



Ministry of Education
and Sports

HOME-STUDY LEARNING

SENIOR
3

FOOD AND NUTRITION SCIENCE

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This material has been developed as a home-study intervention for schools during the lockdown caused by the COVID-19 pandemic to support continuity of learning.

Therefore, this material is restricted from being reproduced for any commercial gains.

National Curriculum Development Centre
P.O. Box 7002,
Kampala- Uganda
www.ncdc.go.ug

FOREWORD

Following the outbreak of the COVID-19 pandemic, government of Uganda closed all schools and other educational institutions to minimize the spread of the coronavirus. This has affected more than 36,314 primary schools, 3129 secondary schools, 430,778 teachers and 12,777,390 learners.

The COVID-19 outbreak and subsequent closure of all has had drastically impacted on learning especially curriculum coverage, loss of interest in education and learner readiness in case schools open. This could result in massive rates of learner dropouts due to unwanted pregnancies and lack of school fees among others.

To mitigate the impact of the pandemic on the education system in Uganda, the Ministry of Education and Sports (MoES) constituted a Sector Response Taskforce (SRT) to strengthen the sector's preparedness and response measures. The SRT and National Curriculum Development Centre developed print home-study materials, radio and television scripts for some selected subjects for all learners from Pre-Primary to Advanced Level. The materials will enhance continued learning and learning for progression during this period of the lockdown, and will still be relevant when schools resume.

The materials focused on critical competences in all subjects in the curricula to enable the learners to achieve without the teachers' guidance. Therefore effort should be made for all learners to access and use these materials during the lockdown. Similarly, teachers are advised to get these materials in order to plan appropriately for further learning when schools resume, while parents/guardians need to ensure that their children access copies of these materials and use them appropriately. I recognise the effort of National Curriculum Development Centre in responding to this emergency through appropriate guidance and the timely development of these home study materials. I recommend them for use by all learners during the lockdown.



Alex Kakooza
Permanent Secretary
Ministry of Education and Sports

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The Centre appreciates the contribution from all those who guided the development of these materials to make sure they are of quality; Development partners - SESIL, Save the Children and UNICEF; all the Panel members of the various subjects; sister institutions - UNEB and DES for their valuable contributions.

NCDC takes the responsibility for any shortcomings that might be identified in this publication and welcomes suggestions for improvement. The comments and suggestions may be communicated to NCDC through P.O. Box 7002 Kampala or email admin@ncdc.go.ug or by visiting our website at <http://ncdc.go.ug/node/13>.



Grace K. Baguma
Director,
National Curriculum Development Centre

ABOUT THIS BOOKLET

Dear learner, you are welcome to this home-study package. This content focuses on critical competences in the syllabus.

The content is organised into lesson units. Each unit has lesson activities, summary notes and assessment activities. Some lessons have projects that you need to carry out at home during this period. You are free to use other reference materials to get more information for specific topics.

Seek guidance from people at home who are knowledgeable to clarify in case of a challenge. The knowledge you can acquire from this content can be supplemented with other learning options that may be offered on radio, television, newspaper learning programmes. More learning materials can also be accessed by visiting our website at www.ncdc.go.ug or ncdc-go-ug.digital/. You can access the website using an internet enabled computer or mobile phone.

We encourage you to present your work to your class teacher when schools resume so that your teacher is able to know what you learned during the time you have been away from school. This will form part of your assessment. Your teacher will also assess the assignments you will have done and do corrections where you might not have done it right.

The content has been developed with full awareness of the home learning environment without direct supervision of the teacher. The methods, examples and activities used in the materials have been carefully selected to facilitate continuity of learning.

You are therefore in charge of your own learning. You need to give yourself favourable time for learning. This material can as well be used beyond the home-study situation. Keep it for reference anytime.

Develop your learning timetable to cater for continuity of learning and other responsibilities given to you at home.

Enjoy learning

TOPIC: EGGS**Specific objectives:**

- Discover the food value of eggs
- Demonstrate the different uses of eggs in cooking
- Find out the factors to consider when choosing eggs
- Practice the different methods of cooking eggs
- Carry out the tests for egg freshness
- Store eggs appropriately

Requirements you will need:

Time, notebook, pen/pencil, ingredients for egg cookery

Instructions/Procedures

This self-study material has been developed for you to use at home. It has some activities that you are expected to do. Read through carefully and attempt all of them. Keep good record of all completed work because you will need them when school reopens. You are expected to do some practical cookery, please request for ingredients from your parents. Remember to be economical with ingredients.

Introduction

Eggs are the most versatile of all cookery ingredients; they can be used in many recipes. Eggs are made up of egg shell (10%), egg white (60%) and egg yolk (30%). The egg yolk is the most nourishing part of the egg because it stores nutrients for the chick.

Lesson 1: Food value and uses of eggs in cookery**Specific objectives:**

By the end of this lesson, you will be able to:

- Discover the food value of eggs
- Demonstrate the different uses of eggs in cooking
- Find out the factors to consider when choosing eggs
- Practice the different methods of cooking eggs

Requirements you will need:

Time, notebook, pen/pencil, ingredients for egg cookery

The egg is a very nutritious food that is digested, absorbed and fully utilized by the body. Different parts of eggs and the nutrients they contain

Egg white-this contains protein ovalbumin which is dissolved in the white. It also contains small amounts of riboflavin and Sulphur.

Egg yolk- the yolk contains;

- Two important proteins; vitelline and livetin, which have all the essential amino acids.
- Vitamins A, D, B group as well as vitamin B12.
- Minerals calcium, iron, phosphorus and Sulphur.
- Fat in very highly emulsified form and so is easily digested.
- The fat like substance lecithin which helps in nerve repair and stabilizes emulsions.
- Cholesterol needed for brain development especially in children.

Egg shell- this consists almost entirely of carbonate of lime. The calcium present in the shell may not be beneficial unless it is eaten.

Hint: The shell can be cleaned, crushed and added as powder in food to improve the calcium content of the meal.

Eggs have many uses in cookery and they include;

1. As a main dish - in combination with other ingredients or food. Their animal protein which contains all the essential amino acids makes them of great value in place of meat and fish. They are easily digested and make them suitable as invalid food. They are cooked very quickly and hence suitable as snacks.
2. Thickening – the coagulation of protein on heating at 68°C is responsible for their value as a thickening agent. This property is made use of in thickening custards, soups, sauces, lemon, cheese etc.
3. Binding – the coagulation properties of an egg will give cohesiveness to a mixture containing dry ingredients like rissoles, fish cakes, croquettes, forcemeat, hamburgers and icings.
4. Coating – beaten eggs form a protective covering for fried foods. The albumen quickly hardens on heating and prevents the contents being saturated with fat while the heat penetrates.
5. Enriching – the addition of whole eggs or yolks to a mixture is valuable, especially as a means of adding proteins and fat. Fat has a moistening and shortening effect.
6. Lightening – by means of whisking either egg white or whole egg, air is entangled and lightness given to a mixture. This can be used as;
 - a. Raising agents in cakes. A whole egg can aerate an equal weight of flour.
 - b. Light fluffy dishes e.g. soufflés, meringues.
7. Glaze – rich pastries and savoury pies can be made more attractive by brushing them with beaten egg. This gives a rich, golden, shiny finish on baked products.
8. Garnishes – if sliced or finely chopped, hard boiled eggs make an attractive decoration for savoury flans and fish dishes. The yolk and the white may be

chopped separately. These may be used with finely chopped parsley to garnish dishes. They may also be chopped with foundation white sauces for serving with white fish.

9. To emulsify – lecithin, a natural emulsifier present in egg yolk makes it ideal for stabilizing the oil/vinegar mixture of mayonnaise. It also helps to emulsify ice cream and creamed cakes.
10. To clarify – soups, stock, home-made wines and jellies are made clear using egg white and crushed egg shell.

You can use some these recipes for eggs:

Scotch eggs

4 hard-boiled eggs
300 g sausage meat
25 g flour
1 beaten egg
50 g bread crumbs

1. Completely cover each egg with sausage meat
 2. Pass it through the flour, beaten egg and bread crumbs. Shake off the surplus crumbs.
 3. Deep fry to a golden brown colour in moderately hot fat
 4. Drain well, cut in halves and serve hot or cold.
 5. For hot: garnish with fried or sprig parsley a suitable sauce such as tomato
- For cold: garnish with salad in season and a salad dressing

Stuffed eggs

2 hard-boiled eggs
25g margarine
4 tbsp. mayonnaise or yoghurt
Salt and pepper to taste

1. Half the eggs, remove yolks, mash them and pass through a sieve
2. Mix the yolks with butter and mayonnaise and correct the seasoning
3. Place a piping bag with a star tube and pipe neatly back into the egg whites
4. Dress on a bed of shredded lettuce leaves

Plain Omelet

2 eggs
10 g butter or margarine or 1 tbsp cooking oil
Seasoning (salt and pepper)

1. Break the eggs into a basin, season lightly with salt and pepper.
2. Whisk well to thoroughly combine the yolks and the whites.
3. Heat the pan and wipe thoroughly clean with a dry cloth.
4. Add 10 g fat and heat. Add the eggs and cook quickly, moving the mixture continuously with a fork until lightly set. Remove from the heat.
5. Half fold the mixture over at right angles to the handle.
6. Bring up the omelet by tapping the bottom of the pan.
7. Tilt the pan over completely so that the omelet falls carefully into the centre of the dish or plate.
8. Neaten the shape if necessary and serve immediately with a garnish such as slice of tomato, green pepper, etc.

Spanish omelet

To the three egg omelet, add 2 tbsp. of olive oil instead of 1½ tbsp. fat, 1 tomato, 1 shredded sweet pepper, 1 small onion and 1 small potato

1. Chop the onion, dice the potato and fry them till golden brown in the oil.
2. Scald, skin and cut the tomato into strips discarding all juice and pips. Shred the pepper and add these to the potato. Cook for a few minutes.
3. Cook the omelet with the mixture in the pan. Do not fold the omelet but brown it lightly under a moderate grill.

Cheese omelet

To the 3 egg omelet, add 25 g grated cheese and 1 tbsp. cream from the top of milk.

- Mix the extra ingredients into the beaten egg.

