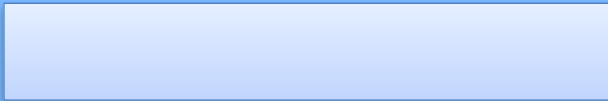




Balanced Diet



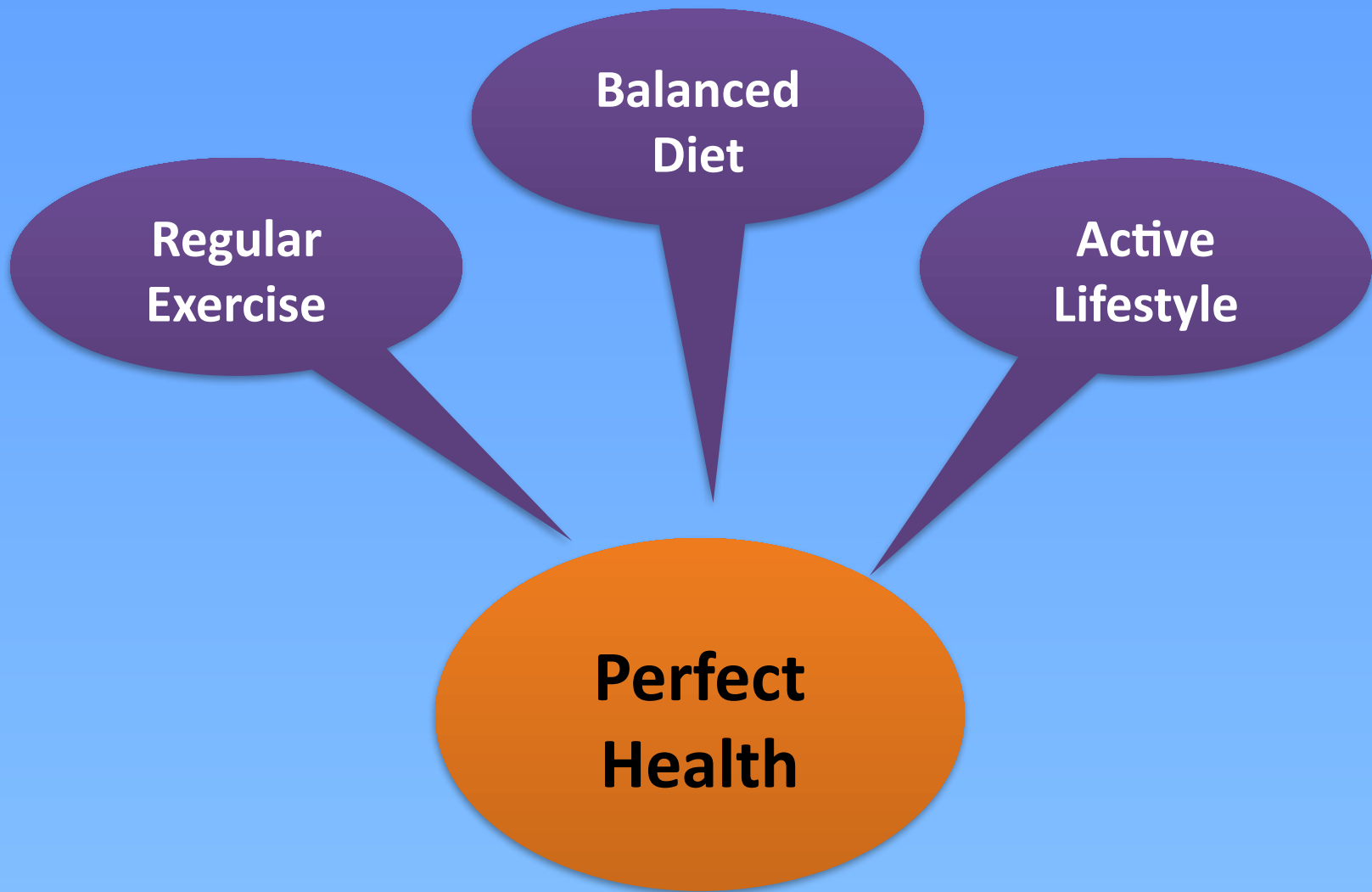
- **Terminologies**
- **Importance of a Balanced Diet**
- **WHO Recommendations**
- **Recommended Dietary Allowances**
- **Recommended Calories**
- **Food Pyramid**
- **Nutritional Importance of Carbohydrates, proteins, Fats vitamins, minerals & water**
- **Geriatric Nutrition**
- **Nutrition for denture wearer**
- **Conclusion**
- **References**

- **To eat is a necessity, but to eat intelligently is an art."**

- La Rochefoucauld

- **"The wise man should consider that health is the greatest of human blessings. Let food be your medicine."**

- Hippocrates



Nutrition-

The science of how the body utilizes food to meet requirements of development, growth, repair and maintenance by utilization of food by living organisms.

