIVERSITY OF NIGERIA

National Open University of Nigeria
Headquarters
14/16 Ahmadu Bello Way
Victoria Island
Lagos

Abuja office
No. 5 Dar es Salaam Street,
Off Aminu Kanu Crescent
Wuse II, Abuja
Nigeria

e-mail: centralinfo@nou.edu.ng
URL: www.nou.edu.ng

Published By
National Open University of Nigeria 2008

First Printed 2008

ISBN

CONTENTS **PAGES**

Introduction

HPM 238 Food and Beverages Production II is a 200 level follow-up course designed to enable you to understand the fundamentals of food and beverage production. It will be available to all students to take towards the core modules of their B.Sc (Hons) in Hotel and Catering Management.

The course will consist of fifteen units which involves food and the society with reference to food culture and the various commodities from which food are supplied.

The material has been developed to suit students, not only from Nigeria but from other countries, since food is universal and a basic need of every society. The intention is to make you familiar with all kinds of foods, their sources and availability a swell as preparatory techniques capable of good service delivery in hotel and catering industry.

There are no compulsory prerequisites for this course, although prior to commencing study of this course you are expected to have taken HCM 103 and HCM 106. It should be noted that this course is a follow-up of another core modules in Hotel and Catering Management. Interestingly, these courses are interwoven and it is not unexpected that you will find some of the topics appearing similar but actually differ in application as far as food and beverages service course production are concerned respectively. You will surely benefits as this course will go a long way in providing you with a basic sound knowledge and understanding of issues and practice in the industry moreso, when hotel and catering in Nigeria is fast growing as part of the global tourist industry.

The course guide tells you briefly what the course is about, what course materials you will be using and how you can work your way through these materials. It suggest some general guidelines for the amount of time you are likely to spend on each unit of the course in order to complete it successfully. It also gives you some guidance on your tutor-marked assignments. Detailed information on tutor –marked assignment is found in the separate assignment file.

There are regular tutorial practical classes that are linked to the course. You are advised to attend these sessions.

What you will learn in this Course:

The overall aim of HPM 238 Food and Beverage Production II is to further bring into focus the fundamental aspects of food and beverage production as it applies to hotel and catering management. During this course you will learn about foods in general; the society and food, menu planning and the different uses of some food commodities. You will also learn some skills necessary to handle and manage practical preparation of food items such as meat, fish, poultry, eggs and cakes.

Course Aims

This course aims at providing you with an understanding of food, society and catering.

This will be achieved by aiming to:

- Introduce you to the fundamentals aspects of food and beverage production in relation to food and society.
- Give you an understanding of meat production.
- Give you a description of beef and veal, their joints, uses and cooking methods.
- Help you recognise lamb and mutton, pork, ham and sausage, their uses and cooking or preparation methods and other domesticated birds used for consumption.
- Identify types of fish and shellfish.
- Describe milk and dairy products, their production and food value.
- Explain eggs, their quality and uses in catering.
- Identify fats and oils, categories and uses.
- Classify vegetables, their uses and food value.
- Describe pasta, cheese and how to make cakes.
- Define and explain food additives.
- Explain, menu and catering
- Understand kitchen planning.
- Describe the various types of kitchen equipment.

Course Objectives

To achieve the aim set above, to each unit also has specific objectives. The unit objectives are always included at the beginning of a unit and you should read them before you start working through the unit. You may want to refer to them during your study of the unit to check on your progress. You should always look at the unit objectives after

completing unit. This way, you can be sure that you have done what was required of you by the unit.

Set out below are the wider objectives of the course as a whole. By meeting these objectives you should have achieved the aims of the course as a whole.

On successful completion of the course, you should be able to:

1. Explain the fundamental aspects of food and beverage production in relation to food and society.
2. Explain different aspects of meat production.
3. Described veal, beef, their joints and uses in catering.
4. Recognise lamb and mutton, pork, ham and sausages.
5. Identify tea and c offee, and wine and food
6. Identify the different types of fish and shellfish, explain quality points, storage and food value.
7. Describe milk and dairy products, their production uses, storage and hygiene.
8. Explain the nature of eggs, their quality points, uses and storage.
9. Identify fats and oils, explain their categories, uses of hydrogenation, storage and quality points.
10. Mention the various types of vegetables, their classification, uses and food value.
11. Identify pasta, cheese, cakes and explain how to produce them.
12. Define and explain food additives, their advantages and disadvantages.
13. Explain man, menu and catering and in particular plan and compile menus for different kinds of people.
14. Explain kitchen planning.
15. Describe the various types of kitchen equipment, their uses, purchase and maintenance.

Working through This Course

To complete this course, you are required to read the study units provided by the National Open University of Nigeria (NOUN) and other books and references that may be applicable. You will also need to undertake practical exercises for which you need to a make visits to some places aside from the usual kitchen or laboratory exercise that may be arranged from time to time.

Each unit of this course contains self-assessment exercises and tutor marked assignment questions, and at points you are required to submit assignment for assessment purposes. At the end of the course is a final examination.

Below you will find listed all the components of the course, what you have to do and how you should allocate your time to each unit in order to complete the course successfully on time.

Course Materials

The major components of the course are:

1. The Course Guide
2. The Study Unit
3. The Assignment File
4. The Presentation Schedule

Study Units

There are fifteen study units as follows:

Module 1

Unit 1 Food and Society
Unit 2 Meat
Unit 3 Meat Production – Beef
Unit 4 Lamb and Mutton, Pork, Ham and Sausages
Unit 5 Tea and Coffee, Wine and Food

Module 2

Unit 6 Fish and Shell Fish
Unit 7 Milk and Dairy Products
Unit 8 Eggs
Unit 9 Fats and Oils
Unit 10 Vegetables

Module 3

Unit 11 Pasta
Unit 12 Food Additives
Unit 13 Man, Menus and Catering
Unit 14 Kitchen Layouts
Unit 15 Kitchen Equipment, Types, Selection, Uses and Maintenance

The first unit explains food and society. The next three units concentrate on meat in general. This is followed by another seven units, which discusses poultry, fish and shellfish, milk and dairy products, eggs, fat and oils, vegetables, pasta, cheese and cake making. Other are

singular units which explain, food additives, man, menu and catering, and kitchen planning respectively. The last unit concentrates on kitchen equipment, types, uses and maintenance.

The unit directs you to work on exercise related to the required readings and to undertake practical exercises where necessary.

The Assignment File

In this file you will find all the details of the work you must submit to your tutor for marking. The marks you obtain for these assignments will count towards the final mark you obtain for these courses.

Assessment

Assessment consists of two sets:

1. Tutor-Marked Assignments
2. Written Examinations

In order for you to be successful with the information contained in the course you must submit, all your assignments to your tutor for formal assessment in accordance with the deadline as stated in the presentation schedule and the assignment file.

The work you submit to your tutor for assessment will count for 50% of your total course mark.

At the end of the course, you will need to sit for a final written examination of three hours duration. The examination will also count for 50% of your total course mark

Tutor Marked Assignments (TMA's)

There are thirty Tutor-Marked Assignment questions in this course. You are expected to submit all thirty and the twenty of them with high grades or marks will be considered towards your total course mark.

- Assignments given are not enough for you, you are also expected to widen your understanding by making further research privately.
- You must send all completed assignments together with a Tutor Marked Assignment (TMA) Form to your tutor.

Make sure that each assignment reaches your tutor on or before the deadline given in the presentation schedule and assignment file. If for any reason you cannot complete your work on time, contact your tutor before the assignment is due to discuss the possibility of an extension. Extensions will not be granted after due date unless in exceptional circumstances.

There are fifteen assignments in this course. Each unit consists of two assignments questions. The fifteen assignments will cover.

1.	Food and Society	(Unit 1)
2.	Meat	(Unit 2)
3.	Meat Production - (Beef and Veal)	(Unit 3)
4.	Lamb and mutton, pork,. Ham and sausage	(Unit 4)
5.	Tea and Coffee, Wine and Food	(Unit 5)
6.	Fish and Shellfish	(Unit 6)
7.	Milk and Dairy products	(Unit 7)
8.	Eggs	(Unit 8)
9.	Fats and oils	(Unit 9)
10.	Vegetables	(Unit 10)
11.	Pasta	(Unit 11)
12.	Food Additives	(Unit 12)
13.	Man menu and Catering	(Unit 13)
14.	Kitchen Layout	(Unit 14)
15.	Kitchen equipment, types selection, uses and maintenance	

(Unit 15)

Each unit contains a number of self-tests. In general, these self-tests question you on the materials you have just covered or require you to apply your knowledge in some way and hereby, help you to gauge your progress and to reinforce your understanding of the materials. Together with Tutor-Marked Assignments, these exercises will assist

you in achieving the stated learning objectives of the individual units of the course.

The Presentation Schedule

The presentation schedule included in your course materials gives you the important dates for this year for the completion of tutor-marked assignments and for attending tutorials. Remember, you are required to submit all your assignments by due date. You should guard against falling behind in your work.

Course Overview

nit	Title of work	Weekly activity	Assessment
	Course Guide		
.	Food and Society		Assignment 1 & 2
.	Meat	1	Assignment 2 & 3
.	Meat Production - (Beef and Veal)		" 5 and 6
.	Lamb and Mutton, Pork, Ham and Sausage	2	" 7 and 8
.	Tea and Coffee, Wine and Meal		" 9 and 10
.	Fish and Shellfish	3	"11 and 12
.	Milk and Dairy Products		"13 and 14
	Eggs	4	" 15 and 16
.	Fats and Oils		" 17 and 18
0.	Vegetables	5	"19 and 20
1.	Pasta, Cheeses and Cake Making		" 21 and 22
2.	Food Additives	6	" 23 and 24
3.	Man Menu and Catering		" 25 and 26
4.	Kitchen Layout,	7	"27 and 28
5.	Kitchen planning Types Selections Use and Maintenance		" 29 and 30
	Total		**30**

Final Examination and Grading

The final examination for HPM 238 will be for three hours and it attracts a 50% of the course grade. The examination will be similar to the self-assessment tests, practice exercises and tutor-marked assignment which you have previously encountered.
Use the time between finishing the last unit and sitting for the examination to revise the entire course. You might find it useful to review your self-tests, tutor-marked assignments and comment on them before the examination.

We wish you all the best in this course.

Course Code	HPM 238
Course Title	Food and Beverage Production II
Course Developer /Writer	Adesuyan A.J.
Course Editor/Co-ordinator	Martha Oruku National Open University of Nigeria 14/16 Ahmadu Bello Way Victoria Island Lagos.
Programme Leader	Onwe, O.J. National Open University of Nigeria 14/16 Ahmadu Bello Way Victoria Island Lagos.

NATIONAL OPEN UNIVERSITY OF NIGERIA

National Open University of Nigeria
Headquarters
14/16 Ahmadu Bello Way
Victoria Island
Lagos

Abuja Office
No. 5 Dar es Salaam Street
Off Aminu Kano Crescent
Wuse II, Abuja
Nigeria

e-mail: centralinfo@nou.edu.ng
URL: www.nou.edu.ng

First Printed 2007

ISBN:

Printed by ……..
For
National Open University of Nigeria

CONTENTS PAGE

MODULE 1

UNIT 1 FOOD AND SOCIETY

CONTENT

1.0 INTRODUCTION

This unit focuses on food and society. It serves as the fundamental of food production studies in hotel and catering management. The issue of food as we all know encompasses every kind of the edible commodity from the natural state to the finished product after some form of preparation and cooking process has taken place.

In this unit, we shall look into the value of food, the factors which affect what we eat, general ideals and images of food. Since food is meant to serve many purposes, the unit also highlights the various needs food can satisfy in ad diverse cultures and how people get information on food as well. Knowledge about eating and foods is learnt from the family, through teachers, at school meal times, through the media and through the experience of eating at home and abroad.

The unit however, emphasises the fact that food should also be in keeping with the religious beliefs and cultural backgrounds of those in need while professionals in food production and services should adhere strictly to this development whenever occasion demands.

2.0 OBJECTIVES

By the end of this unit, you should be able to:

- Explain issues regarding food and society
- Explain the purpose of food
- Describe the various factors that influence food
- Describe international cooking styles.

3.0 MAIN CONTENT

3.1 Food and Society

It is of vital importance to anyone in a position of responsibility in the hotel and catering industry that he should understand what food is and the reasons why people need food.

It is not sufficient to say that we eat in order to live. It is what we eat and how we eat it that is important. A caterer in supplying food to man should be in a position to assesses the amount of satisfaction that his/her service is going to provide. Yet in order to be able to measure the amount of satisfaction provided, he/she must be aware of the natural or essential needs of the customer as well s those imposed by society and the customer's place in society. Because of the difficulties involved, behaviour and market orientation have until recently received only superficial treatment by the catering industry and to a certain extent this is still a fairly vague area. (Cracknell, Kaufmaan and Nobis 1987).

3.1.1 The Value of Food

People and animals need food in the same way that motor cars, railway engines, ships and machinery need fuel in order to operate efficiently,

and like these examples people also need fuel to keep themselves at the right temperature as well as in good repair and working order.

Nearly everyone enjoys eating. We eat because we feel hungry, because we like eating and because we feel that food is "good for us" It enables us to be fit and energetic, and it helps us to resist infections and disease. Food has these effects on our bodies because of the substances it contains. It contains main different chemical substances, which are called nutrients. The requirements of the human diet are supplied by these nutrients and can be listed under five headings.

1) **Protein**: Protein is necessary in our diet for the proper growth of the body. Even when people are fully-grown, they need protein to repair and replace cells which have become worn out.
2) **Carbohydrate**: This Provides the energy we need to keep fit and active. It is the carbohydrate foods which contain dietary fibre.
3) **Fats;** Fats are also sources of cheap energy but are not easily digested as they are so full of nutrients that they provide twice as much heat and energy as an equal quantity of either protein or carbohydrate.
4) **Minerals**: Minerals contain elements vital for the maintenance of healthy blood, bones, teeth, tissues etc. Examples of minerals are iron, calcium, fluoride, potassium.
5) **Vitamins**:These are chemical substances essential for many body processes including growth, resistance to disease, the maintenance of healthy tissues and the normal functioning of the digestive system.

In the light of the above explanation, a caterer should provide food which contains the entire nutrients required by the body. Menu should be constructed, bearing in mind the above in adequate proportion that leaves the consumer satisfied and at the same time providing a balanced diet.

3.1.2 Factors, which affect what, we Eat

Catering reflects the eating habits, history, customs and taboos of society; but it also develops and creates them. You just have to compare the variety of eating facilities available on any major street today with those of a short while ago. Everyone has needs that they wish to be met to their satisfaction.

Meanwhile, some factors which affect what we eat are discussed under three major headings namely:

1) **Tastes and Habits:** These are influenced by three main factors; upbringing, peer group, behaviour and social background. (Foskets, Ceserani and kintion 2004). According to their opinion, children's taste are developed at home in line with the eating pattern of their family, as is their expectation of when to eat meals. Teenager may frequent hamburger or other fast-food outlets; and adults may eat out once a week at ethnic or high class restaurants.

2) **Degree of Hunger:** The degree of hunger is another factor that will affect what is to be eaten, when and how much to eat. Everyone ought to eat enough to enable body and mind to function efficiently. If you are hungry or thirsty, you will find it difficult to work or study, remember also that a hungry man is an angry man.

3) **Health Considerations**: Whenever a special diet is required for health reasons, there is a need for choice of food as the case may be. Some people today avoid certain foods because of ill-health while others are allergic to some foods. Food intake part from being a necessity, also serves other purposes as discussed below:

3.1.3 Ideas about Food

Perception of people from different societies and culture about food and meals vary considerably. The variation to a greater extent depend on how and where people were raised, as well as the social custom of the area. Be that as it may, there have been differences and conflicting ideas about what constitutes good cooking and a good chef and about the type of food a good chef should provide. Over the years, the French tradition of producing good food and high regard for chefs made the chefs renowned professionals in the art of cooking over other countries with less interest in the field.

People's ideas about what constitutes a proper meal and the interpretation of terms such as lunch and dinner or the main meal depend on their background. Also the idea of what is right regarding eating varies with age, social class, and religion.

To certain people, it is right to eat with fingers, others use only, fork; some will prefer cheese before the sweet course, others will have cheese after it; it is accepted that food for children and elderly people need to be cut up into small pieces, and that people of some religions do not eat certain foods.

3.1.4 Food and Resources

Fosket *et al* (2004) suggested three factors that affect what people eat. They are money, time and facilities. How much money an individual is able, or decides to spend on food is crucial to what he eats. Some people will not be able to eat out, others will only be able to eat out occasionally, but for others eating out will be a frequent event. The money that individuals allocate for food will determine whether they cook and eat at home, use a take-away (e.g. fish and chips) go to a restaurant, etc.

Secondly, the amount of time people have to eat at work will affect whether they use any facilities provided, go out for a snack or meal or bring their own food to work.

Thirdly, the ease of obtaining food, the use of convenience and frozen foods and the facility for storing foods, has meant that in the home and catering establishments the range of food is wide. Food in season can be frozen and used throughout the year and in case of surplusity spoilage can be eliminated.

SELF ASSESSMENT EXERCISE 1

Explain the purpose of food.

3.2 The **Purpose of Food**

3.2.1 Developing Social Relationships

Eating is a necessity, but it is also a means of developing social relationship. Eating at home or away from home helps to renew or provide the opportunity for people to meet each other. It may be for occasions such as birthday, anniversary, wedding, and award ceremony etc. or for a group of friends for dinner at a restaurant. Business related matters may also be discussed over a meal.

3.2.2 Emotional Needs

People sometimes may need to eat not only as a result of hunger, but to satisfy emotional needs. Giving a meal can give comfort for sadness or at a time of depression.

It could also be given for a reward or to give encouragement to oneself or to another person. An invitation to a meal is a good way of showing appreciation.

3.3 Food Influences

We have mentioned some factors which affect what we eat. In this section, we shall examine yet another issue on what influences what we choose to eat. This is what is being referred to as "food influences". Food influences in this context can be described as what motivates people or creates awareness about a particular food either as positive or negative influences.

3.3.1 Media Influences

The media influences what we eat. Television; radio, newspaper, magazines and literature of all kinds have an effect on our eating habits. According to Fosket *et al* (2004), healthy eating, nutrition, hygiene and outbreaks of food poisoning are publicised, experts in all aspects of health including those extolling exercise, diet and environmental health state what should and should not be eaten. Similarly, information regarding the content of food packets and the advertising of food also influence our choice of food. Knowledge about eating and foods is learnt from the family, through teachers at school, meals at college, through the media and through the experience of eating at home.

3.3.2 Geographical Influences

Geographically, climate and weather conditions affect food production and supplies of various species of animals, plants, poultry, fish and other food commodities produced from different countries of the world. As a result, some of the items of food available on a menu may have been imported from countries, which have a climate that allow the production of food not grown here. This situation will normally influence what we eat from time to time since no nation is self sufficient in food production.

3.3.3 Sociological Influences

The various institutions that make up the society have different requirements. These requirements are expressed not only in the type of food demanded but also in terms of service and environment. For example when an individual is out shopping or sight seeing, the choice of food may be different from the type of a family at table.

Similarly, a person at his place work may require meal which is quite different from that of those attending a social function or a meal that may be served in a school. In other words, these situations as explained above would influence the choice of food from time to time.

3.3.5 Psychological Influences

The study on patterns of eating habits of people shows that eating habits derive not only from the attempt to satisfy basic biological needs but also to some extent from interlinked psychological concepts which can affect the benefit to be gained from certain foods. For examples, the appearance of food, its smell, flavour, taste presentation as well as reaction to new foods all have influences on what people eat.

SELF ASSESSMENT EXERCISE 2

Explain the values of food, what are the factors that affect what we eat?

3.4 Food and Ethnic Culture

Different races and nations of the world have a variety of cultures and each of these cultures has its own food tradition and cooking. A few years ago, it was necessary for caterers to be knowledgeable about traditional classical French cooking. Today, they must also be aware of the foods and dishes of many other races and, how to cook them for different occasions as the case may be.

The rapid growth for a broader culinary experience has become necessary as many people from different countries have opened restaurants using their own foods and styles of cooking.

3.4.1 Religion

There are different types of religions throughout the world and each religion has a set of beliefs that affect what many people eat, when to eat it and how they eat. Fasting, feasting, celebration and anniversaries are important religious events, as such it is necessary for people involved in catering to have some basic knowledge of the requirements and restrictions associated with religion. We shall therefore examine some of these religions and their food requirements. This is necessary for consideration especially when planning menu for our numerous customers who cut cross the globe.

Christianity: The Christian religion is not in most cases affected by eating habits except for a few vegetarians who chose not to eat meat on moral grounds. Many Christian faithful abstain from eating certain foods during lent usually something they like very much. However, there are other religious days when they also refrain from eating. These days include:

Good Friday: A day of selective eating to remember the crucifixion of Jesus Christ many Christians abstain from meat.

Easter Sunday: Depending on race, some eat cakes and eggs (boiled and decorated) as a symbol of new life.

Christmas: Christmas is usually celebrated with feasting. Roast turkey, chicken, feature prominently on the menu while Christmas cakes and puddings are also essential aspects of the food on Christmas day.

Islam: Traditionally, the Muslims religion forbid pork in their diet. Only meat that has been prepared according to Islamic rites is permitted. The birth of Prophet Mohammed is always celebrated at the end of February or early March. Similarly, Ramadan, which lasts for one month, is the ninth of the Muslim calendar. During this period, Muslim faithful do not eat or drink anything form dawn to sunset. Alcohol is completely forbidden. The end of Ramadan fast is usually celebrated with special food. Lamb stew is mostly favoured and it may be eaten with rice of different flavours and methods of cooking.

Hinduism: Hindus do not eat meat. Strict Hindus are strict vegetarian and none of them eat beef as it is considered sacred. Different festivals are celebrated at different times of the year. Samosas (triangle of pastry containing vegetables), banana fudge and vegetable dishes of all kinds as well as favorite foods are eaten to celebrate such festivals.

Sikh: Most Sikhs are vegetarians and do not have strong restrictions regarding food.

Buddhism: Buddhists like the Sikhs are vegetarians and their foods vary since most live in India and China, where available foods will be different.

f. **Judaism**: Jewish religion has strict dietary laws. Shellfish, pork and birds are forbidden. Foods acceptable to the Jews are fish with scales and fins, animals that have "cloven hoof" and birds killed according to the law. Strict Jews eat only meat that has been specially slaughtered, known as kosher meat. It is not the practice in Jewish cookery to serve milk and met together at the same meal; an interval of three hours should be between eating food containing milk and food containing meat. Prominent among Jewish festival foods include plaited bread on Sabbath days, and unleavened crisp bread, served at Passover as a remainder of the exodus of the Jews from Egypt. Other foods include cheese cake, pancakes and potato dishes.

3.4.2 Various Cooking Styles

Over the years especially recently, a mixture of modern national cooking styles and flavourings from different countries has developed. This development has been brought about as a result of improvement in transportation and tourism, which has greatly aided the movement of people from one part of the globe to another.

The origin of these styles can be traced to Australian chefs who have been influenced by the Pacific Rim i.e. the countries around the Pacific Ocean considered as an economic group. These various styles, ideas and methods are today drawn from the variety of sources throughout the world. (Fosket *et al* 2004).

Further development on the various styles has been the introduction of matching serving dishes and plates to the end food with the effect of enhancing the overall presentation. Such a concept stretches the chef's creativity and imagination pioneering into new dimensions of food presentation, making the dishes ever more attractive thereby adding colour, flair and fashion to dining out.

Modern restaurants place great emphasis on décor, space, fashion and overall design. The chef's role is to ensure that the food style and presentation match the new era of food styles.

The following are examples of food styles:

- French Thai
- American Japanese
- Indian with French presentation.
- Australian/Pacific Rim

3.4.3 International Cooking

British: The finest raw ingredients in the world come from the United Kingdom and Ireland. There are also a large number of regional recipes including a vast list of puddings.

French: France is the recognised home of classical cooking as a result of craftsmanship, love and respect for food of many famous chefs over the years. France provides a wide range of food' while its specialties and gastronomic tours also provide a wide education in food and good eating. French chefs were the first to use a variety of cooking styles and ingredients.

Italian: Italy is reported to have compiled the first cook book (a puns) during the Roman Empire and brought their culinary skills to France in 1533 through Catherine de Medici, claming justifiably to have influenced French cooking. Italy is famous for its pastas, risottos, cheese, pizzas etc.

German and Austrian: Germans and Austrians enjoy meat and sausages of many varieties. The list of regional dishes, which reflect the type of produce available in those countries, is endless. Cooks from Vienna in Australia have developed high quality skills in pastry and baking with worldwide reputation.

Eastern Europe: The countries of Eastern Europe –Russia, Hungary, Poland and others have contributed to international cooking with Russia noted for caviar, blini chicken kiev. Hungar on the other hand is famous with her traditional "Goulash" flavoured with paprika stew.

American: America is noted for her cosmopolitan nature with her cooking influenced by the many immigrants from all the over the would. It is a country versatile with a vast wealth of gastronomy. America has developed an immense fast food industry, which has been franchised world wide. Anyone, aspiring to a career in catering would be well advised to visit and work in America for a period of time.

Scandinavian: Scandinavian countries of Denmark, Norway, and Sweden due to their proximity to the sea, eat large quantities of fish, particularly herring. Butter, bacon and blue cheese are imported into Britain in large quantity. Rye is used for crisp breads in low-calorie diet. A famous buffet known as "smorgasbord" with its wide variety of dishes is offered.

Swiss: Switzerland is famous for cheeses but greatly influenced by the cooking of France, Italy and Germany.

Caribbean: Cooking in Caribbean islands is spicy and based mainly on the products of their rich tropical soil. Food such as plantain, coconut, okra, breadfruit, sweet potato, and fruit are famous. There are also endless varieties of tropical fish, lobsters and prawns.

Chinese: Chinese foods are produced with wide climatic variations and therefore many kinds are available. Because of its size, china is divided into four religions, each with its own style of food. The Eastern region of Shanghai is blessed with a wide variety of fruit, vegetables and fish. Stirring, frying and steaming are famous Chinese cooking methods with light and delicate seasonings. Chinese foods are finished with soy sauce, which is considered to be the best in China.

In Northern Beijing, where wheat and corn are produced extensively the choice of food includes noodles, pancakes, dumplings, while vegetables, garlic, leeks, onions, and sesame seeds are used extensively. However, rice and meat are less consumed. The use of hot spices, chilies and strong flavouring is common in the Western part of China. Met fish and vegetables also commonly feature in their menu.

In the Southern part of China, foods are overcooked and less use is made of garlic. Rice is the staple food; sweet and sour dishes are famous. The methods of cooking are sir fry and steaming. Chinese flavours include sweet, sour, acid, bitter and sharp, all of which affect part of the body. Generally, foods are divided into cooling food, heating food and neutral food.

Indian, Pakistani and Bangladeshi; Indian cookery is noted for its use of spices, herbs and flavourings. Northern India is famous for tandori cooking. This method of cooking is named after the unusual oven called the tandoor which produces slightly charred spiced chicken and lamb dishes. In Pakistan, kebabs and youghurt are used extensively.

African: The climate of Africa is suitable for growing bananas, pawpaw, and citrus fruits. In North African countries of morocco, Tunisia and Algeria, couscous is made from wheat. It is steamed over soup, stew or fish. East Africa which includes Ethiopia is where coffee originated from; teas are also grown here while maize is an important crop.

In West Africa, cassava is the staple food Ghana and Nigeria produce cocoa, groundnut, maize yam, and beans. In South Africa, sugar cane, and maize, are produced. Cattle and sheep are raised.

4.0 CONCLUSION

In this unit, we looked at food and the society. We found out that food serves not only our biological needs but also other psycho-social aspects of life. Various factors have been identified as influencing our choice of food. Since foods are produced globally, people form different races have their eating cultures as well as cooking methods and styles. You have learned all these in order to keep abreast of relevant background knowledge required in the provision of food for consumption in the hotel, catering and tourism industry in general.

5.0 SUMMARY

This unit treats as a stepping stone, the study of food and food production for service and consumption for different groups of people

who are patrons in hotel and catering establishments. Some of the points covered were not really new even from our personal experiences regarding food in general. We have tried to discuss these subjects as prelude to other issues in food production, necessary for the training and development of professionals in food services industries.

6.0 TUTOR-MARKED ASSIGNMENT

1. Mention 5 good reasons why you think that the study of food and society is relevant in this course.

2. Explain what you understand by international cooking. Briefly describe the food and eating culture of Africans Chinese and France.

7.0 REFERENCES/FURTHER READINGS

Ceserani, Kinton and Fosket (2004) *Theory of Catering*. London: Houdder and Stoughton.

Cracknell, Kaufmaan and Nobis (1987). *The Professional Catering*. London Heinemann.

UNIT 2 MEAT

CONTENTS

1.0 INTRODUCTION

This unit considers meat a food commodity which is in daily use in the catering industry. All the major categories of meat are described with a view to providing a broad understanding of their values and importance in the diet. It provides information about the structure of meat, quality points, slaughtering and cuts of meat. The unit also highlights the storage and cooking methods of meat in general.

In addition, our discussion on this topic will be limited to beef, veal, lamb, mutton and pork. Other types of meat will be treated in subsequent units.

2.0 OBJECTIVES

By the end of this unit, you should be able to:

- Describe the structure of meat.
- Identify types of meat.

- Explain the importance of meat in the diet.
- Describe the various cuts of beef, veal, lamb and pork.
- Explain and apply the cooking methods of the various cuts.
- Store and preserve meat appropriately.
- State the hygiene regulations of meat.

3.0 MAIN CONTENT

3.1 Meat

Meat is used to describe the flesh of animals, which is prepared for human consumption and includes the offal and the interior organs. Here are the main types of meat in general use: beef, veal, pork and lamb and mutton. Meat is not a seasonal commodity and in all its forms, it is possible to include it on menus throughout the year. (Cracknel *et, al* 1987).

3.1.1 The Structure of Meat

Meat is composed of muscle, connective tissue, fat and bone in various amounts according to type, age, sex and breed. The muscle part is the actual lear flesh and is composed of bundles of muscle cells, which are held in place by the connective tissue. The connective tissue is mainly collagen, which softens during cooking; this should not be confused with the tough sinew which does not become tender and should be removed from the joint. The fat of meat varies in colour from the hard white fat of lamb to the deep yellow of old cow beef and the amount of bone and its hardness is an indication of the age of the animal.

The tenderness of meat is determined by the age, breed and part of the animal according to the degree of activity a particular joint in the anatomy undergoes. Ideally, meat is usually hung for a length of time in order to allow it to develop tenderness and flavour.

3.1.2 The Importance of Meat

In most catering establishments, the amount of money spent on the purchase of meat outweighs that of all other commodities put together. It is being estimated at the more than 30% of each expenditure in the kitchen goes on meat in its various forms. This is because on most menus, meat is the main thing and except for vegetarians, it plays a part of everyone's diet each day. Its importance can also be viewed from the nutritional point of view serving as the most valuable source of protein (a substance in the diet, which provides growth, and repair of the body tissues). Race also has a bearing on meat consumption. You should

recall that in our last unit, mention was made of the kind of meat a particular person and even a nation, or sect will consume.

To some people beef is obnoxious while to others pork is absolutely forbidden because of religious affiliations and a caterer needs to know the rules governing the eating habits of such groups of people so as to avoid serving unsuitable meat. Below is a summary of the value of meat.

The Value of Meat

1) Protein – Present in lean part of all meats.
2) Fat –It can be seen on the meat and in the fat spread through the meat.
3) Iron –It is present particularly in liver and kidney, corned beef, black pudding and red meat.
4) Vitamin "B"- it is found in most-meats.

3.1.3 Storing Meat

Meat must be kept in a cold place, preferably in a fridge at an appropriate temperature, usually between 1 and 5^0C (34 – 41^0F).

Raw meat should be stored separately from cooked meat or meat products. When storing meat, cover loosely with a clean film or foil paper so that it does not dry out. In developed countries of the world with regular electricity supply animals are slaughtered, portioned into various joints or cuts and packaged for use within a stipulated time of storage by the suppliers. Temperature of chillers and freezers must be measured regularly. Uncooked beef, pork and lamb will keep for 2-3 days in a refrigerator. Chilled, cooked meat must generally be stored below 80^0C (46.4^0F) but if it has been prepared for consumption, further cooking or reheating, the temperature must be at or below 5^0C (41^0F). (Ceserani 2004). Cut or sliced, smoked or cubed meats must be stored at or below 5^0C (41^0F). You must however, note that frozen meat can be kept for varying lengths of time, depending on what kind it is.

3.1.4 Cuts of Meat

Meat is cut into different joints. The more expensive cuts are lean meat and more tender cuts. They can be cooked by quicker, dry methods such as roasting, frying or drilling. For economic reasons and for saving of both labour and storage space, very many caterer purchase meat by joints rather than by the carcass or whole. Cheaper cuts usually cost less because they are tougher or have more fat.

They need to be cooked more slowly, by a moist cooking method such as stewing, boiling or in a casserole. They have good flavour and are just as nutritious as expensive cuts.

