

NUTRITION & BALANCED DIET

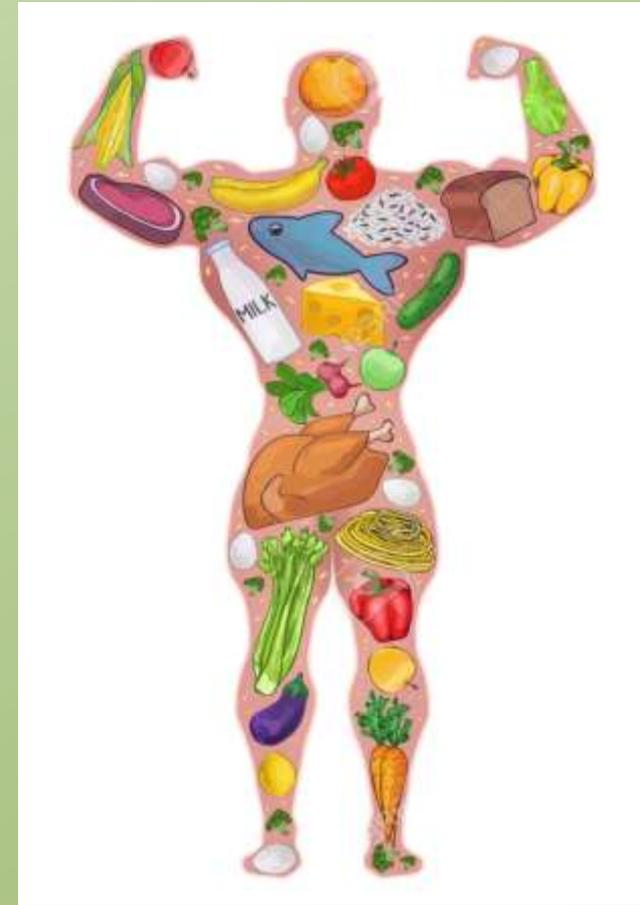


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"A hungry man is an angry man"

What is nutrition?

- The process of taking in food and using it for growth, metabolism, and repair.
- Nutritional stages are ingestion, **digestion**, absorption, transport, assimilation, and excretion.



Balanced Diet

- **A diet that contains the proper proportions of carbohydrates, fats, proteins, vitamins, minerals, and water necessary to maintain good health.**

