Home Economics

for Secondary Schools



Book Two

HOME ECONOMICS FOR SECONDARY SCHOOLS

BOOK 2

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FOREWORD

Curricula must be flexible enough to respond to the existential needs of the children in a changing society. Textbooks which are aids in the delivery of those curricula must be revised and edited as often as the need arises to make them contemporary in information and presentation.

Because of these things one welcomes the revised editions of the secondary school textbooks with pictures in appropriate colours.

We wish to commend all those persons responsible for this painstaking effort for having done a worthwhile job. The nation's children and their teachers will benefit significantly because of this effort.

May the industry of the editors be suitably rewarded by the wise use of the revised secondary school texts.

Priya Manickchand
Minister of Education

PREFACE

This series of secondary textbooks has evolved from the first and second sets of secondary textbooks which were planned for students in Secondary Schools. An important modification is that the new secondary books have been designed for students exposed to all types of secondary education (Senior Secondary Schools, Junior Secondary Schools and the secondary divisions of Primary Schools).

The books have been prepared with the common curriculum in focus and will be found to be consistent with most of the concepts dealt with in the curriculum guides for these schools. It is hoped that the introduction of these books to the different levels of secondary education now evidenced in Guyana, will help to remove some of the disparities which exist in accessing suitable learning materials.

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Home Management

1: THE FAMILY AND THE COMMUNITY

The family

A family is a group of people related by blood, marriage or adoption and living together in the same house.

Family patterns

There are two main types of families:

1. The **nuclear** or companionship family - a group of persons consisting of parents and children.

2. The **extended**, joint or institutional family- grandparents, parents, aunts, uncles and other persons who are closely related.

3. The **single parent** family consists of one parent raising one or more children on their own. Often, a single parent family is a mother with her children, although there are single fathers as well. The single parent family is the biggest change society has seen in terms of the changes in family structure.



Fig.1.1 (a) nuclear family (b) extended family (c) single parent family

The **nuclear family** is the type mostly found in the Western World. The **extended family** is the type practised in most developing countries and in predominantly Muslim areas. It is usually large and kinship ties are strong. The **single parent family** occurs as a result of separation or divorce between mother and father or death of either parent.

Other Forms of Family

Reconstituted Family

A Reconstituted Family (also known as a blended family) is the sociological term for the joining of two adults via marriage or cohabitation, who have children from previous relationships. Reconstituted families are becoming more prevalent.



Fig. 1.2 Reconstituted family

A Sibling family

A sibling household consists of children living by themselves due to the death of their parents or as a result of their parents abandoning them. The eldest usually is the most responsible individual and he or she works and provides for the younger children.



Fig. 1.3 Sibling family

Functions of the family

The functions of a family vary from country to country and are very much influenced by culture. Common family functions are:

- reproducing to continue life and the family line.
- caring for the young and the aged, both groups are dependent on others.
- giving love and security.
- creating a feeling of belonging.
- shaping behaviour patterns of children.
- passing on traditions and cultures.
- teaching respect for authority.
- supervising basic learning.
- teaching roles of the different members of the family.
- giving moral, financial and social support.
- acquiring and passing on property.
- fitting individual members of the family into the system of their society.

Roles and responsibilities of family members

Years ago few women went to work. They were responsible for almost all the house work-cleaning, cooking, laundering, child minding and sewing for the family. These duties left them with little time for social activities. The man's role was mainly to give financial support to the family and to enforce discipline on the children. At present, women find it necessary to go out to work and this has to an extent altered family roles and patterns. Women are able to make financial contributions towards the maintenance of the home.

Ideally, everyone should have a share in the family activities. When family responsibilities are shared among members, the more likelihood there is of having a happy and contented family. There should be a division of labour.

Men, women and children can contribute according to:

- age and abilities
- health

- occupation
- time spent at home
- involvement in the community

The success of sharing family work lies in wise planning. First of all, the mother and father must decide upon the duties to be carried out in the home. They must assign such duties to members of the family.

Family life cycle

Every individual recognizes two or three important land-marks in their life. These are birth, marriage and death. Within the human cycle emerges the family cycle which has three distinct phases.

The first phase is usually referred to as the "beginning family". It is the time when two people marry and set the foundation for a happy family life. Relationships are built up and long term goals are made.

The second phase is the time when children are born or adopted into the family. The family relationships increase. Money is spent to care for the children. There is great need for management of all resources.

The third phase is the stage when children are old enough to leave home either to begin a new family or to take up jobs away from home. Parents need to learn to adjust to the new situation and can live a perfectly satisfactory life. They may be involved in leisure activities. Such is the life cycle of a nuclear or companionship family.

The life cycle of an extended family is slightly different. There is the contracting period when the younger ones marry and leave home or go away to further their studies. Older members of the family help with cooking, mending and the like, and general Supervision of the home. They are looked at for advice in any important family matter, one of which is consumer practices.

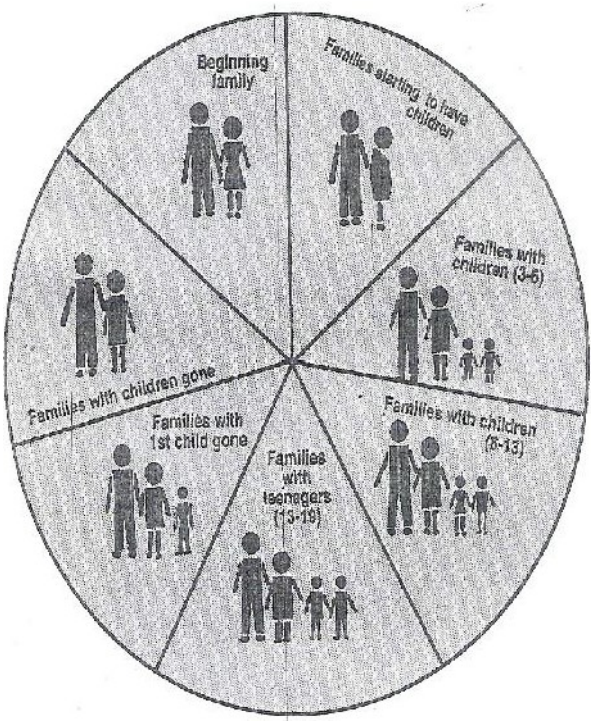


Fig. 1.4 Life cycle of a nuclear family

FAMILY STAGE	SUBSTAGE	DEMAND ON
1. Beginning	Period of establishment	Light to heavy
2. Expanding	Childbearing and Pre-school/Nursery, Primary School. Secondary School, College and University	Heavy Light to heavy Heavy Very heavy
3. Contracting	Vocational adjustment of children financial, recovery and launching retirement	Heavy Light or heavy

Your responsibilities as a consumer

Consumer protection

Over the past two decades there has been a marked improvement in science and technology which has had a great effect on the production of goods. In order for you as a consumer, to get the best value for money spent, you must be equipped with the right kind of education. With wise planning, good shopping sense and knowledge of food storage, you should be able to use a variety of goods throughout the years.

Do you know that Public Agencies and laws protect you as a consumer?

In most countries a special Government Department of Trade and Industry in conjunction with the Ministry of Finance and Central Bank, agrees on a price list for major basic commodities which is made available to trading companies and consumers. This is called price control. Although there are few consumer protection organisations, consumers must be aware of their rights.

In most countries, a special government department is responsible for consumer affairs. A consumer protection body is responsible for the improvement of all conditions of shoppers. Provision is made for Environmental Health Officers to check premises where food is cooked and sold, to see that the highest possible standard of hygiene is practised. Spot checks are made at food stores, supermarkets and open stalls to see that foods sold are in good condition. The Health Officer is also responsible for dealing with complaints of contaminated food. It is important that you as a consumer know where, how and when to shop.

Consumer Rights

The Right to Consumer Education- means the right to acquire knowledge and skills to be informed citizen.

The Right to a Healthy Environment -means the right to a physical environment that will enhance the quality of life.

The Right to Truthful and Honest Information -about the goods and services which are purchased.

The Right to Safety in goods and services bought.

The Right to Choose - to be able to select from a range of products and services offered at competitive price.

The Right to be Heard -to complain to a retailer if one is dissatisfied about a product.

Consumer Responsibilities

The responsibilities to protect oneself by:

- Keeping informed about new products
- Saving receipts
- Shopping carefully and wisely
- Reading and following instructions
- Getting guarantees in writing
- Asking question at point of sale

How to shop

As a consumer you should be courteous to whoever you are buying from. Always give an idea of what is wanted, such as size, colour and price. There is nothing to stop you looking around the different shops and market places to study:

- current prices of commodities
- design of equipment and clothing.
- the distribution and availability of goods.

Such a study will help make you to be a more informed and responsible consumer and develop your confidence in the ability to buy wisely.

2: CONTROLLING PESTS INTHE HOME

Household pests are insects and small animals that destroy or spoil things around the house. Some are very dangerous because they are germs and disease carriers. It is important to prevent them from breeding and multiplying.

Household pests

The household pests are rat, mouse, housefly, cockroach, ant, tick, flea, louse, beetle, termite and moth.



Fig. 2.1 Common household pests

Housefly

The housefly is a dangerous insect. It carries germs from one place to another and causes many diseases. It carries germs on its body, legs and mouth. The germs cause diseases such as dysentry, cholera, typhoid and diarrhoea. The housefly usually lives in all dirty places e.g. bins and rubbish heaps. Therefore, it should not be allowed to breed anywhere.

PREVENTION OF HOUSEFLIES



Fig.2.2 Housefly

- Put all garbage in a tightly covered bin.
- Empty all bins regularly, wash and disinfect.
- Cover all food.
- Buy foods from clean and well ventilated shops.
- Keep kitchen and yard clean and dry.
- Burn or bury all garbage and rubbish.
- Kill the houseflies.
- Keep garden refuse, manure etc; away from house.

Cockroach

The cockroach is an insect which lives in dark/hidden corners, in drawers, store-rooms and cupboards. It will even live and breed in the bedroom, in wardrobes and hat cases. It hides in the dark during the day and comes out at night when it is dark and quiet to look for food. It is a dirty creature and should be destroyed and not allowed to live in the house.

PREVENTION OF COCKROACHES



Fig. 2.3 Cockroach

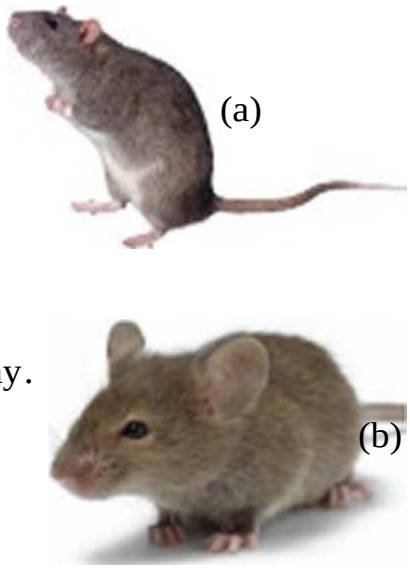
- Store in properly sealed cupboards.
- Keep foods covered or wrapped.
- Keep all rooms, kitchen and cupboards clean.
- Spray all corners, crevices and pictures regularly.

Rats and mice

Rats and mice are man's enemies and should be destroyed whenever they are found. These creatures are closely related. A rat is larger than a mouse but both are dangerous and destructive and are carriers of diseases. They come out at night to find food; any food eaten by man. They are also the carriers of the 'Bubonic Plague'. (The fleas that live in their hair can spread this dreadful disease.)

PREVENTION OF RATS AND MICE

- Put garbage in tightly covered bins.
- Keep yard and surroundings clean.
- Never leave scraps of food about.
- Keep kitchen and storage cupboards clean.
- Set traps where rats and mice visit.
- Keep a cat or a dog that will keep mice and rats away.
- Leave poisoned foods for them to eat.
- Close all holes in woodwork or plaster.
- Burn or bury all rubbish.



(a)

(b)

Fig. 2.4 (a) Mouse (b) Rat

Fleas, ticks and lice

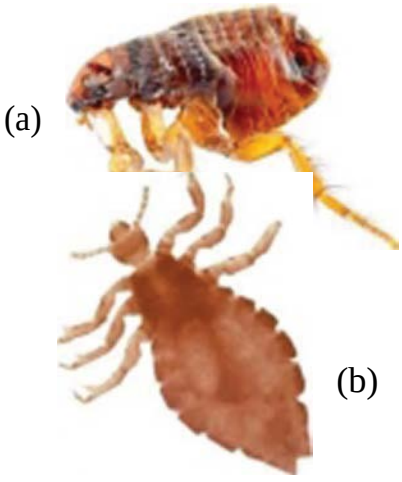
Fleas live in the feathers of birds or on the hair of animals, and feed mainly on the blood of their host. They carry diseases e.g. Bubonic Plague, if dwelling on rats. They sometimes find their way out and bite human beings, thus causing rashes and sores.

Ticks also suck the blood of animals and also spread disease among people and animals.

Lice live on man and other animals and feed mainly on blood. They lay many tiny eggs which are hard to get rid of. The bite of the lice on the skin causes an itch which is irritating. Germs can easily enter the body through the bites which turn into sores. The germs also enter the blood and cause French Fever.

PREVENTION OF FLEAS, TICKS AND LICE

- Keep all domestic animals clean.
- Keep poultry pens clean and disinfected.
- Spray cracks in floors and walls.
- De-tick household animals.
- Keep all rooms clean and as airy as possible.
- Do not allow rubbish to collect in the house.
- Wash and brush hair regularly.



(a)

(b)

Fig.2.5 (a) Flea (b) Louse

Bed bugs

Bed bugs live in dark holes and cracks in the floors, walls and ceilings of houses. They also live in furniture and mattresses. They feed on human blood which they search for at night. The bite can make us itch and feel uncomfortable and sometimes cause sores and spread the disease 'typhus' fever.



Fig. 2.6 Bed bug

PREVENTION OF BED BUGS

- Spray all the crevices/cracks in which they live.
- Keep beds and bed-linens clean.
- Keep furniture clean and disinfected.
- Clean and sun all carpets and rugs.

Ants, termites and moths

These are not as dangerous as some other pests. Some are very difficult to get out from food. The biting ones may attack people and cause some pain and swelling.

Termites

These are dangerous as they destroy wood, and if they get into trunks and wardrobes, they destroy clothes. They live in their tunnels and burrows and never come out in the open.

Moths

The damage they do to clothing and carpets is great. It is the grub of the moth that destroys fabrics.

PREVENTION OF ANTS

- Spray dwellings with insecticide.
- Keep all foods protected.
- Keep sweet foods in tightly covered containers.
- Keep legs of tables with food in water.

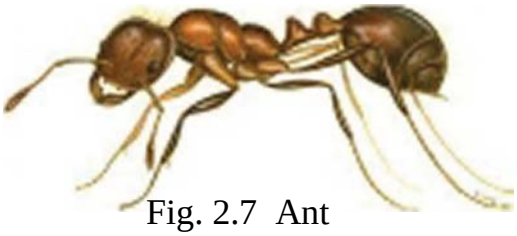


Fig. 2.7 Ant

PREVENTION OF TERMITES

- Keep home clean.
- Spray their dwelling places with insecticide.

PREVENTION OF MOTHS

- Have blankets or clothing well aired and clean.
- Pack blankets or clothing in newspapers with naphthaline balls.
- Examine blankets and clothing frequently and beat in open air.

3: SAFETY IN THE HOME

Accidents in the home are common to persons of all ages. Many of these are due to carelessness and lack of thought. We should therefore try to prevent them for our own safety. In this chapter, we will look at some common accidents, their causes, treatment, prevention and steps in first aid, together with the first aid kit.

Accidents in the home

These include burns, scalds, cuts, falls and poisoning.

Burns

Burns are caused by contact with dry heat such as fires, hot metal, electric current or corrosives.



Fig. 3.1 Fat on fire

TREATMENT

- If it is a minor burn, apply vaseline and give a pain killer, e.g. Aspirin.
- Apply a mild vinegar dressing or cold tea infusion on burns caused by corrosives such as caustic soda.
- For burns caused by acid, use a bicarbonate of soda compress.
- If clothes are on fire, put the patient on the floor and roll him over, or cover with a thick rug or blanket and roll over.

Scalds

These are caused by moist heat such as steam and boiling water, hot oil and hot fats.

TREATMENT

- Avoid unnecessary handling of the affected area.
- Take care not to burst any blisters; cover them with a sterile dressing, or with a thick layer of cotton wool.

Bandage lightly while waiting for a doctor.

NOTE: Burns and scalds have the same effect on the skin.

Minor cuts and wounds

The causes are varied and many. Small cuts and wounds are caused by sharp instruments such as razor blades and knives or by scraping the skin. Deep cuts may be caused by broken glass, contact with sharp instruments, or punctures from nails, pins and needles.

Treatment

- Control bleeding by any means available.
- Keep wound or cut clean.
- Remove any dirt and wash with a few drops of disinfectant e.g. Dettol; press the edges together and cover with any first aid dressing if available.
- If the injury is severe send for medical help after first aid treatment.



Fig. 3.2 Cutting meat

Electric shock

An electric shock is the effect of a sudden discharge of electricity caused by contact with exposed electricity outlets. If electric currents pass through the tissues they do some form of damage to the heart. If the damage is severe the victim may suffer from shock or fall unconscious. If the current is very high, instant death may result.
In order to save the patient's life the following points must be noted:

- Wear rubber shoes or gloves, or stand on several thicknesses of newspaper to protect yourself.
- Switch off the current.
- Use a dry stick or a rope to remove the live wire and to drag the victim from the electric contact.
- Treat bums and scalds.
- If the case is severe, send for medical help.



Fig.3.3 Electric shock

Poisoning

Poisoning may result from children taking tablets for sweets; taking of wrong medicines as well as wrong doses of medicine; household cleaners and disinfectants being stored within the reach of children; poisonous liquids being placed in bottles without labels, e.g, poisonous liquids placed in lemonade bottles.

Treatment

- If the poison is not a burning one, induce vomiting by putting two fingers at the back of the victim's throat, or give an emetic, 2 ml of salt to a glass of tepid water. Try to keep the patient calm; do all you can to save his life.
- If the mouth and throat are burnt do not induce vomiting. Give the patient milk, albumen (egg white) or palm oil, to lessen the se verity of the p o i s o n .
- •. Seek medical assistance.



Fig. 3.4 Poisonous substances left carelessly

Falls

Persons at any stage of the family cycle can fall and hurt themselves. The elderly are more likely to get hurt seriously because their bones will be broken easily. Falls can be caused by tripping over books, handbags, toys, slippery mats, highly polished floors and standing on chairs to reach high places such as shelves and cupboards.



Fig.3.5 A Fall

Prevention of accidents

Careful thought must be given in order to make our homes safe. Therefore we must consider each room and check to ensure its safety.

The Kitchen

This is the area in which most accidents occur and it may be seen as the most dangerous room. Accidents are frequently caused in the kitchen by haste, carelessness, poor and unsuitable clothing. Children are generally fascinated by flames and it is easy for toddlers to be burnt.

- Children must always be supervised when in the kitchen.
- Learn how to use all equipment and tools the correct way.
- Use a step ladder or ask someone to reach things that are placed high.
- Wipe spills-oils, grease or soapy water immediately.
- Matches should be kept out of the reach of children.
- When you take the lid off a pan, lift the far side first.
- Electric cords should not be used if they are cracked or worn.
- Always unplug equipment from sockets after use; never touch sockets with wet hands.

Causes of accidents





Fig. 3.6 In the kitchen

- Turn off stove knobs or gas taps immediately after cooking. Never blow out flames as the gas may continue to flow over when the flame is out.
- If a frying pan or pot of oil catches fire, do not attempt to put it out with water. Cover the pot or pan with a large lid or a metal plate; this will extinguish the flame.
- If the oil is scattered about and continues to burn, throw baking soda, salt or sand over it.
- Keep saucepans, pots and dishes containing hot food away from children.
- Always use pot holders when removing hot pans from the stove.
- Turn pot handles inwards on the stove.
- Ensure that a fire extinguisher or a bucket of sand is available.

NOTE: A well planned, lit and ventilated kitchen is an important asset to the family's safety.

In the Bathroom

This room is considered another danger zone. It is very easy to slip in the bath or under the shower. Most bathrooms have a medicine chest. The contents should be clearly labeled. There should be no expired medication inside.

- Many pills and medicines look like candies, so the chest should be well out of the reach of young children and, if possible, locked.
- Never leave a small child alone in the bathroom if there is water in the bath or in the bucket.
- When bathing a child, always put cold water in the bath or bucket first, then add hot water until the required temperature is reached. Test the water before bathing the child.
- Do not allow a toddler to bathe or wash his/her face by himself/herself; he/she may get water into his/her nose.

In the Living or Sitting Room

Good storage space is helpful here to store toys, records/compact discs or books.

- Make sure there are no electrical leads under carpets or rugs because if these are worn they could cause a fire.
- Make sure that mats and rugs on the floor do not slip; falls may cause severe injuries.





Fig. 3.7 Living or sitting room

- Put glass ornaments and sharp articles out of the reach of young children.
- Select furniture with well rounded edges.
- Do not allow children to play with electric switches, plugs and appliances.
- Keep electric fans out of the reach of children.

In the Bedroom

Clothes, toys or shoes may cause accidents if they are left lying about. Do you remember the saying, "There is a place for everything and everything in its place"?

- Bedside rugs should not be placed on a polished floor; they can be dangerous.
- Always place a light or a flash light near the bed because a person can easily fall in the dark.
- Never smoke in bed, you may doze off and be seriously burnt or even start a fire.

In the Dining Room

- Do not have table cloth hanging low enough for children to pull them off the table.
- Do not allow children to play with table appointments, especially forks, knives and glasses.

Some General Preventions

- Keep all medicines, drugs and tablets in locked cupboards or on high shelves out of the reach of children. They may swallow them out of curiosity or by mistaking tablets for sweets.
- Do not give medicines prescribed for adults to children; this may have disastrous results.
- Dispose of all unused medicines and tablets; they may be dangerous if they are kept too long.
- Label all medicine bottles clearly.
- Never allow children to play with matches or burning firewood.
- When hanging pictures and curtains, stand on a chair or a table that will support your weight, or use a strong ladder.
- Do not give hard sweets, stone fruit or groundnuts to children. They may swallow them whole and choke.
- Keep needles, pins, buttons, coins and anything that can be swallowed out of the reach of toddlers.
- Keep knives and sharp pointed articles out of the reach of children, e.g., scissors.
- Never encourage children to drink out of bottles.

First Aid

First aid is the immediate temporary treatment given to an injured person before medical attention. In spite of all precautions, accidents do occur in the home and it is important to have some knowledge of first aid so that cuts or scalds can be treated quickly to prevent more serious injury.

The aim of first aid is to:

- save life
- prevent further damage
- relieve suffering.

First aid can be carried out by anybody intelligent enough to use a few well known treatment with whatever material is available at the time of the accident, without encroaching upon the responsibilities of the doctor. The first aider should be able to make quick decisions and have enough courage to follow them through.

STEPS IN FIRST AID

1. Control the situation. Be tactful and firm. If other people are around, get them to assist you in obtaining medical attention immediately.
2. Observe carefully the extent of the accident and check for the following:
    - Scratches, abrasions, cuts and wounds which might cause bleeding.
    - If bleeding is severe, call the doctor.
3. Watch for movement of the chest to see if the patient is breathing; if there are no signs or symptoms give artificial respiration.
4. Watch for giddiness and numbness.
5. Look at the victim's lips for burning or discolouration, and to see whether there is any froth coming out of his/her mouth.
6. Examine the patient carefully for deformities like swellings and fractures of the limbs.
7. Look out for first aid appliances that may be available, and waste no time using them.
8. Leave the patient lying undisturbed.
9. Keep patient calm and cheerful.
10. Treat for shock (a very serious condition due to a sudden failure in the blood circulation) if necessary.

THE FIRST AID KIT

Every home should have somewhere to keep medicine. It may be a cupboard, an empty tin or box, a small basket or any safe container which should be stored away from children. The kitchen is an ideal place for the first aid kit. Check regularly and replace any items that are used. Try to keep the kit as clean as possible. Ensure hands are washed before applying dressing.