Diet-

The total intake of substance that furnish nourishment and calories.

Nutrients –

Are the constituents of food necessary to sustain the normal functions of the body .

Balanced diet-

It is defined as diet which contains a **variety of food in such quantities and proportions that the need for energy**, proteins amino acids, vitamins, minerals, fats, carbohydrates and other nutrient is adequately met for maintaining health, vitality and general well being and also makes a provision for an extra nutrients to withstand short duration of illness.

RDA - Recommended Dietary Allowance

- The average daily dietary intake of a nutrient that is sufficient to meet the requirement of nearly all healthy people.

Carbohydrates: These provide a source of energy.

Proteins: These provide a source of materials for growth and repair.

Fats: These provide a source of energy and help in absorption of fat soluble vitamins.

Mineral : These are required for healthy teeth, bones, muscles ,fluid regulation, Blood pressure regulation .

Fibre: This is required to help your intestines function correctly.

Balanced Diet: we must have the above nutrients in the correct proportions.

Importance of a Balanced Diet

- **Maintaining the health**
- **Preventing Infections and Diseases**
- **Safeguard from nutritional deficiencies**
- **Weight Control**
- **Healthy Body Growth**
- **Active Lifestyle**

WHO recommendations

- Achieve an energy balance and a healthy weight
- Limit energy intake from total fats and shift fat consumption away from **saturated fats** to **unsaturated fats**
- Increase consumption of **fruits ,vegetables,legumes,whole grains and nuts**
- Limit the intake of **sugar**.
- Limit **salt** consumption from all sources and ensure that salt is iodized