BALANCED DIET

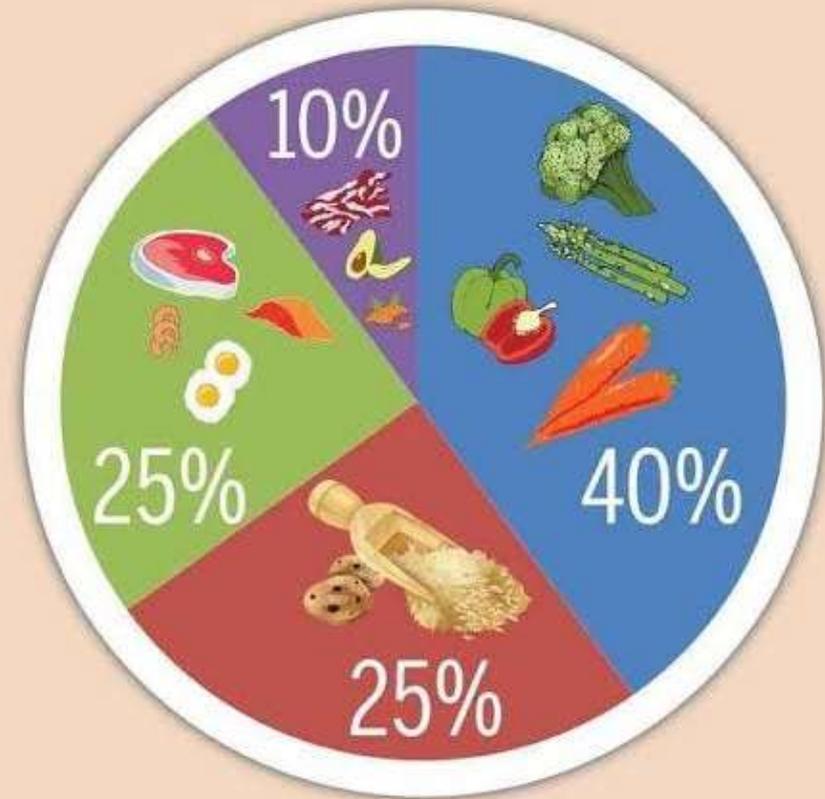
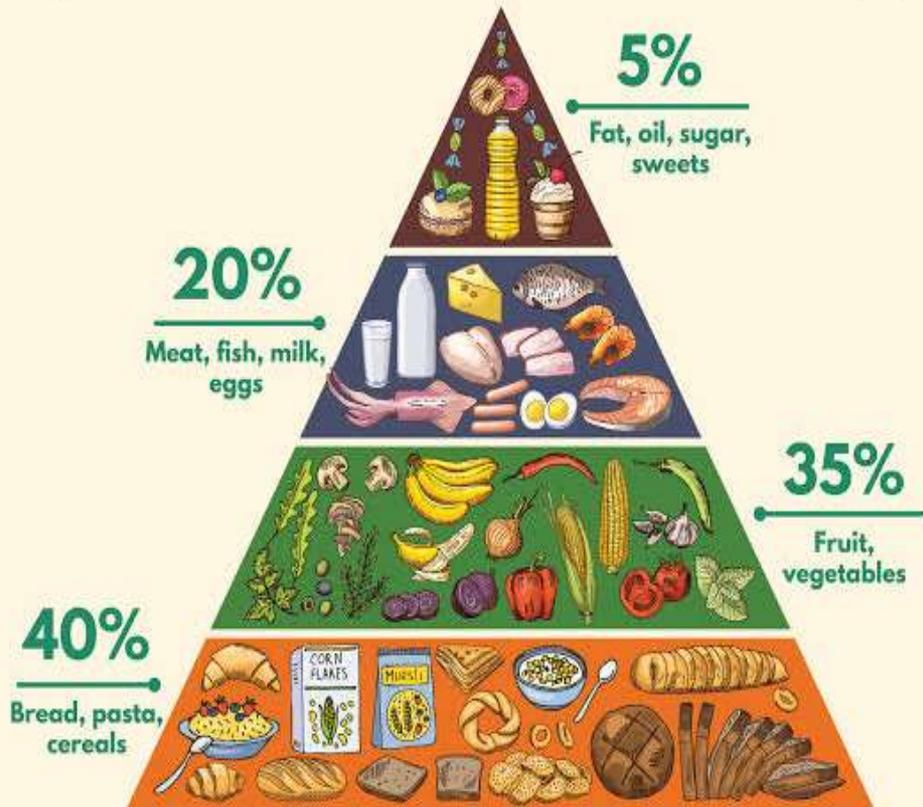


ENERGY SOURCES (MACRO NUTRIENTS)

- > CARBOHYDRATES
- > FATS
(ESSENTIAL FATTY ACIDS)
- > PROTEINS
(ESSENTIAL AMINO ACIDS)

MICRONUTRIENTS

- > VITAMINS
- > MINERALS



- Fruits and vegetables
- Protein
- Fibre-rich carbohydrates
- Fats

BALANCED DIET

All energy is provided by three classes of nutrients called Macronutrients

- Carbohydrates
- Proteins
- Fats
- Vitamins and minerals - Micronutrients

DIET IN PREGNANCY & LACTATION

PREGNANCY & LACTATION are normal physiological processes. There is considerable increase in nutrition requirement due to nausea; vomiting & loss appetite in early months of pregnancy as food intake is generally reduced.

