

**1. Vitamins** (found in raw fruits and vegetables)

a. **needed in small quantities** to maintain good health and prevent sickness / diseases.

b.

Vitamins	
Water soluble	Fats soluble
- Such as vitamin B , C	- Such as vitamin A , D , E , K

c. A **shortage** of vitamins may cause **deficiency disease** but **excess** of vitamins may cause **toxicity** / vitamin overdose.

d.

Vitamin	Main sources	Functions	Effect of deficiency
i. <b>A</b>	Milk, eggs, fish, liver oil, <b>carrots, papayas, tomatoes.</b>	- Helps ensure <b>good night vision</b> (build pigmen in the eye). - Maintains healthy skin	- <b>Night blindness</b> - Dry and scaly skin
ii. <b>B</b>	<b>Liver</b> , nuts, milk, eggs, cereal, yeast, vegetables.	- <b>Healthy nervous system</b> - <b>Increase appetite.</b>	- <b>Beriberi</b> (injury to the nervous system and paralysis) - <b>Loss of appetite.</b> - <b>Pellagra</b> (skin disease)
iii. <b>C</b>	Fresh citrus fruits, oranges, tomatoes, papayas, guavas, vegetables	- Helps ensure gums and <b>skin are healthy.</b> - Enable wounds to heal faster. - Prevents infections.	- <b>Scurvy</b> (gums bleed easily) - Wounds heals slowly - Low resistance to infections (especially the flu)
iv. <b>D</b>	Fish, egg yolk, milk, liver, can be <b>produced by the skin when expose to ultra violet</b> (sunlight)	- Help <b>absorption of calcium.</b> - <b>Form strong bones and teeth.</b>	- <b>Rickets</b> (weak and curved bones) Poor bone formation, brittle bones, <b>dental decay</b> and <b>osteoporosis.</b>
v. <b>E</b>	Nuts, egg yolk, wheat, vegetable oil.	- Maintains a healthy reproductive system - Prevent sterility	- Infertility / difficult in conceiving/sterility
vi. <b>K</b>	Green vegetables, liver, egg yolk	- Helps blood to clot	- Slow clotting of blood (hemophaelia)

**2. Minerals** (found in various salts)

a. i. Are needed in **small quantities** for the proper functioning of the various processes in the body system

b. **Excess** mineral salts may cause **high blood pressure** and disability of the **kidneys**.

Mineral	Sources of food	Function	Effects of deficiency
i. <b>Calcium</b>	Milk, eggs, vegetable, cheese	- Form strong bones and teeth - Helps blood to clot - Contraction of muscles	- Osteoporosis - <b>Rickets</b> / Brittle bones - Tooth decay - Poor blood clotting / hemophilia - <b>Muscle cramps</b>
ii. <b>Iron</b>	<b>Liver</b> , meat, eggs, vegetables / <b>spinach</b>	- Form <b>hemoglobin</b> in red blood cells	- <b>Anaemia</b>
iii. <b>Iodine</b>	Seafood, iodinised salt, seaweed.	- Produces hormones in the thyroid gland	- <b>Goitre</b>
iv. <b>Sodium</b>	Common salt (sodium chloride)	- Balances body fluid	- Muscle cramps
v. <b>Phosphorus</b>	Meat, milk, fish, eggs, beans	- Form strong bones and teeth	- <b>Rickets</b> / Osteoporosis - Dental decay
vi. <b>Fluorine</b>	Drinking water, fish, vegetables	- Protects teeth	- <b>Dental decay</b>
vii. <b>Potassium</b>	Meat, fish, cereals	- Maintains a healthy nervous system	- Muscle cramps - Fatigue

3. **Fibre / Cellulose** (found in plants, **fruits, vegetables, grains and cereal**)

- Is made up of cellulose, which **cannot be digested by our body**.
- Helps to move food through the alimentary canal by **peristalsis**.
- Softens the faeces and **prevents constipation** or bowel cancer. (Constipation: difficulty in defecation) (Defecation: excreting of faeces)

4. **Water is needed for:** -

- Helping the digestion of food.
- Transporting the digested food substance.
- Transporting excretory products such as urea.
- Maintaining the **body temperature** and **metabolic processes**.
- Maintaining the concentration of blood.

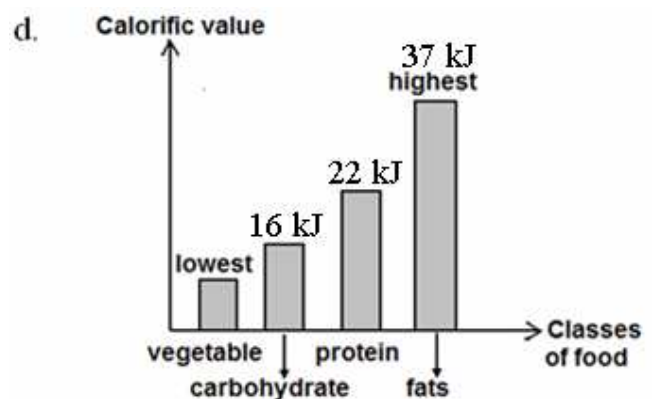
5. **The Colorific Value of Food.**

- Energy in food is measured in **joules (J)** or **calories (cal)**

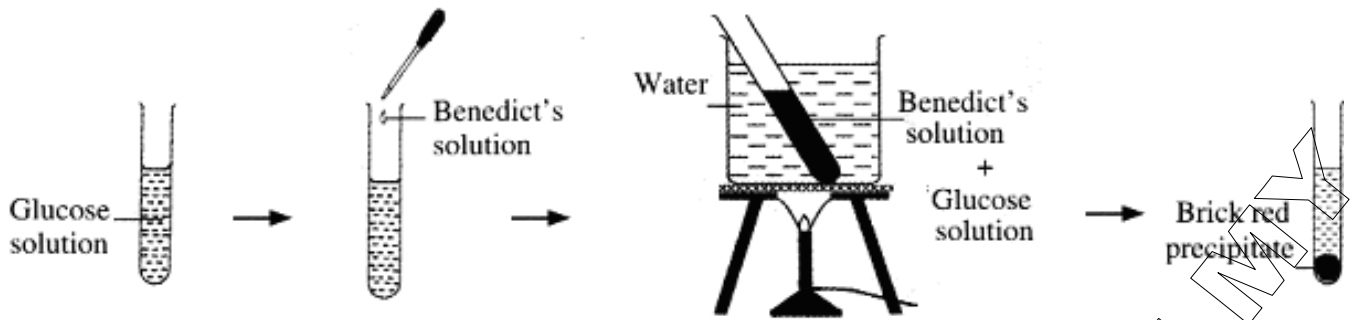
b. The calorific value of food is the amount of heat energy released when **1 g of food is completely burnt in the air**.

c. **Energy provided by 1g of the following food.**

- Carbohydrate** release **16 kJ/g of energy**.
- Protein** release **22kJ/g of energy**.
- Fat** release **37 kJ/g of energy**. (double than carbohydrate)



**6. a. Steps to test the presence of glucose**



**c. Steps to test the presence of oil / fats**

- i. Add ethanol and oil in a test tube
- ii. Add distilled water into the mixture
- iii. Shake the mixture and leave it for two minutes.

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