Sweet or soufflé omelet

2 eggs
25 g castor sugar
2 drops of vanilla essence
1 tbsp. jam

1. Proof the omelet pan and warm the serving dish. Heat the oven.

2. Separate yolks from the whites of eggs.
3. Beat the yolks in the sugar until they are pale yellow and thick. Add the vanilla.
4. Warm the omelet pan and grease it.
5. Whisk the egg whites until they are stiff and fold them into the yolks and sugar.
6. Pour the egg mixture into the pan and cook it over top heat oven or grill very gently for 15 minutes.
7. Bake the omelets for 15 minutes or until golden, set and very light.
8. While the omelet is baking, warm the jam over hot water, and dredge a square of paper with castor sugar.
9. Turn the omelet upside down on to the paper; mark the underside across the middle with the back of a knife.
10. Spread the warm jam over one half, lifting the other half with the help of the paper, fold the omelet into half.
11. Dish out and serve at once.

Activity 1.1: Factors when choosing eggs and cookery using eggs

1. Have a discussion with family members about the factors you would consider when choosing eggs. Write down the points discussed in your notebook.
2. Practice the different ways of cooking eggs. Request for ingredients and
3. Carry out some practical using eggs in the different cookery processes.

Summary:

In this lesson you have learnt that; egg white contains the protein ovalbumen and also riboflavin and Sulphur. The egg yolk contains proteins; vitelin and livetin. It also has vitamins A, D, and B group together with calcium, phosphorus, iron and Sulphur. There is also fat, lecithin and cholesterol.

Eggs are used in cookery as a main dish, in thickening, binding, coating, enriching, lightening, glazing, garnishing, emulsifying and clarifying.

Specific objectives:

By the end of this lesson, you will be able to:

- Eggs to test for freshness
- Store eggs appropriately

Requirements you will need:

Time, notebook, pen/pencil, eggs to carry out freshness tests, egg tray to demonstrate proper storage of eggs

The following tests are carried out to identify fresh eggs;

- The shell of a newly laid egg should be slightly rough.
- If held up to light an egg should be slightly translucent with no black specks showing
- Fresh eggs feel heavy for their size. Loss of weight due to evaporation of moisture shows that egg is stale. Hence a stale egg is light in weight.
- Brine test: place an egg in a salt solution (25g salt, 250ml water) fresh egg will sink to the bottom, not so fresh egg is suspended and a very stale egg floats/rises.
- Break the egg into a saucer, a fresh egg will have a rounded yolk and thick white. A stale egg will have a flat yolk and watery white.
- If the egg is very stale, there will be unpleasant smell when broken into a saucer, due to formation of hydrogen sulphide as the egg decomposes. Bacteria will also be present.

Eggs have a porous shell and this may allow entry of smell and bacteria. It is therefore important to store eggs appropriately to avoid spoilage.

- Keep in a cool place. Place in a suitable tray, with the round end upper most and the pointed end facing down on the tray.
- Keep away from strongly smelling foods e.g. onions, fish, cheese as their flavor may be absorbed through the porous shells.
- Refrigerators may be used to store eggs for short periods but if left for too long the liquid inside the egg freezes. This may expand and crack the shells.

Hint: Remove from refrigerator in time to allow eggs to return to room temperature before use.

- Unbroken egg yolks which have been separated from the whites should be placed in a cup. Cover with cold water and keep in a cool place, protected from dust.
- Broken yolks should be in a screw top jar or polythene container and used as soon as possible.
- Unused white should be covered and stored in a cool place.

Activity 1.2:

1. Carry out the above tests to find out the freshness of eggs.
2. Demonstrate the correct storage of eggs at home.

Summary:

In this lesson you have learnt that the characteristics of a fresh egg are; slightly rough shell, translucent with no black specks showing if held up to light, heavy, sinks in salty water, rounded yolk and thick white.

When storing eggs do the following; keep in a cool place, store with the round end upper most, and keep away from strongly smelling foods, store eggs for short periods in refrigerators.

TOPIC: FRUITS AND VEGETABLES**Specific objectives:**

1. Classify fruits and vegetables.
2. Discover their nutritive value.
3. Find out the uses of fruits and vegetables in the diet.
4. Conserve nutrients during the preparation of fruits and vegetables.
5. Discover the factors to consider when choosing fruits and vegetables.
6. Prepare fruits and vegetables using various methods.
7. Analyze the effects of heat during the cooking of fruits and vegetables.

Requirements you will need:

Time, notebook, pen/pencil, available fruits

Instructions/Procedures

You are expected to go through this material at your own pace. Remember that you have been given some activities that you are expected to do. Read through carefully and attempt all of them.

Introduction

Vegetables are both nutritious and tasty. Fruit, like vegetables contains a high percentage of water and is an important source of vitamin C. Raw fruit is refreshing and palatable. It adds colour and texture to the diet.

Lesson 1: Classification and nutritive value of fruits and vegetables**Specific objectives:**

By the end of this lesson, you will be able to:

- Classify fruits and vegetables.
- Discover their nutritive value.

Requirements you will need:

Time, notebook, pen/pencil, available fruits

Fruits and vegetables are varied in the market and may be classified as follows;

Classification of fruits:

- **Berry fruits:**
These have a fragile cell structure and include black berries, blackcurrants, cranberries, gooseberries, grapes, strawberries, raspberries.
- **Citrus fruits:** -have a tough leathery peel surrounds a succulent, juicy mass of segments. Some have seeds and others do not e.g. grape fruit, lemons, limes, oranges, tangerines.
- **Fleshy fruits** may be seedless or have seeds throughout the flesh or in a central core e.g. apples, bananas, water melon, pawpaw, passion fruit, pears, pineapples.
- **Stone fruit**-have a single seed which is surrounded by a fleshy portion e.g. Apricots, avocado pear, cherries, dates, mango, peach, plums.

Fresh vegetables may be divided into several groups;

- **Green vegetables** e.g. Brussels sprout, cabbage, curly kale, endive, spinach, lettuce, water cress, broccoli and cauliflower.
- **Roots and tubers**-carrots, beetroot, parsnip, turnip, potato, Jerusalem artichoke.
- **Pulses**-broad bean, runner bean, French bean, pea.
- **Fruits**-courgette, marrow, cucumber, tomato, sweet corn, pepper (red and green)
- **Stems and bulbs**-celery, asparagus, onion, garlic, leek.
- **Fungi**-cup mushroom, button mushroom, flat open mushroom.

Fruits and vegetables are a good source of many nutrients but are important in the diet for their vitamin content.

The nutritive value of fruits is as follows;

Protein – there is very little amount of vegetable protein. A little more is present in dried fruit.

Fat – a very small amount, more in olives, as vegetable oil and avocado pears.

Carbohydrates – may be present in many forms, as the disaccharides fructose or sucrose; this give fruit its sweet taste. Also as the polysaccharide pectin, this is found in some fruits and is especially in the skin and cell walls of fruit.

Vitamin C – fruit is an important source.

The richest source is rose hip, rich is black currant, good is orange, strawberry, redcurrant, gooseberry, grapefruit, tomato, raspberry, loganberry lemon and fairly good is cherry, peach, banana, apricot, rhubarb

Vitamin A (as carotene) - Fairly good supply in apricots, very small supply from other fruits and none in lemons.

Vitamin D – none

Vitamin B group – very little

Iron – small supply.

Calcium – small supply.

Hint: There is a good supply of fruit acids – tartaric acid, citric and malic acids and the supply decreases as the fruit ripens. Citric fruits have a good supply of acids. Acids help the laxative action of fruit by stimulating the action of the intestines. If unripe fruit is eaten, excess acids may upset the digestion.

Vegetables contain the following nutrients;

Protein-traces of protein are found in many vegetables such as potatoes. However, pulse vegetables such as peas and beans and especially soya beans and also nuts, are the best sources of vegetable protein. Root vegetables, cauliflower and Brussels sprouts contain small amount of protein

Fats – many vegetables are deficient in fat although soya beans and nuts are a good source of natural oils. Vegetables can be tossed in butter when cooked or can be served with a sauce.

Carbohydrate- may be present in the form of starch or sugar; potatoes, carrots and pulse vegetables contain starch.

Carrot, tomatoes, leeks, onions and pulse vegetables contain sugar.

Green vegetables, contains little digestible carbohydrate, but are a good source of cellulose.

Cellulose is a type of indigestible carbohydrate which forms the cell walls of vegetable. It is most plentiful in the skin or outer husk of vegetable and cereals. It is not digested but stimulates the peristaltic movement of intestine, preventing constipation and associated diseases. When vegetables are peeled or cereals milled, much of this roughage is lost.

Vitamin A- many vegetables are a source of pro-vitamin A (carotene).

It is plentiful in dark green and most red or orange fruits and vegetables such as carrots, red peppers, spinach, broccoli, cabbage, lettuce and tomatoes.

Vitamin E and K – present in green vegetables in small amount as these vitamins are fat- soluble and are stable to heat. Little is lost during preparation or cooking processes.

Vitamin B – thiamine is plentiful in pulse vegetables and to a lesser extent, in green vegetables. Small amount of riboflavin and niacin are also present in many vegetables.

Vitamin C- vegetables are one of the best sources of vitamin C. It's plentiful in all green vegetables, particularly dark green ones. E.g. amaranthas, lettuce, green pepper, spinach)

Onions, some root vegetables (especially swedes), cauliflower and pulse vegetables are also sources of vitamin C. Tomatoes and potatoes contain smaller amounts. Water cress and parsley are very rich in this vitamin, but because they are used in such small amounts, they cannot be counted as a good source.

Vitamin D – does not occur in vegetables

Calcium- is present in green vegetables, some root vegetables and tomatoes but most may be unavailable because it's in the form of calcium oxalate; the human body is unable to assimilate/utilize.

Iron - A moderate source in spinach water cress, cabbage, peas, beans, lentils, parsley but may be unavailable because of the oxalic acid present. Oxalates prevent the iron in spinach from being absorbed. Some green vegetables also contain Sulphur and a small supply of phosphorus is also present.

Water – a high percentage of water is present in all fresh vegetables.

Many contain 90% of water or more; potatoes 76% and dried pulses 8%.

Hint: Energy value of vegetables is not very high because many have no fat. Most are supplied by pulse vegetables and potatoes from their carbohydrate.

Activity:

Classify fruits and vegetables that have been bought at home into their different classes/groups.

