
Good Morning
Buttima

NUTRITION AND ORAL HEALTH

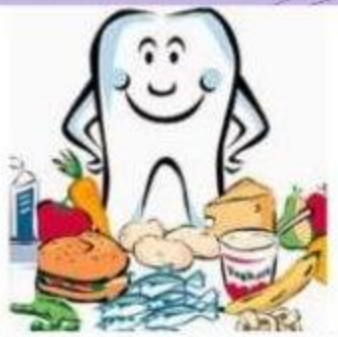
Dr.G.Shobana, MDS
Department of Public Health Dentistry
Sri Venkateshwaraa Dental College,
Puducherry

Contents:

INTRODUCTION

- Life cannot exist without food, hence every living organism strives its utmost to obtain its food requirements. As all foods are not of the same nutritive value, the health of a person depends on type & quality of food stuff he chooses to eat & to satisfy his hunger.
- But for sustaining healthy life, diet should be planned with full knowledge of scientific facts & observations concerning the science of nutrition.

- There is interdependent relationship between Nutrition and oral health. Early signs of many common degenerative diseases, nutritional deficiencies, & disease of metabolism are seen intra orally before they are physically apparent elsewhere, hence Sir William Osler referred "**mouth**" as a **"mirror of nutritional status"**.



Definitions

- **Food**

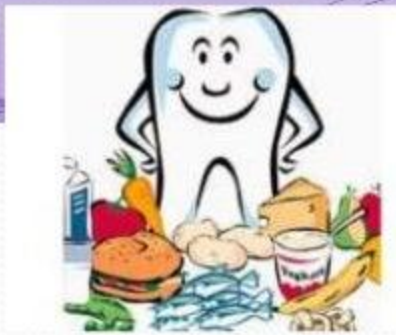
"An edible substance made up of a variety of nutrients that nourish the body."

- **Diet**

"The types & amounts of food eaten daily by an individual."

- **Nutrition**

"The intake and absorption of nutrients from those foods and drink."



- **Recommended Dietary Allowance (RDA)**

"The average daily nutrient value considered adequate to meet the nutrient needs of nearly all (97-98%) healthy people in a life stage and gender group."

Classification of Foods:

A) Classification by origin - Plant origin

Animal origin

B) Classification by chemical composition

Organic : containing carbon

1) Proteins

2) Fats

3) Carbohydrates

4) Vitamins

Inorganic: do not contain carbon

5) Minerals (4% of body weight)

C) Classification by predominant function

1) Body building foods: proteins milk, meat, poultry, fish,

2) Energy giving foods : cereals, sugars, roots.

3) Protective foods: vegetables, fruits, milk.

D) Classification by nutritive value

1) Cereals and millets
2) Pulses
3) Vegetables
4) Nuts and oilseeds
5) Fruits
6) Animal foods
7) Fats and oils
8) Sugar and jaggery
9) Condiments and spices
10) Miscellaneous foods

NUTRIENTS

- Nutrients are organic and inorganic complexes contained in food. There are about 50 different nutrients which are normally supplied through the foods we eat.
- Each nutrient has specific functions in the body. Most natural foods contain more than one nutrient. These may be divided into macro nutrients & micro nutrients.

(i) **Macronutrients**: form the main bulk of food. In the Indian diet, they contribute to the total energy intake in the following proportions.

- Proteins 7- 15 per cent
- Fats 10- 30 per cent
- Carbohydrates 65- 80 per cent

(ii) **Micronutrients**: (mg to grams)

- Vitamins and minerals

PROTEINS

- Proteins are complex organic nitrogenous compounds.
- Proteins are made up of smaller units called amino acids.
- <u>Functions:</u>

- Body building
- Repair and maintenance of tissues
- Synthesis of antibodies, hemoglobin, enzymes
- They provide **4 kcal of energy per gram**.
- RDA for protein for adults is **0.8-1 g of protein/day/kg** body weight.

Oral manifestations of protein deficiency

- Formation, eruption & alignment.
- Adversely effects periodontium cells- fibroblast, osteoblast, cementoblast.
- Caries prone teeth.
- Retarded cementum deposition.
- Degenerative changes in gingiva & PDL.
- Poor calcification of dentin & matrix.
- Reddening of tongue with loss of papilla.

FATS/LIPIDS

- Fats are solid at 20 deg C, they are called oils if they are liquid at that temperature.
- They are concentrated sources of energy.
- Classification:
  - Simple lipids - Triglycerides
  - Compound lipids- Phospholipids
  - Derived lipids- Cholesterol
- Almost 99% of body fats are in the form of triglycerides

- Functions:

- They provide **9 kcal of energy per gram**.
- Carry flavor of food
- Carry the fat-soluble vitamins A, D, E & K.
- Fat beneath skin provides insulation against cold.
- Fat supports viscera like heart, kidney and intestine.
- Omega-3 fats-linolenic acid-decreases cholesterol level and cardiac risk diseases by reducing blood pressure and preventing blood clots.