3.1.5 Preservation of Meat

Preservation of meat is the process of keeping meat in its original state or in good condition in order to prevent spoilage. Spoilage occurs in meat due to its perishable nature. The activity of certain microorganisms breaks down protein, causing spoilage leading to putrefaction, which is detectable by smell. The following methods as suggested by Ceserani *et al* (2004) are used to preserve meat.

1) **Salting:** Meat can be pickled in brine, and this method may be applied to silverside, brisket and ox-tongues (see the diagram of beef cuts). Salting is also used in the production of bacon.

2) **Chilling:** This is the process of keeping meat at a temperature which must be above freezing point in a controlled atmosphere.

3) **Freezing:** Meat is kept at a very low temperature as a result of extreme cold, which makes it to become hard or form ice. Small carcasses of meat, such as lamb and mutton can be frozen and kept in that condition until required for use. Before cooking, ensure that the meat is thawed out completely.

4) **Canning:** Large quantities of meat are canned by sealing in airtight speciallyly made metal containers. Corned beef is of importance since it has a very high protein content. Pork is used for tinned luncheon meat.

3.1.6 Meat Substitute: Textured Vegetable Protein (TVP)

According to Ceserani *et al* (2004) textured vegetable protein is a meat substitute manufactured from protein derived from wheat, oats, cotton-seed, soybean and other sources. Soybean, due to its high protein content is the main source of (TVP). It is used chiefly as a meat extender, varying from 10 –60% replacement of fresh meant. Some caterers on a very high budget make use of it, but its main use is in food manufacturing.

By partially replacing the meat in certain dishes, such as casseroles, stews, pies, pastries, sausage rolls, hamburgers, meat loaf, and pate. It is possible to reduce costs, provide nutrition and serve food acceptable in appearance.

1) **Myco-Protein:** Quorn is produced from plant, which is distant relative of the mushroom. This myco-protein contains protein and fibre and is the result of the fermentation process similar to the way youghurt is made. It may be used as an alternative to chicken or beef in vegetarian dishes.

2) **Quorn:** Quorn is a low fat food which can be used in a variety of dishes e.g oriental stir-fry. Quorn does not shrink during preparation and cooking. Quorn mince or pies can be substituted for chicken or minced meat. Its mild savoury flavour spices a recipe and it is able to absorb flavour. Ceserani *et al* (2004).

Frozen quern may be cooked straight from the freezer or may be defrosted overnight in the refrigerator. Once thawed it must be stored in the refrigerator and used within 24 hours.

3.2 Offal and other Edible Parts of the Carcass of Animals Slaughtered for Consumption

Offal is the name given to the edible parts taken from the inside of a the animal, such as carcass of liver, kidneys, heart and sweetbreads. Tripe brains, tongue, head, oxtail are also sometimes referred to by this term. (Ceserani, Kinton and Fosket 2000).

Fresh offal (unfrozen) should be purchased as required and can be refrigerated under hygienic conditions as a temperature of –1% (30^0F) at a relative humidity of 90% for up to 7 days. Frozen offal must be kept in a deep freezer and defrosted in a refrigerator as required.

1) **Liver**: The liver of animals is generally considered the best in terms of tenderness and delicacy of flavour and colour. It consists chiefly of protein and useful amounts of vitamins "A" and iron. Liver is full flavoured and used for many dishes in catering. Beef liver is reddish-brown and course. Lamb liver is mild in flavour, tender and light in colour while pig's liver is highly flavoured and used as "pate" recipe. Liver should appear fresh and have an attractive colour. It should not be dry or contain tubers.

2) **Kidney**: The kidneys of most food animals are put to good purposes. They are dark brownish –red and are divided into sections or "lobes". Sheep and pig's kidneys are bean-shaped and do not show ay division or lobes as that of beef. Kidneys are delicate in flavour and can be used in a wide variety of dishes. Qualities include fresheners and fat enabling. The food value is similar to that of liver i.e containing vitamin "A" and Iron.

3) **Heart**: The heart is the organ that pumps blood around the entire animals' body. It has very high protein content and is valuable for the growth and repair of the body. Cosco hearts are the largest used for cooking; they are dark coloured, solid and tend to be dry and tough. Lamb's heart is smaller and lighter and is normally served whole or sliced if big. The heart should not be too fatty nor should it contain too many tubes.

4) **Tongue:** The tongue is another part of the offal mostly used in cooking. Beef or ox tongues are usually salted then soaked before being cooked. Tongues must be fresh; they should not have excessive amount of waste.

5) **Oxtail:** These is usually sold fresh and it provides useful "meat course". The tips of the oxtail are used for oxtail soup. There should be no sign of stickiness and the should be unpleasant smell.

6) **Sweetbreads**: These are found in two sections, the "thymus" from the throat and the "pancreas" from beneath the stomach. They are cream-coloured, ductless glands. They should be fresh and of good size. Sweetbreads are useful for building body tissues and are easily digested. They are very good diet for hospital patients.

7) **Tripe:** Tripe is the stomach lining of the animal. Tripe contains protein, low in fat and high in calcium. It should be fresh, with no signs of stickiness or unpleasant smell.

3.3 Meat and Nigerians

Nigerians are known to eat a wide variety of meat than Europeans or Americans. In addition to the usual beef, pork and sheep goat and undomesticated animals are popular among Nigerians. (Isoun and Anthorio 2002). No matter how they are processed, all meats should be well cooked before consumption.

Since animal husbandry methods are yet to be fully developed in most parts of Nigeria, there is the tendency for most local animals to carry a variety of parasites, all of which are destroyed with prolonged cooking.

3.3.1 Sheep and Goat Meat Delicacies

Sheep and goat are popular meat. They may be served in restaurants and may also be used for ceremonial occasions. To kill a sheep or goats

for a religious festival or party is a mark of prestige. Cut pieces of goat meat are sold in the markets and are popular for special meals.

Large pieces of goat meat especially, can be seasoned with salt and pepper and then roasted over charcoal or wood fire. This is known as *asun* or *suya* in Yoruba and Hausa speaking communities respectively. Goat can also be roasted "whole" by eviscerating the furs and carefully removing the innards through a small opening that allows you to clean it, stuffed with assorted food seasonings (garlic, pepper, onions, salts etc)and marinate before roasting whole.

Goat head popularly called "*isi-ewu*" by the Igbo speaking communities consists of the head of the goat with the brains, eyes and all other parts and blood which are chopped up and cooked in a thick soup with pepper, herbs and spices. The following are other types of meat substitutes:

3.3.2 Bush-Meat (Game)

Bush-meat (game) fall within the category of animals that are trapped hunted or shot for food. bush-meat includes antelope, grass-cutter, monkey, bush pig, rat, buffalo, and many more depending on the food culture of the people.

Bush meat is rich in protein, fats and other minerals as a result of the variety of food they consume in their natural habitats. As this type of meat is usually produced from the rural areas where refrigeration is limited, bush-meat is often preserved by drying which reduces the moisture content until it is transported to local and urban markets where it fetches a high price. It is also a common sight along our major highways where hunters display freshly killed animals whole, for sale to motorists.

3.3.3 Beef and Pork

In Nigeria, fresh beef is sold in the markets. Health officials operating at designated abattoirs certify fit for consumption. Before it is sold Butchered on the day of purchase, it is not cut in any particular style but prepared in large chunks of muscle and may be sold in that form or cut into pieces usually measured in kilogrammes for customers.

Beef which has been cut into chunks and dried is popular, and when well prepared very tasty. It is best to buy this carefully, as some dry beef may be poorly prepared and preserved. It is better to wash it thoroughly and scrub with a brush and then rinse in boiling water before cooking.

Most of the innards of beef are highly sought after but often expensive. You must however, get to the market early to get a good selection of intestines.

Unlike beef, pork is less common in the market. A large population of Muslims does not eat it while other Nigerian considers it delicious. The fat gives a nice flavour especially when eaten with plantain, rice or yam.

3.3.4 Cowfoot Hocks

The feet and hocks from cows and pigs are sold in the markets or large supermarkets, partially processed. They would have been blanched and have had the hair removed. They should be washed well and the larger bones which have no skin or cartilage on them discarded. The bones which have skin and cartilage should be separated into large chunks by working around with a sharp knife. The great nutritive value of cowfoot lies in its high content of gelatine, a water-soluble protein that forms an important part of certain invalid, diets. Pig's feet are also nutritious and may be served in a variety of ways. Cowfoot and hocks take some time to cook. Cooking should be gentle and prolonged. They are particularly nice with green leaf vegetable stew or red stew. Local bars sell cowfoot in pepper soup.

3.4 Health, Safety and Hygiene Aspects of Meat

It is important that every food handler is healthy, safe and maintains good personal hygiene. When preparing uncooked meat and then cooked food or changing from one type of meat to another always ensure that equipment, utensils and working areas are thoroughly cleaned. Knives must be handled with care and used correctly so that professional performance can be achieved without causing injury to the user, nor cross –contamination of food.

If colour-coded chopping boards are used, it is essential that the correct colour-coded boards be used for preparation of foods and different ones for cooked foods. You should also ensure that uncooked meat is stored on trays to prevent dripping, in separate refrigerators at a temperature of $3\text{-}5^0$Cor ($37\text{-}41^0$F).

Make sure you wash all work surfaces with a bactericidal detergent to kill bacteria. When using boning knife, a safety apron acts as protection; if a great deal of boning is being done then protective gloves should also be used.

4.0 CONCLUSION

In this unit, you have learnt a number of important issues that relate to meat and offal in general and their importance in catering. You should have also be able to describe the structure of meat, its preservation and storage. You also need to be aware that meat has substitutes for people who do not eat animal flesh and of course, the idea of meat in the Nigerian society.

It is equally expected that you should have learned more about health, safety and hygiene aspects of meat.

5.0 SUMMARY

What you should have learnt in this unit concerns a general perception of meat as an important food commodity in catering. It has served to introduce you to meat in general. The unit that follows shall build upon this introduction.

6.0 TUTOR-MARKED ASSIGNMENT

1. Outline the importance of meat in catering.

2. State four methods of preserving meat

3. Describe offals and other edible parts of meat?

7.0 REFERENCES/FURTHER READINGS

Ceserani, Kinton and Fosket (2004). *The Theory of Catering*. London: Hodder and Stoughton.

Cracknel, Kaufman and Nobis (1987). *Professional Catering*. London Macmillan.

Isoun, M. and Anthonio, H. (2002). *Nigerian Cookbook.* Port-Harcourt: Riversides Publications.

Mcgraith H. (1996). *All About Food*. Great Britain: Oxford University Press

UNIT 3 MEAT PRODUCTION - BEEF

CONTENTS

1.0 INTRODUCTION

In this unit we shall be looking at two types of meat, one of which is considered to be the most popular for consumption. These are "beef" and "Veal'.

The unit focuses specifically on beef and veal on a number of aspects which include quality and appearance, preparation of joints, uses as well as their menu examples.

2.0 OBJECTIVES

By the end of this unit, you should be able to:

- Identify beef and veal as meat used in catering.
- State their qualities and appearance.

- Evaluate your own understanding of the topic.
- Identify the various cuts in their uses in cooking.
- Apply what you have learnt in practical terms.

3.0 MAIN CONTENT

3.1 Meat Production (Beef)

Meat is generally accepted as being the flesh of animals used as food. Beef is not an exception and for the purpose of catering, beef constitutes a major meat item used for the preparation of various dishes. It may be used as a main dish or used in the preparation of other dishes. Beef is available all year round. It may be obtained whole and slaughtered for use or wholesale or even in smaller portions sold by kilogrammes in the market.

3.1.1 What is Beef?

Beef is the name given to meat obtained from the ox, bull or cow, but prime beef is always that from the ox, another name for the bullock. The word is derived from the French word "boeuf" and came into English language with the Norman Conquest, (Hilton 1976). The parts that were considered inferior, consisting largely of offal such as oxtail, ox tongue, kidney, cow—heel etc - were given to the sefts, who were of Anglo – Saxon origin, and retained. The prime cuts such as the rib, loin, and fillet of beef, beef steak etc reserved for the lords and their families, and thus acquired Norman –French names, which have also remained with us (in their anglicised form).

In Nigeria however cow meat also known as beef is consumed by nothing less than 90% of Nigerians regardless of social class and income group. People who cannot afford to buy lean meat often go for cheaper parts such as the skin, head and dried chunks of meat.

Unlike what obtains in Europe and other developed countries of the world, beef offal are mostly cherished by Nigerian and are more expensive than the muscle or lean meat. Cow foot, oxtail and other outer parts of the beef also feature prominently on Nigerian menus.

3.1.2 Quality of Beef

The best quality of beef is obtained only from the male, the ox (known alternatively as the steer or bullock). The flesh of the female (known as the heifer), being more delicate in flavour. For obvious reasons, however, heifer is more often kept for breeding purposes and as dairy cattle and comparatively, few are slaughtered at an early age. Meat

obtained from the breeding or working bull or cow has developed sinew and is therefore tougher and of poorer quality as well as having a stronger flavour and aroma. The finest beef in the world is said to come from Scotland and consists of small, compact joints of close texture. It is also reported that the breed is widely used as it matures at an early age and provides excellent baby beef. In this part of the world, Nigeria in particular, beef from "Ndama "breed of cattle is tender and finer grained than the "Zebu" breed but is not often available, (Isoun and Anthonie 2002).

The Fulani nomads in Nigeria are noted for rearing cattle as they move about with their animals for greener pastures, thereby making Nigeria's cattle one of the best naturally fed breeds when compared with other animals from the temperate regions of the world.

3.1.3 Appearance

Prime beef can be identified by the fresh, bright colour and small fibres of the lean meat and the clear, creamy-yellow fat.

The bones of young animals are smaller and softer than that of old animals and there is more gristle present, especially around the joints. When compared with the marbled effect characteristics of the younger animals' flesh, the older animals have their fat and muscle distinctly separate and the older the animal, the tougher, stringier and darker the flesh will appear. It is customary to indicate the origin of the animal by a stamp run on near the spine. This is the practice in Scotland, Argentina or New Zealand. For example "Scotch" or "Argentine" are made on the cows marks. In Nigeria, the animals are marked for the purpose of owners' identifications among cattle flock and marks or symbols of the various agricultural producers of livestock such as the Ministries of Agriculture and Natural Resources or the privately owned livestock' enterprises.

3.1.4 Butchery of Meat (Beef) and Order of Dissection

For ease of handling the carcass of beef is cut either into two sides or into beef quarters, giving two forequarters and two hindquarter. There are many methods used for dividing this again into joints. This method will vary considerably according to the need of the consumers, which is also dictated by the uses to which it is put.

Before we go into the order or dissection of beef, let us study the diagram of beef as indicated in figure 1 below

Diagram

Figure 1: Side of Beef

3.1.5 Order of Dissection of Beef

1. Remove the rump suet and kidney.
2. Remove the thin flank.
3. Divide the loin and rump from the leg (topside), silverside, shin and flank.
4. Remove the fillet (s) divide rump from the sirloin.
5. Remove the wing ribs.
6. Remove the shin.
7. Bone out the aitchbone
8. Divide the leg into 3 remaining joints (silverside, topside, thick flank).

3.2 Preparation of Joints

After dissecting the beef, it is still necessary to cut most of the meat further into joints suitable in size for sale or for use in the kitchen. In catering, roasting joints average 5.5 – 6.5 kg large enough to be economical without being too cumbersome for convenient cooking and use. Since the parts of the carcass that receives the most exercise during the animal's life will develop more sinew, it is common sense that such cuts (e.g. shoulder, topside, silverside and shin) will be tougher and will need to be either boiled, braised or stewed, while the cuts which have had the least exercise (e.g. loin, ribs, rump and fillet) will be of finer texture and more tender, and may be roasted, fried or grilled. Much fat and sinew will be found in the region of the thin flank and brisket as they protect the living animal's vital organs.

3.2.1 Forequarter of Beef

A whole side of beef is divided into two quarters between the tenth and eleventh ribs which gives forequarter with ten rib bones in it and a hindquarter with three rib bones. A forequarter of beef provides only one good quality roasting joint, i.e. the fore rib, the remainder of the carcass being most suitable for braising in joints or cut into cubes for stewing.

This suggests that the forequarter is generally tougher than the hindquarter and has a slightly higher bone and fat content. When cutting beef for stewing it is preferable to use meat all from one cut rather than to have it mixed from more than one joint. Cracknell, Kaufmann and

Nobis (1987). The illustration in fig 1.2 below shows a forequarter of beef viewed from the inside and the more usual joints into which it is directed for catering

Diagram

Figure 2: Forequarter of Beef

3.2.2 Hindquarter of Beef

When a whole side of beef is divided into two quarters between the tenth and eleventh ribs, it gives a hindquarter with three rib bones and then a fore quarter with ten rib bones. A hindquarter of beef has most of the best quality cooking joints and is mostly used in high-class catering establishments.

Diagram

Figure 3: Hindquarter of Beef

3.2.3 Prime Cuts

Several cuts for roasting are obtainable from the ribs of the animal, particularly from the fore-rib, almost identical in position to the best-end-of-neck of lamb and which is in shape, rather like a set of large cutlets.

The sirloin of beef, like the loin of lamb or pork is a choice roasting cut, but is more economical when cut for grilling or frying. Whereas loins of lamb or pork are cut through the joints in the vertebrae into chops, the sirloin of beef is usually boned and cut into steaks (Hilton 1976).

3.2.4 Boning Meat

From the point of view of flavour, it is considered best to roast meat on the bone, but to make it easier for carving it is preferable to removing the chine, a ridge of the backbone standing out approximately at right-angles to the rib while leaving the rib-bone in place, when meat is completely boned, then one can roll and tie it in order for it to remain in good shape after cooking and give a perfect slice when carving.

3.2.5 Larding

Larding is a cooking process whereby certain cuts of meat are improved in flavour by adding thick fats or strips of bacon fat already seasoned and spiced. This is done by the use of special larding needle inserted into the meat, especially cut such as fillet and topside considered to be practically devoid of fat in their interior or structure. Other cuts, such as the chuck-rib and a part of the middle rib are also improved by the insertion of a thick slice of cod fat into the cavity from which parts of the scapula or shoulder-blade have been removed.

Note:

- A male animal which has been castrated has a considerable development of fat in the groin known as cod fat or scrotal fat. This quality fat is put to use as described above.

- The caloric value of fish beef is 2.482 cal per kg while that of corned beef is 2.822 cal. per kg.

SELF ASSESSMENT EXERCISE 1

Describe the carcass of beef, what is larding.

3.3 Beef Cut Uses and Menu Examples

We have already noted the fact that beef is cut into different joints or cuts. These cuts are used for various beef dishes achieved through different cooking methods. The following table provides an outline of beef; it uses method of cooking and menu examples.

Table 1.1 Cuts, Uses/Cooking Method And Menu Examples

	Cuts	Uses/Cooking Methods	Menu Examples
1.	Shin	Consommé , beef, team stewing	Consommé Royale
2.	Top side	Braising, stewing, end class roasting	Braised beef with noodles.
3.	Silverside	Pickled and boiled	Boiled silverside, carrots and dumplings
4.	Thick flank	Braising and stewing	Ragout de beouf aux legumes
5.	Rump	Grilling and frying as steaks braised in the piece	Grilled rump steaks

6.	Sirloin	Roasting, grilling and frying in steaks.	Fillet of beef.
7.	Wing ribs	Roasting , grilling and frying in steaks	Cote de beuof, a la anglais
8.	Thin flank	Stewing, boiling, sausage s	Boiled beef
9.	Fillet	Rousing, frying, grilling	Tonados chasseur, fillet steak
10.	Forerib	Roasting and braising	Cote de beouf
11.	Middle rib	Roasting and braising	Cote de beouf roti
12.	Chuck rib	Stewing and braising	Beef steak pie
13.	Sticking pieces	Stewing an sausages	Sausage toad in the hole
14.	Plate	Stewing and sausages	
15	Brisket	Pickled in brine and boiled	Pressed beef.
16.	Leg of mutton	Braising and stewing	Hachis de beouf duchess
17.	Shank	Consumme, beef tea	Consommé aux profiterolles

Note; some menu examples are written in French terms.

Table 2: Beef Offal Uses/Cooking Method

No	Beef Offal	Uses/Cooking Method
1.	Tongue (la langue)	Pickled in brine, boiling braising
2.	Heart (le Coesu)	Braising
3.	Liver (le foie)	Braising and frying
4.	Kidney (le Rongon)	Stewing, soup
5.	Sweet bread (le Ris)	Braising
6.	Tripe (la tripe)	Boiling, braising
7.	Tail (la Quene)	Braising, soup
8.	Suet(la graisse)	Suet paste and stuffing or rendered down of 1st class dripping.
9.	Bones les	Beef stock
10.	Marrow (la moelle)	Savoureis and sauces

SELF ASSESSMENT EXERCISE 2

Mention 5 cuts from the hindquarter of beef

3.4 Veal

Veal is obtained from the young cow. The name is derived from the French word “veau” meaning calf, either alive or as flesh. It is pale pink

with small amounts of white fat. The meat is very lean and tender. It is very scarce and is not eaten much in Nigeria as it is considered immature. Veal is imported into the country and sold in exclusive supermarkets". It is also produced by indigenous meat production companies in Nigeria.

3.4.1 Preparation of the Carcass

The carcass of veal is usually inflated before flaying (i.e skinning) in order to separate the skin more easily from the carcass as well as to improve its appearance. Until recently, the inflation was done simply by means of the operator applying his mouth to a certain prepared aperture in the skin of the carcass and blowing. The practice nowadays is the use of a mechanical air pump. Great care has to be taken not to damage veal as it so much softer than most other meats.

Now let us consider further, the following method of preparing veal carcass

Division into sides

The carcass of a veal is usually split into two sides by suspending a it from a hook by the right hind leg at a suitable height, cutting between the hind legs and through the pelvis, then cutting down through the middle of the backbone, using a heavy knife. When the region of the kidney is reached, the left hind may be placed on another hook at a reasonable distance while the remaining of the carcass is split.

Removal of the Hind Leg

In order to cut up the side of veal, place it on the block, skin side down and remove the hind leg by cutting straight across the carcass where the loin joins the launch. The fore and hind feet would already have been removed at the lower ends of the tibia and fibula and the radius and ulna respectively and sent for use as calves feet.

Division of the Leg

The leg is divided at the knee joint, the lower part is known as the knuckle. The upper part of the leg or thigh is divided according to its natural division, the thick fleshy part at the top equivalent to the rump in beef, while the outer fleshy part is known as the "cushion". The part equivalent to the topside of beef is called "under cushion". All of these cuts, provide choice tender joints and are excellent for roasting, braising or for the preparation of veal escalope.

Division of the Remainder

The manner in which the remainder is divided depends, entirely upon the uses to which it is put. If the saddle and best end neck are to be used for roasting and braising, the flank left attached and the rib-bones are merely cracked, in which case the whole section is treated as one joint. If it is to be used for veal cutlets the flank is removed down to two inches from the kerne I of the meat.

Uses of Cuts

The flank or breast is very scrappy and is only useful in stews or made up dishes. The neck end and scrag when boned is used for stew, saute pies, etc.

In high-class catering the saddle is used fairly commonly in the form of unseparated loins, in which case, it must be cut before the carcass is split into two sides. In this form, it is rather roasted or braised. Braising is a method of cooking recommended for veal because it improves the flavour and succulence of meat which might otherwise have a dry and insipid taste. (Hilton, 1976).

3.4.2 Veal Cuts, Uses/Cooking Method and Menu Example. (Ceserani and Kinton)

Table 3:

No.	Joint	Uses/Cooking Methods	Menu Example
1	Knuckle	Stewing	Osso Bucco
2.	Cushion	Escalopes, roasting	Noix de veau braise
3.	Under cushion	Soute, braising	Belle Helene , Escaplope
4.	Thick flank	Suate braising	
5.	Loin	Roasting, frying grilling	Cote de veau milanaise
6	Best end	Roasting, frying	Cote de veau millanise
7.	Shoulder	Braising and stewing	Goulash de veau
8.	Neck end	Stewing	Fricassees de veau.

3.4.3 Uses of Veal Offal and Quality of Veal

The calf is exceptional in that it is probably the only animal of which the head and feet are used to a greater extend in first class catering establishments. They are both great delicacies when blanched, boned, and either stewed or sauté.

3.4.4 Quality of Veal

1. Flesh should be pale pink
2. Flesh should be firm
3. Cut surfaces should be slightly moist
4. Fat should be firm and pinkish white
5. The kidney should be hard and well covered with fat

4.0 CONCLUSION

The unit treats beef and veal with emphasis on the preparation of their carcass, joint and cuts as used for various dishes in catering. You should be able to identify good quality beef and veal and you should be in a position to explain how to slaughter them in a professional way.

5.0 SUMMARY

What you have learned in this unit concerns beef and veal with great knowledge of preparation and uses in catering.

6.0 TUTOR-MARKED ASSIGNMENT

1. What is beef?
2. What is veal?
3. Distinguish between the various cuts of beef.
4. Give three menu examples of beef and three menu examples of veal
5. Give three menu examples of veal.

7.0 REFERENCES/FURTHER READINGS

Ceserami ,V. and Kinton, R. (1987). *The Theory of Catering.* London: Stoughton.

Hilton, .J. (1976*). Catering – Food and Drink.* Plymouth: Macdonald and Evans.

UNIT 4 LAMB AND MUTTON, PORK, HAM AND SAUSAGES

CONTENTS

.

1.0 INTRODUCTION

This unit is a continuation of our discussion on meat as an essential commodity in catering. It focuses on the production of lamb and mutton, pork, ham and sausages. However, our explanation on the above mentioned would be limited in scope, unlike what we experienced in our previous discussion on beef. These animals have peculiar characteristics, except for minor differences in the names of cuts, order of dissection and menu examples.

You may reread unit 3 of this course to serve as a guide in understanding how to handle the carcasses of these animals accordingly.

2.0 OBJECTIVES

By the end of this unit, you should be able to:

- Explain the relevance of lamb and mutton, pork ham and sausage as meat commodities in catering.
- Draw the carcasses of lamb and mutton, and pork.
- Identify the various cuts of those meats.
- Explain the method of cooking, and menu examples.

3.0 MAIN CONTENT

3.1 Lamb and Mutton

The word "mutton" is derived from the Norman – French "mouton" and is used to denote the meat from the full –grown sheep. The meat from an animal up to the age of twelve months is called lamb. Lamb is the young sheep and is normally classified as such. The French equivalent is agneau [M]

3.1.1 Quality of Confirmation of Carcass Is Particularly Important In Lamb

It means a compact shape that will yield the maximum amount of usable meat without excessive waste and bone loss. The meat of lamb should be dull red or pinkish in colour. In other animals, it is darker. The fat should be a creamy white colour and bone, small.

3.1.2 Preparation of the Carcass

The best cut of mutton, like beef, retain their Norman titles, e.g. " saddle of mutton" " leg of mutton" as compared with the parts that were at one time considered inferior such, as sheep's liver, sheep's kidney and sheep's head. Sheep are slaughtered and dressed in a very similar fashion to oxen, but the carcass of a sheep or lamb, being smaller than beef. Like beef it is cut to suit local requirements but its size does not permit such a wide variety of cuts as is possible with beef. Bone for bone, the skeleton of the sheep is almost identical with that of the ox.

Diagram

Fig 1: A carcass of Lamb.

3.1.3 Joints, Uses/ Cooking Method and Menu Examples

As lamb is young, most cuts are tender enough to be fried, grilled or roasted. The only exceptions are the middle or scrag end of the neck, sometimes sold as stewing chops. (McGrath, 1996).

The following table describes the different joints of lamb, uses/ cooking methods and menu examples.

Table 4

No.	**Joint**	**Uses/ Cooking Method**	**Menu Example**
1.	Shoulder	Roasting and stewing	Epaule d' Agneau Boulangere.
2.	Leg	Roasting boiling	Gigot d' Agneau Roti Gigot d' Agneau d' mutton bouilli.
3.	Breast	Stewing and roasting	Frish stew
4.	Mid- neck	Stewing	Navarin d' Agneau
5.	Scrag – end	Broth	Mutton Broth
6.	Best – end	Roast, grilling, frying	Carre d' Agneau Peisille
7.	Saddle	-do-	Saddle d' Agneau Nicoise
8.	Loin	-do-	Louge d' Agneau Farci
9.	Chop	-do-	Grilled lion chop
10.	Cutlet	-do-	Cotelette d' Agneau
11.	Fillet	-do-	Fillet mignon.

3.2 Pork, Bacon and Ham.

3.2.1 Pork

Pork is the name given to the flesh of the pig. It is in season all the time and available as fresh or frozen pork. In Nigeria, pork is less common in the markets than beef and is more expensive. A large population of Muslims does not eat it while other Nigerians consider it a delicacy.

Americans consume more pork than any other meat. In Britain, supplies of home – produced pork are available all year round, although some frozen imported pork is available.

3.2.2 Bacon

Bacon is pork which has been cured so that it can be kept fresh for a longer time. The pork is cut into two sides and cured in brine [a solution of salt and water] for about two weeks. (McGrath, 1996). It is either sold as green bacon after curing or it may be further treated by smoking and thus become smoked bacon. This has a stronger flavour than green bacon. When choosing bacon, look for a deep pink colour and firm white fat. Store bacon well covered to prevent it from drying out. It is a good source of protein.

3.2.3 Ham

Ham is prepared from the leg of the pig. It contains large muscle with relatively small amounts of connective tissue.

Like many other cuts of pork, ham is often cured and smoked. It is available in a variety of styles; it can be purchased bone – in, shankless or boneless, partly or fully cooked from the factory. Fully cooked hams are also available, canned. There is a specific kind of ham for nearly every use and desired degree of convenience. The shank portion of ham is called the ham hock. It is used in the same manner as the shoulder hock. (Labensky and Hause, 1995).

Diagram

Figure 5: A carcass of pork

SELF ASSESSMENT EXERCISE 1

i) Distinguish between lamb and mutton.
ii) Explain their qualities.

3.3 Dissection

For catering purposes it is usual to cut up a side of bacon as follows:

Gammon: The gammon is removed by one clean cut across the side. It may be divided into two joints i.e. the cushion or corner gammon and the gammon hock. It may be boiled and served cold as ham, braised or boiled and served hot, or sliced into rashers or steaks while still raw, and fried or grilled.

Fore – end: The fore–end is also removed in one clean sweep and is sometimes boiled and served cold as boiled bacon. It may be divided into two joints known as the " fore hock" and "collar", the latter providing rashers for grilling or frying while the former, which needs to be boned and therefore produces more ragged and more sinewy cuts, is generally served for utility purposes [e.g for flavouring dishes such as veal or rabbit, practically in pies].

The Remainder: The remainder of the side, known as a "middle" is usually divided into five cuts namely back, loin, thick streaky, thin streaky and flank; the first four are all rashered and may be grilled or fried according to taste because of its position in the anatomy of the pig, i.e. in the lower part of the abdomen. The flank contains a much higher

percentage of fat and therefore is normally used in flavouring other dishes such as chicken, veal, soups, braises etc (Hitton, 1976).

3.3.1 The Quality of Pork

The old belief that pork is unfit for consumption is out dated and has been overtaken by modern methods of meat production. Today, animals are farm – bred to produce high quality meat. However pork should be thoroughly cooked to avoid the danger of trichinosis, a disease caused by the presence of minute threadlike worms of trichina in pork.

The flesh should be light pink to grayish pink in colour, firm in texture and finely marbled; the fat covering firm and milky white and not brittle. The bones should be small and pinkish and with a very small proportion of bone in relation to the weight of the carcass; the outer ring should be thin, smooth, golden and with no hairs left on it.

3.3.2 Pork Joints, Uses / Cooking Method and Menu Examples

Table 5

S/N	Joints	Uses / Cooking Method	Menu Examples.
1.	Leg [le cuissot]	Roasting, Boiling	Cuissot de pore[sauce pommes]
2.	Lion [la longe]	Roast, frying, grilling	Longe de porc roti
3.	Spare rib [la basse cote]	Roasting, pies	Pork pie
4.	Belly [la poitrine]	Pickling, boiling	Boiled belly of pork
5.	Shoulder [Epuale]	Roasting, sausage pies.	Saucisse de porc. [sauce charcutiere]
6.	Hock	Boiling, grilling	
7.	Streaky	Grilling, frying	Canapé Diane
8.	Gammon	Boiling, grilling, frying	Jambon Braise au made Madeira, Jambon grill [sauce Diable]

SELF ASSESSMENT EXERCISE 2

Describe the dissection of pork and mention the joints.

3.4 Sausage

“Sausage” is a name that covers a wide variety of products usually consisting of finely minced and highly – seasoned meat of various kinds

and even at times a mixture of different meats. Initially, sausages were usually made from pork, but today other meats such as beef, veal, and poultry are also used. There is usually some addition of rusks, bread, potato or other types of carbohydrate to act as binder and to make up the bulk. The mixture is fed into skins which consist of sheep's or pig's intestines or weasands according to the size and type of sausages being made. (Hilton, 1976). The modern trend is towards synthetic casing which has the advantage of allowing the manufacturer to add his trade name to the skin.

