
Maternal Nutrition

INTRODUCTION

The term “maternal nutrition” focuses attention on women as mothers, on their nutritional status as it relates to bearing and nurturing of children.

Maternal nutrition comprises anthropometric factors such as pre-pregnancy weight for height and gestational weight gain, as well as intake of protein and micronutrient.

So nutrition at optimal levels is fundamental in the maintenance of positive health, and maternal nutrition is very important for the course and outcome of pregnancy.

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Lactation represents a stage where health and nutritional status of the infant are dependent on the mother, so successful pregnancy and lactation require adjustments in the maternal body composition, metabolism and function of various physiological changes.

The major changes occur during pregnancy period are:

1. Physiological changes
2. Gastrointestinal changes
3. Changes in body fluid

PHYSIOLOGICAL CHANGES IN PREGNANCY

Maternal physiological changes in pregnancy are the normal adaptations that a women undergoes during pregnancy to better accommodate the fetus. And these changes include:

A- **Increased basal metabolic rate (BMR)** : fetal growth and development increases the BMR by 5% during 1st trimester and about 15% during 2nd and 3rd trimester. This increase the total energy requirement of the mother

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B- **Changes in the body fluid** : mother's blood volume increases so as to carry the appropriate amount of nutrients to the fetus and metabolic wastes away from the fetus. Increase blood volume will decrease the concentration ratio of the plasma protein, hemoglobin, and other blood constituents.

C- **Gastrointestinal changes** : Alteration in GIT functions include nausea, vomiting, constipation and fluid retention. In later trimester, the absorption of Vit B12, iron and calcium increases in order to meet the increased needs of mother and fetus.

NUTRITIONAL REQUIREMENT DURING PREGNANCY

Nutrients need increases during pregnancy, so a pregnant women is advised to increase her energy intake by 300kcal/day.

The total energy requirement during pregnancy are as follows :

Group	Energy requirement (Kcal/day)
Sedentary lifestyle	1875 + 300 = 2175
Low-moderate worker	2225 + 300 = 2525
Heavy worker	2925 + 300 = 3225

NUTRITIONAL REQUIREMENT DURING PREGNANCY

Protein : is the primary need during pregnancy.

Additional 15 g of protein is required for enlargement of maternal tissues, growth of placenta and fetus, and preparation for labor and lactation.

RDA for protein is 0.75-1g/kg/day

Fibers : it is important for prenatal diet. Pregnant women needs 28 g/day

NUTRITIONAL REQUIREMENT DURING PREGNANCY

Lipid and fats : the mother must include enough fat in her diet to meet the needs of her growing baby

So Recommended Dietary Allowance (RDA) for the fat intake during pregnancy is 20-35% of total calories.

Essential fatty acids (EFAs) : the EFAs are linoleic acid (omega-6) and linolenic acid (omega-3) are necessary for optimal formation of the brain and eyes.

RDA : Omega-6 (13 g/day) and Omega-3 (1.4 g/day)

NUTRITIONAL REQUIREMENT DURING PREGNANCY

Carbohydrate : dietary carbohydrate is broken down to form glucose which is known also as blood sugar.

RDA for carbohydrate during pregnancy is 175g/day

Calcium : is important for fetal bone and teeth development and growth and also helps in muscle contraction and blood clotting

RDA during pregnancy is 1g/day

NUTRITIONAL REQUIREMENT DURING PREGNANCY

Iron : aids in fetal growth and increase RBC production in mothers
RDA is 27 mg/day

Iron should be prevented in 1st trimester because og GI upset effect

Folic acid : needed for maternal blood formation and prevents fetal neural tube defects and improves birth weight.

RDA is 400 micro gram per day in preconception and early pregnancy. While for women with previous child born with neural tube defect, she must administer 800 microgram per day

NUTRITIONAL REQUIREMENT DURING PREGNANCY

Vitamins and other minerals :

RDA for each one is :-

Vit A : 800 microgram per day

Vit D : 5 microgram per day

Vit E : 7 mg/day

Vit K : 60 microgram per day

Vit C : 60 mg/day

NUTRITIONAL REQUIREMENT DURING PREGNANCY

RDA for **B Vitamins** are :-

Vit B1 : 1.4 mg/day

Vit B2 : 1.6 mg/day

Vit B3 : 18 mg/day

Vit B5 : 5 mg/day

Vit B6 : 1.9 mg/day

Vit B12 : 2.6 micro gram per day

Sodium and potassium : RDA for both are 460-920 mg/day and 2800 mg/day respectively

NUTRITIONAL REQUIREMENT DURING PREGNANCY

Magnesium : protects against fetal growth retardation and cerebral palsy.

RDA is 360 mg/day

Zinc : deficiency in zinc result in neural tube defect, premature delivery and low birth weight.

RDA is 11 mg/day

Water : intake of water is increased during pregnancy

About 3 liters is required daily

NUTRITIONAL REQUIREMENT DURING PREGNANCY

Nutrients requirement

Nutrient	Non-pregnant	pregnant	increase
Energy (kcal	2100	2400	300
Protein (g)	44	74	30
Retinol (µg)	800	1000	200
Vitamin D (µg)	7.5	12.5	5
Vitamin E (mg)	8	10	2
Vitamin C (mg)	60	80	20
Riboflavin (mg)	1.3	1.6	0.3
Nicotinic acid mg)	14	16	2
Vitamin B6 (mg)	2	2.6	0.6
Folic acid (µg)	400	800	400
Thiamin (mg)	1.1	1.5	0.4
Calcium (mg)	800	1200	400
Iron (mg)	18	-(S)	-(S)
Zinc (mg)	15	20	5

IMPORTANCE OF GOOD NUTRITION DURING PREGNANCY

A well nourished mother will give birth to a healthy child. Maternal diet during pregnancy has a direct influence on fetal growth, size and health of the newborn.

Poor nutrition during pregnancy increases the risk for complications such as prolonged labor and even death.

Inadequate diet during pregnancy affects the health of the baby during early infancy. If the infants survive, they develop nutritional disease like anemia, rickets etc. and also may suffer infectious diseases due to lack of good immunity.

INCREMENT OF NUTRITION DURING PREGNANCY

1. To develop maternal organs such as uterus, placenta, and breast tissues.
2. To build up body reserves to be utilized at the time of delivery and lactation]
3. First trimester : during 1st trimester, there is no significant increase in the size of the fetus, thus only quantitative improvement in nutrients intake is required during this time.
4. 2nd and 3rd trimester : an increased nutrient intake is suggested in 2nd and 3rd trimester and pregnancy, thus need for almost all the nutrient is increased during pregnancy (quantitative and qualitative)

EFFECT OF MATERNAL MALNUTRITION ON FETAL OUTCOME

The possible harmful effect observed is a deficit in brain growth associated with maternal malnutrition.

It has also been observe that the lower the birth weight of term infants the greater deficit in mental and other systems capacity.

In general, birth weight is a reflection of intrauterine growth.

SUPPLEMENTATION

Iron and folic acid are the major supplement during pregnancy.

Iron during pregnancy is essential for fetal growth. Having anemia can cause a baby to be born too small or too early. One should start taking a low dose of iron supplement when became first prenatal appointment.

Folic acid during pregnancy is important to prevent birth defects known as neural tube defect including spina bifida.


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