Effects on oral health

- Phospholipids are a structural component of cell membrane, tooth enamel and dentin.
- Research indicates that high-fat foods tend to be inhibitory towards dental caries.
- Small quantities of nuts and cheese can be good between meal snacks for patients concerned with dental caries.

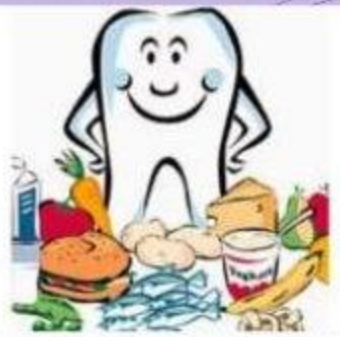
CARBOHYDRATES

- Carbohydrates provide the body's primary source of fuel for heat and energy. They also maintain body's back up store of quick energy as glycogen (animal starch).
- The 3 main sources are Starches, Sugars and Cellulose.
- The carbohydrate reserve of a human adult is about 500gms, which is rapidly exhausted when a person is fasting.
- RDA for carbohydrates is **130g/day**.

- Functions:

- Fat metabolism
- They provide **4 kcal of energy per gram**.
- Synthesis of ground substance of connective tissues.
- Synthesis of certain non-essential amino acids.
- Glucose is essential for erythrocyte and brain function.

Effects on oral health



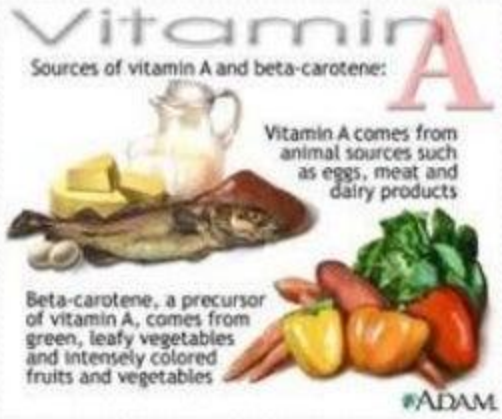
- Dental caries is a local phenomenon caused by the diet, especially the carbohydrates.
- The most important among them is Sucrose, which is utilized by the bacteria to produce both intra and extracellular polysaccharides.
- The type, consistency, time of intake and frequency of the carbohydrates are major factors in causation of dental caries.

VITAMINS

- It is a substance which must be obtained by dietary means because of a lack of capacity in the human body to synthesize it.
- They are part of the enzyme system.
- Classification:

➢ Fat-soluble: A, D, E & K

➢ Water-soluble: B, C



Nutrient	Dietary source	function	Oral signs of deficiency
Retinol (Vitamin A)	Carotenoids (yellow fruits and vegetables)	Epithelial differentiation	Mucosal keratinization, Leukoplakia, Cheilitis, Enamel Hypoplasia
Thiamine (vitamin B1)	Yeast extract, milk ,Eggs, wheat flour	Coenzyme thiamine pyrophosphate functions in energy metabolism	Oral sensitivity, Burning Mouth syndrome, Reduced taste perception
Riboflavin (vitamin B2)	Dairy products and eggs, liver kidney and whole grains	Flavoproteins; coenzyme involved in energy metabolism	Angular cheilitis, Burning mouth syndrome, Ulceration, Lip fissures.

Nutrient	Dietary source	function	Oral sign of deficiency
Niacin (Vit B3)	Dairy products, Eggs, liver, meat, Pulses.	Nucleotide coenzyme involved in energy metabolism	Mucosal atrophy and stomatitis, Glossitis, Angular cheilitis
pyridoxine (Vit B6)	Liver, meat, fish, Whole grains, milk, peanuts.	Coenzyme involved in amino acid metabolism	Glossitis, Cheilitis, Burning mouth syndrome, Ulceration, Lip fissures.
Folate folic acid	Liver, kidney, green leafy veg, oranges, pulses	Purine and pyrimidine synthesis	Glossitis, stomatitis, Recurent apthae, Dysplasia, Angular Cheilitis, Candidosis

cyanocobalamin (Vit B12)	**Meat, fish,eggs, dairy products,**	**Purine and pyrimidine synthesis**	**Atrophic glossitis, stomatitis, recurrent aphthae, dysplasia, angular cheilitis, candidosis**
Ascorbic acid (Vit C)	Citrus fruits, berrries, potatoes, green veg,	Antioxidant involved in redox reactions	Recurrent aphthae, angular cheilitis, gingivitis/ periodontitis
Calcitriol (Vit D)	Oily fish,eggs,sunlight	Calcium homeostasis	Hypoplasia
Vit E	Veg oils, sunflower seeds, whole grains, eggs	antioxidant	none
Vit K	Veg,pulses,liver	Formation of clotting factors	Gingival bleeding, postextraction haemorrhage

