



Centurion
UNIVERSITY

*Shaping Lives...
Empowering Communities...*

Balanced Diet

Malnutrition

Menu Planning

Nutritional Disorders



Centurion
UNIVERSITY

*Shaping Lives...
Empowering Communities...*

Introduction

- **Diet influences an individual's risk of obesity, heart disease, cancer, and other lifestyle related diseases**
- **Balanced diet is defined as one which contains the various groups of food such as energy yielding, body building and protective foods in right proportions so that an individual is assured of obtaining minimum requirements of all nutrients**
- **Nutrient requirement is defined as the minimum amount of the absorbed nutrient that is necessary for maintaining normal physiological functions of body**
- **Recommended Dietary Allowance (RDA) is defined as nutrients present in the diet which satisfies the daily requirement of all the individuals in a population**



Centurion
UNIVERSITY

*Shaping Lives...
Empowering Communities...*

Introduction

- **A balanced diet should provide around 60-70% of total calories from carbohydrates, 10-15% from proteins and 20-25% from fats**
- **Should also provide dietary fiber, antioxidants, and nutraceuticals that have positive health benefits**
- **Balanced diets at high cost – include liberal amounts of protective and protein rich foods such as milk, eggs, meat, fish, fruits and moderate levels of cereals, pulses, nuts, greens**
 - **Moderate cost – moderate amounts of protein and protective rich foods with liberal amounts of cereals and pulses, nuts**
 - **Low Cost – minimal of protein foods and liberal amounts of cereals, pulses, nuts, and green leafy vegetables**
 - **Ill Balanced Diet – deficient in calories, proteins, essential vitamins and minerals (lacking in protein rich and protective foods)**



Centurion
UNIVERSITY

*Shaping Lives...
Empowering Communities...*

Modified Foods

- **Designer food is the food that has therapeutic or prophylactic characteristics**
- **Functional foods can deliver benefits beyond that of sustenance bridging the gap between food and drugs**
 - **Functional foods delay, prevent, or treat disease (nutraceuticals, pharma foods)**
- **Energy foods provide energy – sugars and fats**
- **High complex carbohydrate foods keep blood sugar under control – hypoglycemic**
- **Fortification – addition of one or more essential nutrients to a food for preventing or correcting deficiency**



Centurion
UNIVERSITY

*Shaping Lives...
Empowering Communities...*

Modified Foods

- **Restoration – addition of essential nutrients to food which are lost during the course of Good Manufacturing Practices (GMP's) or during normal storage or handling**
- **Enrichment – restoration of vitamins and minerals lost during processing**
- **Modified foods fortified with nutrients are called functional foods – bakery products, breakfast cereals, milk fortified with vitamins and minerals, B complex, iron and calcium**



Centurion
UNIVERSITY

*Shaping Lives...
Empowering Communities...*

Menu Planning

- **Dietetics is a science that deals with the adequacy of diets during normal life cycle and modifications required during diseased conditions**
- **Menu planning is the process of planning and scheduling intake of meals for general or specific individual requirement**
- **Adequate Intake (AI) – is a nutrient recommendation based on observed or experimentally determined approximation of nutrient intake by a group of healthy people when scientific evidence is not available to give RDA**
- **Balanced diet contains different types of foods in quantities that the need for calories, proteins, minerals, vitamins and other nutrients is adequately met and a small provision is made for extra nutrients to withstand short duration of illness**



Centurion
UNIVERSITY

*Shaping Lives...
Empowering Communities...*

Principles of Planning Diets

- **Menu planning should meet nutritional requirements**
 - **Should provide adequate calories, fats, and proteins with minerals and vitamins essential for physical wellbeing**
 - **In a balanced diet the ratio of energy distribution from carbohydrates: proteins: fats should be 7:1:2**
 - **Diet should include basic five foods**
- **Meal pattern should fulfill family needs**
 - **Meal should cater to needs of different members of family**
 - **Meal pattern varies with age, occupation, life style of members**
 - **Family meal must offer children enough fat and flexibility in caloric density to meet their energy needs**



Centurion
UNIVERSITY

*Shaping Lives...
Empowering Communities...*

Principles of Planning Diets

- **Meal planning should save time and energy**
 - Recipes should be simple and nutritious
 - Labour and time saving devices can be used
 - Convenience foods can be used to save time and energy
- **Meal planning should satisfy the budget of the family**
 - Cost can be decreased by bulk purchasing and using seasonal fruits and vegetables
- **Meal plan should give maximum nutrients**
 - Loss of nutrients during processing, cooking should be minimal
 - Sprouted grains/fermented cereals enhance nutritive value
 - Pressure cooking can be used to conserve nutrients



Centurion
UNIVERSITY

*Shaping Lives...
Empowering Communities...*

Principles of Planning Diets

- **Should provide variety and meet individual preferences**
 - Should meet RDA
 - Veg/non-veg, religion, tradition, customs
 - Create variety by changing colour/texture/taste
- **Meals should give satiety**
 - Each meal should have some amount of fat, protein, fibre
 - Intervals between meals should be considered
- **Meal planning should be according to the availability of foods**
 - Should include locally available foods
 - Wide variety in dietary pattern depending on available food



Centurion
UNIVERSITY

*Shaping Lives...
Empowering Communities...*

Steps Involved in Planning a Diet

- There are three steps involved in planning a menu:
 - Know the RDA – the RDA for different age groups recommended by Nutrition Expert Committee of ICMR
 - Know the food lists – use ICMR tables and exchange lists
 - Planning menu
 - Purchasing – seasonal foods of good quality at reasonable cost
 - Preparing the food hygienically with minimum nutrient loss
 - Serving fresh and hot/cold
- Points to be considered in planning a diet:
 - Variety of foods should be used
 - Minimum RDA must be met for all nutrients
 - Energy derived from nutrients should not be more than 75%
 - Whole grain cereals, parboiled rice, malted grains have high nutritive value
 - Use two cereals in one meal