Recommended Dietary Allowances-

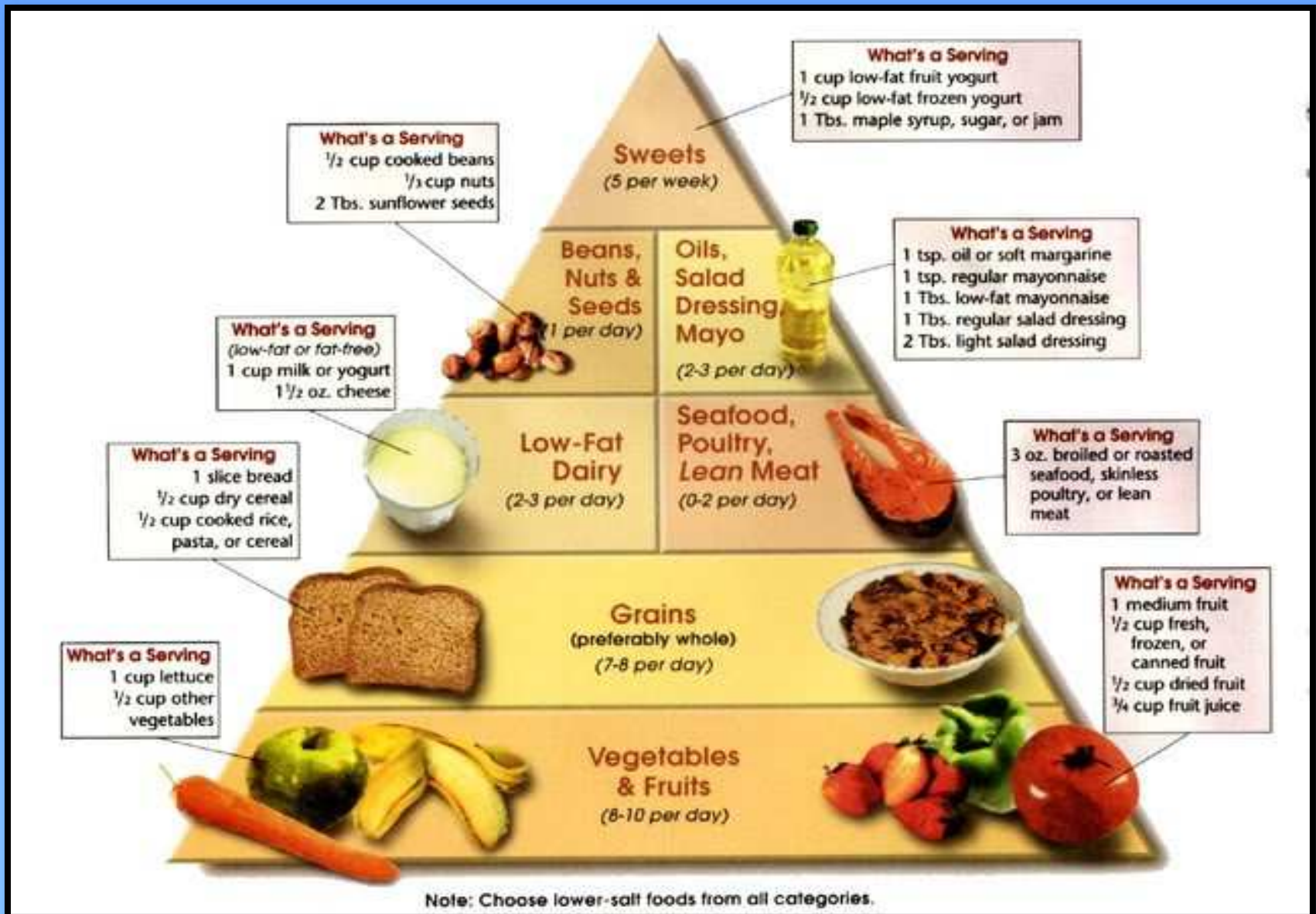
Caloric Content of Foods

	Indian Man (60kg)	Indian Woman (55kg)
➤ Proteins g/d	60	50
➤ Carbohydrate	4 cal/g	
➤ Protein	4 cal/g	
➤ Fats	9 cal/g	
➤ Vit A mg/d	600	600
➤ Thiamine mg/d	1.4	1.1
➤ Riboflavin mg/d	1.6	1.3
➤ Nicotinic acid mg/d	18	14
➤ Pyridoxine mg/d	2.0	2.0
➤ Ascorbic acid mg/d	40	40

Recommended Calories for Indians

Group	Particulars	K Calories
Man	Sedentary work	2350
	Moderate work	2700
	Heavy work	3200
Woman	Sedentary work	1800
	Moderate work	2100
	Heavy work	2450
	Pregnancy	+ 300
	Lactation 0 - 6 months	+ 550
	6 - 12 months	+ 400

- FDB in Denmark in 1978
- USDA in 1992 to replace the earlier food groups classification system