Dietary Reference Intakes (DRIs): Recommended Intakes for Individuals, Vitamins

Life-stage group	Vitamin A (µg/day)[a]	Vitamin C (mg/day)	Vitamin D (µg/day)[b,c]	Vitamin E (mg/day)[d]	Vitamin K (µg/day)	Thiamin (mg/day)	Riboflavin (mg/day)	Niacin (mg/day)[e]	Vitamin B_6 (mg/day)	Folate (µg/day)[f]	Vitamin B_{12} (µg/day)	Pantothenic acid (mg/day)	Biotin (µg/day)	Choline (mg/day)[g]
INFANTS														
0-6 mo	400*	40*	5*	4*	2.0*	0.2*	0.3*	2*	0.1*	65*	0.4*	1.7*	5*	125*
7-12 mo	500*	50*	5*	5*	2.5*	0.3*	0.4*	4*	0.3*	80*	0.5*	1.8*	6*	150*
CHILDREN														
1-3 yr	300	15	5*	6	30*	0.5	0.5	6	0.5	150	0.9	2*	8*	200*
4-8 yr	400	25	5*	7	55*	0.6	0.6	8	0.6	200	1.2	3*	12*	250*
MALES														
9-13 yr	600	45	5*	11	60*	0.9	0.9	12	1.0	300	1.8	4*	20*	375*
14-18 yr	900	75	5*	15	75*	1.2	1.3	16	1.3	400	2.4	5*	25*	550*
19-30 yr	900	90	5*	15	120*	1.2	1.3	16	1.3	400	2.4	5*	30*	550*
31-50 yr	900	90	5*	15	120*	1.2	1.3	16	1.3	400	2.4	5*	30*	550*
50-70 yr	900	90	10*	15	120*	1.2	1.3	16	1.7	400	2.4[h]	5*	30*	550*
>70 yr	900	90	15*	15	120*	1.2	1.3	16	1.7	400	2.4[h]	5*	30*	550*
FEMALES														
9-13 yr	600	45	5*	11	60*	0.9	0.9	12	1.0	300	1.8	4*	20*	375*
14-18 yr	700	65	5*	15	75*	1.0	1.0	14	1.2	400[i]	2.4	5*	25*	400*
19-30 yr	700	75	5*	15	90*	1.1	1.1	14	1.3	400[i]	2.4	5*	30*	425*
31-50 yr	700	75	5*	15	90*	1.1	1.1	14	1.3	400[i]	2.4	5*	30*	425*
50-70 yr	700	75	10*	15	90*	1.1	1.1	14	1.5	400	2.4[h]	5*	30*	425*
>70 yr	700	75	15*	15	90*	1.1	1.1	14	1.5	400	2.4[h]	5*	30*	425*
PREGNANT														
≤18 yr	750	80	5*	15	75*	1.4	1.4	18	1.9	600[j]	2.6	6*	30*	450*
19-30 yr	770	85	5*	15	90*	1.4	1.4	18	1.9	600[j]	2.6	6*	30*	450*
31-50 yr	770	85	5*	15	90*	1.4	1.4	18	1.9	600[j]	2.6	6*	30*	450*
LACTATING														
≤18 yr	1200	115	5*	19	75*	1.4	1.6	17	2.0	500	2.8	7*	35*	550*
19-30 yr	1300	120	5*	19	90*	1.4	1.6	17	2.0	500	2.8	7*	35*	550*
31-50 yr	1300	120	5*	19	90*	1.4	1.6	17	2.0	500	2.8	7*	35*	550*

Data from Food and Nutrition Board, Institute of Medicine: *Dietary Reference Intakes for calcium, phosphorus, magnesium, vitamin D, and fluoride* (1997); *Dietary Reference Intakes for thiamin, riboflavin, niacin, vitamin B_6, folate, vitamin B_{12}, pantothenic acid, biotin, and choline* (1998); *Dietary Reference Intakes for vitamin C, vitamin E, selenium, and carotenoids* (2000); and *Dietary Reference Intakes for vitamin A, vitamin K, arsenic, boron, chromium, copper, iodine, manganese, molybdenum, nickel, silicon, vanadium, and zinc* (2001). Washington, DC: National Academies Press [www.nap.edu].

Note: This table presents Recommended Dietary Allowances (RDAs) in **bold type** and Adequate Intakes (AIs) in ordinary type followed by an asterisk (*). RDAs and AIs may both be used as goals for individual intake. RDAs are set to meet the needs of almost all (97%-98%) individuals in a group. For healthy breastfed infants, the AI is the mean intake. The AI for other life-stage and gender groups is believed to cover needs of all individuals in the group, but lack of data or uncertainty in the data prevent being able to specify with confidence the percentage of individuals covered by this intake.