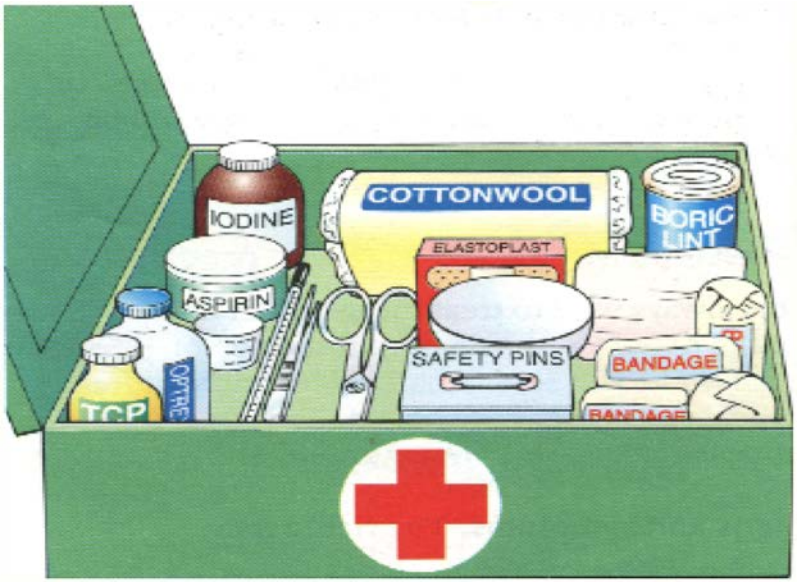


Fig. 3.8 First Aid kit

4 WOODEN AND METAL SURFACES IN THE HOME

Wood

Wood is a hard fibrous material obtained from trees. It ranks among the world's most important and most widely used raw materials. Its lightness, strength and durability make it ideal for building purposes. Large amounts are also used in making paper and paper products. Cellulose from wood is used in the manufacture of various synthetic fabrics. Certain woods yield valuable oils.

Woods are usually classified into two groups according to whether they are obtained from hard wood trees or soft wood trees. Hard woods are used to make flooring, furniture, tool handles and equipment. Soft woods are used mainly for construction purposes. They are relatively soft and straight-grained and are easily cut into planks, boards and beams. Resistant soft woods are used for cabinets and tables.

Identification and Use

The forests of Guyana contain several hundred species of trees which produce useful timber. Unfortunately, many species are of rare occurrence and are not produced in large quantities. The species identified are of outstanding value because of their strength, durability and highly decorative appearance. Listed below are the species of wood and their usage.

Simarupa - whitish wood with a slightly bitter taste, soft, straight grain, easy to work and finishes well.

Uses - Suitable for: Interior joinery, furniture, toys, boxes and plywood.

Dukali - off white to pale cream to pinkish, texture moderately fine with moderate lustre, straight grain, easy to work and finishes smoothly.

Uses- suitable for: Interior joinery, windows, furniture, general interior carpentry and plywood. Excellent for soft drink boxes, should be treated with wood preservative.

Crabwood- closely resembles Mahagony and certain grades of Cedar in colour and appearance. There are three types of this wood:

- **Black Crabwood**- from hills darker, heavier and more dense, non- floating with interlocked grain.
- **Red Crabwood** - normal type from hill lands, mora forest, reddish brown floating wood with straight grain.

- **White Crabwood** from the swamp lands, softer, paler, coarse, often wally wood which floats high out of the water.

Uses - for building construction – floors, doors, windows, shingle, lattice work jalousies, panelling, ceilings and rafters. It is also used for cupboards, cabinets, etc.

Wallaba- dull red and streaked, with straight grain texture, moderately coarse, heavy, hard, termite and decay resistant.

Uses - used locally as transmission poles, fence posts, shingles, paling staves, vat staves, charcoal, fuel/fire wood and pulp.

Greenheart- greenish-yellow to olive brown to blackish in colour. Uniform grain, straight to rosy. Lustrous medium fine texture. Very hard, heavy, cold to touch, exceptionally strong, almost immune to decay and termites. Highly resistant to marine organisms. Very durable, both exposed and in contact with the ground. Finishes well, lustrous and smooth. Takes a high polish.

Use - for marine work and boat building, also for fine flooring and decking, steps, siding and panelling.

Kabukalli - light lustre, unpleasant smell when freshly sawn, disappears on drying and certainly under paint or lacquer. Texture- uniform, medium coarse, grain straight to rosy, Hard strong tough. Resistant to decay and very durable underground. Works easily to a smooth finish, especially if a filler is used.

Uses - sills, framing, siding, panelling general marine construction.

Mora - dark or reddish-brown hardwood, streaked with white or brown lines. Lustrous uniform texture, coarse grain straight or interlocked, often with attractive wavy or birds' eye figure. Very hard, heavy, tough, strong and durable, termite resistant. Finishes smoothly, polishes and lacquers well. Takes nails and holds them well.

Use- floor, siding and steps.

Purpleheart- one of the most distinctive woods of tropical America, when freshly cut, the hardwood is a greyish - purple in colour but it becomes a deep purple to violet purple after a few days. Uniform texture, medium to fine grain, usually straight, sometimes interlocked and rosy and with colour variations, satiny lustre and feather striping makes very attractive panelling. Very hard, tough, strong, resilient. Finishes smoothly and easily.

Uses- floors and decorative purposes and heavy construction.

Deal- white or yellow. Used for floors, tables, spoons and pastry boards.

Uses – floors, tables, spoons, pastry boards.

Elm- heavier, harder, darker than Deal.

Uses - floors, sink stands, stools, chopping and drying boards.

Oak- Hard, durable, expensive.

Uses - furniture, kitchen fittings, floorings, sieves.

Sycamore- harder and whiter than Deal and has a finer grain.

Uses - furniture.

Care and Cleaning of Unfinished Wood

When cleaning and caring for unfinished wood, three (3) main points must be considered.

- Avoid making the surface rough.
- Avoid discolouring the surface.
- Avoid distortion or warping.

Avoid Making the Surface Rough

- Do not use a hard scrubbing brush which will tear the fibres of the wood. Hot water .will soften the wood and cause it to swell.
- Coarse abrasives will cut the fibres of the wood. Do not scrub across the grain of the wood; this will pull the fibres in the wrong direction.

Avoid Discoloration

- Avoid using too hot water.
- Avoid the use of too much cleaning agents, e.g. soap, washing soda. If these are not thoroughly rinsed off, the wood will become discoloured.
- Avoid exposure to direct sunshine or direct heat from a fire.
- Avoid warping.
- Do not use too much water.
- Do not allow wood to remain wet for a very long time.

NOTE: Wood which has become warped cannot be restored successfully to its original condition.

Cleaning of Solid White Wood

- Remove all surface dust.
- Scrape off any scraps with a palette knife.
- Wipe with a damp cloth.
- Scrub along the grain, using soap and scrubbing brush.
- Rinse in clean water.
- Dry wood as much as possible.
- Finish drying in the open air or in a current of air.



Fig. 4.1 Cleaning wood along the grain

Removal of Stains from White Wood

Various stains can be removed in different ways.

Meat or blood stains- Scrub with cold water or sp1inkle the stain with kitchen salt and then scrub.
Vegetables- Same as meat stain.
Oil and grease- Scrub with hot water into which baking soda was added.
Ink- Rub with squeezed lemon rind dipped in salt.

Finishes and Covering for Wood

Wood surfaces can be finished in various ways. This is done to:

- preserve the wood.
- beautify the wood.
- cover unsightly marks on the wood.

METHODS USED TO FINISH WOOD

- **Painting** - This must always be applied in several thin coats so as to produce a good effect.
- **Enamelling** – This a mixture of paint and varnish. It gives a glossy finish, durable and easy to clean.
- **Staining** -This can either be water or oil. It is a cheap way of finishing wooden surfaces.
- **Varnishing** -This is used mainly to finish toys and small household articles.
- **Polishing-** This method is used for wood which is naturally beautiful in colour and grain.

COVERING WOOD

Covering wooden surfaces is done in many other places. We will deal with those coverings that are commonly used today.

- **Carpets-** These were made mainly of wool or silk, but today are made of nylon and other synthetic materials. Carpets make rooms much quieter, warmer and reduce the danger of slipping.
- **Rugs -** These are carpet "pieces" and must be laid so that there is no danger of stumbling over a raised edge or skidding on a polished floor.
- **Mattings** - These may be made of various materials such as grass, fibre and string.
- **Rubber** -This type of covering has become very popular.
- **Linoleum** - This was a very popular wood covering found in every home but it is not very popular today.
- **Cork Linoleum** - This is similar to linoleum but has a larger proportion of cork.
- **Vinyl** – This type of covering is extremely popular and is found in practically all homes.
- **Tiles** - These can either be:
  (i) Thermoplastic
  (ii) Cork

(iii) Rubber

Thermoplastic is a very popular covering. Cork tiles are made chiefly from cork.

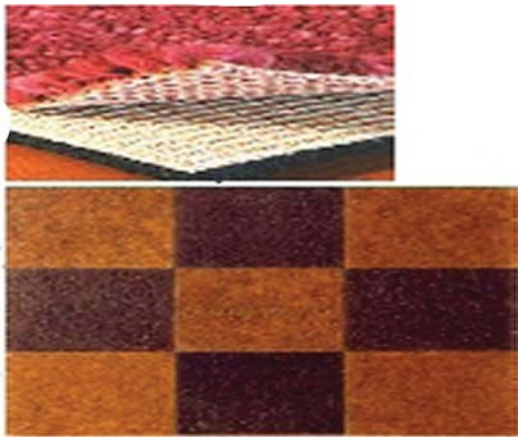




Fig. 4.3 Coverings for wood

Like fashion, the use of floor covering will change with the trend of the day.

CARE AND CLEANING OF COVERINGS FOR WOOD

It is normal for a new carpet to shed fluff. For the first three months, use a stiff brush to keep the carpet clean. When a carpet has stopped shedding fluff, it should be cleaned daily with a carpet sweeper or vacuum cleaner. Any marks or stains should be treated immediately.

- Rub gently with a damp cloth, working from the outer edge of the stain to the middle. Obstinate stains can be rubbed with warm water and detergent or a special carpet cleaning fluid.
- Rub with a dry cloth. Rugs and carpet squares should be turned frequently. This will prolong their life by evening out the wear. Carpets and rugs can be shampooed with a special cleaning fluid or warm water and detergent. Allow all carpets to dry thoroughly before replacing furniture.

NOTE: Do not over-wet a carpet.

Vinyl - These should be swept and washed regularly. Use warm water and detergent, or a special floor cleaning liquid. Only non-slip polish should be applied.

Linoleum- Linoleum should be dusted regularly. Wash occasionally with warm

water and detergent, but do not over wet. Rinse and allow to dry. Polish, using either a self-shine liquid or a wax polish.

Matting

-Dust or brush thoroughly to remove surface dust.

-Sponge with warm soapy water using a rag or wet cloth.

-If very dirty, a soft nail brush can be used.

-Rinse thoroughly and dry. Finish drying in the open air, if possible.

NOTE: Avoid making the matting too wet.

Metals

DEFINITION

Metals are chemical substances found in the earth's crust or in river beds. In their raw state, they are called "ores". One example is bauxite. When it is mined, it becomes aluminium.

There are two main classes of metals-

- White
- Coloured

Examples of common white and coloured metals used in the home:

White	Coloured
Aluminum	Brass
Chromium	Bronze
Electro-Plate	Copper
Silver Plate	Gold
Stainless steel	
Silver	

Metals and Their Properties

A small amount of metals have properties which allow them to be by themselves, but must unite together to form compounds called "alloys".

Metal	Properties
1. Aluminium	A soft white metal which does not rust or tarnish; it is light, has strength and is unbreakable; it dissolves in most acids; it should not be exposed to caustic alkalis or ammonia.
2. Chromium	A hard white metal which acts as a coating to protect as well as to decorate steel and brass.
3. Silver	A very soft white metal which is easily scratched or dented, if handled carelessly. It can be highly polished; it hardens when mixed with an alloy, e.g. copper.
4. Stainless Steel	Steel to which chromium has been added; it will not rust or tarnish under ordinary circumstances, it is strong, durable and easy to keep clean.
5. Brass	This is an alloy of copper and zinc, and is yellow or sometimes orange in colour. It is suited for articles which are heavily used; is cheap, long-lasting and capable of taking a very high polish; it is resistant to corrosion, but can suffer zinc corrosion 'dezincification' which is caused by the sea, tap water or acids.
6. Copper	This is a soft, reddish and very unique metal. It does not rust, but when exposed to air and moisture, it will be covered by a greenish substance which is a highly dangerous poison known as 'VERDIGRIS'. It is therefore important, that copper is cleaned and polished carefully, before use.
7. Enamel	**NOTE:** Avoid using copper utensils for cooking. This is mainly referred to as 'VITREOUS' enamel which means that a vitrified coating has been added to the metal and fired. It has a smooth glossy or glass-like surface and is cheap.
8. Tin	This is a very bright, silvery, white, light metal which is easily moulded, it is resistant to acid attack and can therefore be used in the canning of foodstuff.

Metals and Their Uses

Metal	Uses
Aluminium	cooking utensils, plates, serving dishes, baking pans, trays, teapots, measuring jugs, graters, flour dredgers.
Chromium Plate	taps, pipes, small ornaments,- ashtrays, trays, tea sets, bathroom fittings, towel racks, table tops.
Silver	jewellery, tab1eware, ornaments, cutlery, kitchen utensils, serving dishes, sinks, draining boards.
Steel	cases of cookers, window frames, gates, refrigerators, washers, drying cabinets, dishwashers.
Tin	kitchen utensils, kettles, storage containers.
Brass	curtain rods, trays, ornaments, decorations, vases, ashtrays.
Copper	water pipes, utensils, jewellery, ornaments, tanks, cyclinders.
Enamel	saucepans, plates, bowls, sinks, bath tubs, laundry equipment, buckets.

Cleaning of Metals

ALUMINIUM

- Wash in hot soapy water to remove any grease.
- Never use soda on aluminium; it turns the metal black, as well as dissolves it and ruins its surface.
- Clean inside and outside with steel wool, a fine wire scourer or a nylon pan scrubber, if very dirty. Special attention must be paid to the handles of equipment.
- For removal of stains, boil some acid substance, e.g. lime peeling, lime leaves or vinegar.
- Rinse thoroughly and leave to dry.

CHROMIUM PLATED ARTICLES

- Wash in hot soapy water using a soft cloth.
- A scourer should not be used because it will damage the surface and wear away the chromium.
- Dry immediately with a soft cloth, rub well to avoid leaving any marks which may be left by moisture, if allowed to dry.
- Always keep chromium-plated articles dry.

SILVER

- Silver must always be kept bright and shiny, therefore always wash in hot soapy water after use and dry immediately with a soft towel.
- Silver should be wrapped in tissue paper, cloth or polythene before storing to avoid tarnish- result of lengthy exposure to air.

STAINLESS STEEL

- Wash in hot soapy water, using a soft cloth or sponge.
- Rinse thoroughly in clean water.
- Dry with a clean cloth.
- Rub with a clean dry cloth to polish.

TIN

- Wash in hot soapy or detergent water.
- Boil in soda, if very greasy or dirty.
- Dry near heat to ensure proper drying. If left damp, tin-ware will rust.

BRASS

- Wash with lemon, lime, ash or fine sand- pay special attention to crevices and embossed patterns.
- Wash out cleaning agent, then rinse thoroughly in clean water.
- Dry well and rub with a clean soft cloth.

COPPER

- Wash in detergent, using hot soapy water, if greasy or dirty.
- Use steel wool or brillo pad to remove stubborn stains.

ENAMEL

- Fill with water after use - cold for milky food, hot for very greasy foods.
- Wash in warm soapy water.
- Avoid using scourers which may scratch or chip enamel.
- Use borax or a mild cleaning agent to remove stains.
- Remove burns by boiling salted water in enamel untensils.

5 : ROOMS FOUND IN THE HOME

The Sitting Room

This is considered the main living room where the family can be in comfort to sit and relax at the end of the day and even entertain their guests. The most important pieces of furniture in this room are seats of various kinds- chairs, settees, sofas and divans. These must be comfortable enough for relaxation. For persons who cannot be comfortably seated on low chairs, one or two upright chairs may be useful. Chairs and settees which have removable cushions are very popular in many home s. Loose cushion covers should be made of durable material that can be easily laundered.

Chairs, benches and stools made of cane, wicker, bamboo or wood are used in many homes. They are light and comfortable and can be moved around easily when cleaning the home. For extra comfort cushions may be used on them. Other furniture in the sitting room may include a center table, small stools or tables for placing tumblers or ashtrays, television, radio, standing lamps and book cas es.

The type of floor covering to be used will bed pendent on the type of floor. For a wooden, cement or tiled floor, carpets, rugs or brightly coloured mats may be preferred. Mud floors may be covered with fibres, palm leaves or mats of different kinds.

Additional colour and interest may be added by hanging attractive and interesting pictures, photographs or ornaments on the walls, at eye level, where they can be easily seen. Since colour plays an important part in furnishing a room, the colour of curtains, walls and floor covering must be kept in mind when choosing furniture. The arrangement of furniture is considered a matter of personal taste, but it should be made for homely atmosphere, comfort and convenience and also for good balance. It should be cheerful and bright as well as cool and comfortable.



Fig. 5.1 The Sitting Room

The Dining Room



Fig. 5.2 The Dining Room

This room is basically used for eating meals. The dining table and corresponding chair should be enough and suitable for all family members. Space should be provided to house a cupboard to hold china, glasses, cutlery, table linen and table mats for convenience of the household.

The Bedroom

This room should never be crowded with furniture or unnecessary ornaments that breed insects and collect dust. The most important piece of furniture is the bed. If possible, a bed should be provided for each family member, because when persons share beds they tend to disturb each other's sleep, and infections such as colds and skin diseases would spread rapidly. Furniture in the bedroom should be kept at a minimum and may include wardrobe, chest of drawers, or a cupboard; an easy chair for relaxation when not in bed, can be very useful. The furniture should be arranged to suit a quiet, comfortable and refreshing atmosphere for sleeping. Unnecessary ornaments, wall hangings and draperies collect dust and breed insects, making it difficult to clean this room.



Fig.5.3The Bedroom

Bedmaking

The bed should be made properly every day. A badly made bed makes the sleeper uncomfortable. Always place the bed away from the wall to allow for movement around the sides of the bed. A chair should be placed at the foot of the bed to place the bed clothes when the bed is to be stripped.



Fig. 5.4 Stages in making a bed

How to make a bed

1. Loosen the covers on all sides of the bed.
2. Remove the top covers first, then the rest of the bedclothes, fold each blanket or sheet into thirds (folding one-third from the top and one-third from the bottom of the bed).
3. Turn or air the mattress.
4. Lay the sheet on the bed with the hem at the top, right side up.
5. Tuck in the sheet top and bottom. If an under blanket is to be used tuck in both under blanket and sheet to give a smooth finish.

NOTE: A crumpled bottom sheet or loosely tucked in sheet and blanket give an uncomfortable sleep. This can be avoided by making mitred or 'hospital' corners with the bedclothes.

Making of a Mitred Corner

1. Remove the side of the sheet near the foot of the bed, and place it over the bed so that the corner hangs down in a point.
2. Tuck the corner of the sheet under the mattress.
3. Make a neat fold from the top corner of the mattress to the foot of the bed, and fold the rest of the sheet under, so that it lies flat on the bed beneath the mattress.
4. Repeat, at the other corners of the mattress, and it will be observed that the sheet will lie smoothly, and fit neatly on the mattress.

The Kitchen

This room is mainly used for preparation, cooking and serving of food, therefore it should be well planned to increase efficiency and save labour. A well planned kitchen is one in which there is ‘a place for everything and everything in its place'. This arrangement of equipment must be in the sequence most convenient to avoid unnecessary walking. For example, the cupboard and refrigerator should be near the door for the storage of food stuff. There should be shelves for storing equipment and cupboards for utensils. The stove should be installed near the work surface. The sink should be against an inside wall to let out the waste water, and under a window to give maximum light.

The kitchen should have good natural and artificial light to aid work in every part of the room. Enough window space for proper ventilation is essential, especially where wood and charcoal is used in the kitchen.

It is very important that the work surface or kitchen table be made of material that can be easily cleaned and that stands up to common kitchen hazards such as hot saucepans and pots, hot water or oil. All food preparation should be done on the work surface.

The floor must be easy to clean and resistant to grease. Tile floors are easily cleaned and are quite durable, but they are slippery when wet and can cause accidents. Mud floors must be kept clean and dry and should be resurfaced with mud at the earliest sign of deterioration.



Fig. 5.5 The kitchen

6 . SIMPLE HOME MAINTENANCE

Maintenance is the upkeep or protection of articles or equipment you possess. Therefore, it is essential that maintenance be considered important and necessary so that equipment and materials can last the time they were made to serve. A wise home maker should know the value of maintaining his/her household effects. In this chapter, we will discuss some simple maintenance of household effects.

Care

Furniture

The most important point in the care of wooden furniture is regular and careful cleaning.

- Treat carefully, avoid bangs, scratching, moisture and spills.
- Wipe up any spills immediately; liquids with a soft dry cloth and sticky stains should be washed with warm water.
- Heat marks should be sparingly rubbed with oil of eucalyptus; rub in well.
- Paint stains should be removed with a rag dipped in white spirit. Repolish the area.
- Treat scratches with linseed oil.
- Keep the furniture free from finger marks by rubbing with damp chamois leather.
- Rub the furniture when dusting, to keep a smooth glossy surface.
- Apply polish periodically.
- Check for attack by moths.

Table glass

- Collect the glasses on a tray and empty, if necessary.
- Milky glasses should be rinsed and filled with cold water.
- Wash glasses in warm water.
- Wash one at a time.
- Rinse in clean water.

- Drain, and wipe the glass while it is still warm with a towel that is free of fluff.
- Polish with a second glass- cloth or a chamois leather.
- Wash carefully, avoiding extreme heat and careless handling.
- Turn glasses down when storing, to avoid accumulation of dust.
- Wrap in tissue paper, when storing for long periods.
- Never store or carry glass inside another.
- Buy glasses which can be easily matched, in case of breakage.

NOTE- If a large number of glasses is being washed, rinse in cold water and drain thoroughly, before drying.

Cooking glassware

- Put to steep when cool.
- Steep in cold water for floury dishes and hot water for greasy dishes; add soda if dishes are very greasy.
- Remove stubborn stains with steel wool and salt.
- Rinse thoroughly with clean water and dry.

Windows

CLEANING

- Dust the windows thoroughly.
- Clean outside of windows first, from top to the bottom.
- Wash painted area of window frame.
- Wash inside of the glass with warm water, then dry.
- Methylated may be used for removing stains or specially manufactured window cleaners.
- Wipe with a pad of newspapers, ensuring the corners are properly cleaned.

NOTE- Add ammonia to water, if windows are greasy.

Mirrors

CLEANING

- Remove all surface dust.
- Clean frame according to the material.
- Wash mirror with warm water using a rag.
- Avoid making mirror too wet.
- Add methylated spirits to washing water or use alone.
- Dry thoroughly and polish.

China

CLEANING

- Wash in warm soapy water, begin with the cleanest first.
- Rinse thoroughly and dry.
- Store in a cupboard, free from dust, according to the kind.
- Cups and jugs can hang on hooks in a cupboard, if space is limited.
- Plates should not be piled high; lower ones will crack.
- To prevent chipping and breaking, avoid placing several articles inside each other.
- Remove tea stains by rubbing gently with salt.
- Shelves should be strong enough to bear weight of china.

N0TE: New china can be soaked in cold water, then boil slowly, allowing to cool before using, so as to harden the china.

Sink

CLEANING

- Wash sink bowl with hot water.
- Wipe behind the taps and around the overflow outlet.

- Wipe the draining board.
- Remove grease by using hot water and detergent.
- Do not allow scraps of food and tea leaves to get into sink. Use a sink basket or a bin for scraps which may escape.
- Rinse and flush well with hot water and finally with cold water.
- Rub taps and disinfect waste pipe once a week
- Remove stain by using detergent on a wet rag. If stains are stubborn, use a cleansing paste, a little bleach or a small amount of scouring powder, depending on the material.

NOTE: A cleaning paste or detergent will not scratch or dull the sink surface or metal.

Scouring powder is an abrasive and should not be used on stainless steel sink.