3.4.1 Types of Sausages.

There are three main types of sausages

Fresh Sausages: These include breakfast sausage links and Italian sausages. They are made with fresh ingredients that have not been cured or smoked.

Smoked and Cooked Sausages: These are made with raw meat products treated with chemicals usually with the preservative of sodium nitrate. These sausages known in French as " saucissons" are usually served as cold starters. Examples are bologna, salami, hot dugs among others.

Dried or hard sausages: These types of sausages are made with cured meats, then air – dried under controlled conditions. Dry sausages may or may not be smoked or cooked. Dried or hard sausages include salami, pepperoni, Lebanon bologna and landjager.

Smoked and Cooked sausages and dry or hard sausages are rarely prepared in typical food service operations. They are produced by specialty shops. (Labansky and Hause, 1995).

3.4.1 Sausage Casings

Although sausage mixtures can be cooked without casings, most sausages are stuffed into casings before cooking. Two types of sausage casings are commonly used in food service operations.

Natural Casings: Natural casings are portions of pig, sheep or cattle intestines. Their diameters are measured in millimeters and they come in several sizes, depending on the animal or the portion of the intestine used. Pig casings are the most popular. Pig and sheep casings are used to make hot dogs and many types of pork sausage. Beef casing are quite large and are used to make sausages such as ring bologna and Polish sausage. According to Labansky and Hause (1995), most natural casings

are purchased in salt packs. In order to rid them of salt impurities, the casings must be carefully rinsed in warm water and allowed to soak in cool water for at least one hour or overnight before use.

Collagen Casings: Collagen casings are manufactured or extracted from cattle hide. They are generally inferior to natural casings in taste and texture, but they do have advantages; collagen casings do not require any washing or soaking prior to use and they are uniform in size.

3.4.3 Preparation and Filling

In preparing the sausages, the meat must be thoroughly checked to remove any gristle or bone. Both fat and lean meat are minced separately and mixed together thereafter. The sausage seasoning is mixed with the rusks in the dry state and moistened to a suitable consistency, neither too sloppy nor too dry. The minced meat is then placed on top in a suitable trough or container and the mass thoroughly mixed, after which the resulting mixture is again minced using one of the finer plates of the mincing machine. At this stage, the sausage is now ready for the filling process whereby a special machine fills the skins or casings with the mixture; the casings are first well – soaked in cold water and used while still wet. After filling the casings, the sausage is twisted or tied into uniform links.

Below is a simpler order of procedure for making sausages from Labansky and Hause. (1995).

- Prepare a forcemeat i.e. minced, mixed meat
- Thoroughly chill all parts of the sausage stuffer that will come in contact with the forcemeat.
- Rinse and soak the casings. If using natural ones, cut the casing into 4 – 6 ft [1.2 – 1.8 meter] lengths.
- Put sausage in the special sausage stuffing equipment
- Slide the casing over the nozzle of the stuffer. Tie the end in a knot and pierce with a skewer to prevent an air pocket.
- Support and guide the casing off the end of the nozzle as the sausage is extruded from the nozzle into the casing.
- After all the sausage has been stuffed into the casing, twist or tie the sausage into uniform links of the desired size.

4.0 CONCLUSION

This unit, you has provided more information about meat. Hopefully, it has provided you with a good knowledge of the nature, preparation and uses of lamb and mutton, pork, ham and Sausages in catering.

5.0 SUMMARY

This unit examines the use and consumption of lamb mutton, Pork, ham and sausages.

6.0 TUTOR-MARKED ASSIGNMENT

1. Explain the importance of pork as an essential meat commodity in catering.
2. State the joints of lamb and their cooking methods

7.0 REFERENCES/FURTHER READINGS

Hilton, E. J. (1976). *Catering; Food and Drink.* Plymouth: Macdonald and Evans.

Labensky S. R and Hause, A. M, (1995). *On cooking: Techniques from Expert* Chef New Jersey: Prentice – Hall.

UNIT 5 TEA AND COFFEE, WINE AND FOOD

CONTENTS

1.0 INTRODUCTION

The unit considers tea, and coffee as non-alcoholic beverages. Tea and coffee are used extensively in catering, not only for breakfast but for other meals. We have decided to include them in this course because of their importance as food.

Wine is also another aspect of food that we have included in the unit. Read through the unit and discover how important wine is in food production is.

2. 0 OBJECTIVES

By the end of this unit, you should be able to:

- Identify types of tea
- Explain how tea is made in catering
- Describe coffee and coffee making methods
- Describe the types of wine.
- Explain the uses of wine in the hotel and catering industry.

3.0 MAIN CONTENT

3.1 Tea

Some researchers claim that Tea plants were first imported or grown in China or India. One point on which science agrees however is that tea has its genesis in the Monsoon district of South East Asia. Whichever claim, is true, the caterer's main concern is how to prepare tea and serve it to the guest.

Rules of Tea Making

- **Uses of Good Tea**: High quality tea blends and produces better quality tea for consumption.

- **Use of Freshly drawn water/freshly boiled water**: Water goes stale if allowed to stand and water which has been boiled before should never be used again for making of tea. Water which has not come to the boil causes tea to be slap and insipid (not tasty for drinking).

- **Warm the tea pot**: If water is poured into a cold tea pot, its tempo reduces rapidly and will therefore not allow for the good blending of the tea affect the taste.

- **Use Short Pour**: To get the full benefit, the water to be used should reach the tea leaves as near boiling point as possible. If kettles are used for boiling the water, as a rule, the tea pot should be taken to the kettle. If boilers are used, make sure the pots are brought right up to the water outlet.

- **Tea should be brewed not stewed**: The time to be allowed for infusion should be between 4 and 6 minutes depending on the size of the pot in used. The larger the pot, the longer it takes to brew. However, soft water infuses more readily than hard water.

- **Quantity to be used:** From experience, many establishment have their own measurements for quantities, depending on their taste and management policy. However an ideal measurement should be one teaspoon full of tea leaves to half a pint of water.

3.4.4 Tastes of Some Known Tea Drinkers In The World

In Tibet, just across the mountains of India, their favourite tea concoction is hot, buttered tea, made by boiling tea leaves with rancid butter.

The Persians prefer theirs half and half, which is a glass of tea, half filled with sugar and half with tea.

The English never deviate from cream and sugar in their tea.

In Japan, tea drinking is always ceremonial; each person sits on the floor in a small room and the bowl of tea is drained in 3½sips, the last sip being inhaled loudly. While they sip, the drinkers think upon the beauty of everyday living.

The Russians always add lemon to the tea and sweeten it with jelly. Only on occasions they add a drop of vodka.

The Chinese, the main lovers of tea have some set of rules for tea making:

Rule 1: Only freshly boiled water must be used.
Rule 2: Warm the tea pot with scalding water.
Rule 3: There is a level teaspoon of tea for each tea cup and one for the pot.
Rule 4: Pour the boiling water on the tea leaves.
Rule 5: Brew the tea 3 – 5 minutes no more.

3.1.2 Iced Tea (Cold Water Method)

Use 2 teaspoons of your favourite blend of tea for each cup of water. Allow the cold waterto remain on the leaves in a glass, China or pot for 12 to 18 hours or overnight. This method saves ice and a quantity of iced tea can always be available, sweetened to taste and served.

Tea made by this method will not cloud at all because the tannine in the leaves is not as soluble in cold water as the caffeine and other properties.

3.1.3 Herb Tea

A lot of herbs can be made into tea but what is most important is that the quantities taken should not be too much because they turn to be drugs, e.g. tea grass etc.

3.2 Coffee

If certain rules are adhered to, the making of good coffee is a simple procedure. Coffee should be strong without being bitter, of dark but bright colour and full flavoured with a pleasant aroma. There are varied applications in use for coffee making. However, to obtain a balanced

coffee, coffee should always be freshly made never more than half an hour or so before service.

To ensure good coffee: There are the dos' and don'ts':

1) Be accurate in your measurement of water and dry coffee.
2) Be sure you have the correct ground of coffee for your special method of brewing:
   - Fine ground, for deep pot method
   - Medium ground, for percolator method
   - Coarse ground, for pot method
   - Extra fine, for vacuum type coffee makers.
3) Be sure the appliance you want to use is clean and scald with boiling water before use.
4) Use 2 level teaspoons of coffee or one table spoon full for each coffee cup of water. If you like stronger coffee, then use more. Longer brewing will make coffee stronger, but will also spoil its flavour and taste.
5) Coffee looses its flavour when exposed to air.
6) If the inside of your coffee pot burns dry, see that it is thoroughly scoured out with steal wool or a stiff brush before the next use. Unless this is done, coffee may have a slightly burnt flavour.
7) Removing grounds from coffee as soon as it is made helps to avoid bitter flavours.
8) Milk used in coffee as a substitute for cream will taste better if it is scalded and poured into the cup while still very hot.

3.2.1 Coffee Making Methods

Pot Method: Measure one grounded tablespoon of coarsely ground coffee for each cut into a scalded pot; add one extra measure of coffee. Measure briskly boiling water and pour over coffee. Stir, cover, and let simmer (not boiled) for 5 – 6 minutes. Allow 2 – 3 minutes longer if coffee is to desired stronger. Settle with a dash of cold water and serve at once.

Drip Pot Method: Measure one grounded tablespoon of finely ground coffee for each cup into the dripper. If filter paper is required, measure the coffee on top of the paper. Insert the water spreader. Measure boiling water and pour into dripper. Cover and allow dripping into pot.

Remove dripper as soon as water has filtered through coffee. Cover the pot and serve.

Percolator Method: Measure water into a freshly scalded percolator. Use cold water for percolators without values and hot water for those with values. Measure (into the basin) one rounded tablespoon of medium ground coffee for each cup of water placed into the percolator. Insert water spreader and cover. Percolate 6 – 9 minutes or less if desired. Serve at once, as prolonged percolating spoils flavour.

Other Methods: Other methods of interest includes the vacuum method.

Arabian mocha Aretic cooler, Armenian coffee, Brazilian mocha 1 & 2, café diabolique, crede manner Café Espresso, Café Gloria.

Espresso: This is an Italian coffee specialty which is served only in well equipped restaurants. The steam pressure apparatus for it costs several thousand dollars. The Imitation method takes 1/3 cup of coffee and is prepared by the usual drip method. Beat one egg white till foaming or stiff. Beat in two tablespoons of granulated sugar. Whip one cup of sweet heavy cream until light. Fold the sweetened egg white and cream together. Serve the coffee, each portion on a lump of sugar and use the mixture of egg white and cream to top each.

3.2.2 Turkish or Egyptian

This can be best made by the use of Turkish coffer coffee plot which are normally lidless. Place 4 generous tablespoon of coffee and 4 tablespoon of sugar into a coffee plot. Stir in 2 cups of cold H_20. Heat and stir till the mixture boils briskly. Remove from the heat and let to subside/cool down. Repeat the process for 3 times and serve with a drop of rose flavoured water in each cap. Could be taken with milk if desired.

3.3 Purchases of Wines and Spirits

Wines and spirits are products which are sold in the food and beverage industry like all other products, a sound knowledge of the following is necessary to understand the uses of wines and spirits

- An industry's requirements
- The market trend
- The demand of the locality
- The purchasing power of the envisaged client (customer)
- Seasons of the year

- Storage facilities available
- Money at hand/records of past sales
- Availability and types
- The knowledge of service or use of each brand.

These are some of the basic factors to be taken into account when purchasing wines and spirits.

The duty of the food and beverage manager is to make sure he selects from a wide range of available wines and spirits, those which are most suitable for his establishment, functions or purpose.

Since the wine list also appears as a menu card, it will be wise to have a good selection, which in fact, will not only attract the customers, but also enhance industrial profitability.

3.3.1 Types of Wines and their Characteristics

The species of wine and type of grapes, the climate, the soil, the method of cultivating the wine and manufacturing the wine will all have effect on the type of wine produced.

The most common wines are table wines with an alcoholic strength between 8% and 16% and the most common being between 10% – 13%. Table wines include white, rose and red wines.

White Wines

White wines are produced from white or black grapples, the juice of which is got from pressing into another cask or vat where they will ferment without their skin, pips and stock. If the grapes have a low sugar content which is all converted during fermentation, the wine will be dry.

On the other hand, if the grapples have a high sugar content, that the yeast is not able to convert during fermentation, the wine will be sweet.

Grapes grown in Southern areas in France are deliberately grown to produce a high percentage of sugar for the production of sweet wines. In addition, there are other methods of making sweet wines, mainly by stopping the fermentation before the sugar gets converted by the yeast or by introducing into the fermentation at an appropriate time, a calculated amount of sulphur dioxide or grape spirit.

Rose Wines

Rose wines are made by leaving the grape skin immersed with the "must" during the fermentation process until the required degree of colouring has been obtained. Depending on the vineyard or the producers of the wine or brand, sweetness in rose wines can be obtained by either method.

Red Wines

Red wines are produced from black grapples which are crushed and the whole must, juice, skins stocks and pips are kept together to ferment during which time colouring is extracted from the skin. Taste, thus dry or sweet would be obtained depending on the wish of the producers.

Fortified Wines

These are wines with strength added by the addition of grape spirit. Examples of these are sport wines, chewy, Madeira, Malaga and marshal. The alcohol may be added during fermentation so that some of the grapple sugars remain or at the end increases the potency of the wine.

Mistelle Wines

These are produced by adding alcohol to the unfermented grapple juice and they are used to sweeten some wine such as Vermouths. Vermouths are usually dry white wines flavoured with Aleine herbs, spices. Orange peels etc. which infuse the wine for some days together with mistelle and grape spirits. Italian vermouths usually contain a higher proportion of mistelle than that of the French.

NOTE: The wines made in Britain are usually port wine and sherry wine which are actually made from imported concentrates of grape juice from natural wine countries like France.

Petillant or Spiritzig Wines

Petillant or spiritzig wines are wines slightly effervescent but naturally so. They leave a sprickling sensation on top of them due to the region from which they are produced or bottled or having been fermented in pressure terms.

Perlwein Wine

These are produced in Germany and fermented in special tanks. They are also characterised by sparkling.

Cremant Wines or Creaming Wines

This class of wine has greater amount of effervescence than sparkling wines. They are made from grapples grown in Cote des Blanc areas of Champaign and are mainly associated with the village cramant. Those found in France mainly come under an attractive name cremant cramaut.

Sparkling Wines

Wines in this category are all known as Vins Mouseux, except Champaign which even if a full title or name should be given should be Champaign Mouseux, because of their region of production and methods.

There are three methods of making champaign or sparkling wines:

(a) The Champaign method (methode champeroise)
(b) The close tank method (cuve close)
(c) The impregnation method.

This is a method which is less suitable because it causes the end result to go green and loose the effervescence in glasses.

These wines are normally pressurised in tanks and carbon dioxide injected into them.

The Champaign Method: Different wines after fermentation are blended, yeast and sugar are added to create a secondary fermentation which takes place especially after bottling. C02 remains trapped beneath the cork on top of the wine and is chemically binded to the wine. This is the reason why effervescence is retained in the glass after the wine is poured for longer time than from wines made by other methods.

The Close Tank Method: Wines produced with this method are normally poured into vitreous-coated pressure tanks where yeast and sugar cultures are added to cause a secondary fermentation which can last for about 3 weeks.

Vintage Wines

Vintage wines are normally made once a year when the grapple of grapes is good and their productions is available. These ones are normally produced in Bordeaux area of France.

Non-Vintage Wine's

These are produced from grapples of more than one year's pressing. They are less expensive than the vintage wines, and they are less popular. They are also produced from Bordeaux area of France.

3.4 Pre-Meal Drinks (Appetizers)

Pre-meal drinks are normally served before meals as the name indicates to stimulate or sharpen taste by their flavour, whereas wetting the appetite by their alcoholic contents. These drinks come in the following order:

1. Essential Drinks: Orange juice, Tomato juice, Bitter lemon, dry, medium and sweet sherry.

2. Cinzano bianco, sweet martini, dubonnet, light ales, the lager, tonic waters.

3. Campari, whisky, Gin, brandy, White rum vodka, dry ginger and cordials.

NOTE: Drinks with higher alcoholic contents are always meant to assist digestion and as such should not be served as appetisers. Those with lower alcoholic content are favoured as appetiser.

3.4.1 Drinks with Meals

1) Soups go with dry sherry
2) Hors d'oeuvres go with dry white wine
3) Fish goes with medium dry white wine (veal blanquette) – a type of main dish.
4) Poultry goes with dry white wine or under special situations, light red wines such as Marten rose, is ideal.
5) Red meat goes with full bodied red wine
6) Game goes with red wine
7) Sweet goes sweet white wine
8) Cheese goes with any type of wine or port wine.

3.4.2 Special Details

1. Oysters go with gravies or chablis
2. Soups go with sherry, marsala, Madeira, hock moselles, burgundy and Chianti.

NOTE: Hor d'oeuvres containing vinegar goes with no wines. Eggs neutralise the taste of wine because of iron-Sulphur content.

3. Relieves or entrees, Roast etc. go with champagne.
4. Cheese is served with port wines mainly
5. Fruits are served with port or malaga wines
6. Coffee and tea go with brandy or liqueours.

Generally sweet wines are to be served after dry wines.

4.0 CONCLUSION

This unit teaches tea and coffee making in general. Apart from providing details of tea and coffee production in hotel and catering, it examines wines and their relevance to food.

5.0 SUMMARY

By now you should have acquired knowledge about the major things which concern tea and coffee. You should be able to make tea and coffee. Also, you should have a good knowledge of wines in relation with food.

6.0 TUTOR-MARKED ASSIGNMENT

1. Explain how to make tea. Does it differ from coffee making?

2. Mention three kinds of food and the type of wine that can go with each kind of foods.

7.0 REFERENCES/FURTHER READING

Cracknell, Kaufmaan and Nubis (1987). *Professional Catering*. London: Heinemaan

Ondo State Polytechnic Department of Hotel and Catering Management Owo (1986). Lectures note on Beverage Production

MODULE 2

UNIT 1 FISH AND SHELLFISH

CONTENTS

1.0 INTRODUCTION

Fish contributes a great deal to the menu and is second only in importance to meat for the provision of protein in the diet.

In this unit, you will learn how to identify a large assortment of fish and shellfish as well as how to properly purchase and store them, fabricate and prepare them for cooking and cook them by a variety of dry-heat

and moist heat cooking methods. This unit presents many of the salient points and cooking methods applied to meat and poultry in the previous units. Review the corresponding procedure for meats and poultry and note the similarities and differences.

2.0 OBJECTIVES

By the end of this unit, you should be able to:

- Identify a large assortment of fish and shellfish
- Explain how to purchase and determine freshness and other qualities of fish
- Explain food value and storage of fish
- List and apply various cooking methods
- Identify and apply the various accompaniments to grilled and broiled fish and shellfish

3.0 MAIN CONTENT

3.1 Fish

Fish are aquatic vertebrates with fins for swimming and gills for breathing of the more than thirty thousand species known, most live in the seas and oceans; (Labensky and Hause, 1995).

Fresh water species are far less numerous. Shellfish are aquatic invertebrates with shells or carapaces. They are found in both fresh and salt water.

Salt water fish includes those fish caught in the oceans which are available in commercial quantities either in fresh or frozen form, whether fished by a Nigerian trawler, local fishermen in the seas around this country or from far away countries or those brought here from a foreign boat. Fish from the rivers and lakes are not generally available in commercial quantities like those from salt water.

Always an important food source, fish and shellfish have become increasingly popular in recent years, due in part to demands from health conscious consumers. Nigeria has a wide variety of fishes from both fresh water and the ocean. Fresh fish and shellfish are available at the coasts and lake sides and some varieties, which can survive for long periods out of water are available from inland markets.

3.1.1 Fresh Fish

According to Isoun and Anthonio (2002), more than 200 species of fish are caught in the various acquatic habitants of Nigeria. In local markets near their source, live, fresh fish are available daily. However, being highly perishable and caught under difficult conditions, often with local technology, by a decreasing population of individual private fishermen, they are expensive even much more than processed "dry fish" of equal size.

There are a variety of fishes available but their availability depends on the location and season, while a few are available all year round mostly those ones that are bred at indigenous fish farms scattered across the country.

Fish should be bought and cleaned as soon as possible, either cooked or quickly frozen until needed. "Clarias", however is a kind of mudfish, related to the cat fish, which survives for long periods in the absence of water and can be carried home live and kept for some days in a bucket of water. It is a very strong and active fish and may jump out of the container if not properly secured. Although with big head, the fish has few bones and dense flesh. It is commonly smoked or roasted before cooking.

Fresh fish should be purchased with care. The eyes should be clear and bulging, the gills pink-red and the flesh firm. It should be free from "fishy" smell. This category of fish should be thoroughly cleaned before cooling. When not ready for immediate use, fresh fish should be frozen, fried, boiled or in the alternative roasted and smoked.

3.1.2 Nigerian Frozen Fish

Frozen fish in Nigeria is consumed by almost 80% of the people especially the low-income group who cannot afford to buy meat or fresh fish. It is considerably cheaper than meat and it is affordable. Today, the modern methods of fish freezing and storing provide a high quality product at a reasonable price, which is regularly available in most local markets.

The most common types of frozen fish available all year round are varieties of mackerel and horse mackerel. These are related to tuna fish, which is occasionally seen for sale in the markets, in slices. When in season, bream, ladyfish, croaker, barracuda, eel and sprats are available from the sea and the Niger River. More varieties are also available in the supermarkets than in the local open markets, but at a substantially higher cost. Mackerel and related varieties are oily and many Nigerians

prefer to smoke or roast them to drain off the oil, before storing them for use. (Isoun and Anthonio, 2002).

3.1.3 Dry Fish

Fish, which has been preserved by heat is generally referred to as 'dry fish'. This term, however includes fish which has been lightly smoked to give flavour mainly but essentially raw. It can also be fish which has been smoked and roasted or heated thoroughly, so that it is in fact cooked and can be eaten directly. Dry fish in the real sense is that which has been completely dried over charcoal or wood fire until it is crisp and can be kept safely for weeks. Since dry fish is susceptible to infection by flies, you must ensure that good quality dry fish is purchased. Each piece must be thoroughly examined for any sign of deterioration especially around large bones. Check also for dampness, maggots and smell.

Dried fish may be prepared over charcoal or firewood. A poor substitute for charcoal or firewood processing can be achieved by oven roasting but at a low but steady temperature of 1100C (225 –0 2500F). Examples of dried fish include clarias (of various sizes) Niger Perch (in large chunks), tilapia, herring, mackerel, various tiny fish and sprats.

3.1.4 Stockfish

Stockfish, or *Panla, okporoko* as it is popular called in Yoruba and Igbo respectively is a completely dried fish. It is imported, is very popular throughout Nigeria. Imported in large quantities, stockfish has excellent keeping qualities. Because of restrictions on importation, it is rather very expensive when compared with what obtained in years past. While stockfish does not add a lot of flavour to a dish, it however, provides protein and gives "something to chew on". Usually, the fish because of its hardness cannot be cut through easily except by the use of electric saw available in the market for a few naira. Before use, it is necessary to soak it in hot water for about 30 minutes or more or have it boiled until it is softened and then added to the food being prepared.

3.1.5 Structure and Muscle Composition of Fish

The fish and shellfish used in food service operations can be divided into three categories: Fish, molluscs and crustaceans.

This Fish has both fresh and salt water varieties. They have fins and an internal skeleton of bones and cartilage. Based on shape and skeletal structure, fish can be divided into two groups: round fish and flatfish. Round fish swim in a vertical position and have eyes on both sides of

their heads. Their-bodies may be truly round, oval or compressed. Examples of round fish are anchovy, bass, bream, bloater, catfish, cod, eel, haddock etc. Flat fish on the other hand have asymmetrical compressed bodies, swim in a horizontal position and have both eyes on top of their heads. Flat fish are bottom dwellers; most are found in deep ocean waters around the world.

They have dark skins to camouflage them from predators and can change colour according to their surroundings. Their scales are small and their dorsal and anal fins run the length of their bodies (Labensky and Hause 1995). Examples of flatfish are brill, skate, dab, halibut, plaice, sole, turbot

3.2 Types of Fish

Fish can be divided into two categories: white fish and oily fish. According to Hilton (1976), it has been a fairly common error amongst students and others to think of oily fish as those from which oils such as cod-liver and halibut-liver oils are obtained. It cannot be emphasised too much that this is fallacy. The oils mentioned above are obtained from fish which fall into the category of white fish – fish which feed mainly on the sea-bed or feed deep in the ocean and which have a high oil content in the liver. Fish which are classified as oily feed mainly on plankton on the surface and have a high proportion of oil distributed throughout the tissues of their bodies, and are consequently very filling and highly nutritious, but often too compact and indigestible for invalids and young children to consume. Fish in this category include such fish as anchovy, herring, mackerel, sardines, salmon, sprats and trout.

3.2.1 Food Value of White and Oily Fish

White fish is a good source of protein, phosphorus and iodine. As there is little fat or oil in the flesh of white fish, it is easily digested. This makes it suitable for invalids and elderly people. The liver of the cod is used to make cod-liver oil, which is a good source of vitamins A and D.

Similarly, oily fish are a good source of protein, phosphorus, iodine, but the rich in polyunsaturated fats (in the form of oil), and vitamins A and D. They are particularly useful as a source of vitamin D as this is not found in many other foods. Canned fish, where the bones have been softened and may be eaten, are also a good source of calcium.

SELF ASSESSMENT EXERCISE 1

i. What is fish?
ii. Explain the uses of fish in Nigeria

3.3 Shellfish

For the purpose of clarity, this type of fish is treated separately in order that you would be able to understand its structure which is quite different from that of the other category of fish as previously discussed.

A hard external shell protects shellfish. Lobster, crabs, prawns and shrimps, cockles and mussels, and oysters are all shellfish. Shellfish is a good body building food, the flesh is coarse and highly indigestible, we shall look at each of the main groups of shellfish in the next sub-unit. Make sure that you study each group carefully without any form of confusion.

3.3.1 Molluscs

Molluscs are shellfish characterised by soft unsegmented bodies with no internal skeleton. Most mollusks have hard outer shells. Single shelled mollusks are known as *univalves.*

Univalves are recognised by the characteristic spiral formation of their shells. Examples are whelks and winkles. Those with two shells are known as *bivalves* and examples are clams oysters and mussels. Squid and Octopus which are known as *cephalopods* do not have a hard outer shell, rather they have a single thin internal shell called a "pen or cuttlebone" Now let us study some of the common examples of molluscs as follow:

Clams: These are a species of bivalve mollusc found in most coastal areas but more widely appreciated in America where they are baked or made into broth. There are many species, but the kinds most commonly used are the "soft" or round clams (Venus mercenaries) and the "hard" or long clams (Mya arenaris). Both kinds form an important ingredient of "sea-foods".

Cockles: These are small bivalves about 1 inch (2.5cm) long with two ribbed shells, regular and almost identical in shape that interlock tightly at the edges when closed. They are found a few inches below the surface of the beach on sandy coast. Cockles are usually cooked by steam and are less dangerous as a source of contamination.

Mussels: They have long, narrow, rather curved black or blue shells divided into two halves and hinged together. Mussels are frequently contaminated by harmful bacteria and should be carefully examined for offensive smells. They are normally cooked in a covered pan over slow heat until shells open. After removal from the shells, they may be fried or stewed.

Oysters: According to Hilton (1976), oysters have been considered a great delicacy for many centuries and are well known to the ancient Romans who imported oysters into Italy from Britain and kept them alive in local waters. They have rough gray shells, their soft, gray briny flesh can be eaten raw or cooked. They can also be steamed or baked in the shell or shucked and fried, sautéed or added to stew. Oysters are served by first opening them with a special knife and then scraping the flesh off the shells turning the oysters over in their shell and serving them in their own liquor in the deep half of the "shells", which are arranged usually in portions of six oysters per person, on a bed of crushed ice in a deep dish. The accompaniments are wedges of lemon and slices of butter brown bread, chilli vinegar, mill pepper, tobacco sauce, tomato ketchup.

Scallops: These have two regular shaped radially ribbed-shells, one of which is flat, the other convex. They are larger than oysters but cannot be compared to them for quality.

Snails: Although not truly a fish, the snail is included here because it is certainly an edible mollusc. Snails are both found in the water and on land. Water snail is our major concern here. However land snail also makes a good delicacy in Nigerian dishes. The edible snail is a particular variety of snail specially bred and fed on water leaves.

Whelks and Winkles: These are dark small molluscs with thick spiral shells. They are really a form of edible sea snails and can make delicious dishes.

3.3.2 Crustaceans

Crustaceans are other shellfish such as lobster, crabs, crayfish, prawns and shrimps. They too have a hard outer shell and jointed appendages, and they breathe through gills. The shells of crustaceans however, do not grow with the fish, unlike those of mollusks, but are shed each year. A fresh one is then formed to suit the new size.

Crabs: There are different species of crabs: Soft shelled crabs, hard shelled crabs, blue crabs, king crabs and such other names as they may be called in different parts of the world. Crab meat varies in flavour and texture and can be used in a range of prepared dishes. The crab is a "decapod" i.e. it has ten limbs (eight legs and two claws). The male, distinguishable by the longer, narrower, hinged flap to the "pocket" or "purse" under the body, is the more fleshy, containing comparatively less water than the female. (Hilton, (1976). In developed countries, crabs can be purchased fresh, or frozen and are also available precooked, shredded and minced. In Nigeria, usually, they are bought in the open

market, fresh. Crab can be used for cold *hors-d'oeurve,* cocktail, salads, sandwiches and dressed crabs.

Lobsters: (French: l'*hommard*) (**m**) Lobsters have brown to blue-black outer shells and firm, white meat with a rich sweet flavour. Lobster shells turn red when cooked. They are usually poached, steamed, simmered, baked or grilled and can be served hot or cold. Because of their firmer flesh, male lobsters are preferable for preparing such dishes as lobster Americana, lobster thermidor and lobster newburg. Female lobsters are longer and broader. They are available throughout the year and are found commonly around the rocky parts of the coast.

Crayfish (French: *l'ecrevisse*): This is smaller than the common lobster. Some varieties have pink claws, and others white. Normally only the tails are eaten, although the claws may be pounded in a mortar and used as seasoning. The tail tastes nicer and it is tender. Crayfish may be boiled whole and served hot or cold, the flesh can be deep-fried or used in soups, bisques or sauces.

Shrimps (Fr: *la crevette grise*): These are found worldwide and are popular especially in sandy areas and around shores. The largest specimens are about 50mm (2 ins) long. They have long "whiskers" or antennae. Although they are grayish-brown, they become pink when boiled. They may be obtained fresh or parboiled and are used mainly in *hors d'oeuvres* and for ganishes.

(iii) Prawns: (Fr. *La crevette rouge*): These are larger than shrimps but are often used interchangeably with the word "shrimp" in English; although it is perhaps more accurate to refer to fresh water species as prawns and marine species as shrimp (Labensky and Hause, 1995). In commercial practice prawn refer to any large shrimp. *Scampi* is the Italian name for the type of prawn known as the Dublin Bay prawn, which is actually a species of miniature lobster. In America, scampi refers to shrimp sautéed in garlic.

3.3.3 Food Value of Fish and Shellfish

Fish and shell fish are generally low in calories, fat and sodium, and are high in vitamins A, B and D and protein. Fish and shellfish are also high in minerals, especially calcium (particularly in canned fish with edible bones), phosphorus, potassium and iron (especially mollusks). Unlike fish, shellfish are not as high in cholesterol as was once thought. Crustaceans are higher in cholesterol than molluscs, but both have considerably lower levels of cholesterol than red meat or eggs.

The cooking methods used for fish and shellfish also contribute to their healthfulness. The most commonly used cooking methods – broiling, grilling, poaching and steaming add little or no fat (Labensky and Hause, 1995).

3.4 Determining the Freshness of Fish and Shellfish

Because fish and shellfish are highly perishable, it is important that you are able to determine for yourself the freshness and quality of the fish and shellfish you purchase or use. Freshness should be checked before purchasing and again just before cooking.

Freshness according to Labensky and Hause (1995) can be determined by:

1. **Smell**: This is by far the easiest way to determine freshness. Fresh fish should have a slight sea smell or no odour at all. Any off-odours or ammonia odours are a sure sign of aged or improperly handled fish.

2. **Eyes**: They should be clear and full. Sunken eyes mean the fish is drying out and is probably not fresh.

3. **Gills**: they should be intact and bright red.

4. **Texture**: Generally, the flesh of fresh fish should be firm. Mushy flesh or flesh that does not spring back when pressed with a finger is a sign of poor quality.

5. **Fins and Scales**: Fins and scales should be moist and full without excessive drying on the outer edges. Dry fins and scales are a sign of age; damaged fins or scales may be a sign of mishandling.

6. **Appearance**: Fish cuts should be moist and glistening without bruises or dark plots. Edges should not be brown or dry.

3.4.1 Storage of Fish and Shellfish

The most important concern when storing fish and shellfish is temperatures between (-1 to 10^0C). The temperature must be maintained jus above freezing point. Most fish except fresh live fish are shipped or transported on ice and should be stored on ice in the refrigerator as soon as possible after receipt. Clams, mussels and oysters should be stored at (4^0C) or (40^0F). Under ideal conditions, shellfish can be kept alive for

up to one week. Never store shellfish in plastic bags and do not ice them. Frozen fish must be stored in a deep freeze cabinet or compartment at (18^0C) (0^0F). Smoked fish should be kept in a refrigerator.