[a] As retinol activity equivalents (RAEs). 1 RAE = 1 µg retinol, 12 µg beta-carotene, 24 µg alpha-carotene, or 24 µg beta-cryptoxanthin. To calculate RAEs from REs of provitamin A carotenoids in foods, divide the REs by 2. For preformed vitamin A in foods or supplements and for provitamin A carotenoids in supplements, 1 RE = 1 RAE.

[b] Calciferol. 1 µg calciferol = 40 IU vitamin D.

[c] In the absence of adequate exposure to sunlight.

[d] As alpha-tocopherol. Alpha-tocopherol includes RRR-alpha-tocopherol, the only form of alpha-tocopherol that occurs naturally in foods, and the 2R-stereoisomeric forms of alpha-tocopherol (RRR-, RSR-, RRS-, and RSS-alpha-tocopherol) that occur in fortified foods and supplements. It does not include the 2S-stereoisomeric forms of alpha-tocopherol (SRR-, SSR-, SR-, and SSS-alpha-tocopherol), also found in fortified foods and supplements.

[e] As niacin equivalents (NEs). 1 mg of niacin = 60 mg of tryptophan; 0-6 months = preformed niacin (not NE).

[f] As dietary folate equivalents (DFEs). 1 DFE = 1 µg food folate = 0.6 µg of folic acid from fortified food or as a supplement consumed with food = 0.5 µg of a supplement taken on an empty stomach.

[g] Although AIs have been set for choline, few data assess whether a dietary supply of choline is needed at all stages of the life cycle, and it may be that the choline requirement can be met by endogenous synthesis at some of these stages.

[h] Because 10% to 30% of older people may malabsorb food-bound B_{12}, it is advisable for those older than 50 years to meet their RDA mainly by consuming foods fortified with B_{12} or a supplement containing B_{12}.

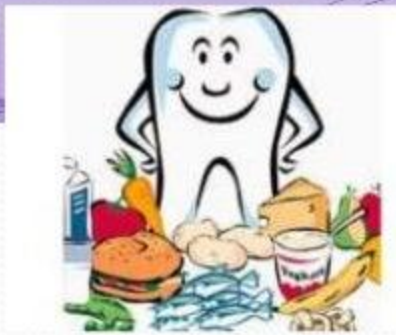
[i] In view of evidence linking folate intake with neural tube defects in the fetus, it is recommended that all women capable of becoming pregnant consume 400 µg from supplements of fortified foods in addition to intake of food folate from a varied diet.

[j] It is assumed that women will continue consuming 400 µg from supplements of fortified food until their pregnancy is confirmed and they enter prenatal care, which ordinarily occurs after the end of the periconceptual period—the critical time for formation of the neural tube.

MINERALS

- Minerals make-up 4% of body weight.
- Minerals are divided into 3 major groups.

1. **Major**: Calcium, Phosphate, Sodium, Potassium, Magnesium (these are required from dietary sources in amounts greater than 100 mg per day).
2. **Trace elements**: Iron, Iodine, Fluorine, Zinc, Copper, Cobalt, Chromium, Manganese, Molybdenum, Selenium, Tin, Silicon, Vanadium, Nickel (these are elements required by the body in quantities of less than a few mgs per day).

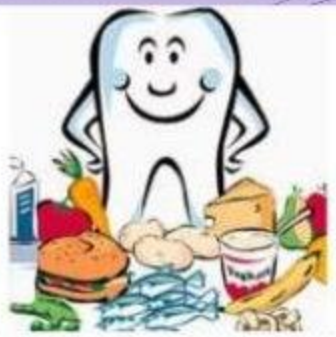


3. **Trace Contaminants**: with no known function: Lead, Mercury, Barium, Boron and Aluminium.

Effects on oral health

- Calcium in association with vitamin D and Phosphorus is essential for proper development and maintenance of mineralized tissues like teeth and bones.
- Fluorides have anticaries effect on teeth.
- Iron deficiency anemia manifests in oral cavity by pallor of oral tissues, especially the tongue.
- Zinc deficiency can inhibit collagen formation and reduces cell-mediated immunity.

Trace elements in dental caries



- Trace elements in human dental enamel are derived from the environment during mineralization and during and after maturation of tooth.
- Navia JM (1972) has probably best summarized the cariogenic effect of many of the minerals.