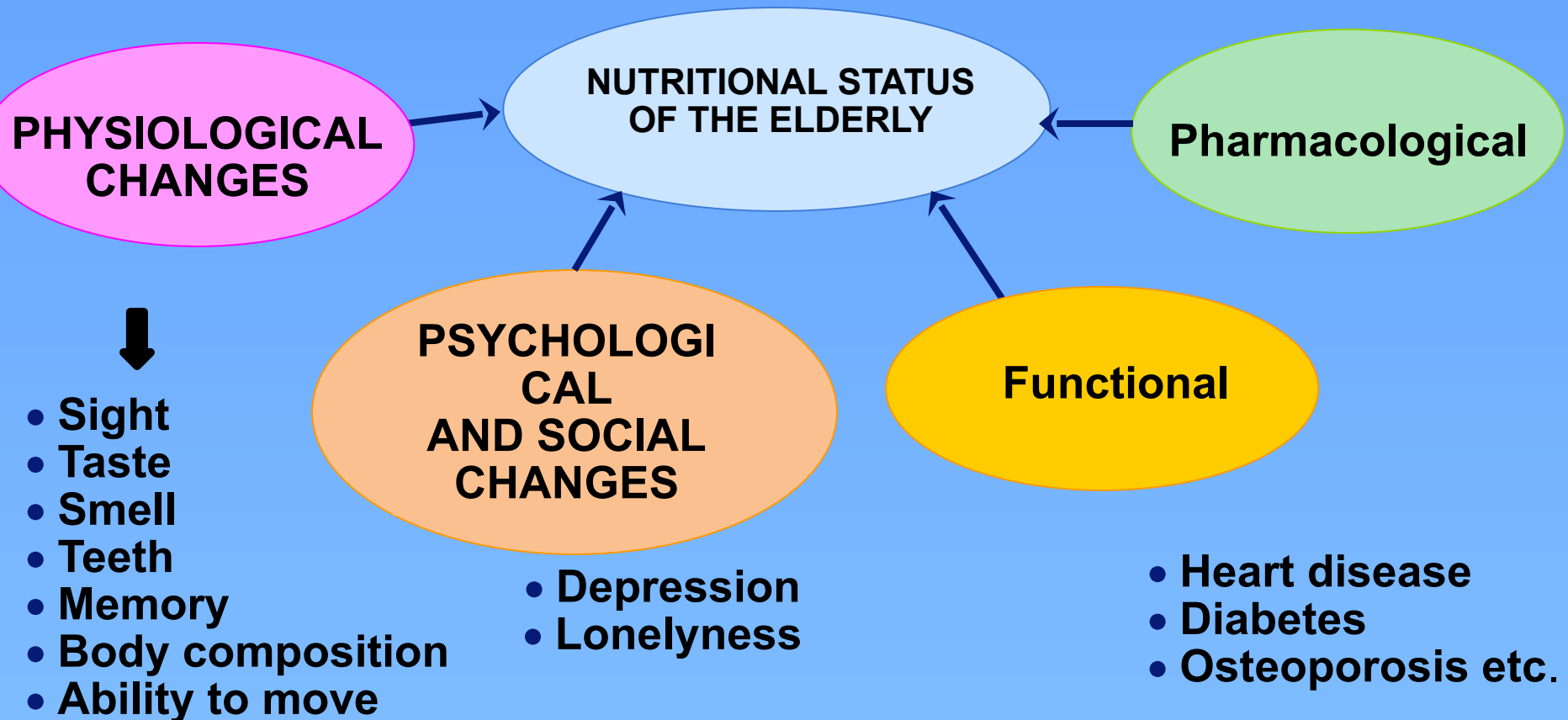
USDA changed the Pyramid in 2005



Geriatric nutrition

- Geriatric nutrition applies nutrition principles to delay effects of aging and disease, to aid in the management of the physical, psychological changes commonly associated with growing old.
- There is also good evidence that prosthetic failures are often, the result of tissue deficiencies rather than technical deficiencies.
- Research indicates that dietary habits, such as restricting one's calorie intake and consuming antioxidants, may increase longevity

Factors that influence the nutritional status of the elderly



Oral factors

- Xerostomia – 1 in 5
- Sense of taste and smell
- Oral infectious conditions
- Effect of dentures
 - Taste & Swallowing
 - Chewing ability
 - Food choice & Diet quality

Dietary recommendations for Geriatrics

- Energy needs decrease.
- Average energy consumption of 65-74 yrs
 - Women – 1300 Kcal
 - Men – 1800 Kcal
- RDA : Women – 1600 Kcal
Men – 2400 Kcal
- The average calorie requirements are :
 - 10% less at age 60
 - 20% less at age 70
 - 25% less over age 90

Indian Diet Chart

Food Group	Quantity	Sources
Cereals	300 g	Wheat, Rice, Millets
Pulses	60g (Veg), 30g(Non-Veg)	Sprouts/dal
Meat	30 g	Egg / Chicken / Fish
Vegetables	300 g (minimum)	Peas, Carrot, Pumpkin, Beans, Green Leaf Vegetables etc.
Fruits	100 g (minimum)	Orange, Apple, Papaya, Guava, Mango etc
Milk & Milk products	300 g	Cheese, Curd etc
Sugar	20 g	Confectionary
Fats	20 g	Oil/ Butter/ Ghee

NUTRIENTS

MACRONUTRIENTS

MICRONUTRIENTS

Carbohydrates

Fats

Proteins

Water

Dietary Fibers

Minerals

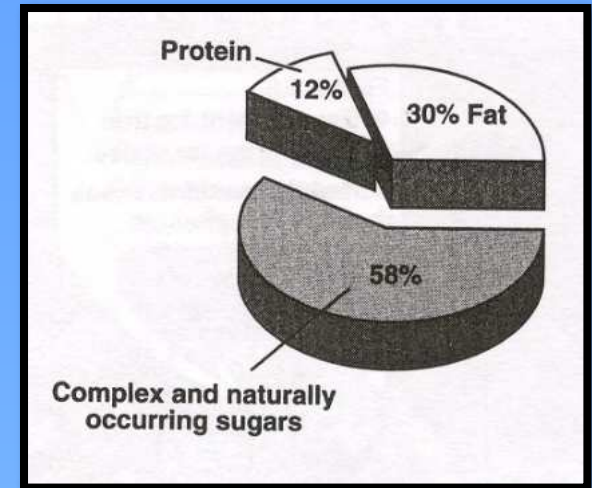
Vitamins

Nutritional Importance of Carbohydrates

- $(CH_2O)_n$ – Hydrated C
- Call for an intake of **50-70%** of total calories
- Provides **4Kcal/g** of energy
- **RDA**- Females - **177 gm/day**
Males - **287 gm/day**

