

# NUTRITION

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## Nutrition: Key To A Healthy Beginning

Pregnancy, unlike any other stage of life, results in dramatic changes in a woman's body. During this short period, the body shifts from supporting one person to two people, and makes good nutrition an even more critical factor in the well being of both. The unborn baby is completely dependent on the mother's food intake for all of its nutrients. During this time, women should forget about cutting calories in favor of following a healthful diet that includes foods from all the food groups. Milk, red meats, eggs, grains, fruits, and vegetables are especially important as these foods are good sources of calcium, iron, protein, and vitamins. Besides providing nutrients for the baby, extra calories are needed to facilitate the multiple physiological changes occurring in the pregnant woman. Along with good nutrition, healthy lifestyles factors such as avoiding alcohol and not smoking are ways to ensure a healthy start for the baby. Prenatal care is also important so that the doctor can regularly monitor the progress of the baby's

development as well as teach the mother-to-be about the changes that will occur in the upcoming months.

Aside from the physiological changes, a pregnant woman also experiences emotional changes, one minute she is happy and eagerly waiting for the baby's arrival, and the next minute she is anxious about the life changes a new baby brings. This is more common among first time moms since everything is new and different. Books on pregnancy are helpful, but they cannot fully prepare the woman for the awesome changes to come. But, since the human gestation period lasts for nine months it allows mother-to-be and their partners and families to fully prepare for the new arrival in their life. In addition to eating healthy, getting plenty of rest, preparing baby's room, and buying things for the baby, parents should select a good pediatrician even before the birth of their baby to take care of their baby when it finally arrives.

Good nutrition continues to be important in the life of all new moms, but especially in women who breast feed. These women need more calories than during pregnancy as their body works hard to produce breast milk. A healthy diet remains important even in women who either cannot or choose not to breast feed, since they now must replenish various nutrients that were depleted during pregnancy. And, remember that having a healthy mom to look after a new healthy baby is the best way to start a new healthy life.

*Written by Linda Min, MS, RD*

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# Recommended Tips For Common Pregnancy Discomforts



# ENERGY NEEDS

## NAUSEA

- Before getting out of bed try eating dry toast or crackers. Avoid sudden movements and get up slowly.
- Eat small meals more frequently throughout the day. Avoid long periods without eating.
- Avoid spicy or greasy foods and foods that have strong odors. Get plenty of fresh air.
- Drink fluids between meals rather than with meals when nauseated.
- Chew gum or suck on hard candy.
- Avoid drinking citrus juice, water, milk, coffee, or tea when nauseated.

## CONSTIPATION

- Drink more liquids. Make sure to drink at least eight or more cups of liquids daily.
- Eat foods high in fiber.
- Exercise regularly.
- If the problem persists, talk to a doctor.

## HEARTBURN

- Eat small frequent meals throughout the day and drink fluids between meals instead of with meals.
- Relax and eat food slowly.
- Avoid greasy or spicy foods.
- Wait an hour before lying down and two hours before exercising.
- Check with the doctor before taking any over-the-counter medications.
- Elevate your head while sleeping and sit up while eating.
- Wear clothes which are loose fitting around the waist.


• All pregnant women should gain weight during their pregnancy. Weight gain is essential because fetal growth and maternal health depend on it. Maternal weight gain during pregnancy is strongly related to infant birth-weight, and infant birth-weight is an indicator of the health and subsequent development of the infant.

The Subcommittee on Nutritional Status and Weight Gain During Pregnancy of the National Academy of Sciences recommends that a woman gain about a pound or less per month during her first trimester, the first through twelfth weeks of pregnancy. This is not much weight to gain and is only an extra 135 calories a day. Some women gain little or no weight during their first trimester, but a weight gain between two to four pounds is ideal.

During her second trimester, the thirteenth through the twenty-sixth weeks of pregnancy, and third trimester, the twenty-seventh through forty weeks of pregnancy, a pregnant woman will need to increase her energy intake by an extra 300 calories a day. Weight gain will increase and become more steady. She should aim for an average weight gain of one pound a week from the second trimester throughout the remainder of her pregnancy. A woman can easily get an extra 300 calories by eating one extra serving from each of the five food groups - a slice of bread, a serving of vegetables, an egg, a piece of fruit, and a cup of milk. Pregnant teenagers, underweight women, and exceptionally active women often require more calories. For women of average size and moderate physical activity, 300 extra calories a day represents only 15 percent more food energy than before pregnancy. Nutrient needs expand more than caloric needs, so nutrient dense foods are encouraged as the source of the extra 300 calories. Nutrient density is a measure of the nutrients a food provides relative to the energy it provides. The more nutrients and the fewer calories, the greater the nutrient density. Foods such as eggs, nonfat milk, dark green vegetables, citrus fruits, and whole-grain breads and cereals are examples of nutrient dense foods. Successful breastfeeding requires adequate nutrition as well. This, plus the support of all family members and friends, will enhance the well-being of the mother and infant. By continuing to eat nutrient-dense foods throughout lactation, the mother who chooses to breastfeed will be nutritionally prepared to do so. An adequate diet is needed to support the stamina, patience, and self-confidence that nursing demands.