- Cariostatic elements: F, P
- Mildly cariostatic: Mo, V, Cu, Sr, B, Li, Au
- Doubtful: Be, Co, Mn, Sn, Zn, Br, I
- Caries inert: Ba, Al, Ni, Fe, Pd, Ti
- Caries promoting: Se, Mg, Cd, Pt, Pb, Si

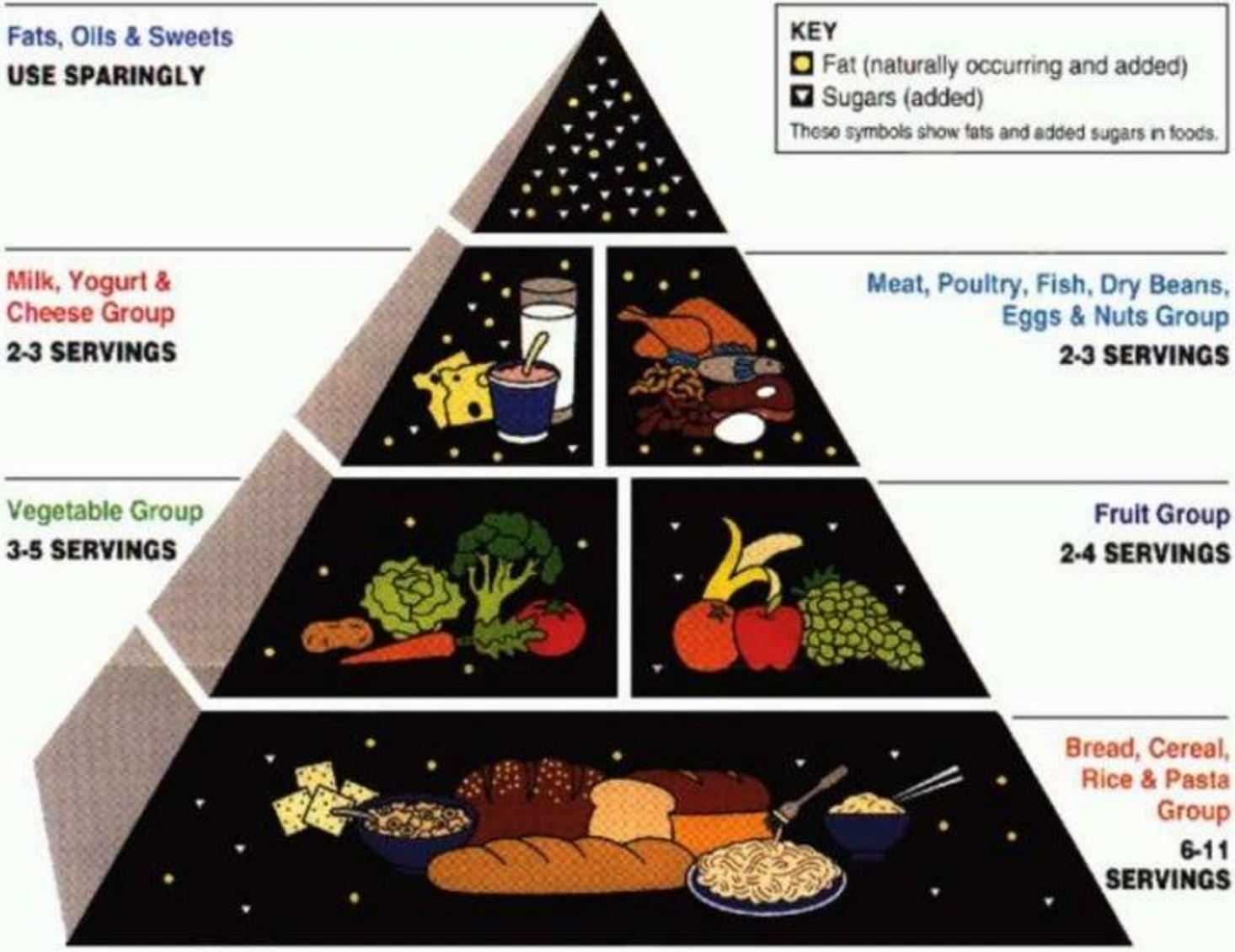
BALANCED DIET

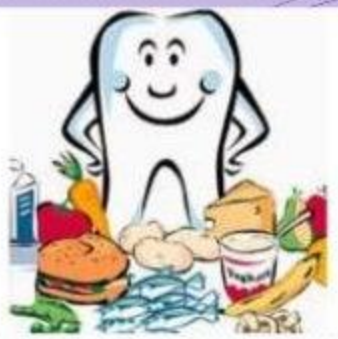
- A balanced diet is one which contains a variety of foods in such quantities and proportions that the need for energy, amino acids, vitamins, minerals, fats, carbohydrate, and other nutrients is adequately met for maintaining health, vitality and general well-being and also makes a small provision for extra nutrients to withstand short duration of leanness.

- A balanced diet contains:

- Protein – 10 – 15%
- Fat – 15 – 30%
- Carbohydrates – remaining part

FOOD GUIDE PYRAMID





- The Dietary Goals recommended by expert committee of WHO-

- Dietary fat should be limited to 15 – 30% of total daily intake.
- Proteins should be limited to 10 – 15% of total daily intake.
- Excess consumption of refined carbohydrates to be avoided.
- Saturated fats – not more than 10% of total energy intake.
- Salt intake should be restricted to not more than 5g per day.
- Reduced consumption of junk food – empty calories.

