Practical Manual
of
NORMAL NUTRITION

Course No. FSN - 244
IV Semester
B.Sc. (Hons.) Community Science

Prepared By

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College of Community Science
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Parbhani - 431 402 (MS)

Practical Manual

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CERTIFICATE

Certified that this is Bonafide Record of the work done in the laboratory

*during the year*_____ *by* _____

Reg.No. _____ *in the course* ***Normal Nutrition,***

Course No. FSN - 244 during IV semester of B. Sc. (Hons.) Community Science.

Date :

Course Teacher

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Exercise No. 1 Date :

Nutrient Requirements & Recommended Dietary Allowances (RDA)

Requirements are the quantities of nutrients that healthy individuals must obtain from food to meet their physiological needs. The recommended dietary allowances (RDAs) are estimates of nutrients to be consumed daily to ensure the requirements of all individuals in a given population. The recommended level depends upon the bioavailability of nutrients from a given diet. The term bioavailability indicates what is absorbed and utilized by the body. In addition, RDA include a margin of safety, to cover variation between individuals, dietary traditions and practices. The recommended dietary allowances are suggested for physiological groups such as infants, pre-schoolers, adolescents, pregnant women and lactating mothers, adult males and females, taking in to account their physical activity. In fact, RDA are suggested averages/day. However, in practice, fluctuation in intake may occur depending on the food availability and demands of the body. But, the average requirement need to be satisfied over a period of time. The diet that one consumes must provide adequate calories, proteins and micronutrients to achieve maximum growth potential. Therefore may be situations where adequate amounts of nutrients may not be available through diet alone. In such high risk situations where specific nutrients may not be available through diet alone. In such high risk situations where specific nutrients are lacking, fortified food, such as iodized salt, is necessary.

Recommended Dietary Allowances (RDA) for energy, protein, fat and minerals for Indians

Group	Category/Age	Body Weight (kg)	Net Energy (Kcal/d)	Protein (g)	Visible Fat (g/d)	Calcium (mg/d)	Iron (mg/d)	Zinc (mg/d)	Magnesium (mg/d)
Men	Sedentary Work								
	Moderate Work								
	Heavy Work								
Women	Sedentary Work								
	Moderate Work								
	Heavy Work								
	Pregnant								
	Lactating 0-6 m								
	6-12 m								
Infants	0-6 Months								
	6-12 Months								
Children	1-3 year								
	4-6 year								
	7-9 year								
Boys	10-12 year								
Girls	10-12 year								
Boys	13-15 year								
Girls	13-15 year								
Boys	16-17 year								
Girls	16-17 year								

Recommended Dietary Allowances (RDA) for water soluble and fat soluble vitamins for Indians

Group	Category/Age	Body Weight (kg)	Vitamin A (µg)		Thiamine (mg/d)	Riboflavin (mg/d)	Niacin equivalent (mg/d)	Vitamin B_6 (mg/d)	Ascorbic Acid (mg/d)	Dietary Folate (mg/d)	Vitamin B_{12} (mg/d)
			Retinol	ß-carotene							
Men	Sedentary Work										
	Moderate Work										
	Heavy Work										
Women	Sedentary Work										
	Moderate Work										
	Heavy Work										
	Pregnant										
	Lactating 0-6 m										
	6-12 m										
Infants	0-6 Months										
	6-12 Months										
Children	1-3 year										
	4-6 year										
	7-9 year										
Boys	10-12 year										
Girls	10-12 year										
Boys	13-15 year										
Girls	13-15 year										
Boys	16-17 year										
Girls	16-17 year										

Exercise No. 2 Date :

Planning of diet for Infancy

From birth to 1 year of age, a child is called as an infant. Infancy is the most rapid period of growth. The foundation of further health is laid down during the first year of life. Proper feeding of infants is necessary to ensure normal growth & development. This is a period in which the capacity of the stomach of the infant & the ability to digest various food components changes rapidly. After the first six months, there is not only a decrease in the volume of her milk secretion, but there is, at the same time, an increase in the baby's nutritional needs. Therefore introduction of food supplements along with breast-feeding is necessary to infants by 4-6 months of age.