A nursing mother produces about 25 ounces of milk a day, depending on the infant's demand. To produce milk, a woman needs extra food energy during lactation. To meet this energy need, the woman is advised to eat an extra 500 calories of food each day and let the fat reserves she accumulated during pregnancy provide the rest. Severe energy restriction may hinder milk production and is not recommended.

The Dietary Reference Intake (DRI) for calcium does not change with pregnancy or lactation and the recommended daily amount for women age 19-50 is 1000 mg. However, females age 15-17 need 1300 mg of calcium a day since their bones are still developing. The Tolerable Upper Intake for calcium is 2500 mg per day for all women in all age groups.

Pregnancy and lactation are exciting times in a woman's life. During these special months it is a good idea to remind woman that eating right needs to be a priority. 

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Cataldo, C., Rolfes, S., & Whitney, E. *Understanding Clinical Nutrition*. Wadsworth Publishing Company, Belmont, CA. 1996.

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Swinney, B. *Eating Expectantly. A Practical and Tasty Guide to Prenatal Nutrition*. Meadowbrook Press, New York, NY. 1996.

## QUESTIONS FROM

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**Q:** Are there any food assistance programs available for pregnant and/or breastfeeding women?

**a:** The Supplemental Food Program for Women, Infants, and Children, WIC, provides nutrition education and nutritious foods to low-income pregnant women and their children. WIC provides eggs, milk, cereal, juice, cheese, legumes, peanut butter, and infant formula to infants, children up to age five, pregnant women, and breastfeeding women who qualify financially and are at a medical or nutritional risk. The service includes health care referrals, nutrition education, and food packages that consist of vouchers for specific foods to supply nutrients known to be lacking in the diets.

**Q:** Is it safe for a woman to exercise when pregnant and during breastfeeding?

**a:** An active and physically fit woman who is having a normal pregnancy can continue exercising during pregnancy and while breastfeeding. The duration and intensity of the exercise may need to be adjusted as the pregnancy progresses. Staying active can improve fitness, prevent gestational diabetes, facilitate labor, and reduce stress.

Intense exercise can raise the lactic acid concentration of breast milk, which influences the milk's taste. Infants appear to prefer milk produced prior to exercise, it has a lower lactic acid content.

**Q:** Is iron important during pregnancy?

**a:** Iron is important during pregnancy and throughout breastfeeding. The requirement for iron doubles in pregnancy to 30 milligrams (mg) a day, and is 15 mg per day when breastfeeding. A pregnant woman's blood volume expands by 50 percent which is why the requirement doubles. Iron is involved in hemoglobin production, which is the portion of baby's and mother's red blood cells that carry oxygen to the cells.

A pregnant woman should consume sufficient food sources of iron to make sure her body is absorbing enough. Iron comes in two forms, heme and non-heme. Heme iron is found mostly from animal sources, such as red meats and eggs, and is the form that is best absorbed. Non-heme comes from plant foods. A pregnant woman can increase the amount of iron her body absorbs by selecting vitamin C foods along with iron rich foods, an example would be drinking one cup of orange juice while eating two large scrambled eggs.

**Q:** What are some advantages of breastfeeding?

**a:** Breastfeeding offers significant advantages over bottle-feeding for both infant and mother. Even if the baby is breast-fed for a short amount of time, the baby will benefit. Breast milk provides the most optimal source of nutrition for a growing infant's needs. Colostrum, or first milk, contains mother's antibodies. Breast-fed babies have fewer allergies, less diarrhea, a lower risk of serious bowel disorder, and fewer ear infections and respiratory illness. Essential fats found in breast milk are important for brain development. In general, breast-fed children have higher IQ's than formula fed children.