Dietary Reference Intake (DRI)

- DRI: Estimates the amounts of nutrients required to prevent deficiencies and maintain optimal health and growth
- Incorporates upper limits on consumption of nutrients

DRIs

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graph LR; DRIs[DRIs] --> EAR[Estimated Average Requirement (EAR)]; DRIs --> RDA[Recommended Dietary Allowance (RDA)]; DRIs --> AI[Adequate Intake (AI)]; DRIs --> UL[Tolerable Upper Intake Level (UL)];
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Estimated Average Requirement (EAR)

Recommended Dietary Allowance (RDA)

Adequate Intake (AI)

Tolerable Upper Intake Level (UL)

RDA:

- Average daily dietary intake level that is sufficient to meet the nutrient requirements for nearly all (97-98%) the individuals in a life stage and gender group

Recommended allowances/day

• 25 years adult male sedentary worker	2400 kcal/day
• 25 years adult male moderate activity	2700 kcal/day
• 25 years adult male hard worker	3700–4000 kcal/day
• 25 years adult female	2100 kcal/day
• 60 years old male	2300 kcal/day
• 60 years old female	2000 kcal/day
• 6 years old child	1800 kcal/day
• 12–15 years old child	2500 kcal/day

RPA

Age	
0–6 months	2–2.5g/kg/day
6–12 months	1.5 g/kg/day
1 year–12 year	1.5–2g/kg/day
Adults (males and females)	1.0 g/kg/day
Pregnancy	2.0 g/kg/day
Lactation	2.5 g/kg/day

Food	Glycaemic index
Bread	70 – 79
White polished rice	70 – 79
Parboiled rice	60 – 69
Banana	60 – 69
Legumes, milk, ice cream etc.	35 – 40

Calorie

- **Calorie**: amount of heat required to raise the temperature of 1 gm of water by 1°C (specifically from 15-16°C)
- Kilocalorie = 1000 calories

Caloric Value

- Amount of heat- energy obtained by burning 1.0 gm of food stuff completely in the presence of O₂
- Determined in vitro in a special apparatus called “**Bomb Calorimeter**”
- Caloric values of carbs and proteins is 4.0 kcal/gm. And 9.0 kcal/gm for fats

Caloric value of macronutrients

Macronutrients	Caloric value/gm	Utilization of O ₂ (L/gm)	Utilization of CO ₂ (L/gm)
Carbohydrates	3.7-4.7	0.8	0.8
Fat	9.5-10.0	2.03	1.43
Protein	4.3	0.78	0.97

Use of food energy in the body

- 1. Basal Metabolic Rate (BMR) or Resting metabolic rate (60%)**
 - 2. Physical activity (30%)**
 - 3. Thermic effect of food (10%)**
- The number of calories expended by these processes in a 24-hour period is the *Total Energy Expenditure (TEE)*

- An average woman needs to eat about **2000 calories per day to maintain weight**
- An average man needs **2500 calories to maintain weight**

BMR

- **Definition:** Calories utilized by an individual who is awake but at complete rest both mentally and physically to maintain respiration, circulation, muscle tone, functions of viscera like kidney, liver and brain and for the maintenance of body temperature

Factors Influencing BMR

- *Age:* Higher in children than in adults
- *Sex:* Females lower BMR than men
- *Surface area:* BMR is directly proportional to surface area
- *Climate:* In colder climates BMR is high
- *Racial Variations:* Eskimos have 33% above normal BMR
- *State of Nutrition:* BMR is lowered in conditions of malnutrition, starvation and wasting disease
- *Body temp:* BMR increases by 12% for every 1°C rise in temp
- *Drugs:* Caffeine, nicotine, alcohol increase. Anesthetics **decreases** BMR