Diet plan for an infant (Weaning foods / supplementary foods)

Time	Feedings	Menu	Servings	Ingredients	Amount (g/ml)

Diet plan for an infant (Weaning foods / supplementary foods)

Time	Feedings	Menu	Servings	Ingredients	Amount (g/ml)

Nutritive value of diet planned for an Infant

Ingredients	Amount (g/ml)	Energy (kcal)	Protein (gm)	Fat (gm)	Fibre (g)	Calcium (mg)	Iron (mg)

Nutritive value of diet planned for an Infant

Ingredients	Amount (g/ml)	ß-carotene (µg)	Retinol (µg)	Thiamine (mg)	Riboflavin (mg)	Niacin (mg)	Folic acid (µg)	Vit.C (mg)	Vit. B_{12} (µg)

Exercise No. 3 Date :

Planning of Diet For Preschool Child

Children between 1-6 years of age are called preschool children. They are extremely vulnerable. They succumb readily to malnutrition where the diet is poor in quantity & quality & infectious disease & infections are widespread. The rate of growth & development of children depend largely on the adequacy of the diet consumed by them. Recommended allowances for calories protein, vitamin A, B & C gradually increase throughout the preschool period. Include all the basic food groups in the diet of preschool child. Supplementary foods are very essential for preschool children. A daily supplement of about 30 g processed pulses or roasted groundnuts or processed protein foods based on blends of cereals, oilseeds & legumes such as *Paushtic laddu* etc will help to prevent malnutrition and facilitate proper growth and development among preschool children.

Diet plan for a Preschool Child

Time	Feedings	Menu	Servings	Ingredients	Amount (g/ml)

Diet plan for a Preschool Child

Time	Feedings	Menu	Servings	Ingredients	Amount (g/ml)

Diet plan for a Preschool Child

Time	Feedings	Menu	Servings	Ingredients	Amount (g/ml)

Nutritive value of diet planned

Ingredients	Amount (g/ml)	Energy (Kcal)	Protein (gm)	Fat (gm)	Fibre (g)	Calcium (mg)	Iron (mg)
1	2	3	4	5	6	7	8

for a preschool child

ß-carotene (µg)	Retinol (µg)	Thiamin (mg)	Riboflavin (mg)	Niacin (mg)	Folic acid (µg)	Vit. C (mg)	Vit.B_{12} (µg)
9	10	11	12	13	14	15	16

Nutritive value of diet planned

Ingredients	Amount (g/ml)	Energy (Kcal)	Protein (gm)	Fat (gm)	Fibre (g)	Calcium (mg)	Iron (mg)
1	2	3	4	5	6	7	8

for a preschool child

ß-carotene (µg)	Retinol (µg)	Thiamin (mg)	Riboflavin (mg)	Niacin (mg)	Folic acid (µg)	Vit. C (mg)	Vit.B_{12} (µg)
9	10	11	12	13	14	15	16

Exercise No. 4

Date :

Planning of Diet For School Going Child

Many surveys on the nutritional status have shown that a majority of the school children consume inadequate diets & are malnourished. The nutritional needs of the children of school age should not be over looked. At this stage, meal should carry sufficient amounts of protein, minerals & vitamins. The food needs are increased in keeping with the child's growth rate & activity. The amount of milk given to children should be greater than that for the adult. No food needs to be forbidden to this age group. Include foods from all food groups. But it is extremely important that high CHO & high fat foods not be allowed to replace essential items of the diet. Don't give candy, paper mints, soft drinks, ice fruits. These foods reduce or dull the appetite without meeting the body's need. Allow about an hour between breakfast & school time for the child to get ready. The lunch time should be mid-way between breakfast & dinner. Some children need mid-morning as well as mid afternoon snacks.