Breastfeeding is also beneficial to the mother. Breastfeeding helps to strengthen the mother-baby bond. It also speeds the shrinking of the mother's uterus back to its pre-pregnancy size, and reduces risk of breast-cancer. And best of all, it does not cost anything and is always available!

*Nutrition Realities* welcomes your Questions from the Clinic. If you have questions or comments, please send them by mail, FAX, or e-mail to:

### Questions from the Clinic

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# FOLIC ACID

Folate, also called folic acid or folacin, is a B vitamin essential for cell division, producing red and white blood cells, development of healthy tissues, and proper development of the fetus. Folic acid is the form found in fortified foods and dietary supplements; the form found naturally in foods are folate and folacin. Folate is found in many foods, including leafy green vegetables, liver and eggs. Folic acid needs are increased considerably during pregnancy whenever cells are multiplying, pregnant women require 600 micrograms per day which is higher than the daily 400 micrograms that non-pregnant women require. In addition, folic acid taken before and during early pregnancy can help prevent certain birth defects in infants.

The neural tube forms the beginnings of the brain and spinal cord which are key structures of the central nervous system. Neural tube development in the infant occurs from 17 to 30 days of gestation and neural tube development is most vulnerable to nutrient deficiencies or toxins during this time. Any abnormal development of the neural tube or its failure to close completely can produce major defects in the central nervous system, causing serious disabilities and even infant death. One extreme type of neural tube defect is anencephaly. Anencephaly is when a baby is born without a brain and babies born with anencephaly die shortly after birth.

The most common neural tube defect is spina bifida, a disorder characterized by incomplete closure of the spinal cord and its bony encasement. The membranes covering the spinal cord often protrude as a sac, which may rupture and lead to meningitis, a life-threatening inflammation of the membranes. Spina bifida is accompanied by varying degrees of paralysis, depending on the extent of spinal cord damage. Mild cases may not even be noticed, but severe cases can lead to death. Approximately 1 of every 1000 newborns has a neural tube defect in the United

States, and 2500 to 3000 infants are affected each year.

To prevent neural tube defects it is recommended that a woman increase the folic acid in her diet one month before conception and continue this increase throughout the pregnancy. The U.S. Public Health Service recommends all women of childbearing age, who are capable of becoming pregnant, should take 400 micrograms of folate daily. All women need to be concerned about getting proper amounts of folate in their daily diet, too little folate can also cause a blood disorder called megaloblastic anemia where underdeveloped blood cells are unable to carry adequate oxygen.

Since many pregnancies are unplanned, and because neural tube defects occur so early in gestation before many women realize they are pregnant, the Food and Drug Administration (FDA) has mandated that grain products be fortified with folic acid. In January 1998, enriched grain products, which include most breads, flour, pastas, corn grits, cornmeal, farina, macaroni, noodles, rice, and cereals are required by law to be fortified with folic acid to help women consume adequate amounts in their diets. Finally, the recommended dietary allowance (RDA) for a breastfeeding woman is also increased daily to 500 micrograms because the baby can deplete the mother's stores which could result in impaired ability to build red blood cells and anemia. These amounts are best met from a combination of taking dietary supplements, eating foods fortified with folic acid, and eating foods that are rich folate sources.

Rolfes, S. & Whitney, E. *Understanding Nutrition*. Wadsworth Publishing Company, Belmont, CA. 1999.

*Recommendations for the Use of Folic Acid to Reduce the Number of Cases of Spina Bifida and Other Neural Tube Defects*. Centers For Disease Control.

*Morbidity and Mortality Weekly Report*. Sept. 11, 1992, vol. 41, No. RR-14. U.S. Department of Health & Human Services.

## Nutrition Needs

Nutrient needs during pregnancy and lactation are higher than at any other time in a woman's life, to ensure the development and growth of a healthy baby. Women who eat well and avoid known risks tend to have fewer complications during their pregnancy and labor. If a pregnant woman's overall diet is inadequate, her baby's development may be impaired, and the baby may be underweight at birth. The following table shows the nutrients that pregnant and lactating women need compared to what non-pregnant women need.