Clinical aspect

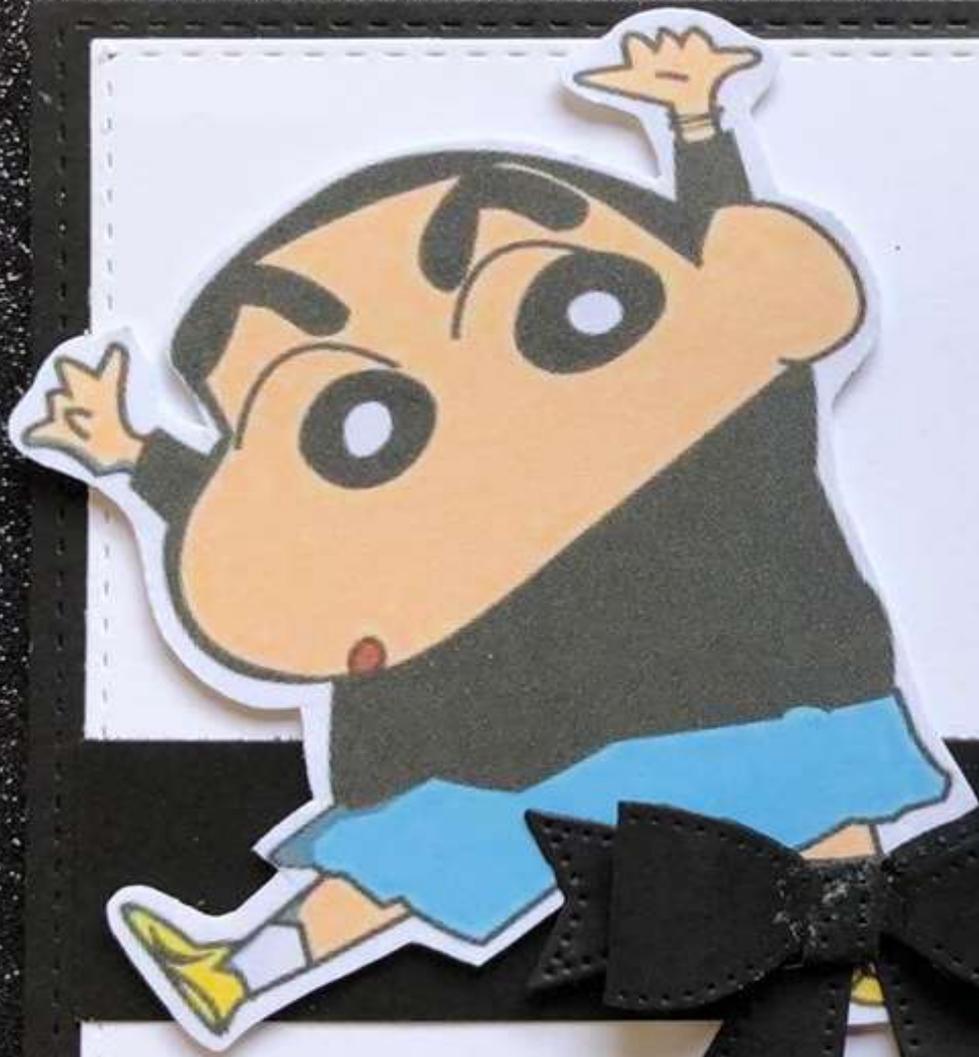
Pathological variations:

- Fever increases BMR
- Diseases: Characterized by increased activity of cells, increase heat production and BMR
e.g. leukemias
- Endocrine disease: Hyperthyroidism increases, hypothyroidism decreases

MALNUTRITION

TABLE 28.7: Differences between marasmus and kwashiorkor

Feature	Marasmus	Kwashiorkor
Onset	Before 1 year	Later: 4–5 years
Main deficiency	Energy deficiency	Protein deficiency
Cause	Early weaning and repeated infections	Starchy diet after weaning
Growth retardation	Marked	Less
Appearance	Shrunken, skinny with prominent bony appearance	Plum, with swollen face and limbs
Oedema	Absent (–)	Present (+)
Dehydration	Present (+)	Absent (–)
Skin	Dry and atrophic	<ul style="list-style-type: none"> • Specific dermatitis described as 'crazy pavement' • Dermatitis due to peeling, denaturation, etc.
Muscle wasting	Weak and atrophic	<ul style="list-style-type: none"> • Marked wasting indicating delayed milestones
Serum albumin	<ul style="list-style-type: none"> • Decreased (↓) • Not below 2 g 	Usually below 2 g%



Thank
You