Diet plan for a Preschool Going Child

Time	Feedings	Menu	Servings	Ingredients	Amount (g/ml)

Diet plan for a Preschool Going Child

Time	Feedings	Menu	Servings	Ingredients	Amount (g/ml)

Nutritive value of diet planned

Ingredients	Amount (g/ml)	Energy (Kcal)	Protein (gm)	Fat (gm)	Fibre (g)	Calcium (mg)	Iron (mg)
1	2	3	4	5	6	7	8

for a school going child

ß-carotene (µg)	Retinol (µg)	Thiamin (mg)	Riboflavin (mg)	Niacin (mg)	Folic acid (µg)	Vit. C (mg)	Vit.B_{12} (µg)
9	10	11	12	13	14	15	16

Nutritive value of diet planned

Ingredients	Amount (g/ml)	Energy (Kcal)	Protein (gm)	Fat (gm)	Fibre (g)	Calcium (mg)	Iron (mg)
1	2	3	4	5	6	7	8

for a school going child

ß-carotene (µg)	Retinol (µg)	Thiamin (mg)	Riboflavin (mg)	Niacin (mg)	Folic acid (µg)	Vit. C (mg)	Vit. B_{12} (µg)
9	10	11	12	13	14	15	16

Exercise No. 5

Date :

Planning of Diet For an Adolescent

Adolescence is a stage of rapid growth & intense activity. Individual variation is also great in this age group. A number of physical, emotional & mental changes occur in this period. The need for all nutrients is increased at adolescence. Therefore it is important to plan to supply sufficient amounts of protein, vitamins, and minerals in each meal. The increased needs of this period can be met if increased amounts of foods from basic food groups are included in the diet. As age increases, there is expansion in blood volume, so there is need of increased iron. They should get good quality & quantity food. Leafy vegetables should be included in their diet, as it helps to regenerate bloods cells. Include dals, dried fruits, and vegitables, egg, liver, & if acceptable may also be used. Boys require more energy so it should be supplied through diet.

Diet plan for an adolescent

Time	Feedings	Menu	Servings	Ingredients	Amount (g/ml)

Diet plan for an adolescent

Time	Feedings	Menu	Servings	Ingredients	Amount (g/ml)

Nutritive value of diet planned

Ingredients	Amount (g/ml)	Energy (Kcal)	Protein (gm)	Fat (gm)	Fibre (g)	Calcium (mg)	Iron (mg)
1	2	3	4	5	6	7	8

For an adolescent

ß-carotene (µg)	Retinol (µg)	Thiamin (mg)	Riboflavin (mg)	Niacin (mg)	Folic acid (µg)	Vit. C (mg)	Vit.B_{12} (µg)
9	10	11	12	13	14	15	16

Nutritive value of diet planned

Ingredients	Amount (g/ml)	Energy (Kcal)	Protein (gm)	Fat (gm)	Fibre (g)	Calcium (mg)	Iron (mg)
1	2	3	4	5	6	7	8

For an adolescent

ß-carotene (µg)	Retinol (µg)	Thiamin (mg)	Riboflavin (mg)	Niacin (mg)	Folic acid (µg)	Vit. C (mg)	Vit.B_{12} (µg)
9	10	11	12	13	14	15	16

Exercise No. 6 Date :

Planning of Diet For an Adult Man and Woman

Adulthood represents the steady state in life, when a person would have completed his/her growth in terms of body size. The nutritional needs are for maintenance of body functions. The energy needs in adulthood are mainly to sustain body functions & activity. The protein requirement is to make wear & tear & the losses which occur as a result of normal life processes. Adulthood also represents the productive stage of life. Therefore it is important that the nutritional needs of an adult should be met adequately so as to keep up vitality & a positive attitude in life, which are essential for optimum productivity. The amount of foods included from the various groups will depend on the body size & activity of the individual. Sedentary working (SW) person will reuire less nutrients than moderote working (MW) and having working (HW) person. MW person will require nuterients less than HW person and more than SW person. HW person will require more nutrients than SW and MW person.