EFFECT OF NUTRITION ON ORAL TISSUES

DENTAL CARIES

- The demineralization of the enamel and of the dentine is caused by organic acids that form in the dental plaque because of bacterial activity, through the anaerobic metabolism of sugars found in the diet.
- The evidence linking dietary sugar to caries comes from a number of different types of study, namely; human intervention studies, human observational studies, animal studies, enamel slab experiments, plaque pH experiments and incubation experiments.

- Human intervention studies in the field of diet and dental caries are rare owing to ethical problems and the difficulty of placing groups of people on strict dietary regimens for long periods of time.
- The only two studies from which conclusive evidence can be drawn are the Vipeholm study and the Turku study.

PERIODONTAL DISEASES

- One of the oldest observations on nutrition and periodontal health is James Lind's account of scurvy in the first controlled therapeutic trial conducted in 1747.
- Patients with severe scurvy can have healthy gingivae, but a deficiency of vitamin C can exacerbate an existing gingivitis.
- Deficiencies of vitamin A, C, E and folate have detrimental effects on periodontal health.

- Evidence exists from early animal studies which has shown that deficiency of nicotinic acid, pantothenic acid, riboflavin and folic acid results in gingival inflammation.
- The ratio of calcium to phosphorus in the diet is also important since secondary hyperparathyroidism causes marked loss of alveolar bone.

MALNUTRITION

- Malnutrition is a multifactorial disease that can have an early onset during the intrauterine life or childhood or it can occur during an individual's lifetime as a result of poor nutrition.
- It can cause altered tissue homeostasis, a reduced resistance to the microbial biofilm and a reduced tissue repair capacity.
- In poorly nourished communities where sugar is available, malnutrition may increase caries risk by causing defective enamel development and salivary gland atrophy.

- It was found that malnutrition was an etiological factor in dental hypoplasia which resulted in increased susceptibility to caries.

ORAL CANCER

- The use of tobacco can alter the distribution of nutrients such as antioxidants, which develops protective action towards the cells.
- Vitamins A, E, C, and Beta Carotene have antioxidant properties. They neutralize metabolic products, interfere with the activation of pro-carcinogens, inhibit chromosomal aberrations and potentially inhibit the growth of potentially malignant lesions.

- In a recent report which has shown that diets rich in animal origin and animal fats are positively, and those rich in fruit and vegetables and vegetable fats inversely related to oral and pharyngeal cancer risk.

NUTRITION IN THE ELDERLY

- A major problem of many elderly persons is limited physiological capability to digest and absorb foods due to inability to chew food thoroughly due to inadequate /poorly functioning dentition.
- Both periodontal disease and dental caries can lead to tooth loss. Tooth loss can result in chewing difficulty because of inadequate occlusive surfaces or the limitations of prostheses

- Loss of natural teeth causes reduced masticatory efficiency even after replacement with dentures, thus alters food selection & dietary quality, which can affect nutritional status.
- Poorly fitting prostheses may also cause stomatitis & oral pain. Xerostomia and decreased or altered taste can also, contribute to changes in nutrient intake and nutritional status.

- Denture-wearing individuals consume more refined carbohydrates, sugar and dietary cholesterol than dentate individuals.

DIET COUNSELLING AND DIETARY ADVICE

- Main objective – prevent and control caries development
- Diet counselling – is tailor made and is done on one to one basis based on the needs of individual patients.
- Dietary advice – set of general instructions given to people at large.
- Patients at risk for dental caries – ideal candidates for diet counselling

- Candidates should have a positive attitude and interested in understanding their problem and its prevention, accept responsibility for dietary modification.
- Dentist or hygienist – ideal for counselling
- Face to face interview, keep eye contact with patient
- Modified diet – not to deviate much from regular diet
- Should be adapted to patient's daily need and lifestyle

- Qualities to be possessed by the counsellor-

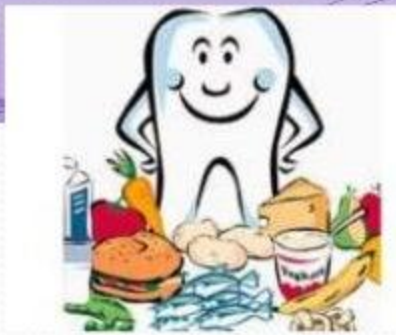
- Patience, sound knowledge about nutrition and health, good communication skill
- Counsellor needs to help the patient to make final decision regarding diet
- Patients should be encouraged to have more fresh fruits, green vegetables, fibrous foods(stimulate saliva).
- Explain patient effect of diet on caries (sucrose, sticky foods)

❖Patient selection:

- Potential candidates for counseling should give high priority to preventive dentistry and should be willing to expend long- term efforts to maintain their natural dentition in good health for a lifetime.
- The Dental Health Diet Score - screening device

- Step 1:
- To ascertain the average daily intake, list everything you eat and drink on an ordinary weekday including snacks.