Nutrient	Females age (yr.)			Pregnancy	Lactation	
	15-18	19-24	25-50		1 <sup>st</sup> 6 mo	2 <sup>nd</sup> 6 mo
Energy (kcal)		2200		+300	+500	+500
Protein (g)	44	46	50	60	65	62
Vit A (µg RE)		800		800	1300	1200
Vit E (mg α-TE)		8		10	12	11
Vit K (µg)	55	60	65	65	65	65
Vit C (mg)		60		70	95	90
Iron (mg)		15		30	15	15
Zinc (mg)		12		15	19	16
Iodine (µg)		150		175	200	200
Selenium (µg)	50	55		65	75	75
Folate (µg DFE)	400			600	500	500
Vit B6 (mg)	1.2	1.3		1.9	2.0	2.0
Choline (mg)	400	425		450	550	550
Calcium (mg)	1300	1000		1000	1000	1000
Tolerable Upper Intake	2500			2500	2500	2500

Whitney, E. & Rolfes, S. *Understanding Nutrition*. Wadsworth Publishing Company, Belmont, CA. 1999.

# FOOD safety

Food safety is especially important during pregnancy because a pregnant woman is more vulnerable and has more to risk if she develops a foodborne illness. Most importantly, the fetus can be severely harmed by some microorganisms. Plus, having a foodborne illness while pregnant can also be dangerous because the vomiting and diarrhea that often occurs can result in dehydration, nutrient loss, fluid imbalance weakness, and general physical trauma. This can cause reduced nutrient intake for the mother which results in slowed baby growth. The baby's health, as well as the health of the mother, can be jeopardized when foodborne illness occurs during pregnancy.

To practice safe food handling during pregnancy the following tips are important to remember. Keep raw and cooked foods separated at all times. Cook foods, especially those containing raw animal products, thoroughly. Keep hot foods at temperatures of 140° F and above and cold foods at temperatures of 40° F and below. Keep refrigerators clean and at temperatures of 40° F or below. Stay away from all cheeses (especially soft cheeses), milk, and fruit juices that are not pasteurized. Change sponges, dishcloths, and dishrags frequently to prevent bacteria from being spread around. And, when refrigerating leftover foods, divide food into smaller containers so food can cool quickly.

The following food safety tips are important when using eggs. Wash hands with warm soapy water for at least 20 seconds before and after handling food. Wash utensils and preparation areas thoroughly with hot soapy water before and after they are used with raw eggs. Do not allow cooked foods containing eggs to sit out at room temperatures longer than two hours. Never consume foods that are raw, runny, or that contain raw eggs such as Egg Nog, and some Caesar Salad Dressings, unless they are prepared using pasteurized egg products. Cook eggs thoroughly to make sure foods are cooked to the correct temperature, 160° F, (it may be helpful to use a thermometer to check the temperature). Discard eggs that are cracked, dirty, or older than four weeks after expiration date on the carton. Always buy refrigerated eggs and keep them refrigerated at home. Use eggs promptly after they are cracked open, especially if they are mixed together in a bowl or blender and, remember to not reuse any dirty cookware.

When practicing these helpful food safety tips a pregnant woman will greatly reduce her chances of developing a foodborne illness and will ensure that she and her fetus will stay safe throughout her pregnancy.



*The American Dietetic Association (written by E. Ward). Pregnancy Nutrition Good Health for You and Your Baby. Chronimed Publishing, Minneapolis, MN. 1998.*

*Swinney, B. Eating Expectantly. A Practical and Tasty Guide to Prenatal Nutrition. Meadowbrook Press, New York, NY. 1996.*

# PROTEIN needs

Protein is important during pregnancy, mainly so new body cells of the developing baby can be made. Changes in a pregnant woman's body, especially the placenta, require a high quality source of dietary protein. Protein is also needed to manufacture the wide variety of enzymes and hormones that regulate metabolism and control fluid balance. For all these reasons it is easy to understand why dietary protein is essential during pregnancy.

A pregnant woman only needs 10 extra grams of protein a day. That is 60 grams of protein compared with 50 grams recommended for non-pregnant women. To put this into perspective, eating two large eggs will supply enough extra protein to fulfill the 10 extra grams a day a pregnant woman needs. For the extra protein to do its job, it is essential an expectant mother consumes an adequate amount of energy. If she does not consume enough calories, her body will use protein for energy instead of for cell building.

A pregnant woman needs to get her protein daily from food sources since prenatal supplements do not provide protein. And, high protein foods have many beneficial nutrients. Eggs supply not only protein but vitamin D, calcium, and phosphorus, all necessary nutrients to build strong bones and teeth for baby.

A breastfeeding woman needs to increase her protein intake by 5 grams the first six months while she is breastfeeding, she will need 65 grams of protein per day. And, six to twelve months later she will need only 2 extra grams of protein which is 62 grams a day.