TO CLEAN A BLOCKED SINK

Sinks can become blocked by tea leaves, grease or food particles that collect in the U-bend trap.

- Use a force pump. Place the pump over the plug-hole, press down firmly and then pull the force pump up sharply. Repeat until blockage is cleared.
- Pour enough water in the sink to ensure it is cleared.
- If the blockage remains after using a force pump, then the U-bend trap will have to be emptied by unscrewing the nut.
- Place a bucket under the trap and carefully unscrew the nut to drain trap.
- Using a piece of wire, clean each side of the trap with a twisting movement.
- Pour hot water down the sink.
- If cleared, replace the nut.
- Run fresh hot water down the drain to rinse the pipes and to refill the U-bend trap.
- If still blocked, send for the plumber.

7: DECORATING THE HOME

Soft furnishings

Soft furnishings are items used in the home for the following purposes:

- decoration
- adding colour and beauty
- comfort and warmth

The following are examples of soft furnishings found in the home:

- draperies and curtains
- bedspreads and slip covers
- table cloths
- lamp shades
- dressing table covers
- cheval sets
- loose covers for upholstered furniture
- rugs
- stool coverings
- screens
- cushions
- chair backs



Fig.6.1 Soft furnishings

The pleasure of decorating your own home can be rewarding and exciting particularly when you are involved in creating items as well as ideas. The instructions in this chapter are detailed, and if followed carefully should result in professional looking items. Such items, no matter how well made, must be considered as a part of a decorative scheme. Selection of colour, design and texture of fabrics, furnishings and accessories must be co-ordinated into a beautiful and harmonious unity.

You are the most important ingredient, your home furnishings and decor should be a reflection of you- your personality, your interests, your talents and your tastes. But where do you start? Turn to the professional decorators; study their furniture groupings, use of colour and texture, treatment of walls, windows and floors. Adapt their ideas and 'know-how' to your own needs and individuality.

To help you, we have included a few photographs of professionally decorated rooms: living rooms, dining rooms, multipurpose rooms, kitchens, bedrooms, bathrooms. Included are many ideas that you can adapt and carry out by yourself.

You as the Decorator

Get the scrapbook habit. Before you buy clothes, collect clippings or pictures of hats, dresses, coats, suits and accessories from magazines and newspapers and assemble the wardrobe from the pictures. Study the lines, designs and texture stories, until you have an ideal plan for your present wardrobe and additions to it. Therefore a woman who is decorating her home, should assemble a scrapbook of ideas that are appropriate to her home, the size of her rooms, the furniture she has to work with, the window, and wall spaces she has. This scrapbook will save worry and disappointment because it will give you a very good idea of the effect that you want to achieve before you buy and before you start to cut.

Decorator's Tool Chest

All good craftsmen have a kit of tools – carpenters, electricians, watch-makers, etc., and so too the decorator must have his/her tools. They should be of good quality, suitable for the particular work and to the skill of the craftsman. Any person who wants to be a good decorator should have the right tools for decorating.



Fig.7.2 Decorator's Tools

ITEMS FOR TOOL CHEST OR BOX

- A pad and pencil for accurate measurements
- Yardstick
- An accurate tape measure
- Six- inch metal ruler
- Tailor's chalk
- Crayon
- Tracing wheel
- A quarter to a half pound box of dressmaker pins (learn to use and return them to the box thus keeping them clean and ready for fabrics)
- Scissors and shears

Simple floral arrangements

In making a floral arrangement, first have a plan in mind. Keep the tip of the highest spray exactly over the base of the container. Do not place all the flowers on the same level, except in extreme stylized arrangements. It is well not to have the flowers lean against each other or face the same direction. Keep the design clean; prune extra leaves after you have completed the arrangement. Do not try to keep long stems; cut them to suit the requirements of your design. Remember that leaving out certain flowers, sometimes means the difference between a good arrangement and a bad one.



Fig. 7.3 Floral Arrangements



Fig.7.4 Arranging Flowers

METHOD

- Cut a length of chicken wire. Fold edges over until wire is firm and compact.
- Mold wire into a shape to fit container.
- Cut straw of roses with a sharp knife, and remove thorns and lower leaves.
- Place tallest rose in chicken wire to establish starting point of design.
- Form outline of design with roses. Always add only one flower at a time.
- Add ivy to soften outline of arrangement. Focal point is low, centred

FOOD AND NUTRITION

8: CARBOHYDRATES

We obtain seventy percent (70%) of energy from carbohydrate foods. Compared to other foods, they are inexpensive and grow easily. They are highly palatable and can be stored for reasonable periods.

Types and sources

Carbohydrates include sugars, starches and cellulose or fiber. They are found mainly in plant foods such as fruits, vegetables and grains. These are usually products containing stored energy which the plant has obtained from sunlight with the help of chlorophyll in the leaves, carbon dioxide in the air and water.

Sugars

All sugars are sweet to taste and soluble in water. Sugar has little nutritive value but it is a good source of energy. We are familiar with sugar in its common form- table sugar.
Complex sugar must be broken down into glucose, a simple sugar to be used by our body.
Foods rich in sugar are honey, jams, jellies, syrups, sweets, chocolate and dried fruits.

Starches

Starches are often called complex carbohydrates. Starch granules are not sweet and are completely insoluble in cold water. They are composed of numerous glucose units linked together in 'long chains' called **polysaccharides**. Before starches can be used in our body as energy, they must be converted into simple sugars, during digestion. Foods rich in starch are wheaten flour, cereals, sago, cakes, pastries, macaroni and root vegetables.

Cellulose or Fibre

Cellulose or fibre is the most complicated form of carbohydrate. It provides the structural framework for plants namely the skin, leaves, stems, roots and seeds.

Our body cannot digest cellulose so it is useless as food. It is however necessary in our diet. This is because fibre provides the roughage that stimulates the normal activity of our intestines. Fibre moves food through our body and helps us to get rid of solid waste. Foods rich in fibre are whole-grain cereals, raw vegetables, and the skins of raw fruits.

Elements of Carbohydrates

The word, carbohydrates, is composed of parts of the names of the elements contained in it- carbon, hydrogen and oxygen. The hydrogen and oxygen in carbohydrates are found in the same proportion as water.

Classification According to Complexity

Carbohydrates are classified into three major groups on the basis of their chemical structure.

Monosaccharides

The monosaccharides are simple sugar. Glucose, fructose and galactose are three monosaccharides that are important to human. Glucose is also known as grape sugar. Dextrose and corn sugar are found in fruits and plant juices.

The second monasaccharide, fructose, is also found in fruits and vegetables, honey and cane sugar.

Galactose is the third type of simple sugar and is found in milk and milk products. These simple sugars are the products of all digestible forms of carbohydrates.

Disaccharides

The disaccharides or double sugars are so called because they yield two simple sugars upon breakdown. The disaccharides are sucrose, lactose and maltose. Of the three, sucrose is composed of molecules of glucose and molecules of fructose and is most widely distributed in foods. Its "pure" form, is found in ordinary table sugar, whether derived from cane or beet. It is usually mixed with glucose and fructose in fruit and plant juices. Lactose consists of equal parts of galactose and glucose, and is found in varying amounts in milk. Maltose which is composed of two molecules of glucose is the result of the breakdown of starch. The disaccharides are easily digested, they are crystalline, sweet and easily soluble.

Polysaccharides

The polysaccharides yield more than two simple sugars upon breakdown or digestion. Some of these are starch dextrin, glycogen and cellulose. Of these, starch is of primary importance to human nutrition.

Starch is found in cereal grains, roots, bulbs and tubers. Most plants store their food supply in the form of starch. As ripening takes place, the starch changes into glucose. Cooking makes the starch more available to digestive enzymes, although cold water does not affect it. The starch grains absorb warm water which causes them to swell and burst.

Simple Digestion

In our body, carbohydrates are converted into sugars, the form in which they are used. Glucose, the simplest sugar, is absorbed into our blood stream and carried first to the liver, then to the rest of the tissues.

Where Digestion Occurs

THE MOUTH

Our salivary glands secrete saliva which contains the enzyme ptyalin. This enzyme breaks down cooked starch into ma1tose and dextrin.

STOMACH

Carbohydrates remain the same in our stomach.

DUODENUM

In our duodenum, the pancreatic juice produces the enzyme amylase, which continues the process of breaking down starch, maltose and dextrin into glucose.

THE SMALL INTESTINE

The intestinal juices continue the breakdown of starch. The enzyme maltose breaks down maltose to glucose. The enzyme **invertase** converts cane sugar to glucose and fructose.

The tissues break down the glucose by combing the constituents with oxygen. The carbon combines with oxygen to form carbon dioxide and hydrogen with oxygen to form water. The chemical process is called **oxidation**, during which energy is released.

END PRODUCT

After being absorbed, carbohydrates exist in the body as glucose and as glycogen. Glucose is a constant constituent of the blood that provides the tissue cells with energy. The amount of glucose, circulating in the blood, supplies only enough calories for 10 to 15 minutes of normal energy expenditure, and thus has to be instantly replenished from glycogen, the form in which carbohydrate is stored. This store of reserved energy, glycose, is found in both the liver and the muscles.



Fig. 8.1 Sources of carbohydrates

Functions of Carbohydrates

- To m aintain the process of living- the beating of the heart or circulation, breathing, digestion, maintaining body temperature. This is known as basal metabolism.
- For everyday activity- standing, eating moving.
- To assist muscular work.
- To stimulate the digestive tract.
- To activate the metabolism of fat to prevent ketosis.

The Value of Carbohydrates in the Diet

- Carbohydrate foods provide plenty of bulk and are useful to satisfy hunger.
- They are the cheapest foods available and are eaten in large quantities.
- They provide energy and warmth very quickly.
- Carbohydrate foods are used as accompaniments to other foods to create balanced meals.

- The foods may be cooked in many different ways to provide variety in the diet

The quantity of carbohydrate foods we consume in our daily diet must depend on our size, age and activities.

Insufficient and Excessive Intake of Carbohydrate

Carbohydrate foods are one of our prime sources of calories. They are very important because some of these foods are also very rich in other nutrients.

Since carbohydrate foods are plentiful and cheap, easily stored and readily prepared, there is the chance that many people, particularly the poor, may eat too much or too little of other foods containing other important nutrients. The reverse may also occur in certain cases.

Excess carbohydrate

When we eat too much carbohydrate foods our bodies receive an excess amount of calories. This leads to the storage of large amounts of fat in the fatty tissues of the body causing a condition known as obesity. The excess weight can shorten our lives and cause other advance conditions such as hypertension, coronary heart diseases and diabetes mellitus.

Too much refined carbohydrate foods in the diet, such as sugars and sweets, may aid dental caries particularly if we observe poor dental hygiene. Later, we may suffer from digestive disorders.

We must recognize that diets which are consistently high in carbohydrates are usually lacking in important amounts of other essential nutrients.

Insufficient carbohydrate

When we consume too little carbohydrate foods, our body receives insufficient amounts of glucose to produce the energy we need. Fat is then used to an extent greater than normal. During fat metabolism, substances known as ketones are produced. In the absence of carbohydrates, ketones are produced at a rate exceeding that of their disposal. The accumulation of ketones in our body causes a toxic state known as ketosis. When there is inadequate carbohydrate in our body, the nutrient protein is diverted from its main purpose of building tissues and used to produce energy. For this reason, carbohydrate is said to be a protein sparer. Therefore, a serious lack of carbohydrate in our bodies can cause depletion of our body tissues. This causes a condition known as marasmus. In severe cases, starvation occurs and may lead to death.

In the case of diabetes mellitus, the body cells may loose their ability to utilize glucose. This disorder can produce a lack of carbohydrates at cell level resulting in a complicated condition.

The Effect of Heat on Carbohydrates

When starches and sugars are subjected to heat they undergo important changes.

Dry Heat

Starch changes colour and becomes brown. Water is given off and, on the surface, the starch is reduced to dextrin. Continuous heat eventually carbonises the starch. The process can be seen when we prepare toast. Sugar caramelises and burns. Caramel is a thick brown liquid which is useful for colouring and flavouring foods.

Moist Heat

Starch grains soften, swell and burst and the mixture becomes thick. During this process, we must blend and stir the mixture thoroughly to prevent lumping and burning.

Sugar dissolves rapidly and the mixture becomes a syrup. If syrup is subjected to continuous heat it will eventually burn to carbon and ash.

9: CEREALS

During the early stages of man's existence, he roamed the earth, gathering nuts and berries to feed himself and family. Sometime later, he discovered that grains could be cultivated so he adopted a settled life-style and made grains his staple food. During those early days, the Romans and other ancient civilizations believed that their crops were under the protection of the Roman goddess Ceres, so the name **cereal** was given to **all edible seeds of cultivated grasses**.

Today, cereals are still the most important foods known to man. In rich countries, fifty percent of man's energy comes from cereals and in poorer countries, cereals provide as much as seventy percent of the nation's energy needs. Cereals are also used as animals fodder in some countries.

Cereal grains

The principal cereals grown around the world are wheat, rice, corn, oats, rye, barley, and millet.



Fig.9.1 Wheat

Wheat

Wheat can be grown in most parts of the world but it is most successfully cultivated in temperate countries. Some regions that produce wheat in large quantities are the U.S.A, Canada, Australia, Europe, Asia, India and Argentina. The many varieties of wheat produced in these countries can be grouped into two main classes - winter wheat and spring wheat. Winter wheat produces a "soft" flour, that is, flour with a low gluten content. Spring wheat produces "strong, flour, that is, flour with a high gluten content. Beside rye, wheat is the only grain that contains large amounts of gluten.

Rice

Internationally, rice farming is just as widely practiced as wheat farming. This cereal is best grown in warm humid temperate zones and in damp tropical lands such as Japan, China, India, Guyana and some southern parts of the U.S.A., where mud, water and sunshine are plentiful. Rice does not contain gluten so its flour is not suitable for breadmaking, but it does contain quality protein. The grain is used extensively in a variety of ready-to-eat cereals and as an accompaniment to meats and sauces. The long and medium grain varieties are favourite accompaniments to meats and sauces because, when cooked correctly, they are loose and fluffy. The short grained variety is more suitable for dessert as they are chalky in appearance and have a tendency to stick together during cooking.



Fig.9.2 Rice



Fig.9.3 Corn

Corn

Com is also known as maize. It is the third most widely produced cereal and accounts for twenty-five percent of the world's grain. It is widely grown in the southern United States- where it originated, Italy, Yugoslavia, Egypt, Brazil, parts of Africa and India. Besides being used as a vegetable, it is also processed and produced into breakfast cereals, low cholesterol cooking oil and industrial products.

Oats

Oats, one of the hardest cereals known to man, was once the staple food of Scotland. Today it still plays a small role in Scottish agriculture and cookery but much of the land that was formerly used for oat farming is now used to cultivate hardier varieties of wheat.



Fig.9.4 Oat

Rye

In the last five hundred years, rye has also been progressively replaced by wheat. As a result, it is only grown and used in countries where the soil is too poor and the climate is too cold to support other cereals. Some countries that still grow rye are Scandinavia, Russia and Poland. Rye is used mainly for making a slightly heavy bread. A very small amount is used as breakfast food.



Fig. 9.5 Rye



Fig.9.6 Barley

Barley

Although barley is probably the most ancient cereal, it is not widely used. At present much of the barley grown today is used as a whole grain or as a flour. Malted barley is used in malted milk beverages, coffee substitutes and malted syrups.

Millet

Millet is grown in hot climate where the soil is poor and the water supply is limited. It is the staple food in poorer parts of Africa, Asia and Latin America. Although it is regarded as poor man's food, millet is a relatively nutritious cereal. One of the most widely used varieties is the sorghum vulgar, popularly known as large millet or sorghum.

Parts of the Cereal Grain

All cereal grains are similar in structure. They have three basic parts: the bran, endorser and germ. The bran is the covering found directly under the husk or chaff. It consists of several sheet -like layers and is often removed during the milling process. The endorser is the white portion of the grain. It is the largest part of the grain. The germ is located at the base at the kernel.

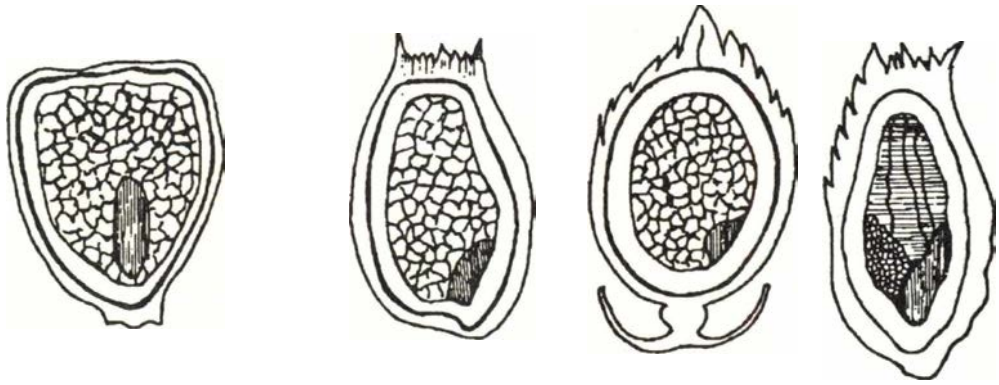


Fig.9.7 Cereal grain

It is the part which eventually sprouts into a new shoot. Other important parts are the aleurone layer and the scutellum. The aleurone layer is located between the bran and the endorser and the scutellum is located between the germ and the endorser.

Food value

The cereal is the storehouse of nutrients for its potential shoot. The nutrients available in them are carbohydrates, vitamins, minerals, fat and protein, but they are eaten mainly for their carbohydrate. Cereals are also a significant source of protein in vegetarian diets.

Distribution of Nutrients

The **bran** is rich in cellulose and minerals, namely calcium, iron and phosphorus. It is also rich in the B vitamins.

The **aleurone** layer is the main storehouse of the cereal's protein and starch. The

scutellum contains Vitamin B,

The **germ** contains most of the grains fat, iron and B vitamins. It is also a good source of protein and Vitamin E.

As the nutrients are not evenly distributed throughout the grain, some nutrients are lost when parts of the grain are discarded during the manufacturing process. To replace lost nutrients, cereal products may be fortified or restored with protein, iron, the B vitamins and calcium. In some cases, nutrients such as Vitamins C and D are also needed to enrich the product.

Processing

During the early years of cereal cultivation, man ate most of this, whole. Today, we have a wide variety of sophisticated cereal products from which to choose. There are whole grains, cracked grains and flours; puffed grains, shredded grains and flakes; hot cereals, instant cereals and ready-to-eat products.

To prepare these products, the cereals must first be cleaned. At this stage, impurities are removed and the grains are washed. They are then hulled or husked to remove the thick fibrous husk and bran. The next stage or stages of processing depend on the cereal product being made.

Wheaten Products

Flour is the most widely used wheaten product. To make flour, the grain is hulled then broken, sifted and ground to fine white powder. In producing whole wheat and whole grain flours, very little of the grain is discarded. These flours are said to have a high **extraction rate**- 85 to 100%. White flour which has an extraction rate of 70% is made from the endorser only. Self-rising flour is white flour to which manufacturers have added baking powder. Starch reduced flour is flour which has had some of its starch washed out, or flour to which extra gluten has been added.

Cracked wheat is made by cracking cleaned wheat into fragments.

Farina. Farina is similar to cracked wheat but the particles are finer and the bran and germ are sifted out.

Pasta products are also known as alimentary pastas or macaroni products. They are made from a high gluten wheat known as durum wheat. To make pasta, durum wheat is mixed to a stiff dough then shaped. While the dough is being mixed, vegetable pulp, flavourings and eggs may be added to vary the colour, flavour and richness of the pasta Macaroni, vermicelli, sphagetti and chowmein noodles are the most popular pasta products in Guyana.

Rice Products

Brown or unpolished rice is the whole grain with just the husk removed.

White or polished rice is brown rice which has been polished to remove the germ and bran. As the name suggests, it is whiter than unpolished rice.

Parboiled or converted rice is rice which has been steamed or pressured before being husked and polished. Its nutritive value is somewhere between that of brown rice and white rice because the heating process causes vitamins and minerals to migrate from the outer coatings of the grain to the endorser.

Corn Products

In this country, corn-on-the-cob is a favourite vegetable snack, but it is also used to make other products.

Homing and grits are made by first removing the hull and germ from the grain. The endorser is left for homing and it is broken up for grits. Quick- cooking grits are prepared by lightly steaming the endorser before it is broken.

Cornmeal is made by reducing the grain to fine particles that are too coarse to be called a flour. This product is usually the entire grain but a degerminated variety can be produced by first removing the bran and germ.

Cornstarch or cornflour is made from the endorser of the grain. A wet milling process is used to extract the starch from the grain.

Corn oil is extracted from the germ of the grain through the application of pressure.

Corn Syrup and Glucose are produced by means of a highly complexed process which involves the application of acid to cornstarch.

Other Cereal Products

Oatflakes are made by first steaming, then rolling and drying whole oat grains. To produce quick cooking oatflakes, the grains are cut into pieces and rolled into very thin flakes.

Pearled barley is made by steaming, shaping and polishing the grain from which the husk and bran have been removed.

Barley flour is made by grinding pearled barley to a fine powder.

Ready-to-eat cereals can be made from the whole grain of corn, oats, wheat or rice. They are pre-cooked, rolled, flaked, puffed, shredded or granulated, after which they are toasted and sometimes coated with sugar, salt or malt.

Storage

The quality of cereals can be preserved for long periods, if the cereals are properly stored.

1. Store whole grains and ready to cook products in a cool well ventilated place.
2. Remove flour from sacks and store in bins that are easy to clean.

3. Opened boxes or packages of ready-to-eat cereals should be stored in air-tight containers to prevent the cereal from absorbing moisture that is present in the air. The crispness of cold ready-to-eat cereals can be restored by putting them in a pre-heated oven for a short time.

Cereal Cookery

Ready-to-eat cereals can be eaten straight from the box, but all other cereal products must be cooked before they are eaten.

Aims in cereal cookery are to:

- improve flavour
- soften cellulose
- gelatinize starch
- minimise the loss of vitamins and minerals
- produce a product free of lumps.

Preparation

The directions for preparing and cooking cereals may vary from product to product, but there are some general guidelines we should always follow.

- Avoid washing cereal grains and pasta products before or after cooking. If washing is necessary, keep it to the minimum to reduce the loss of water soluble nutrients.
- Cook grains in the rninimum amount of water required for softening them. Valuable vitamins and minerals are lost when excess cooking water has to be strained away.
- Cook cereal grains long enough to develop the flavour, but avoid overcooking as this causes them to become gummy.
- To avoid lumping:

  (a) Add whole cereals and pasta product to rapidly boiling water and stir gently for a short time.

  (b) Mix cereal grains with a small amount of cold water before stirring into boiling water. Keep stirring until the mixture thickens.

  (c) Mix flour with enough water to form a thin paste, then stir in boiling water. Return the mixture to the pot for cooking or mix flour with a small amount of melted fat adding the liquid or

Mix flour with sugar, pour into boiling liquid then return mixture to the pot for cooking.

All these flour mixtures must be stirred until they reach boiling point.

Suitable Methods of Cooking

Because of their high starch content and low moisture content, most cereals require moist cooking. This may be done by boiling, steaming, or in a baking dish in the oven.

Uses In Cookery

Cereals are used as:

- a breakfast dish, e.g., oat meal porridge
- toppings, coating and stuffing, e.g., fish in crumbs
- an ingredient in breads, cookies and cakes, e.g., oatmeal cookies
- an ingredient in desserts, e.g., cornflour mould
- an accompaniment, e.g., boiled rice
- an ingredient in main dishes, soups and salads, e.g., macaroni cheese.

Questions

1. What are cereals? List four examples.
2. Name the flour that is most suitable for breadmaking and state why.
3. Where are the following nutrients located in the cereal grain?

   (a) carbohydrates (b) protein (c) cellulose (d) Vitamin B.
4. Define the term "extraction rate".
5. (a) List the pasta products that are popular in your community and name some dishes that they are used to prepare.

   (b) Collect labels of the pasta products listed in (a) above and record their food value.
6. Gayle does not like to cook rice because the grains always lump together. Explain what steps she could take to prevent this problem.
7. List three uses of cereals in cooking.