Summary:

In this lesson you have learnt;

- The classification of fruits and vegetables.
- The nutritive value of fruits and vegetables.

Lesson 2: Uses, conservation of nutrients and factors considered in choosing fruits and vegetables

Specific objectives:

By the end of this lesson, you will be able to:

- Find out the uses of fruits and vegetables in the diet.
- Conserve nutrients during the preparation of fruits and vegetables.
- Discover the factors to consider when choosing fruits and vegetables.

Requirements you will need:

Time, notebook, pen/pencil, some fruits and vegetables

Fruits have various uses in the diet and they include;

- As a starter to a meal (appetizer/1st course); for example, grape fruit.
- As an accompaniment to the main meal in form of fruit drink.

- Dried fruits are added when making cakes, bread, scones and other baked items.
- Used as toppings in ice creams like strawberries.
- As an addition to yoghurt for example strawberry, passion fruit.
- As a filling for pies.
- Used in puddings.
- As a decoration in sweet dishes.

Some uses of fruit in puddings, pies and topping on cakes



Vegetables are used in the diet in various ways and these include;

- As a horsd'oeuvre.
- As an accompaniment to hot roast meat, poultry or fish. Green salad plants are served with French dressing.
- As an accompaniment to cold meat. Green salad coleslaw, cooked vegetables or fruits served with French dressing, mayonnaise or salad cream.
- As a lunch, high tea or supper dish in which a green salad and cooked vegetable or fruit are served with a protein food e.g. fish, cheese, meat or for vegetarians use nuts.
- As a filling for rolls and sandwiches.

Fruits and vegetable are important for the essential vitamins and minerals they contain. They should be eaten raw or lightly cooked as far as possible to conserve the vitamins. The following should be done to preserve vitamins and minerals in fruits and vegetables.

- Use fresh when there is most food value.
- Peel thinly because most vitamins and minerals are just below the skins; use a sharp knife to avoid cell damage.
- Prepare just before cooking or vitamins will be destroyed by the actions of the enzymes.
- Avoid the use of an iron knife to reduce the losses of vitamin C the rate of oxidation is increased by iron.
- Blanch to prevent susceptible foods e.g. potatoes, from darkening.
- Do not soak to avoid vitamin mineral loss by solubility.
- Cook in a small amount of boiling water. This reduces the loss of solubility. The ascorbic acid oxidase enzymes which destroy vitamin C are

themselves destroyed by boiling water. Cooking is quicker and so there is less loss of vitamins by heat. Keep a lid on the pan to avoid oxidation.

- Avoid cooking in a copper pan, because it speeds up the rate of oxidation of vitamin C.
- In the case of green vegetables leave the lid off for the first minute or two to preserve the bright green colour.
- Never use bicarbonate of soda as this destroys vitamin C and thiamine.
- Avoid acids in the preparation of green vegetables as it causes the bright green to turn brown and olive green.
- Serve immediately to avoid vitamin loss by oxidation.
- Serve the cooking liquid if possible as a soup or sauce to use the vitamin C lost in the cooking liquid.
- Avoid further mashing or pureeing to prevent vitamin c loss.

Note: use acids such as lemon juice to prevent losses of vitamin C by oxidation and to prevent browning of bananas, avocado and apple.

There are many factors that should be considered when choosing fruits and they include;

- Choose only very fresh, sound, ripe and unblemished fruit,
- It should have a good colour
- Feel firm and heavy for its size.
- Buy in small quantities and use quickly.

When choosing vegetables consider the following;

- Choose vegetables that look fresh, unbruised and insect-free.
- Buy vegetables in season when they are at their best, plentiful and cheap.
- Avoid buying them in polythene bags as these can cause condensation, mould growth and eventually decay.
- Avoid buying in bulk unless time and facilities for deep freezing are available.

Activity:

1. Discover other uses of fruits and vegetables in the diet. You may use the internet if possible or have a discussion with family members. Note points discussed in your book.
2. Take note of the factors to consider when choosing fruits and vegetables. Do you think these factors were considered when purchasing the fruits and vegetables that have been brought home?

Summary:

In this lesson you have learnt;

- The uses of fruits and vegetables in the diet.
- To conserve nutrients during the preparation of fruits and vegetables.
- The factors to consider when choosing fruits and vegetables.
- Prepare fruits and vegetables using various methods.
- Analyze the effects of heat during the cooking of fruits and vegetables.

Time, notebook, pen/pencil, some fruits and vegetables for preparation and cooking

Fruits are usually eaten raw but they may also be cooked and used in puddings, pies or stewed.

Here are some of the recipes for fruit dishes that you can use:**Apple crumble**

Filling

3medium apples (peeled and cored and sliced to 1cm thick

2tbs sugar (can use brown sugar if available)

For the crumble

175g flour

100g sugar

100g margarine/butter

Oven temperature: 190°C/Gas 5

Method

1. Peel, core, slice apples and toss with 2tbs sugar.
2. Put in a pie dish/oven proof container. Flatten down with your hand to prevent too much crumble falling through.
3. Put flour and sugar in a bowl with a pinch of salt.
4. Rub in fat with finger tips until mixture looks like moist breadcrumbs.

5. Pour the crumbly mixture over the apples to form a pile in the centre, and then use a fork to spread it evenly.
6. Gently press the surface with the back of the fork so the crumble holds together, goes crisp and then lightly drag the fork over the top for a decorative finish.
7. Set on a baking tray and put in the preheated oven for 30-45minutes, until the top is golden. Cool for 10 minutes before serving. Note: Try it out with other fruits; pineapples



Pineapple/Apple upside down pudding

100g flour

1 tsp baking powder

100g sugar

100g margarine

1 egg

1 tsp vanilla/pineapple essence

3-6 slices pineapples with core removed from centre (pineapple rings)

3-6 glacé cherries/ 4tbs red plum jam

2tbs brown/Demerara sugar

Method:

1. Grease a round shallow baking tin/saucepan.
2. Sprinkle with brown sugar, place slices of pineapple rings on top and a cherry/jam in each of the hollow centres.
3. Sift flour and baking powder in a mixing bowl; add sugar, margarine beaten egg and essence.
4. Beat mixture thoroughly well; add some liquid to make it soft and dropping.
5. Spread the cake mixture on top of the pineapple rings in the baking tin; spread it evenly and bake until firm and slightly brown.
6. Cool for 5 minutes and turn on a round plate, serve with a suitable sauce.



Vegetables are prepared in different ways including;

- Boiling, this is suitable for all vegetables.
- Baking, for example potatoes in their jackets. Most vegetables except some of green leafy variety may be baked in a casserole. Marrows and tomatoes may be stuffed and baked. Some vegetables like cauliflower and courgettes, may be served au gratin.
- Roasting- potatoes and other root vegetables may be roasted in fat or round the joint of meat.
- Frying; in deep fat – used for potatoes, sprigs of cauliflower, onion rings and parsley.
- In shallow fat – sauté potatoes (usually partially cooked first), onions, tomatoes, mushrooms.
- Braising for celery, chicory, onions, and lentils.
- Grilling for tomatoes and mushrooms.
- Stewing-mushrooms, celery (usually stewed in milk)

Conservative method

This is a suitable method of cooking most vegetables except the green leaf varieties. The vegetables cut finely, are sautéed in fat. Then they are cooked with a small amount of liquid in a covered casserole, by gentle heat in the oven or on top of the stove. This method retains much of the flavor and shape of the vegetables. The liquid should be used as a base for sauces or gravy.

Some recipes for vegetable dishes:

Tomato and cucumber salad

2 tomatoes

1 cucumber

Chopped parsley

1 teaspoon vinaigrette

1. Alternative slides of tomato and cucumber.
2. Sprinkle with chopped parsley.

French beans salad

200g cooked French beans
2 carrots (diced and slightly cooked)
Salt and pepper to taste
1 tea spoon vinaigrette
Combine all ingredients.

Fish salad

200g cooked fish (flaked)
1 hard-boiled egg
50g cucumber
Chopped parsley, 1 teaspoon vinaigrette
Salt and pepper to taste
¼ lettuces

1. Flounce the fish, dice egg and cucumber.
2. Finely stirred the lettuce, mix ingredients together and add parsley.
3. Correct the seasoning
4. Decorate with lettuce

Russian Salad (Vegetable salad)

100g carrots
50g turnips
50g French beans
50g peas
125ml mayonnaise or yoghurt
Salt and pepper to taste
1 tea spoon vinaigrette

1. Peel and wash the carrots and turnips and dice them (½ cm)
2. Cook separately in salted water, refresh and drain well.
3. Top and tail the beans and cut in ½ cm dice, cook, refresh and drain well.
4. Cook the peas, refresh and drain well.

5. Mix all the well-drained vegetables with mayonnaise or yoghurt.
6. Correct seasoning and dress neatly.

Potato salad

200g cooked potatoes

1 tea spoon vinaigrette

Salt and pepper to taste

10g chopped onion

60ml mayonnaise or yoghurt

Chopped parsley or mixed fresh herbs.

1. Cut the potatoes in $\frac{1}{2}$ - 1 cm dice
2. Mix with the onion, add mayonnaise and correct the seasoning.
3. Dress neatly and sprinkle with chopped parsley.

The effects of heat during cooking of fruits are;

- May increase the digestibility by softening the fibre
- Will destroy some of the bacteria present.
- Fruit containing a lot of seeds may be made less irritating to the digestion by cooking and sieving.
- Vitamin C is destroyed by heat, but not quite so quickly as in vegetables. The presence of fruit acids helps to retain the vitamin.

The effects of heat on vegetables include;

- The cell walls are softened and broken, making the food more digestible.
- The starch grains burst, releasing starch.
- Water-soluble vitamins and minerals dissolve into the cooking water.
- Lowering of vitamin value, especially vitamin c by heat destruction.
- Absorption of water which adds to the bulk in some cases e.g. potatoes.
- There is a loss of green colour.
- Over-cooking causes vegetables to disintegrate and lose flavor.

Activity:

Try out some of the recipes given at your pace at home. You may request for some ingredients from your parents. Discover other recipes and write them in your notebook.

Summary:

In this lesson you have learnt;

- To prepare fruits and vegetables using various methods.
- To analyze the effects of heat during the cooking of fruits and vegetables.