3.4.2 Preservation and Safety Aspects

Apart from storage, there are other methods of fish preservation. These include canning, freezing salting, pickling and smoking. Oily fish are usually canned. Sardines, salmon, anchovies, tuna, herring roe are canned in their own juice or tomato sauce. Salting of fish is usually accompanied by the smoking process. For example, cured herrings are packed in salt. Also these types of fish may be pickled in vinegar as fillet, rolled and skewered (Ceserani *et, al* 2000).

To avoid the risk of cross-contamination, fish should be stored in a separate refrigerator away from other foods. Cooked and raw fish should be kept separate. Fish offal and bones are a high risk for contamination and must not be mixed or stored with raw prepared fish. Ensure that equipment, utensils, knives, chopping boards, and working tables are washed regularly using bactericide detergent or sanitising agent, to kill germs.

SELF ASSESSMENT EXERCISE 2

i. Distinguish between molluscs and crustaceans.
ii. What are the points to consider when purchasing Fish?

Practical Exercise: Buy a large sole fish. Fill it and roll out for a made fish dish of your choice

3.5 Basic Fish Preparation and Cooking Methods

As we discussed, fish and shellfish can be purchased in many forms. Here we explain several procedures for cleaning, and cutting of fish and also discuss some cooking methods thereafter. The following are points to be considered for basic fish preparation (Ceserani *et.al* 2000).

- All fish must be washed under running cold water before and after preparation.

- Whole fish are trimmed to remove the scales fins and head using fish scissors and a knife. If the head is to be left on (as for salmon for the cold buffet), the gills and the eyes are removed.

- If the fish has to be gutted.

1. Cut from the vent to two thirds along the fish

2. Draw out the intestines with your fingers and in the case of a large fish; use the hook handle or a utensil such as a ladle.

3. Ensure that the blood lying along the main bone is removed then wash and drain thoroughly.

4. If the fish is to be stuffed then removing the innards through the gills slits, thus leaving the stomach skin intact forming a pouch in which to put the stuffing, may gut it. When this method is used, care must be taken to ensure that the insides of the fish are clear of all traces of blood.

3.5.1 Cuts of Fish

The following are different styles of cutting fish to suit the menu as may be required:

Steaks:
These are thick slices of fish on or off the bone

- Steaks of round fish such as salmon and cool may be called "darkness".
- Steaks of flat fish (turbot and halibut) may called troncons.

Fillets
These are cuts of fish free from bone: a round fish yields two fillets, a flat fish four fillets.

Supremes
These are prime cuts of fish without bone and skin (pieces cut from fillets of salmon, turbot, brill, e.t.c.)

Goujons
Goujons are filleted fish into strips approximately 8 – 0.5cm (3 x ½ inch).

Paupiettes
They are fillets of fish (sole, plaice, whiting) spread with a stuffing and rolled.

Plaited
They are also known as 'en tresse'. Examples are Sole fillets cut into three even pieces lengthwise to within 1cm (1/32 inch) of the top, and neatly plaited.

3.5.2 Methods of Cooking Fish

Boiling

This method is suitable for whole fish such as salmon, turbot, trout and certain cuts of fish on the bone. Immerse the fish in cooking liquid such as water, water and milk, fish stock, or a court bouillon (water, vinegar, thyme, bay leaf, parsley stalks, onion, carrot, pepper corns) for oily fish.

Poaching

It is suitable for small whole fish, cuts or fillets. Barely cover with fish stock, covered with buttered paper, bring to the boil and cook in the oven without allowing the liquid to boil. The cooking liquid is usually used for the sauce which masks the fish (Ceserani *et, al* 2000). Fish can also be poached by a special aluminum pan designed for poaching fish whole

Grilling

This method can also be applied to fish either for small whole or cuts and fillets. You can grill fish under the salamander after passing it through seasoned flour and brushed with oil. You can also grill whole fish or fillets cut in barbecue or kebabs having marinated it for some time.

Shallow Frying

You can shallow fry small whole fish, fillets and cuts by passing them through seasoned flour and then shallow fry on both sides. Serve on a plate masked with brown butter, lemon juice, slices of lemon and chopped parsley.

Deep Frying

Coat fish either as whole, fillets or cuts with flour, eggs and bread crumbs, batter, milk and flour and deep fry. Serve with a quarter of lemon and/or a suitable sauce.

Baking

Fish may be baked as whole, or filleted in an oven to retain the natural moisture. To bake whole fish, cover in a thick coating of seasoning and bake. You may also wrap in pastry and bake.

For portions of fish, place in a buttered dish and bake slowly.

Roasting

The cuts of any fish are suitable for roasting. Depending on size, fish may be roasted whole. Add finely chopped vegetable and sprigs of herbs on the roasting tray.

4.0 CONCLUSION

Unit has taught various issues on fish and shellfish. We have examined the different types of fish as used in Nigeria and overseas. The unit has given us the opportunity to appreciate nature's gift of different kinds of sea food which constitutes a very good source of protein. We have also found out how to purchase, store, preserve and cook fish and shellfish taking cognizance of the health and safety aspects as professional caterers.

5.0 SUMMARY

This unit has presented the necessary aspects of fish and shellfish that you need to understand and apply in catering.

6.0 TUTOR-MARKED ASSIGNMENT

1. Give a detailed classification of fish and shellfish.
2. Explain the various methods of cooling fish

7.0 REFERENCES/FURTHER READINGS

Ceserani, Kinton and Fosket (2000). *Theory of Catering*. London.Houdder and Stoughton.

Labensky, S. R. and Hause, A. M. (1995). On *Cooking Techniques from Expert Chefs*. New Jersey: Prentice–Hall

Hilton, E. J. (1976). *Catering Food and Drink.* Plymouth: Macdonald and Evans

Isoun M. and Anthonio, H. O. (2002). *Nigerian Cook Book* London: Macmillan

UNIT 2 MILK AND DAIRY PRODUCTS

CONTENTS

1.0 INTRODUCTION

Milk is one of the earliest known of all foods. All animals including human beings live solely upon milk for the first days of their lives – the length of time during which it remains their only food varies with the development of the particular animal and human babies.

This unit considers milk as a perfect food, which can be drunk raw or cooked and can also be used as a basis for a large variety of dishes or as an accompaniment. The unit also guides you through important aspects of milk, especially in areas that will help you to understand and identify the types, characteristics and uses of milk and other dairy products in use in the catering industry.

2.0 OBJECTIVES

By the end of this unit, you should be able to:

- Explain the production and composition of milk.
- Explain the importance of milk in the diet and in catering in general
- Process milk
- Identify the different types of milk and dairy products
- Store and use a variety of milk-based products.
- Explain and differentiate between various milk products.

3.0 MAIN CONTENT

3.1 What is Milk?

The definition of the word 'milk' is that whitish fluid secreted in the mammary glands, i.e. the breasts of all female animals that suckle their young. When milk is referred to in catering and in domestic recipes, it should be taken to mean that which is obtained from dairy cows, unless specifically stated to the contrary. The analysis of the milk obtained from different species of animals varies considerably in its water, fat, mineral and vitamin content (Hilton 1976). Milk and its products are known as dairy foods. The main milk products are butter, cream, cheese and Yogurt all produced from cow's milk.

Milk is not only a popular beverage, it is also used in the preparation of many dishes. It provides texture, flavour, colour and nutritional value for cooked or baked items. It is highly perishable and an excellent bacteria breeding ground. Care must be taken in the handling and storage of milk and other dairy products (Labesky and Hause, 1995).

3.1.1 Constituents

The normal analysis of white milk: that is, milk as it comes from the cow is composed primarily of water, which forms 87.6%, with 4% protein consisting mainly of casein and 3.5% butterfat. Carbohydrate content is 4.2% in the form of lactose, a disaccharide or double sugar, which has little sweetness, compared with cane sugar. The remaining 0.7% is made up of minerals and an indestructible substance known as "ash". The vitamins A, B_1, B_2, C, D and E are all present. The minerals present are principally calcium, sodium, phosphorus, potassium and chlorine. There are also traces of iron, magnesium and sulphur (Hilton, 1976).

3.1.2 The **Importance of Milk in the Diet**

Milk is the single most complete food known to exist naturally. Since it is designed to feed young mammals, it contains sufficient nutrients in the right proportions.

The nutrients in milk are in a readily digestible form, and little is wasted during digestion. Milk is a valuable food not only for babies, but for people of all ages. The following points will complement our discussion on milk constituents as discussed in (3.1.1.) above.

Protein

Milk proteins are of high biological value and the chief ones are caseinogens, lactalbumin and lactoglobulin. Caseinogens accounts for about 80% of the protein in milk and in fresh milk they are combined with calcium caseinate. If an acid is added to the milk, or if it is soured naturally by lactic acid bacteria, the casein coagulates and separates from the calcium and phosphorus. This happens in cheese making. During digestion, it is coagulated by rennin to form a clot.

Lactalbumin accounts for about 8% of the protein in milk and lactoglobulin for about 3.5% . When milk is heated, they both coagulate and form a "skin" on the surface of the milk. They are not coagulated by rennin in the stomach during digestion or by acid.

Fat

The fat content of milk is often used as a guide to the quality of the milk, (Tull, 1990). The fat is present in the form of tiny globules or droplets, which being higher than water rise to the surface to form a cream layer (except in homogenised milk). Milk fat contains both saturated and unsaturated fatty acids, the proportion of which varies, according to the feed given to the cow. Milk fat is used in the production of butter.

Carbohydrate

Carbohydrate in milk is the disssacharide usually in the form of lactose or milk sugar. Lactose is less sweet than sucrose and is therefore not easy to detect. Lactic acid bacteria readily ferment lactose to lactic acid, thus causing the milk to go sour, and curdle.

Minerals

Milk is an excellent source of calcium and milk products are excellent suppliers of minerals in the diet. Milk also contains a good supply of

phosphorus but smaller amounts of sodium, chlorine and potassium. However it is a poor source of iron (Tull, 1990).

SELF ASSESSMENT EXERCISE 1

What is milk?

3.4 Milk Processing Techniques and Treatment

Milk produced by a healthy cow contains very few harmful bacteria, but cows can catch a variety of diseases which could be passed on to humans e.g. tuberculosis. All dairy herds have to be inspected by a veterinary doctor to ensure that they are healthy before they are used for milk. Rules of hygiene must be strictly followed at all stages of production.

Unlike in developed countries where milk, both fresh and processed is available in abundance, very few milk production companies exist in Nigeria. For example, The West African Milk Company (Nig. Plc) produces farm fresh pasteurised milk in Jos, and such milk is now regularly available in major cities of Nigeria. Fresh milk is also available from government experimental farms in a few places. Secondly in some areas in Nigeria especially among the cattle raising people of the North, fresh milk is produced from the cows in crude form. It is generally very rich and creamy, but it should always be boiled to ensure that it is free from pathogens.

3.2.1 Pasteurised Milk

This method was originated by Louis Pasteur, a French scientist. Pasteurisation is the process of heating milk to a sufficiently high temperature for a sufficient length of time to destroy pathogenic bacteria. This typically requires holding milk at a temperature of 72% (161^0F) for 15 seconds (Labensky and Hause, 1995). On the other hand, the milk is held at a temperature of between 63^0C and 66^0C (1450F and 150^0F) and that temperature is maintained for about 30 minutes. Whichever method is used, it is essential that the milk be cooled immediately to a temperature of not more than 10^0C (50^0F). Included in the apparatus used in pasteurisation is an ingenious device which ensures that any milk which has not reached the required temperature is automatically trapped and returned to pass through the heating process again (Hilton, 1976).

3.2.2 Homogenisation

Homogenisation is a process in which the fat globules in whole milk are reduced in size and permanently dispersed throughout the liquid. This

prevents the fat from clumping together and rising to the surface as a layer of cream. The milk is first heated, then forced at high temperatures through a special filtering process. It may be pasteuriaed before or after homogenisation, but in either case the milk is finally sterilised. Because this type of milk does not show a cream-line on top of the milk, many people are inclined to believe that the cream has been removed, but this is not so. Although it is more digestible than most milk, homogenised milk has a very limited appeal to the general public.

3.2.3 Sterilised Milk

Sterilisation kills harmful and souring bacteria more completely than pasteurisation and the milk will keep for several weeks if unopened. Sterilised milk is a grade of milk which is heated to a temperature of at least 100^0C (212^0F), then passed through a filter, is filled while still hot, into narrow-necked sterile bottles which have been preheated and sealed with corks or stoppers. The milk is then sterilised inside the bottles after filling and corking. This can be done in one of the following ways:

1) In a batch process, where the milk is heated in bottles in an autoclave (a large industrial pressure cooker) at up to 113^0C (235^0F) for 15 – 40 minutes.

2) In a continuous process, where the bottles pass on a conveyor belt through hot water tanks, into a steam chamber (under pressure) at 113^0C (235^0F) for 15 – 40 minutes and then into cooling tanks (Tull, 1990).

   The disadvantage of sterilised milk is that its protein and mineral content are greatly changed. This type of milk is most popular in the Midlands of England and other industrialised areas (Hilton, 1976).

3.2.4 Ultra Heat Treatment (UHT)

UHT processing is a form of ultra-pasteurisation in which milk is held at a temperature of 1380 (150^0C - 2800 – 30^0F) for 2 to 6 seconds. It is then packed in sterile containers under sterile conditions and aseptically sealed to prevent bacteria from entering the containers. UHT milk can be stored without refrigeration for at least three months if unopened. Although UHT milk can be stored un-refrigerated, it should be chilled before serving and stored like fresh milk once opened. Ultra heat treatment processing may give milk a slightly cooked taste but it has no significant effect on milk's nutritional value (Labensky and Hause, 1995).

3.3 Concentrated Milk

Concentrated or condensed milk products are produced by using a vacuum to remove all or part of the water from whole milk. The resulting products have a high concentration of milk fat and milk solids and an extended shelf life.

3.3.1 Evaporated Milk

This is produced from fresh cow's milk which has its water content reduced to approximately one-third of the original amount. Evaporated milk must contain at least 7.25% milk fat and 25.5% milk solids. No additional sweetening agent is added. After evaporation by a similar process used in making condensed milk it is sterilised and packed into cans which are hermetically sealed then sterilised again at a very high temperature (about 104^0C, 240^0F). This results in a cooked flavour and darker colour. A can of evaporated milk requires no refrigeration until opened, although the can should be stored in a cool place. Evaporated milk can be reconstituted with an equal amount of water and used like whole milk for cooking or drinking. It is also occasionally used in catering for enriching sauces, soups, e.t.c., in lieu of cream, but care must be taken to ensure that it is not represented as cream, as that is strictly prohibited by law.

3.3.2 Condensed Milk

This may be obtained either as whole milk (usually known as full cream milk) or skimmed milk. It is similar to evaporated milk in that 60% of the eater has been removed. Both grades may also be obtained either sweetened or unsweetened. Sweetened condensed milk contains a large amount of sugar (40 – 45%). In any of the grades of condensed milk, the milk is first pasteurised, and in sweetened milk, the heat assists in dissolving the sugar, which is added in the proportions of approximately 17% sugar to milk; the presence of the sugar also acts as a preservative. The resulting fluid is then reduced in stainless steel vacuum plans at a temperature of approximately 52^0C – 54^0C (125^0F – 130^0F) after which it is allowed to cool to a temperature a little above 15^0C (160^0F) then packed and sealed into cans. Sweetened condensed milk cannot be substituted for whole milk or evaporated milk because of its sugar content.

3.3.3 Dried Milk

Removing virtually all of the moisture from pasteurised milk makes dried milk. The moisture content must be less than 5% by weight. Dry whole milk contains between 26% and 40% milk fat. Non fat milk

powder is made from skimmed milk and must contain less than 1.5% milk fat by weight. Both types of dried milk are usually fortified with vitamins A and D.

According to Labensky and Hause (1995), the lack of moisture prevents the growth of microorganisms and allows dry whole and non fat milk powders to be stored for extended periods without refrigeration. However, because of its high milk fat content, dried whole milk can turn rancid if not stored in a cool place. Either type of milk can be reconstituted with water and used like fresh milk. In general catering usage, it is of great value to the confectionery, baking and ice cream trades and also in the manufacture of many baby foods and invalid foods.

3.3.4 Skimmed Milk

The fat content can be skimmed off, thus reducing the energy value of the milk. Skimmed milk is available in cartons or bottles, or in dried form and is useful in low-fat or energy-reduced diet. (Tull, 1990).

3.4 Storage of Milk:

Fresh milk should be stored in a cool, dark place, preferably a refrigerator, and covered to prevent exposure to dust, bacteria in the air, and contamination by strong flavours of other foods. It should be used within two to three days if pasteurised or homogenised, sterilised, canned and milk should be treated as fresh once opened.

Dried milk should be stored in a cool dry place with the lid firmly in place to prevent absorption of moisture. Once opened it should be used up within the time stated by the manufacturer and when reconstituted with water should be treated as fresh milk.

3.5 Cream

Cream is a rich, liquid milk product containing at least 18% fat and all the main components of milk but in different proportions. It must be pasteurised and may be homogenised. Cream has a slight yellow colour and is more viscous than milk. Cream is marketed in several forms with different fat contents, as described below (Labensky and Hause, 1995).

1. **Half and Half:** is a mixture of whole milk and cream containing between 10% - 18% milk fat. It is often served with cereal or coffee, but does not contain enough fat to whip into a foam.

2. **Light Cream, Coffee Cream and Table Cream:** are all products with more than 18% but less than 30% milk fat. These products are often used in baked Goods or soups as well as with coffee, fruit and cereal.

3. **Light Whipping Cream or, Simply, Whipping Cream:** contains about 30% milk fat. It is generally used for thickening and enriching sauces and making ice cream. It can be whipped into a foam and used as a dessert topping or folded into custards or mousses to add flavour and lightness.

4. **Heavy Whipping Cream or, simply, Heavy Cream:** contains not less than 36% milk fat. It whips easily. It must be pasteurised, but is rarely homogenised. Heavy cream is used throughout the kitchen in the same ways as light whipping cream. Ultra-pasteurised cream will keep for 6 – 8 weeks if refrigerated. Unwhipped cream should not be frozen. Whipped, sweetened cream can be frozen, tightly covered for up to 3 months, then slowly thawed in the refrigerator. Keep away from odours and bright lights.

3.5.1 Production of Cream

Milk is left to stand for 24 hours. During this time, the cream forms a layer on top of the milk as the light fat globules float to the top. All that cream-making used to entail was carefully skimming off the top of the open pans of milk by hand. Nowadays, it is mechanically and considerably more quickly separated by centrifugal force (i.e. in a rapidly revolving container which spins the heavier part, the skimmed milk, to the outside, while the cream flows towards the middle) at a temperature of 35^0C – 4^0C (95^0F – 104^0F). The separated cream is then pasteurized, heated to 79.50 and cooled to 4.5^0C ready for packaging.

SELF ASSESSMENT EXERCISE 2

Why is milk such a valuable product?

Practical Exercise

Heat milk to a high temperature and observe the result

3.6 Cultured Dairy Products

Dairy products such as yogurt, butter milk and sour cream are produced by adding specific bacteria cultures to fluid dairy products. The bacteria

convert the milk sugar lactose, into lactic acid, giving these products their body and tangy unique flavours. The acid content also retards the growth of undesirable micro-organisms; thus cultured products have been used for centuries to preserve milk

.

3.6.1 Butter Milk

Originally, this was referred to as the liquid remaining after cream was churned into butter. Today, butter milk is produced by adding a culture (streptococcus lactic) to fresh pasteurised skim or low fat milk. This results in a tart milk with a thick texture. Buttermilk is most often used as beverage or in baked foods.

3.6.2 Sour Cream

This is produced by adding the same culture to pasteurised, homogenised light cream. The resulting product is a white tangy gel used as a condiment or to give baked foods a distinctive flavour. Sour cream must have a milk fat content of not less than 18%.

3.6.3 Yogurt

Yogurt may be made from either skimmed milk or whole milk (low-fat or non-fat). It is a thick, tart, custard like product cultured with lactobacillus, bulgaricus and streptococcus thermophilus (Labensky and Hause, 1995). Though touted as a health or diet food, yogurt contains the same amount of milk fat as the milk from which it is made. Yogurt may also contain a variety of sweeteners, flavourings and fruits. Yogurt is generally consumed as it is but may be used in baked products, salad dressings and frozen desserts.

3.6.4 Butter

Butter is a fatty substance produced by agitating or churning cream. It is good in flavour for sauces, bread and pastries. Butter contains at least 80% milk fat, not more than 16% water and 2 – 4% milk solids. It may or may not contain added salt. Butter is firm when chilled and soft at room temperature. It melts into a liquid at approximately 38^0C (98^0F) and reaches the smoke point at 127^0C (260^0F). Butter should be well wrapped and stored at temperatures between 0^0 – 2^0C (32^0 and 35^0F).

4.0 CONCLUSION

In this unit, we have generally discussed milk and other dairy products. We looked at their processing techniques, food value, storage and uses. We also discussed the different types of milk but rather as concentrated

milk with distinct characteristics and storage. Other dairy products discussed are cream, butter milk, yogurt and butter.

5.0 SUMMARY

This unit treats milk and other dairy products as known and used in catering for different purposes. Some of the points covered are useful information for the hotel and catering profession.

6.0 TUTOR-MARKED ASSIGNMENT

1. List the various heat treatments given to milk
2. What are cultured dairy products?

7.0 REFERENCES/FURTHER READINGS

Hilton, E. J. (1976). *Catering – Food and Drink.* Plymouth: Macdonald and Evans.

Labensky and Hause (1995). *On Cookery – Techniques from Expert Chefs.* New Jersey: Prentice – Hall,

Tull, A. (1990). *Food and Nutrition*. Oxford: Oxford. University Press.

UNIT 3 EGGS

CONTENTS

1.0 INTRODUCTION

Eggs constitutes an important food in the diet. It is considered to be very versatile and ranks among the most nutritious of foods.

This unit provides a study of eggs from production to their uses and consumption as various dishes.

The major points also discussed here include the nutritional value of eggs, quality points, sanitation, cooking methods and egg substitutes.

2.0 OBJECTIVES

By the end of this unit, you should be able to:

- Give details about egg production
- State the composition of eggs
- Purchase and store eggs properly
- Explain the uses of eggs in catering

- Identify and prepare egg dishes
- Give details about other aspects of eggs, such as egg products and egg substitutes

3.0 MAIN CONTENT

3.1 EGGS

By the term eggs we ordinarily mean those of the domestic fowl but these are not the only edible eggs. The eggs of such domestic birds as ducks, geese, guinea fowl and turkey as well as those of such wild birds as the plover, gull and heron can be used as human food. Other eggs used for food are those of the turtle and many varieties of fish, e.g. herring (roe) and sturgeon (cariare) (Hildreth, 1991).

For our purpose, we shall limit ourselves to hen's egg which constitute the chief source of our supply of eggs in catering. We will better understand the value of an egg if we realize that it is a living organism. It contains an undeveloped chick, or embryo, with its store of food enclosed in a protective shell. Hen's eggs are graded as small, medium, large and extra large, (Ceserani *et. al.* 2000).

3.1.1 Production of Eggs

Traditionally, eggs were produced in Nigeria by free range farming. This meants that hens were allowed to roam loose in the farmyard, eating grain and other food from the ground. The eggs were then laid in a hen house. Free range hens are still kept, but usually on a small scale.

As the demand for eggs grew, large scale production in the form of battery farms was developed. Thousands of hens are kept in cages and large hen houses which are artificially lit and heated. The hens remain in the cages at all times and the eggs they lay are collected, graded and checked for quality. Another form of large-scale production according to Tull, (1990), involves keeping large numbers of hens together in huge heated sheds but not in cages. The hens lay their eggs in nest boxes. This is called "deep-litter" farming.

3.1.2 Structure and Composition of Eggs

The structure of an egg consists of three basic parts: the shell, the white (albumen) and the yolk.

The Shell: The shell, considered inedible is discarded, making about 11% of the total weight of the egg. Two membranes lies just inside the shell of the egg. One lines the shell and the other covers the egg

contents, but both stick to the shell when the egg is broken out; only when the egg is hard-cooked are they apparent. As the egg grows, and an air sac forms between the two membranes at one end of the egg, the membranes separate into an 'air space' to supply the chick with oxygen. The colour of the shell varies according to the breed of the bird and does not influence the nutritional value of the egg in any way. The shell is relatively strong but older birds tend to produce weaker shells.

Egg White: The white consists essentially of a solution in water of proteins, mainly egg albumen. It also contains some riboflavin. Unlike the protein of meat, that of egg is not in the form of muscle fibres and is not surrounded by tough connective tissue. It is in colloidal solution and is thus easily digested and very suitable for young children, invalids and convalescents. The main protein in egg white are ovalbumin and mucin.

The Yolk: The yolk is the yellow portion of the egg. It is covered by a membrane to separate it from the white and to support it. The yolk which is very much richer than the white constitutes just over one third (1/3) of the egg and contains three fourths (¾) of the calories, most of the minerals and all of the fat (Labensky and Hause, 1995). The fats in eggs are highly emulsified and consequently easily digested. A fatlike substance, lecithin, which contains phosphorus, is also present. The colour of the egg yolk is related to the diet of the hen and is due to the presence of carotenes. Tull (1990). The yolk is supported by the "chalazae" which are attached to the egg white and help to keep the yolk away from the shell where it can pick up bacteria. The egg yolk is an exceptionally fine food with its animal protein, its easily digested fat, its valuable calcium, iron, phosphorus, sulphur and its vitamins.

3.1.3 Tool Value

Eggs are highly nutritious and form a staple part of the human diet. They are easily digested by most people, especially when lightly cooked. As they are used in so many different ways in food preparation, they make a valuable contribution to the diet when used as a main dish; two eggs should replace a portion of meat or fish. The white of fresh shell eggs contains 9% protein and a very slight trace of fat, and provides 370cal/kg. Yolks are much more nutritious with 17% protein and more than 30% fat and they provide 3,326 cal/kg. Eggs contain no traces of carbohydrate. The analysis of a whole egg shows nearly 12% proteins, more than 12% fat and 1,630 cal/brie per kg (cal/kg).

Eggs contain vitamins A, D, E, K and the B-complex vitamins. They are rich in minerals but also in cholesterol. The nutritional value of egg makes it unique a food that is truly designed to support life.

3.1.4 Storage

Egg quality is quickly diminished by improper handling. Eggs should be stored at temperatures below 4^0C (40^0F) and at relative humidity. Eggs according to Labensky and Hause (1995) will age more during one day at room temperature than they will during one week under proper refrigeration. As eggs age, the white becomes thinner and the yolk becomes flatter. While this will change the appearance of poached or fried eggs, age has little effect on nutrition or behaviours during cooking procedures. Older eggs, however, should be used for hard cooking, as the shells are easier to remove than on fresh eggs.

Cartons or crates of uncooked eggs will keep for at least four to five weeks beyond the pack date if properly refrigerated. Hard-cooked eggs left in their shells and refrigerated should be used within one week. Store eggs away from strongly flavoured foods to reduce odour absorption. Rotate egg stock to maintain freshness. Avoid using dirty, cracked or broken eggs as they may contain bacteria and other contaminants. Frozen eggs should be thawed in the refrigerator and used only in dishes that will be thoroughly cooked, such as baked jacket potatoes.

3.1.5 Sanitation

Eggs are potentially hazardous food. Rich in protein, they are excellent breathing ground for bacteria. Salmonella is of particular concern with eggs and egg products because this bacteria is commonly found in the fowl's intestinal track. Although egg shells are cleaned at the packing houses, some bacteria may remain. Therefore, to prevent contamination, it is best to avoid mixing the shell with the liquid. In the opinion of Labensky and Hause (1995) inadequate cooking and improper storing of eggs may lead to food-borne illnesses. Hold egg dishes 4^0C (40^0F) or above 63^0C (145^0F). Never leave an egg dish at room temperature for more than one hour, including preparation and service time. Never reuse a container after it has held raw eggs without thoroughly cleaning and sanitising it.

3.1.6 Testing Egg for Freshness

The contents of fresh egg completely fills the shell until it cools, when a slight shrinkage causes an air-sac to form. This process continues slowly until the egg is used. The staler the egg becomes the smaller the contents and the greater the air-sac. As egg gets older, several changes take place:

1. Water moves from the white into the yolk
2. The yolk membrane weakens
3. The thick white becomes thinner
4. The size of the air space increases
5. Moisture is lost through the shell
6. Bacteria enter through the shell
7. The bad smell of hydrogen sulphide is produced by the reaction of sulphur from the egg white and phosphoric acid in the yolk.The egg eventually decomposes as bacteria contaminate the contents.

An easy way to test for freshness is to place each egg in turn in a basin of cold water. If it sinks to the bottom, it is fresh; the staler it is, the more buoyant the egg becomes.

SELF-ASSESSMENT EXERCISE 1

i. Explain the difference between free range and battery egg production
ii. Practical Exercise: Collect three fresh eggs and three stale eggs, immerse each set of eggs in a bowl of cold water. What is your observation?

3.2 Uses of Eggs in Food Preparation

Eggs are used for a variety of processes in food preparation and they are very versatile in this respect. You can use eggs in the following ways:

1. **Trapping air**: In order to make flour mixtures rise and have a pleasant mixture, air must be introduced. Both egg white and the whole egg are capable of trapping air as a result of the ability of ovalbumin to stretch. In doing so, eggs are utilised to trap air as a raising agent. This is particularly useful in **cake making** and in **lightening** mousses, soufflés etc. as meringues or whole egg.

2. **Thickening**: Eggs are used as thickening agents for sauces, custard, soups, fillings, stuffing, salad dressing and hundreds of other dishes. This is made possible because of the coagulation of the egg protein.

3. **Emulsifying**: Egg yolk contains /lecithin' and emulsifier which enables oil and water to be mixed to an emulsion without separating. This is use in mayonnaise as stabiliser and in cake making when eggs are added to the fat in the former and also to the fat and sugar in the latter respectively.

4. **Binding**: Ingredients for rissoles, croquettes and meat or fish cakes can be bound together with eggs, which when heated will coagulate and hold the ingredients together.

5. **Coating**: Eggs are used either on their own or combined with flour and bread-crumbs as a coating agent for fried foods. This forms a protective layer on the outside of the food, which sets and holds it together thereby preventing it from overcooking and sticking.

6. **Glazing**: In order to produce a golden brown shiny glaze during baking of items such as pastry, break etc. egg yolk, egg white or whole egg can be used to brush over these items.

7. **Enriching**: Eggs can be added to sauces, milk puddings, soups etc, as a way of including extra protein.

3. **Garnishing**: Hard-boiled egg white and yolk can be used to garnish salads, hot or cold meat as well as numerous vegetables.

In addition to the above, eggs enhance flavour, colour and the texture of the product of which they are used, giving them not just only nutritive power but also serving as cement that holds the castle of cooking together in that they are specially rich in all necessary elements required by the body.

3.5 Egg Dishes and Cookery

Eggs are also used as main ingredient in a variety of dishes, thus providing an important supply of protein in the diet. There are quite a number of dishes that may be prepared from eggs. They can be used for any meal during the day and will find a place in every course ranging from appetisers to sweet; as breakfast or main luncheon dishes. Eggs can be cooked by the following methods:

1. **Baking:** In small dishes or with vegetables in custards and flans
2. **Frying:** Normally shallow frying
3. **Boiling:** Boiling them in their shell
4. **Poaching:** By using the pan meant for this purpose
5. **Scrambling:** Over a gentle heat

Egg dishes include:

1. Scrambled eggs
2. Egg in cocotte
3. Boiled eggs, either hard-boiled or soft boiled

4. Fried Eggs/bacon
5. Poached eggs
6. Scott egg
7. Omelets.

3.3.1 Effect of Heat on Eggs

When eggs are heated, Ovalbumin in the egg white starts to coagulate at 60^0C (14^0F) until the whole white is solid and opaque. The proteins of the egg yolk start to coagulate at 70^0C (158^0F) and continue until the yolk is dry and hard. If overcooked, the protein becomes tough and difficult to digest Tull (1990). If an egg is boiled for some time, a green black ring of iron sulphide forms around the yolk. This is due to the reaction of sulphur in the egg white with iron in the egg yolk, particularly in eggs which are not very fresh. This reaction can be prevented to a certain extent by cooling the egg rapidly as soon as it has been cooked. If eggs are heated too quickly, the proteins will coagulate and shrink rapidly, causing any liquid that the egg contains to be squeezed out and the protein to become tough. This is called "Syneresis".

The higher the temperature and the longer the time of cooking, the tougher and more solid the eggs become and, therefore, more difficult to digest thus; fried eggs are harder to digest than poached or scrambled eggs and hard-boiled eggs more difficult to digest than lightly boiled ones (Hildreth, 1977).

