

Nutrition is the science of foods, the nutrients and other substances therein; their action, interaction and balance in relationship to health and disease; the processes by which the organism ingests, digests, absorbs, transports and utilizes nutrients and disposes of their end products.

What is balanced diet?

A diet that provides all the essential nutrients in sufficient quantity and in the correct proportion to promote good health.

The six main classes of nutrients are carbohydrate, fat (lipid), protein, vitamins, minerals and water.



Malnutrition and its management

Malnutrition may be due to over nutrition (Obesity, toxicosis), imbalance nutrition or under nutrition (deficiency diseases).

Malnutrition in context of under nutrition are of 2 types:

- Protein Energy Malnutrition (PEM)
- Micronutrient Deficiencies

a) Protein Energy Malnutrition (PEM)

It mostly affects infants and young children whose rapid growth increases nutritional requirement. The long term intake of insufficient food can result in **Marasmus** before one year. **Kwashiorkar** is common after 18 months.

Management of PEM

Immediate Measures-

- A diet containing enough of calories from carbohydrates, proteins, fats and dairy, as well as vitamins and minerals.
- Artificial nutritional support is required as tube feeding or intravenous feeding.
- Milk and banana mashed can be given after 6 months.
- ORS to be given from 6 months onwards.

When the condition improves-

- Exclusive breast feeding for 6 months and to continue upto 2 yrs and beyond.
- Dalia, kitcherie, green gram dhal, pulse vegetable porridge, idli, suji, ragi kheer, curd rice, puffed rice, paustik roti can be given after 6



Fig. Kwashiorkar



Fig. Marasmus

months.

- Complementary feeding should be given 2-3 times for 6 to 9 months and 3-5 times for 9 to 12 months old.
- Give semi solid foods.
- Add oil to cereals, pulses, meat, egg, fish, etc.

b) Micronutrient Deficiencies

Micronutrients deficiencies are due to vitamin (vitamin A, B complex, C, D) or mineral deficiencies (calcium, phosphorus, iron and iodine).

Management of vitamin A deficiency:

- Inclusion of milk and milk products, egg yolk, oils and ghee, dark green leafy vegetables as amaranthus, spinach, radish, lettuce, carrots, cabbage, papaya, peas, beans, tomato and fruits as mango, ripe papaya, orange.
- Vitamin A supplementation.



Fig. Vitamin A deficiency

Managements of Thiamine (vitamin B₁) deficiency:

- Inclusion of pulses, oilseeds and nuts, whole cereals as parboil rice, whole wheat flour, meat, fish, egg, fresh peas, beans, soybean.
- Inclusion of milk and milk products.

Management of Riboflavin (vitamin B₂)

deficiency:

- Include dark green leafy vegetables and bael fruit
- Milk and milk products
- Pulses, whole and split, whole cereal.

Management of Niacin (vitamin B₃) deficiency:

- Consumption of 125 g of groundnuts daily
- Include soyabean, barley, sweet potatoes, all nuts
- Include brown rice



Fig. Vitamin B₂ deficiency



Fig. Vitamin B₃ deficiency

Management of vitamin C deficiency:

- Include fruits as amla, orange, vegetables as papaya, cabbage, broccoli, plantain, drumstick leaves, capsicum, bittergourd, knol khol, radish leaves, methi, beans, potato
- Others as sprouts, fresh milk, liver, fish



Fig. Vitamin C deficiency

Management of vitamin D deficiency:

- Inclusion of milk and milk products, leafy green vegetables (spinach), egg yolk, ragi, soybean, custard apples & strawberries.
- Sea food- fish, prawn and fish oil.



Fig. Vitamin D deficiency

Management of iron deficiency:

- Iron-rich foods include raisins, meats (especially liver), fish, poultry, egg yolks, legumes (peas and beans), and whole- grain bread, oats, spinach, molasses, peanut butter, soybeans.
- The best sources of iron include breast milk, infant cereals and other iron-fortified cereals & liver.



Fig. Iodine deficiency

Management of iodine deficiency:

- Use of iodized salt in cooking.
- Sea foods as fish, prawn.
- Vegetables grown in iodine rich soil.



Fig. Iron deficiency



Fig. Vitamin D deficiency

FOOD NUTRITION

AND

HEALTH CARE



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