TOPIC: FISH**Specific objectives:**

- Discover the nutritive value of fish
- Discover the effects of heat on fish
- Find out the factors to consider when choosing fish
- Practice the different ways of cooking fish
- Demonstrate the different uses of fish in the diet
- Store fish appropriately

Requirements you will need:

Time, notebook, pen/pencil, fresh and smoked fish to observe qualities, fish for cookery

Instructions/Procedures

Remember that you have been given some activities that you are expected to do. Read through carefully and attempt all of them. Please request for ingredients from your parents to carry out some practical cookery. Remember not to waste the ingredients.

Introduction

You have already learnt about eggs in the previous work; use this knowledge to help you understand this topic. Fish is a protein food which very closely resembles meat both in structures and composition. It is more easily digested and thus less satisfying.

Lesson 1: Nutritive value and effects of heat on fish

Specific objectives:

By the end of this lesson, you will be able to:

- a) Discover the nutritive value of fish
- b) Discover the effects of heat on fish
- c) Find out the factors to consider when choosing fish

Requirements you will need:

Time, notebook, pen/pencil, fresh and smoked fish to observe qualities, fish for cookery

The flesh is made up of muscles divided into flakes. The flakes are myotomes and vary in size according to the fish. They are composed of the same type of protein amino acid pattern as meat. However, there is less connective tissue in fish and the flakes are therefore not held together as strongly as meat fibres. This causes the flakes to fall apart. For this reason, fish is tender than meat and quicker to cook but is more liable to break up on serving. Fish is particularly suitable for invalids as it is easy to eat and digest.

The nutritive value of fish includes;

Protein:

Fish contains proteins of high biological value in slightly smaller proportions than does meat. Shell fish has generally more proteins but it tends to be indigestible. The connective tissue contains collagen but no elastin.

Fat

In white fish fat is present in the liver only. There is usually less than 1% but in halibut it is about 4%. In oily fish, the oil is distributed throughout the flesh. In shell fish, there is about 4%.

Carbohydrate:

This is lacking in all fish. Carbohydrate foods such as rice or potatoes are generally served with fish to make a balance meal.

Vitamins:

Fish liver oils are the best source of vitamins A and D. Oily fish are also a good source. White fish lacks these vitamins. All fish contain small amount of vitamin B group vitamins.

Mineral elements

Shell fish, is an excellent source of mineral elements. Iodine and fluorine are in sea fish. Calcium and phosphorus are in fish of which the bones are eaten e.g. mukene/silver fish and sardines. Potassium and sodium are present in all fish. Iron is found in sardines, tuna, sprats, and smelts but fish is not a good source of iron.

Water

This varies according to the fat content, but is usually up to 80%. The flesh of fish is similar to that of meat in structure but contains a greater %age of water. This accounts for the characteristic delicacy of its flavor.

Heat affects fish in various ways and these are;

- Protein coagulates and shrinks slightly at 60-70°C and the fish becomes opaque.
- The connective tissue changes to gelatine, making the fish tender. Overcooking causes the fish to disintegrate.
- Bacteria and parasites such as worms and eggs are destroyed if sufficient heat is used.
- Vitamins A and D remain unchanged but there is some loss of B group vitamins.
- Some minerals and extractives dissolve into the cooking water; this should be used for sauces and soups.

There are many kinds of fish in the market and therefore the need to have some qualities to look out for. The factors to consider when choosing fish are;

- Pleasant, fishy smell
- Bright, prominent eyes that are moist
- Bright red gills
- Firm to the touch and a stiff tail.
- Moist skin
- Plentiful supply of scales on scaly fish.

Hint: Buy fish which is in season as it is cheapest and has the most flavor.

Smoked fish should be glossy and clean with firm flesh but not sticky.

Activity 1.1:

Observe fresh fish that has been bought and take note of the qualities that you have learnt.

Summary:

In this lesson you have learnt that fish is made up of high biological value protein, fats, vitamins A and D, iodine and fluorine, calcium, phosphorus, potassium and sodium.

The effects of heat on fish are; the protein coagulates; shrinks and the connective tissue changes to gelatine. Overcooking causes the fish to disintegrate, bacteria and parasites are destroyed, vitamins A and D remain unchanged but there is some loss of B group vitamins. Some minerals and extractives dissolve into the cooking water. The qualities of fresh are; pleasant fishy smell bright and prominent eyes that are moist, bright red gills, firm to the touch and a stiff tail. The skin is moist and also plentiful supply of scales on scaly fish.

Lesson 2: Nutritive value and effects of heat on fish**Specific objectives:**

By the end of this lesson, you will be able to:

- practice the different ways of cooking fish
- demonstrate the different uses of fish in the diet
- store fish appropriately

Requirements you will need:

Time, notebook, pen/pencil, fresh and smoked fish to observe qualities, fish for cookery

You may cook fish in various ways but take care to avoid breaking it up. Some of these methods are used to cook fish.

- Poaching, sometimes called boiling is suitable for large fish. It should be simmered very gently in just enough boiling liquid to cover it like fish stock. Add a little salt, lemon juice/ vinegar to improve flavor and the acid helps to keep the flesh white.
- Stewing is a very suitable way of cooking even the most delicate portions of fish. It is a particularly good method of cooking fish for invalids as it's very easily digested.
- Stewing of fish is best carried out in the oven using milk as the liquid. This can afterwards be used as the base of a sauce.
- Baking is a method in which very little of the flavor of fish is lost.

- Grilling is a quick and appetizing method of cooking small fish or fillets with no loss of flavors.
- Frying is an appetizing method of cooking fish, most of which should be coated first.
- Souasing is a method of stewing fish in the oven using vinegar as the liquid and adding seasoning and herbs to give a highly flavored, spicy dish.

Fish cakes

200 g cooked fish, free from bones and skin.

200 g mashed potatoes

Salt and pepper to taste

25 g flour

1 egg

50 g bread crumbs

Method:

1. Combine the fish, potatoes and eggs and season.
2. Divide into 4 pieces. Mould into balls.
3. Pass through the coating of flour, egg and bread crumbs.
4. Flatten slightly, neaten with a pallet knife.
5. Deep fry in hot fat for 2-3 minutes.
6. Serve with fried or picked parsley
7. Serve with a suitable sauce, such as tomato sauce.

Fish pudding

200 g white filleted fish

25 g stale bread without crust

50 g margarine

125 ml milk or fish stock

1 egg

2 tbsp. chopped parsley

A little grated lemon rind

Salt, pepper and lemon juice to taste

To coat: 250 ml parsley or egg coating sauce

1. Grease a 450 ml basin and prepare a steamer.
2. Heat the milk or fish stock with the margarine. Add the bread and cover it to

sock.

3. Skin the fillets and flake them.
4. Mash the bread in the liquid and when cool, add the fish and the egg and beat the mixture smooth.
5. Season well and add the lemon and parsley.
6. The mixture should drop easily from the spoon.
7. Steam in the basin over simmering water until the pudding is firm in 45 minutes to 1 hour.
8. Turn out the pudding, coat it with sauce and garnish with parsley.
Sprinkle chopped parsley on top of the sauce and decoratively cut lemon slices separately.

Fish stew

- 1 medium sized fish
- 750mls water
- 2 tomatoes (blanched)
- 1 ½ teaspoon salt
- 1 onion
- 1 teaspoon curry powder
- 2 table spoons cooking oil
- 1 tablespoon wheat flour.
- 1 green chilli) optional) ½ lemon for serving
- 2 chopped teaspoons cot mill
- 2 cloves crushed garlic
- Time 45 minutes

Method

1. Clean and cut the fish into suitable pieces.
2. Chop onions, blanches tomato, green pepper, chilli and crush the garlic.
3. Marinade the fish and leave to stand for a while and then deep fry.
4. Fry the onions. Garlic tomato, green pepper, chilli and crushed garlic.
Add wheat flour and curry powder
5. Add water gradually stirring hard after every addition. Bring to boil add salt and cot mill.
6. Add the fried fish and simmer for 10 -15 minutes.
Serve sprinkled with chopped parsley, decoratively cut lemon slices separately with a suitable carbohydrate and vegetable.

Fish should be included in the diet regularly because;

- It contains slightly less protein than meat, but in a very digestible form.
- White fish, which is deficient in fat, is ideal for invalid and convalescent diets. It is an excellent dish for low- calorie diets provided it is not cooked in fat.
- It is also ideal for infants, young children and the elderly. This is because it is nutritious, has a mild flavor and is easy to eat.

Fish should be bought on the day it is to be used if possible and not stored. If storage is necessary, wrap loosely in fresh paper and put it in a refrigerator.

You may sprinkle the fish with vinegar or lemon juice and put on a plate in a cool place.

Never soak fish in water or leave wrapped in tight layers of paper.

Do not store fresh fish for more than one day in a refrigerator.

Activity:

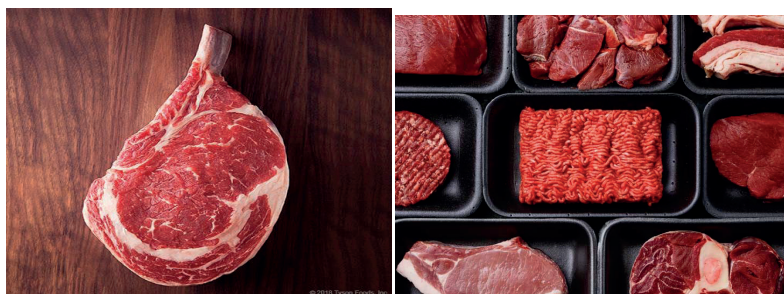
Follow the recipe to prepare two fish dishes. You may also use the internet if possible or discuss with family members how to prepare other fish dishes.

Summary:

In this lesson you have learnt that fish can be prepared by; poaching, stewing, baking, grilling, frying and sousing.

Fish should be included in the diet regularly because; it contains proteins in a very digestible form. White fish is ideal for invalid and convalescent diets. It is excellent in low calorie diets. It is also ideal for infants, young children and the elderly.

If storage of fish is necessary, wrap loosely in fresh paper and put it in a refrigerator. You may sprinkle the fish with vinegar or lemon juice and put on a plate in a cool place. Never soak fish in water or leave wrapped in tight layers of paper.

TOPIC: MEAT

Specific objectives

By the end of this lesson you should be able to:

1. Identify the different cuts of meat
2. Discover the suitable methods of cooking each cut.
3. Find out the nutritive value of meat dishes.
4. Discover the effects of heat on meat.