Diet Plan for Sedentary Working Adult Man and Woman

Time	Feedings	Menu	Servings	Ingredients	Amount (g/ml)

Diet plan for sedentary working adult man and woman

Time	Feedings	Menu	Servings	Ingredients	Amount (g/ml)

Nutritive value of diet planned

Ingredients	Amount (g/ml)	Energy (Kcal)	Protein (gm)	Fat (gm)	Fibre (g)	Calcium (mg)	Iron (mg)
1	2	3	4	5	6	7	8

for sedentary working an adult man and woman

ß-carotene (µg)	Retinol (µg)	Thiamin (mg)	Riboflavin (mg)	Niacin (mg)	Folic acid (µg)	Vit. C (mg)	Vit.B_{12} (µg)
9	10	11	12	13	14	15	16

Ingredients	Amount (g/ml)	Energy (Kcal)	Protein (gm)	Fat (gm)	Fibre (g)	Calcium (mg)	Iron (mg)
1	2	3	4	5	6	7	8

for sedentary working an adult man and woman

ß-carotene (μg)	Retinol (μg)	Thiamin (mg)	Riboflavin (mg)	Niacin (mg)	Folic acid (μg)	Vit. C (mg)	Vit.B_{12} (μg)
9	10	11	12	13	14	15	16

Exercise No. 7

Date :

Diet Plan for Moderate Working Adult Man & Woman

Time	Feedings	Menu	Servings	Ingredients	Amount (g/ml)

Diet plan For Moderate Working Adult Man & Woman

Time	Feedings	Menu	Servings	Ingredients	Amount (g/ml)

Nutritive value of diet planned

Ingredients	Amount (g/ml)	Energy (Kcal)	Protein (gm)	Fat (gm)	Fibre (g)	Calcium (mg)	Iron (mg)
1	2	3	4	5	6	7	8

for moderate working adult man & woman

ß-carotene (µg)	Retinol (µg)	Thiamin (mg)	Riboflavin (mg)	Niacin (mg)	Folic acid (µg)	Vit. C (mg)	Vit.B_{12} (µg)
9	10	11	12	13	14	15	16

Nutritive value of diet planned

Ingredients	Amount (g/ml)	Energy (Kcal)	Protein (gm)	Fat (gm)	Fibre (g)	Calcium (mg)	Iron (mg)
1	2	3	4	5	6	7	8

for moderate working adult man & woman

ß-carotene (μg)	Retinol (μg)	Thiamin (mg)	Riboflavin (mg)	Niacin (mg)	Folic acid (μg)	Vit. C (mg)	Vit.B_{12} (μg)
9	10	11	12	13	14	15	16

Exercise No. 8 Date :

Diet Plan For Heavy Working Adult Man & Woman

Time	Feedings	Menu	Servings	Ingredients	Amount (g/ml)

Diet plan For Heavy Working Adult Man & Woman

Time	Feedings	Menu	Servings	Ingredients	Amount (g/ml)

Nutritive value of diet planned

Ingredients	Amount (g/ml)	Energy (Kcal)	Protein (gm)	Fat (gm)	Fibre (g)	Calcium (mg)	Iron (mg)
1	2	3	4	5	6	7	8

for heavy working adult man & woman

ß-carotene (µg)	Retinol (µg)	Thiamin (mg)	Riboflavin (mg)	Niacin (mg)	Folic acid (µg)	Vit. C (mg)	Vit.B_{12} (µg)
9	10	11	12	13	14	15	16

Nutritive value of diet planned

Ingredients	Amount (g/ml)	Energy (Kcal)	Protein (gm)	Fat (gm)	Fibre (g)	Calcium (mg)	Iron (mg)
1	2	3	4	5	6	7	8

for heavy working adult man & woman

ß-carotene (µg)	Retinol (µg)	Thiamin (mg)	Riboflavin (mg)	Niacin (mg)	Folic acid (µg)	Vit. C (mg)	$Vit.B_{12}$ (µg)
9	10	11	12	13	14	15	16

Exercise No. 9 Date :

Planning of Diet For a Pregnant Woman

Pregnancy is a stage of life when a woman's needs are increased. She has the responsibilities of supporting the growth of the foetus internally during the nine month of pregnancy & later externally by nursing the infant. Foetal development is accompanied by extensive changes in maternal body composition & metabolism. Thus the need for all nutrients involved in tissue synthesis is increased during pregnancy. The requirement during last 3 months of pregnancy is very high because foetus growth rate is very high. BMR increases during pregnancy. The anabolic activity may be increased. Hence, increased need of nutrients should be met.