3.2.2 The Don'ts in Egg Cookery

1) Do not wash an egg until you are ready to use it
2) Do not rush egg cooking as they turn tough.
3) Do not use or cook eggs that are just taken from the refrigerators. Very cold eggs cracks when plunged into boiling water to cook. This can be prevented by blanching or making a hole around the egg before placing it in water for boiling. You will find it easier for boiled eggs if you plunge them into cold water just after cooking.
4) Do not differentiate from white and brown coloured egg because colour makes no difference.
5) Do not beat egg while in an aluminum container as it will turn dark. Do not dispense powdered eggs as they are just as good as fresh ones.
6) Do not let egg stand in a temperature of about 650C and above.

SELF-ASSESSMENT EXERCISE 2

What are the don'ts in egg cooking? Mention the various egg dishes and their cooking methods.

3.4 Other Aspects of Eggs

In concluding this unit, there are other points about eggs which we wish to point out. These are egg products and **Egg substitutes**. Now let us see what each of them entails.

3.4.1 Egg Products

In modern day catering operation, food service establishments often want the convenience of buying eggs out of shell in the exact form needed, either as whole eggs or whites only. These process items are called "egg products" and are subject to strict pasteurisation standard in the developed countries of the world. Egg products can be frozen, refrigerated or dried. Precooked, proportioned and blended products are also available. However, such egg products are not common in Nigeria except perhaps through importation and are limited in use.

3.4.2 Egg Substitutes

Concern about the cholesterol content of egg has increased the popularity of egg substitutes. (Labensky and Hause, 1995). There are two generals types of substitutes. The first is a complete substitute made from soy or milk proteins. It should not be used in recipes where eggs are required for thickening. The second substitute contains real albumen, but the egg yolk has been replaced with vegetable or milk product. Egg substitutes have different flavours than real eggs but may be useful for persons on a restricted diet.

3.4.3 Dried Eggs

Dried eggs as the name suggests are eggs which have either been film-dried or spray dried. They have the advantages of requiring less space and kept in good condition for long periods of time in the right circumstances and of being easy to handle and measure. Whichever method is used, the eggs are first mixed with a little water to which bicarbonate of soda has been added, in order to produce a uniform consistency. The liquid is then either spread in a thin film over a dry surface at 45^0C (113^0F), when an even powder forms after slow evaporation, or sprayed into a pre-heated chamber in similar fashion as spray-dried milk. Once reconstituted, dry eggs are easily contaminated and should be used immediately (Hilton, 1976). Custard powder may be

similar in composition to egg substitutes, or may merely consist of corn flour coloured to resemble egg and flavoured usually with vanilla with the addition of milk, to a paste. It does not compare in food value with genuine eggs.

4.0 CONCLUSION

In this unit, you should have learned much about eggs, their importance and uniqueness among the most nutritious of foods. We discussed the sources of eggs, their composition and uses in cookery. We also looked at their food value, storage and quality. Other issues we discussed are the effect of heat on eggs, egg dishes, products and substitutes.

5.0 SUMMARY

This unit treats eggs as another important and unique food commodity used extensively in catering. The major points covered are useful information necessary to make you to purchase and use eggs of high quality for the various needs in cooking.

6.0 TUTOR-MARKED ASSIGNMENT

1. Why are eggs used in food preparation and production?
2. Explain the food value of eggs.

7.0 REFERENCES/FURTHER READINGS

Ceserani, Kinton and Fosket (2000). *The Theory of Catering*. London: Houdder and Stoughton.

Hildreth, E. M. (1991). *Elementary Science of Food*. London: Mills and Boon.

Hilton, E. J. (1976). *Catering Food and Drink.* London: Macdonald and Evans

Tull, A. (1990). *Food and Nutrition.* London: Oxford University Press.

UNIT 4 FATS AND OILS

CONTENTS

1.0 INTRODUCTION

This unit is a continuation of our discussion on food commodities. It focuses on fats and oils and their various uses in catering. There is a wide variety of fats and oils used across the world depending on individual food culture and taste. In Nigeria for example, the most popular of all the oils is palm oil and groundnut oil. The supply of both of these oils does not meet present demand; so many other cooking fats and oils are now available in the local markets. Common fats such as butter and margarine are also used extensively. In this unit, we will look at the various types of fats and oils under the classification of plant and

animal fats and oils, their nutritional importance as well as the effect of heat on them.

2.0 OBJECTIVES

By the end of this unit, you should be able to:

- Explain the need for fats and oils in catering
- Classify the types of fats and oils available for use
- Explain the properties of fats and oils
- Discuss the effect of heat on fats and oils
- Explain rancidity
- Differentiate between the different types of fats and oils
- State the nutritional/ value of fats and oil.

3.0 MAIN CONTENT

3.1 Fats and Oils

The fats which are eaten in the normal diet are meat fats, butter, and animal and vegetable oils. The main difference between fats and oils is the temperature at which they solidify, most oils having a fairly low melting – point compared with that of fats found in the tissues of warm-blooded animals, which become fluid at a temperature a little below blood heat.

3.1.1 Chemical Properties of Fats and Oils

Fats and oils have the same basic chemical structure but differ in physical appearance at normal room temperature. Fats and oils are composed of the elements: carbon, hydrogen and oxygen. These are formed into two types of substances called **glycerol** and **fatty acids** which combine to form fat molecules. There are at least forty different fatty acids known, each with its own chemical name. They may be either **saturated** or unsaturated, according to the way in which their carbon and hydrogen atoms are arranged (Tull, (1995).

Saturated fatty acids are predominantly present in fats which are solid at room temperature. Most fats contain a mixture of saturated and unsaturated fatty acids, but in widely varying proportions. This affects the hardness of the fat. However fats and oils are obtained from both plants and animals. We shall discuss this in detail as we progress in this unit. Examples of saturated fatty acids are palmitic and stearic acid found in beef and mutton fat, butyric acid in butter and caprylic acid found in coconut oil and butter from goat or cow's milk. Unsaturated

fatty acids include: oleic acid found in olive oil and in lard, linoleic acid in corn oil, soya bean and linseed oils and arachidonic acid found in some animal fats.

3.1.2 Uses of Fats and Oils

- Fats and Oils have many uses in catering. For the purpose of this topic; we shall look at each of the major uses and for what purpose(s) as follows:

- Spreading on bread, biscuits, sandwiches etc. (butter, margarine)

- Creaming: Margarine is economical and provides colour and flavour. "Soft" margarine is specially produced for creaming, but is not very suitable for rubbed in mixtures as it is too oily. Also butter provides a very good flavour and colour to the mixture. For economy, it can be mixed with margarine or another fat.

- Shortening: Fat is used in pastry making to provide 'Shortness" as in cake mixture except that for pastry, the fat is not mixed as thoroughly with the flour as it is for cakes. This causes the fat to form layers between strands of gluten, so that the pastry is tender and flaky. Oil can also be used, but it lacks flavour. However any fat used should be cold and firm.

- Frying: In most cases, vegetable oil is used for deep frying. While butter or margarine is for shallow frying.

- Oiling: Oils and melted butter are used to prepare baking trays for the oven in order that baked items do not stick after cooking but are easily removed.

- Salad Dressing: Vegetable oil is used in the preparation of mayonnaise – a popular creamlike mixture of oil, egg yolk, vinegar, mustard, salt, sugar, and pepper used as salad dressing.

- Ice-cream: Fats and oils are also used in the preparation of ice-cream.

3.1.3 The **Effect of Heat**

You should have at one time or the other experienced that when fat is heated, it melts to oil, and then gradually heats up until it eventually ignites. Some fats can be heated to a higher temperature than others, and are therefore more suitable for frying.

Apart from vegetable oils, other fats such as butter and margarine cannot be used for frying at high temperatures as they contain other substances such as water and emulsifiers, which make them, burn easily.

When fat is heated at a certain temperature, a thin, bluish haze of smoke will be given off and if used, gives food an unpleasant flavour. This happens at a temperature known as the "smoke point" when fat molecules start to split up thereby reducing the keeping quality of the fat. Soon after this, the fat will ignite and burn fiercely. The temperature at which this occurs is called the "flash point".

3.1.4 Rancidity

Rancidity occurs when fat molecules are broken down by the action of the enzyme "lipase" or by oxidation thereby producing "off" flavour and odour as a result of free fatty acids in the food. Heat can destroy lipase and the micro-organisms in the food that may produce lipase.

In oxidation, oxygen is absorbed by the fat and reacts with the fat molecules, producing substances which give the fat an unpleasant flavour and odour. Light, impurities in fat, enzymes and the presence of many unsaturated fatty acids are factors which accelerate oxidation and cause rancidity in fats and oils. Rancidity occurs in fat-containing foods that are kept in cold storage or frozen.

SELF ASSESSMENT EXERCISE 1

Explain the uses of fats and oils

3.2 Types of Fats and Oils

Edible fats and oils are obtained from both animals and plants. Animals store fat for energy in the same way that plants store starch as their reserve, but fat is a more concentrated form of food supply. For the purpose of this topic, we shall limit our discussion on fats and oils obtained from animal sources and take up those obtained from plant sources in our next discussion (See 3.3) below. Meanwhile, the following are the main animal sources of fats and oils.

3.2.1 Butter

Butter is the name given to the substance made from the fat contained in milk; no other substance being added except salt and a little edible colouring where needed. Easily digested, fat is very rich in vitamins "A" and "D" especially if obtained from cows which have been fed

naturally in pastures. The average composition of butter is 84.3% fat, 13.5% water, 1.9% salt and 0.3% curd (Hilton, 1976).

The amount of butter to be obtained from a given quantity of milk varies considerably, depending on the breed and the nature of cow the. Today butter is entirely produced in the factory. After being separated from the milk, the cream is first pasteurised to remove undesirable flavours and air, then it is held at 4.5^0C (40^0F) to harden the fat globules. It is then held at 15 – 18C (50 – 64^0F) for three to four hours to develop the acidity (for flavour) and to prepare it for churning. It is then cooled to 7^0C (50^0F) and churned. Churning is done by a butter making machine which breaks up the seal of milk solids around the fat globules so that they coalesce i.e. stick together. The non-fat milk solids then mix with the liquid in the cream to form butter milk which is drained off and used for cattle feed or sold as a drink. The fat is then chilled, washed and hardened and salted, if required. (Tull, 1990). Flavouring may also be added as well as preservative and antioxidant.

3.2.2 Suet

Suet is obtained from the fat around vital organs, e.g. kidneys, usually from the ox. Beef is the only meat which yields a suet which is put to any appreciable use, purely as suet. The fat content varies from 70% to 99% and it is a very solid, hard fat, composed of mainly saturated fatty acids. Top quality beef fat and suet, free from fibre and of low melting-point is pressed through a special type of riddle with small round holes of even size, the resulting shreds being dusted with a small quantity of rice flour, not exceeding 15% of the total weight, the purpose of keeping the shreds free-running and to prevent them from forming into a solid mass. Beef suet should be creamy white, brittle and dry (Ceserani, Kinton and Foskett, 2000). It is considered to have the highest calorific value of any food and it is used mainly for suet puddings, dumpling and in mincemeat. Suet is either sold in cartons or in shreds.

3.2.3 Dripping

Dripping is the fat that is released during the roasting of a joint of meat (usually beef). On cooling, it separates into a layer of fat and a layer of meat extractives in a jelly. The fat can be used for roasting other joints or vegetables, or for shallow frying. Some people eat dripping spread on bread or toast. It is also use for sauté, potatoes and for brown roux and occasionally for savoury pastry.

3.2.4 Lard

Lard is produced from pigs that are specifically bred for this purpose. The fat is obtained from the fatty tissues under the skin. It can also be

obtained from any part of the pig's carcass, but the best lard is produced from kidney and back fat. They are cut into small pieces and heated to remove the lard – a process known as 'rendering'. Antioxidants are added to it to prevent rancidity, and it may be modified to improve its baking qualities.

Lard is seldom used nowadays in the catering industry, except possibly in choux pastry or hot water pastry in conjunction with margarine for added flavour. Since the availability of wide variety of compound fat, lard has declined in usage. It has poor creaming qualities and therefore unsuitable for cake making. Lard is however, used for deep and shallow frying. It must be pored for this purpose so that it can be heated to high temperatures.

3.2.5 Marine Oils

According to Tull (1990), Fish-liver oils, such as oils obtained from cod fish and halibut fish are classified as marine oils and are considered to be rich sources of vitamins A and D. it is available as supplementary diets for children on a regular basis, people now realised that a well-balanced diet can provide all the required fat-soluble vitamins. If too many are given, they are stored in the body and may cause poisoning. Whale and fish oils contain many polyunsaturated fatty acids and must be refined, as they deteriorate rapidly after being extracted.

3.3 Plant Oils

Plant oils are mostly available from seeds of edible plants. Such oils are k nown generally as vegetable oils. Plants are able to form fat from carbohydrates; their fat contents increases as the starch decreases. Seeds that store oil in this way are used in the production of margarine. Oils are fats, which remain liquid at normal atmospheric temperature but may solidify when cooled. Cooking oils are almost 100% pure fat, unlike butter which is a mixture of fat and water.

3.3.1 Coconut Oil

This is oil obtained from the dried kernel of the familiar nut (*cocos nucifera*) – a botanical name given to coconut. The palms which produce the nut grow abundantly in most tropical areas such as Nigeria, Ghana, Sri Lanka, Malaysia, Philippine Islands, Indonesia and the British Pacific Islands. The kernel or endosperm is extracted from the nut and dried in the sun or kiln dried. Considerably, more than half of this substance consists of edible oil which is extracted under pressure and is used in the manufacture of such foodstuff as chocolate and

margarine. Coconut oil is available in Nigerian markets and is sold as both body oil and for consumption.

3.3.2 Groundnut Oil

Groundnut oil comes from a plant with a variety of names, as it is known as either arachis (*arachis hypogaea*), groundnuts peanuts or monkey nuts (Hilton, 1976). It is believed to have come from South America, but has been cultivated in South Africa for nearly four hundred years or more and peanut oil is now produced in India, China, Nigeria and the United States of America.

The plant grows close to the ground and the young nuts it produces grow under the soil. One plant may produce over a hundred nuts, two or more to the pods. Over 40% of the total weight is oil, and the residue after pressing provides valuable food for cattle, very rich in vegetable protein. Nigeria produces excellent groundnut oil, but it has been largely replaced by the cheaper vegetable oils in the market (Isoun and Anthonio, 2002). Groundnut oil has a distinctive groundnut smell and taste, but heating can drive this off if it is not desirable in the finished product. It is high in unsaturated fats.

3.3.3 Cotton Seed Oil

This is an important edible oil used as salad oil, for frying purposes and in the manufacture of margarine and compound fats. Although not common in Nigeria, the seed in its crude state is exported in large quantities into the United Kingdom from the cotton-growing countries, mainly from the U.S.A., Egypt and Uganda. Cotton seed produces very dark oil with a strong characteristic taste and smell very difficult to destroy. The refined oil is pale yellow; considerable quantities of it are sold for consumption in the U.K. and other industrialised countries and are used mainly in the manufacture of edible fats.

3.3.4 Olive Oil

Olive oil is one of the prime oils and probably one of the most expensive. It is produced from the fruit of the olive plant. Olive oil is a native of the Mediterranean countries and has also been cultivated successfully in North and South America and to a lesser extent in Australia and South Africa but not as such in Nigeria. A good source of vitamin A, the oil is produced by pressing the fruit usually under hydraulic pressure; two grades of edible oils are produced, the first pressure being known as “virgin” oil and lower grade being obtained from a second pressing after water has been added to the pulp (Hilton, 1976).

Its main uses in Northern Europe as far as catering is concerned are for mayonnaise and other salad dressings and to a lesser extent in batters and marinades and for shallow frying and also in the preparation of certain *hors d'oeuvre*.

In Nigeria, Olive oil is not used as edible oil, rather it is used mostly as body oil and "anointing" oil by a group of Christian faithfuls. The best quality oil comes from Italy, but the greatest quantity from Spain.

3.3.5 Palm Oil

The palm tree *(Elaeis guineensis)* provides two distinctly different edible oils; one from the pericarp or fleshy substance of the palm fruit, the other being very similar in substance and usage of coconut oil. The oil produced from the fruit is known as palm oil and is extracted on the plantation, while that obtained from the nut is called palm kernel oil and is usually extracted from the kernels in oils mills.

In Nigeria, palm oil is mostly extracted through local technology by boiling harvested palm, fruits in large quantity and crushing or pressing them manually to extract the unrefined oil containing pulp and later, the liquid oil is served out.

Both oils are suitable for use in food preparation but palm oil is mostly preferable. They are used for frying purposes and may serve as substitutes for groundnut oil. Palm kernel oil is good ingredient for soap making. Palm oil is available in large quantity in Nigeria and Malaysia.

3.3.6 Melon-Seed Oil *(Egusi)*

Melon seed is a popular ingredient for making soups in Nigeria. When pressed, melon seed produces a special oil which is used in cooking soup, stews and boiled foods. If used for frying, the aroma is delicious. The Hausa sell this oil in bottles.

SELF ASSESSMENT EXERCISE 2

i. Mention the different types of oil you know.
ii. Practical Exercise: Use vegetable oil to fry plantain. Observe the difference with frying with palm oil.

3.4 Margarine

The origin of margarine according to Hilton (1976) is a classic example of necessity being the mother of invention. It was claimed that as a

result of an enormous increase in the population of the world during the nineteenth century, there was an acute shortage of edible fats with the result that Napoleon III's government offered a large prize to any scientist who could produce an efficient substitute for butter. A man named Mege – Mouries successfully produced a form of artificial butter by churning together milk or cream and the oil obtained by pressing animal fats thus producing the basis of a relatively stable emulsion which became the predecessor of the margarine we know today.

3.4.1 Margarine Production

The process of producing solid fats from liquid oil is known as hydrogenation. This process is used in the manufacture of margarine. Unsaturated fatty acids have the capacity to take up more hydrogen atoms and if they do, they become more solid. If oils have hydrogen bubbled through them under carefully controlled conditions, their fatty acids take up the hydrogen atoms and they become solid. This is what is meant by hydrogenation (Tull, 1990).

In modern factories, the fats are first treated to remove their natural colour, odour and flavour, then melted and clarified in special hygienic pans and blended with milk by means of a mechanical agitating device. A ripening culture is then added together with the colouring agent and the amount of vitamins A and D required to bring its nutritional value near to that of butter. The resulting mixture is then churned, cooled and treated in much the same manner as butter. As with butter the keeping qualities of margarine are enhanced by the addition of lactic acid cultures, but the natural keeping qualities of margarine are much greater than those of butter (Hilton, 1976).

3.4.2 Types of Margarine

One of the advantages of margarine over butter is that different types can be produced to suit different purposes. Now let us study the following types and learn what they are used for:

(a) **Table Margarine**: This has a predominantly good quality animal fat and a little vegetable fat. Butter is added to improve the flavour and palatability, but food regulations limit the amount of butter to 10% of the total weight.

(b) **Cake Margarine**: It has a considerably reduced animal fat content and a correspondingly higher vegetable oil content e.g. coconut oil, to facilitate the creaming process used in cake making.

(c) Pastry Margarine: It contains hard waxy fats such as palm-kernel oil and oleo-stearine to increase its "shortening" properties and to produce the tough, hard texture and high melting point which pastry-making requires.

3.4.3 Constituents, Uses, Storage and Food Value

The average composition of margarine is 83% fat, 14.6% water, 0.4% salt and 2.0% curd. In good class catering, the use of margarine is limited to the making of cakes and for the preparation of roux and foundation sauces. Fats and oils should be stored in a cool place, covered, and away from strong odours, which they could absorb. Oils that have been used for frying should be strained to remove any impurities and food particles, which may cause them to become rancid. They should not be used over and over again, as the molecules are split up when heated and this may cause rancidity. Fats and oils are very good sources of energy. They contains vitamins A, D, E, K, and protect delicate organs of the body. Fat helps us to feel full and have high satisfying value.

SELF ASSESSMENT EXERCISE 3 (PRACTICAL)

i. Compare the taste of palm oil and vegetable oil

ii. a) Compare the length of time taken to cream 50g caster sugar with 50g of soft margarine, butter and lard, all taken directly from the refrigerator.

b) Account for the differences and observe which fat creamed the most easily.

4.0 CONCLUSION

In this unit, we have discussed extensively issues relating to fats and oils. We have tried to classify fats and oils into groups and pointed out their physical and chemical properties. We also examined some of their production processes, storage and uses in catering.

5.0 SUMMARY

You should have acquired knowledge about fats and oils, their classification, properties, production techniques, storage and uses. The unit has attempted to provide you with more knowledge of fats and oils as food commodities.

6.0 TUTOR-MARKED ASSIGNMENT

1. What are the uses of the following fats and oils in cookery?

    a) Margarine
    b) Butter
    c) Lard
    d) Suet
    e) Vegetable oils.

2. What is hydrogenation?

7.0 REFERENCES/FURTHER READINGS

Ceserani, Kilton and Foskelt (2000). *Practical Cookery*. London: Houdder and Stoughton.

Hilton, e. J. (1976*). Catering – Food and Drink.* Plymouth: Macdonald and Evans.

Labenskyu and Hause (1995). *On Cooking – Techniques from Expert Chefs.* New Jersey: Prentice – Hall

Tull, A. (1990). *Food and Nutrition*. Oxford: Oxford University Press.

UNIT 5 VEGETABLES

CONTENTS

1.0 INTRODUCTION

The unit presents fruits and vegetables according to the ways most people view them and use them rather than by rigid botanical classification. In the catering industry, vegetables and fruits play an important part as they are always served as an integral part of a main meal. Certain ones are served as a course on their own and they also serve as admirable garnishes. Produce, such as tomatoes, peppers and egg plant are all served like vegetables. In this unit, only the more commonly used fruits and vegetables are described and classified into root and green categories. Similarly, fruits are described and classified accordingly, while edible fungi and potatoes, vegetables, are also discussed. The unit ends with a discussion on cereals such as wheat, oats, barley, maize and their importance in catering.

2.0 OBJECTIVES

By the end of this unit, you should be able to:

- Identify different types of vegetables and fruits
- Classify vegetables and fruits
- Explain their uses in catering
- Describe fruits and vegetables
- Identify edible fungi and potatoes.

3.0 MAIN CONTENT

3.1 Vegetables

The term vegetable refers to any herbaceous plant that can be partially or wholly eaten; any herbaceous plant that has little or no woody tissue. The portions we consume include the leaves, stems, roots, tubers, seeds and flowers. Vegetables contain more starch and less sugar than fruits. Therefore, vegetables tend to be savory, not sweet. Also, unlike fruits, vegetables are most often eaten cooked, not raw except for salads. You can buy a great variety of vegetables and fresh fruits in the shops and market today.

3.1.1 Types of Vegetables

Vegetables are classified according to the part of the plant from which they come as described below. Some people distinguish vegetable from fruit by their inclusion in the savoury part of a meal while fruits are eaten with the sweet part of a meal. However, some foods which are called vegetables (e.g. tomatoes) are really fruits. Many vegetables are available all the year round; some have a definite season and some are imported to make up supplies. Nigeria has a wide range of vegetables, grown and harvested at different times and seasons with many Nigerian dishes prepared from them.

The following types of vegetables are discussed under major headings below:

1) Green Vegetables

These consist mainly of items grown above the ground, regardless of colour and are divided into leaves, stem, bulbs and pulses.

a. Leaves: Cabbage, lettuce, watercress, spinach, bitter leaf, water leaf, etc.

b. **Fruits:** Tomato, pumpkin, cucumber, marrow, aubergine (eggplant), citrus fruits (orange, grapes, lemon e.t.c.) mango, water melon, pepper, pear.

c. **Seeds and Pods:** Runner beans, broad beans, peas, red kidney beans, corn, okra e.t.c.

d. **Stem:** Leek, green onions

2) Root Vegetables

a) **Roots:** carrots, beetroot, ginger, parsnips, radishes, beets, turnips
b) **Tubers:** Yam, potatoes, cassava, cocoyam
c) **Bulbs:** Onion, garlic, shallot, white onion
d) **Flower**: Cauliflower
e) **Stalk:** Artichokes, asparagus, cerlery.

3.1.2 Choice and Preparation

Vegetables should be chosen carefully. Avoid damaged, wilted and bruised vegetable. Leaf vegetable should be crisp, firm, and of a good colour. Insect and mould-infected vegetable should be avoided.

In order to preserve the vitamin and mineral content of vegetables Tull (1990), suggests the following method of preparation:

If the vegetable requires peeling, peel it very thinly to avoid vitamin and mineral loss from the skin. Young vegetables like potatoes, and carrots often do not require peeling.

3.1.3 Storage of Vegetables

The most important thing to remember in storing vegetables is that if they are stacked one on top of the other, they will sweat and begin to rot. The best ways to keep them fresh is to make sure that they are adequately ventilated.

Root vegetables should never be stored in sacks one upon another, but should be emptied into wire racks or open bins; the sugar content in root vegetables make them very susceptible to the attack of fungi, especially if they have been bruised. Potatoes should be stored in a dark, cool and dry place to prevent mould and sprouting in warmth. Leafy vegetables should be stored for the minimum time in a cool place and in plastic bags in order to stop them from loosing vitamin C and water rapidly. All vegetables should be used as soon as possible.

3.1.4 Food Value

It is easier to understand the respective food values of root and green vegetables in general if we try to visualise their place in nature. Leaf stalk such as celery or rhubarb and green leaves such as spinach, cabbage do not have storage organs and therefore do not contain much protein, oil and carbohydrate. They are rather valued for their vitamin c and mineral content. The reserve organs, such as the tubers, roots and bulk of potatoes, carrots and onions respectively are the store houses of sugar and starches as are also seeds of pulses, such as pleas, beans, lentils and as such are good sources of carbohydrate (Hilton. 1976).

Prepare vegetables just before cooking to prevent the destruction of vitamins by enzymes.

Wash the vegetables but do not soak them in water as this will cause the loss of water soluble vitamins.

Cook vegetables in a minimum amount of boiling water. Placing them in boiling water destroys the enzymes and therefore helps to preserve the vitamins.

When the vegetables are just tender, they should be drained and served immediately. If kept hot, there will be further loss of vitamin C.

SELF ASSESSMENT EXERCISE 1

Identify the various categories of vegetables

3.2 Fruits

Botanically, fruits are the part of the plant that carries the seeds for future generations of plants. They are often attractively ‘packaged’ by nature to encourage man, animals and birds to eat them and scatter the seeds. Fruits are a unique group of foods because there is such a wide variety of types, flavours, colours, and texture.

3.2.1 Types of fruits

Fruits may be classified as hard fruits, stone fruits, and soft fruits (citrus fruits).

1) **Hard Fruits:** Apples, peers, Worcester etc.
2) **Stone Fruits:** Black grapples, apricots, peaches cherries, nectarines.

3) **Citrus or Soft Fruits:** Oranges, lemons, limes, grapple fruits, tangerines etc.
4) **Berry Fruits:** Strawberries, raspberries, blackberries, gooseberries.
5) **Currants:** Black and red currants
6) **Miscellaneous Fruits:** Water melon, honeydew, bananas, paw-paw, pine apple.
7) **Dried Fruits:** Sultanas, currants, raisings, prunes.

3.2.2 Preparation

Most fruits can be eaten raw when ripe but they are cooked for various dishes, often by stewing them in a little water. Fruit should be cooked over gentle heat for the minimum time. Very little water should be used as most fruits produce a fair amount of juice when cooked. This should be served with the fruits to conserve the nutrients (Tull, 1990).

Fresh fruits should also be chosen carefully and the following points are useful as a guide:

- Choose fruit that is just ripe, and has no bruises or blemishes.
- Wash fruits carefully, to remove dust and in case fruits have been sprayed with insecticide or pesticide.
- Store fruit carefully, talking care not to crush it as this will cause bruising

3.2.3 Food Value of Fruits

The food value of fruits varies quite a lot, depending on the type of fruit. Apart from their actual nutritional value, fruits are a great aid to the diet as appetisers and stimulants to the digestive juices and the high proportion of cellulose in many fruits provide a valuable source of roughage. Citrus fruits are an important source of vitamin C. Apricots contain carotene Vitamin A. Fruits do not contain vitamin "D" and they contain very little of the Vitamin B group. Ripe fruits contain fructose.

Fruits also supply a small amount of iron and calcium plus some of the trace elements. Most dried fruits are also rich sources of vitamins and minerals.

3.2.4 Storage and Handling

The texture, shape and nature of different fruits vary to such an extent that it is difficult to give any general rule on their storage without going into detail. However, ensure that fruits of all kinds are not bruised or damaged in any way, as this causes loss of ascorbic acid (Vit. C).

Fruits, particularly soft fruits are best eaten fresh and ripe and should be stored in a cool, dry, well-ventilated place.

Storage of fruits over a long period or in unsuitable conditions destroys the vitamin content of fruit in the same way that damage to cells does, but more slowly. Always make sure that fruits are handled carefully and frequent inspection should be carried out to remove damaged fruits to avoid contact with good ones.

3.3 Edible Fungi

Edible fungi are plants without leaves, seeds, stems, flowers or green colouring usually growing in other plants, they reproduce through spores. Although not actually vegetables, they are used and served in the same manner as vegetables.

3.3.1 Mushroom

Mushrooms (*Fr. Champignon*) are members of a broad category of plants known as fungi. Mushrooms have a stalk and an umbrellalike top. Several types of mushrooms are available because their spores are spread around the world. The common type, the button mushrooms which is the smallest type the most immature form of the common mushroom and the wild mushroom which have a stronger earthy or nutty flavour. Mushrooms whether cultivated or gathered from the forest are available fresh, canned or dried. Mushrooms contain some protein, but no carbohydrate; they contain traces of mineral elements such as phosphorus, copper, potassium and some vitamin B. They are eaten in small quantities, as such contributes little to the diet themselves, but because of their individual flavours, they serve as useful accompaniments to other dishes. Mushrooms are generally washed before cooking, it is not necessary to peel them. If dirty, quickly rinse in cold eater before use.

3.3.2 Truffle

Truffles is a fungi which grows wild just beneath the surface of the soil around the roots of certain types of trees. Truffle is something like an irregular – shaped potato in appearance and the texture is rather similar to that of a firm mushrooms. When fresh, it has a very strong, rather unpleasant odour, but it is valued for its flavour which is delicate and distinctive, when added to soups, sauces, pasta and other items. They are also used in garnishes for the meat course.

3.4 Potatoes

Potatoes *(Fr. Pommes)*

When we consider how frequently potatoes are used in the preparation of almost any variety of meals, it is difficult to imagine a kitchen where potatoes were unknown. Botanically, potatoes are succulent, non woody annual plants. The portion we consume is the tuber, the swollen fleshy part of the underground stem. Many varieties of potatoes are available but it is useful to know when they are available and for which purposes are they best suited in the kitchen.

Discussed below are some of the more commonly used types of potatoes:

(a) White potatoes

White potatoes are available in round or long varieties; they have a thin, tender skin with a tender, waxy yellow or white flesh. The smaller ones are sometimes marketed as new potatoes (not to be confused with new red potatoes). Round white potatoes are so referred to as chef or all-purpose potatoes and are usually cooked with moist heat or used for sautéing (Labensky and Hause, 1995).

(b) Sweet Potatoes

Sweet potatoes are from a different botanical family than ordinary potatoes although they are tubers that originated in the New World. Two types are commonly available. One has yellow flesh and a dry, mealy texture, the other has a darker orange, moist flesh and is high in sugar. Both types have thick skins ranging in colour from light tan to brownish red.

Sweet potatoes should be chosen according to their degree of sweetness. They are best suited for boiling, baking and pureeing, although the less sweet potatoes can be deep-fried. The cooked flesh can also be used in breads, pies and puddings.

3.4.1 Storage and Food Value

Generally, potatoes contain a high percentage of easily digested complex carbohydrates and little or no fat. They are also a good source of many minerals and some vitamins. Potatoes should be stored between 100 – 180^{o}C (500 – 650^{o}F). Do not store potatoes in the refrigerator. At temperatures below (40^{o}C) 400^{o}F, potato starch turns to sugar, making the cooked product too sweet. Potatoes with a high sugar

content also burn more easily when fried. Store potatoes in a dark room, as light promotes chlorophyll production, turning them green and bitter.

3.4.2 Applying various Cooling Methods

Potatoes have a relatively neutral flavour, making them a perfect accomplishment to many savoury dishes. They can be prepared with almost any dry – or moist cooking method: baking, sautéing, pan-frying, deep frying, boiling or steaming. They can be combined with other ingredients in braises and stews. Potatoes are used in soups, dumplings (gnocchi), breads, pancakes, puddings, salads and even vodka.

Many potato dishes, both classic and modern, employ more than one cooking method. For example, lorette potatoes require boiling and deep-frying. French fries are best when first blanched in hot oil.

SELF ASSESSMENT EXERCISE 2

i. List and explain the food value of fruits
ii. Practical Exercise-Take a visit to the market and identify the various types of vegetables you find there.

3.5 Cereals

Cereals are the seed grains of grasses, so called after cereal, the Greek goddess of the harvest (McGrath, 1996). They include wheat, oats, barley, rye, maize or corn and rice. The cereal crop grown in any particular country is usually a very important staple food in that country. Examples are rice in India and China, and wheat used for flour for making bread in Western countries. In Nigeria, corn or maize, millet and tapioca are common cereals.