Requirements you will need:

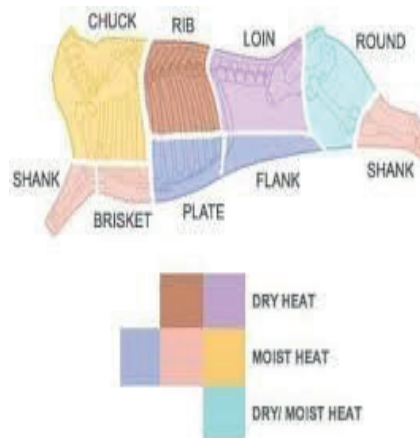
Time, notebook, pen/ pencil, heat source, meat (of any kind), kitchen equipment

Lesson 1: Meat cuts and different methods of cooking meat**Introduction:**

Meat is muscle tissue and consists of bundles of fibres which contain the meat and juices and proteins. The bundles of fibres lie side by side and are held together by connective tissues. On the wall of the fibres the connective tissue is called elastin and between the fibres the connective tissues are called collagen, and the two are proteins.

The length and thickness of the muscle fibres in lean meat vary according to the type of animal, the breed, the age and the cut.

Different cuts of meat and suitable methods of cooking each cut.



Cooking Methods for Proteins			
Type of Cut	Tender Cuts	Medium-Tender Cuts	Tough Cuts
Cooking Method	Poach, Grill/Broil, Sauté, Fry, Roast, Sous Vide	Roast, Braise, Grill/Broil	Braise, Stew, Simmer, Sous Vide, Barbecue
Meats	Tenderloin Rib Roast, Chops, Steaks Loin Roast, Chops, Steaks	Leg, Round, Fresh Ham, Sirloin, Flank Steak	Shoulder/Chuck, Brisket, Belly, Plate, Breast, Shanks Short Ribs, Spare Ribs, Back Ribs
Poultry	Breast	Leg	Leg
Fish	Most Species	Shark Chilean Seabass Monkfish	
Shellfish	Crab, Lobster, Shrimp Scallops, Mussels, Oysters, Squid	Clams	Squid Octopus Snails

Nutritive value

- Meat contains protein of a high biological value. That is myosin, albumin and globulin found in the muscle and collagen and elastin in the connective tissue.
- All meat, even the leanest cuts, contains some fats.
- Mineral salts include iron found in the liver and kidney. There are little amounts of Sulphur and offal is rich in phosphorus. Calcium is lacking in all meat as well as the minerals like iron and zinc.
- Meat contains most of the B-vitamin complex (B1, B2, niacin, B6 and B12). Meat lacks carbohydrate so it should be accompanied with carbohydrate foods.
- Most meat is about 70% water varies with the amount of fats.
- Extractives- these are animal flavourings present in the tissue of meat.

The effects of heat on meat

1. Protein coagulates; it toughens if cooked too quickly.
2. Elastins contracts and water evaporates, causing meat to shrink and juices to escape.
3. Collagen changes to soluble gelatin upon moist cooking.
4. Haemoglobin turns brown, giving a cooked appearance.
5. Fat decomposes and melts away.
6. Bacteria and parasites are destroyed at high temperatures and decomposition is delayed.
7. Meat becomes tender and digestible.
8. Extractives are released producing appetizing odours and flavours and some B vitamins and minerals pass into meat juice.

Follow up activity:

Prepare and cook a beef stew for your family's dinner. Take note of the observation (changes) that take place during the cooking process.

Summary:

In this lesson you have discovered the different cuts of meat and their methods of cooking. You have found out that meat is composed of proteins, fats, mineral salts and vitamins especially the vitamin B group. You have also looked at the changes in meat during cooking.

TOPIC: CEREALS**Specific objectives:**

By the end of this topic you should be able to:

1. Discover the types of cereals.
2. Discover the nutritive value of cereals.
3. Find out the types of flour.
4. Experiment the effects of heat on cereals
5. Make cereal dishes

Requirements you will need:

- Time
- Notebook
- Pen pencil
- Some cereal grains, flour and other ingredients according to the recipe.

Instructions/procedure

Find a suitable place and time to read this material. Attempt all the activities given. In case you need to consult family members, feel free to discuss with them. Some activities may require your parents to provide materials and ingredients for you. Remember that some activities may need more than 1 hour to complete them. Follow the instructions that you have been given carefully before doing each activity.

Glossary:

Starchgelatinization: - is a process that breaks down the intermolecular bonds of starch molecules in the presence of water and heat causing it to thicken.

Dextrinisation-It's the breaking or partially breaking down or hydrolyzing starch or **cereal** of high starch content by means of heat, acids, acid salts, enzymes, or a combination.

Lesson 1: Nutritive value of Cereals and varieties of flour

Specific objectives:

By the end of this lesson, you will be able to:

- List the types of cereals.
- Explain the nutritive value of cereals.
- Find out the types of flour.

Cereals are annual grass plants, whose grains are used as food. They include maize, rice, millet, sorghum, and wheat. Some cereals are staple foods in some cultures. Cereals also include prepared products such as breakfast foods. They are convenient to transport, fairly cheap, can be stored for long periods. They are cooked and eaten in different forms.

Nutritive value of cereals:

- Starch is the main constituent of cereals, forming about 75% of their nutrient content.
- Fat are present in small amounts in most cereals; the germ of wheat contains more.
- Proteins of low biological value are present with only small amounts of essential amino acids. Lysine for example, is deficient in many cereals, including wheat, and there is only half as much methionine, tryptophan and isoleucine in cereal proteins as there is in animal proteins.
- Mineral elements include calcium, iron and phosphorus. These mineral elements may not be available because of the presence of phytic acid which makes them insoluble and so unavailable.
- Cereals are good sources of vitamin B group. These are found in the outer husk and germ, which is removed during milling.
- Cereals are deficient in moisture.

Types of flour

Dry cereals are milled to provide flour. The flour can be used to make various products. You will be able to use some cereal flours in baking lessons.

Activity 1:

- Can you identify the types of flour obtained from cereals on the market or your food store at home?
- Give the different uses of the flour mentioned. Write this in your notebook.

Varieties of wheat flour

1. White flour-is heavily milled and sieved to remove the outer skins and germ. It is about 70% extraction. White flour is usually fortified by added calcium, iron, vitamin B1 and nicotinic acid.
2. Whole meal flour-this contains the whole grain (100% extraction) which is crushed after cleaning. The bran provides roughage in the diet. Whole meal and wheat meal flours are rich in B group vitamins contain iron, calcium fat and cellulose than white flour. The presence of fat and higher moisture content reduces its shelf life.
3. Stone-ground whole meal-wheat ground with stones has a superior taste and food values. It contains most of the B group vitamins.
4. Self-rising flour-this is house hold (white) flour to which a raising agent for example baking powder has been added after milling.
5. Starch-reduced flour –some of the starch is removed by washing, leaving a higher proportion of protein and other nutrients. This is ideal for those who are slimming.
6. Wheat germ flour-A mixture of 75% white flour + 25% cooked germ-the germ. Cooking gives a malted flavor.
7. Gluten-free flour –White flour is 'washed' so that the starch is removed with the water; this starchy liquid is dehydrated to produce gluten free flour. The removal of the gluten means that the flour loses some of its nutritive value. To compensate for this soya flour is added. It is rich in protein and gives the gluten free flour a cream colour. This is used by those who suffer from coeliac disease.
8. Strong flour-this flour has a high percentage of gluten and given better results in yeast baking and puff pastry.
9. Semolina – This is after the rough endosperm obtained after the initial splitting of the wheat grain during the milling process.

Summary: In this lesson you have learnt that:
Cereal grain crops are grown in all parts of the world. They include; maize, rice, millet, sorghum and wheat.
Dry cereals are milled to provide flour. The flour can be used to make various products.

Lesson 2: Effects of heat on cereals

Specific objectives:

By the end of this lesson, you will be able to:

1. Experiment the effects of heat on cereals
2. Make cereal dishes

Requirements you will need:

Time, notebook, pen/pencil, some cereals to demonstrate the effects of heat

Effects of heat on cereals

1. Dry heat causes the starch grains to expand and burst releasing the starch cells which absorb fat or moisture from the surrounding matter – fat in pastry.
2. Moist heat swells the starch granules until they burst and absorb the water surrounding them causing them to gelatinize. This makes the starch digestible, e.g. when making porridge
3. Cereals absorb large amount of water, often tripling their weight by the end of the cooking time.
4. Protein such as gluten in its expanded form coagulates and sets baked products such as bread.
5. Cellulose absorbs water and softens.
6. Surface starch is converted into dextrin which browns baked products such as bread or toast.
7. Thiamine, which is plentiful in most cereals, is reduced by heat.
8. An alkali (bread soda) combined with cereals destroys the thiamine present.

Activity2:

Step 1 Get a slice of bread. Place on top of a wire rack on a charcoal stove/oven. Heat up each side for about 1 or 2 minutes. **OR** roast cassava or potatoes on a charcoal stove/firewood/oven. What is your observation?

Step 2 Heat up 2 cups of water. Mix 4 tablespoons of millet/maize flour and 6 spoons of water. Pour this into the boiling water, stir well and continue to cook. Observe the changes that take place.

Step 3 Get some popcorn seeds place in a saucepan with oil. Put on the source of heat. What is your observation?

Make cereal dishes

Activity 3:

You can prepare at least two dishes following the recipes below for your family.

Millet Bread

250gms cassava flour

250gms millet flour

250mls water

Time 15minutes

Method

1. Sieve both types of flour together to mix them thoroughly
2. Boil the water.
3. Mix them thoroughly
4. Add half the flour to the boiling water and mix quickly until all the water has been absorbed and the bread is fairly thick.
5. Add the rest of the flour until a reasonably stiff bread is formed.
6. Keep turning the millet bread and breaking up all the lumps with a mingling stick until all lumps disappear. Use low heat for about ten minutes.

Turn it out on to a clean plate or a serving basket dusted with millet flour then toss it around until it is smooth

Posho Delight

- 250g maize flour
- ½ medium grated or chopped onion
- ½ medium grated carrot
- 1 table spoon margarine
- Salt to taste
- Hot water

Method

- Put the onions, carrot, salt and fat into the hot water in a saucepan. Cover and boil for a few minutes
- Pour in the maize flour and mingle until ready.
- Either mould the posho using any greased baking tin and bake for a few minutes at 150c or steam the posho in banana leaves.
- Serve well garnished.