Diet Plan For a Pregnant Woman

Time	Feedings	Menu	Servings	Ingredients	Amount (g/ml)

Diet plan For a Pregnant Woman

Time	Feedings	Menu	Servings	Ingredients	Amount (g/ml)

Nutritive value of diet planned

Ingredients	Amount (g/ml)	Energy (Kcal)	Protein (gm)	Fat (gm)	Fibre (g)	Calcium (mg)	Iron (mg)
1	2	3	4	5	6	7	8

For a Pregnant Woman

ß-carotene (µg)	Retinol (µg)	Thiamin (mg)	Riboflavin (mg)	Niacin (mg)	Folic acid (µg)	Vit. C (mg)	Vit.B_{12} (µg)
9	10	11	12	13	14	15	16

Nutritive value of diet planned

Ingredients	Amount (g/ml)	Energy (Kcal)	Protein (gm)	Fat (gm)	Fibre (g)	Calcium (mg)	Iron (mg)
1	2	3	4	5	6	7	8

For a Pregnant Woman

ß-carotene (µg)	Retinol (µg)	Thiamin (mg)	Riboflavin (mg)	Niacin (mg)	Folic acid (µg)	Vit. C (mg)	Vit.B_{12} (µg)
9	10	11	12	13	14	15	16

Exercise No. 10 Date :

Planning of Diet For a Lactating Woman

Lactation makes considerable nutritional demands on the mother. The mother's diet & state of nutrition are likely to affect the composition & output of milk. It is recommended that the diet of a nursing mother should supply 500-600 calories in addition to her normal needs. This helps her to meet the demand of extra energy. The need for protein, minerals such as calcium, phosphorus, iron & iodine & vitamins as A, D, B complex & C is increased during lactation. Intake of high quality protein helps in improved secretion of milk. The lactating mother will need extra amounts of all the nutrients. To provide this increased amount of nutrients, the amount of cereals, pulses, milk, fat, vegetables, and fruits are increased. Weight gain beyond desirable should be avoided. When the baby is weaned, the mother must reduce her food intake in order to avoid obesity.

Diet Plan For a Lactating Woman

Time	Feedings	Menu	Servings	Ingredients	Amount (g/ml)

Diet plan For a Lactating Woman

Time	Feedings	Menu	Servings	Ingredients	Amount (g/ml)

Nutritive value of diet planned

Ingredients	Amount (g/ml)	Energy (Kcal)	Protein (gm)	Fat (gm)	Fibre (g)	Calcium (mg)	Iron (mg)
1	2	3	4	5	6	7	8

for a lactating woman

ß-carotene (µg)	Retinol (µg)	Thiamin (mg)	Riboflavin (mg)	Niacin (mg)	Folic acid (µg)	Vit. C (mg)	Vit.B_{12} (µg)
9	10	11	12	13	14	15	16

Nutritive value of diet planned

Ingredients	Amount (g/ml)	Energy (Kcal)	Protein (gm)	Fat (gm)	Fibre (g)	Calcium (mg)	Iron (mg)
1	2	3	4	5	6	7	8

for a lactating woman

ß-carotene (µg)	Retinol (µg)	Thiamin (mg)	Riboflavin (mg)	Niacin (mg)	Folic acid (µg)	Vit. C (mg)	Vit.B_{12} (µg)
9	10	11	12	13	14	15	16

Exercise No. 11 Date :

Planning of Diet For an Old Person

Aging process brings about physiological, psychological & immunological changes which influence the nutritional requirements. The senses of taste & smell are less acute in later life, thus interfering with the appetite for many foods. Less saliva secreted & the swallowing of food is sometimes difficult. The loss of natural teeth makes it difficult to chew food properly or to eat with comfort. Digestion is affected in number of ways. The tone of the muscles of stomach, small intestine & colon is reduced which leads to less motility & thereby results into constipation. Basal metabolism & physical activity is reduced, hence the calorie requirements are about 25% less than those of normal individuals doing light work. Calcium & iron deficiencies occur frequently as absorption of these nutrients is less. Serve colorful foods attractively on a tray. Serve 4 or 5 light meals instead of 3 heavier meals. Include essential foods first. Serve heaviest meal at noon rather than at night if sleeping is difficult. Avoid tea or coffee late in the day.