Centurion
UNIVERSITY

*Shaping Lives...
Empowering Communities...*

Points to be considered in planning a diet

- **For low calorie diet, fried foods cannot be planned:**
 - **1/3 of day's nutritional requirement should be met in lunch**
 - **Number of meals should be 4 times and for patients or children it can be more**
 - **Each meal should have all 5 food groups**
 - **Five servings of fruits and vegetables per day should be included to meet antioxidant requirement**
 - **Choose a diet low in fat, saturated fats and cholesterol**



Centurion
UNIVERSITY

*Shaping Lives...
Empowering Communities...*

Malnutrition

- **Malnutrition defined – impairment of health resulting from deficiency, excess, or imbalance of nutrients**
- **Includes both under nutrition and over nutrition**
- **Under nutrition is caused by eating too little or an unbalanced diet that does not contain all nutrients necessary for good nutritional status**
 - **Under nutrition is due to inadequate protein and micronutrients to meet basic requirements for body maintenance, growth, and development**
 - **Direct effects are occurrence of subclinical nutritional deficiency diseases**



Centurion
UNIVERSITY

*Shaping Lives...
Empowering Communities...*

Malnutrition

- **Indirect effects are high morbidity and mortality among young children, retarded physical and mental growth, lowered vitality leading to lowered productivity**
- **High rate of maternal mortality, still births, and low birth weight are all associated with under nutrition**
- **Over nutrition is defined as over consumption of nutrients and food to the point at which health is adversely affected**
- **Health hazards from over nutrition are high incidence of obesity, diabetes mellitus, hypertension, renal diseases, cardiovascular, disorders of liver and gall bladder**



Centurion
UNIVERSITY

*Shaping Lives...
Empowering Communities...*

Obesity

- **Is a condition in which the individual is overweight due to deposition of fat in the adipose tissue**
- **Factors that contribute to development of obesity:**
 - **Age – can occur at any age and incidence is high in persons leading sedentary lifestyle**
 - **More common among high income groups**
 - **Common in individuals with low physical activity**
 - **Some individuals are more prone to develop obesity**



Centurion
UNIVERSITY

*Shaping Lives...
Empowering Communities...*

Obesity

- **Assessment of Obesity:**
 - **Body weight** - a person whose body weight is higher than normal by 20% may be considered as obese
 - **Estimation of total body fat**
 - **Skin-fold measurement**
- **Complications of Obesity:**
 - **Physical disability, metabolic disorders, cardiac disorders, low life expectancy**
 - **Metabolic disorders such as diabetes, arteriosclerosis, and heart diseases, more prone to accidents**



Centurion
UNIVERSITY

*Shaping Lives...
Empowering Communities...*

Obesity

- **Treatment includes:**
 - **reduced calorie intake resulting in utilization of fat stored in the adipose tissue to meet the calorie needs**
 - **Moderate exercise will help to expend more energy and prevent increase in body weight**
 - **Consuming weight maintenance diets**
 - **Prevented by avoiding excessive and frequent eating of foods rich in calories – fried foods, nuts, sweets**



Centurion
UNIVERSITY

*Shaping Lives...
Empowering Communities...*

Food Groups

- **Have been classified into different groups depending upon the nutritive value, for convenience of planning diets**
- **'basic four' food groups suggested by ICMR can be used for planning diets**
 - **Cereals and millets: rice, wheat, bajra, ragi, maize, jowar, puffed rice (energy, protein, thiamine, iron)**
 - Pulses and legumes: chick pea, black gram, green gram, soyabeans**
- **Vegetables and fruits – green leafy, carrots, brinjal, capsicum, beans, mango, guava, tomato, papaya, orange, watermelon**
(carotenoids, vitamin C, riboflavin, folic acid, iron, fiber)



Centurion
UNIVERSITY

*Shaping Lives...
Empowering Communities...*

Food Groups by ICMR

- **Milk and animal products: milk, curd, cheese, chicken, fish, liver, egg**
- **Oils, fats and nuts – butter, ghee, cooking oil, sugar and jaggery, nuts (energy, essential fatty acids, fat soluble vitamins, iron, protein and omega fatty acids)**



Centurion
UNIVERSITY

*Shaping Lives...
Empowering Communities...*

ICMR Food Pyramid





Centurion
UNIVERSITY

*Shaping Lives...
Empowering Communities...*

Nutritional Disorders

Nutrient	Sources	Deficiency
Energy, protein	Sugar, pulses, egg, meat	Underweight – marasmus and kwashiorkar
Calcium	Milk, green leafy, gingelly seeds	Rickets, osteomalacia, tetany
Iron	Liver, green leafy, jaggery, rice flakes	anaemia
Vitamin A	Liver, egg yolk, carrots, green leafy, butter	Blindness
Vitamin D	Eggs, sunlight	Rickets, osteomalacia
Thiamine	Yeast, pulses, nuts, outer layers of cereals	Dry beri beri, infantile bery beri, pain in calf muscle
Niacin	Groundnuts, whole cereals, pulses	Dementia, diarrhea, dermatiits



Centurion
UNIVERSITY

*Shaping Lives...
Empowering Communities...*

Nutritional Disorders

Nutrient	Sources	Deficiency
Vitamin-B6	Meat, liver, vegetables, whole cereal grains	Anaemia, angular stomatitis
Folic acid	Green leafy, cluster beans	Megaloblastic anaemia
Vitamin B12	Yeast, fermented foods	Pernicious anaemia
Vitamin C	Citrus fruits, amla, guava	Bleeding of gums, scurvy