

## Mass food production

Effects on cooking of nutritive value of food The objectives of processing and cooking food,

### **To improve their digestibility and appearance**

- To develop new flavours
- To destroy harmful microorganisms

The important processing and cooking methods are;

- Boiling in water
- Steaming
- Baking
- Frying
- Canning
- Dehydration

Effect of cooking on various nutrients;

1. Carbohydrate: When heat is applied to moist starch granules swell and burst and the starch gets gelatinized. Cooked starches digested and absorbed easily are good source of calories
2. Fat: normal household cooking, no loss in fats. While fats heated for long periods, eg;- frying, loss of EFA and toxic polymerized products are formed.
3. Protein: moderate heat application coagulates proteins. Cooking helps in digestion of protein, roasting, baking, frying has been reported loss of protein. Maillard reaction is the result of protein (amino acid) and reducing sugars-cause browning (brown crust in cakes, etc.)

The nutritive value of legume protein improved by inactivating, inhibiting factors such as trypsin inhibition

1. Vitamins: loss of vitamin and minerals occur due to leaching while cooking, frying or roasting causes vitamin-A and carotene loss up to 30-60%. Strong light and heat destroys riboflavin. Addition of cooking soda while cooking destroys vitamin B complex. The quantity of vitamin C loss during cooking of vegetables varies from 10-60%.

2. Minerals: when excess amount of water is used in cooking minerals leached into the water. Use of iron pan for cooking improves iron intake.

Cutting of vegetables & fruits into smaller pieces and exposed to air causes oxidation of vitamins and minerals and hence loss occurs. **Various deficiency disorders & terms**

1. Junk food: junk foods are those foods that contain no protein, vitamins or minerals. But are rich in salt, sugar, fats and are high in energy.

Eg:-chocolates, lays, potato chips

2. is a precursor of vitamin -A B – Carotene

3. Malnutrition: is the condition of health either from a deficiency or excess or imbalance of nutrients. Severe malnutrition in certain phases life (infancy, childhood) can do irreparable damage to the body.

Eg;-kwashiorkor

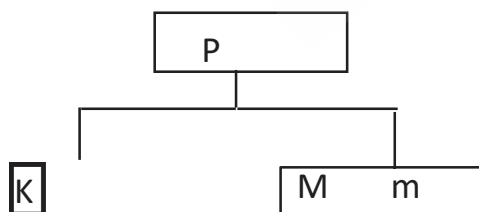
Marasmas } are the results of protein deficiency Obesity-excess nutrition

4. PEM

This is known as protein energy malnutrition. Otherwise known as

**PCM(PROTEIN CALORIE MALNUTRITION).**

This is the name to various degree of nutritional disorders caused by inadequate quantities proteins and energy I the diet. Such deficiency occurs in children below 5 years of age, when they are waned from mothers milk.



Marasmus means when protein and energy are insufficient a condition known as marasmus will seen in children. In marasmus growth failure

occurs and the child is all skin and bone.

#### 5. Vitamin -A deficiency

Deficiency of vitamin -A shows in delayed adaptation to darkness on coming from

the lighted area because it produces changes in the eyes. In a healthy person the eyes adapt quickly to dim light and bright light. In vitamin-A deficiency rhodopsin is formed effectively; therefore vision in dim light is not easy. This symptom is known as night blindness.

As the deficiency advances a condition known as xerophthalmia develops. The conjunctiva becomes dry. The transparent appearance of the eye and its elasticity is lost. The eye becomes grey and opaque. If this condition persists the eye becomes infected and ulcerated. This is a serious condition which results in blindness. Advanced neglected xerophthalmia leads to degeneration of cornea and blindness. This condition is known as keratomalacia.

#### 6. Beri-beri Beri beri is a thiamine deficiency disease.

forms are there;

1. Dry beri-beri: in dry beri-beri the nerves of the legs are affected first. Calf muscles become tender. Wasting of muscles and difficulty in walking.
2. Wet beri-beri : oedema on the legs will be prominent. The patient may be bed-ridden and cardiac failure may take place, if untreated leads to death within hours.
3. Infantile beri-beri : it affects infants within six months, vomiting, green coloured diarrhea are common, if treatment delays it leads to death.

#### 7. Optimum or adequate nutrition?

When all the essential nutrients are present in correct proportion as required by

the body, it is called optimum or adequate nutrition. Optimum nutrition is required to maintain good health.

8. What is kwashiorkor? What are the supplementary protein foods you will suggest to overcome kwashiorkor?

Kwashiorkor means the sickness a child develops when the next child is born. It occurs when there is not enough protein in the diet but calories or energy in the form of

carbohydrates are available in sufficient quantity. Kwashiorkor is characterized by growth failure, swelling of legs and feet, wasted muscles, change in the colour of skin and hair, pot belly etc.

Food supplements containing good quality protein (high biological value) along with adequate amount of energy, minerals vitamins and fat. All animal foods, pulses, nuts and oil seeds are rich source of protein these food along with cereals veg & fruits will supply adequate amount of nutrition.

