Chapter 16
Stimulating Beverages

Stimulating Beverages

The common beverages are coffee, tea, and cocoa. These beverages are rich in caffeine. They are classified as stimulant alkaloids produced by plants. These alkaloids are known to stimulate the nervous system.

Caffeine is known to enhance the sympathetic responses (increase in heart rate, blood pressure, and respiration). It is promotes alertness and endurance and inhibits fatigue and drowsiness. Caffeine is known to enhance the effect of some pain - relieving drugs, for example aspirin and acetaminophen. It is also an appetite suppressant. It causes insomnia, nervousness, and irritability to some individuals. Caffeine can be addictive to some individuals. Some individuals become irritated and nervous without taking their caffeinated beverages.

Coffee is known to have originated from Ethiopia, Tea from China, chocolate drink from cacao tree in Tropical / Central America.

Coca cola drink from kola nut tree in West Africa.

Key Points
1. The major stimulating beverage is coffee, others are tea, and chocolate drink. These beverages contain caffeine.
2. Caffeine stimulates the sympathetic nervous system to elevate the heart beats, blood pressure, and respiration.
3. Caffeine promotes alertness and endurance; it suppresses fatigue, drowsiness, and appetite.

Study Questions

Name 3 stimulating beverages, and state their target of action in the body.

CHAPTER 17
Herbs and Spices

INTRODUCTION

Herbs are usually leaves or seeds that are aromatic, while spices are usually fruits or flowers or barks of trees. These are used for cooking to give flavor to our food.

Some are used for medicine, natural dyes, perfume or other cosmetics. From these herbs and spices are extracted essential oils that provide the characteristic scents of aromatic plants.

SPICES

Cinnamon is a spice obtained from the bark of a plant, which is a native of India and Sri Lanka. Other spices include black and white pepper, nutmeg and mace. Nutmeg and Mace are obtained from the nutmeg tree. The nutmeg tree produces a fruit that is fleshy, outer covering of the fruit is dried and ground to produce the mace, while the seed is the nut meg, which can be sold ground or as whole. Cloves are also a type of spice common in China. Cloves can be added to tobacco in the making of Cigar or cigarettes. Ginger is a rhizome obtained from tropical Asia. Hot Chili peppers were discovered from Mexico. Vanilla is obtained from orchid and is native of Central America and Mexico

HERBS

Herbs are used for their **aromatic mints**, examples include spearmint, peppermint, marjoram, oregano, rosemary, sage, sweet basil, and thyme. These aromatic mints are used as flavor in gums, candies, cookies, cakes, cigarette, toothpaste, mouthwash, antacids, soaps, jellies, ice cream, and teas. **Peppermint** is extracted from menthol, an extract of a Japanese plant *Mentha arvensis*. The herbs from the **Parsley family** include the common Parsley used for garnishing as well as flavor. The parsley family plants include **carrots, parsnips, parsley, celery, and celantro**. The **Mustard family** includes **cabbage, broccoli, cauliflower, brussels sprout, turnip and radishes**. Unless acidified, the flavor of this prepared mustard deteriorates. **The Lily family** includes onions, garlic, leeks, shallots, and chives. Onions and garlic have pungent flavor due to the presence of the volatile sulfur compounds released as the tissues are being cut. This sulfur compound produces the undesirable aroma of onion and garlic in the breath. This organic sulfur in onions and garlic are known to be antibacterial, they also inhibit blood clotting.

Key Points

1. Herbs are aromatic leaves and seeds, while spices are made from flowers, fruits, and bark of trees. They are used as flavors, medicine, dyes, perfume and cosmetics.
2. Among the common spices are cinnamon, black and white pepper, nutmeg and mace, clove, ginger; turmeric and saffron, hot chillies, vanilla and all spice.
3. Among the common herbs include the following leave families, parseley, mustard and Lily.