Types of Carbohydrates

- Digestible
 - Candy, Sweets, fruits Sugar, pasta, rice, breads, potatoes
- Non Digestible/Dietary Fibre- 35-40gm/day
 - Pectin, gums, cellulose



Functions

- Source of energy
- Storage form of energy - Glycogen
- Structural component – Glycosaminoglycans, glycoprotein
- Non Digestable – Serve as dietary fibre
- Constituent of nucleotide
- Detoxification
- Enhances fatty acid metabolism

Excessive consumption - Overweight

Insufficient consumption - Ketosis

Geriatric considerations for Carbohydrates

- Most of them should be from complex carbohydrates
- Complex carbohydrates Promote the bowel function & Reduce cholesterol.
- Reduced intake – Gastrointestinal disturbance, constipation, Colon cancer,
- Increased cholesterol - cardiac diseases.
- Carbohydrates cause an increase in blood sugar.



Diabetics should be encouraged to keep track of the amount of Carbohydrates they eat.

Fibre containing food

Soluble fiber can be found in foods such as oatbran, barley, nuts, seeds, beans, lentils, fruits (citrus, apples), strawberries and many vegetables



Soluble fiber sources



Insoluble fiber is found in foods such as whole wheat and whole grain products, vegetables, and wheat bran

Insoluble fiber sources



Nutritional Importance of Proteins

- Most abundant macromolecules.
- Linear chains of **Amino acids** linked by **Peptide bond**
- Types of Amino Acids
 - **Nonessential (10)** – Can be synthesized by body
 - **Essential (10)** – Can't be synthesized by the body



- 7-15% of Total energy intake
- 1gm/kg body weight
- Sources of Protein
 - ❖ **Animal** - Meats, Fish, dairy products
 - ❖ **Vegetable** - Beans, nuts, legumes, grains



Types

- Catalytic Protein : Enzymes-trypsin,pepsin,glucokinase
- Transport Protein :Hb,Lipoproteins
- Storage Protein : Apoferritin,Myoglobin
- Contractile Protein :Actin,myosine
- Structural protein : Collagen,keratin,cartilage.
- Regulatory protein : Harmones – Insulin,GH

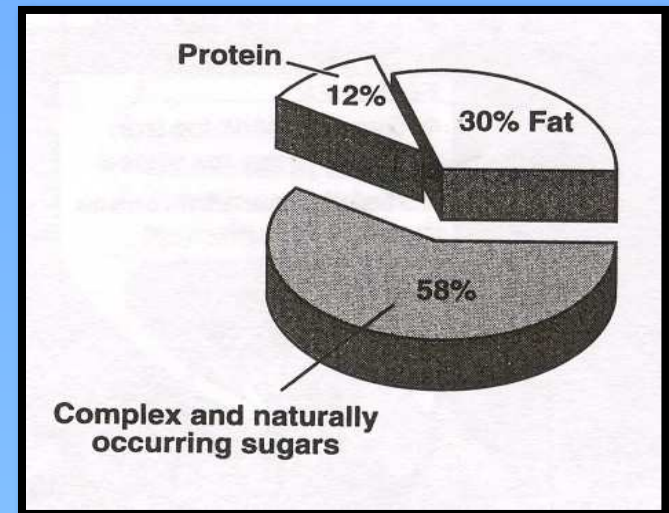
Functions

- Fundamental constituent of tissues & cells.
- Important component of blood ,muscle.
- Form Enzymes, Hormones,Neurotransmitters,Heamoglobin
- Form Immunoglobulin
- Maintenance of Osmotic pressure, blood clotting
muscle physiology
- Replacing wear & tear in tissues

Diet should contain adequate Carbohydrates & Fats to provide energy so that proteins in the diet are most economically used to fulfill other functions essential to life

Geriatric considerations for proteins

- Protein requirement increases with aging
- 1.4gm/kg body weight is optimum.
- 12% total energy intake.
- Too much protein never damages the health of the elderly person.
- Deficiency causes edema.