Consuming a certain quantity of protein is not the only goal throughout pregnancy. The quality of protein affects how the body will use it. Protein needs are calculated by determining the need for high biological value, or high-quality, protein. High biological value protein has a mixture of essential amino acids similar to that of human protein and can be made into body tissues. Eggs are an excellent source of high-biological value protein. The egg's protein is actually the highest quality in the market place and is used as a standard to which other protein foods are compared. Eggs are an excellent protein choice and should be part of a pregnant woman's diet.



*The American Dietetic Association (written by E. Ward). Pregnancy Nutrition Good Health for You and Your Baby. Chronimed Publishing, Minneapolis, MN. 1998.*

# WEIGHT GAIN

Birth-weight is the most reliable indicator of an infant's health. An underweight infant is more likely to have physical and mental defects, become ill, or die than a normal weight infant. Low birth weight infants are also at a higher risk of developing coronary heart disease as an adult. In general, higher birth-weights present lower risks for infants. Two aspects of the mother's weight influence an infant's birth-weight, her weight prior to conception and her weight gain during pregnancy.

A woman's weight prior to conception influences fetal growth. Even with the same weight gain during pregnancy, underweight women tend to have smaller babies than heavier women. An underweight woman has an even higher risk of having a low birth-weight infant if she is unable to gain sufficient weight during pregnancy. In addition, the rates of pre-term births and infant deaths are higher for underweight women. An underweight woman improves her chances of having a healthy infant by achieving an appropriate body weight prior to conception or, if that goal is not achieved, by gaining extra pounds during pregnancy.

Being overweight has its own problems related to pregnancy and childbirth. Overweight women have an especially high risk of medical complications such as hypertension, gestational diabetes, and postpartum infections. Compared with ideal weight pregnant women, overweight women are more likely to have stillbirths and other complications of labor and delivery. Infants of overweight women are likely to be born post term and to weigh more than 9 pounds.

Abnormally large newborns increase the likelihood of a difficult labor and delivery, birth trauma, and need for cesarean section. These infants also have a greater risk of poor health and death than infants of normal weight. Overweight women are less likely to have premature infants, but if they do, the infants may be large for their gestational age. Infants born to obese mothers often experience poor development and obesity may double the risk for neural tube defects in the infant. Excessive weight gain after the twentieth week of pregnancy can be a sign of preeclampsia which is characterized by high blood pressure, protein in the urine, and fluid retention. Preeclampsia affects almost all of the mother's organs, and blood flow through the vessels that supplies oxygen and nutrients to the placenta diminishes. Preeclampsia often retards fetal growth and in some cases, the placenta separates from the uterus, resulting in stillbirth.

Weight-loss dieting during pregnancy is never advisable. Overweight women should try to achieve a healthy body weight before becoming pregnant, and postpone weight loss until after childbirth.

The recommended weight gain for a woman who begins pregnancy at a healthy weight and is carrying a single fetus is 25 to 35 pounds. An underweight woman needs to gain between 28 and 40 pounds; and an overweight woman should gain between 15 and 25 pounds. Some women should try to gain at the upper range of the target weight gain, mainly adolescents, who are still growing. And, women who are carrying twins should aim for a weight gain of 35 to 45 pounds.

Weight gain is a very important part of pregnancy, especially since the infant's birth weight and future health depends on it. For these reasons it is crucial to encourage pregnant women to gain enough weight throughout their pregnancy.

## Components of Weight Gain During Pregnancy

Development	Weight Gain (lb.)
Infant at birth	7 1/2
Placenta	1 1/2
Increase in mother's blood volume to supply placenta	4
Increase in mother's fluid volume	4
Increase in size of uterus and supporting muscles	2
Increase in size of mother's breasts	2
Fluid to surround infant in amniotic sac	2
Mother's fat stores	7
<b>Total</b>	<b>30</b>

Pregnant women often express concern about the weight gain that accompanies a healthy pregnancy. Some need to be reminded that most of the weight gain supports the growth and development of the placenta, uterus, blood, and breasts, as well as a healthy 7 1/2 pound infant. A small amount goes into maternal fat stores, which provides energy for labor and lactation. The above table shows where the weight goes that a pregnant woman gains.

Source: *ACOG Guide to Planning for Pregnancy, Birth, and Beyond*. (Washington, D.C.: The American College of Obstetricians and Gynecologists, 1990), p. 109.

Whitney, E. & Rolfes, S. *Understanding Nutrition*. Wadsworth Publishing Company, Belmont, CA. 1999.

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