Breakfast	A.M. Snack
(Time :)	(Time :)
Lunch	P.M. Snack
(Time :)	(Time :)
Dinner	Any Other Snacks
(Time :)	(Time :)



- Step 2
- Circle the foods in the diary that have been sweetened with added sugar or are concentrated natural sweets (honey, raisins, figs, and so forth).
- Classify the uncircled foods or mixed food dishes into one or more of the appropriate food groups.
- For each serving of these foods listed in the food intake dairy, place a check mark in the appropriate food group block.

- Add the number of checks and multiply by the number shown. The maximum number of points credit for the milk and meat groups is 24 each and for the fruit vegetable and bread-cereal groups is 24 each.
- Add the points. The sum is the Food Group Score (96 is the highest score).

Food Group / Recommended Adult Servings	Portion Size Considered one Serving	Number of Servings	Points
MILK (milk and cheese) 3	8 oz (1c) milk 1 ½ oz Cheddar cheese 1 ½ slice American cheese 1 ½ c cottage cheese 8 oz (1 c) yogurt	_____ x 8 =	_____ (Highest possible score = 24)
MEAT (Meat, fish, poultry, dry beans, nuts) 2	203 oz lean cooked meat, fish, or poultry 2 eggs 4 tbsp peanut butter 1 c cooked dry beans or lentils	_____ x 12 =	_____ (Highest possible score – 24)
FRUITS AND VEGETABLES Vitamin A : (dark green and deep yellow fruits and vegetables) 1	½ c cooked fruit or vegetable 1 medium raw fruit or vegetable ½ medium grapefruit or melon 4 ox (½ c) juice	_____ x 5 =	_____ (highest possible score – 6)
Vitamin C (juice and citrus fruits) 1		_____ x 6 =	_____ (highest possible score =6)
Other 2		_____ x 6 =	_____ (highest possible score =6)
BREAD AND CEREALS (enriched or whole grain) 4	1 slice bread ¾ c dry cereal ½ c cooked cereal, rice, noodles, or macaroni	_____ x 6 =	_____ (highest possible score = 6)

TOTAL SCORE = _____

(Highest Possible score = 96)

- Step 3
- How many of the foods listed contain one or more of the ten nutrients essential for dental-oral health? In the Nutrient Evaluation Chart are listed the foods that are good sources of the nutrients essential for good health in general and dental oral health in particular.
- In each of the eight columns of foods, check the one or more eaten on this usual weekday.

- The same food, such as broccoli, may be found in several columns. Also, in column more than one food may be checked. Regardless of the number of foods checked in the column, only seven points is given per nutrient (56 is a perfect score).

Protein and Niacin 7	**Vitamin A** 7	**Iron** 7	**Folic Acid** 7
Cheese Dried beans Dried peas Eggs Fish Meat Milk Nuts Poultry	Apricots Broccoli Butter Cantaloupe Carrots Collards Eggs Greens Liver Margarine Milk Peaches Squash Spinach Sweet potatoes	Beef Broccoli Eggs Green leafy vegetables Liver Oysters Sardines Shrimp	Asparagus Broccoli Cereals Kidney Liver Spinach Yeasts
Riboflavin (Vitamin B_2) 7	**Ascorbic acid (Vitamin C)** 7	**Calcium and phosphorus** 7	**Zinc** 7
Broccoli Chicken breasts Eggs Ham Liver Milk Mushrooms Pork Okra Spinach	Broccoli Brussels sprouts Cantaloupe Grapefruit Green peppers Greens Raspberries Strawberries Strawberries Tomatoes	Broccoli Cheese Eggs Green leafy vegetables Milk String beans	Beef Liver Lobster Oysters Shrimp (other red meats and shelfish)

- Step 4
- List the sweets and sugar-sweetened foods and the frequency with which they are consumed in a typical day.
- Classify each sweet into either the liquid, solid and sticky, or slowly dissolving category.
- Place a check mark in the frequency column for each item as long as they are eaten at least 20 minutes apart.

