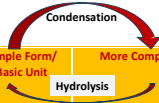


Doggo Cheat Sheet - Food Substances of Human

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Condensation = two food molecules joining together by removing a water molecule
Hydrolysis = uses a water molecule to break the chemical bonds in large food molecules

	Chemical Structure / Nature	Simple Form/Basic Unit	More Complex Form	Function	Food Source	Storage of Excess	If Not Enough	Food Test	Digestion				Assorption & Assimilation
									Organ	Digestive Juice	Enzyme or Chemical Substance	Effect	
Carbohydrates	Carbon (C), Hydrogen (H), Oxygen (O) H to O ratio = 2:1	Monosaccharide (e.g., glucose, fructose, galactose)	Disaccharide (e.g., sucrose = glucose + fructose, lactose = glucose + galactose, maltose = 2 x glucose)	Main source of energy Energy storage (glycogen) Dietary fibre (cellulose)	Fruit, sugar, milk, starchy food such as oat, rice and potato, etc.	As glycogen and when the capacity for glycogen is full, as fat	Forces your body to break down fat and muscle for energy → long term health problems Lack of dietary fibre → constipation and gastrointestinal discomfort	Glucose: Glucose test strip → distinct color change Reducing sugar: Benedict test → Brick-red precipitate Starch: Iodine test → Color change from yellowish brown to blue-black	Mouth	Saliva	Salivary amylase	Starch → Maltose	Small intestines (blood capillaries) → Liver → Other parts of body Cells break down glucose to release usable energy (ATP) <u>Function of Liver</u> 1) Convert converts galactose and fructose into glucose 2) Regulates blood glucose level by storing excess glucose as glycogen
			Polysaccharide (e.g., starch, glycogen, cellulose)						Pancreas	Pancreatic juice	Pancreatic amylase	Starch → Maltose	
Lipids	Carbon (C), Hydrogen (H), Oxygen (O) H to O ratio > 2:1	Glycerol, Fatty acids	Triglycerides (1 Glycerol + 3 Fatty acids)	Energy reserve Insulating layer (subcutaneous fat) Shock-absorber (adipose tissues)	Fatty meat, egg yolk, nuts, dairy products, butter, plant oils	As adipose tissues	Many health problems such as persistent hunger, fat-soluble vitamins deficiency, dry, flaky skin and hair and Hormones imbalance, etc.	Grease spot test → Permanent, translucent mark that does not disappear upon drying. Emulsion test → A cloudy, milky-white layer or emulsion forms at the top	Liver	Bile	Bile salt	Emulsify lipids to smaller droplets	<u>Inside the lining of small intestine</u> 1) Fatty acids + monoglycerides & Triglycerides 2) Triglycerides + Cholesterol, lipoproteins and other lipids → Chylomicrons Small intestine (Lacteal) → Lymph → Blood → other parts of the body Lipoprotein lipase breaks down triglycerides from chylomicrons into fatty acids and glycerol for energy or fat storage <u>Function of Liver</u> 1) Clear Chylomicron remnant 2) Packages fats into lipoproteins 3) Storage of fat and fat-soluble vitamin
			Phospholipids (1 Glycerol + 2 Fatty acids + Phosphate Group)	Main building block for cell membrane					Pancreas	Pancreatic juice	Lipases	Lipids → fatty acids + monoglycerides	
			Cholesterol	Essential for building cells and making hormones									
Proteins	Carbon (C), Hydrogen (H), Oxygen (O), Nitrogen (N) and sometimes Sulphur (S)	Amino acids	Peptides and polypeptides, e.g., Dipeptide = 2 amino acids joining together Tripeptide = 3 amino acids joining together	Growth and repair Forming haemoglobin, enzymes, antibodies and certain hormones Energy source if running out of carbohydrate and lipids	Meat, fish, eggs, dairy products, peas, soya beans	Digestion breaks down protein into amino acids for different usages Our body cannot store excess amino acids. Excess amino acids are broken down in the liver through deamination	Many health problems such as muscle wasting, a weakened immune system, brittle hair and nails, persistent hunger, and swelling	Biuret Test → The solution turns purple or violet Protein strip test → Distinct color change	Stomach	Gastric juice	Pepsin	Proteins/peptides → smaller peptides	Small intestine (blood capillaries) → Liver → Blood → Other Parts of Body Building blocks for new proteins, tissues, enzymes, peptide hormones, antibodies, etc. <u>Function of Liver</u> 1) Control the release of amino acids to blood 2) Synthesize certain proteins 3) Deaminate excess amino acids
									Pancreas	Pancreatic juice	Endopeptidases (e.g., Trypsin, Chymotrypsin) Exopeptidases (e.g., Carboxypeptidases)	Proteins/peptides → smaller peptides Proteins/peptides → smaller peptides and/or amino acids	
									Epithelial cells of the small intestine		Exopeptidases (e.g., aminopeptidases, dipeptidases) e.g., Dipeptidases: Dipeptides → amino acids	Proteins/peptides → smaller peptides and/or amino acids	
Water	H ₂ O			Solvent, transport medium and medium in which chemical reactions take place Reactant in some metabolic reactions Cooling agent and temperature buffer Supporting agent	Water, drinks and water-rich whole foods such as fruits and vegetable		Many health problems such as headaches, fatigue, dry mouth, difficulty concentrating, constipation, muscle cramps, kidney stones, urinary tract infections, heat injuries, seizures	Anhydrous Copper(II) Sulfate → From white to blue Cobalt Chloride Paper → From blue to pink					Small intestine (blood capillaries), small portion in large intestine
Minerals	Calcium			Formation of bones and teeth, blood clotting and muscle contraction	Milk, cheese, other dairy products, green vegetables		Rickets, osteoporosis	Food and Digestive System Overview >>>					Small intestine (blood capillaries), small portion in large intestine
	Iron			Formation of haemoglobin	Liver, beef, eggs, green leafy vegetables		Anaemia						Small intestine (blood capillaries)
Vitamins	Vitamin A			Formation of visual purple in the retina, maintains the healthy state of the cornea of the eyes, the skin, and the lining of the alimentary canal and the respiratory system	Liver, fish-liver oil, milk, cheese, eggs, green vegetables, carrots		Night blindness, thickening of the cornea, dry skin and an increased risk of infection of the lining of the respiratory system	Doggy the Scientist Home >>>					Small intestine (lacteal)
	Vitamin C			Collagen synthesis, maintains healthy skin, blood vessels, bones, and cartilage, supports immune function, aids iron absorption	Fruits and green vegetables		Scurvy, fatigue, muscle weakness, joint aches, weakened immunity						Small intestine (blood capillaries)
	Vitamin D			Helps the absorption of calcium and phosphate ions from the intestine	Liver, fish-liver oil, milk, cheese, egg yolk		Rickets, osteoporosis						Small intestine (lacteal)
Dietary Fibre	Cellulose from plant cell wall			Stimulates peristalsis and makes faeces pass out of the body more easily	Legumes (beans, lentils), whole grains (oats, brown rice), nuts, seeds, and fresh fruits and vegetables		Constipation, unstable blood sugar, frequent hunger, and high cholesterol						

