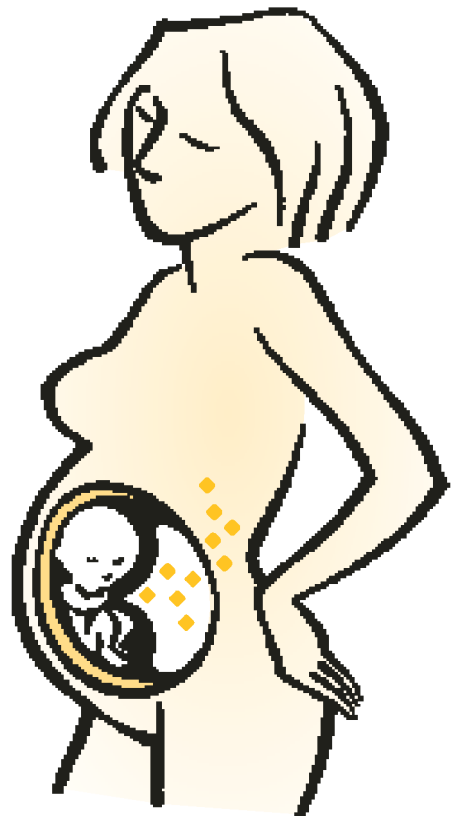


NUTRITION

Nutrient Recommendations during Pregnancy


To increase the chances of having a healthy baby, a woman needs to be in good health and well nourished **prior to and throughout** her pregnancy. Maternal nutritional status at the time of conception and during pregnancy can affect the newborn's birthweight, the risk of neural tube defects, and possibly the offspring's ability to respond to stress factors during adulthood. In this regard, recent research has focused on adult chronic disease associated with alterations in fetal organ development due to maternal nutrient deficit. Not only is good nutrition needed for a healthy baby but also to offer the offspring the best chance for a healthy and long life.

Both the amount of nutrient intake and its time of ingestion are extremely important in assuring a normal pattern of fetal growth. Nutrients such as zinc, folate, vitamin B12, and protein are critical during the first three months of pregnancy. In fact, adequate maternal folate and essential fatty acids stores are now known to be necessary at the time of conception, a time of rapid cell division. During the second and third trimesters, fetal growth parallels increases in maternal blood volume, putting extra stress on the mother to maintain an adequate nutrient and energy intake. Calories, protein, iron,



calcium, magnesium, B vitamins and essential fatty acids are in greater demand during this later stage of pregnancy.

Low birthweight infants are often born to undernourished mothers. Historically, the incidence of spontaneous abortions, stillbirths, neonatal death and congenital malformations has increased during times of famine. Surviving infants had significantly lower birth weights and lengths. As living conditions and access to nutrition improved, mean birth weights rose.

Low birthweight appears to be related to chronic illness later in life. Adult diseases such as cardiovascular disease, obesity, diabetes, leukemia and metabolic syndrome, have been linked to poor maternal diet. 

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Macronutrient Considerations during Pregnancy:

Protein: No longer is the requirement for protein based on maternal age. Adolescents are assumed to have similar protein needs during the second and third trimesters as adult women. The Recommended Daily Allowance for protein increases 25 grams per day during pregnancy which brings the recommendation during pregnancy to 70-75 grams daily. Of greatest concern are women who follow a vegan diet or are unable to afford the price of meat, fish or poultry. Both groups can meet their protein needs by balancing inexpensive protein sources such as beans and grains to supply their increased needs. Those who consume dairy and eggs can easily meet their protein needs inexpensively by increasing their milk and egg intake.

Fat: If calorie, protein and micronutrient intake is adequate, an intake of 30% of calories from fat appears to be acceptable. The recommended adequate intake (AI) for pregnant women, established in 2002, was set at 13 grams per day of omega-6 fatty acid and 1.3 grams of omega-3 fatty acid per day. Women should be encouraged to eat fish and seafood several times per week and use omega-3 fatty acid rich canola oil or flaxseed oil to insure adequate fatty acid intake.

Fiber: The recommendation for fiber intake remains the same as that for nonpregnant women, 28 grams total fiber per day. Fluid needs may increase during pregnancy especially when fiber intake is increased.

Carbohydrates: The RDA for carbohydrate during pregnancy is 175 grams per day, which accounts for both maternal and fetal glucose needs. Intake of complex carbohydrates such as whole grains, fruit and vegetables is preferred.

Vitamins and Minerals:

Recommendations are as follows: (See chart pg. 3)

Calories: Caloric needs parallel increased fetal growth during the second and third trimesters. The Dietary Reference Intake (DRI) for calories for pregnant women changed with the 2002 Institute of Medicine report. The new recommendations suggest no additional calories are needed during the first trimester, an additional 340 calories are needed during the second trimester and 452 calories are recommended in the last trimester for each age group.