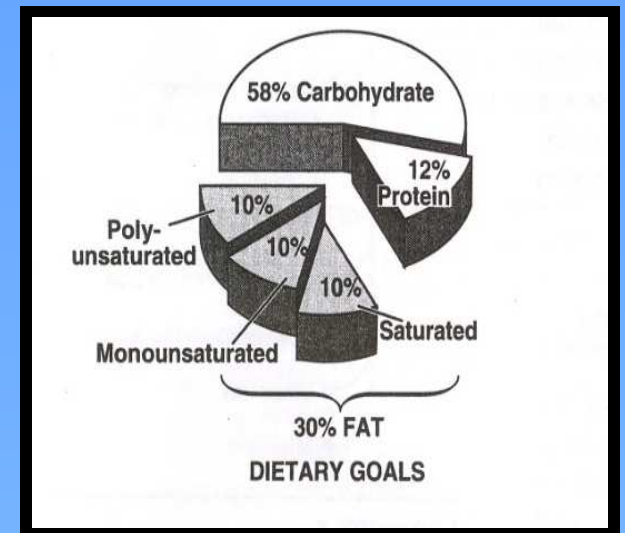


Nutritional Importance of Fats

- High energy yielding nutrients
- 35-45% of calorie intake.
- Less than 1/3 of dietary fat

should be saturated

- Provides 9Kcal/g of energy



Fats

•Types

▪ Saturated

-Animal sources : Solid at room temperature

▪ Unsaturated

-Vegetable : Liquid at room temperature

•Functions

- ✓ Vehicle for absorption of fat soluble vitamins
- ✓ Provide **essential fatty acids**,
- ✓ Dietary fat - palatability of food

- Geriatric diet: consists of 10-30% total calorie intake
- Should avoid Fried food & prefer boiled food.



Minerals

- **Macrominerals** –More than 100mg/day

Na,K,Cl,Ca,Ph,Mg,Su

- **Microminerals/Trace elements** – Less than 100mg/day

Cr,Co,Zn,Cu,Al ,Fl,Mn,Mb I (150 µgm/day and 1 teaspoon of

iodized salt. provides around 400 micrograms)

Functions: 1) Protoplasmic activity

2) Maintenance of body fluids

3) Regulation of acid base balance

4) Part of physiologically important compounds –Hb,Thyroxine

Minerals

Minerals	RDA	Function	Deficiency
Sodium	1-5gm	<ul style="list-style-type: none"> ·Regulates balance of body fluids ·Nerve function ·Acid base balance ·Blood pressure 	<ul style="list-style-type: none"> ·Headache ·Weakness, cramps ·Increased fluid retention in body
Potassium	2-5gm	<ul style="list-style-type: none"> ·Fluid n electrocyte balance ·Muscle nerve function ·Release of energy 	<ul style="list-style-type: none"> ·Muscular weakness ·Arrythmias ·Kidney n lung failure
Chloride	2-5gm	<ul style="list-style-type: none"> ·Water balance ·Osmotic regulation ·Acid base balance 	<ul style="list-style-type: none"> ·Headache ·Weakness, cramps ·Increased fluid retention in body

Calcium	800mg/day 1200mg/day (pregnant & lactating mother)	<ul style="list-style-type: none"> •Development of bone n teeth •Clotting of blood •muscle activity •nerve function 	<ul style="list-style-type: none"> •Retarded growth •Poor tooth formation •Increased clotting time •Increase in fractures
Phosphorus	800mg/day	<ul style="list-style-type: none"> •Formation of bones n teeth •Muscle activity •Acid base balance 	<ul style="list-style-type: none"> •Weakness, loss of appetite •Retarded growth •Porous bone •Poor tooth formation
Magnesium	Men-350mg/day Women -300mg/day	<ul style="list-style-type: none"> •Building bones •Nerve n muscle function •Blood clotting •Cofactor 	<ul style="list-style-type: none"> •Muscle twitching n tremors •Convulsions •Leg n foot cramps •Shaky hands