4. Cinnamon is obtained from the bark of a tree, native of Sri Lanka, & India. Nutmeg is obtained from nutmeg tree, the seed is the nutmeg, the outer covering of the fruits are dried and grounded to make the mace. Turmeric is used for food coloring, and in making curry powder. Saffron is from iris family, the petals are dried to make the spice. Hot chili is from tomato family. Vanilla is an orchid from Central America and Mexico. All spice is cinnamon, nutmeg, and clover mixed together.
5. Aromatic mints are extracted from menthol; carrots, parsnips, parsley, celery, celantro are all from the parsley family. They are edible, some are used in garnishing and for flavor.
6. Cabbage, broccoli, cauliflower, brussel sprouts, turnips, and radishes are from mustard family. They are used as vegetables.
7. Onions and garlics are from lily family. They are used as flavor. The flavor is due to the organic sulfur in them. This sulfur is an antibacterial that helps in suppressing blood clotting.

Study Questions
1. In one sentence, describe a herb and a spice.
2. List 10 examples of common spices. State how each can be obtained from the plants; also state in what ways each can be used as food.
3. List 10 spices and 10 herbs, and state their uses. State which plant family they belong.

CHAPTER 18
CLOTH, PAPER, AND WOOD

Introduction

Plant fibers are made up of mainly cellulose which are strong materials. Fibers that consist of pure cellulose are extremely strong and can be used to make clothes, rope, paper, and baskets. Other substances in the plants include lignin, tannins, gums, pectins and other polysaccharides. When these substances are mixed with the cellulose, the tensile strength of the cellulose is reduced. Fibers can be classified according to their use: textile fibers for cloth, cordage fibers for making ropes, filling fibers for stuffing in mattresses and cushions. Plant fibers are different from animal fibers because of the high cellulose content. Wool and silk are made from animal fibers. Rayon is made from cellulose of wood pulp. Fibers can also be classified according to the location in the plant: surface fibers are on the seed, leaves, or fruit coverings. For example, cotton clothes are made from seed hairs covering of cotton seeds. Linen is made from soft fibers or bast which are phloem tissues found in the bark of dicot stems. Hard fibers are obtained from veins of leaves or vascular bundles.

Surface fibers can be extracted from plants mechanically, a process known as ginning, the soft fibers are extracted by bacterial actions a process known as retting. Hard fibers can be obtained from plants by decortication.

Extracted plant fibers are cleaned and placed in strands. The strands are spun to make yarns and threads. These yarns are used to make clothes. Cotton clothes are made from cotton plant seeds. The fibers are obtained from seeds. The cotton plant species is *Gossypium,* that is used to make the clothes. These fibers in the seeds make the seeds to be easily dispersed by wind. Cotton seeds are also used to make livestock feed, and cotton seed oil, used for cooking.

Woven cotton clothes or yarns may undergo finishing processes in order to improve the quality of the fabric. Finishing treatment includes bleaching and the use of chemicals. Some cotton fibers become permanent press if treated with chemicals that cross-link the cellulose fibers, others that need improved dye retention undergo a process known as mercerization. Sizing is another finishing process that involves the treatment of the fibers or yarn with starch, resin or other dextrin to provide stiffness or firmness. This also provides sheen to the fabric.

Flax Plants produce bast fibers that are used to produce linen fabrics. Flax plants are also used to produce linseed oil that is used to make paints, stains, varnishes, linoleum, livestock feed, and laxatives.

Other bast fibers include Ramie. **Hemp, Jute. Ramie** is blended with cotton and rayon to make sweaters and other knitted fabrics. Jute fibers are used to make upholster lining, carpet backing, rope, wall covering, sack clothes and other inexpensive clothing.

Hemp (*Cannabis sativa*) fibers are used to make canvas, ropes and twines. Jeans were originally made from hemp fibers.

Manila hemp is a member of the banana plant, the fibers are used to make light weight clothing, cigarette filters, and tea bags.

Pineapple plants are also used for clothing. Fibers of pineapple leaves are used to make scarfs, shawls and shirts.

Sisal (Agave sisalana) leaf fibers are used to make ropes, strings and floor mat.

R**ayon** is a synthetic fiber; it is called "artificial silk".