10: VEGETABLES

A wide variety of vegetables can be purchased in Guyana; red ones, green ones, even purple ones. Some of them are imported in tins but the majority is grown locally in our own gardens.

Types and Classification

All vegetables come from plants and if we think about them we would see that they come from different parts of the plant. Here are the parts of a plant and some vegetables that we get from each part.

Leaves	- cabbage, calaloo, lettuce
Flower buds	- cauliflower, broccoli
Stems	- asparagus, sea kale
Roots	- carrots, sweet potato, cassava
Tubers	- potato, yam, dasheen
Bulbs	- onions, eschallot
Fruits	- cucumber, tomatoes, pumpkins
Seeds	- bora, beans, blackeye, minica.

Because vegetables from different parts of plants are similar in nutritive value and appearance, they can be classified. Some common classifications are:

A. Green leafy and coloured vegetables

Bulbs, roots and tubers.

B. Green vegetables
Stems, roots and tubers

Seeds/Pulses

C. Juicy or succulent vegetables

Vegetables rich in Carbohydrates



Fig. 9.8 Vegetables

Nutritive Value of Vegetables

Vegetables from each group have a different nutritional make-up. Therefore, we should eat a variety of them, if we want to be healthy.

Vitamins

Vitamin A

Vegetables do not contain Vitamin A, but the leafy green and deep yellow/orange vegetables are an excellent source of carotene. Carotene is a yellow substance which can be converted to Vitamin A. The deeper the colour of the vegetables, the higher is its carotene content.

Vitamin B

All vegetables contain small amounts of the B vitamins but leafy vegetables are the richest vegetable source. Seeds are also a good source of these vitamins.

Vitamin C

Most vegetables also contain small amounts of Vitamin C but leafy vegetables and some fruits are the richest sources.

Minerals

Leafy greens are excellent sources of calcium and iron but the presence of oxalic acid in some of these vegetables, e.g., spinach make these minerals unavailable.

Carbohydrates

All three carbohydrates - cellulose, starch and sugar, are found in vegetables. The vegetables with the highest starch content are the storage organs - roots, tubers and seeds. Some sugar is found in sweet potatoes and corn. The skin and pulp of vegetables are rich in cellulose.

Protein

Most vegetables contain very small amounts of incomplete protein, but dried peas and beans are an important source especially for vegetarians.

Selection

It is important to get value for money when buying food. Here are some guidelines that would help us to get value for our money when selecting vegetables.

- Choose fresh, young, firm vegetables that are of a good colour. The nutritional value and eating quality are highest when vegetables are young and fresh.
- Avoid damaged, wilted and bruised vegetables. There is likely to be waste and loss of nutrients in damaged produce.
- Choose root vegetables that are firm and free of spade marks. Damaged root vegetables may be infested with soil bacteria.
- Choose roots and tubers that show no signs of sprouting. Sprouting vegetables have a depleted supply of nutrients.
- Avoid insect or mould infected vegetables. These may be harmful to our health.
- Avoid vegetables with cracked or rough surfaces. A lot of waste is incurred when peeling them.
- Realize that size does not necessarily mean quality.
  Very large vegetables tend to be corky, woody and tasteless.
- If possible, choose vegetables that are in season. These are usually cheaper.

Storage

To enjoy the goodness of vegetables we should eat them as fresh as possible. Colour, flavour, crispness and vitamins deteriorate during storage, even under ideal storage conditions. It is therefore unwise to purchase vegetables in greater quantities than can be properly stored or used over a short period of time. To minimise the loss of colour, flavour and texture during storage, we should:

- examine vegetables carefully, remove imperfect leaves and wash them to remove dirt and spray. Washing must always be followed by careful draining. Too much moisture increases spoilage and decay.
- store green and coloured vegetables in a cool place. The crisper of the refrigerator is the ideal place. If space is limited, store in plastic bags or covered containers on a refrigerator shelf. Loss of Vitamin C is gradual in cool conditions.
- store seeds and peas in their pods. They remain fresh longer.
- empty root vegetables from sacks and store in bins or racks in a cool place, but not in the refrigerator. When being stored indoors, they should not be kept for more than a few days

as they lose moisture, become limp and shrivel. But outdoors, they may be stored for longer periods in heaps covered with straw to exclude air.

- store frozen vegetables at 0° F (-18 °C) or below immediately after buying. This ensures the maintenance of top quality.
- store canned vegetables at room temperature or in a cool dry place and use within a year. After opening, refrigerate any unused portion and use within two or three days.
- keep dried vegetables at room temperature on shelves, and store opened packets in tightly closed containers.

Vegetable Cookery

Some vegetables can be eaten raw, but others must be cooked to make them palatable. When cooking is necessary, we should aim to:

- soften fibre.
- make starch digestible.
- preserve colour, texture and flavour.
- prevent unnecessary absorption of water.
- minimise the loss of vitamins.
- destroy harmful bacteria.

To achieve these aims we must observe the rules governing the preparation and cooking of vegetables.

Rules for Preparing Vegetables

- Wash thoroughly, preferably under running water. If running water is unavailable, wash vegetables quickly in a bowl of clean water. Vegetables to be eaten raw need special care.
- Remove all undesirable leaves and discoloured portions, but utilise green outer leaves as they are richer in Vitamin A.
- Avoid soaking vegetables in water as this causes water soluble, Vitamin A and minerals to be lost. Less Vitamin C is lost from potatoes when they are soaked in salted water.
- Peel vegetables as thinly as possible. Valuable nutrients are stored directly under the skin. Some young vegetables, e.g., potatoes, carrots and boulangers can be served in their skins.

- Avoid shredding or cutting vegetables into small pieces. This allows vitamins to be destroyed by enzyme action and the action of air.
- If shredding is necessary, use a sharp instrument. This reduces bruising and the consequent loss of Vitamin C.
- Do all cutting and shredding after washing to avoid the loss of vitamins and minerals.
- Prepare vegetables just before cooking. Long exposure to air and enzymes would cause greater loss of vitamins. If vegetables must be prepared in advance, place in a plastic bag and refrigerate.

Rules for Cooking Vegetables

- All vegetables should be cooked for as short a time as possible. Long cooking destroys vitamins and changes colour, texture and flavour. However, long cooking may be necessary when there is the threat of epidemics such as cholera.
- Cook vegetables in a covered pot. A covered pot reduces cooking time and prevents the escape of volatile flavours.
- When using the boiling method, place vegetables in boiling water. This reduces the loss of vitamins under luke warm conditions.
- Cook vegetables in the minimum amount of water. When large quantities of cooking water are used, more vitamins and natural flavours are leached out.
- Avoid adding baking soda to shorten the cooking time, it destroys vitamins and changes the flavour of vegetables.
- Do not keep vegetables warm. This has the same effect as overcooking.
- Use left-over cooked vegetables as soon as possible. They continue to lose their Vitamin C even when refrigerated.

Suitable Methods of Cooking

- **Baking -** Vegetables may be baked by the direct heat of the oven or in a covered casserole. All vegetables except the leafy variety can be satisfactorily baked.
- **Roasting** is suitable for root vegetables.
- **Frying** is suitable for most vegetables. They can be either deep fried or shallow fried. Conservative cooking, a modification of shallow frying, is often considered to be the best cooking method for green and coloured vegetables. There is very little loss of vitamins and minerals when this method of frying is used.

- **Boiling** is a suitable method for cooking seeds and root vegetables. Only a slight loss of soluble nutrients occurs when root vegetables are boiled in their skins, but pared and cut vegetables lose much more. To make use of nutrients that are leached out during boiling, use vegetable stock in soups, sauces and gravies.

Questions

- Name five (5) vegetables that are grown in your community. Name the parts of the plant from which they come.

  (i) List the main nutrients that are found in:

  (a) Root vegetables

  (b) Green and coloured vegetables.

  (ii) Name two sweet dishes and two savoury dishes that can be made from vegetables found in the two groups mentioned above.

- Give reasons for observing the following rules when selecting, preparing and cooking vegetables.

  (i) Avoid damage, wilted or bruised vegetables.

  (ii) Cut or shred with a sharp instrument.

  (iii) If possible cook vegetables in their skin.

  (v) Cook vegetables in a small amount of water in a covered pot.

  (iv) Avoid soaking vegetables in water.

  (vi) Choose vegetables that are free of spade marks.

- Explain how you would store each of the following vegetables to prevent deterioration of quality:

  (a) pigeon peas (b) calaloo (c) eddoes.

11: PROTEINS

The word protein comes from a Greek word meaning **I am first**, and protein is indeed one of the most important substances in every living cell. In fact, there can be no life without protein.

Like carbohydrates, proteins are made up of the elements carbon, hydrogen and oxygen, but, in addition, they also contain nitrogen. Nitrogen is a very important element in protein. In some cases, mineral elements such as sulphur, phosphorous and iron, are also present in proteins.

The Structure of Protein

There are thousands of different proteins. Some are simple and others are complex. Although each protein is different from the other, they are all alike in one respect. They are made up of amino-acids. At present, we know of twenty three different amino-acids. In foods, some or all of these amino-acids are found, linked together in various patterns to make up the many proteins found in plants and animals. Ten of these amino-acids are called essential amino-acids because our bodies must have them for proper growth and repair of the body tissues. While other amino-acids can be manufactured by the body, these ten must come directly from food. Because adults are no longer growing, they can exist on eight of these essential amino-acids only, but babies and children must have all ten in their meals everyday.



Fig.9.9 Sources of protein

Types and Sources

With the exception of gelatine, all proteins in foods from animals, contain the ten essential amino-acids. Animal proteins are therefore known as **complete proteins** or proteins of a **high biological value**. Some complete proteins or proteins of high biological value are:

- albumen found in eggs and milk
- casein found in milk
- elastic found in meat

Any protein that has one or more essential amino-acid missing is called an incomplete protein or a protein of low biological value. With the exception of soya bean, all plants contain proteins of this nature. (soya bean contains protein of a high biological value.) Some proteins of a low biological value are:

- zein found in corn
- gluten found in wheat
- legumin found in legumes
- gelatin found in connective tissues

Soya beans and foods such as egg, cheese, milk, meat, fish and offal are therefore our best sources of protein. Cereals, nuts and pulses, e.g., wheat, corn, peanuts, blackeye and red beans are protein foods of a lower quality. This does not mean that plant foods should be omitted from our meals. Cereals, nuts and pulses supply us with valuable complete proteins when they are eaten:

(1) together at the same meal, e.g., rice and peas, flour and peas(dholl pouri) or

(2) along with small quantities of animal protein, e.g., beef and peas, bread and cheese.

Digestion

When we eat protein foods, our digestive juices break up the proteins into amino-acids. These amino-acids are taken around our bodies in the blood and each cell chooses the amino-acids needed for growth and repair. The digestive juices that break up proteins are pepsin, rennin and trypsin. These digestive juices are found in the stomach and small intestines.

Functions of Protein

When amino-acids are extracted from the blood, they are used to:

(1) **Build new cells** -All cells and body fluids except urine and bile, contain protein. From the time we are born to the time when we stop growing, the number of cells and quantity of fluids in our bodies keep increasing rapidly. Proteins are therefore important in growing children and adolescents.

(2) **Replace worn-out tissues-** Everyday, cells and tissues in our bodies need to be replaced or repaired. Even the adult who has stopped growing needs some protein to replace worn-out tissues. When we receive injuries such as cuts, bruises and burns, there is a greater need for protein.

(3) **Supply energy-** Surplus amino-acids, not required for building or repairing tissues, are used to provide the body with energy. Sometimes our bodies use up protein to provide energy even before the growth and repair work is done. To prevent this, we should always eat protein foods along with carbohydrate foods, e.g., cheese with bread.

Effect of Deficiency

In many poor countries, protein rich foods are not available in adequate supply. In such places, a protein deficiency disease known as kwashiorkor is observed, especially among children under five years. Kwashiorkor is also seen in some babies whose parents stop breastfeeding them too early, and in babies who suffer from repeated attacks of diarrhoea, malaria and chickenpox.

Signs of Kwashiorkor- failure to grow, swelling of the limbs, changes in the colour of the skin and hair, muscle wasting and apathy. Kwashiorkor is noticed often in children who suffer from starvation. When these two conditions occur together, the person is said to be suffering from **Marasmus.**

Effects of Heat on Protein

- Proteins "set" or coagulate when heated. This change is seen very clearly when an egg is fried.
- Proteins shrink on heating. This becomes obvious when we compare the size of a piece of meat before and after it has been roasted.
- Proteins are more easily digested when lightly cooked. However, we should be careful not to over-cook protein foods. Over coagulation makes protein less digestible and reduces its value to our bodies. Raw protein is also difficult to digest.

12: MILK

Although milk from different animals is used as food, cow's milk available in commercial quantities in Guyana and some other countries is the type used for food. Milk is often spoken of as "Nature's" most perfect food. While not a complete food for human beings, it is the one food for which there seems to be no adequate substitute. Cow's milk is a great necessity at all stages of human life. It is of special value to children, adolescents, expectant and nursing mothers, invalids and the elderly.

What is Milk?

Milk is the creamy liquid produced by all female mammals for feeding their young.

Sources: Cow's milk is most commonly used by man. Ewes, goats, mares, asses and reindeer are animals that also produce milk as human food but their food value may vary.

Food Value

Milk is regarded as the main food for the very young since it contains many valuable nutrients. It is often called the "perfect food". Let us then take a closer look at the contents of our daily pint of milk.

Milk contains protein in the form of Caseinogen and Lactoalbumen. Caseinogen is the protein responsible for milk clot. Lactoalbumen is responsible for forming a skin on the milk when it is heated. These proteins contain more of the essential amino - acid than other foods, thus making milk a food of high biological value. Milk contains fat in varying quantities.

Fat: The fat is present in the form of tiny globules of driblets which being lighter than water, rise to the surface to form cream, which is used in the production of butter.

Carbohydrate: It is present in milk in the form of a sugar called lactose. This is a disaccharide yielding glucose and galactose. They are less sweet than cane sugar.

Minerals: Milk contains very good supplies of calcium, phosphorous and smaller amounts of sodium, chlorine and potassium. Two-thirds of the minerals in milk are combined with milk solids (e.g., calcium and phosphorous with caseinogen) and the rest is dissolved in water. Milk contains no iron.

Vitamins: Milk contains both fat soluble Vitamins A and D, and water soluble vitamins, thiamine and riboflavin. Vitamins A and D are present in milk fat in varying amounts. Vitamin B2 is found in great quantity but thiamine is rather scarce. Milk contains no Vitamin C.

Water: Milk contains about 87% of water. The fats are deposited in the water as an emulsion.

Types of Milk

There are five types of milk. We will look at three types briefly.

Fresh or untreated milk: This is milk that comes straight from the animal, e.g., cow. This milk has not undergone any form of heat treatment.

Pasteurized milk: Milk is heated at 72°C and the temperature is held for 15seconds. The milk is then cooled rapidly to a temperature of about 11°C. Pasteurisation destroys micro-organisms in the milk which might cause disease. The keeping quality of the milk is also improved. Bacteria such as tuberculosis are killed in this way. The taste and flavour are not altered, but sometimes the cream line is reduced.

Powdered or dried milk: This is obtained in two forms-

Full cream milk: The milk is first homogenized, then completely dried either by spreading it as a thin film over steam heated rollers or by spraying into a current of warm air. Powdered or dried milk, when stored in air tight containers, will keep indefinitely. Exposure to air will cause the fat in the milk to become rancid.

Skimmed milk: The process is the same as that for full cream, except that the fat and Vitamins A and D are removed. It has a lower energy value than the full cream milk and may be used by people having dietary problems.

Treatment of Milk

Milk can be made safer to drink and will keep longer if heat treated. There are various methods of heat treatment, milk should be treated to ensure its safety. Here we will discuss some common ways used to ensure milk is safe to be consumed.

Pasteurised milk: Louis Pasteur believed that milk soured because of the presence of bacteria He showed by experiment that if heated, the souring process could be delayed and the milk could be made safer to drink. The aim of pasteurisation is to destroy harmful bacteria without affecting the flavour and quality of milk.

The milk is heated to about 72°C for at least 15 seconds, then cooled rapidly to about 10^{o}C. This is known as the flash process or the high temperature. The milk is heated to 63°C for half an hour, then cooled rapidly. This is known as the Holder Method.

Note: Milk must be cooled rapidly to prevent:

(i) destruction of nutritive value.

(li) bacterial growth.

Sterilised milk: This means that the temperature has been raised and the milk treated for much longer. The flavour is altered and the cream line disappears altogether, but the milk will keep unopened for months and days.

Further treatment at high temperature will result in milk which will have considerably long life and does not need to be kept in a refrigerator. This milk comes in cartons and is expensive.

Tuberculin tested milk: This milk is produced by cows which are tested, to ensure that they are free from tuberculosis, at intervals, of 2 to 6 months. The milk from these special herds must be labelled to indicate this.

Ultra Heat Treatment (U.H.T): Fresh milk is heated to 132°C for one second, then cooled rapidly. This can be done by passing it directly through heat or steam. After this treatment, the milk must be packed under sterile conditions.

Milk Products

Cheese is made by heating milk and then coagulating the casein by means of a starter such as rennet or lactic acid. The milk separates to curd and whey and the whey or water is drained off. The curd is a very concentrated food. We will discuss this topic fully in the next chapter.

Butter is made by churning cream after it has 'ripened'. The ripening is the souring brought about by lactic acid bacteria. The fat globules stick together into a solid mass of butter. These lumps of butter are collected and moulded into shape, after salt and colouring are added. Butter has about 85% fat and contains Vitamins A and D. It has a very pleasant taste and flavour.

Cream is the part of milk which rises to the top of the milk, if left standing. It contains most of the fat of the milk in the form of tiny drops. It contains all the main components of milk but in different proportions. The fat content is higher and the quality of non-fat solids and water is lower.

Yoghurt is made from whole or skimmed milk resulting in varying nutritional quantities. The milk has to be made sour by the addition of culture. It can be obtained plain or flavoured and used as a dessert. It is also added to many savoury dishes and salad dressings. Yoghurt is better than milk.

Butter milk is made from by-products of scraps of butter. It is acid due to the addition of lactic acid bacteria. It is useful in making scones.

Whey is the liquid left after the curd has been removed when milk goes sour. It is mainly used for the feeding of animals.

Storage of Milk

To ensure the proper storage of milk, the following must be done:

- Fresh milk should be kept in the container in which it is delivered.
- Milk should be stored in a refrigerator.
- Cover milk to prevent it from absorbing strong smells such as onion and fish.
- Fresh milk and cream should be bought daily.
- Store tinned milk in a well ventilated place.
- Store dried milk in air tight tins in a dry place.

Safety of Milk in the Home

To ensure safety of milk:

- Never mix fresh and stale milk, unless it is to be used immediately. The bacteria in the stale milk will quickly infect the fresh milk.
- Milk should be kept covered to protect it from dust and flies. Both may infect milk with bacteria.
- Never leave milk exposed to sunlight.
- Keep refrigerated, if possible.
- Ensure that containers are perfectly clean, before pouring milk into them.
- Never place milk near sink or near foods with a strong smell, e.g., onion.
- In very hot weather, stand the container of milk in a basin of cold water with a piece of muslin over the top with the edges dripping in the water.
- Boil or scald to keep.

Uses of Milk in Cookery:

Milk is used in cookery as:

Drink	Milk shake.
Custards	baked or steamed.
Sauces	white sauce.
Batters	pancakes.

Puddings	rice, bread and butter.
Scones	cheese dropped.
Soups	potato, tomato
Cold Sweet	cornflour mould, fruit fool.

Effects of heat

The protein coagulates and forms a skin on top of the milk. Steam builds up under the skin, thus causing boiling over. The lactose is changed to caramel altering the flavour. Harmful bacteria are destroyed.

Exercise

1. Compile a scrap book showing the
   (a) various animals which produce milk.
   (b) composition of each type of milk.

2. List and discuss the various treatment given to milk.

3. How should fresh milk be stored in the home?

13: CHEESE

Cheese has been used for more than 3000 years. During the Middle Ages, cheese was made in the family kitchen by those householders, who kept livestock just as articles and clothing had to be home produced. Commercial methods and new technology came later and led to large scale production and the import and export world.

The home production of cheese probably amounts for the wide variety of different cheeses which are available. More than 400 are known in the world today.

Types of Cheese

Cheese may be grouped using two factors, namely the (i) amount of moisture in the finished cheese and (ii) kind or extent of ripening, e.g., hard pressed cheese- Cheddar: Lightly pressed or semi-hard -Lancashire, Blue Veined- Blue Stilton and Cottage cheese. Many of the cheeses are named after the district in which they were first made.

Manufacture

Cheese making is a method of preserving milk. Here we will describe the processes that should be followed in its manufacture.

Pasteurized fresh milk is used and is pumped into large vats at 30°C.

Ripening

A special bacteria culture is added to the milk to convert the lactose to lactic acid. This helps to preserve the cheese and produce a clot by turning the milk. The curd is then cut to release the whey. When this is run off, the curd is put into blocks to be drained.
Draining of the curd continues as the curd settles and is cut into blocks. These are piled on top of each other and turned at regular intervals to complete draining. An electrically driven curd mill cuts the curd into tiny pieces and salt is added for flavour and to preserve the cheese. The salted curd is then packed into moulds for 24 hours. If hot water is sprayed on to the cheese mould, it produces a thin hard rind which helps to preserve it.

The cheese is then removed, dated, stamped and left to ripen at 10°C for about four months to develop the flavour, smell and texture. At the end of the ripening period, the cheese is graded according to its flavour, texture, appearance and colour.

Food Value

Cheese is one of the most concentrated foods. A pound of cheese contains approximately the same amount of protein and fat as a gallon of milk. Cheese also contains other valuable nutrients. The nutrients present in cheese are:

Protein: Animal protein- casein is found abundantly. It is required for growth and body building.

Vitamins: Cheese is a rich source of Vitamin A and a good source of Vitamin B2 (Riboflavin which is partly combined with casein and so remains with the curd and is not totally removed by the whey).

Fat: Cheese is a very rich source of fat. The content will vary, depending upon the type of milk used. If cottage cheese is made from skimmed milk, it is low in fat. Cream cheese is made from whole milk and therefore rich in fat.

Carbohydrates: The carbohydrate in milk is a sugar known as lactose.

Hard cheese: This is made mainly from skimmed cow's milk. It contains less water and has a mild flavour.

Semi-hard cheese: This is made from either cow's or sheep's milk. It has a distinctive strong flavour and pungent odour, due to longer ripening.

Soft cheese: This is made from skimmed milk by the addition of rennet which lactose turns to lactic acid and the milk begins to snow. The action of rennet and acid causes curds to form. The soft unripened curds are sold as dry Cottage Cheese. This cheese has a short shelf life of a few days and must be kept in a cold place.

Blue veined cheese: These are produced by inoculating the curd with harmless mould, which grows in the air spaces in the curd. The mould produces the characteristic flavour and colour of the cheese.

Processed cheese: The cheese is made by thoroughly mixing Cheddar and other cheeses. These cheeses are shredded and mixed together with an emulsifier. Sometimes colouring and flavouring are also added. This cheese has a mild flavour and excellent keeping quality. It does not become stringy during cooking and blends easily.

Cream cheese: These are not true cheeses but are made from cream with a fat content of 30% - 60%.

Storage

- Cheese should be covered or wrapped and stored in a refrigerator.
- Waxed paper, plastic wrapping materials or foil are suitable. These prevent the cheese from becoming dry and hard.
- Cheese should be purchased in amounts which can be conveniently stored.
- Remove cheese from the refrigerator half of an hour before use, to allow the flavour to develop.
- Wrap 'strong' cheeses carefully because they easily contaminate other foods in the refrigerator that readily absorb odours.

Digestibility

- Cheese is difficult to digest because it is highly concentrated with a high percentage of fat.
- A waterproof layer or coating around the protein, prevents the stomach juices from reaching the protein rapidly.
- Cheese should be eaten along with carbohydrate food, e.g., bread, biscuit.

Rules for Cheese Cookery

Cheese has a high protein content which influences the principles of cheese cookery. If overcooked, the protein becomes tough and rubbery.