Choline: An essential nutrient found to play a role in memory function, fetal brain development, and prevention of heart disease,

fatty liver and neural tube defects. An intake of 450 mg is recommended for pregnant women. Beef liver and eggs are considered excellent sources of choline.

Folate: To prevent neural tube defects, women of childbearing years and pregnant women should consume 400 mcg per day of synthetic folic acid from fortified foods (cereals and other grains), supplements or both, in addition to consuming folate from foods in a varied diet. To ensure that blood vitamin levels are adequate at the time of neural tube closure, supplementation should begin at least one month before conception. Research indicates that abnormal folate metabolism may also play a role in Down syndrome and other birth defects. Women who have previously delivered an infant with a neural tube defect may need to consume more than the recommended amount of dietary folate equivalents (up to 4 to 5 mg/ day). Until more information becomes available, pregnant women in the general population, ages 19 years and older, should not exceed the tolerable upper limit of 1,000 mcg of folate per day from foods, fortified foods, and supplements (14- to 18-year-olds should not exceed 800 mcg per day).

Lutein and Zeaxanthin: are antioxidants that appear to reduce harmful free radicals in various parts of the body. Free radicals can play a role in a variety of chronic diseases including macular degeneration, cancer and heart disease. Lutein levels increase significantly during pregnancy and are found to be elevated in umbilical cord blood indicating the importance of these antioxidants in fetal development.

Activity: Physically active women have been shown to have infants who weigh less than women who are sedentary. Maintaining adequate weight gain through sufficient calorie consumption should insure a healthy birthweight unaffected by the mother's physical activity. The American Dietetic Association recommendations on exercise during pregnancy include:

- After 20 weeks, avoid doing exercises while lying on the back which can impede blood flow.
- Avoid brisk exercise in hot, humid environments
- Avoid exercise if body temperature is elevated
- Drink plenty of water to prevent dehydration and overheating
- Maintain a heart rate at 60% to 80% of maximum (220 minus age=maximum) 

Essential Vitamins/Minerals	Amount Needed During Pregnancy	Foods That Supply Nutrient
Vitamin A & Carotenoids	770 mcg > 18yrs, 750 mcg < 18yrs	Liver, milk, eggs, carrots, green and yellow vegetables, broccoli, potatoes, pumpkin, yellow and orange fruits,
Vitamin D	5 mcg	Milk, fatty fish, egg yolks, sunshine
Vitamin E	15 mcg _ TE	Vegetable oil, margarine, wheat germ, spinach, fortified cereal
Vitamin K	90 mcg > 18 yrs 75 mcg < 18 yrs	Liver, vegetable oils, green leafy vegetables, wheat bran
Vitamin C	85 mg > 18 yrs, 80 mg < 18 yrs.	Citrus fruits and juices, bell peppers, green beans, strawberries, broccoli, tomatoes, potatoes, papaya
Biotin	30 mcg	Liver, mushrooms, peanuts, egg yolk
Thiamin/ Vitamin B1	1.4 mg	Whole grain, fortified cereals, wheat germ, organ meats, eggs, rice, pasta, berries, nuts, beans, pork
Riboflavin/ Vitamin B2	1.4 mg	Dairy products, meats, poultry, fish, fortified cereals and eggs
Niacin/ Vitamin B3	18 mg NE	Meats, fish, milk, eggs, poultry, peanuts
Pantothenic Acid	6 mg	Eggs, liver, salmon, yeast
Pyridoxine/ Vitamin B6	1.9 mcg	Chicken, fish, liver, pork, eggs, whole grains, vegetables, nuts
Cobalamin/Vitamin B12	2.6 mcg	Liver, milk, eggs, fish, cheese, meat
Folic Acid/ Folate	600 mcg	Liver, mushrooms, green leafy vegetables, spinach, broccoli, orange juice, whole wheat bread, beans
Calcium	1000 mg > 18 yrs. 1300 mg < 18 yrs.	Yogurt, milk, cheese, fortified soy, tofu, dark green leafy vegetables, canned fish with bones, fortified juices
Iron	27-30 mg	Liver, seafood, lean meat, poultry, cereal, dried beans, egg yolks
Phosphorus	700 mg > 18 yrs 1250 mg < 18 yrs	Meat, fish, poultry, eggs
Magnesium		Seeds, nuts, beans, grains, vegetable
Fluoride		Drinking water, processed foods
Iodine	11mg > 18 yrs.	Drinking water, seafood, fish
Zinc	12 mg < 18 yrs.	Red meats, poultry, eggs, fish, beans, nuts, whole grains, oysters, dairy