Steamed or Boiled Vegetable Rice



- 1 small cup rice
- ½ medium chopped onion
- 1 chopped carrot
- 100g fresh peas
- salt to taste
- 2 cups hot water
- 1 teaspoon fat

Method

- Put all the ingredients into a saucepan, cover and steam or boil over gentle heat until ready.
- Serve attractively

Chapattis



- 300g plain flour
- 50g fat
- ½ tsp salt
- 300ml or enough water to bind
- Vegetable oil for shallow frying
- 1 grated onion

Method

1. Sieve flour into a bowl
2. Rub in the margarine or two tablespoons cooking oil, add an egg.

3. Add the grated onion and mix thoroughly
4. Add salt to the measured water
5. Mix water to the flour
6. Knead well till smooth
7. Cut into eight equal pieces. Roll each into a ball.
8. Cover with a plastic sheath for 15-20 minutes to relax the pastry.
9. On a floured board, roll the ball flat and circular to a thickness of 0.5cm.
10. Heat the pan and grease it lightly with some cooking oil.
11. Place the chapatti on the hot pan. Press down lightly and leave to cook for two minutes and turn the other side too.
12. The cooked chapatti should be golden brown. Do the same for all the balls.
13. The cooked chapatti should be golden brown. Do the same for all the balls.
14. Put on a plate and cover to keep it soft.
15. Serve chapatti with suitable protein and vegetable dish.

Summary: In this lesson you have learnt that:
Moist heat on cereals causes gelatinization. Dry heat leads to starch grains to burst and dextrinise. You have tried out different dishes using cereals.

TOPIC: SAUCES AND GRAVY**Specific objectives:**

By the end of this lesson you should be able to:

1. Discover the types of sauces
2. Find out the rules for prepare sauces
3. Identify the suitability and uses in the diet.
4. Make sauces and gravy
5. Identify the importance of wheat flour in the cooking of sauces and gravies

Requirements you will need:

Time, notebook, pen/pencil, recipe books

Instructions/procedure

Attempt all the activities given. In case you need to consult family members, feel free to discuss with them. Some activities may require your parents to provide materials and ingredients for you. Remember that some activities may need more than 1 hour to complete them. Follow the instructions that you have been given carefully before doing each activity.

Glossary:

Roux -a mixture of fat (especially butter) and flour used in making sauces.

Gravy- a sauce made by mixing the fat and juice extracts from meat during cooking with stock and other ingredients.

Glossy- shiny and smooth appearance of sauces

Purees- a smooth cream of liquidized or crushed fruit or vegetables

Lesson 1: Specific objectives:

1. Discover the types of sauces
2. Find out the rules to follow when preparing sauces
3. Identify their suitability and uses in the diet.

Requirements you will need:

- Time
- Notebook
- Pen pencil

- Some ingredients according to the recipe like:
 - Stock and soup ingredients
 - Vegetables, herbs and spices
 - Kitchen equipment (sauce pan, wooden spoon, sieve, ladle)
 - Heat source

A sauce is a liquid food which is usually flavoured and thickened with wheat flour, corn flour, eggs or cream. A good sauce will improve any food, adding flavour, food value, moisture and often colour. It should be smooth, glossy in appearance, definite in taste and light in texture. Use thickening in moderation not to change the flavour of the sauce.

Types of sauces

1. Simple sauces:

- Blended (e.g. corn flour or custard powder)
- Infused e.g. jam and syrup sauces thickened with corn flour.
- Or made from purees e.g. apple, cranberry, tomato.

2. Roux sauces;



These include white sauce (béchamel), brown sauce (Espagnole and their variations and chauffoid sauce.

1. Egg – based sauces.

These include egg custards, Hollandaise sauce (a hot egg/ vinegar/butter emulsion) and mayonnaise (a cold/ egg/ oil/ vinegar emulsion).

2. Cold sauces and dressings e.g. mint sauce, horse radish sauce, French and other salad dressings.

3. Butter sauces;

Such as brandy butter and maître d' hotel butter.

Sauces can be classified according to their consistency.

1. Pouring sauce;

As its name implies; should be sufficiently fluid to be poured from a container and is used as an accompaniment e.g. custard sauce with stewed fruit, parsley sauce which steamed food.

2. Coating sauce.

This is thicker than a pouring sauce. It should be sufficiently ladled over the food it is to coat and to flow evenly over it before it begins to set, but thick

enough to form a covering which does slide off, e.g. coating for fish or cauliflower au gratin.

3. Binding sauces or panada.

Are too thick to flow and are used to bind together finely – divided ingredients e.g. croquettes, rissoles.

There are two methods of preparing these sauces

- a. By blending, usually corn flour.
- b. By roux method, when ordinary flour is used.

Blending method:

This method is very similar to that used in starch-making in laundry but a little fat may be added to improve flavour, colour and glossiness.

1. Blend the corn flour to a smooth cream with a little of the cold liquid.
2. Bring the remainder of the liquid to the boil and add seasoning, flavourings and fat.
3. Pour the boiling liquid on the blended mixture, stirring continuously.
4. Return all liquid to the pan and bring back to the boil. Stir continuously over a low heat for two minutes. E.g. corn flour moulds, when poured into wetted containers while hot and allows cooling before serving.

The Roux method



This gives a glossier and better flavoured sauce. It is always made with plain flour and fat; with a liquid, usually milk, but this may be combined with meat or fish stock.

1. Melt the fat in the pan but do not allow it to brown.
2. Stir the flour into the melted fat and cook together until smooth but do not allow the mixture to brown.
3. Remove the pan from the heat and add 1/3 of the liquid, stirring continuously. Continue to heat and stir until mixture is thick and smooth. Repeat this process with each of the other 2/3 of the liquid.
4. Boil gently for 3 -4 minutes to cook the starch completely, stirring continuously.

NB: a good sauce should be free from lumps, have good flavour, glossy, of the correct consistency, good colour.

Variations of basic sauce mixtures

Cheese sauce 50 -100g grated cheese to each 250ml sauce.

Egg sauce: 1 hard – boiled egg, chopped to each 250ml sauce.

Mustard sauce: 2 tsp. dry mustards and 2 tsp vinegar to each 250ml sauce.

Onion sauce: 250g cooked onions, chopped to each 250ml sauce

Suitability and uses in the diet.

1. It may be part of a dish e.g. beef (stew, braised celery).
2. It may be used to coat food e.g. cauliflower au gratin.
3. It may be used to bind food e.g. rissoles.
4. It may be served with food as an accompaniment e.g. gravy
5. Important in the diet as they stimulate the appetite and aid digestion.
6. They give flavour to insipid foods.
7. Help to counteract richness of indigestible foods (e.g. roast duck and orange sauce).

Rules for prepare sauces

1. Start with fresh ingredients these give the best flavor.
2. Make your own stock
3. Thicken with starch- a mixture of flour and butter, can be used to thicken opaque sauces.
4. Thicken without starch- As you simmer, the sauce the moisture will evaporate, leaving you with a viscous sauce.
5. Blend the sauce well to get a smooth glossy sauce
6. Season your sauce to taste.
7. Match your sauce to your meal- Think about the type of meal you're having, then decide on a sauce.

Lesson 2: Making sauces and gravy**Specific objectives**

- Make sauces and gravy
- Identify the role of wheat flour in cooking of sauce and gravy

Requirements

Notebook and pen, heat source, sauce and gravy ingredients, kitchen equipment

Activity:

Follow one of the recipes and make a sauce for the family's dinner. Ask your family members to give you comments on the sauce.

Write down the qualities of the sauce you have made in your notebook.

White sauce made with white stock

100g margarine

100g flour

1 litre stock (from fish chicken or veal)

1. Melt the fat in thick bottom pan
2. Add the flour and mix thoroughly.
3. Cook over gentle heat for a few minutes without browning
4. Add stock gradually and mix thoroughly until smooth.
5. Bring to boil and reduce the temperature to simmer for about an hour.
6. Pass through a strainer.
7. Reheat and serve.

Variations of White sauce**Cheese sauce**

To the basic white sauce, add 50 g grated cheese and 1 egg yolk.

1. Mix well in the boiling sauce.
2. Remove from heat and strain if necessary, reheat but do not allow to re-boil.
3. Serve with fish or vegetables.

Onion white Sauce

To the basic white sauce, add 100 g chopped or diced onions lightly cooked either by boiling or sweating in butter i.e. without browning. Serve with roast mutton

Egg sauce

To the basic white sauce, add 2 hard-boiled eggs, diced. Serve with poached or boiled fish.

Cream sauce

To the basic white sauce, add cream, milk or natural yoghurt to give the consistency of double cream. Serve with poached fish or boiled vegetables.

Parsley Sauce

To the basic white sauce, add 1 tbsp. chopped parsley. Serve with poached or boiled fish and vegetables.

Brown onion sauce

25 g margarine / butter
100 g sliced onions
2 tbsp. vinegar
250 g reduced stock

1. Melt the fat in a pan
2. Add the onions and cover with a lid
3. Cook gently till tender
4. Remove the lid and colour lightly
5. Add the vinegar add completely reduce
6. Add the reduced stock, simmer for 5-10 minutes
7. Skim and correct the seasoning.

Bean sauce

250gms fresh beans	1 onion
1 big tomato (blanched)	½ teaspoon currying
powder	1 carrot
½ green peppers	
1 tea spoon cooking oil or 1 tablespoon	2 cloves garlic
¼ teaspoon white pepper	1 teaspoon parsley
1 litre water	

Method

1. Sort and wash the beans
2. Put the beans in a saucepan, add water and put to boil for 45 minutes
3. Cut the vegetables into small pieces,
4. Heat the oil in a clean pan to frying temperature. Add onions and garlic and fry until soft. Add curry powder.
5. Add green pepper, carrots, parsley and blanched tomato, stir to prevent sticking. Add the beans without the stock and fry for five minutes.

6. Add the stock, salt and white pepper. Continue simmering for another 15 minutes.

Variations

1. Dry bean sauce – the beans have to be soaked after washing and cook for a longer time.
2. Leafy vegetables and bitter tomatoes may be added before simmering.
3. Fish powder or flakes may be added to the sauce minced to the sauce during simmering.
4. Fresh or dry beans may be skinned boiled, mashed and fried using ghee. Add liquid seasoning and other vegetables.

