

Human nutrition

Diet

Balanced diet

All nutrients Correct proportions Right energy

Carbohydrates, fats, protein

Energy Insulation and store Growth and repair

Vitamins C and D

C: skin and gums D: absorbs calcium

Calcium and iron

Bones and teeth Haemoglobin

Fibre and water

Bulk, no constipation Solvent for reactions

Deficiency diseases

Scurvy: vitamin C Rickets: vitamin D or calcium

Chemical digestion

Large insoluble to small soluble

Enzymes Can be absorbed

Amylase

Starch to sugars Salivary glands, pancreas

Protease

Protein to amino acids Stomach, pancreas

Lipase

Fats to fatty acids and glycerol Pancreas

Starch in detail **Supplement**

Amylase: maltose Maltase: glucose

Protein in detail **Supplement**

Pepsin: acid stomach Trypsin: alkaline intestine

Digestive system

Alimentary canal

Mouth, oesophagus, stomach Duodenum, ileum Colon, rectum, anus

Associated organs

Salivary glands Pancreas Liver Gall bladder

Five processes

Ingestion, digestion Absorption Assimilation Egestion

Teeth

Incisors cut Canines tear Premolars and molars crush Enamel, dentine, pulp, cement

Stomach

Churns food Hydrochloric acid

Bile **Supplement**

Emulsifies fats Alkaline: neutralises acid

Absorption

Small intestine

Nutrients absorbed Most water

Colon

Some water

Villi and microvilli **Supplement**

Increase surface area

Villus structure **Supplement**

One cell thick Capillaries Lacteal

Capillaries and lacteals **Supplement**

Capillaries: glucose, amino acids Lacteal: fatty acids, glycerol