Table – 5

Example

10:00 A.M. 1 jelly donut
12:00 Noon ham and cheese sandwich
1 c milk
1 cupcake
3:00 P.M. 1 coke
5:00 P.M. 1 cough drop

From	Frequency	Points
Liquid	✓ x 5 =	5
Solid and sticky	✓✓ x 10 =	20
Slowly dissolving	✓ x 15 =	15

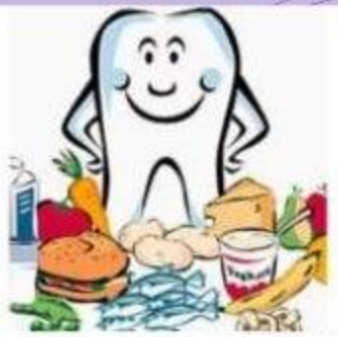
TOTAL SCORE = 35

Decay Promoting Potential

Form	Frequency	Points
Liquid Soft drinks, fruit drinks, cocoa, sugar and honey in beverages, nondairy creamers, ice cream, sherbet, gelatin dessert, flavored yogurt, pudding, custard, popsicles	_____ x 5 =	
Solid and Sticky Cake, cupcakes, donuts, sweet rolls, pastry, canned fruit in syrup, bananas, cookies, chocolate candy, caramel, toffee, jelly beans, other chewy candy, chewing gum, dried fruit, marshmallows, jelly, jam	_____ x 10 =	
Slowly Dissolving Hard candies, breath mints, antacid tablets, cough drops	_____ x 15 =	

TOTAL SCORE = _____

- Step 5
- Now put it all together. Transfer the 4 Food Group Score and the Sweet Score to the Totaling the Scores page.
- If the 4 Food Group Score is barely adequate or not adequate and/or the Sweet Score is in the "Watch Out" zone, nutrition counseling is indicated.



Step 5 :Totaling the Scores

4 Food Group Score :

72 – 96	Excellent
64 – 72	Adequate
56 – 64	Barely Adequate*
56 or less	Not adequate*

Sweet Score :

5 or less	Excellent
10	Good
15 or more	“Watch Out” zone

PREVENTIVE AND SOCIAL MEASURES

- **Action at the family level:**

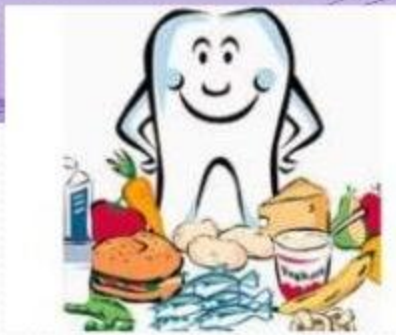
- Nutritional education about the selection of the right kind of foods.
- Identification and correction of harmful food habits.
- Promotion of breast feeding; improvement in infant and child feeding practices.
- Promotion of a kitchen garden or keeping poultry.

- **<u>At the Community level:</u>**

- Analysis of the extent, distribution and types of nutritional deficiencies; population groups at risk.
- Conduct diet and nutrition surveys.
- Real solution can only be obtained through fundamental measures which correct the basic causes of malnutrition – increasing the quality and quantity of available foods.

- **At the National level:**

- By rural development
- Increasing agricultural production
- Stabilization of population
- Nutrition – related health activities.
- Nutritional intervention programs



- **At the International level:**

- FAO, UNICEF, WHO, UNDP, World Bank and CARE are some agencies helping national governments in different parts of the world in their battle against malnutrition.

CONCLUSION

- Nutrition is vital to human development, growth and health maintenance. Compared to other health care workers, we the public health dentists reach a larger number of the general public per year and are in a position to provide clinical and behavioral assessment, information, education , motivation and follow up.
- Nutrition risk may be minimized and/or avoided with early intervention, proper diet instruction, and further referral to the appropriate health professional.

Previous year question – PY University

- Role of diet and nutrition in oral health
- Diet counselling
- Discuss the importance of nutrition in oral health

REFERENCES

- Pathak MU, Shetty V, Kalra D. Trace elements and oral health: A systematic review. J Adv Oral Res 2016;7(2):12-20.
- Kulkarni N, Kalele K, Kulkarni M, Kathariya R. Trace elements in oral health and disease: An updated review. J Dent Res Rev 2014;1:100-4.
- Hiremath SS. Textbook of Public Health Dentistry. 3rd edition. Elsevier Publishers, New Delhi; 2016.

- CM Marya. A Textbook of Public Health Dentistry. 1st Edition 2011. Jaypee Brothers Medical Publishers, New Delhi
- Rugg-Gunn AJ, Hackett AF. Nutrition and dental health. 1993, 1st edition;Oxford university Press:375-410
- Nizel AE, Papas AS. Nutrition in clinical dentistry. 1989, 3rd edition; W.B.Saunders co:277-367.
- P Soben. Essentials of Public Health Dentistry. 6th ed. Arya publishing house, New Delhi; 2017.

- Pine, Cynthia M, and Rebecca Harris. Community Oral Health. London: Quintessence Pub, 2007. Print.
- Moynihan PJ. The role of diet and nutrition in the etiology and prevention of oral diseases. Bull World Health Organ. 2005 Sep; 83(9):694-9. Epub 2005 Sep 30.
- Ghosh, Abhishek & SK, Pallavi & Nagpal, Dr. Bhuvan & Hegde, Usha & S, Archana & Nagpal, Jyoti. (2015). Nutrition and Oral Health: A Review. Indian Journal of Applied Research. 5. 546-549.

THANK YOU