NB. Peas may also be used in the same way as beans.

Firinda

- i) Fresh or dry beans may be skinned boiled and mashed fried using ghee. Add liquid seasoning and other vegetables.

NB. Peas may also be used in the same way as beans.

Curry sauce (1)

-250g tomatoes	-100g onions
-50g fat (butter or margarine)	-2 cloves garlic
-10 fresh peeled ginger	-½ tea spoon chilli powder
-½ tea spoon dried coriander	-½ tea spoon salt
-3 tea spoons water	

1. Peel and slice onions
2. Peel and crush garlic
3. Wash and firmly chop ginger
4. Heat fat in a pan on moderate heat, add onions, garlic and ginger, and cook for 5 minutes.
5. Add chilli powder, coriander and salt continue frying for more 5 minutes.
6. Add tomatoes and water and continue cooking over low heat for more 20 minutes.
7. Note: This sauce can be used to make different types of curries such as beef, chicken, fish, egg and vegetable.

Curry Sauce (II)

- 50g onion
- 1 clove of garlic
- 10g margarine/butter
- 10g of flour
- 5g curry powder
- 10g ginger root in 5g ground ginger
- 10g sultanas
- Salt to taste
- 5gml tomato puree
- 25g apple chopped
- 1 tea spoon – chutney
- 5g desiccated coconut
- 375ml of stock

Method

1. Gently cook the onions and garlic in fat without browning.
2. Mix in the flour and curry powder
3. Cook gently to a sandy mixture
4. Mix in the tomato puree, cool.
5. Gradually add boiling stock and mix thoroughly to a smooth sauce.
6. Add the remainder of the ingredients, season with salt and simmer for 30 minutes.
7. Skin and correct the seasoning served with eggs, vegetables, fish.

Bread sauce

- 375ml milk
- 1 small onion studded with a clove
- 25g fresh bread crumbs
- Salt to taste
- 10g butter

1. Infuse the simmering milk with the studded onion for 5 minutes.
2. Remove the onion, mix in the crumbs, simmer for 2 – 3 minutes.
3. Season, correct the consistency.
4. Add the butter on top of the sauce to prevent a skin forming.
5. Mix well when serving.

Note: Served with roast chicken, turkey and roast game

Tomato sauce

- 10g margarine/butter
- 50g tomato pounce
- 375ml stock
- ½ clove of garlic
- Salt and pepper to taste
- 10g bacon scraps (optional)
- 10g flour
- 50g onion
- 50 g carrot
- 25g celery
- ½ bay leaf

1. Melt the margarine/butter in a pan.
2. Add the vegetables and herbs (mirepoix) and bacon scraps if used. Brown slightly.
3. Mix in the tomatoes puree, allow cooling.
4. Add boiling stock gradually and stir to boil.
5. Correct the seasoning and cool.
6. Add the garlic, season and simmer for 1 hour
7. Correct the seasoning and cool
8. Pass through a fine strainer.
9. Reheat and serve

Served with spaghetti, eggs, fish, meat

Roast gravy

- 200g Beef bones or trimmings
- 250 ml stock
- 50g onion
- 25g celery
- 50g carrot

1. Chop the bones and brown then in a little fat on top of the stove in a frying pan. Drain off all the fat.
2. Place the bones in a sauce pan with the stock.
3. Bring to boil, skim and allow to simmer.
4. Brown the vegetables highly in a little fat and add the bones.
5. Simmer for 1 ½ - 2 hours.
6. Remove the joint from the roasting tin when cooked.

7. Return the tray to allow heat to allow the sediment to settle.
8. Drain off the fat carefully, leaving the sediment in the tin.
9. Return the joint to the stove and brown carefully.
10. Remove the grease from the brown stock
11. Allow to simmer for a few minutes.
12. Correct the colour and seasoning.
13. Strain and skim - Reheat and serve.

Note: The gravy may be renaissance by simmering the roast gravy with the addition of tomato paste and a few mushroom trimmings. A little flour may be added in the sediment and allowed to brown before adding the stock.

Importance of wheat flour in cooking of sauce and gravy

Wheat flour in sauces, gravies, plays the role of:

- Thickening.
- Nutritive value it contains proteins, fats, and starch.
- Giving a glossy, creamy mouthfeel
- Adding body to sauces like in creamy chicken sauces

Hint: When a sauce begins to thicken, the starches within each flour particle take up liquid. Stirring also keeps the temperature of the sauce uniform so the sauce stays smooth as each starch granule takes up its share of water.

TOPIC: STOCK, SOUPS AND APPETIZERS**Specific objectives:**

By the end of this topic you should be able to:

1. Discover the types of stock, soups and appetizers
2. Find out the rules for preparing stock, soups and appetizers
3. Discover the uses of stock, soups and appetizers in the diet.
4. Make stock, soups and appetizers

Requirements you will need:

Time, notebook, pen/pencil, heat source

Instructions/procedure

Find a suitable place and time to read this material. Attempt all the activities given. Some activities may need more than 1 hour to complete them. Follow the instructions that you have been given carefully before doing each activity.

Introduction

In the previous lesson we learnt to prepare and cook sauces. Soup is a liquid dish, usually savoury and made by boiling meat, fish, or vegetables in stock or water. Stock is a liquid in which bones, vegetables, scraps of meat have been simmered gently for a long time it is used as a basis for savoury sauces and soups improving the flavour and colour.

Glossary:

Appetizer-is a small dish served before a meal

Broth -is simply a liquid that is built from protein and/or vegetables with the addition of water.

Convenience stock-already made concentrated crystal, cube and powder forms found on the market.

Dips are used to add flavor or texture to a food, such as pita bread, dumplings, crackers, cut-up raw vegetables, fruits, seafood.

Extractives-are the water-soluble part of meat responsible for its flavour.

Garnishes-are items or substances used as decoration accompanying a prepared food dish or drink.

Stock cubes- dehydrated vegetables, meat stock, a small portion of fat, preservatives, salt, and seasonings, shaped into a small cube.

Savoury-It is food belonging to the category that is salty or spicy.

Purees- is cooked food, usually vegetables, fruits or legumes, that has been ground, pressed, blended or sieved to the consistency of a creamy paste or liquid.

Lesson 1: Stock and Soups

Requirements you will need:

Time, notebook, pen/pencil, heat source, stock and soup ingredients, kitchen equipment (saucepan, wooden spoon, spoon, sieve)

Types of stock and appetizers

The types of stock vary with the ingredients used like:

- Scraps of lean meat, raw or cooked.
- Bones of meat or fish.
- Giblets.
- Root vegetables rather than potatoes.
- Bacon rinds.
- The liquid in which vegetable, meat or fish have been cooked.

The different types of stock include:

- Convenience stock - Here stock cubes of various flavours are used with the addition of hot water to produce 'instant' stock.
- White stock- Use pale meats (veal, chicken scraps, etc.) and do not fry.
- Vegetable stock - Use Onions, carrots, celery and mushrooms, tomatoes, leeks and parsnips.

Appetizers/ Hors d'oeuvres

Appetizers or starters are small dish served before a meal. Some are served cold, others hot. Appetizers include: soups, cheese bites, chips and dip, cocktails, finger foods (meat balls, meat rolls, samosa), fruits (unsweetened fruit drinks) and vegetables

Diagrams showing some appetizers



Types of Soups

1. Broths

Small pieces of meat and vegetables served in seasoned liquid. For invalids' diets, the meat and vegetables may be strained off before serving. The liquid is thickened by the addition of a cereal ingredients for example rice, pearl barley varieties of broth: scotch, chicken, mutton, rabbit, veal.

2. Clear soups or consommés

They are made from a rich bone stock clarified (to make clear) with egg whites. It consists of adding egg white and crushed egg shell to the other ingredients during preparation and straining the soup before serving.

3. Thickened or creamed soups.

These are made from meat, fish and vegetables and thickened by flour, corn flour. You can stir in beaten egg mixed with cream varieties include; cream of tomato, celery.

4. Purees.

Soups thickened with a puree of their own ingredients. Example bean, pea, potato, tomato

Rules for prepare stock

1. The pan used should be strong and deep, with a well-fitting lid.
2. Cut meat scraps into small pieces before cooking in order to extract as much flavour as possible.
3. Vegetables should not be chopped finely for cooking as they might break down and cause the stock to become cloudy instead of clear.
4. There should be no fat floating in the stock. Therefore, take care to remove all fatty layers from meat.
5. Starchy foods should not be included, because of their poor keeping qualities, may cause the stock to become sour.

Uses of stock and appetizers in the diet

Appetizers

- It stimulates the appetite,
- encourages the secretion of digestive juices and
- introduce variety to the diet
- Soups give warmth to the body on cold days.
- Enriched appetizers especially proteins add on the nutritive value of the diet.
- Broths are given to invalids and convalescents as a dilute and easily digested form of food.

Stock

Stock is used:

- As a liquid to substitute for water,
- To add small amount of soluble flavourings (extractives)
- To add mineral salts and protein
- To increase the flow of digestive juices and so assists the digestion of food.

Summary:

In this lesson you have learnt that appetizers or starters are small dish served before a meal. They include: soups, cheese bites chips and dip, cocktails, finger foods, fruits and vegetables.

Flavour in appetizers stimulates the flow of gastric juices and facilitates digestion.

Requirements you will need:

Time, notebook, pen/pencil, heat source, stock and soup ingredients, kitchen equipment (saucepan, wooden spoon, spoon, sieve)

Activity:

Follow one of the recipes and make stock. Use the stock to make one soup for the family's dinner. Ask your family members to give you comments on the sauce.

Write down the qualities of the sauce you have made in your notebook.

You can try out some other soup recipe for practice.

Convenience stock

Stock cubes of various flavours are available which require the addition of hot water to produce 'instant' stock.

Brown stock

1. Remove fat (or bones) and cut meat into small pieces.
2. Remove marrow from bones.
3. Fry the meat in a little hot dripping until quite brown.
4. Strain off all surplus fat.
5. Leave meat and bones soaking in cold liquid (1 litre water to each ½ kg of the meat) to soften the fibres.
6. Bring the liquid slowly to the boil and skim off any scum which may form.
7. Add seasoning and bouquet garni, simmer for one hour.
8. Add vegetables and continue to simmer for 4-5 hours.
9. Strain off the liquid and leave to stand and cool.
10. Remove any solidified fat from the liquid.