Cereals are valuable because they are easy to grow and easy to store. They are inexpensive when compared with animal foods and they are filling and nutritious.

3.5.1 Food Value

Cereals form the basic diet of most human beings. They are the most important of all plant foods. We eat more cereals than any other kind of food. The most important nutritive content in cereals is starch, although they contain a fair amount of protein (7.2% rice to 13% oats). They also contain small quantities of fat (1.7% wheat to 8.1% oats) and are deficient in vitamins A, C, and D (Hildreth, 1991). Their content of the B group of vitamins depends upon the degree and type of milling to which they have been subjected. Certain minerals, notably calcium,

phosphorus and iron are also deficient. The amount of carbohydrate in the whole grain varies from 59% in oats to 79% in rice, mainly in the form of starch, Cereals are thus principally sources of carbohydrate and are therefore mainly energy foods.

3.5.2 Wheat

This is the most widespread of all cereals and is used and cultivated in most parts of the world such as the U.S.A., Canada, Argentina, Australia, Russia, Hungary and Romania. It grows well in temperate climates and certain species can survive rigorous weather conditions. It is used mainly for the making of flour for bread but is also used for pastry and flour, confectionery and in many soups and sauces etc., the manufacture of breakfast cereals and in producing pasta, such as macaroni, spaghetti etc.

The difference in the types of flour you can buy depends on the parts of the whole grain of wheat which are included in the flour.

Whole meal flour is the whole grain of wheat ground up to produce the flour. It is said to have '100% of the grain included on the flour.

Brown flour has between 19% and 90% extraction.

White Flour has an extraction rate of about 70% - all outer layers of bran are removed, leaving a smooth white flour.

3.5.3 Other Cereals

(a) **Oats:** They form a very valuable food source second only to wheat; they are used mainly for porridge and certain types of cakes but are unsuitable for bread making.

(b) **Barley**: This is a nourishing cereal, not suitable for bread but used mainly in soups and by brewers in the making of alcoholic beverages. Barley is one of the earliest known forms of cultivated plants.

(c) **Maize**: Maize is cultivated in large quantities and is used for making cornflakes, corn flour and pop-corn. It is used also as a vegetable, as sweet corn or corn on the cob. Corn yields an oil which is useful for cooking. It is also used in the manufacture of custard powder.

(d) **Semolina**: It is produced from the starch in hard wheat when it is coarsely milled.

(e) **Rice**: Rice is undoubtedly next in order of importance to wheat as a food crop as nearly half the human race is dependent upon rice for existence. For cooking, there are three main kinds of rice: long grain, medium and short grain. Long grain rice stays fluffy and separate when cooked, so it is best for savoury dishes. Medium and short grain rice become softer and stickier when cooked, so they are the best kind for rice pudding.

4.0 CONCLUSION

In this unit, we have discussed vegetables and fruits. We looked at their nature, types, food value and storage. We also discussed edible fungi and potatoes, and how they are used for catering purposes. Finally we identified some common cereals such as wheat, barley, oats rice and maize with emphasis on their uses and food values.

5.0 SUMMARY

We expect that by now, you should have learnt more about vegetables and fruits. You should also have learnt more about edible fungi, Potatoes and cereals and their various uses and importance in catering. This is another step in your knowledge of various food commodities.

6.0 TUTOR-MARKED ASSIGNMENT

1. Differentiate between vegetables and fruits
2. Explain the uses of cereals in catering.

7.0 REFERENCES/FURTHER READINGS:

Labensky and Hause (1995). On *Cooking – Techniques from Expert Chefs* New Jersey: Prentice – Hall.

McGrath, H. (1996). *All About Food*. Oxford: Oxford University Press.

Tull, A. (1990). *Food and Nutrition*. Oxford: Oxford University Press.

MODULE 3

Unit 1 Pasta
Unit 2 Food Additives
Unit 3 Man, Menus and Catering
Unit 4 Kitchen Layouts
Unit 5 Kitchen Equipment, Types, Selection, Uses and Maintenance

UNIT 1 PASTA

CONTENTS

1.0 INTRODUCTION

The unit focuses on other food items considered to be famous and in great demand (as much as possible). We shall look at pasta, salads and dressings as well as cakes. Pasta are prepared products made from a variety of grains in numerous shapes and flavours and are accompanied by countless sauces and garnishes. Salads are mixtures of different foods bound by a dressing. Cakes are also popular because of their versatility

and therefore demand good attention in producing quality and acceptable cakes.

2.0 OBJECTIVES

By the end of the unit, you should be able to:

- Identify pasta, salads and cakes
- Describe the production and preparation of pasta, salads and cakes
- Describe the basic ingredients used in the production of pasta, salads and cakes.
- Distinguish between the different types of pasta, salads and cakes
- Apply practical skills in the preparation of pasta, salads and cakes.

3.0 MAIN CONTENT

3.1 Pasta

Pasta is a product of unleavened dough of liquid mixed with flour. The liquid is usually egg and (or) water. The flour can be from any grain: - wheat, rice - or a combination of grains. The better – known pasta are based on the Italian tradition of kneading wheat flour with water and eggs to form smooth, resilient dough. This dough is rolled very thin and cut into a wide variety of shapes and sizes before being boiled in water or dried for longer storage. Commercially prepared dried pasta products are usually made with semolina flavour. This type of flavour ground from hard durum wheat has a rich cream colour and produces very smooth, durable dough. Semolina dough requires a great deal of kneading. However bread flavour is an acceptable substitute when preparing fresh pasta by hand.

Asian pasta generally known as noodles is made from wheat, rice, beans or buckwheat [wholemeal flour]. It is available fresh or dry (Labensky and Hausa, 1995).

3.1.1 Types of Pasta

Pasta is widely used in the cuisines of Asia, North America and Europe. In Italy, pasta dishes are usually served as a separate course, referred to as the "minestre". In other European countries, Asia and the United States, pasta, dishes may be served as appetizers, *entrée* or side dishes.

There are two main types of pasta - dried and fresh homemade. Dried pasta is available in at least 56 different shapes, each of which has a name and which is widely used because of the convenience and the fact that the shelf life is up to 2years if it is correctly stored (Ceserani *et, al*, 2000). Fresh pasta are more readily available in a variety of shapes, colours and flavours from the suppliers and there are machines for those who wish to produce their own pasta.

3.1.2 Shapes of Pasta

There are various recognised shapes of pasta, but only a few of these are generally available in Nigeria. When you cook pasta with unusual flavours and shapes, ensure that you consider the taste and appearance of the final dish after the sauce and any garnishes are added is considered.

Italians' Style Pasta: can be divided into three groups based on the shapes of the final product. They are ribbons, tubes and shapes.

Ribbon Pasta: dough can be rolled very thin and cut into strips or ribbons of various widths. All ribbon shapes are served with formative, fish and shellfish sauces. Thicker ribbons such as spaghetti are preferred with cream or cheese sauces. Sheets of fresh pasta dough can be filled and shaped to create ravioli, and are usually served with light cream.

Tubes: Cylindrical forms or tubes are made by extrusion**.** The hollow tubes can be curved or straight, fluted or smooth. Tubes are preferred to meat and vegetable sauces and are often used in baked casseroles.

Shapes: Extrusion process can be used to shape pasta dough into forms. The curves and textures produced, provide nooks and crevices that hold sauces well. Shaped pasta is preferred with meat sauces. Larger pastas can be cooked, then stuffed with meat or cheese fillings.

3.1.3 Asian Noodles

Asian noodles are not cut into the same wealth of shapes and sizes as Italian-style pasta, nor are they flavoured or coloured with vegetable puree, herbs or other ingredients. Virtually all Asian noodles are ribbons – some thin, some thick – folded into bundles and packaged. Differences arise because of the flours used for the dough most. Asian noodles benefit by soaking in hot water for several minutes before further preparation. The water softens the noodle strands; the bundles separate, and the noodles cook more evenly.

3.1.4 Wheat Noodles

Wheat noodles also known as egg noodles are the most popular and widely available of Asian noodles. They are thin, flat noodles with a springy texture; they are available fresh or dried. Dried egg noodles can be deep-fried and boiled to crate crisp golden noodles (*chow mein*) used primarily as garnish. Japaneese wheat noodles, known as s*omen* (if thick) and *udon* (if thin), may be round, square or flat. They are eaten in broth or with a dipping sauce (Labensky and Hause, 1995).

3.1.5 Rice Noodles

Rice noodles are dried thin noodles made with rice flour. They should be soaked in hot water before cooking and rinsed in cool running water after boiling to remove excess starch and prevent sticking. Rice noodles are often served in soups or sautéed, rice vermicelli, which has very fine strands will turn white, puff up and become crunchy. Mounds of crunchy rice noodles can be used as a base for sautéed dishes or for presenting *hors d'oeuvres*.

3.1.6 Purchasing and Storing Pasta Products

Food value, purchasing and storing pasta products. Pasta are very low in fat and are an excellent source of vitamins, minerals, proteins and carbohydrate. Also, the processed products are sometimes enriched with additional nutrients.

Pasta products are purchased either fresh or dried. Dried products are by far the most common and are available in packs or bags. They can be stored in a cool, dry place for several months. Fresh pasta can be stored in an air tight wrapping in the refrigerator for a few days or in the freezer for a few weeks

3.1.7 Making Fresh Pasta

Fresh pasta is easy to make requiring almost no special equipment and only a few staples. The basic form is a thin, flat sheet of dough that is cut into ribbons, circles or squares. Although pasta dough can be kneaded by hand, stretched and rolled with a rolling pin and cut with a chef's knife, pasta machines make this task easier. Pasta machines are either electric or manual. Some electric models mix and knead the dough, then extrude it through a cutting disk. The pasta machine more often used is operated manually with a hand crank. It has two rollers that knead, press and push the dough into a thin, uniform sheet. Adjacent cutting rollers slice the thin dough into various widths for spaghetti, capellini etc.

SELF-ASSESSMENT EXERCISE 1

Describe the different types of pasta you know

3.2 Cheese

Cheese (*Fr. Fromage*) is one of the oldest and most widely used foods known to man. It may be served alone or as a principal ingredient in an accompaniment to countless dishes. Cheese is commonly used in commercial kitchens, appearing in everything from breakfasts to snacks to desserts.

3.2.1 Cheese Production

Literally hundreds of natural cheeses are produced worldwide. Although their shapes, ages and flavours vary according to local preferences and traditions. Natural cheeses are produced from mammalian milk - cows, goats and sheep. The protein in the milk (known as casein) is coagulated with the addition of an enzyme, usually rennet which is found in calves' stomachs. As the milk coagulates, it separates into solid curds and liquid whey. After draining off the whey, the curds are either made into fresh cheese or cutting, kneading and cooking, further processes the curds. The resulting substance known as "green cheese" is packed into moulds to drain. Salt or special bacteria may be divided to the moulded cheeses, which are then allowed to age or ripen under controlled conditions to develop the desired texture, colour and flavour (Labensky and Hause, 1995).

3.2.2 Cheese as Products of Their Environment

The reason why most fine cheeses cannot be reproduced outside their locality is as a result of cheese being a product of their environment. The breed and feed of the milk animal, the wild spores and moulds in the air and even the wind currents in a storage area can affect the manner in which a cheese develops.(Roquefort, for example develops its distinctive flavour from aging in particular caves filled with crosscurrents of cool, moist air).

Some cheeses develop a natural rind or surface because of the application of bacteria (bloomy rind) or by repeated washing with brine (washed rind). Most natural rinds may be eaten if desired. Other cheeses are coated with an inedible wax rind to prevent moisture loss. French cheeses have no rind whatsoever.

3.2.3 Quality of Cheese and Food Value

Moisture and fat contents are good indicators of a cheese's texture and shelf life. The higher the moisture content, the softer the product and the more perishable it will be. Low-moisture cheeses may be used for grating and will keep for several weeks if properly stored, (reduced water activity levels prohibit bacterial growth). Fat content ranges from low fat (less than 20% fat) to double cream (at least 60% fat) and triple cream (at least 72% fat). Cheeses with a high fat content will be creamier and have a richer taste and texture than low-fat products.

Most cheese contain high percentages of fat and protein. Cheese is also rich in calcium, phosphorus and vitamin "A". As animal products, natural cheeses contain cholesterol. Today, many low-fat, even nonfat, processed cheeses are available. Sodium has also been reduced or eliminated from some modern products.

3.2.4 Cheese Varieties

Cheeses can be classified by country of origin, ripening method, fat content or texture. Here we classify fine cheeses by texture and have adopted five categories for this purpose: fresh or unripened, soft, semi-soft, firm and hard.

Fresh or Unripened Cheeses

Fresh cheeses are uncooked and not ripened. They are generally mild and creamy with a tart tanginess, they should not taste acidic or bitter. Fresh cheeses have a moisture content of 40% to 80% and are highly perishable. Examples of fresh cheeses are cream cheese, feta, mozzarella, ricotta.

Soft Cheeses

Soft cheeses are characterised by their thin skins and creamy centres. They rank among the most delicious and popular of cheeses. They ripen quickly and are at their peak for only a few days, sometimes less. Moisture content ranges from 50% to 75%. "Brie" and "Camembert" are good examples of soft cheeses.

Semi soft Cheeses

These include many mild, buttery cheeses with smooth, slicable textures. The moisture content of semi-soft cheese ranges from 40% to 50%. Popular examples of semi-soft cheese are gorgonzola, gouda, roquefort.

Firm Cheeses

Firm cheeses are not hard and bristle, some are closed-textured and flaky, like cheddar; others are dense, holey cheeses like Swiss emmenthaler. Most firm cheeses are actually imitators of these two classics. Their moisture content ranges from 30% to 40%. Examples of this class of cheese are cheddar, emmenthaler (Swiss), gruyere.

Hard Cheese

Hard cheeses are not simply cheeses that have been allowed to dry out. Rather they are carefully aged for extended periods of time and have a moisture content of about 30%. Hard cheeses are most often used for grating; the best flavour will come from cheeses grated as needed. The most famous and popular of the hard cheeses can also be served as a table cheese or with a salad.

3.2.5 Cheeses and their Countries of Origin

Different countries of the world produce cheeses according to local requirements. The following examples of cheeses and their countries of origin are highlighted below:

Caboc	-	Scotland
Caerphilly	-	Wales
Cheddars and Cheshire	-	England
Brie, Camembert, Roquefort	-	France
Gorgonzola, Parmesan	-	Italy
Gruyere, Emmentaler	-	Switzerland
Danish blue, Primula	-	Scadinavian
Edam, Gouda	-	Dutch

Note: The following are used in serving cheese. Cheeses are widely used for sandwiches snacks, pastas. The flavour and texture of cheese are best at room temperature. Any selection of cheeses should include a variety of flavours and textures. Do not precut the cheese to prevent drying out. Use a variety of shapes and colours for visual appeal. Provide service knives. Serve fine cheeses with plain bread and crackers.

SELF-ASSESSMENT EXERCISE 2

Describe the production of cheese.

3.3 Cake Making

Cakes are popular because of their versatility: they can be served as snacks in high volume fast food establishments or as the elaborate centrepiece of a wedding buffet. Whatever the case may be, cake

making need not be difficult or intimidating, but it does require an understanding of ingredients and mixing methods. Most cakes are created from liquid batters with high fat and sugar contents. The caterer is to combine all of the ingredients to create a structure that will support these rich ingredients, yet keep the cake as light and delicate as possible. As with other baked foods, it is impossible to taste a cake until it is fully cooked and too late to alter the formula. Therefore it is extremely important to study any formula before beginning and to follow it with particular care.

3.3.1 Ingredients for Making Cakes

According to Labensky and Hause (1995) good cakes begin with high-quality ingredients. However, even the finest ingredients must be combined in the proper balance. Too much flour makes the cake to be dry; too much egg and the cake will be tough and hard; changing one ingredient may necessitate a change in one or more of the other ingredients.

Each ingredient performs a specific function and has a specific effect on the final product. We can classify cake ingredients by their functions as toughenerers, tenderisers, moisteners, driers, leaveners (raising agents) and flavourings. Some ingredients fullfil more than one of these functions. For example, eggs contain water, so they are moisteners and they contain protein, so they are toughenerers. By understanding the function of various ingredients, you should be able to understand why cakes are made in particular ways and why a preparation sometimes fails. With additional experience, you should be able to recognise and correct flawed formulas and develop your own cake formulas. Now let us look at each of the ingredients as specified below:

1) **Toughenerers:** Flour, milk and eggs contains protein. Protein provides structure and toughens the cake. Too little protein and the cake may collapse; too much protein and the cake may be tough and coarse textured.

2) **Tenderisers:** Sugar, fats and egg yolks shorten gluten strands, making the cake tender and soft. These ingredients also improve the cake's keeping qualities.

3) **Moisteners:** Liquids such as water, milk, juice and eggs bring moisture to the mixture. Moisture is necessary for gluten formation and starch gelatinisation, as well as improving a cake's keeping qualities.

4) **Driers:** Flour, starches and milk solids absorb moisture, giving body and structure to the cake.

5) **Leaveners (Raising Agents):** Cake rise because gases in the butter expand when heated. Cakes are leavened by the air trapped when fat and sugar are creamed together, by carbon dioxide released from baking powder and baking soda and by air trapped in beaten eggs.

6) **Flavourings:** Flavourings such as extracts of cocoa, chocolate, spices, salt, sugar and butter provide cakes with the desired flavours. Acidic flavouring ingredients such as sour cream, chocolate and fruit also provide the acid necessary to activate baking powder. Cake ingredients should be at room temperature, approximately 21^0C (70^0F), before mixing begins. If one ingredient is too cold or too warm it may affect the cake mixture's ability to trap and hold the gases necessary for the cake to rise.

3.3.2 Cake Mixtures (Mixing Methods)

There are three basic methods of making cake mixtures, also known as cake batters.

1) **Sugar Batter Method:** For this method, the fat (cake margarine, butter or shortening) is blended in a machine with castor sugar. This is the basic or principal stage; the other ingredients are then usually added.

2) **Flour Batter Method:** For this method the eggs and sugar are whisked to a half sponge; this is the basic or principal stage which aims to foam the two ingredients together until half the maximum volume is achieved. Other ingredients are added.

3) **Blending Method:** Used for high ratio cake mixtures, the principal stage is the mixing of the fat and flour to a crumbling mixture. It is essential that each stage of the batter is blended into the next to produce a smooth batter, free from lumps. When using mixing machines, it is important to remember to:

a) Blend on a slow speed
b) Beat on a medium speed using a paddle attachment. (Ceserani et al, 2000).

3.3.4 Possible Reasons for Faults in Cakes

1) **Uneven Texture**
- Fat insufficiently rubbed in
- Too little liquid
- Too much liquid

2) **Close Texture**
   - Too much fat
   - Hands too hot when rubbing in
   - Fat to flour ratio incorrect

3) **Dry**
   - Too much liquid
   - Oven too hot

4) **Bad shape**
   - Too much liquid
   - Oven not hot enough
   - Too much baking powder

5) **Fruit sunk**
   - Fruit wet
   - Too much liquid
   - Oven net not enough

6) **Cracked**
   - Too little liquid
   - Too much baking powder

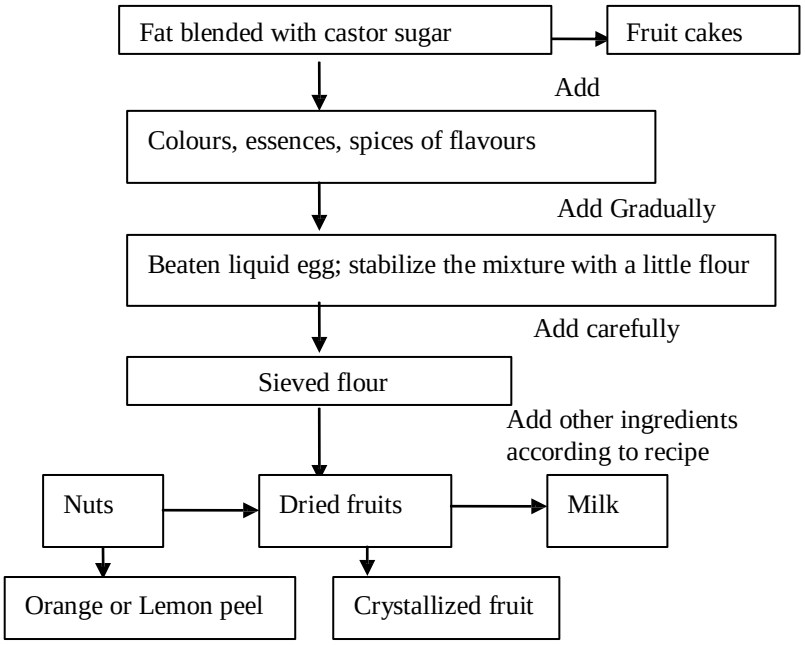

Figure 4: Sugar Batter Method

Source: Ceserani, Kinton and Fosket (2000). *Practical Cookery*. London. Hondder and Stoughton.

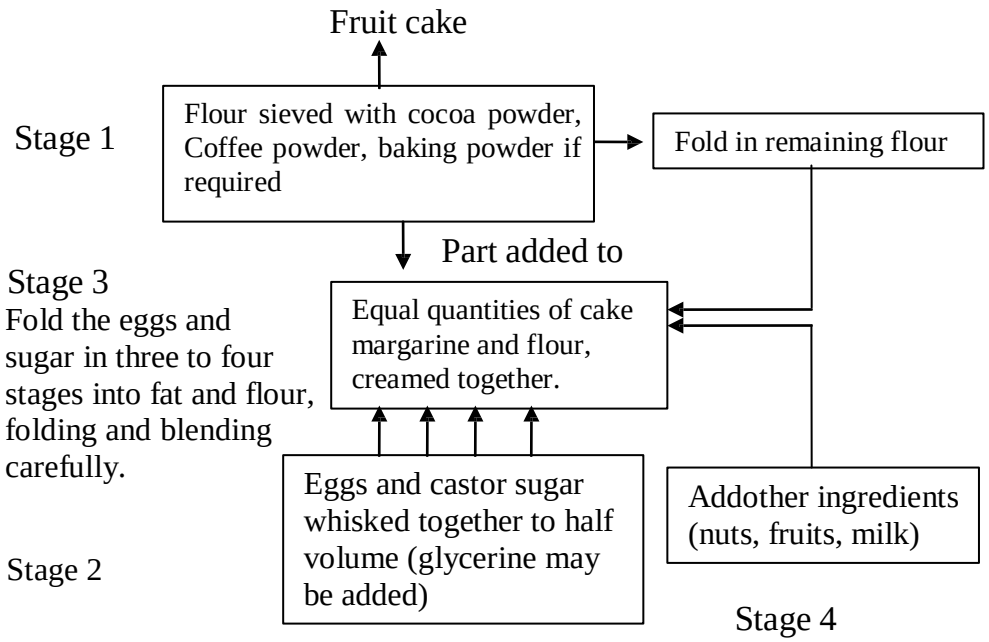

Figure 5: Flour Batter Method

Source: Ceserani, Kinton and Foskett (2000)
Practical Cookery. London: Hudder and Stoughfon.

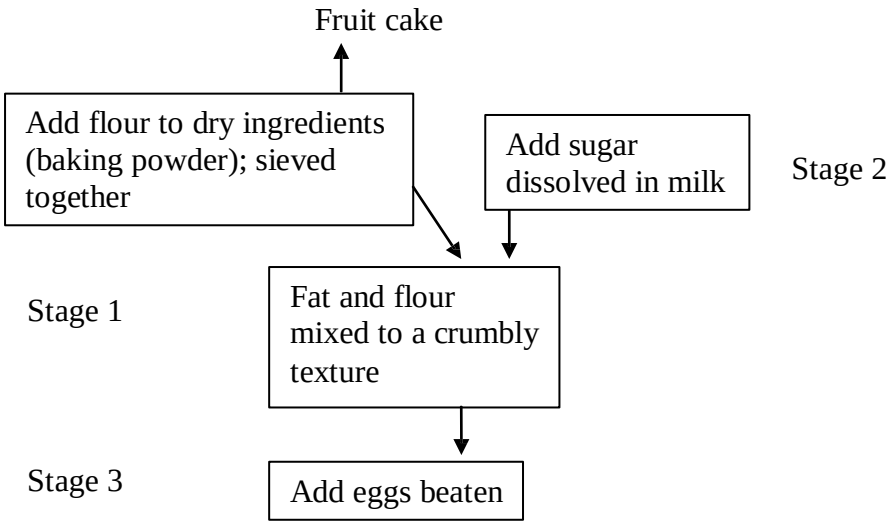

Figure 6: Blending Method

Sources: Ceserani, Kinton and Foskett. (2000) *Practical Cookery.* London: Hudder and Stoughton

4.0 CONCLUSION

In this unit, we have discussed pasta, cheese and cakes as other important food items used extensively in catering. We looked at the

types of pasta as dried and fresh and also how to make pasta in the kitchen. We again studied cheese, its production, quality and uses.

The unit also presented an insight into the principles of cake making, possible faults and causes.

5.0 SUMMARY

What you should have learnt in this unit includes pasta, cheese, and cake making. You should be able to describe the nature of these food items and explain their importance. Besides, you should be able to prepare them. We expect you to find the knowledge you have gained, useful in your profession.

6.0 TUTOR-MARKED ASSIGNMENT

1. Distinguish between pasta, cheese and cake
2. Explain the basic ingredients as categorised in cake making

7.0 REFERENCES/FURTHER READINGS

Ceserani, Kinton and Foskett (2000). *Practical Cookery*. London: Hudder and Stoughton.

Labensky and Hause (1995). *On Cooking Techniques from Expert Chefs*. New Jersey: Prentice- Hall.

UNIT 2 FOOD ADDITIVES

CONTENTS

1.0 INTRODUCTION

This unit identifies and discusses other forms of food commodities that may be served along with other dishes as finished products and may also be used in the production of other dishes. These commodities include food additives, gelatin, herbs and spices, raising agents, dough, pastry and convenience foods. Although they seem to have common usage in catering, we shall treat each of them on their own. Carefully study each topic as outlined and observe major differences and similarities as the case may be.

2.0 OBJECTIVES

By the end of this unit, you should be able to:

- Identify food additives and why they are used in catering
- State why food additions are used in catering
- Explain how to make and use gelatin
- Differentiate between herbs and spices
- Apply your knowledge of food additives in food production

3.0 MAIN CONTENT

3.1 Food Additives

Food additives are substances added to food in small quantities while it is being prepared for sale. Most manufactured foods often contain certain food additives. If you make a habit of reading the labels on food packets, you will soon realise that they are widely used. They are added to food for the following reasons:

- To preserve food from decay or spoilage
- To improve their keeping quality during food distribution
- To improve or enhance the flavour, colour, and texture of food to make it more acceptable.
- To produce a uniform food during large scale manufacture
- To produce easy-to-prepare convenience foods in a society that is busy and spends less time in the kitchen.

Additives, such as salt, alcohol, spirces, and sugar have been used for a long time and there are now many synthetic additives used in a variety of ways.

3.1.1 Types of Additives and their Uses

Food additives fall into two categories: natural and synthetic. Natural food additives are those produced by plants and animals. Synthetic additives on the other hand are those manufactured and are generally considered to be pure and can be tested for their effects on the body by animal experiments. All the amount added to food can be strictly controlled. Both natural and synthetic additives are used in foods, and their use is strictly controlled by law. (Tull, 1990).

The following types of food additives are commonly used in food processing and production.

They include:

1) **Preservatives and antioxidants:** Preservatives such as vinegar, salt, sugar and wood smile, work by surrounding the microbial cells of food with a concentrated solution which draws water out of the cells thereby rendering the cells inactive. Enzyme activity is also affected by the high concentrations of salt, acid, sugar etc. Antioxidants prevent fats and oils from going rancid.

2) **Emulsifiers and Stabilisers:** These are used to ensure that food products remain in good, stable condition for a certain period of time. They are used to improve the texture and consistency of foods. They may, for example, stop foods like salad cream or instant dessert whips from dividing into separate layers or make sure that join "gels" or sets.

3) **Acids:** Acids are used to develop an acid flavour in sweets, for setting jam, and in baking power. Types of acid used are:

- Citric acid (from lemon Juice)
- Tartaric acid (from grapples)
- Malic acid (from apples and grapples)
- Acetic acid (in vinegar)
  Lactic acid (from dairy products).

4) **Non-stick Agents:** These are used in powdering foods to prevent them from sticking together, e.g. magnesium carbonate is used in salt.

5) **Colouring**: Natural food colours are chemicals produced by plants and animals. Colour in food is a very important aspect of consumer choice and the desire to eat. Some foods have to be coloured during or after preparation. There is a list of colours that may be used e.g. yellow, red, blue, green, brown and black. They may be natural colours or artificial. Most manufacturers and chefs are changing to the use natural colours because some of the synthetic ones are suspected of having harmful effects.

6) **Flavours and Sweeteners:** The flavour of a food product is an important factor in its success. The most widely used sources of food flavours are herbs, fruits, roots, therries, seeds, barks. Many flavours are also extracted from oil e.g. peppermint, cloves, citrus oils, olive oil etc. monosodium glutamate is used to bring out flavours in foods. Sweetners such as saccharin are often added to foods instead of sucrose as they are more concentrated and produce the desired degree of sweetness at a lower cost.

3.1.2 Requirements and Possible Effects of Food Additives

For an additive to be acceptable for use in food, it must conform to certain principles; these include the following:

- It must be safe to use
- It must be effective in its intended use
- It must only be used in the minimum quantity required for it to work
- It must not mislead the consumer about the quantity or nature of food.
- It should, where possible, be of nutritional value to the body.

In addition to knowing the requirements of food additives as highlighted above, most people also want to know whether additives are harmful or not. There is no simple answer to this question. The chemicals used can be of very different kinds. Some of them are used very widely, others are used very little. Some of them are used in tiny amounts in many different foods and so consumption of them may be quite high. According to MacGrath (1996) some additives result in hyperativety in children and allergic reactions in adults and children, the results of which can lead to aggressive behaviour, insomnia and lack of concentration. They can also produce allergic reactions such as migraine and skin rashes. At the same time, many more people have allergic reactions to "natural foods" like milk, cheese, eggs, strawberries of shellfish.

Additives have to be tested to see whether they might cause these or other effects. But it is not easy to decide what effects they mighjt have over a long period. It is also not easy to know how much or how little of a substance may be considered "sage" or harmful. Not everyone reacts in the same way to the same additives.

Above all, it seems possible to plan our daily meals around fresh, unprocessed foods as far as possible, and to keep the number of processed foods high in additives to a minimum level. McGrath (1996).

3.2 Convenience Foods

Convenience foods refer to those foods which are processed and partly or totally prepared by a food manufacturer, so that they are either ready to eat, or require minimal preparation by the consumer. In most cases, preparation and cooking has already been done before we buy them. Tinned, frozen and dried foods and foods in packets, jars, and bottles are all convenience foods. Many of the foods which once had to be prepared in the kitchen from fresh ingredients can now be bought like

this. They include soups, stock cubes, meat, fish, vegetables, fruits, puddings, cakes, biscuits, bread, pastry and scones.

3.2.1 Classification of Convenience Foods

Today, a wide range of convenience foods is available. They can be loosely classified under the following categories with their examples thus: (Full, 1990).

1) **Dehydrated Foods**: These include instant foods (quickly and easily prepared by constituting with water or other liquid). Examples are mashed potatoes, custard, cold desserts, soups, coffee, porridge, baby foods, pasta or rice based snacks etc.

2) **Foods Requiring Reconstituting and Short Cooking Time**: In this category are soups, main meals e.g. curries, stews, sauces custard, pie fillings, textured vegetable protein (TVP) (See unit 3 of this course)

3) **Ingredients for Main Dishes requiring the Addition of Extra Ingredients and Liquid**: Examples of such are cake mixes, batter mixes, bread mixes, cheese cake mixes, icing mixes etc.

4) **Ready to Eat:**

a) Sweet: Cakes, biscuits, fruit pres, puddings and sweets.
b) Savoury: Meat pies, pastries, cold meats, pates, salads, fish and meat pastes, cheese spreads and preserves.

5) **Canned Foods**:

a) Foods requiring heating: In this category are pasta and pulses in sauce e.g. beans, stews, puddings, baby foods, soups, milk puddings etc.
b) Foods requiring no cooking: Such as fish, cold meats, custard, fruit, butter, milk, cheese etc.
c) Foods requiring some cooking: Such as vegetables, pies and meat puddings.
d) Foods used as part of a main dish also include meat and fruit pie fillings, special sauces e.g. bolognaise.

6) **Frozen Foods**:

a) Foods ready to eat on thawing are cold sweets, e.g. mousses, triffle, ice cream, fruit juice.

b) Foods ready to cook: Examples are pastry, yeast dough, sausage rolls, mince pies, beef burgers, meat pies, fish fingers.
c) Foods cooked and ready to heat include fish in sauce, casseroles, pies etc.