Eg:-Rice soya laddu, nutrimix (rice, wheat, gram, ground nut), idly, kichidi (Rice

+dal), kuzhandai amuthu (maize + Bengal gram ground nuts).

9. What does '4D' stands for? Why does this happen?

Pellagra-deficiency disorder of vitamin-B3(Niacin) the symptoms are,

- D-Diarrhoea
- D-Dermatitis(skin disease)
- D-dementia (mental disturbance)
- D-Death

If the first '3D'S are not treated that may lead to the fourth 'D'-Death. The sources of niacin are pulses, yeast, fish etc.

10. What is ariboflavonosis?

Riboflavin (vitamin-B2) deficiency disorder.

Symptoms:-angular stomatitis, glossitis (megeater tongue) and

cheilosis(cracks at the corners of the mouth).

Source:-milk,yeast,fish,green leafy veg.

11. Empty calorie foods?

Supplkes only energy.

Eg:-sugar, oil & fats, honey jaggery, chocolates, synthetic carbonated drinks (coca-cola,alcohols, wine etc

12. Hypervitaminosis?

Intake of excess amount of vitamins for a longer period may cause hypervitaminosis, it occurs in fat soluble vitamins.

Eg:-Hypervitaminosis A, D, E & K.

Because fat soluble vitamins are stored in the body, while water soluble vitamins are not stored in the body.

13. What are the effects of cooking on nutritive value of food?

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14. Effect of cooking on various nutrients

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**Vitamin :**-loss of vitamins and minerals occur due to leaching while cooking. Frying or roasting causes vitamin-A and B-carotene loss upto 30-60%. Strong light and heat destroys riboflavin. Addition of cooking soda while cooking destroys vitamin B-complex, the quantity of vitamin-C loss during cooking of vegetables vary from 10-60%.

**Minerals:**-when excess amount of water is used in cooking, minerals leached into the water. It is advisable not to throw away the excess water, use of iron pans for cooking improves iron intake.

Cutting vegetables & fruits into smaller pieces and exposed to air-causes oxidation of vitamins and minerals hence loss occurs.

15. Discuss the significance of milk and milk products in promoting good health?

Milk is a complete food. Milk protein is of excellent quantity and it promotes growth and maintenance of body tissues. Hence it is an ideal food for infants and children. Milk is very low in iron and vitamin. C content. Calcium and phosphorus very high, and is an excellent source of vitamin-A, rich in B-vitamins especially riboflavin. Lactose is the milk sugar. Whole milk contains. 4.7% carbohydrates, 4% fat, 3.3% protein and 88% water. Milk protein is casein.

Non-fat milk, cream, butter are the common milk products. Milk and milk products promote good health.

16. Plan a low cost dinner menu for your hostel and find out its nutritive value?

Cost (Rs)	Menu Ingredients	Quantity (g)	Nutritive value	
			Protein (g)	Energy (kcal)
10	Stuffed Wheat flour, Chappathi	80	8	280
	with smashed potato	10	0	10
	potatoes and peas	10	2	30
7	Cooked Rice	120	8	350
	rice (350g)			
10	Fish curry (60g) Fish	50	10	20
10	Dal amaranth Dal,	20	4	65
	porial (80g) amaeanth,	100	3	45
	coconut,	10	0	5
	oil	10	0	90
Total=40			35	880

17. Why it is necessary to group foods? Describe one method of food grouping and discuss how it is used in menu planning?

The ultimate aim of consuming food is to maintain health. There is no single food stuff which can contribute all the nutrients needed by the body. In order to select the sources of all nutrients and in correct proportions one must know about the basic principles of food selection.

A nutritionally adequate diet should be consumed through a wise choice from a variety of foods. Foods are grouped into basic 7 food group & basic 4, suggest 4edc by U.S. Department of Agriculture, while ICMR India suggested basic 5 food groups.

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## BASIC 5 FOOD GROUP PLAN

GROUP	NUTRIENTS
<b>MILK GROUP:-</b> milk and milk products, pulses, nuts, meat, fish,	Supplies protein, minerals and vitamins.
Egg Fruits and green leafy vegetables:-	
included in this.	Rich Source of vitamin C,A, minerals & vitamins
Other vegetables:-all vegetables included	Good source of vitamin-C,A, minerals.
Cereals, roots & tubers:-creals-rice, wheat, ragi, corn, potato, topioca, etc.	Rich in starch, good source of protein & b-vitamins
Fats and oil & pure carbohydrate foods:-all cooking oils, butter, ghee, sugar, jaggary, honey etc.	Energy rich, EFA, vitamin A&E (RICH IN CHOLESTROL,RESTRICTEINTAKE)
<b>How to use this grouping in menu planning.</b>	
<ol style="list-style-type: none"> <li>1. Choose a variety of foods in amounts appropriate for age, sex, physiological status, physical activity.</li> <li>2. Use a combination of grains, grams and greens. Include jaggery or sugar, oils, just enough to bridge the energy gap.</li> <li>3. Include fresh vegetables and fruits</li> <li>4. Include milk, meat, egg etc.</li> <li>5. Develop healthy eating habits and exercise regularly.</li> </ol>	