- Have all other ingredients cooked and hot before adding cheese.
- Cook for a short time to prevent toughness.
- Cook at a low temperature to avoid a rubbery tough consistency.
- Cut into small pieces so that it will melt quickly and blend with other foods.
- Overcooking may cause fat to separate and drain from the cheese.
- Well ripened cheese and processed cheese blend better in mixtures than natural cheese and are less likely to produce stringiness.

Suitable Methods of Cooking Cheese

When cooking cheese, short quick application of heat is best. Methods of cooking and examples of dishes are:

- Grilling - Cheese pudding, macaroni and cheese
- Baking- Cheese pies, pastries, macaroni and cheese
- Frying - e.g., cheese angrettes

Cheese should be chewed well before swallowing.

Addition of high seasoning, e.g., mustard stimulate the digestive juices

Cheese should be finely chopped or grated to provide the best conditions for digestion. If over-cooked, protein becomes tough and stringy and difficult to digest.

Heat melts the fat and exposes the protein to the digestive juices.

Aims in Cheese Cookery

These are to:

- increase the savoury flavour of food.
- improve the flavour of insipid food.
- increase the nutritive value of some dishes.

Effects of Heat on Cheese

- When hard cheeses are heated, the fat melts first.
- The protein (caseinogen) continues to coagulate.
- Overheating causes the protein to become tougher and stringy.
- Cheese will eventually burn.

Uses of Cheese in Cookery

Cheese adds variety and pleasure to meals. It can be eaten alone, combined with other foods , or be the main ingredient in a dish, or grated and sprinkled on top of dishes.

Here are some ways cheese can be used when cooking;

- Main dish - cheese souffle
- Garnish - macaroni cheese, soups.
- Snack - cheese roll, cheese cookies
- Flavouring - soups and sauces
- Appetizers- canapes
- Salads- cheese salad

Exercises

(1) Why is cheese important in the diet?

(2) Draw a diagram to show the stages in the manufacture of cheese.

(3) Describe briefly how cheese should be stored at home.

(4) Carry out the following experiment:

(i) Cook a piece of cheese slowly.

(ii) Cook another piece rapidly at high temperature.

Write your observations.

14. CAKES





Fig.14.1

In the days when Greeks and Romans offered cakes to their *Gods,* there was only one type of cake. It was a baked product resembling a gingerbread. Today, there is a wide variety of sponges, plain cakes, rich cakes, muffins and gingerbreads. Flour, sugar, and eggs are used to make all of these cakes, but depending on the type of cake being made, fat may or may not be used.

Types of cakes

Cakes made with fat or shortening are known as **shortened** cakes. Such cakes usually require a chemical raising agent such as baking powder to lighten them. Cakes made without fat are known as **foam** cakes. A true foam cake does not contain any raising agent, but it contains a large number of eggs which are beaten to trap air. As the cake bakes, this air expands making the cake light fluffy and spongy. **Chiffon** cakes are also made with a large quantity of eggs, but they are much more tender because oil is used. They can therefore, be classified as shortened cakes or put into a category all by themselves.

Since a variety of mixing methods are used in the preparation of cakes, they may be classified according to their methods of preparation.

Method	**Cakes**
Rubbed-in	plain cake, e.g., rock bun
Creamed	rich cake, e.g., queen cakes
All-in-one	all rich cakes and large plain
Melted fat	gingerbread, e.g., pankins
Whisked	sponges, e.g., jam roll

Ingredients in cake making

Flour forms the framework of the cake. Weak or soft flour is best for most cakes. 'This type of flour can be made at home by adding one ounce cornflour to seven ounces of all purpose flour. Self raising flour is suitable for plain cakes, but richer cakes require plain cake flour.

Fat makes cakes tender and helps to keep them moist. Butter and margarine are the fats most commonly used but lard and clarified fat can be used in plain cakes.

Sugar sweetens cakes and helps to make them tender. Sugar also helps to give the crust its brown colour. Granulated and brown sugar are suitable for rubbed-in mixtures but castor sugar or finely ground granulated sugar is best for creamed cakes.

Eggs entrap air and help to lighten cakes. The more eggs used, the lighter the cake will be.

Liquid provides moisture, helps to raise cakes and helps to blend ingredients. However, if excess is used, it toughens the gluten producing a heavy, tough cake. The amount needed depends on the number of eggs used and the proportion of fat to sugar in the recipe.

Flavouring creates interest in cakes. Citrus and dried fruits also extend their shelf life. Except in the case of Black Cake, all dried fruits should be cleaned, dried and floured before they are add to a cake mixture. In the case of Black Cake, the fruits are cleaned, ground and sometimes soaked in wine or liquor before addition to the mixture. Dry powders should be sieved into flour and granules should be mixed with liquid to prevent a speckled appearance.

Raising agents are responsible for lightening cakes. Air, carbon dioxide and water vapour are three known raising agents.

Preparing Cake Pans

Grease pans with pure fat that is free of salt, solids and water. White cooking fat, lard and oil are suitable.

In addition to greasing:

For small plain cakes- no further preparation



Fig.14.2 Preparing cake pan

For large plain cakes - line the bottom of the pan with greased paper.

For other small cakes - dredge the greased pan with flour or use paper cases.

For other large cakes- line the pan completely with greased paper that is cut to fit the tin.

Rubbed-in cakes

Cakes made by this method take little time to prepare but are dry and will keep longer. The fat is rubbed into the flour. This method is only suitable for recipes with half or less than half of fat to flour.

Basic recipe

Fat – ¼ - ½ lb (100-225 g)
Sugar – ¼ - ½ lb (100-225 g)
Egg 1- 4
Flour – 1lb (500g)
Milk – $^{1}/_{8}$ – ½ pt
Baking powder - 4 teaspoons

Oven temperature- small cakes: 375 - 400 °F (190-204 °C) or Gas *5*

-large cakes: 350 °F (180°C) or Gas 4.

Method

1. Wash and dry fruit. Dust in a little flour.
2. Sieve flour with baking powder, spice and other dry ingredients.
3. Rub fat into flour with finger tips until the mixture looks like fine bread crumbs.
4. Stir in sugar. Add fruit, if used.
5. Stir in egg and milk to get the desired consistency.

   Consistency - stiff for buns, a soft dropping mixture for large cakes.
6. Bake: Small cakes- two thirds of the way, up the oven for 15-20 minutes.

Large cakes -below half way mark in the oven for $1^1/_4$-$1^1/_2$ hours.
Test for cooking: evenly brown, slightly shrunken, no bubbling noise, firm to the touch.
Storage: Should not be kept for more than three days.

All- in- one mixtures

This is another quick method for making cakes. The product is usually fine grained, tender, moist and of a good volume. The shelf life is also relatively good.

Several recipes have been specially developed for this method, but the most basic recipes can be used with a slight increase in the sugar and liquid.

Basic recipe

Fat- 4 ozs (100g)

Sugar- 4 ozs (100g) + 1 tbsp. sugar.

Eggs- 2

Milk - $^1/_2$ tbsp. if required.

Baking powder- $^1/_2$ tsp

Oven temperature- small cakes: 350°F(180°C) or gas 4

-large cakes: 350°F (180°C) or gas 4

for 1 hour then 300°F (150°C) or gas 2 for $^1/_2$ hour

Method

1. Soften or whip margarine for a few minutes.
2. Add all other ingredients and beat with a wooden spoon until smooth.
3. Add dried fruits if used.

Consistency- soft dropping mixture

Bake: Small cakes- two thirds of the way, up the oven for 15-20 minutes.

Sandwich cakes - half way mark for 20 minutes.

Large cakes - below half way mark for 1 hour at Gas 4, 180°C (350°F) then $1^1/_2$ hour at gas 2, 150°C (300°F).

Test for cooking: same as rubbed- in cakes.

Storage: same as rubbed-in cakes.

General faults in cake making

CLOSE HEAVY TEXTURE

- Too slow an oven
- Insufficient cooking
- Mixture too wet
- Insufficient raising agent.
- Over beating when adding flour causing over development of gluten

COARSE, OPEN TEXTURE

- Too much raising agent
- Uneven mixing-in of flour

SUNKEN CAKE

- Excess raising agent, resulting in overspreading and collapse of gluten.
- Too much sugar or syrup causing gluten to even, soften and collapse
- Too slow an oven or under baking
- Moving the cake pan or allowing cold air to enter the oven before the cake was set

BADLY SHAPED

- Uneven lining of the pan
- Careless filling of the pan
- Wrong consistency

CRACKED TOP OR A PEAK

- Too small a pan
- Too hot an oven
- Cake placed too high in the oven

DRY CAKE

- Insufficient liquid
- Too much chemical raising agent
- Cake has been overcooked

HARD, SUGARY, SPECKLED CRUST

- Too high a proportion of sugar
- Too slow an oven
- Too coarse sugar

UNEVEN RISING

- Tilting of pan in oven
- Pan put unevenly near sides of oven

The above faults may occur in all types of cakes, but specific faults related to rubbed-in mixtures and all-in-one mixtures are given below.

Rubbed-in mixtures

UNEVEN TEXTURE

- Insufficient rubbing-in
- Too vigorous mixing after adding liquid
- Too much baking powder

CLOSE HEAVY TEXTURE

- Too high a proportion of fat
- Hands hot causing mixture to be sticky
- Insufficient cooking

DRY CAKE

- Insufficient liquid where the proportion of fat is low.

LOSS OF SHAPE IN ROCK BUNS

- Too wet a mixture
- Too cool an oven

All-in-one mixtures

CLOSE HEAVY TEXTURE AND PEAKS

- Too much beating.

STREAKY APPEARANCE

- Bowl not scraped often during mixing.
- Insufficient mixing.

15: STEAMING

Steaming is the cooking of food in steam from boiling liquid.

Suitable Foods for Steaming

Eggs, fish, poultry, thin slices of good quality meat, root vegetables, fruits, pudding mixtures.

Methods of Steaming

Indirect Steaming

Food cooked by this method does not come into direct contact with steam. The plate method is an indirect method of steaming.

Plate method: This method is suitable for warming up cold cooked food and for cooking fish. The food is placed on a plate, covered with another plate or saucepan cover, then put over a pot of boiling liquid.

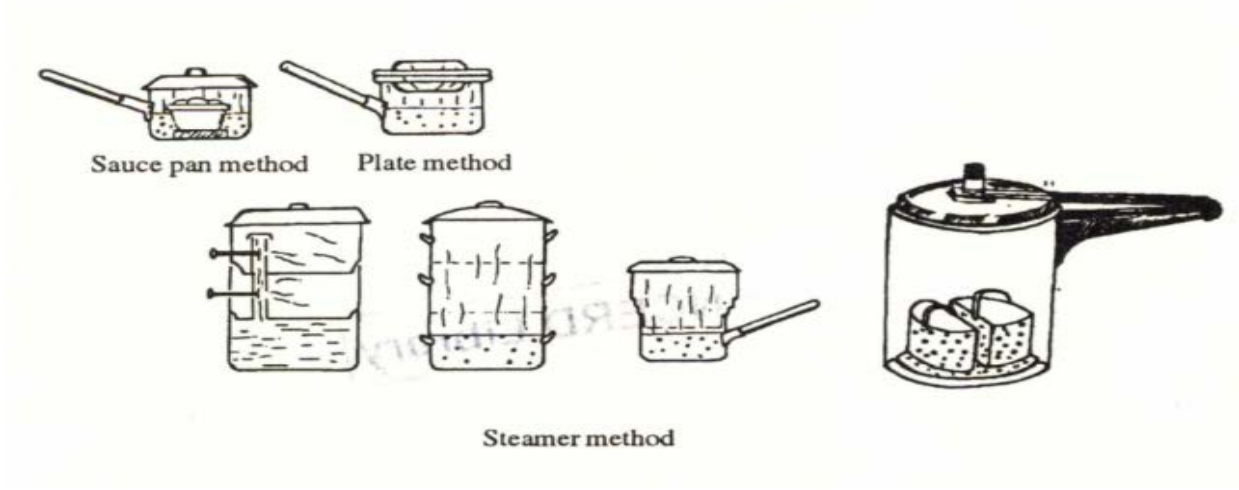


Fig. 15.1 Methods of steaming

Direct Steaming

Food cooked by this method comes into direct contact with steam. The saucepan method and the steamer method are direct methods of steaming.

Saucepan method: This method is suitable for cooking puddings. Food is put in a basin, covered, then placed in a pot of boiling water. The water in the pot should reach half-way up the side of the basin.

Steamer method: This method of steaming is suitable for most of the foods listed. The food is placed in a bowl or wrapped in foil, then placed in the upper part or parts of the steamer. Sometiered steamers consist of two perforated pans fitted over a normal pot. Others have an inner vent with outlets to pass steam into each tier. The amount of steam entering each tier is controlled by valves that can be opened or closed independently.

Rules for Steaming

- Food must be covered with a waterproof covering to protect it from condensed water.
- The lid must fit tightly and each section of the steamer must fit snugly into the other to prevent the escape of steam.
- A good supply of boiling water must be available to replenish the steamer, as water evaporates.
- Water must reach boiling point, before food is placed in the steamer.

Advantages

- Can be used for most foods.
- Steamed food is light in texture and easily digested. It is therefore, a suitable method of cooking for babies and invalids.
- Little attention is required while the food is cooking.
- A gentle method of cooking, so food does not break up.
- An economical method of cooking, as low heat is needed and more than one food can be cooked at the same time.
- Loss of nutrients by leaching is reduced, as the food does not come into direct contact with water.
- There is very little risk of overcooking.

Disadvantages

- A slow method of cooking.
- There is little development of flavour.
- Steamed dishes lack crispness.

High pressure steaming. This type of steaming is done in a special type of pot, under high pressure. Food is put in separate containers which are put to stand in a small amount of water. These containers are raised so that the food and base of the containers are never in contact with the water. High pressure steaming is suitable for most foods, including green vegetables. It is unsuitable for puddings.

Questions

1. Define the term "steaming".
2. List four (4) foods that are suitable for "steaming".
3. Why is steaming a useful method of cooking for preparing an invalid's meals?
4. List the steps that you would take when steaming a piece of fish. Give reasons for each step taken.
5. List three (3) advantages of steaming.

Clothing and Textiles

16: SEWING LABORATORY EQUIPMENT

The Sewing machine

A sewing machine of one kind or another can be found in most homes. Many of these machines are never used to their fullest extent and some are rarely used. A machine that is constantly put away tends to stay put away. If it is at all possible to have a permanent place for the sewing machine, do so. It is ideal to have a sewing corner or a sewing room.

An instruction book is essential for every sewing machine. It gives instructions on how to use the specific model of machine.

This chapter deals with general information on sewing machines rather than on one specific model or make.

CLASSIFICATION OF SEWING MACHINES



Fig. 16.1 Sewing Machines

Types	Method of Operation	Features
Domestic Cabinet or Portable	Hand and Threadle Electricity	Straight stitch, swing needle, computerized, overlock
Industrial	Electricity Electronics	Straight stitch, overlock or Serger, button and Button hole, bar Tack, elastic, embroidery

NB- The domestic swing needle machine can produce most of the stitches done on the industrial machines. With the use of an attachment, disc and/or stitch regulator. However, because of the system of specialised operators in garment factories there are separate industrial machines to produce each feature.

Tips on choosing a sewing machine

- **Type** - choose the type that will suit your particular needs.
- **Price** - choose the best model that can be afforded.
- **Space** - if space is limited choose a portable type in preference to the cabinet type.
- **Test** - always check and test run the machine before making purchase.
- **Guarantee** - find out if there is a guarantee and how long it is in force.
- **Machine Hand Back** - a booklet on how to use care and clean the specific model of machine must be provided.

Care and Cleaning

- Cover or put in case when not in use.
- Use the machine brush to remove all lint, fluff, loose threads or foreign matter from the feed dog and bobbin case.
- Dust the entire machine, using a cheese cloth or lintless cotton.
- Oil the machine, following instructions in Hand book.
- Place a piece of fabric under the presser foot, lower the needle and store.

- Have it repaired and serviced professionally.

Parts -attachments and uses

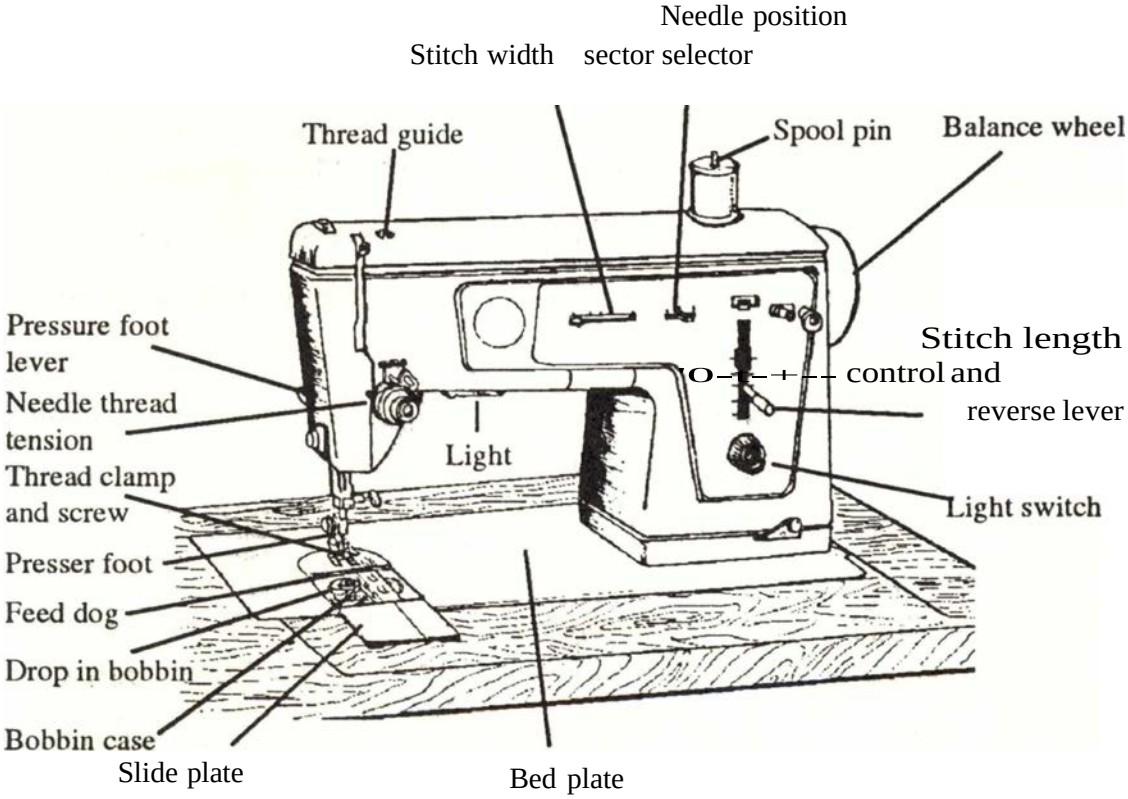


Fig. 16.2 Main parts of a sewing machine

Balance wheel	-	The machine is worked by turning the balance wheel which is driven by hand, threadle or electric power.
Stop motion screw	-	This puts the needle out of action when filling the bobbin.
Bobbin winder	-	Bobbin winding differs according to the model of machine, but the thread always passes through a tension control to ensure even winding. The balance wheel is disengaged in order to wind the bobbin.
Stitch length control and reverse lever	-	The lever is used for regulating the length of stitch. For reverse feed motion, the lever is pushed to the top of the slot. Some machines have a dial control with a push button for self-release reverse.

Machine light	-	This is normally situated over the needle. The bulb should have a protective guard. The switch is used to turn on and off the light.
Bed plate	-	This is the flat working surface beneath the machine arm and the needle to support the sewing. Some models have an extension table that clips on to the left of the machine to increase the working surface.
Slide plate	-	This covers the bobbin case section. It slides or is pulled to gain access to the bobbin.
Bobbin and bobbin case	-	Bobbins are circular and vary in size. The bobbin thread feeds through a tension spring on the bobbin case which can be adjusted. The bobbin fits snugly into the bobbin case.
Throat plate	-	This surrounds the feed dog. It is held in position magnetically or by screws or clips and has fabric guide markings.
Feed dog	-	This glides the fabric through at an even speed during sewing.
Presser foot	-	This is under the needle of the machine. It is used to hold the fabric down when stitching.
Needle clamp and screw	-	This holds the needle securely in position. The screw is used to release and secure the needle.
Thread guides	-	These are small loops of wire which guide the thread from the reel to the needle.
Needle thread tension or Tension Disc	-	The disc controls the rate at which the thread is fed to the needle. The tension is altered by a numbered dial or by a plus and minus indicator.
Presser foot lever	-	This is positioned behind and above the presser foot. It raises and lowers the foot.

Pressuer regulator/bar	-	This holds the pressure foot and often incorporates a thread cutter at the back of the bar. The pressure can be adjusted to suit the weight of fabric to be stitched.
Stitch width selector		This controls the width of zig-zag and other decorative stitches.
Needle position selector swing		Machine needles have a left, centre and right position (LCR). This allows the needle to be set in any one of these positions.
Spool pin		This holds the spool of thread in position when sewing.

Most sewing machines have special attachments for sewing different types of fabrics, saving time and producing a better result. (Refer to Hand book for information on use.) Some attachments are provided with the machine while others can be bought separately. Zipper, embroidery, overlock, button sewing, gathering, darners, hemmers and binders are some of the attachments used on the sewing machine, Fig. 16.3

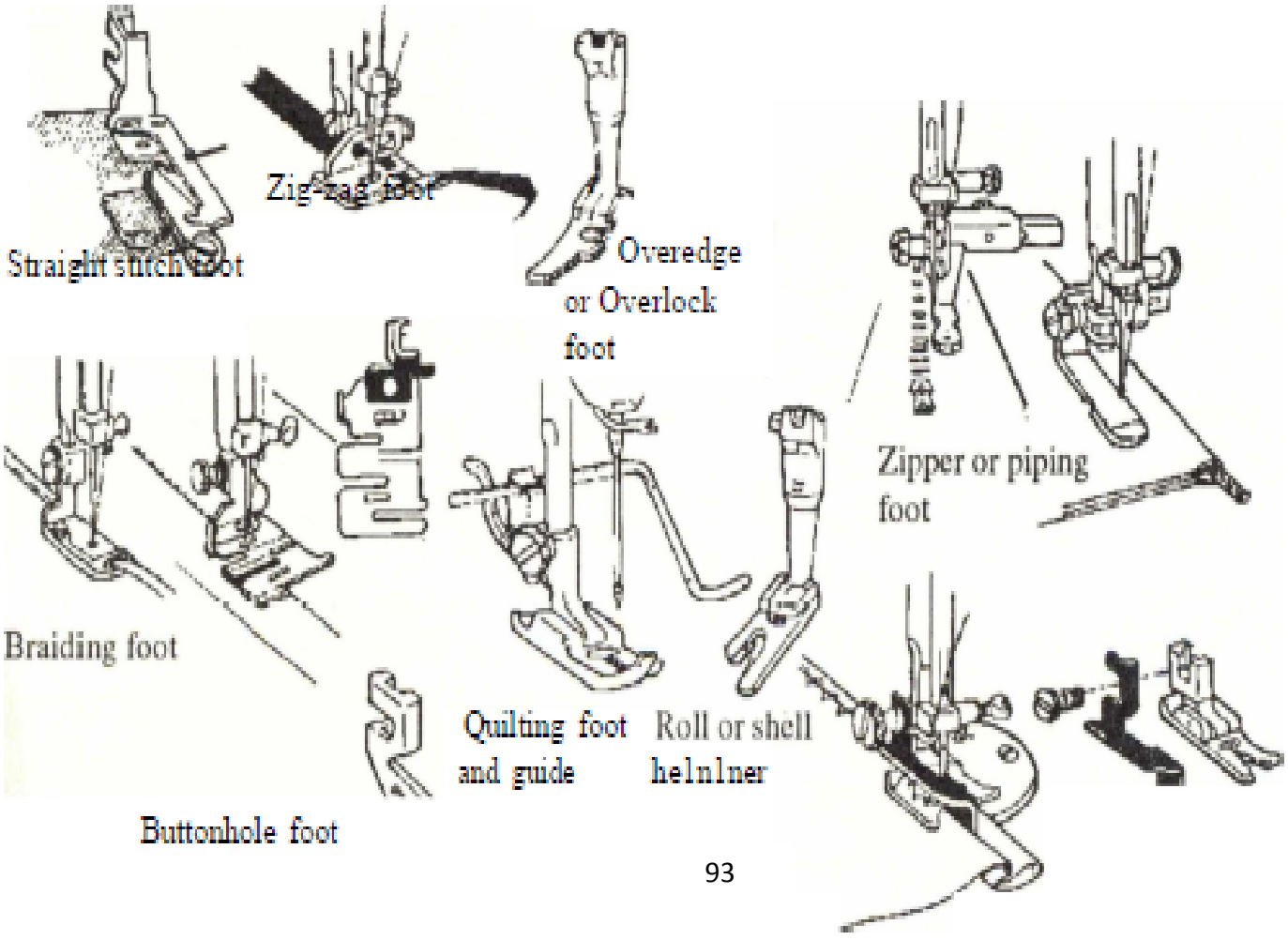


Fig.16.3 Sewing machine attachments

Faults, causes and remedies

FAULTS	CAUSES	REMEDIES
Stitches of uneven length	(a) Needle in the wrong way (b) Feed dog clogged up with fluff or dirt.	Insert needle length correctly. Use the machine brush and remove fluff or dirt.
Loops on wrong side of stitching	(a) Tension too loose on thread from reel. (b) Bobbin up-side-down.	(a) Tighten tension screw. (b) Correct bobbin position.
Loops on right side of stitching.	(a) Top tension too tight (b) Two weights of thread used. (c) Incorrect threading.	(a) Loosen tension side (b) Use identical thread on spool pin and bobbin. (c) Re-thread correctly.
Stitches missed	(a) Needle blunt or bent. (b) Thread too thick for the needle. (c) Needle thread incorrectly. (d) Wrong type of needle. (e) Material pulled as it is being stitched.	(a) Replace needle with new one of correct type. (b) Use hand to guide, not to pull the fabric.
Broken needle	(a) Needle badly centred and hitting needle plate or sewing foot. (b) Failure to lift needle before removing material. (c) Zig-zag setting too wide when using twin needle. (d) Seam or hem too-thick for size of needle. (e) Presser foot passing over pin in folds and needle hitting them.	(a) Insert needle correctly. (b) Always raise the needle out of the fabric. (c) Correct stitch width (d) Cut away some of bulk when not required. (e) Remove all pins before machining.
Stitches knot	(a) Needle in backwards	Reverse need inter- locking
Puckered Seams	(a) Top and bottom threads different. (b) Wrong sewing foot	(a) Use identical thread on reel and bobbin. (b) Use correct sewing foot.