Fluoride	1-4mg	<ul style="list-style-type: none"> ·Bone n tooth formation ·Inc resistance to decay 	Inc dental caries
Zinc	15mg	<ul style="list-style-type: none"> ·Wound healing ·Tissue growth ·Reproduction 	<ul style="list-style-type: none"> ·Retarded growth ·Taste/smell alteration ·Dec immune function ·Delayed wound healing ·Slow physical /sexual maturity
Iron	<p>Adult men & postmenopausal</p> <p>women -10mg</p> <p>Premenopausal – 15-20mg</p> <p>Pregnant-30-0mg</p>	<ul style="list-style-type: none"> ·Growth ·Immune system ·Hb formation 	<ul style="list-style-type: none"> ·Loss of weight ·Gastric disturbances ·Pallor ·Anemia

Importance of minerals for geriatrics

- Minerals are of considerable importance to the aged person.
- RDA of Ca- 800mg/day
- Decreased ca absorption- Ca deficiency - bone fragility .
- They often experience a rapid and excessive ridge resorption under complete dentures which may be related to negative Ca balance; which is also one of the prime causes o OSTEOPOROSIS.
- Deficiency of Zn- Taste acuity, mental lethargy & slow wound healing.

- Thus the inclusion of Ca and PO₄ in the diet is absolutely important as the prime mineralizing substance of bone .
- Minute quantities of trace minerals are also important , which include: Cu, zn, mg, K, Na...
- Ca levels may be improved by increasing the intake of milk and milk products plus a VIT D supplement of 400-1000units/day.

Importance of vitamins

Intake should be increased for the following reasons:

1. Provide nervous stability.
2. Provide resistance to bacterial infections.
3. Improve digestive efficiency by aiding the use of carbohydrates and utilization of mineral elements.
4. The intake of vitamin A, B-complex, C and D should be increased mainly .



Vitamin A

- RDA 800-1000 μgm (1000 μgm)
- Deficiency – Bitots spots, Conjunctival & corneal xerosis, Xerosis of skin, Xerostomia, Keratosis of the mucosa & decreased taste acuity

Vitamin B Complex

Thiamine – RDA 500-1000 μgm (1-1.5mg)

Deficiency – Beriberi

Vitamin B6-RDA- 1.2-1.4mg (1.6-2mg)

50-90% of elderly are affected by deficiency

Glossitis

Vitamin B12-

RDA – 3.0 µgm

Deficiency – Fissuring and redness of eyelid corners and mouth

Vitamin C -

RDA – 60 µgm

Deficiency - spongy bleeding gums

Delayed healing of the wounds

Painful joints

Vitamin D –

RDA – 5 µgm

Frequently deficient – Bowlegs & beading of ribs

Functions of Water

- Comprises about 60% of body weight
- Total Body water – 42 ltr
 - Extacellular –14ltr
 - Intracellular – 28ltr
- Chief component of blood plasma
- Aids in temperature regulation
- Lubricates joints
- Shock absorber in eyes, spinal cord, and amniotic sac.
- Helps in excretion

	Age	(ml/kg body wt)
Infants	Birth-1	120-100
Children	0-10	60-80
Adolescents	11-18	41-55
Adults	19-51	20-30

Geriatric considerations for water

- Elderly are generally susceptible for negative water balance
- At least 30ml/kg body weight/day
- Inadequate fluid intake –Dehydration, hypotension, elevated body temperature, dryness of mucosa, decreased urine output

NUTRITION FOR NEW DENTURE WEARER

➤ DIET FOR THE FIRST DAY :

A liquid diet which may consist of fruit juices, milk, etc

➤ DIET FOR THE SECOND AND THIRD DAY :

Soft food that requires a minimum of chewing like , eggs, noodles, rice, boiled cereals, boiled vegetables etc.

➤ DIET FOR THE FOURTH AND LATER :

As the sore spots have healed firmer foods can be eaten.