Diet plan For an Old Man

Time	Feedings	Menu	Servings	Ingredients	Amount (g/ml)

Diet plan For an Old Man

Time	Feedings	Menu	Servings	Ingredients	Amount (g/ml)

Nutritive value of diet planned

Ingredients	Amount (g/ml)	Energy (Kcal)	Protein (gm)	Fat (gm)	Fibre (g)	Calcium (mg)	Iron (mg)
1	2	3	4	5	6	7	8

for an old man

ß-carotene (μg)	Retinol (μg)	Thiamin (mg)	Riboflavin (mg)	Niacin (mg)	Folic acid (μg)	Vit. C (mg)	Vit.B_{12} (μg)
9	10	11	12	13	14	15	16

Nutritive value of diet planned

Ingredients	Amount (g/ml)	Energy (Kcal)	Protein (gm)	Fat (gm)	Fibre (g)	Calcium (mg)	Iron (mg)
1	2	3	4	5	6	7	8

for an old man

ß-carotene (µg)	Retinol (µg)	Thiamin (mg)	Riboflavin (mg)	Niacin (mg)	Folic acid (µg)	Vit. C (mg)	Vit.B_{12} (µg)
9	10	11	12	13	14	15	16

Exercise No. 12 Date :

Diet Plan For an Old Woman

Time	Feedings	Menu	Servings	Ingredients	Amount (g/ml)

Diet plan For An Old Woman

Time	Feedings	Menu	Servings	Ingredients	Amount (g/ml)

Nutritive value of diet planned

Ingredients	Amount (g/ml)	Energy (Kcal)	Protein (gm)	Fat (gm)	Fibre (g)	Calcium (mg)	Iron (mg)
1	2	3	4	5	6	7	8

for An old women

ß-carotene (µg)	Retinol (µg)	Thiamin (mg)	Riboflavin (mg)	Niacin (mg)	Folic acid (µg)	Vit. C (mg)	Vit.B_{12} (µg)
9	10	11	12	13	14	15	16

Nutritive value of diet planned

Ingredients	Amount (g/ml)	Energy (Kcal)	Protein (gm)	Fat (gm)	Fibre (g)	Calcium (mg)	Iron (mg)
1	2	3	4	5	6	7	8

for an old women

ß-carotene (µg)	Retinol (µg)	Thiamin (mg)	Riboflavin (mg)	Niacin (mg)	Folic acid (µg)	Vit. C (mg)	Vit.B_{12} (µg)
9	10	11	12	13	14	15	16

Exercise No. 13 Date :

Planning of Diet For Special Occasions

Tradition and culture dictate that every occasion be marked by festivity, whether it is the birthday of a child or adult person; anniversaries; festivals; birthday of a god or goddess, the birth of a child in the family, naming ceremony; to seek the Lord's blessings for prosperity in general or only celebration. Even in bereavement it is tradition not to let sympathizers go unfed, irrespective of their numbers. People thus find several occasions to get together in large numbers to express their feelings and satisfy their emotional and social needs. The special occasions and situations require special skills and knowledge to plan meals. There are symbolic recipes or meals according to occasion. There are specific meals to be planned for specific occasions.

1. Meal planning for a festival
2. Meal planning for a Birth day party : 1. Child 2. Adult

Planning of Diet For Special Occasions

Time	Feedings	Menu	Servings	Ingredients	Amount (g/ml)

Planning of Diet For Special Occasions

Time	Feedings	Menu	Servings	Ingredients	Amount (g/ml)

Planning of Diet For Special Occasions

Time	Feedings	Menu	Servings	Ingredients	Amount (g/ml)