3.2.2 Advantages and Disadvantages of Using Convenience Foods

1) **Time**: Convenience foods are quick and easy to prepare and save time and fuel.
2) **Flavou**r: The flavour of convenience foods is not usually as good as that of freshly prepared and cooked food. The home-made foods usually tastes better than the "bought" or packet one.
3) **Skill**: Someone who is not very good at cooking or who has not had much practice might find that he or she can produce better meals with the help of convenience foods. A more skilled cook could find them useful for adding variety to meals.
4) **Storage**: They are easy to store, especially dried foods and are used for emergencies.
5) **Cost**: Convenience Foods can be more or less expensive than fresh ones, although it depends on the food vegetables for example core often as cheap as fresh ones. Some home-made joins and cakes can cost as much or more than the bought variety.
6) **Food Value**: The nutritional value of convenience foods is usually about as good as that of fresh ones. The protein, fat, carbohydrates and mineral content are about the same. The vitamins which is lost in foods, (Vit. C) tends to be present in about the same amounts in canned and frozen fruits and vegetables as in fresh foods.

However, the more foods have been prepared, cooked, and processed, the less likely they are to contain dietary fibre or roughage, so from this point of view, "whole", unprocessed foods are better. "Bought" cakes, biscuits and puddings are also more likely to contain more saturated fat and large amounts of sugar which you would do better to avoid (McGrath, 1996). If you make cakes and puddings in the kitchen yourself, you can make them as you choose and to your taste, using such ingredients as whole meal flour, soft margarine, eggs and black currant. This way, you will at least know what you have produced.

3.2.3 Using Convenience Foods

Tull (1990) has suggested that it is possible in theory to live entirely on the convenience foods as described without necessarily suffering from any nutritional deficiencies. However, in practice, most people would not be able to tolerate such a diet and it would become monotonous. In

terms of flavour, texture, and appeal there is no substitute for fresh foods.

Some people object to processed and refined convenience foods on the grounds that they are not as nutritious as fresh foods and contain many additives which are not naturally found in foods. A logical sensible approach is to use both fresh and convenience foods in proportions that suit the individual in terms of money, time, likes and dislikes.

SELF ASSESSMENT EXERCISE 1

Mention the various categories of convenience foods

3.2 Gelatin

Gelatin is a protein which is extracted from the collagen present in the skin, tendons, bones, and connective tissue of cattle that have been slaughtered for meat. It is a tasteless, transparent, odourless, brittle solid which is faint yellow in colour. When mixed with water, the gelatine absorbs it and swells due to the protein molecules in it. When the water is trapped, it forms a "gel". If the gel is then heated above 350^{o}C (950^{o}F), it becomes a liquid and is called a "sol" (Tull, 1990). When cooled, the sol becomes solid and this process is known as *gelation*.

The ability of gelatin to cause liquids to set in this way is used in food preparation for several purposes.

3.3.1 Domestic and Industrial Uses of Gelatin

As mentioned above, gelatin is used in food manufacturing and preparation. Gelatin may be used for the following domestic purposes:

1) **Jellies:** Clear or sweet or savoury jellies
2) **Whips:** This is made by beating plain jelly into a froth until it thickens.
3) **Sponges:** Sponges are made by adding whipped egg whites to plain jelly to form a spongy – textured sweet.
4) **Creams:** Made with gelatin, milk or cream and eggs.
5) **Sweet:** Mashonallows, Turkish delight
6) **Aspic:** For setting meat, fish and vegetables in a savoury jelly.

Industrial uses of gelatin include the making of the following:

1) **Ice Cream:** Gelatin serves as a stabiliser, to ensure a smooth texture.

2) **Meats:** Canned ham and pressed meat, meat loaves, pies, sausages are made possible by the use of gelatin.
3) **Thickening Agents:** For soups and cream
4) **Crystalized Fruits:** e.g. cherries.
5) **Medicines:** Gelatin serves as a coating for pills and capsules.
6) **Yogurt:** Used as stabiliser to stop separation.

3.3.2 How to Use Gelatin in Food Preparation, Storage and Food Value

Proportions to use:

12.5g (1/2 03) or 3 teaspoon gelatin

575ml (1 pint) water or other liquid.

To dissolve gelatin:

1) Sprinkle the gelatin into the liquid in a jug.
2) Stand the jug in a pan of hot water, stir and leave to dissolve
3) The gelatin is ready to use when it is clear and transparent
4) Do not boil the gelatin liquid.

Adding Gelatin to a Mixture

The dissolve gelatin should be poured slowly into the mixture, stirring all the time to incorporate the gelatin completely. Avoid cold mixture, as the hot gelatin will not mix well and will form globules which prevent it from setting properly. Gelatin should not be added to very hot milk as it will cause it to curdle. Gelatin can be used to help jam to set but will not keep it by storing gelatin in a cool dry, place as it absorbs moisture readily. It is also capable of absorbing odours from other foods and therefore, it should be kept in an air tight container.

Gelatin, although an animal protein, it has a low biological value, hence not as useful in the diet as once thought. It can be used to set jam for people suffering from diabetes, where sugar intake has to be limited.

SELF ASSESSMENT EXERCISE 2

What is gelatin? Mention its uses

3.4 Herbs and Spices

Herbs and spices constitute kitchen staples, used as flavourings. **Herbs** refer to the large group of aromatic plants whose leaves, stems or

flowers are used to add flavours to other foods. Most herbs are available fresh or dried. Because drying alters their flavours and aromas, fresh herbs are generally preferred and should be used if possible.

Spices are strongly flavoured or aromatic portions of plants used as flavourings, **Condiments** or aromatic. Spices are the back, roots, seeds, buds or berries of plants, most of which grow naturally only in tropical climates. Spices are almost always used in their dried form, rarely fresh, and can usually be purchased whole or ground. Some plants can however be used as both herbs and spices. (Labensky and Hause, 1995).

In Nigeria, regional differences account for the different names given to herbs and spices and are either obtained as roots, seeds, leaves, stalks e.t.c. Some common local herbs in Nigeria include: African lemon grass, bitter leaf, tea-bush and partminger. Spices also include African black pepper, African nutmeg, ginger, red pepper, turmeric and many others in their local nomenclatures.

Other herbs and spices usually grown in temperate climates are greatly used in hotel and catering establishments as described below:

(A)	**Herbs**	**Uses**
	Angelica	The terms are candied i.e. preserved in sugar and used for decoration on cakes, puddings etc. The root is sometimes used to flavour drinks.
	Basil	The leaves are used for salads, tomato, eggs or mushroom dishes and pasta, and can also be used in sauces.
	Bay	The leaves are used in meat and fish stews, soups and marinades.
	Chives	Leaves used for salads, vegetable soup, omelettes, cream cheese etc.
	Garlic	The bulbs are used and divided into cloves. It has a very strong flavour, should be used sparingly in soups, salads, mayonnaise, butter.
	Mint	Leaves traditionally chopped into vinegar.
	Parsley	The leaves are used for many dishes e.g. stuffings, sauces, soups and salads.
	Rosemary	The leaves are served with roast lamb or chicken, fish, eggs and cheese.
	Tarragon	Used for flavouring vinegar, sauces and mustards, or are cooked with chicken dishes.
	Thyme	The leaves are used in stuffings soups, stews, herbs sauces, and with vegetables.
(B)	**Spices**	**Uses**
	Allspice	Used whole as pickling splice and ground as a part of mixed spice, sometimes called pimento.
	Caraway	The seeds are used in bread, cakes and some

	cheese, particularly in German and Jewish cooking.
Cayenne Pepper	Made from ground chillies and is a hot, fiery pepper which is to be used sparingly.
Chillies	Hot pickles, curries and spicy West Indian and Mexican dishes. Also used in chilli and Tabasco sauce. Chilli powder (mixture of ground chilli peppers, aromatic seeds spices and herbs).
Cinnamon	This comes from the bark of a tree. It is used in fruit cakes, apple pres,. Biscuits etc.
Ginger	Grows as a root in Africa, Asia and the West Indies. Used as either powder, crystallized or whole.
Mustard	The seeds are used to make mustard powder or for pickling. Usually served with meat, cheese, ham etc. It is used in oil and vinegar dressing.
Nutmeg	The seed is obtained whole or powdered. It is used in egg custards, cheese sauce, milk puddings
Turmeric	A family of ginger, its yellow colour is useful in the manufacture of pickles.
Paprika	This is ground sweet red peppers and is not usually very hot used in Goulash, egg, cheese and shell fish as garnish.
Curry Powder	Combination of milk and hot spices used for soups, sauces, main dishes.
Vanilla	Vanilla plants are a type of orchid. Dried seed pods are used either whole or as essence for cakes, puddings

3.5 Raising Agents

A raising agent is a substance introduced into flour mixtures by mechanical or chemical means, providing a gas which expands on heating. The flour contains gluten which stretches and holds the mixture together.

3.5.1 Mechanical Raising Agents

Air is incorporated into mixtures by various mechanical methods. They include:

a) **Sieving:** When flour is sieved, air becomes trapped between its many fine particles.

b) **Creaming:** When fat and sugar are creamed together, air becomes trapped in the form of tiny bubbles making the mixture lighter and fluffy.

c) **Whisking:** Egg white have the power to hold large quantities of our making a frothy mixture.

d) Rolling and folding dough: In the preparation of rough puff and flaky pastries, air sandwiched between layers of paste.

3.5.2 Chemical Raising Agents

This method of raising consists of the aeration of a mixture by liberating gas within it by chemical means. The principle involved is the production of gas by mixing bicarbonate of soda with an acid causing the release of carbonic acid gas, as the same time depositing a form chemical salt in the goods. The acid used may be one which is naturally present in the ingredients such as lactic acid in sour milk, acetic acid in vinegar, citric acid in lemons or more commonly the acidity present in jaw, treacle or golden syrup. Hilton (1976).

3.5.3 Baking Powder

Baking powder is produced commercially and usually consists of bicarbonate of soda – a fine white powder which when heated, breaks down into simpler soda giving off a gas called carbon dioxide. Carbon dioxide is a colourless, flavourless gas therefore suitable for raising mixture. Baking powder also consist acid sodium pyrophosphate, acid calcium phosphate and starch e.g. rice flour. Rice flour or other starch is added to absorb any moisture from the atmosphere, which would otherwise, caused a reaction to occur, with the release of carbon dioxide (C02). This would render the baking powder in effective. For a satisfactory, efficient rousing agent, a substance known as cream of tartar is added to bicarbonate of soda. This type of baking-powder leaves no after taste and goods raised by this method are superior in flavosur.

Bicarbonate of soda + Cream of tartar > Carbon dioxide) + Rochelle salt

3.5.4 Yeast

The use of the fermentation of yeast as a raising agent is a long established practice and is carried out today by the use of purified yeast, a form of fungus which feeds on sugar. Yeasts are usually supplied fresh or dried.

Dried yeast consists of tiny pellets of fine granules of yeast which are pale brown in colour with a very characteristics smell. When yeasts is added to flour together with water under the right conditions it will feed upon the flour part of which it converts into sugar, this it then converts into carbon-dioxide gas and alcohol. The alcohol evaporates leaving the gas to leaven the dough.

3.5.5 Dough

Dough consists of strong flour, water, salt and yeast which are kneaded together to the required consistency at a stable temperature. The basic bread dough may be enriched with fat, sugar, eggs, milk and numerous other added ingredients. When proving the dough, the yeast feeds upon the sugar and produces gas which begins to form cells of air and this raise the dough.

For dough to become bread, it must undergo fermentation process. This is brought about by the action of yeast, with enzymes in the yeast and dough; these convert sugar into alcohol, thus producing the characteristics flavour of bread. Enriched doughs or enriched breads are burns, savarins, brioche, croissants Danish pastries. Ceserani, Kinton and Foskett (2000).

3.5.6 Pastry

There are basically three types of pastries, short crust pastry, puff pastry and flaky pastry. Let us look at each type of pastry as may be used in catering.

(a) **Short crust Pastry:** This is produced by rubbing fat into the flour until all of the individual particles of flour are coated with fat, thus separating them from each other and preventing them from forming lumps. During the baking process vapour is formed and then driven off by the he at of the oven between the particles of fat, forcing them apart and creating on open or "short" texture past.

(b) **Puff Pastry:** When puff pastry is made thick layers of fat are enclosed between thin layers of pastry dough. It's the pastry is rolled out and folded layers of pastry dough are decreased in thickness. When the pastry has been properly handled, it consists of many fine layers of dough each of which is separated from the next by a thin film of grease. When in the oven the moisture in the dough is slowly converted into steam which forces the layers apart and causes the pastry to rise. The fat is then melted by the heat and absorbed into the cooked pastry.

(c) **Flaky Pastry:** Its name describes the texture of the this pastry. It is much less dense than short crust and the flakes of the cooked mixture should be easily discernible. Flaky pastry are used for savoury plies, pastries, sausage roll, sweets.

4.0 CONCLUSION

There are various kinds of food additives and they are used for different purposes in catering.

In recent times a wide variety of convenience foods have become available and people are taking advantage of their availability.
Herbs and spices flaviour food, improve its aroma and make it tastier.

5.0 SUMMARY

By now you should be able t tell why additives are used in crokery identify food additives, explain how to make gelatin and differentiate between herbs and spices.

6.0 TUTOR-MARKED ASSIGNMENT

1. a) What are food additives?
   b) Give four measures for the use of food additives.

2. a) What are herbs and spices?
   b) Write out ten herbs and spices, and expressly state their uses.

7.0 REFERENCES/FURTHER READINGS

Abensky and Hause (1995). *On Catering* – Techniques from Expert Chef. Prentice-

Caserani, Kinton and Foskett. *Practical Cookery*. London: Houdder and Stoughton.

Hall, New Jersey.McGrath, H. (1996) – All about Food. Oxford: Oxford University Press.

Hilton, E. J. (1976). *Catering – Food and Drink.* Plymouth: MacDonald and Evans.

Tull, A. (1990). *Food and Nutrition*. Oxford: Oxford University Press.

UNIT 3 MAN MENUS AND CATERING

CONTENTS

1.0 INTRODUCTION

This unit provides an outline of catering operations as they relate to food choices and consumption by individuals and concerns categories of people. It highlights the role of providers of catering services in the areas of meal planning and compilation.

The unit is also a step further on our discussion of the various food commodities used as raw material and which in turn produce finished products in terms of exotic dishes to end users or customers in food services establishments.

Our emphasis on menu has become imperative in view of its multifarious functions from numbers of different aspects in hotel and catering operations.

2.0 OBJECTIVES

By the end of this unit you should be able to:

- Explain man's relationship with menu and catering
- Relate the nutritional needs of man to food production.
- Explain food in combination with menu planning.
- Explain some gastronomic considerations e.g. food combination in menu planning.
- Explain menu planning and compilation.
- Plan meals for different categories of people e.g. pregnant women, toddlers and small children, elderly people.

3.0 MAIN CONTENT

3.1 Main, Menu and Catering

You would recall that in our first two units of this course, we mentioned issues relating to food and the society with emphasis on food influences and ethnic cultures. It is important that caterers should not only consider supplying food to man, but also be in a position to assess the amount of satisfaction that their services are going to provide.

Yet in order to be able to measure the amount of satisfaction provided, a caterer must be aware of the natural or essential needs of the customer as well as those imposed by society and the customer's place in the society. This awareness on the part of the caterer will enable him or her to organise, plan and compile menu for the ultimate consumption of end users.

3.1.1 Nutritional Needs

Like any other living creature man requires food for growth, body repair and energy. Man's body is like a sophisticated machine in constant need of fuel to keep it going. The following then is a brief outline of man's nutritional requirements as previously mentioned.

At a practical level, the menu is the mode of operation of the entire food preparation and service section and everybody concerned must work from it, from the buyer to the cashier.

In effect, the menu instructs all staff as to their duties and, kowing exactly how the person in charge requires things to be prepared, they can get on with the work without requiring further detailed instructions.

Protein; Protein is necessary for the growth of the body. Even when we are fully grow adults we still need protein to repair and replace cell which has become worn out. Carbohydrates provide the energy we need to keep fit and active. It is the carbohydrate food, which contain dietary fibre. Fats are broken down by digestion to fatty acids in is various forms, fat provides energy and heat and the protections of the body's organs. Vitamins are essential chemical substances vital to good health and found in small quantities in certain foods. There are many minerals such as iron, calcium performing different functions ranging from bone formation to functioning of certain glands and the nervous system. Water is of great importance in the diet and also performs many essentials functions such as lubrications. The above brief outline can thus provide a background to the physical functioning of man with specific reference to eating behaviour.

3.1.2 Homeostasis

Man's physical body is composed of millions of minute cells with each cell housing a complex mechanism in itself. Most cells are distinctive in structure and effects, that is muscles cells, nerve cells, bone cells, fat cells, bloods cells and others. Some of the specific cells are blood cells and into tissues and the tissues form organ of the body thus giving the organic system

The various system within the body work in close cooperation with each group communicating its requirements to the central control point so that an appropriate balance of activity is maintained at peak efficiency. Where such a balance exists and maintained this ideals state is called **homeostasis** or Equilibrium.

Thus, homeostasis is essential in the survival of complex organisms for maintaining normal body temperature heart beat and blood pressure, a process which is controlled by the brain and governs all the primary drive of eating, drinking and sexual behaviour. From this, it can be indicated that a basic mechanisms in man guides him towards a balance of nutrients essential for his well-being and the satisfaction of his basic biological needs. Cracknel, Kaufmannn and Nobis (1987).

SELF ASSESSMENT EXERCISE 1

Explain homeostasis in man

3.2 The Menu

By definitions, a menu or a bill of fare is a list of prepared dishes of food which are available to a customer; simply put a list of dishes to choose

from in a restaurant. This has been the opinion of so many people, but to the professionals caterer it assumers a much more empirical role and become the outward expression of the entire catering operation of an establishment; at a more personal level, it assumes the processional expression of the person who is actually charged with the responsibility for its compilation.

At a practical level, the menu is the mode of operation of the entire food preparation and service section and everybody concerned must work from it, from the buyer to the cashier.

In effect, the menu instructs all staff as to their duties and, knowing exactly how the person in charge require things to be prepared, and they can get on with the work without requiring further detailed instructions.

3.2.1 Food Combination in Menu Planning

The main components of food combination according to Cracknell *et al*, (1987) are colour, aroma, flavour and taste, temperature, consistency, texture and shape. We shall discuss these components one after the other and see how they are related to menu and food choice.

1) **Colour:** This is a very important factor to consider in the preparation of food. The sensible use of colour will always help the eye. The colour of food or a dish can create favourable reaction of pleasure in the consumer. Colourless dishes or where the expected natural colour is not evident or has been destroyed by poor cooking techniques can create the reverse effect even to that of extreme displeasure. In other, words, the attractive appearance of each "course" is essential, and foods such as, carrots, tomato, peas, watercress, orange, parsley, cherries etc can give colour to the dullest colour dishes, Giwa (2005).

2) **Aroma:** The smell of a dish or food is usually related to what it is expected to be; thus it is essential that its aroma should be clean and identifiable and in line with what is expected by the customer. The new technique of using wine or a liqueurs, or a mixture of different herbs and spices often unrelated in flavour or aroma in the preparation of a single dish, tends to destroy simplicity and elegance thereby making such aromas meaningless.

3) **Flavour and Taste**: There are four basic tastes and flaviours namely: sour, salty, sweet and bitter. All prepared dishes contain a combination of these four flavours although one may predominate the other. In some cases, flavours are used to

enhance, improve, or make more evident the dominant flavour such as adding a pinch of salt to sweet paste. Effort should be made to ensure balancing of flavours for the greatest satisfaction. The repetition of flavours can lead to taste fatigue, hence the need of variety in taste and flavour.

4) **Temperature:** Temperature plays an important role in food combination. Hot food should be served hot while cold food should be served cold. Some foods are prepared to be served either hot or cold. A food which is accepted as being a hot one will not give the consumer pleasure if it is served other than hot.

   A savoury dish which is served cold needs more salt in its preparation than does the same dish when served hot, and this also applies to a sweet dish when served cold. It requires more sugar that when served hot if it is to give the same pleasurable taste. This is because of the anaesthetizing effect of extremes of temperature on the palate (Cracknell *et al*, 1987).

5) **Consistency:** The consistency of a food refers to its viscosity and density; it applies mainly to soups and sauces. It is generally expected that such food should be smooth and should not contain textured or shaped items.

6) **Texture:** texture is concerned not only with firmness or tenderness but more often crispness, crunchiness, rubberiness, and chewness. Food texture involves a degree of mastication and this in itself gives a pleasurable sensation particularly, if associated with variations in texture at different points of a meal.

7) **Shape**: The mouth is a very sensitive part of the body and is able to detect varying shapes even if very small. Rough soups are easily noticeable while the identifiable shape of cooked chicken cut in regular small dices for a chicken cutlet is preferable when compared with the same meat having been passed through a mincer which breaks down the texture and gives no identifiable shape.

   As far as vision is concerned, the even shape of carefully cut garnish in a clear soup conveys a feeling of uniformity and care.

3.3 Menu Planning and Compilation

Menu planning involves two distinct phases, which are very closely related. The first phase embodies the actual planning stage which should be precisely related to the identified demand and its market according to

the policy decisions of the establishment. The policy decisions in effect determine the parameters with which the compiler has to work. Planning includes the type of menu, the language to be used, the type of presentation and such things as cost distribution between courses where applicable.

The second stage, which is menu compilation, refers to the actual compiling or bringing together of those dishes to be featured on any particular menu within the framework of the planning stage.

3.3.1 Types of Menu

The type of menu to be featured in any one food service establishment depends to a greater extent on the policy of the establishment. Pertinent questions that may be asked include: what kind of meals it will serve and, when the service will take place. These are guiding principles that will assist the menu planner as to which kind of menu he must produce.

There are basically two types of meals used in the industry. The first type is referred to as **table d'hote,** usually a set menu with a limited choice for each course. *Table d'hote* is translated to mean the "host's table" derived from the days when a traveller arriving at an inn, partook of a meal prepared by the host or proprietor which was eaten by all his guests who sat down at table together (Cracknel *et al*, 1987).

A la carte is the name given to the second type of menu. This is as menu with each item separately priced and the customer can make his own selection. Usually it is cooked to order.

Special Menus: A third category is also refers to a set of menus sometimes with limited choice and at a set price. They are usually for a private party and in most cases depend on the actual number of guests and the type of occasion.

In addition to the three basic menus discussed above, there are other types of menus that may be compiled for breakfast, lunch, dinner and supper. Below is a brief description of each of these types of menus.

1) **Breakfast Menus:** These are of the straight forward *table d' hote* types that may be served to people living or lodging in residential accommodation such as hotels or at places where people start work very early in the morning. Two kinds of breakfast menus are the full English breakfast and the continental breakfast. A full English breakfast menu includes the following:

- Fruit juice
- Egg dishes
- Grilled items such as bacon ham liver, sausage, tomato
- Mormalade, jam or honey
- Beverage (Tea, coffee, hot chocolate
- Bread rolls, croissants, toast, fresh bread etc
- Cereals (porridge)
- Fish items
- Sauté potatoes
- Cold meats

Examples of continental breakfast comprises

- Fruit juice
- Rolls, croissants, toasts or brioches with butter, jam
- Tea, coffee or hot chocolate

2) **Lunch menus:** Depending on the types of establishment, launch can be the main meal of the day with dinner being shorter and lighter. However, lunch is less expensive and less time is spent over it.

3) **Lunch Menus**: A luncheon *table d'hote* menu may offer a choice of dishes or maybe a set meal with little or no choice depending on the establishment. The lunch menu may be the main meal of the day with dinner being shorter and lighter. If a special menu is required, three or four courses are usually offered.

A Typical Launch Menu

Consommé royale
Or
Cream of Vegetable
……
Pounded yam, okro/*egusi* with herbed Chicken Stew
Or
Stewed Prawns in Whisky sauce
Savoury rice and Fried cubed Plantain
Or Carbonnade of
Beef Parmentier
Potatoes Buttered
Cabbage Finger
Carrots
……
Cream Caramel
Or
Fresh Fruit Salad
……
Coffee or Tea (Extra)

Chef's Specialty
A glass of chapman
Boneless Chicken
Beef Berbecue
Seasonal Salad

Dinner: The number of courses at dinner are usually more than those for lunch and dishes can be more elaborate. Where dinner is designated as the main meal of the day, the menu complier or the chef has a wider scope to show his skill. It is usual to avoid ordinary stew and plain roasts; eggs and farinaceous dishes are not the best for dinner dishes. Sweets should be lighter and more elegant than those for lunch those based on ice cream and fruits. The dinner menu can be used as table *d'hote* or *a lacarte*.

A Typical Dinner Menu
Clear Oxtail Soup
Or
Consumme Bruinoise
…….
Garnished Pottage with Dried Fish Stew
Or
Roast Juliet of Beef
With
Horseradish Sause
…….
Pantneuf Potates
Garden peas
Cauliflower au Gratin
…….
Rice Pudding
…….
Coffee or Tea
Wine Extra Gateau's Rose or Fresh Palm Wines

3.3.2 Sequence of Courses

There is an established order of succession of courses, which by tradition are best-followed. New dishes can be featured in the various courses but the sequence should not be changed if customers are not to be confused.

The following is a sequence of courses with some notes on appropriate dishes.

Lunch and Dinner

Hor's – d' oeuvre: Grape fruit, melon, avocado pears, fruit juice, fruit and shellfish, cocktails; De luxe items such as oysters, caviar, fois, gras, smoked fish salamis, ham, Selection of *hor's-d'oeuvres* varies. Sometimes it is made up of hot or cold vegetables, such as asparagus, and corn on the cob.

Soups: All types of soups except for veloutes, which are perhaps better for dinner. The more robust pottages such as minestrone are very suitable.

Eggs: All types of eggs with various garnishes except boiled, and served in the sheld.

Fish: All types of fish and shellfish cooked by all methods but not too complicated or over garnished.

Entrees: All types of stews, sautés, pices, puddings, hot pots, curries, escolopes, noisettes and offals, rechauffé dishes and made-up dishes boiled and braised meats.

Roast: Joints of butcher's meat, poultry and game.

Grills: Steaks, chops, cutlets or butchers meat, poultry.

Cold Buffet Salads: All cold meats poultry and game. Pies terrines, mayonnaise. Cold fish and shell fish salards

Vegetable Dishes: Hot or cold asparagus, cabbage, corn-on-the-cob aurbergine e.t.c.

Savoury Soufflés; Soufflés of spinach, cheese, lettuce, sweet corn etc can be served in this position. They frequently take the place of the sweet course when not required.

Sweets: Milk pudding, steamed puddings, creams etc pies, flans, tarts baked, rolls, jellies, cakes fruit dishes, ice creams etc

Cheeses: All varieties and types with celery and biscuits.

Dessert: All fresh fruits.

Coffee

Dinner: The sequence of courses mentioned above also applies to dinner except for "releves" (which is mentioned below) and with more emphasis on first-class catering services.

Releves

A more substantial item in the form of a joint or whole bird cooked by poeling or braising and sometimes roasting. Can be well garnished and should always be accompanied by vegetables and potatoes. Examples include saddles of lambs, braised ham, sirloin or fillet of beef, chicken, turkey or duck. Pork other than ham is unsuitable for dinner because of its indigestibility. Cabbage and onions are best not served as an accompanying vegetable.

Observation

From the foregoing, it becomes more obvious that such a large number of courses would not be appropriate for the modern lunch and dinner.

The usual grouping for a three-course lunch excluding coffee would be a selection from *hors d'oeuvres*, soup, farinaceous or egg dishes.

The Second Course – a selection as a main dish from fish, entrees roasts, grills and cold buffet and in all cases served with vegetables, potatoes and/or salad. Third course – a selection from sweet dishes or cheese or, if needed or indicated, vegetable dishes of savoury soufflés.

For a four – course menu, the grouping would be much the same but with an extra course being fish.

For dinner, additional course of releve, a cold dish may make up the 5^{th} or 6^{th} courses respectively (Cracknel *et al*, 1987).

3.3.3 Guiding Considerations for Menu Planning and Compilation

There are no hard and fast rules about guiding considerations for menu planning. Some are determined by the traditional approach to the subject matter, some are as a result of well-tried practices, some consideration came as a result of good gastronomic reasons while other just make good sense and are logical. Without going into the details of these guiding principles, we shall mention some of these considerations for you to understands as a would be chef or manager in the food and beverage arm of a hotel and catering establishment.

The guiding points to notes are as follows:

1) The type of consumer, the occasion and the type of menu.
2) The sequence of courses.
3) The selection and balance of a meal.
4) The capabilities of kitchen staff
5) Availability of equipment
6) Seasons of the years
7) Availability of resources
8) Nutrients

Looking at the above stated points, you would recall that some of them have been previously discussed in this unit and in other courses. You are required to read through and align the major points. Other meals for pregnant women include fish, beef, chicken, pizza, farinaceous foods, fruit cake etc.

SELF ASSESSMENT EXERCISE 2

Mention the type of menu known in catering

3.4 Meals for Special People or Special Meals

Certain categories of people are considered for meals that best suits their situations. Professionals in the areas of food preparation and service should apply their knowledge on the different nutrients when planning meals. Here we shall briefly discuss issues bothering on meals for pregnant s women, toddlers, children, elderly people, invalids, vegetarians and Slimmers.

3.4.1 Meals in Pregnancy

A pregnant woman should be on a good diet. A healthy, well-nourished mother is much more likely to have a healthy baby than a mother who has not taken much care of her nutritional needs during pregnancy. A pregnant woman should have well-balanced meals that supply enough for the mother and the baby.

An expectant mother should avoid sugary, and fatty foods. Strong teas and coffee can also have unfavourable effects on her health. You should therefore consider these factors when planning meals for pregnant women.

The following meals are suggested for one day:

Breakfast	Main Meal	Lighter Meal
Whole meal cereal Fruit juice	Styffed tomatoes	Vegetable
Scrambled egg	Liver casserole	Cheese
Brown toast with	Baked potatoes	Coleslaw (salad)
Butter and mamalade	Cauliflower	Banaba cake
Tea or coffee	Apple charlotte and custard.	

3.4.2 Meals for Children

Children often have small appetites and do not like large quantities. Their food should be well managed and varied. Ensure a well-balanced menu that would contain the necessary nutrients for growth. Milk, eggs, fish, meat and other foods that contain protein should be considered.

3.4.3 Meals for Elderly People

Elderly people, due to physiological and emotional changes cannot eat and enjoy the same foods as they once did. When planning meals for old people therefore, foods which are good sources of the following nutrients in forms suitable for their needs should be considered.

a. **Protein:** More easily digested foods such as chicken, fish, minced beef, lightly looked eggs and milk are ideal.

b. **Vitamic C:** This is for general good health and goods gums, and to help absorb iron. Oranges, grapefruits, tomatoes, and green vegetables should be included are good sources of vitamins

c. **Iron;** They need this to help prevent tiredness and weakness. The easiest sources for old people are in the form of bread, cereals, potatoes, liver, cocoa corned beef and fruits.

d. **Vitamins D and Calcium**: They help prevent the curving of the spine and and prevent the bones from getting brittle. Milk and other diary products are good sources.

e. **Dietary Fibres:** They add bulk and roughage to the diet. Good sources are bread, fruits, vegetables. Avoid erring fatty foods, strong, flavoured and spicy foods. Note also that roasts and grilled meat may be difficult for them to chew (McGrath, 1976).

3.4.4 Meals for Invalids

Invalids are people who are unwell or recovering from an illness. Special attention has to be a paid to the food they are given as it can play an important part in helping them to get well again.

When planning meals, choose food that is easy to digest. Avoid fried fatty foods, all food should be absolutely fresh, well prepared and free from any form of contamination. Since invalids need protein for building up to the body tissues, ensure you plan meals around the more easily digested protein-rich foods. Include plenty of fruits and vegetables to supply the vitamins and minerals needed for good health.

3.4.5 Meals for Vegetarians

Vegetarians are people who do not eat meat. There are two types of vegetarians, lacto-vegetarians and Vegans (McGrtath, 1996).

Lacto-vegetarians do not eat meat, or fish but they eat milk, cheese, eggs and butter as well as fruits, vegetables and cereals. Vegans on the other hand are very strict vegetarians who will not eat any food at all from animal sources which include meat, fish, milk, eggs, cheese, butter, lard or dripping.

All their food has to come from plants, as such their meals are based on beans, peas, lentils, nuts, rice, flour and other cereals, fruits and vegetables. When you are planning meals for vegetarians, you can replace meat and fish with cheese, milk, vegetables, beans, nuts etc.

4.0 CONCLUSION

Generally, this unit teaches menu. We looked the at nutritional needs of man in relationship to food preparation and production. We also discussed menu planning and compilation and highlighted some typical lunch and dinner menus. The sequence of menu has been explained. The unit concludes with a run-through of meals for different categories of people.

5.0 SUMMARY

By now, you should be able to plan and compile menu in general. You should also be able to state the guiding considerations for menu planning. Besides, you should be able to plan needs for pregnant women, children, elderly people and vegetarians.

6.0 TUTOR-MARKED ASSIGNMENT

1. Explain food combination in menu planning.
2. Relate the nutritional needs of man to food preparation and production.

7.0 REFERENCES/FURTHER READINGS

Cracknell, Kaufmann and Nobis (1987). *Practical Professional Catering*. London: Macmillan.

McGrath (1996). *All about Food.* Oxford: Oxford University Press.