Wood and Wood Products
The secondary xylem of the plants forms the woods in the plants. There are both hardwoods and softwoods. **Angiosperms give hardwoods while gymnosperms give softwoods. The term hardwood indicates the amount of lignin present in the wood**.

Lumber, Veneer, and Plywood.
Before any tree is used for furniture, lumber or anything, the water content of the wood must be reduced 10% or less. The important use of softwood is for **timber.** Pine tree woods are important for **home construction** because the woods are light and strong. The most common timber trees are **white pine trees** *(Pinus strobus).* Among the most desirable timber in United States include **yellow pine trees, douglas fir**. Douglas fir is a strong wood and is used to produce **plywood**.

Furniture
Among the hardwood most economically important in United States include **oak trees (Quercus). There are several species ranging from white to red and black oak trees**. The white oak - *Quercus alba* is the most expensive. The wood is heavy, durable and attractive and used for **furniture, cabinets, and flooring**. The red oak (Quercus rubra) is not as strong as the white, but is equally used for furniture, and flooring.

Veneer
Veneer is made from **black walnut, mahogany and black cherry**. It is a very thin sheet of wood glued to the base of an inexpensive wood to provide a good finishing.

Plywood
Plywood can be made from Douglas fir and pine trees. It is made up of three or more layers of veneer glued together

Fuel
Wood is the chief source of fuel and charcoal.

Resins (polymerized terpenes mixed with oils)

Resins protect the trees. Resins are extracted commercially from conifers. Extracts from resins form turpentine used as thinner for paints.

Cork
Provides insulation and protection for trees. They are obtained from bark of oak trees *(Quercus suber)*

Wood Pulp
Wood Pulp is used for production of paper, cardboard and fiberboard, rayon, cellophane and cellulose acetate. Eucalyptus trees are the best commercial sources for pulp production.

Bamboos are used to build houses in African countries. They are also used as post and rafters in houses. Bamboos are also used for construction of musical instruments. It is a good source of pulp for papermaking.

Key Points

1. Plant fibers are made of cellulose. Strong plant fibers contain 100% cellulose and are used to make clothes, rope, paper, and basket.
2. Fibers can be classified according to use: textile fibers (clothes), cordage fibers (ropes), and filling fibers (cushions & mattresses).
3. Wool & silk are made from animal fibers. Rayon is made from cellulose of wood pulp.
4. Fibers can be classified according to location in plants: surface fibers (hairs of cotton seeds); soft fibers (phloem tissues, and bark of stems) used to make linen. Hard fibers (veins of leaves and vascular bundles).
5. There are also bast fibers. Some plant produce them, among them are Flax Plants, their bast fibers are used to make linen fabrics. Flax plants themselves can be used to produce linseed oil, paints, stains, vanishes, linoleum, livestock feed and laxatives. Other bast fibers are Ramie fibers for sweaters and knitted fabrics, Jute fibers for upholster linings, carpet backing, rope, wall covering, sack clothes and other inexpensive clothes. Hemp fibers for canvas and ropes. Manila hemp fibers (banana plant) for lightweight clothes, cigarette filters and tea bags. Pineapple plant fibers for scarves, shawl and shirts.
6. The secondary xylem of the plants forms the wood part of the plant. Angiosperm plants produce hard woods, while gymnosperm plants produce softwoods. This classification of soft and hard is based on the amount of lignin present in the wood.
7. Removal of water from wood before use is highly important. The water content has to be less than 10%.
8. Softwood is for timber, houses, and plywood. Hard wood is for furniture, flooring and veneer. Most desirable wood for timber is pine, and most desirable for furniture is white oak.

9. Wood pulp is used in making paper, cellophane , and cardboard. Bamboos are used for furniture, houses and musical instruments. The best commercial source of wood pulp is the eucalyptus tree.

Study Questions
1. State which trees can produce hardwood and which ones can produce softwood?
2. State the uses of pulp wood, bamboos and cork in the society.
3. Which plants are recommended for lumber, furniture and building construction?
4. State which plants can be used to produce each of these: cotton, rayon, wool, ropes, floor mats, sack clothes, cigarette filters, tea bags, seaters and scarfs.