Foods Recommended for Geriatrics

1) 4 servings of Vegetables & Fruits

2 servings of citrous fruits, green veg, raw cabbage

1 serving of Deep green and yellow veg & fruits

1 serving of potatoes

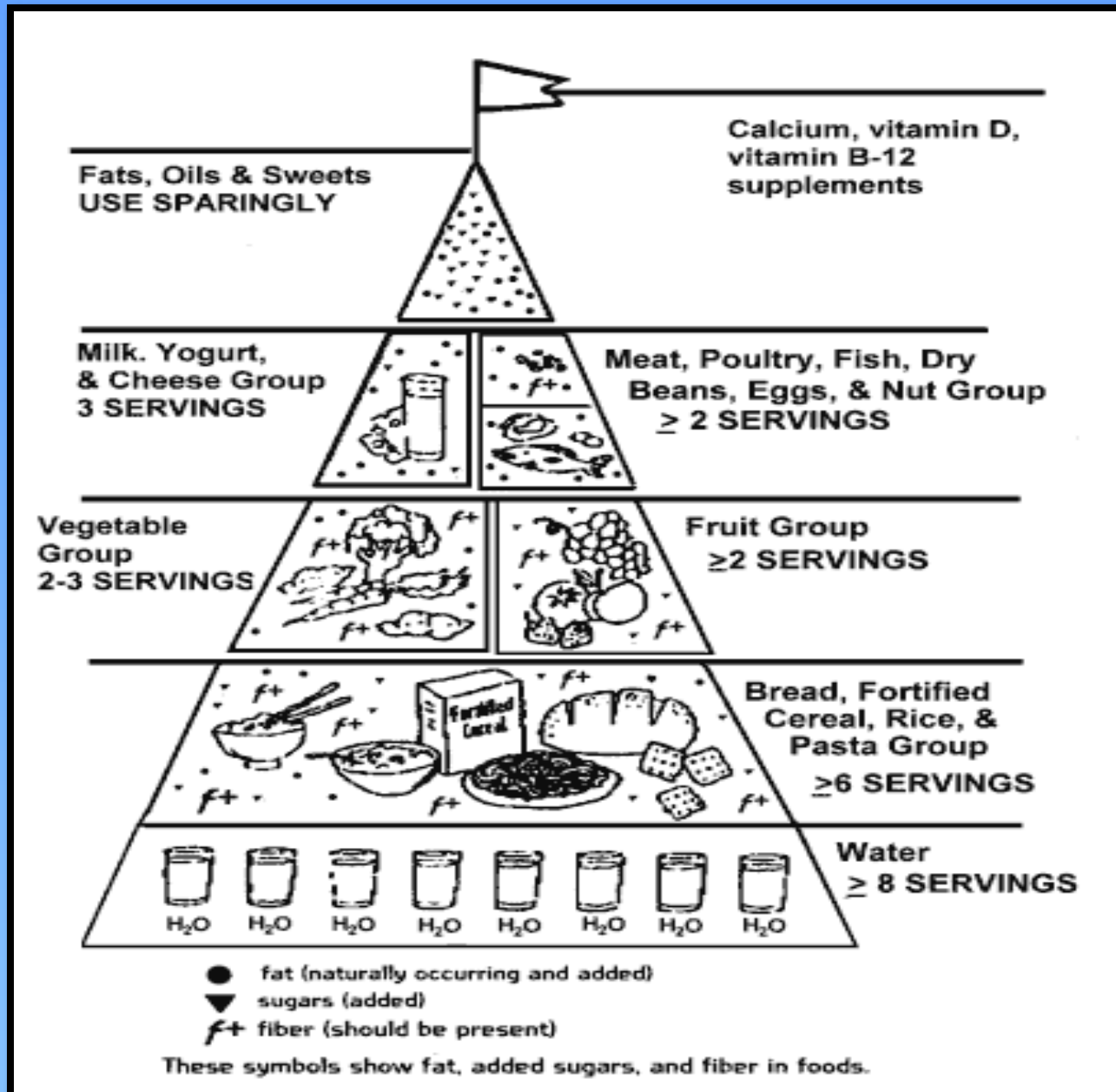
4 Servings of enriched breads, cereals, flour products

2 Servings of milk and milk based foods

2) 2 Servings of meats ,fish,poultry,egge,dried beans,peas.

3) 2-4 table spoon of unsaturated fats.

Remodeled Food Guide Pyramid for Elderly



Conclusion

One should always eat

**“Breakfast as a King, Lunch like a Rich man and
Dinner like a Poor begger ”**

With considerations to carbohydrate, protein, fat, vitamins, minerals salts and fibre in the correct proportions.

If we do not have enough energy containing foods we will feel very tired and work efficiency will be reduced.

Diet plays an important role in success of any treatment so it is very essential to have a balanced diet.

“ Eat healthy and Stay healthy”

References

1. *Text book of geriatric dentistry –Poul Holm, Pederson*
2. *Nutrition for geriatric denture patients-JIPs 2006, Vol-6, Issue-6*
3. *Text book of biochemistry-AC Deb*
4. *Text book of biochemistry –Pankaja Naik*
5. *Text book of Physiology –Choudhary*
6. *Basic physiology -Guyton*