UNIT 4 KITCHEN LAYOUT

CONTENTS

1.0 INTRODUCTION

The kitchen in a catering establishment can be regarded as the very heart of food production. In this section, food is prepared, cooked and presented for onward transmission to food service areas. It is the measure by which the public often judges the quality of the operation. The kitchen is the warming heat, the appetising aroma, and the temple of life and of course the starched white of the cook's uniform. Therefore, great care must be go into each stage of the kitchen's operations.

This unit considers kitchen planning, layout, production, workflow, equipment and quality control.

2.0 OBJECTIVES

By the end of this unit, you should be able to:

- Define the kitchen and what it stands for.
- Describe kitchen planning and layout.
- Explain kitchen layout and design.
- Plan for workflow in the kitchen.
- Arrange kitchen equipment properly
- Apply quality control in food production.

3.0 MAIN CONTENT

3.1 Kitchen Planning

Kitchen planning is the process where by the kitchen is designed and organised for the smooth running and efficient management of a catering establishment. Indeed the kitchen is the nerve centre of the operation, it is the hub of the business and, if not properly planned and carefully thought out, or if the wrong equipment is installed for the job, can result in chaos at works, or slow, costly, inefficient services at best.

There are many important points to be taken into consideration when planning a kitchen. First is the type and size of equipment as dictated by the particular needs of the business to be done. Secondly, the arrangement of the equipment should facilitate maximum and optimum performance, permitting ease of operation and services. Thirdly, is the working environment of the staff employed there vis-à-vis space allocation for good receiving area, storage area, wash-up, stillroom waste-disposal, service area, offices and staff conveniences.

Other factors include lighting, floor and wall covering, ventilation, utility supply, goods receiving, storage, kitchen brigade and communication.

3.1.1 The Kitchen Size and Location

Adequate consideration should be given to the size of the kitchen regarding the equipment to be used. Big equipment for a small kitchen is unsuitable. Again, the workload requirement of the kitchen, not forgetting possible growth of trade, should always be studied very carefully. To put in more seats in the restaurant than the kitchen lay out can cope with, is an invitation to disaster.

Gases, where upwards of 250 dinners were expected to be catered for with a five-course menu in a kitchen measuring fifteen foot square is a near impossible situation and stressful for the chef and his staff.

Similarly, the location of the kitchen is of importance, as ideally it should be sited on the North-East side of the building so that the walls remain as cool as possible and natural light which is an asset to work under will be available. The unloading bay and stores areas must be adjacent to the kitchen. Also the dining room should be next to the kitchen and as a separate unit it should be divided from the dinning room by two doors, with a small lobby between them to act as a noise trap.

In and out doors are necessary to prevent serving systems running into one another, which, means a one-way system must be instituted with doors that open only in the direction of traffic. Doors should be easy to open by a touch of the foot or shoulder, or they should operate automatically.

3.1.2 Kitchen Layout and Design

There are different shapes of kitchen and kitchen's shape becomes a determining factor in the overall placement of equipment and allowance for working space as well as passage for the kitchen staff.

Efforts should be made to ensure that the shape adopted is in conformity with the nature of business, capacity and the exact requirement of the operations. However, the following kitchen shapes can be identified as follows:

1) **Square Shape** Depending on the size of an establishment, the square shaped kitchen can take between 15 –25 people. It normally has only one door leading out, except where there is provision for a goods receiving bay. Staff conveniences are usually located beside such a kitchen.
2) **Oblong Shape**: This type of kitchen layout is normally adopted for institutional catering, such as for schools or industrial step-up. It is more convenient than the square-shaped kitchen and has enough space for equipment.
3) **Passage Type**: This has about two doors both of which can lead to anther section. There is cross ventilation, which makes the kitchen cool. It also allows for free movement of staff as well as good placement of equipment.

3.1.3 Island Layout and Canopy

The most practical form of layout is what is called an "Island' kitchen. This means that all the major fixed, heavy and heat generating equipment are grouped together in the centre, back to back, allowing for completely free movement of staff all around. Since most other wall areas will be free, the moveable pieces of equipment, usually of non-heating nature such as slicing machines, potato peelers, grinding machines, mixers etc are placed at some distances away from the wall.

Again, equipment which is likely to be the most productive of cooking smells and heat can all be grouped under one overall canopy, incorporating an efficient and powerful heat extraction system. The canopy should not be so low as to prevent the wearing of the chef's hat. The extraction system or the hood should be made of stainless steel or other suitable material that will make cleaning easy.

3.2 Planning Flow of Work in the Kitchen

In catering, the storage, handling of foods, tools and utensils need careful study. By examining the way that the various items pass through different stages of production, one would realize that grouping and itemising of activities ensures a logical sequence of events in a proper progression and prevent criss crossing and time wasting.

The need for carefully planning an ideal workflow therefore cannot be over looked. Work flow planning simplifies kitchen operations, reduces tension and eliminates unnecessary movement of staff and equipment. It is very important that the work to be done is planned in such a way that the items requiring long preparations or cooking are started first. Work carried out haphazardly without plan or organisation, obviously takes longer time to do than work done according to plan. Therefore efforts should be made by every caterer to plan a good flow of work that will enhance high productivity, and an efficient worker should learn this sequence as much as possible.

3.2.1 Goods Receiving Area i.e. Goods in

This is an important area of the kitchen and its location depends largely on the type of operations it is serving, the nature of the goods being handled, the volume and frequency of deliveries and the distance to storage and preparation areas. A secure area of storage of returnable containers and empties is necessary. The width of doors and corridors in this area is important.

Depending, on the size of the establishment, a separate staff entrance, if necessary would require someone for the duties of time keeper responsible for security of entry.

3.2.2 Storage Area

Shape allocation for storage area is based also on the same factors as the goods receiving area i.e the type of operation, nature of commodities to be stored, the volume and frequency of deliveries and usage of those commodities. Storage areas can be divided into three categories or more:

1) **Dry Goods Store**: The atmosphere of the dry goods store must be one that keeps goods in excellent condition and steps must be taken to keep it at approximately 50 per cent humidity and a temperature of between $15 – 18^0$.
2) **Vegetable Store**: As a matter of policy, all green vegetables are delivered fresh daily, and if they cannot be had early enough for use that same day, then they should be kept for not more than twenty-fours hours. However, root vegetables needs storage space and it is better to examine sacks of root. Vegetables on delivery to ensure that they are of good quality. Root vegetables may be neatly arranged on racks or spread on the floor in an airy spacious room. Always ensure that old stock is used first.
3) **Cold Storage:** Some commodities require cold storage. In very good establishments, general cold rooms are put in place. In others, only ready made, freestanding refrigerators are affordable. They can be sited at any given point so that each party can have its own, exactly suited to their particular use. Some are self-defrosting and require hardly any maintenance. Storage of all sorts of commodities including cooked and raw meat, fish, cheese, etc. in the same cold room is not acceptable. The various commodities should be kept at their appropriate temperatures.
4) **Deep Freeze Storages:** Commodities that are normally stored in this condition are fresh meat, poultry, fish, game etc and which do not require immediate use. Whenever these commodities are needed, they are taken out to be defrosted and then prepared for use.

3.2.3 Preparation Areas

Traditionally there has always been a separate area for the different forms of preparations carried out in a kitchen with specialist staff in each. The food hygiene regulations of various countries state that meat, poultry and fish must each be handled separately. No wonder then the modern day kitchen planners tend towards recommending preparation

space for different units of a good kitchen rather than having it all done together. Grouping of activities of this nature apart from creating division of labour also enhances food hygiene, standards and efficiency in productivity.

Preparation areas in a good establishment can be categorised as follows:-

1) The vegetable preparation area headed by a vegetable cook (i.e. Chef Entremettier)
2) The larder headed by (i.e. Chef Garde-manager) - Here the preparation of raw foods in readiness for cooking is done. In addition, all the cold buffet, work-making sandwiches, canapés *hor's d eouvre*, and salads are prepared as well.
3) The pastry, headed by the Chef Patissier handles all sweets and pastry work.

3.2.4 Cooking and Plating

The main kitchen is the central cooking area where the equipment is located and where the actual cooking is done. It is the end of production line with only on step further in distributing the finished food to the customer. For this reason it is wise to link this area with its supply lines and its ancillary department of pot and plate wash rooms, to the service counter.

Depending on the type of establishment, a plating or services area may adopt an indirect method of service whereby food is taken to the customer at his table or a direct method where the customer collects the food himself as in cafeteria service.

3.2.5 Serving, Dinning and Washing-up

Food having been plated is taken to the dining area or the restaurant to be served to the dinners.

As soon as food is served, dinning comes next. This takes place in the dinning room or the restaurant, which is linked to the kitchen area through the servey, hotplate or the service area as the case may be.

A good workflow is not complete until all the service items are washed. The obvious location for this section of operations is where the dirty dishes come from, which is just outside the restaurant. The arrangement is to sort the various items and put, like with like, to get rid of plate waste. To soak solid equipment, put it through the dish-washing

machine and back into circulation, hygienically, clean and as quickly as possible.

3.2.6 Putting Away

All the items of equipment that have been used and washed up are put away in the equipment storage area in accordance with a routine. In this manner, each item is returned to its correct place and stored tidily so that when required it will be found in its customary abode.

A reserved equipment store from which replacements are issued for worn out or broken items should be kept; it will also house specialised items which are used only rarely and very expensive items that could get lost if not locked up after use.

3.2.7 Waste Disposal Area

There must be an area, preferably outside the premises, for the storage of waste bins. The place has to be paved and drained as that is can be easily washed down. It must also be accessible for waste disposal vehicles to collect waste. A rental charge is payable to the local authority on waste disposal or a waste contractor depending on the frequency of cleaning.

For use inside the premises plastic sacks in holders should be allocated to the area and when filled, sealed, and taken into the garbage unit.

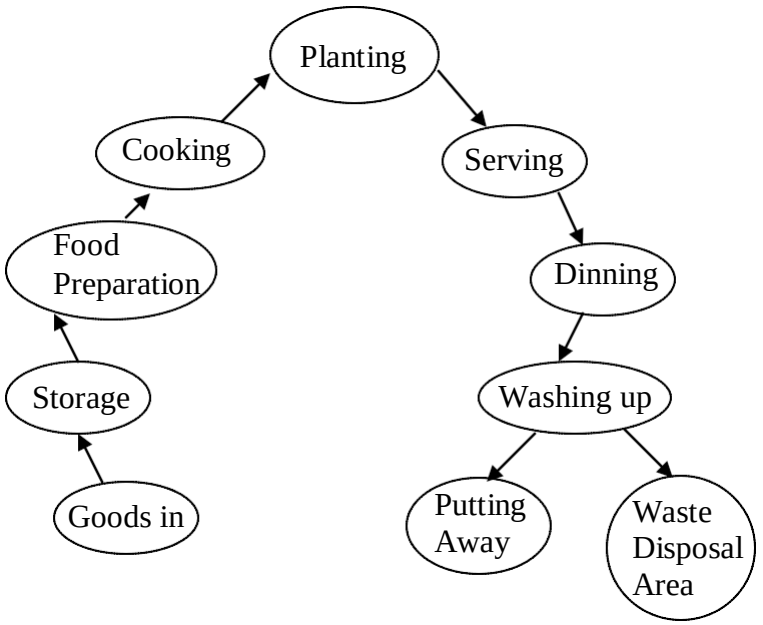

Figure 7: Diagram showing flow of work

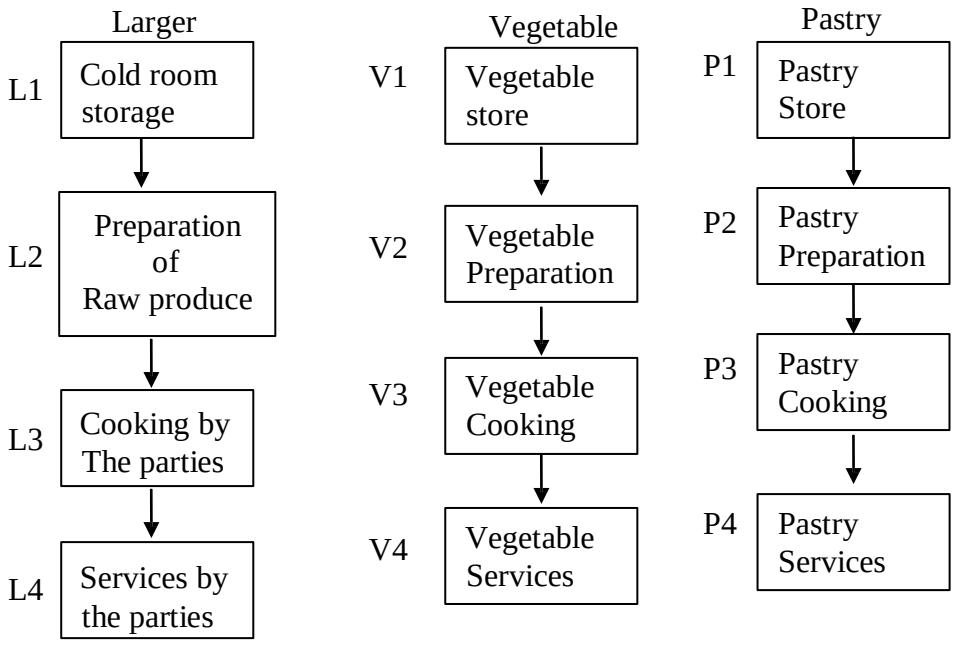

Figure 8: Grouping of Activities

Source: ***Cracknell, Kaufman and Nobis (1987); The Professional Catering, Macmillan, London.***

3.3. Utility Supply

Utility supply comprises electricity, gas, water and drainage to be used in the kitchen. When all mentioned are adequate the kitchen becomes a place where staff would do their work satisfactorily.

3.3.1 Electricity

Electricity in the kitchen is mainly concerned with lighting, cooking and heating. Electrically operated appliances used in the kitchen include cookers, kettles, water heaters, refrigerators, mixers, coffee percolators toasters and hot plates. The *electric circuit* is an electric current flowing through *wires*, which are controlled by *electric switches*. Switches interrupt or break the electric circuit thereby preventing the flow of current through the wires. *Plugs* are fixed into *sockets* to tap electricity (Ceserani and Kinton, 1990).

Materials used in setting up electrical circuits fall into two categories:

1) Those, which allow electricity to flow through them, known as conductors - i.e metals, carbon, water.
2) Those which do not allow electricity to flow through them, known as insulators – i.e. rubbers, porcelain, glass, plastic , air.

3.3.2 Gas

Gas, as a source of fuel in the kitchen, is another form of utility supply that should be considered when planning a kitchen. Cooking gas is a combination of propane and butane which is combusted in conjunction with air to give the correct mixture as donated by the colour of the flame and is maintained at constant even pressure by means of a gas governor in the pipeline to each item, thus giving consistency of performance.

Because gas is a visual heat, it is easier to control than electricity and it can usually be adjusted to give the desired degree of heat. When planning a kitchen therefore, adequate consideration should be given to gas installation by ensuring that gas equipment are arranged logically . Gas pipes should be fitted properly with the control knobs centrally located for every kitchen staff to see and be able to control the main supply as well as the unit supplies to every equipment.

3.4 Water Supply and Drainage

Water supplies to the kitchen is as good and as important as the supply of gas or electricity; for this reason, a fully detailed plan of the necessary service run of water and drainage must be prepared when planning a kitchen. It is usual to run supply of water either form the mains or form water tanks.

The exposed pipe work should be minimal and be clear of walls and there should be no corrosion from the water pipe. Water supply to the kitchen can be done directly to equipment and also run through pipe and tap to water supply outlets such as the sinks or dish washers etc there may be hot and cold water suppliers and the problem of drainage must be solved so that there is no danger from wet and slippery floor. Sinks and drainage should not be blocked while faulty pipes must be reported and repaired immediately.

The accepted way to drain kitchens is to sink glazed stoneware channels into the floor in suitable positions, so that waste water can be carried away to a gully situated outside the building.

Where the channels cross the open floor, a cover-grid should be provided, preferably of galvanised or zinc sprayed cast-iron, to avoid accidents.

The grid must be in short lengths and easily removed to allow regular and frequent cleaning of the channel. Sinks and wash-hand basins should discharged properly into or over gullies. Fresh air inlets and ventilation pipes connected to drainage systems are not allowed in the

kitchen; furthermore, every inlet into such a system must be trapped (Cracknel, Kaufmaan and Nobis, 1987).

3.5 Kitchen Interiors and Fitting

Floors
Traffic in food rooms may vary from normal foot passage to heavy iron-wheeled trolleys, as such the durability of the floor surface must meet the needs of the establishment. Apart from this, the major requirements are that floors must be impervious to moisture and not adversely affected by grease, salt, vegetable or fruit acid or other food scraps. The floor should be non-slippery and with a gentle slope towards a drain to facilitate cleaning. The finish of the floor should not provide lodging for dirt or for insects.

3.5.1 Examples of Kitchen Floorings

a. **Asphalt floors:** This type of flooring is dust-free and water-proof and does not provide a harbour for vermin, it is however, liable to erosion by acids and it will not bear concentrated weights.
b. **Quarry Tiles:** these, when laid well are excellent in all respects, except that unless faced with an abrasive material they are slippery when wet and can be for covering whole floors or as a base for free-standing in rooms where the rest of the floor is pitch mastic.
c. **Terrazzo**: It is a hard floor finish consisting of a mixture of marble and other decorative chips or pieces, set in fine cement which can be colored. The floor is machine ground to give a smooth surface and it is extremely durable

4.0 CONCLUSION

This unit potrays the kitchen as the nerve centre of food production. We discussed kitchen planning to include size and location, layout and kitchen designs, giving example of the types of layout. The unit also shows how to plan the flow of work for easy food production and movement of goods and workers. Other aspects of the kitchen examined are utility supply, water and drainage.

5.0 SUMMARY

This unit has examined kitchen planning, flow of work, utility supply water and drainage as basic issues in the kitchen meant for large-scale food production either as a commercial or non-commercial kitchen.

Your knowledge in this area will help you to organise and plan a kitchen professionally.

6.0 TUTOR-MARKED ASSIGNMENT

1. Plan a modern kitchen that can serve 300 customers for a medium size hotel.

2. Explain the major role of utility supply in a kitchen.

7.0 REFERENCES/ FURTHER READINGS

Ceserani, V. and Kinton, R. (1990). *The Theory of Catering*, London: Houdder and Stoughton.

Cracknel, Kaufman and Nobis (1987). *The Professional Catering.* London: Macmillan.

UNIT 5 KITCHEN EQUIPMENT, TYPES, SELECTION USES AND MAINTENANCE

CONTENTS

1.0 INTRODUCTION

It has become imperative in modern day catering operation to seriously consider the issues of kitchen equipment and how best to procure and use these equipment at the optimum result.

Since kitchen equipment is expensive, an analysis of each item of equipment that may be found in a kitchen should be carried out in order to ascertain if purchase is justified in view of the menu and services.

This unit therefore, focuses on kitchen equipment, their type efficiency, uses, purchase and durability. It also highlights their designs and costs.

2.0 OBJECTIVES

By the end of this unit, you should be able to:

- Identify a wide range of kitchen equipment.
- Explain their uses and maintenance.
- Explain the efficiency and durability of kitchen equipment.
- Differentiate between the different categories of kitchen equipment.
- Purchase kitchen equipment.
- Describe the design of various kitchen equipment and how to install them.

3.0 MAIN CONTENT

3.1 Selecting Kitchen Equipment

Kitchen equipment includes both fixed and mobile items of different shapes and sizes, used in the preparation and cooking of food.

3.1.1 Design and Installation

The materials used and the design and finish of items or equipment should be sufficiently solid to stand up to hard use.

The materials should be strong, non-absorbent and non-corrosive. When purchasing, bear in mind the fact that they should be easy to clean the design of the equipment.

You should study the ergonomics of equipment and ensure that suits the people who would use them. It should make the users move efficient and it should suit the environment. This includes working height of approximately 100cm for most jobs or 90cm for heavy work. Ergonomics helps by reducing unnecessary stress and increasing the effectiveness of the kitchen staff. Work study is part of the planning process and it sets out to obtain the best use of manpower and resources by reducing unnecessary movement and motion in carrying out any task. Making the best use of the equipment installed is a part of work-study.

3.1.2 Cost

Another important aspect when selecting kitchen equipment is the cost. Consideration must be given to the cost and its relation to size,

durability, usefulness or performance, design and finish. The more expensive item may not necessarily be the best or more desirable after all. Desirability is often a deciding factor in purchasing and the buyer looks at the quality of the metal and the possibility of obtaining spare parts, but the buyer should be recognize the fact that advancement in technology assists manufacturers to improve performance and put new improved models on the market. It is therefore necessary to obtain the most up-to-date equipment, which gives good performance in relation to its cost.

3.1.2 Efficiency, Usefulness and Durability

Kitchen equipment, be it a stove, an oven, or a mixer is evaluated by its performance. Performance is its output or what amount can be produced by its use within a given time. How efficient is the piece of equipment?

Manufacturers are able to give figures for output of certain foods in their item of equipment, basing them on production under ideal conditions, which are not always easy to reproduce in ordinary practice. For example, an oven may be said to produce 50 meat pies at once and within a particular period of time. Durability and reliability of equipment are part of this and recognition of it is not only by the cost but also by the design and constructions.

3.2 Types of Kitchen Equipment

The following details provide an outline description of various important items of equipment installed in the kitchen. The list of equipment is inexhaustive neither are all the items necessary in every kitchen.

3.2.1 Fixed or Heavy Duty Equipment (Large Equipment)

1) **The Kitchen Range:** This is the most used piece of equipment. It is a combination of an oven and hot plates, which is designed to cope with a number of tasks at the same time. Usually made of stainless steel or enamel, it may be operated by gas or electricity. An electric range has its oven and hot plates thermostatically temperature controlled, whereas a gas operated range has its own oven controlled as each part has a mark setting with top burners usually manually controlled.

Uses: The kitchen range is used for general purposes; baking, braising, roasting etc. Top plates may be used for boiling, poaching, shallow frying etc.

Cleaning and Maintenance: This equipment should be placed so that it can be easily cleaned from all side and should be at least 300mm away from walls. If it is in a central position, enough room should be left to allow entrance to the back of adjacent ranges and similar equipment. Kitchen ranges should be cleaned regularly to remove greases and food debris.

2. Ovens: There is a different type of ovens that may be found in a kitchen. These are;

i. The General Purpose Oven: This is a freestanding oven which is possible to load and attend to without bending or stretching.

ii. The Pastry Oven: This kind of oven is more usually operated electrically because of its ability to retain heat and make cooking in the even. It is made in separate decks, each operating independently and having a heavy bottom and a narrow opening. This oven is more suitable for pastry and bread making than for general use.

iii. The Rotary or Reel Oven: Also required for bakery work, it may also be used for roasting. It has a wheeled mechanism carrying a number of racks on which the trays of food to be cooked are placed.. The oven may be gas of electric and is very useful in large-scale operation.

iv. Convection Oven: This type is sometimes called the forced –air oven. Convected heat is generated in the oven and is circulated as heated air. At high speed, heats penetrate faster, thereby speeding up the cooking processes.

v. The Microwave Oven: This type of oven cooks food very quickly using very short electric waves instead of heat. The food placed to cook in a microwave oven is bombarded by electromagnetic waves, which cause the molecules in the food to oscillate at a very high rate, producing vapour released from the food and thus cooking the food from within. Cooking in a microwave oven is faster than in an ordinary oven.

Uses: The microwave oven can be used for poaching and shallow frying. It can also be used to reheat food at the point of service and defrosted cooked dishes. Never use metal dishes ceramic and glass dishes are preferable.

Cleaning and Maintenance: The oven should be cleaned regularly as food splashes on the door seal can affect it thereby causing leakage of the microwaves which are very dangerous to the user.

Other types of ovens are micro-processor oven combined microwave and convection oven, combined forced-air and infrared oven.

3.2.2 Grilling Equipment

Grills enable food to be cooked by putting it over heat, under heat or between heat. Grilling equipment can be mounted on a bench or wall or can be freestanding. It may be operated electrically or fired by gas or charcoal. A salamander is usually referred to as top-grill as its sources of heat at the top.

A griddle plate is a solid slab of cast iron or steel and may be heated by gas from beneath or by electric element; some are ridged but a flat surface allows all kinds of food to be dried fried.

Uses: Grills are used for general purpose grilling of meat, fish, toast and for browning items such as meringues, and cheese –topped foods.

3.2.3 Fryers

In the frier, fat is contained in a v-shaped pan and the heat is directed to each side leaving a cool zones at the bottom, where the electric elements is in the pan of fat, so heating the oil above but leaving a cool zone below; its purpose being to receive particles of food that would other wise get burnt, so spoiling the oil.

Fryers can be heated by **gas** or **electricity**. Control is essential for this item as there are obvious hazards in its use. Gas heated fryers may be fitted with thermostats. A cooking timer also acts as an automatic cut off. An electric fryer has the second thermostat bonded to the heating element which becomes operational if the main thermostat fails.

3.2.4 The Bratt Pan

This is a large shallow tilting pan which is moved by the action of a wheel. It is made of cast-iron, steel or stainless steel. It has a hinged cover and the heat is controlled by a thermostat. The item of equipment is capable of fulfilling a number of tasks, it is a labour-saving equipment which may be heated by gas or electricity.

Uses: It can be used for boiling, braising, stewing, shallow frying and as a Bain Marie. It is very easy to clean.

3.2.5 Boiling Pan

This is also a large freestanding lidded pan with direct water filling value and emptying outlets. There are three main types of boiling pan - the direct heated type, the double pan and the steam types. The direct heated one is good for boiling vegetables, making stock and thin soup. A steam boiling pan has steam under pressure circulating through the two walls of the pan and differs from the double pan which is actually the direct type with some water in the cavity but which works a sfast as the pressure type. All have stainless linings and the smaller size can be tilted rather than having to run off the liquid through a pipe. Boiling pans have different capacities ranging form 45-90 litres.

Uses: they can be used for large batch vegetables cooking ,soups, rice, stews, stock, sweet and savoury sources, milk puddings e.t.c.

3.2.6 The Steamer

The steamer is another important equipment used for cooking food in steam. In a steamer, there is no water to weigh down on the food and thus possibly causing distortion, only steam comes in contact with it and consequently there is no cooking liquid, since food must cooked in perforated trays to allow the steam to cook from all sides.

Types of Steamers

1. **The Atmospheric Steamer:** It produces its own steam from the container of water at the bottom, which is heated by gas or electricity. At 100^0c it gives off steam which is trapped in the chamber so cooking the food in trays and door is sealed to prevent escape.

2. **The Pressure Steamer:** A pressure steamer allows cooking at a higher temperature above 100^0C thereby shortening the cooking time and at the same retaining more nutritional value of food.

3.2.7 Bain Marie

Bain Marie are stainless steel containers with lids which rest in a bath of water and can be heated by electricity, gas or a direct steam source. Bain Marie may be incorporated into-hot-cupboards, some in serving counters while others are fitted at the end of a cooking range. It is

available in different designs and shapes. It is helpful to have a water supply and drainage for Bain Marie

Uses: They are used for keeping food items like of hot sauces and soups, which are placed in the Bain-Marie in special tall pots that take up little space. They can also be used in the service area for holding food on cafetareia services counters or by the Ganyemede plated service conveyor.

3.2.8 The Hot Cupboard

Hot-cupboards (commonly referred to as hot-plate) are used for heating plates and serving dishes. Hot-cupboards may be heated by steam, gas or electricity. A temperature of 60^0C –76^0C is suitable for this equipment and a thermostat is used to maintain the temperature, otherwise the plates and food will either be too hot or too cold. Some hot-cupboards are designed with the top as a serving counters. The door should slide easily and occasional greasing may be necessary.

3.2.9 The Refrigerator

A refrigerator is an essential equipment in a food production area. It is an insulated chamber with a compressor attached that keeps it at a lower temperature than that outside. By pumping a refrigerator through a system of pipe and coil its absorbs the heat food as the refrigerant is changed from light to vapour. The vapour is compressed and forced into the condensers which being cooled by a fan causes the vapour to return to its liquid state, the cycle is repeated and the absorbed heat is released into the air. Also, thermostat control is essential as different food has different storage requirements, and the equipment should maintain operation at a selected level. With modern technology refrigerator may be designed as a blast chiller, a blast freezer, a chilled food storage cabinet and a walk-in cold room.

Use: refrigerators are used to maintain food in good condition to avoid spoilage.

3.3 Mechanical Equipment

Another category of kitchen equipment that should be considered for purchase are machines used in the kitchen to lighten the burden of work; and for this reason, they are often referred to as being labour saving. A piece of mechanical equipment can save time and physical effort and still produce a good end result by obtaining uniformity or production over a period of time.

When buying kitchen machines therefore, the mechanical performance must be carefully assessed and all the manufacture's claims as to the machine's efficiency must be thoroughly checked. The design should be fool-poof, easy to clean and operated with the minimum effort.

Machines used in the kitchen are powered by electricity, although there are some that are hand operated and work well. When a new item of equipment is installed, it is must be tested by a qualified fitter before being used by the catering staff. The manufacturer's instruction must be provided and advice regarding service should be strictly followed.

The following are good examples of some prominent mechanical equipment.

3.3.1 The Mixing Machine

The machine is used to do a wide range of jobs; it comes in different sizes for different uses. There are small, medium table models and several size of floor mounted ones. They are designed with bowls and three mixing attachments of whisk, laddle and dough hooks. Mixers have three-speed gears for various uses which assist in obtaining speedy aeration and smooth liquid mixes and are also for denser elastic mixes such as fruit cake, hamburger mix and bread dough and can be operated electrically or manually.

3.3.2 Food Slicers and Choppers

These are another from of labour saving equipment obtainable both manually and electrically operated. The machine is designed with cutting blades to produce various textures, sizes and shapes.

Uses: For slicing and chopping raw meat, or bones depending on the type. It should be handled carefully to avoid accidents.

3.3.3 Mincing Machines (Mince's) or Blenders

A mincing machine can either be an attachment to a mixer or a complete machine on its own. It works by an independent unit, which drives the mince shaft blades and forces the food items through the front plates thereby producing either coarse on fine mince.

Uses: For mincing raw or cooked meat.

3.3.4 Potato Peelers

Potato peelers may be operated manually or electrically. The machine works by rubbing and washing off the skins of potatoes, carrots, turnips and such other vegetables. However, care must be taken that only the outer skin is removed.

3.3.5 The Dish Washing Machine

This is a washing up machine whereby dirty items are stacked face downwards in the trays which are placed in the machine ,over the jets and a water store. A conveyor controls the cycle. It passes through the washing stage, a rinse stage and a sterilising stage. The tray is static throughout the time that the cycle is being completed.

3.3.6 The Food Waste Disposer

Food waste refers to talks of all manners of rubbish, including bones, fat, scraps and spoilt vegetable. The food was to disposer is operated by electricity, it is the most modern and hygienic method of waste disposal. Handlers should avoid pushing waste into the machine by a metal object to prevent damage.

SINKS

Sinks are large open containers (in kitchens) that have taps. The sink is usually fixed on an outside wall below a window to reduce plumbing works. The floor and walls immediately beneath the sink should be of easily cleaned waterproof materials. The sink should be fitted at an appropriate height from the floor for easy use. All materials used for sinks should be able to stand up to heavy usage. Glazed earthenware is strong and durable, other materials of which sinks are made are aluminum and stainless steel. All sinks should be fine fitted with rubber plugs and chains and the waste pipes should have grating and overflow pipes.

Please note that there are other equipments that are found in stillrooms and these include: waste boilers for making tea and coffee, grinder and percolators blenders, and dispensing machines.

3.5 Small Equipment

Small equipment are expensive and easily lost and damaged. They can be categorised as follows:

1) **Cooking Tins:** e.g. baking sheets, roasting tins pie dishes, pudding sleevee. etc
2) **Kitchen Knives:** e.g. Cook's knife, filleting knife, carving knife etc.
3) **Kitchen Tools:** e.g. Laddle spoons and spatulas, whisks etc.
4) **Pans:** e.g. Boiling pans, sauce pans, omelet pans etc.
5) **Proposing Control Equipment:** Laddles, measuring spoons, scoops, severs, tongs.

4.0 CONCLUSION

This unit teaches a number of important issues relating to kitchen equipment. We have discussed different types of kitchen equipment, their selection and uses.

We have also examined the efficiency and durability of these items of equipment. You need to be aware however that you are having a good knowledge of this subject plays a major role in your ability to work and manage a catering establishment profitability.

5.0 SUMMARY

This unit discusses kitchen equipment in general. You should have acquired knowledge on the types, selection, uses, efficiency and durability of kitchen equipment in addition to caring for these items of equipment hygienically.

6.0 TUTOR-MARKED ASSIGNMENT

1. Make a good classification of kitchen equipment and explain each

2. Explain design and installation of kitchen equipment

7.0 REFERENCES/FURTHER READINGS

Cracknel, Kaufman and Nobis (1987). *Practical Professional Catering*. London: Macmillian.

Lawson, F. (2001). *Planning, Design and Investment for Food Service Facilities*, Oxford: Heinemann.