White stock

Use pale meats (veal, chicken scraps, etc.) and do not fry but otherwise proceed as for other stocks.

1. Use fish scraps, heads, bones and trimming.
2. Prepare as for white stock but do not simmer for more than 45 minutes. Longer cooking time may cause the stock to taste bitter.

Vegetable stock

Proceed as for white stock but omit meat.

Recipe of some soups:**Tomato soup (Using tomato puree)**

50g butter/margarine
 100g onion (diced)
 100g carrot (diced)
 50g flour
 100g tomato puree
 1 ¼ litres stock
 Salt and pepper to taste

Croutons

1 slice bread
 50g butter

Method:

1. Melt the fat in a thick-bottomed pan
2. Add the bacon, onion and carrot and brown lightly (mirepoix)
3. Mix in the flour and cook to a sandy texture.
4. Remove from the heat and mix in the tomato puree
5. Return to heat and gradually add the hot stock.
6. Stir to boil, and season lightly.
7. Simmer approximately for 1 hour and skin if required.
8. Liquidize and pass through a strainer.
9. Return to a clean pan, correct the seasoning and consistency,
10. Bring to boil and serve toasted croutons separately.

Mushroom soup

100g onions, leek and celery
50g margarine/butter
50g flour
1 litre white stock (chicken)
200g white mushrooms
Salt and pepper to taste
125ml milk or 60ml cream

1. Gently cook the sliced onions, leek and celery in the margarine or butter in a thick bottomed pan without browning.
2. Remove from the heat and cool slightly.
3. Add the hot stock gradually and mix. Stir to boil.
4. Add the well washed, chopped mushrooms; bouquet garni and season
5. Simmer for 30 - 45 minutes. Skim when needed.
6. Remove the bouquet garni, pass through the strainer.
7. Reheat and serve.

Brown Onion Soup

600 g onions
25 g fat (margarine or butter)
1 clove of garlic (chopped)
10 g flour

1 Litre brown stock
Salt and pepper to taste
¼ French loaf
50 g grated cheese

1. Peel onions halve and slice finely
2. Melt the butter in a thick bottomed pan, add onions and garlic and cook steadily over good heat till cooked and well browned.
3. Mix in the flour over gentle heat, browning slightly Gradually mix in the stock, bring to the boil, skim and season
4. Simmer for approximately 10 minutes until the onion is soft. Correct the seasoning
5. Pour into an earthen ware tureen or casserole or individual dishes
6. Cut the French loaf, 2 cm (1 inch) diameter slices and toast on both sides
7. Sprinkle the toasted slices of bread over the top of the soup
8. Sprinkle with grated cheese and put to brown under a grill or in the oven
9. Place on a dish and serve

Carrot and orange soup

500g carrot
1 small onion
1 large orange
500 ml vegetable stock
2 table spoons vegetable oil
1 table spoon freshly chopped parsley
A pinch of nutmeg
Salt and pepper to taste

1. Scrape or peel and dice carrots
2. Peel and dice onions.
3. Wash the orange, remove the rest, cut in half and squeeze out the juice.
4. Pour oil into a large pan, add diced onion and fry for 5 minutes.
5. Add diced carrot and continue cooking over gentle heat for 5 minutes.
6. Add stock, juice, and rest of orange, Add half of the parsley, mint e.g. pepper and salt if need.
7. Bring mixtures to boil and leave to summer for 40 minutes.
8. Liquidize in a blender or pass through a strainer.

9. Pour the soup back into a clean pan, add extra flouring if necessary and bring to summer
10. Sprinkle with the rest of the parsley and serve.

Bean soup

250g beans (dried)
Plenty of boiling water for soaking beans
3 cloves garlic, chopped or crushed
Juice of 1 lemon
2 litres water or more if necessary)
1 large onion (chopped)
2 carrots, diced
1 large green pepper, diced
3 tomatoes chopped
1 dsp, tomato puree
Salt and pepper to taste
1 crop pasta e.g. macaroon

1. Sort and clean the beans, and soak if dry (with boiling water and leave to stand)
2. Place the beans in a pan with garlic, lemon juice, teaspoonful of the oil and the 2 litres of water and bring to boil.
3. Reduce the heat and simmer until the beans and tender (cooked)
4. Fry onions, carrots and green pepper in a large pan.
5. Add the tomatoes, salt and pepper. Stir well and cook for five minutes
6. Stir in the puree. Remove mixture from the heat
7. Drain the beans (retain the liquor), add to the vegetable mixtures and cook over moderate heat. Stir and add the bean liquor
8. Boil the pasta till ready and add to the soup
9. Serve hot.

Leek and potato soup

400 g leeks, trimmed and washed
25 g butter or margarine
750 ml white stock
200 g potatoes

Salt and pepper to taste

1. Cut the leeks into $\frac{1}{2}$ cm
2. Slowly cook in the butter in a pan with a lid on until soft but without colouring
3. Add the stock, the potatoes cut in $\frac{1}{2}$ cm thick and season with salt and pepper
4. Simmer until the leeks and potatoes are cooked, for approximately 15 minutes.

Activity:

Follow the recipes given for stocks and soups and make some of the dishes. You can also check on the internet if available and prepare some interesting stocks and soups. Write your recipes in your book.

Summary:

In this lesson you have prepared and practiced the making of stock and soups. You now know the qualities of good soup.

TOPIC: MILK AND MILK PRODUCTS**Specific objectives:**

By the end of this topic you should be able to:

1. Discover the nutritive value of milk.
2. Use milk in cookery
3. Identify the milk products
4. Discover the effects of heat on milk
5. Suggest appropriate way of storing milk at home
6. Test for freshness of milk

Requirements you will need:

Time, notebook, pen/pencil, heat source, milk, Kitchen equipment

Instructions/procedure

Find a suitable place and time to read this material. Attempt all the activities given. Some activities may need more than 1 hour to complete them. Follow the instructions that you have been given carefully before doing each activity.

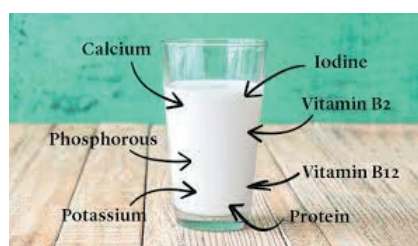
Lesson 1: Milk and milk products**Specific objectives:**

By the end of this topic you should be able to:

1. Discover the nutritive value of milk.
2. Use milk to prepare dishes
3. Identify the milk products

Milk is the liquid produced by all female mammals for feeding their infants. It is an ideal food for the young in that they can live on milk alone for the first six months. The composition of cow's milk varies according to the breed, the length of time since calving and the type of feed.

The nutritive value of milk



Protein

Milk proteins are caseinogen, lactalbumin and lactoglobulin. Caseinogen combined with calcium, is found in tiny particles, which together with fat, give milk its colour. Lactalbumin and lactoglobulin coagulate on boiling, forming a skin which causes milk to boil over easily.

Fat

The fat in milk is found in suspension as very fine emulsion. This varies with the breed of cow. The main fatty acids found in the milk are butyric and oleic acids. The emulsifier lecithin and the steroid cholesterol are also present in milk.

Carbohydrates

Milk contains sugar in form of lactose, a disaccharide which assist the absorption of calcium and gives milk a sweetish taste. During souring, the lactose is changed to lactic acid as in yoghurt and sour milk.

Mineral elements

Milk is an excellent source of calcium and phosphorus, both of which are essential for bone formation. Milk also contains a little potassium and magnesium, but is deficient in iron.

Water:

Milk is about 87% water and this makes it a rather bulky food.

Vitamins

It contains A and D in the cream, greater amount of these vitamins are present in summer when cows are fed on grass. The colour of cream is due to carotene (pro- vitamin A) a natural colouring agent.

Milk is a good source of riboflavine (B2), thiamine (B1) and niacin. Milk lacks vitamin C as most of it is lost during milking, pasteurization and if milk is left standing in the sunlight.

Uses of milk in cookery

- Milk is also used in desserts, for example ice-cream, puddings.
- Curd or buttermilk is used as a leavening agent and to improve the texture
- Curd is used as a marinating agent, for example marinating chicken and meat.
- It's used in enriching beverages like milk tea, chocolate with milk.
- Milk is also used as a liquid; binding loose particles in cookery like in scones and pastry.

Activity:

From the diagram below identify the milk products. Can you mention any other milk product not given below?



Summary:

In this lesson we have discovered that milk contains proteins, carbohydrates, vitamins and mineral salts. Milk is used as a liquid, and to enrich with nutrients. We can also now identify the milk products.

Lesson 2: Effects of heat, storage and test for freshness of milk

Specific objectives

In this lesson, you will be able to:

1. Discover the effects of heat on milk
2. Suggest appropriate way of storing milk at home
3. Test for freshness of milk

Requirements you will need:

Time, notebook, pen/pencil, heat source, milk, kitchen equipment (saucepan, spoon, cup)

Effects of heat on milk

When you heat milk, several changes take place.

Activity:

Heat some milk (1/4 cup) slowly in a saucepan. Observe the changes and write them down in your notebook. Continue heating and take note of your observation for about 20 minutes.

Pour the milk in the cup, check the bottom and sides of the pan. What do you see? Write it down in your notebook.

Ways of storing milk at home

Do not leave milk bottles under the sun. Store in an opaque container covered to avoid loss of vitamin C and B. Keep milk in cool place. Do not store near strong-smelling foods. How do you store your milk at home?

Testing for freshness of milk

Milk is a liquid food, high in nutrients therefore a good media for bacteria. Good hygienic measures should be taken to avoid contamination from cow to the kitchen.

Activity:

Get some fresh milk (1 cup) from a cow or from the dairy shop. Divide it into two, boil one part of the milk and take note of your observations. Keep the other half and boil it after 12 hours and write your observations in your notebook.

Summary:

In this topic you have discovered the effects of heat on milk and how milk can be stored at home. We can also test for freshness by the smell, taste, and boiling to see if the milk curdles.





National Curriculum
Development Centre,
P.O. Box 7002,
Kampala.

www.ncdc.go.ug