	(c) Dull needle causing side puckers.	(c) Replace needle.
	(d) Tension too tight.	(d) Slacken tension.
Thread breaking	(a) Tension too tight	(a) Loosen tension screw.
	(b) Incorrect threading	(b) Re-thread correctly.
	(c) Needle blunt or bent	(c) Replace needle with a new one.
	(d) Needle size incorrect for the thread used.	(d) Use right type thread for the needle size.
	(e) Spool too full and fanning the bobbin case.	(e) Remove bobbin and unwind a portion of the thread.
Material not feeding through correctly	(a) Stitch length regulator turned too far so feed dog is out of action.	(a) Adjust stitch regular
	(b) Dirt around feed dog	(b) Use machine brush and remove dirt.
	(c) Feed dog incorrectly set	(c) Set feed dog correctly.
	(d) Pressure incorrect	(d) Adjust the pressure to suit thickness of fabric.
	(e) Bent pressure foot or feed dog.	(e) Replace with new ones.
Machine runs noisily	(a) Lack of oil	(a) Clean and oil the machine
	(b)Accumulation of fluff in moving parts	
	(c) Loose bobbin case.	

Activities

1. Examine a sewing machine at home or school and note the following features: name, serial number and method of operation.

2. Look at the attachments, and with the help of the machine manual list the use of each.

3. Practise sewing on the machine without thread:
(a) lined paper

(b) unlined paper

(c) circles drawn on the paper

4. Thread the machine and practise sewing on fabric. If you encounter problems try to identify the possible cause and apply the remedy.

17. SEWING TECHNIQUES

Stitches

In Book I, we learnt that stitches are divided into groups and we dealt with temporary and decorative stitches. Now let us dis cus the joining and neatening stitches.

Permanent hand stitches are usually worked from right to left. If left handed, reverse the direction of the stitching. Begin and end with a double back stitch to hold the threads securely.

JOINING STITCHES

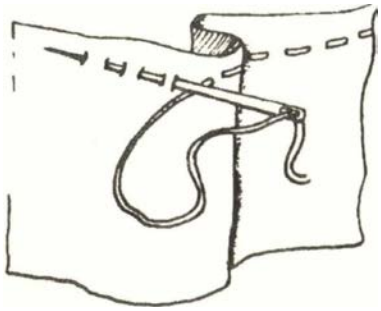


Fig. 17.1 Running stitch

Running stitch: This is the simplest way to join two pieces of fabrics together. It was the method used before the invention of the sewing machine and can still be used in the absence of a sewing machine. It is worked with the needle passing over and then under through the fabric, picking up the same amount of fabric each time- about 1/10"- 1/4" width. It is a smaller version of tacking. Running stitch can also be used for gathering and quilting.

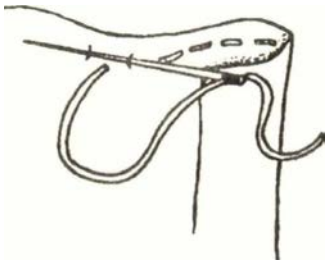


Fig. 17.2 Back stitch

Back stitch: This is much stronger than running stitch and should be used where extra strength is required. Like running stitch, it can be used in the absence of a sewing machine. It looks like machine stitch on the right side, but stitches overlap on the wrong side, like stem stitch.

Machine stitch: This is a continuous stitch made by a sewing machine



Fig. 17.3 Machine stitch

for joining pieces of for joining pieces of fabric together or for neatening edges.

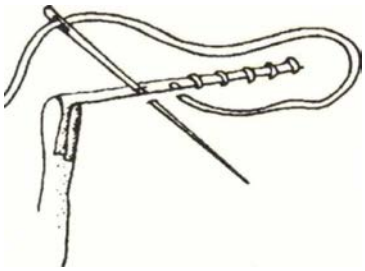


Fig. 17.4 Oversewing

Oversewing: This is used to join two folded edges of fabric when a strong join is needed. It is worked by taking up small amounts of fabric from each fold then pulling the sewing thread quite tightly to give a neat join.

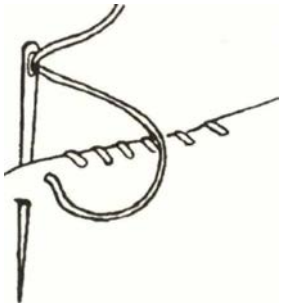


Fig. 17.5 Overcasting

NEATENING STITCHES

Overcasting: This is used to neaten the edges of fabrics which fray easily. Work from either direction. Take the thread over the edge of the fabric. Do not pull the thread too tightly as the edges of the fabric will curl and make bulges. If the fabric frays badly, work a row of machine stitches first. Trim the fabric close to the stitching before overcasting the edge and the machine stitching.

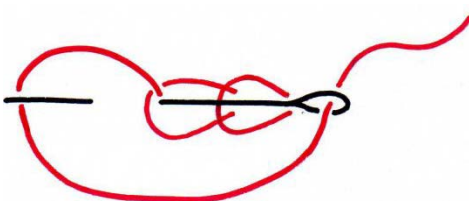


Fig. 17.6

Loop stitch: This is mainly used for neatening raw edges. The loops can be close together or spaced apart, depending on where the stitch is used. Open loop stitch can be used for finishing edges and holding them down. Closely worked loop stitch is used over bar tacks and button shanks.

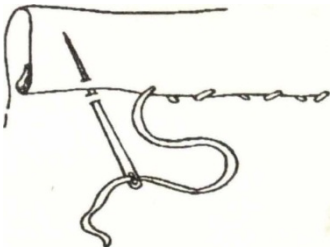


Fig. 17.7 Hem stitch

Hem stitch: This is used to hold down the fold and medium weight fabrics. Worked as shown, picking up a thread of a single fabric and then a thread of the fold before pulling the needle through.

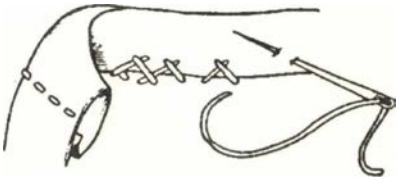


Fig. 17.8 Herringbone stitch

Herringbone stitch: This is used in hand sewing for securing hems on heavy fabrics. Work it directly over the raw edge, and the edge will be neatened at the same time. Herringbone stitch is fairly elastic so it is ideal for use with stretch fabrics and knits.

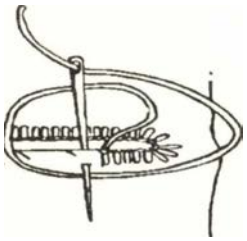


Fig. 17.9 Buttonhole stitch

Buttonhole stitch: This is used for working buttonholes in the absence of a sewing machine. It is worked in a similar way to blanket stitches but, it forms a row of knots against the raw edge. Always keep the stitches close together and make sure that the knots touch in order to keep the edge firm.

Modem sewing machines can do all these processes.

Activities

1. (a) On a double piece of fabric work one row each of running, back and machine stitches.

   (b) Write in your clothing book some of the advantages and disadvantages you have observed in working joining stitches by hand and machine.

2. (a) Work one row of joining stitch one inch away from the edge of a piece of fabric which frays easily.

   (b) Pull out yarns from the section above the stitch line or launder the fabric using the friction method. Record your observations.

   (c) Write up your own conclusion of what can possibly happen if seams, hems, but ton holes and openings are not neatened.

18: FIBRES TO FABRIC - NATURAL FIBRES

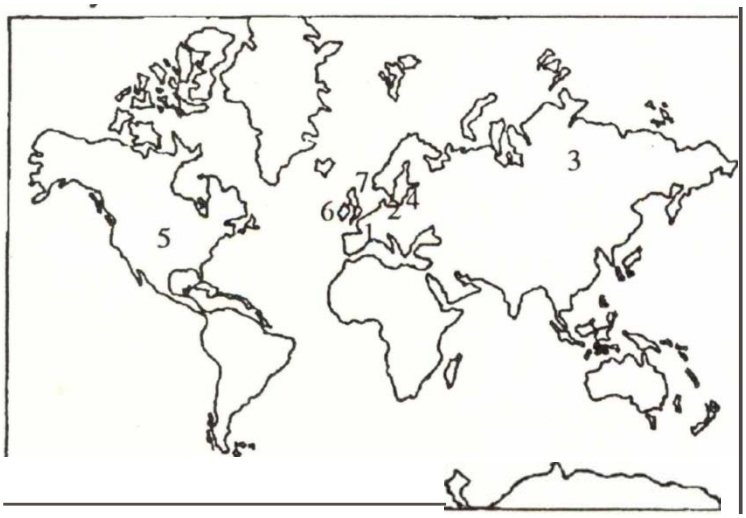
Linen

History of linen

According to historical records, linen was the first textile fiber used by mankind. The earliest record dates from as far back as the Stone Age.

In 1881 a series of pictures depicting the entire process of flax culture was discovered in Egyptian tombs dating about 2,500 years before Christ. The Bible contains references to the use of linen. The tribes of Israel used linen curtains in their places of worship and wore coats and mitre made from linen. In some ancient countries, linen was used only for ceremonial purposes, as the symbol of purity.

As civilisation advanced, linen manufacture spread to other countries. But, it was about the twelfth century that the production of flax was organised into an industry. In the fourteenth century a guild of linen weavers was established in London. The first skilled weavers were those who came to England from Flanders. Although steps were taken to encourage the production of flax and linen in England, it never flourished. By 1685, Ireland became the centre for the manufacture of linen. The flax industry in the U.S. A dates from the early 1800's when many Irish linen weavers emigrated to that country.



KEY

1	France
2	Belgium
3	Russia
4	Germany
5	United states
6	Ireland
7	Holland

Fjg. l8.1 Map of the world showing flax producing countries

Linen fibres are obtained from the inner bark of the flax plant (Linum Usitatissimun). Two types of flax are grown - fibre flax and seed flax. Fibre flax is grown for fibre production, the seed crop produces secondary fibre. Seed flax is grown for its seed.



Fiber flax



Seed Flax

Fig.18.2 Types of Flax Grown

The plant has a straight narrow stalk about thirty six to forty inches in length At the top of the stalk is a round seed pod, the size of a small pea The plant produces a blue flower.



The seeds are sown very thickly in order to produce a single straight stalk without branches. This causes the plants to grow quickly and spring into a straight stalk in the effort to reach air and sun.

Fig. 18.3 Stalks of flax

The plants are pulled by hand or machine. Care is taken to ensure that the entire fibre, from its top to the root, is intact so that a smooth yarn may be spun. The stalks are tied in bundles called beets, in preparation for removal of the fibre.

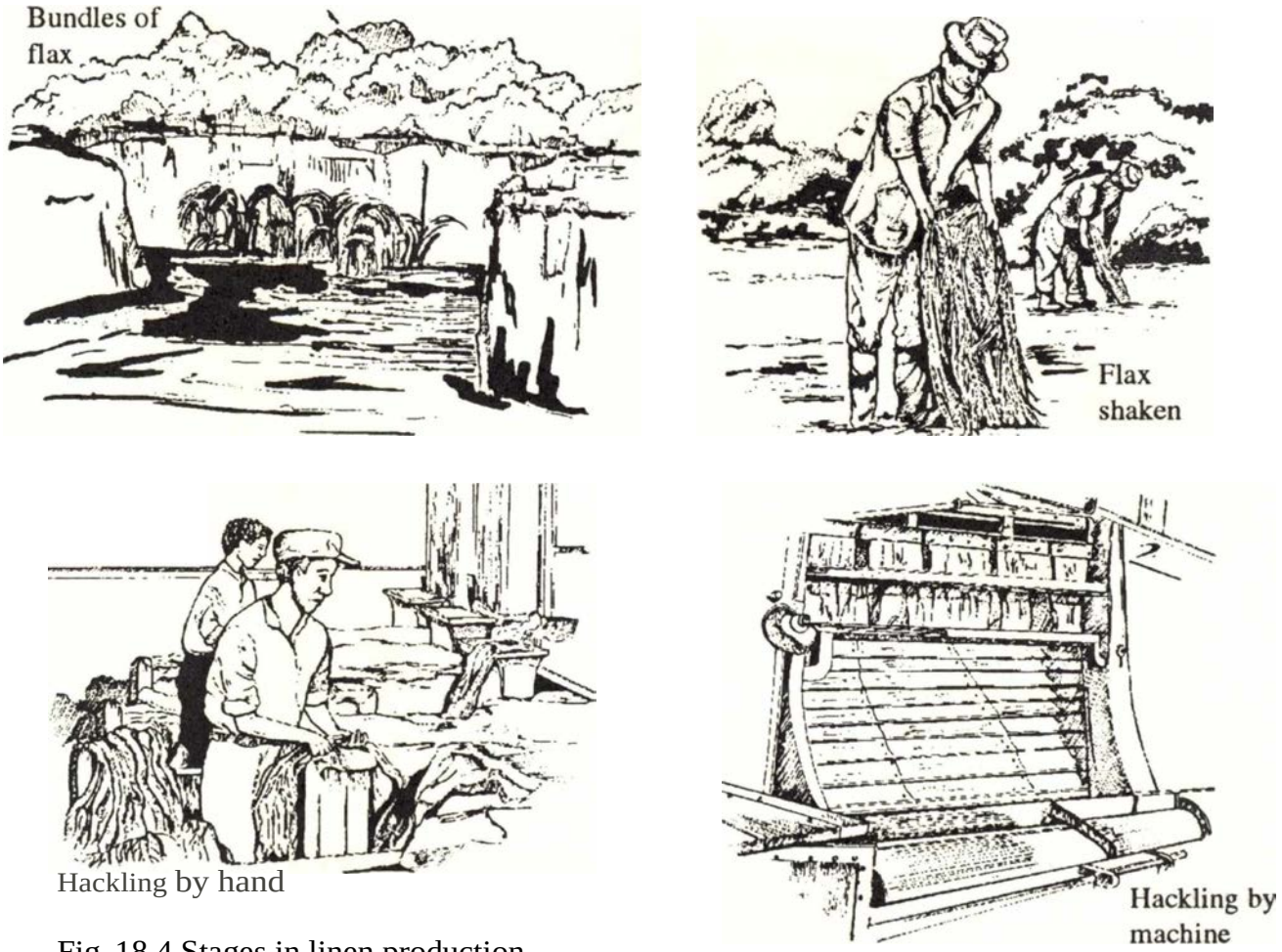


Fig. 18.4 Stages in linen production

STAGES IN THE PRODUCTION

Rippling	The seeds and the leaves are removed from the steins of the flax plants by passing the stalks through coarse combs.
Retting	The bundles of plants are steeped in water to rot away the woody covering and loosen the gum that binds the fibre to the stem. Dew, Pool, Stream, chemical and vat methods of retting are used to separate the fibre from the stem.
Breaking	The wet plants are laid in the fields to dry. After drying they are crushed by f1utled iron rollers. The breaking operation reduces the stalk to small pieces of bark called shives.
Scutching	The scutching machine removes the broken shives by means of rotating wooden paddles, thus finally releasing the flax fibres from the stalk.

Hackling	The combing process which straightens the flax fibres, removes the short fibres and leaves the longer fibres in parallel formation. The fibres are then formed into a sliver.
Spinning	The short-staple fibres called tow, are used for the spinning of irregular linen yarns. Tow is put through a carding operation which straightens the fibres and forms them into sliver. The longer fibres called line are used for fine linens.
Weaving	The sliver is passed through a trough of hot water to loosen the natural gum on the fibre and to allow the twisting together of several strands to produce a compact yarn most linens are produced in plain satin and jacquard weaves. The twill weave is used for linen drills.
Bleaching	The loom state linen fabric is off-white, fawn or greyish in colour. (Often called greycloth).To produce white or coloured linen the fabric must be bleached. However, if colour-woven patterns are required, the yarns are dyed before weaving.

Properties of Linen

Linen is:

- two or three times stronger than cotton and is second in strength to silk in the natural fibre group.
- very hard wearing but, unless it has a special finish it creases easily and frays, making it rather difficult for beginners to use.
- the least elastic of natural fibres.
- smooth to the touch and therefore cool to wear and will not become easily soiled.
- absorbs moisture and dries quickly.
- launders well, can withstand high degrees of heat and is not affected by alkalis. not stained readily as co tton, but is more difficult to bleach.
- resistant to abrasion.
- not resistant to mildew.
- sometimes blended with man-made fibres and contributes absorbency, texture and strength to the blended fabric.
- expensive.

Some Linen fabrics are damask, huckaback, sheeting, towelling, crash, dress suit and coat-weight plain weave fabrics, cambric and canvas.

Special finishes applied to Improve Linen Fabrics

Linen is chemically similar to cotton; consequently, similar finishes can be applied to it. The finish used depends upon the intended purpose and use of the fabric. The natural characteristics of linen are improved by the following finishing processes:

Beetling	The fabric is wound into a large smooth roll. Large heavy wooden 'hammers' are automatically lifted and dropped continuously on the rotating roll of fabric beneath. This flattens the fabric and produces extra shine. Table linen is put through this process, not dress linen.
Calendering	The passing of the fabric between a heated metal roller under pressure to produce a glazed finish.
Merccrising	The fabric is treated with a strong caustic soda solution under high tension. The tension released after the caustic soda has been washed off. It gives the fabric a very high lustre.
Sizing	A stiffening agent such as starch, glue or resin is applied to woven fabric to give stiffness, smoothness and weight.
Wrinkle resisting	The fabric is treated with chemicals to keep it flat and smooth, hence, easier to care.

Uses of linen



Fig 18.5 Articles made from linen

Care of linen



white linen without special finishes.



linen without special finishes where colours are fast at 60°C



linen where colours are fast at 40°C.



discoloured white linen.



may be tumble dried.



line dry

hot iron



- Linen should be ironed while still very damp in order to regain its natural stiffness.
- Due to the brittleness and stiffness of the fibres, creases should not be ironed in and, if it is to be stored, it is better rolled rather than folded.



Identifying linen

Fig. 18.6 Linen symbol

Burning

Both cotton and linen burn quickly, both in and out of the flame, with a smell of burning paper. They leave a white ash.

Microscopic

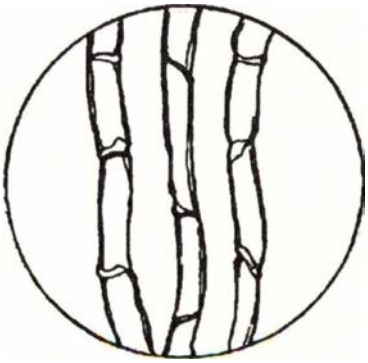


Fig 18.7 Appearance of flax fibres under the microscope

Chemical	-Dissolves in concentrated sulphuric acid in one to two minutes.

Activities

1. Write in your own words how each of the following methods of Retting is carried out: dew, pool, stream, chemical and vat.

2. Using a table, compare the properties of cotton and linen fabrics.

3. Collect samples of linen fabrics and mount each in your Clothing Project Book. Under each sample state the name, type of weave and use or uses.

4. Although linen is more expensive than cotton, it gives much longer service. For what articles would it be wise for a family to choose linen rather than cotton?

5. Distinguish cotton from linen, by conducting the following tests:

   (a) Boil samples in a strong solution of salt and water. Dry samples and burn them. Check results with information provided on burning test.

   (b) Place a drop of olive oil on each sample, blot up excess. What did you observe?

   (c) Place a drop of ink on samples. Write your observations.

19: WOOL

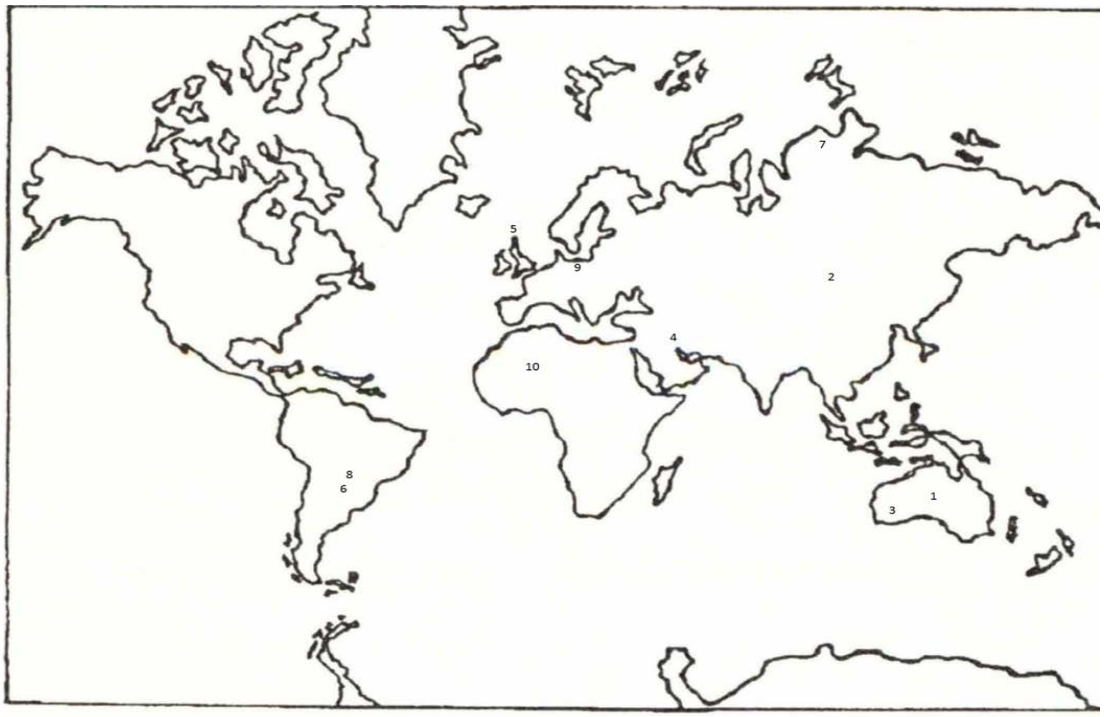
History of wool

The word 'wool' comes from the saxon "woll" or "woole". The earliest clothes worn by man to keep warm were the skins or pelts of animals killed for food. The pelts soon became matted by usage and this gave early man the idea of felting it into a crude fabric. Later, the matted felt was twisted into yarn and braided, woven or knitted into fabric.

