

Macronutrients

Needed by the body in large amounts (proteins, carbohydrates, fats)

Micronutrients

Needed by the body in small amounts (vitamins, minerals, trace elements).

protien

Proteins supply amino acids and amino nitrogen for the body

Types

Essential amino acids

Non-Essential

Body can't synthesize, must be supplied in the diet

Body can synthesize it

Protein-Energy Malnutrition

A condition or disease caused by not eating enough food or not eating a balanced diet

Marasmus

Kwashiorkor

Inadequate intake of energy with **adequate** protein intake

Inadequate intake of proteins with **adequate** energy intake

Carbohydrates

Age+ food intake

1-3 years
Mother milk

After weaning (at about 1 year).
Diet mainly contains CHOs.

Their **major** role in diet is **energy production**.
RDA: **130 grams/day**
intake above RDA causes: **weight gain** or **obesity**

Effects

- 1- Edema "due to decreased protein levels"
- 2-Distended abdomen
- 3-Diarrhea
- 4-Dermatitis / thin hair
- 5-Enlarged fatty liver
- 6-Low plasma albumin

- 1- Arrested growth
- 2- Extreme muscle wasting
- 3-Weakness
- 4-Weight loss

No edema or changes in plasma protein

Types of cho

Simple cho
sucrose, fructose, corn, lactose

Complex cho
whole grains, pasta, wheat

Dietary Fiber		Fats in the Diet	Trans Fatty Acids
<ul style="list-style-type: none"> ❖ The component of food that cannot be broken down by human digestive enzymes ❖ RDA (gm/day): Men: 38, Women: 25 		Importance: <ol style="list-style-type: none"> 1- Supply essential fatty acids such as linoleic and linoleic acids 2- Provide phospholipids for membrane function 3- Source of fat-soluble vitamins 	they are : Unsaturated fatty acids, behaving more like saturated fatty acids in the body They found in : Found in baked food They're formed during hydrogenation of liquid vegetable oils. They increase 1- serum LDL 2- RISK OF CVD
Benefits	<ol style="list-style-type: none"> 1-Slows gastric emptying 2- lower serum LDL 3-Reduces constipation 4-Reduces exposure of gut to carcinogens 5-Promotes feeling of fullness 	RDA (gm/day): Total fats: 65, Saturated: 20 Excessive intake cause: <ol style="list-style-type: none"> 1- Atherosclerosis/heart disease 2-Obesity 	

Essential Fatty Acids	Sources		effects	Recommendations for Omega-3 Fatty Acid Intake		
	Omega-3 Fatty Acids Mainly found in cold-water ocean fish important as: <ol style="list-style-type: none"> 1-Structural membrane lipids 2-Modulator omega-6 fatty acid metabolism 	<ol style="list-style-type: none"> 1-Fish oil containing (DHA)and(EPA) 2- plants 	<ol style="list-style-type: none"> 1-Suppress cardiac arrhythmias 2-decreases Serum triacylglycerols 3-Little effect on LDL or HDL levels 	Patient without CHD	Patients with CHD	Patients who need to lower triglycerides (fats)
				Eat Fatty fish twice a week	1- 1 gm of EPA+DHA per day from fatty fish. 2- EPA+DHA supplements	2 to 4 grams of EPA+DHA per day
Omega-6 Fatty Acids	<ol style="list-style-type: none"> 1-olives 2-nuts 3- avocados 4- Soybeans 4- oils (corn oil) 	Decreases <ol style="list-style-type: none"> 1- plasma cholesterol 2-HDL 3-LDL 				

vitamins

Organic compounds present in small quantities in different types of food Help in various biochemical processes Important for growth - Non-caloric- Essential Required in very small amounts	Fat-Soluble Vitamins A.B.D. E .K	Water-Soluble Vitamins 1. Ascorbic acid (vitamin C) 2. Thiamin (vitamin B1)
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	source	function	RDA	Deficiency
Vit E	Vegetable Oil, nuts, seeds	Antioxidant	Adults: 15 mg/day. Children: 7 mg/day	Defective lipid absorption Male infertility Neurological problems
Vit C	Melon, peppers , tomatoes	Powerful antioxidant Increases iron absorption Stimulates phagocytic action of leukocytes Promotes wound healing Helps in the maturation of RBCs collagen formation	Men: 90 Wemon: 75 Children: 15-25	results in a disease called: Scurvy 1-It's an abnormal collagen production 2-Gums become painful, swollen and spongy 3-The pulp is separated and the teeth are lost
iron	Heme iron: Animal products Nonheme iron: Plants	-Oxygen transport and metabolism -Part of hemoglobin, myoglobin -Body stores iron as ferritin, hemosiderin and transferrin	-Men: 8. -Women: 18. -Children: 7-15	Iron deficiency anemia (is most common in growing children, pregnant, lactating) Hemosiderosis (iron toxicity) Occurs in: persons receiving repeated blood transfusions

Vitamin B1 (Thiamin)		Disorders of Vitamin B1 (Thiamin) Deficiency
Active form	Thiamin pyrophosphate (TPP)	Beriberi (A type of chronic peripheral neuritis due to severe thiamin deficiency) Lead to (weakness, paralysis, neuropathy, disorderly thinking)
RDA	Adults: 1.2 mg/day Children: 0.6 mg/day	
Function	(function) As a Coenzyme for transketolase and oxidative decarboxylation reactions	Wernicke-Korsakoff syndrome (Common in alcoholics due to defective intestinal absorption of thiamin or dietary insufficiency) Lead to (apathy, loss of memory)
source	Plants Cereals Meat	