Diabetes and Pregnancy:

- For diabetic women planning on becoming pregnant it is recommended that blood glucose levels be controlled for three to six months before conception.
- To keep blood sugar under control during pregnancy, it is important to keep food, exercise, and insulin balanced. If blood sugar rises too high, the increased sugar crossing into the placenta can result in a large, over-developed fetus with birth defects or an infant with altered glucose metabolism.
- Gestational diabetes is a form of diabetes that begins during pregnancy and usually goes away after the birth of the baby. Gestational diabetes, can be controlled through diet, medication, and exercise; but if left untreated, gestational diabetes can cause health problems for both mother and baby. If gestational diabetes develops, a registered dietitian can help establish a special meal plan to control maternal blood sugar. 🍷

Gastrointestinal Function:

Several changes in gastrointestinal function during pregnancy can affect maternal nutritional status. During the first trimester, morning sickness and nausea may make it difficult to maintain an adequate nutritional intake.

Morning sickness and nausea are common problems for pregnant women. Most nausea occurs during the early part of pregnancy and, in most cases, will subside once the second trimester begins. For some women, morning sickness and nausea last longer than the early stages of pregnancy or even throughout the entire nine months.

Hormonal changes within the body might cause nausea or vomiting. Symptoms may be caused by exhaustion or stress exacerbated by environmental triggers including certain smells or foods or for no apparent reason at all. Nausea in early pregnancy is a condition that often can be managed by changing when and what you eat.

Suggestions include:

- Eat smaller meals each day, such as six to eight small meals instead of three larger ones.

- Avoid being without food for long periods of time.
- Drink fluids between, but not with, meals.
- Avoid foods that are greasy, fried, or highly spiced.
- Avoid foul and unpleasant odors.
- Rest when you are tired.

Severe nausea and vomiting in pregnancy is rare, but if it occurs, dehydration may result. In such cases, a physician should assess the severity of weight loss or lack of weight gain to determine appropriate treatment.

As the pregnancy progresses, increased hormone production often leads to a relaxation of the muscles of the gastrointestinal track causing slower motility and greater reabsorption of water. These changes frequently result in maternal discomfort due to constipation and heartburn. Increased fluid intake between meals rather than with meals, more fiber and less food eaten before bedtime can offer some temporary relief from symptoms. 🍷



Assessing Nutritional Status:

Maternal weight gain is a primary indicator of nutritional health and fetal development and therefore should be monitored regularly. Recommendations for weight gain are based on classifications of prepregnancy weight status based on Body Mass Index (BMI):



Recommended Weight Gains During Pregnancy Based on Body Mass Index

Weight Category	Total weight gain (in pounds)	First trimester gain (in pounds)	Second and third trimester gain (weekly in pounds)
Underweight (BMI <20)	28-40	5.0	1.07
Normal weight (BMI 20-26)	25-35	3.5	.97
Overweight (BMI >26-29)	15-25	2.0	.67
Obese (BMI >29)	At least 15		

Modified from *Krause's Food, Nutrition & Diet Therapy*. 11th ed. Edited by L. Kathleen Mahan and Sylvia Escott-Stump, Philadelphia, W.B. Saunders, 2004, p184.

Realities

Food Safety During Pregnancy:

The four basic food safety messages of the Partnership for Food Safety Education are vitally important during pregnancy: Clean, Cook, Chill, and Separate.

During pregnancy, changes in hormones cause a woman's immune system to become suppressed, so that it is harder to fight off infections. Therefore pregnant women are believed to be at higher risk of foodborne illness. To prevent becoming infected by harmful foodborne bacteria, it is wise to avoid raw seafood, unpasteurized dairy products such as milk or cheese, pate and raw or undercooked meat, poultry and eggs.

Current thinking is that the consumption of some larger fish should be limited.

Some fish are thought to have sufficient levels of mercury, which, in high doses, can alter fetal brain and nervous system development.

Here are some guidelines:


Fish to be avoided: shark, swordfish, king mackerel, or tilefish (also called golden or white snapper) because these fish have high levels of mercury.

Consume no more than six ounces of "white" or "albacore" tuna or tuna steak each week.

Consume up to 12 ounces of fish per week. Recommended fish include shrimp, salmon, pollock, catfish, or "light" tuna as they are usually low in mercury. For more information on the mercury levels of different kinds of fish, go to:

<http://www.cfsan.fda.gov/~frf/sea-mehg.html>

For more information regarding food safety during pregnancy:

www.fightbac.org, www.fsis.usda.gov,
www.cfsan.fda.gov, www.eggsafety.org 



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