History states that when Julius Caesar arrived in Britain, he found that the natives had mastered the art of making woollen fabric. The early Romans encouraged sheep rearing in England and in A.D 80 introduced wool weaving in England. English wool earned its fame during the medieval period and still retains its skilled Flemish weavers, who emigrated to England and contributed to the excellence and versatility of British wool fabrics. The Weaver's Guilds were largely responsible for maintaining its high quality.

The United States is the largest manufacturer of wool products, consuming all its own raw materials and importing large quantities as well. England and Continental Europe manufacture most of the remainder. English-worsted, scottish-tweeds and French-crepes have a reputation for being among the best of their kind.

Sources



KEY

Australia	1
China	2
New Zealand	3
Iran	4
United Kingdom	5
Argentina	6
Russia	7
Uruguay	8
Turkey	9
Sudan	10

Fig.19.1 Map of the world showing wool producing countries

Wool Production

Wool is the fibre obtained from the protective covering of various animals, however, the sheep is the main producer. The hair from the camel, horse, goat and rabbit is also used for making fabrics.

The main differences between hair and wool are:

- Hair has considerably less crimp than wool and looks straighter under the microscope.
- The scales of hair are less free and more closely attached to the central cylinder than those of wool.
- Hair is shed every year, whereas wool has to be cut (unless pulled from the skin of dead sheep).

There are many different qualities of wool. The quality depends primarily on the breed of sheep from which the wool comes. There are three main types:

- Merino wool — is the finest wool available and is obtained from sheep specially bred for their wool, the meat being commercially valueless.
- Cross-bred wool — is obtained from sheep bred for both meat and wool. There are many varieties of cross-bred sheep. As such, the quality of wool varies.
- Carpet wools — are long coarse wools obtained from Asiatic sheep, which have not been selectively bred, or from mountain and hill breeds of sheep. As the name implies they are used for carpets.

In addition, the steadily increasing demand for wool and the cost for new wool are so high that "reclaimed" wool is used to meet the demands. There are two main types:

- Reprocessed wool - This is obtained from scraps of "unused" woven or felted goods left over during the manufacturing processes.
- Reused wool - known as shoddy is made from all kinds of "used" consumers' goods.

The name 'virgin wool' applies to new wool of any quality.

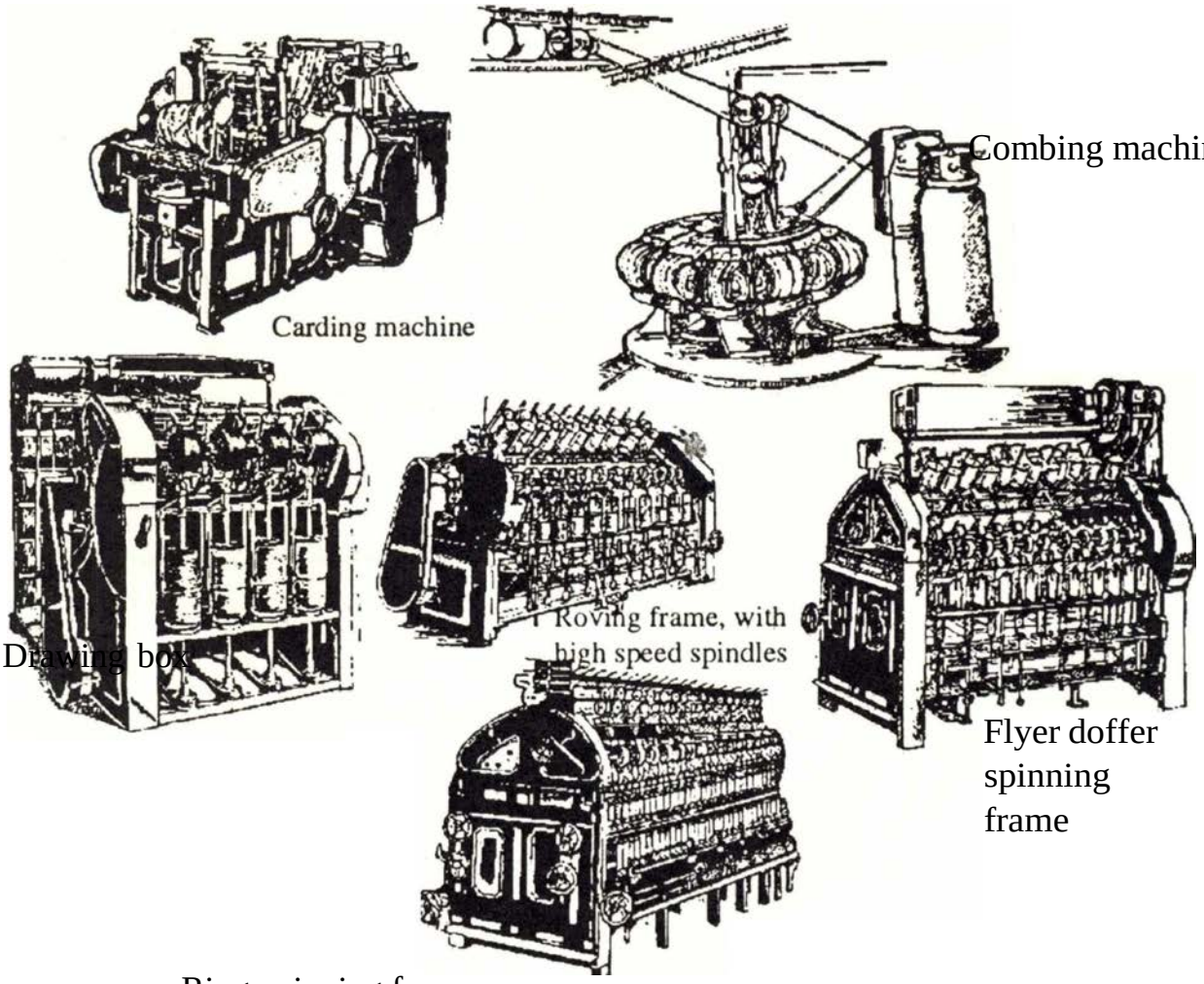


Fig. 19.2

Wool may be manufactured by either of the following methods:

Woollen	-	to produce soft, loose, fuzzy yarns and fabrics.
Worsted	-	to produce strong, smooth, lustrous yarns and fabrics.

STAGES IN THE PRODUCTION

Sorting	-	The fibres are sorted according to length, colour and fineness.
Scouring	-	The fibres are washed in hot soapy water to remove the natural grease and sweat. (Lanolin is a by-product at this stage.)

Rinsing and Drying

Carbonising	-	The fibres are treated with heat, acid and pressure to remove seeds, burns and other vegetable matter.

Carding	The carding machine removes more impurities. Fibres are brushed and made to lie parallel to each other. The fibres are collected into a soft rope-like form known as a sliver.
Combing	Combing is done only for worsted fabrics. The fibres are combed by fine needles in the machine to remove short fibres.
Drawing	Drawing is done only for worsted fabrics. The drawing machine pulls out the slivers and coils several into one.
Roving	The further drawing out and slightly twisting of the diameter of the sliver. Rovings emerge at this stage.
Spinning	The roving is converted into yarn on the spinning frame. Woollen yarns are chiefly spun on the mule spinning machine. Worsted yarns on any kind of spinning machine - mule, ring cap or flyer.

Wool can be made into fabric, using all the methods of fabric construction.

Properties of Wool

Wool:

- has the greatest elasticity of all the textile fibres. This makes wool crease resistant, without being treated.
- each source has its own distinctive characteristics.
- has natural crimp which gives elasticity and cause it to spring back into shape after it is stretched.
- overlapping scales, together with the fibre crimp, hold pockets of air which act as insulators.
- can hold moisture without losing its warmth.
- is partly water repellent. It can absorb as much as 30% of its own weight in water vapour without feeling damp or clammy.
- does not dry quickly.
- which is reclaimed is not as resilient, strong or durable as virgin wool.
- retains odour .
- is not damaged by mildew but, can be attacked by moth, unless treated.
- is likely to shrink, unless treated.
- ignites and burns very slowly, hence it can be used to put out flames.
- fabrics dye well and evenly with a variety of dye .
- is expensive.

Some wool fabrics are felt, flannel, fleece, gabardine, jersey lace, serge, tartan, tropical, tweed, velour, blanket cloth, broad cloth, boucle, challine.

Special finishes applied to improve wool fabrics

Woollen

Milling - fabrics are pounded and squeezed in a warm soapy solution, so that some felting takes place and the fabric becomes compact.

Raising - A finish which gives blankets and coating fabrics a nap or pile raised effect.

Cropping - The treatment of woollen fabrics by passing them through a machine fitted with blades which cut projecting surface fibers to a uniform length.

Worsted

Cropping - Same as for woollens but these are closely cropped.

Singeing- This is another method of removing surface fibres. The fabric is rapidly passed through a gas flame to burn off the surface fibres.

Woollens and worsted

Moth Proofing - The treatment of wool fabrics by adding chemical substances to the dye bath. This discourages moth from attacking the fabric.

Gigging - A special treatment which produces a raised surface.

Flame-proof - A special treatment which prevents fabrics from burning easily.

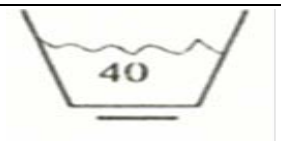
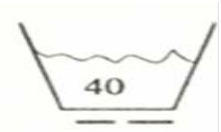
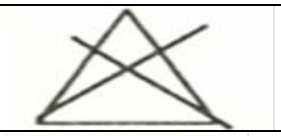
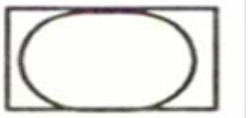
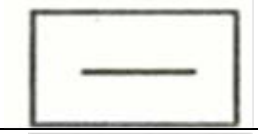
Permanent pleating - A finish in which heat sets pleats and keeps them intact even after washing.

Uses of wool



Fig. 19.3 Clothing made of wool

Care of wool

	For polyester/wool blends. Medium machine action
	Pure wool and wool blends. Minimum machine action.
	Do not bleach.
	May be tumble dried.
	Knitted garments and articles. Dry flat.
	Heavy woven article. Drip dried.
	Hot iron
	Dry-cleanable in solvent 113 and white spirit

Identifying wool



Fig. 19.4 Symbols used to identify wood

Burning -	Wool smoulders as it approaches the flame. In flame it produces, small, slow flickering flame, sizzles and curls. It smells like burning feather or hair and produces a crisp dark ash which crushes easily.
Microscopic-	The surface of each wool fibre is covered with scales, called epithelial scales, which overlap with the edges of the scales pointing from the base of the fibre to the tip.
Chemical	Turns brown with sulphur test. Dissolves in caustic soda.

Activities

1. A serge pants has the label 'Pure new wool' and another woollen pants similar in appearance is labelled 'Pure wool'. What differences are likely to be in the:
   (a) origin of the fibres?
   (b) wearing qualities?
   (c) cost?
2. Using a table, compare the differences in properties between woollen and worsted fabrics.
3. Mount labelled samples of wool fabrics under the heading stated below, in your Clothing Project Book.
   - Woollen
   - Worsted

20: SILK

History of silk

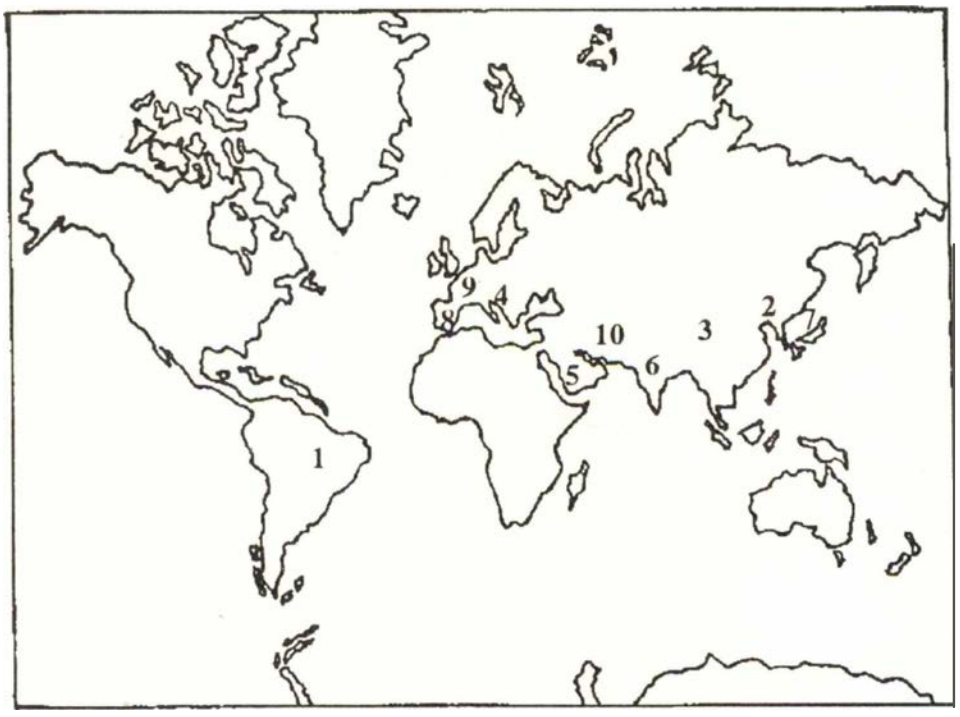
The first people to use silk as a textile fibre were the Chinese. In about 2640 B.C. Si-ling-chi, the young wife of the third Emperor of China discovered how to reel silk from cocoons which she later wove into a robe for the Emperor. For nearly 2,000 years the Chinese guarded the secret of manufacturing silk.

In A.D. 300, knowledge of se mi-culture slowly began to trickle out of China. Silk worm eggs were smuggled out of China and found their way to Japan and then India. By similar method, silk production was introduced into Europe in A.D. 550. From that time, semi-culture and silk production spre ad over the whole of Eastern Europe.

However, because silk cultivation is a more economic proposition in places where cheap labour is available, semi-culture has become most important in China, Japan, India and Italy.

Sources

KEY



Brazil	1
Korea	2
China	3
Italy	4
Greece	5
India	6
Japan	7
Spain	8
France	9
Iran	10

Fig. 20.1 Map of the world showing silk producing countries

Silk production

Silk comes from the cocoon of the silk moth (Bombyx Mori). The production of cocoons for their filament is called semi-culture.

In semi-culture all four stages of the life cycle are important.

The better cocoons are kept for supplying eggs for another hatching.

Silkworms may be hatched three times a year, under scientific condition and once a year under natural condition. The life cycle is as follows:

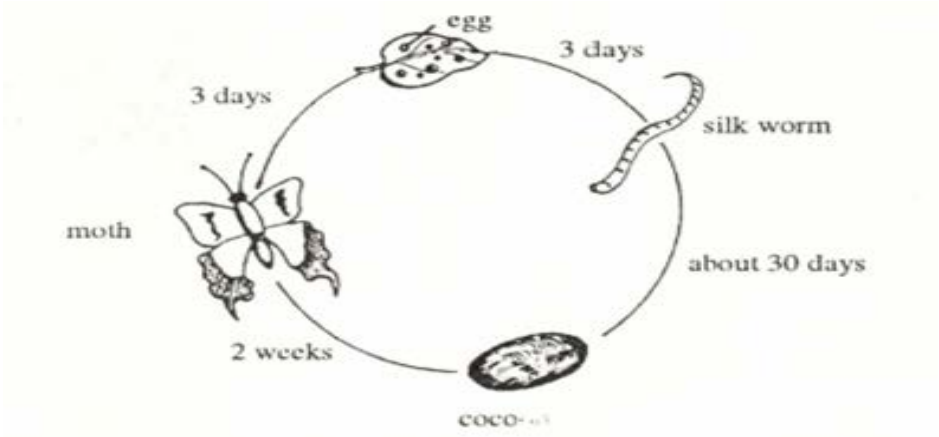


Fig.20.2 Life cycle of the silk moth

- The moth lays about 350-400 eggs then dies.
- The eggs hatch producing silkworm (larvae).
- They grow quickly, changing skin four times.
- After approximately thirty days, the silkworm starts to spin a cocoon.
- Silk comes from two small openings under the jaws called spinnerets.
- The worm changes to moth inside the cocoon.
- The moth emerges from the cocoon and the cycle begins again.

Two varieties of cocoon are used for silk production:

1. Cultivated	Bombyx mori	They are kept under controlled conditions. They feed on mulberry leaves.
2. Wild Silk	Tussah	This moth cannot be cultivated. It lives outdoor on oak leaves

STAGES IN PRODUCTION

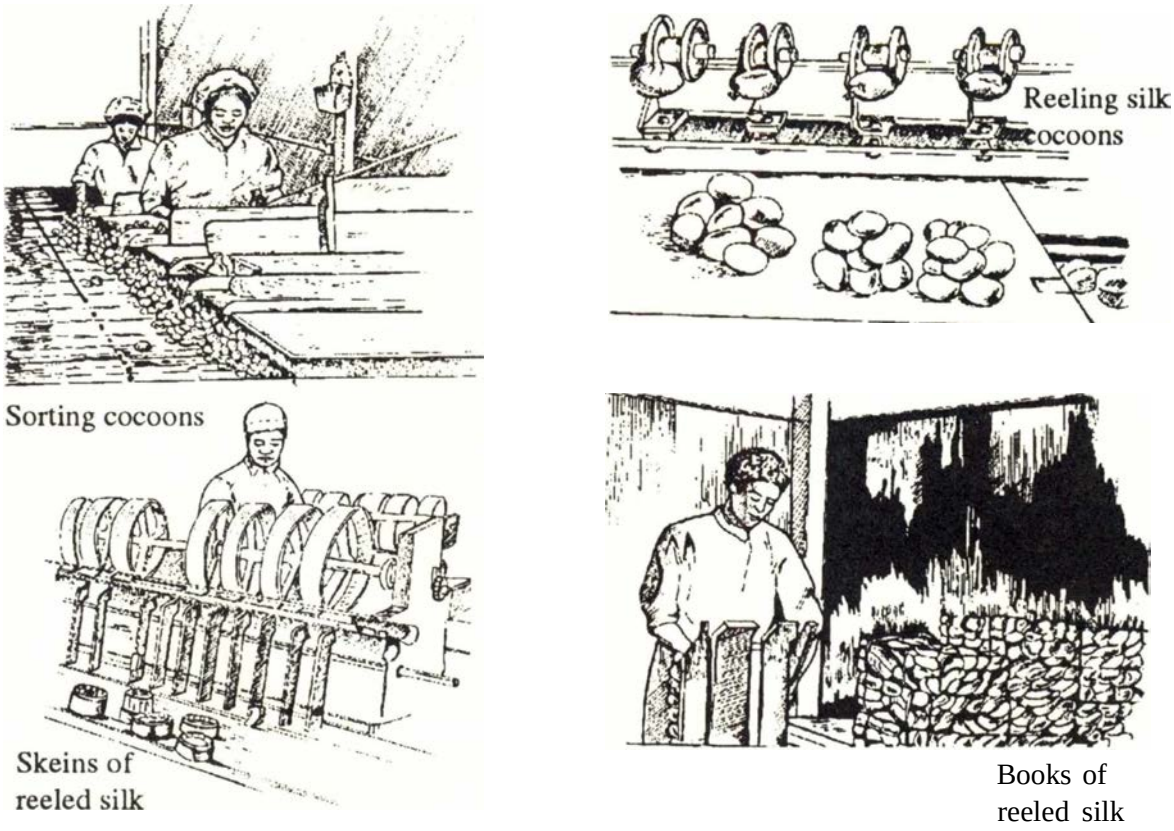


Fig. 20.3 Stage in silk production

During the production of silk the moth is not allowed to break out of the cocoon as it damages the silk threads. Instead, heat is applied to the cocoon to kill the worm before it emerges. The silk can then be wound off in a continuous filament.

Reeling	the process of unwinding the cocoon to obtain the silk.
Throwing	reeled silk is transformed into silk yarn by twisting the filaments.
Spinning	twisting the thrown silk.
Degumming	removing the stiff gum (sericin) to bring out the natural lustre and the soft feel of the silk.

Properties of silk

Silk:

- is the longest natural fibre.
- has a natural lustre.
- is elastic, but not as elastic as wool.
- fabrics help to keep the body warm.
- absorbs water well and dries fairly quickly.
- fibres are extremely strong but this strength decreases slightly on wetting.
- fabrics retain their shape and resist wrinkling.
- water-spots easily but laundering will restore the appearance.
- fabrics are damaged by perspiration.
- is expensive.

Special finish applied to silk fabric

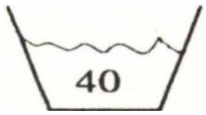
Embossing	A finish which produces raised designs on the fabric surface. The fabric is passed between heated engraved rollers.

Uses of silk



Fig. 20.4 Some uses of silk

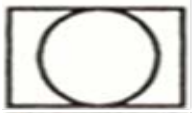
Care of silk



Minimum machine action. Spin, do not hand wring. Initial water temperature should not exceed 30C or 65 to 85F.



Do not bleach. No bleach product may be used. The garment is not colorfast or structurally able to with-stand any bleach.



May be tumble dried.



Drip dry. Hand dripping wet garment from line or bar, in or out doors, without hand shaping or smoothing.



Warm iron. Regular ironing, steam or dry, may be performed at medium setting (150C, 300F).



Dry-clean, using only petroleum solvent. Usually used with other restrictions.

Identifying silk

Burning



Fig. 20.5 100°/o silk symbol

Silk burns in, but not out of, a flame leaving black beads which crush easily. The fumes smell like burnt feathers.

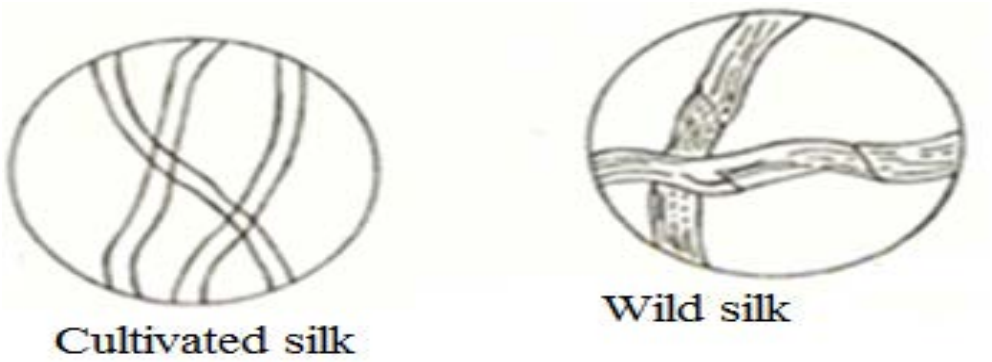


Fig. 20.6 Types of silk

Microscopic Cultivated silk is a narrow rounded structureless fibre. Wild silk is a

	broader fibre with fine, wavy longitudinal lines running across its surface giving it a dark hue under the microscope.
Chemical	Dissolves in sulphuric acid and caustic soda.

Activities

1. Identify silk, using the burning and microscopic tests. Compare your observation with the information provided on identification.
2. Do some tests on samples of fabrics sold as silk in our stores.
3. Write what you understand about 'cultivated silk' and wild silk.
4. Discuss the advantages and disadvantages of silk for use in :
   (i) night dresses
   (ii) school shirts
   (iii) day suits
5. Mount labelled silk samples in your Clothing Project Book.

21. CLOTHING CARE

Clothing

During use, textiles become dirty and may pick up stains accidentally. However, if we follow the correct methods in the caring of clothes, they will look fresh and last longer.

Hints on caring

- Air garments immediately after taking them off.
- Do not wear garments until they become heavily soiled before laundering.
- Launder under garment and stockings/socks daily.
- Never-store soiled clothing.
- Remove stains as soon as possible.
- Repair when necessary.
- Use suitable detergent, washing methods and finishing methods for fabric type

Care labels

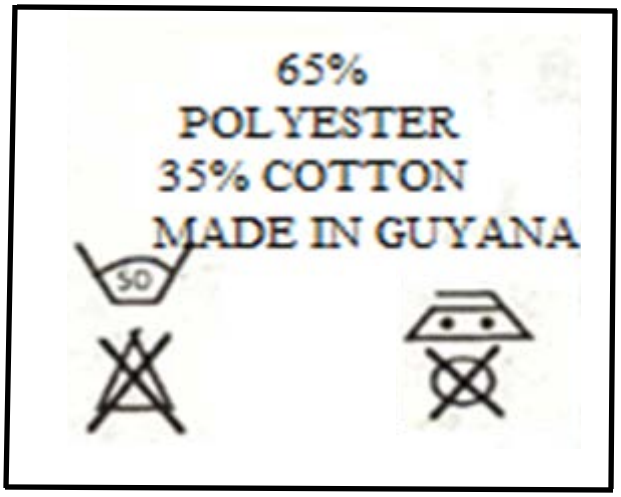
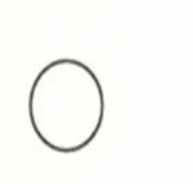


Fig.2.1 Example of a care label

Care labels are tags, sewn into the made up textile article, which provide information on the fibre content and specific care of the article. These can be seen on the label illustrated. The label was removed from a white shirt.

Symbols are used on the care labels to make the instructions easily understood internationally. There are five basic symbols and these are:

	The wash tub represents washing.
	The triangle represents bleaching.
	The square represents drying.
	The iron represents ironing instructions.
	The circle represents dry cleaning.

Always read care labels and follow the instructions. Failing to do so, can result in the destruction of some of the properties and the appearance of the fabric.

Following is an explanation of the various symbols found on care labels:

Washing	The wash tub symbol shows three sets of information:
	Water temperature – this is known from the number in the tub. Amount of agitation – show by bar symbol beneath the tub.
	No bar means normal (maximum) machine action.
	One bar means reduced (medium) machine action.
	Two bars mean minimum machine action.

Method of water extraction – shown by the same bar symbol beneath the tub as for agitation

No bar- means normal spinning

One bar- short spinning

Two bars- normal spinning

Bleaching

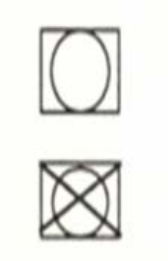


The letters CL indicate that chlorine bleach may be used



Do not bleach

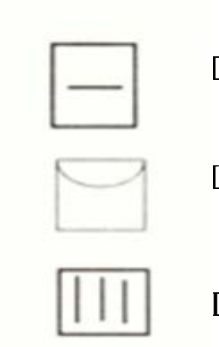
Drying



Article can be tumble dried

Do not tumble dry

In addition, some articles may show the following symbols:



Dry flat

Line dry

Drip dry

Ironing

There are four variations of the symbol, the dots indicate temperature settings:



Hot

Warm

Cool

Do not iron

Dry cleaning



Article can be dry-cleaned

Indicates a sensitivity to dry-cleaning

Normal goods, dry-cleanable in all solvents

Normal goods, dry-cleanable in perchloroethylene, solvent 113, white spirits and solvent 11.

Normal goods, dry-cleanable in solvent 113 and white spirits.

Do not dry-clean.

Stain removal

Stains are discoloured marks on the article. Stains may be divided into three groups, based on the solubility of the stain.
These are:

1. **Water soluble stains,** e.g., fruit juice, tea, coffee. The stains, if washed out immediately, can be easily removed with water containing a wetting agent such as soap or soapless detergent.

2. **Stains soluble in solvents other than water**,e.g., paint grease, oil, ball point ink, lip stick, nail varnish , shoe polish , grass. These substances do not normally react chemically with the fabric, hence can be removed by using a suitable solvent.

3. **Insoluble stains** -Most stains are soluble when first deposited on a fabric, but they may react with the fabric itself, the dye, the oxygen in the air or the application of heat to become insoluble. Some such stains are: blood, meat juices, cocoa, egg, milk, perspiration, wine, iron mould and rust.

To remove these stains, they have to be changed chemically into a soluble substance which can then be removed with a suitable solvent, or they may be bleached to make them invisible.

GENERAL RULES FOR STAIN REMOVAL

- Remove stains as soon as possible.
- Check care label for fibre contents.
- Identify the nature of the stain.
- Test to ensure that the stain remover will not damage the fabric.
- Use the safety precautions for using solvents.
- Follow the safety precautions for using solvents.
- Apply liquid removers from the outside towards the stain, to prevent formation of rings.
- Push the stain out from the back.
- Remove all traces of the stain remover.

Solvents Used in Stain Removal

STAIN	SOLVENT	STAIN	SOLVENT
Blood	Cold salt water	Nail varnish	Acetone
Chocolate	Grease solvent	Ink	Methylated spirits
Curry	Glycerine	Wine	Borax
Egg	Enzyn1e detergent	Wax	Grease solvent
Fruit	Glycerine	Perspiration	Vinegar or ammonia
Grass	Methylated spirits	Paint	White spirits or petrol
Iron mould	Salt and lemon	Adhesive	Acetone

Activities

1. Why do you think basic symbols are used in care labelling?

   (a) Mount labels to show the use of the different care labelling symbols in your Clothing Project Book.

   (b) Compare the washing instructions given for articles of similar fibre content, if possible.

2. You have been presented with a 100% white cotton shirt which has no care label. Make up a care label for the article.

3. There is no care label on a new fabric article. List some of the tests one can carry out before laundering.

4. A stain of unknown origin is on your 'best' suit. What steps would you take to ensure removal without damage to the fabric?

5. Stain sample pieces of natural fabrics. Apply recommended solvent and record the result.

SEWING TECHNIQUES

Seams



Fig. 22.1 (a)

Look at the garments illustrated in Fig. 22.1 (a)
How were they made?
ig. 22.1 (b)

Now look at the garment illustrated in Fig. 22.1 (b)

How were these constructed?



The garment in Fig 22 (a) were made by simply wrapping one length of fabric around the body whereas, those in Fig 22.1 (b) were made by cutting and stitching shaped pieces of fabric together to fit the body.

Seams are formed when two or more pieces of fabric are joined together. Seams are usually machine stitched, but can also be sewn by hand, using back or running stitches.

Now look again at the illustrations in Fig 22.1 (a) and identify the positions of the seams. Then identify the same on the garment you are wearing.

There are different types of seams, e.g. f1at, open or plain, French, run and fell, doubled stitch, crossed, edged stitch, tucked. The choice of seam depends on:

- the weight and type of fabric being used .
- the article or garment being made.
- the position of the seam on the article or garment.
- the shape of the seam .
- whether the garment/article is to be dry-cleaned or laundered .

General rules for working seams

- Threads used must be of suitable colour and type for the fabric.
- The width of the seam is determined by the texture of the fabric. The finer the fabric, the narrower the seam.
- All seams of the same type on a garment or article must be of similar width.
- Straight stitching, with correct tension, is necessary for good results.
- Seams must be flat and neat on both wrong and right sides.

Flat open or plain seam

This seam is the basic method used to join fabrics of normal weight.

- It is always sewn with the right sides of the fabric facing.
- No stitching is visible on the right side.

- The depth of the seam allowance varies according to the texture, fraying qualities of fabric and method of neatening planned.
- The turnings may be pressed open or both pressed to one side, according to where the seam is used.
- It is suitable for joining straight or curved edges.

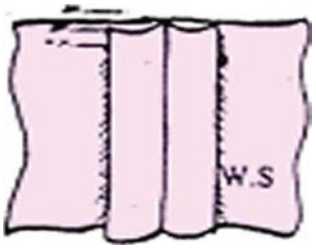
Directions for making flat open seam

Imagine these pieces represent sections of garments to be joined.

(a)



(b)



1. Place raw edges together, right sides facing.
2. Match balance marks and fitting lines.
3. Tack and stitch along the seam line.
4. Remove tacking and press the seam open.
5. Neaten raw edges by using one of the following methods:

Fig. 22.2 (a) and (b) Making a flat open seams

Machine stich

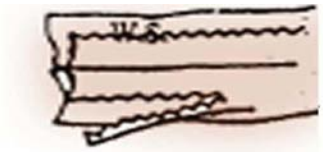




Overcasting

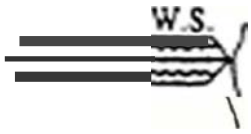
Loop Stitch





Pinking

Zigzag stitch





Crossway strips

Fig. 22.3 (c) Neatening a flat open seam

(a) Turn a lay tack and machine close to edge. Suitable for light weight fabrics.

(b) Loop stitch suitable for heavy fabrics which do not fray easily. Used for waist and armhole seams in the absence of a sewing machine.

(c) Overcasting used as for loop stitching.

(d) Pinking suitable for fabrics which do not fray easily.

(e) Zig-zag stitch suitable for all except sheer fabrics.

(f) Crossway strips. Enclose the raw edge of the seam within the crossway strip. Tack and stitch in position. Suitable for binding straight and shaped seams of unlined coats and jackets.

French Seam

This is a seam within a seam which encloses the raw edges of the fabric so that fraying does not occur.

- No stitching is visible on the right side.
- It is normally used on tine, semi-transparent fabrics or on medium-weight fabrics which have the tendency to fray badly.
- The seam is often used on children's garments, blouses and underwear to give a smooth seam that can withstand frequent washing.
- The finished seam should not be wider than 6m (l/4in).
- When completed, it is always pressed towards the back of the garment

Directions for making French seam

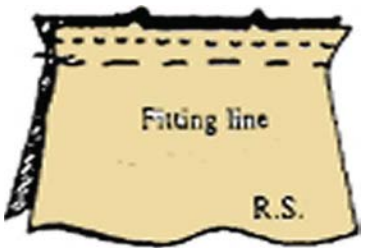


Fig. 22.4 (a) Tacking raw edges together

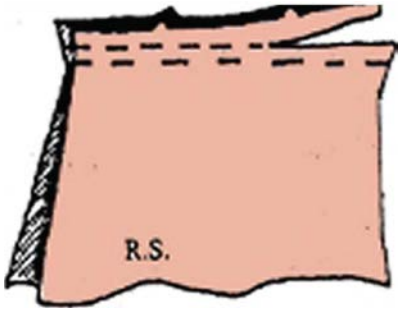


Fig. 22 .4 (b) Removing tacking and trimming at the second stage

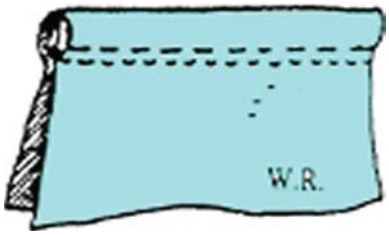


Fig. 22.4 (c) Refolding at the third stage

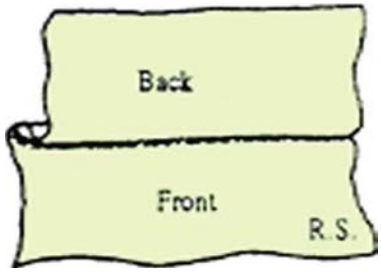


Fig. 22.4 (d) Finished French seam

Imagine these pieces represent sections of garments to be joined.

1. Place raw edges together, wrong sides facing tack and stitch 6m (1/4 in) outside the fitting line.

2. Remove tacking and trim both seam allowances to 3mm (1/8in.

3. Refold so that the right sides are together and the seam is at the edge. Pin, tack and stitch along the fitting line. The raw edges should now be enclosed.

4. Remove tacking. Press the finished seam towards the back of the garment.

Double stitched seam

This is a flat, self-neatened seam which has two rows of machine stitching seen on the right side and one row on the wrong side.

- It is strong because the strain in wear is taken by two sets of stitching.
- It can be used on all except heavy fabrics.
- An excellent seam for clothing which requires hard wear and frequent washing, e.g., shirts, jeans, underwear, nightwear, overalls.
- Contrasting threads can be used.
- It is the easiest seam to launder.

Directions for making double stitched seam

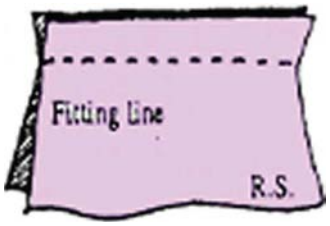


Fig. 22.5(a) Tacking raw edges together

Imagine these pieces represent sections of garments to be joined.

1. Place raw edges together, wrong sides facing. Tack and stitch on fitting line.

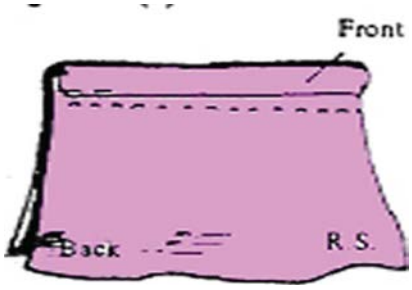


Fig.22.5 (b) Removing tacking at the second stage

2. Remove tacking. Cut down the back, turning by half of its depth.

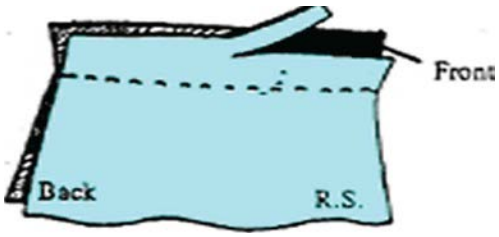


Fig.22.5 (c) The third stage of the Double stitched seam

3. Fold the other raw edge over the trimmed turning and tack in position.

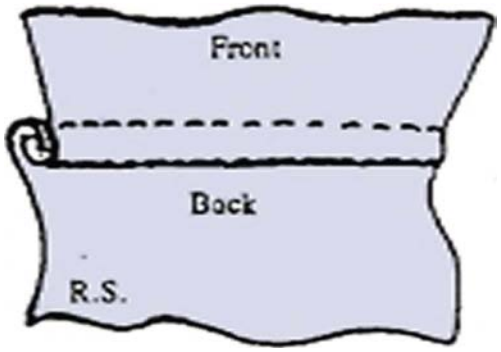


Fig 22.5 (d) Finished Double stitched seam

4. Press the seam down flat, turning down the lay, covering the raw edge. Tack and edge stitch. Remove tacking stitches.

23: SIMPLE REPAIRS

It is important for us to make certain our clothes are always clean and well cared for. This will ensure that we obtain the best value from them. We must therefore make plans for repairs to our garments and articles. These may be from darning simple holes to large patches.

Darning: Holes in knitted or woven fabrics can be darned. Thread suitable in colour, texture and thickness should be used. A long fine darning needle and a mushroom are ideal. Working is done on the wrong side. This is suitable for garments and articles such as socks, underwear and table linen.

Machine: When darning by machine, the ragged edges should be trimmed off. Work across the hole in the weft direction, spacing the rows and making them long enough to cover the worn part from the work. Darn in the warp direction, keeping rows close together. To strengthen the garment a thin piece of fabric can be placed behind the hole first. See illustration 21. 1



A tear which is on the cross grain should be darned as shown below.

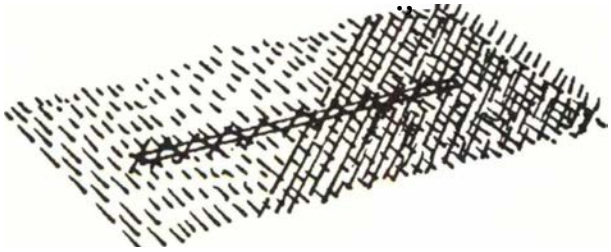


Fig 22.1 Machine darning

Patches: Darning is not suitable for large holes or worn patches, so a patch is ideal. The fabric chosen for the patch should be of the similar weight, type and colour with matching thread. There are many types of patches but we will examine print, calico, decorative and quick invisible.

Print: This is referred to as outer garment patch and is used for printed and patterned light and medium fabrics, e.g., shirts, dresses and covers.

Calico: This is known as the household patch and is used on sheets, pillow cases, towels, shirts and pyjamas.

Decorative: This is used on children's clothes, jeans and lingerie. Appliques cut from contrasting colours or designs are put over the worn area.

Quick Invisible Mending: Commercial adhesive fabrics or tapes can be used. Instructions for their use are given with the pack. Generally they are pressed on. This type of patch is not ideal for washable fabric.

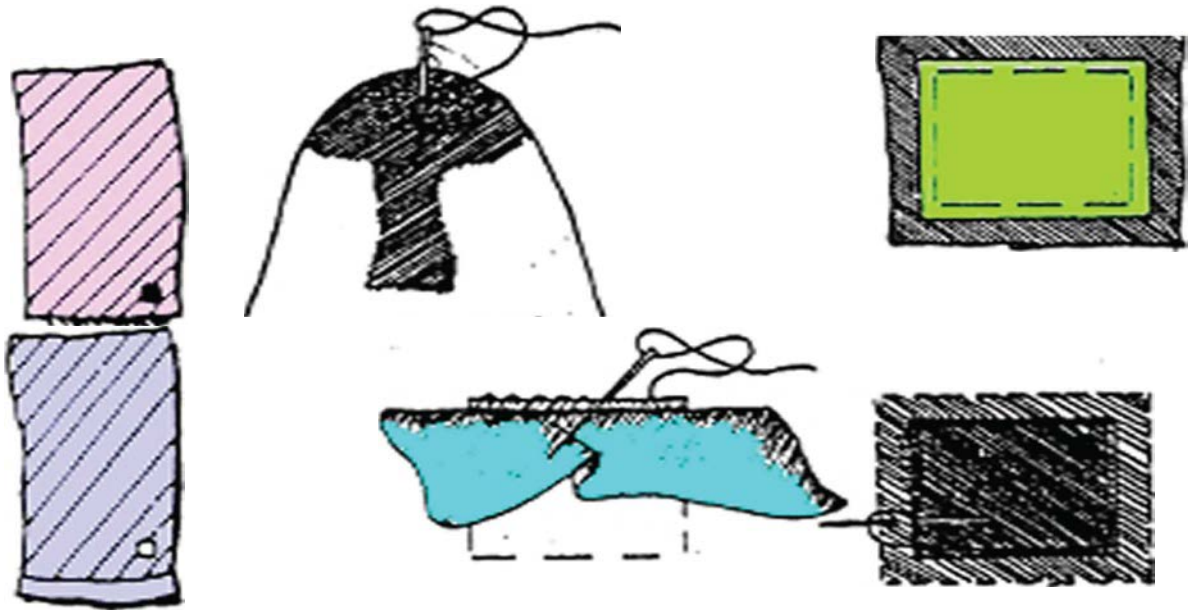


Fig. 23.2 Examples of Patches

STEPS IN PATCHING

1. Cut a patch, allowing 6 mm turnings all round. Make sure that the pattern is matched exactly to the fabric pattern.
2. Fold and press the turnings to the wrong side, mitring the corners.
3. Pin and tack into place.
4. Fold the fabric level with one edge of the patch and oversew them neatly together. Complete all four sides.
5. Trim away the worn area underneath to about 6 mm from the stitching, and blanket stitch the edges together.

6. The zig-zag stitch and step stitch on the modern sewing machines are ideal for patching purposes- refer to the machine handbook for instructions.

   Cloth patch – used for outer garments such as flannel trousers.

Activities

1. Your blue denim jean tore after you fell from the cycle. The hole is too large to be darned.

   (a) Choose a suitable method to repair the hole.

   (b) List the steps you will use in the process.

2. The red and white striped sheet in the Home Economics Department has a one inch hole.

   (a) Which type of repair would you use?

   (b) State the necessary precautions that you should take when handling this fabric.

GLOSSARY

Accompaniment - a food or dish that goes well with another.

Adapted - to change so as to make fit or usable.

Aged - grown old.

Along the grain - the markings, direction or pattern formed by the way the layers of fibres are arranged in a piece of wood.

Amino – acids - units which make up proteins.

Apathy - a lack of emotions or feelings.

Balance - equality in weight.

Balance marks - placed as guide marks on seams to ensure correct fitting position.

Bile - a liquid that is produced by the liver to help split up fats.

Breed - to give birth to young; hatch; reproduce.

Carotene - a yellow substance in plants that our bodies can convert to Vitamin A.

Cellulose - a carbohydrate that forms the framework of plants. It is not digested by human beings.

Cereals - the edible seeds of cultivated grasses.

Cholera - deadly disease that spreads quickly, as a plague, especially in places where sanitation is poor.

Complete proteins - proteins that contain all of the essential amino- acids.

Conservative cooking - the cooking of food in a small amount of fat and or water for a very short period of time.

Consumer - a person who buys goods for his own needs and does not to sell to others or to use in making other goods for sale.

Culture - the ideas, skills, arts, tools and way of life of certain people in a certain time.

Diarrhoea - a condition in which bowel movements come too often and are too loose.

Discipline - training that teaches one to obey rules and control one's behaviour.

Diseases - condition of not being healthy; sickness, illness.

Disinfectant - anything that disinfects, or kills disease germs.

Divans - large, low couches, usually without armrests or backs.

Durability - the ability of the fabric to withstand wear.

Dysentry - a disease of the intestines, in which there is loose bowel movements containing blood and mucus.

Edge stitch - top stitching close to edge of fabric or seam.

Elasticity - the ability of the fabric to stretch and return to shape after stretching.

Enzyme - a substance produced by living things to speed up chemical changes.

Fabric Finishes- a treatment which gives fabrics special characteristics, improving their appearance and reducing the amount of care they may require.

Filter - device for making water, air or other fluid clean or pure by passing it through sand, charcoal, cloth, etc.

First Aid - in immediate temporary treatment given to an injured person before the arrival of a doctor.

Fortify - to enrich food by adding vitamins, minerals, etc.

Garbage - spoiled or waste food that is thrown away.

Gelatin - a tasteless, odourless protein derived from the boiled bones, gristle, skin and feet of young animals.

Gelatinize - the change that occurs in starch in the presence of moist heat.

Germs - living things that can cause disease and are too small to be seen except with a microscope.

Giddiness - feeling slightly sick and unable to balance, because everything seems to be moving

Gluten - the protein in wheat.

Goals - an end that one tries to reach, aim or purpose.

Incomplete protein - a protein that has one or more essential amino- acid missing.

Induce - to lead a person into doing something, persuade.

Injuries - harm or damage done to a person or thing received in a fall or accident.

Invalid - a person who is disabled by injury or disease.

Lacquer - varnish made of shellac, natural or artificial resins, etc, dissolved in alcohol or some other liquid.

Landmarks - buildings, trees, etc., that help one to find or recognise a place because they are easily seen.

Lay - the first fold of a hem.

Leach - the passage of liquid through porous material.

Lustre - the brightness of things that reflect light, gloss, brillance.

Moral - having to do with right and wrong in conduct good or right according to ideas of right and wrong.

Nuclear family - a family unit that consists only of a mother, father and children

Pasta - products made from a high gluten wheat paste, e.g., noodles, spaghetti and macaroni.

Pests - a person or thing that causes trouble, especially, an insect or small animal that destroys things.

Puncture - a hole made by a sharp point or the act of making such a hole.

Resilient - springing back into shape or position; elastic.

Resistant - to fight or work against; to withstand.

Responsibilities -	the condition of being responsible; a thing or person that one is supposed to look after, manage, etc.
Restore -	to place nutrients that have been removed or destroyed during processing.
Roles -	the parts that a person plays in life.
Rubbish –	anything thrown away as worthless
Scalds -	to burn with hot liquid or steam.
Seam -	two or more pieces of fabric joined together.
Seam allowance -	a given amount of fabric between the sewing lines and cutting edges.
Settees -	seats or benches with a back; a small or medium-sized sofa.
Sockets -	hollow parts into which something fits.
Spring wheat -	wheat that is sown in early spring and harvested during the same year. It produces a flour of high gluten content.
Stains -	discoloured marks on the textile article.
Strong/hard flour -	flour with a high gluten content.

Symptoms - something showing that something else exists

Tow - short staple linen fabrics.

Traditions - the handing down of customs, beliefs, etc., from generation to generation, by word of mouth rather than in written records.

Typhoid - a serious disease that is spread by infected food or drinking water, and causing fever, sores in the intestines.

Warping - bending or twisting out of shape; to turn from what is right or natural.

Weak/soft flour - flour with a low gluten content.

Winter wheat - wheat that is planted in autumn and harvested the following summer. It produces a flour of low gluten content.

Ministry of Education, Guyana

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