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This circular was prepared by Mary McCann-Rugg, former Extension specialist in Foods and Nutrition, University of Illinois at Urbana-Champaign.

In preparing this circular, the author drew from many sources, ranging from professional medical journals to Extension publications from other states. For those interested in the sources for parts of this circular, a reference list is available from Home Economics Cooperative Extension, 528 Bevier Hall, University of Illinois at Urbana-Champaign, 905 S. Goodwin, Urbana, IL 61801.
At some point in your pregnancy, you will need to decide whether you wish to breast feed or bottle feed your baby. It is a decision deserving much thought. This circular is particularly relevant to the mother-to-be who is considering or who has decided upon breast feeding. Fathers-to-be, other family members, and even friends also can learn more about nursing and thus feel more of a part of the process between mother and baby. As this circular stresses throughout, a supportive atmosphere from family and friends is important for both mother and baby during the breast-feeding period.

WHO CAN BREAST FEED?

Almost every woman who is determined to do so can nurse. Breast size is not a factor. Folklore has often claimed that a woman with small breasts is unable to produce the milk needed for an infant’s diet, but this claim is simply not true. Breast milk is produced “on-the-spot” in response to an infant’s sucking; very little is stored from feeding to feeding. A woman’s breasts will continue to produce all the milk that is required as long as her baby continues to suck. The factors that can inhibit the production of breast milk include tension, fatigue, a poor diet, or not enough sucking. Breast size is not important.

Mothers-to-be with a family history of breast cancer or with diabetes also can breast feed, despite past beliefs otherwise.

At one time, a woman with a history of breast cancer in her immediate family was told not to breast feed because she might increase her child’s risk of getting cancer. Studies now indicate that this advice was not sound. There is no extra risk for these babies. Moreover, breast feeding may actually help protect the mother against cancer. Studies have shown that women who nurse their children have a lower rate of breast cancer than women who have never nursed. The lower rate for women who nurse their children applies both to women who were breast fed themselves as infants as well as to those who were not.

The diabetic mother also can nurse without any special problems. Her physician or dietitian only needs to help her adjust her food intake to account for the extra calories that a breast-feeding mother needs. Diabetic mothers following their physicians’ advice should be able to nurse just as successfully as nondiabetic mothers.
It also was thought at one time that a woman who delivered her baby cesarean could not breastfeed. Again, this belief has been found to be false. See pages 26 to 27 for the procedures that cesarean mothers can follow for successful nursing.

Women who have inverted nipples, who deliver premature babies, or who work also need not feel that breastfeeding is impossible for them. See later sections of this circular for more details on breastfeeding and inverted nipples, premature babies, and working.

As you may have guessed by now, not many things need stop a woman from nursing. With help and encouragement from her family, friends, and medical attendants, she will probably be able to breastfeed successfully even if she has had trouble nursing before. A strong desire to breastfeed, support from family members, and good information before the baby is born will help most women overcome temporary difficulties.

**BENEFITS OF BREASTFEEDING**

While both breast and bottle feeding can produce babies that are physically and emotionally healthy, breastfeeding has a number of benefits for the mother and her child. One of its major benefits is that it promotes "bonding," or a strong mother-to-infant interaction and affection. Feeding time will bring physical enjoyment to both mother and baby and help to build a secure and loving relationship. However, these strong bonds also can be formed between a parent and a formula-fed baby if the baby is held close during feeding time.

Another advantage to breastfeeding is that breast milk is always immediately available. It is important to respond quickly with milk when a baby is hungry since an infant's immature digestive system cannot easily tolerate a long wait for milk. Breast milk is always clean and at the right temperature; it does not need to be prepared or warmed.

There are many nutritional benefits for a baby if it is breastfed. For one, breast milk is fresh and nutritionally complete, provided the mother's diet is adequate. Breast milk has everything a baby needs to grow and develop in just the right amounts, with the possible exception of vitamin D (research is inconclusive on this point at present). Although infant formulas are made to copy breast
milk as closely as possible, some nutrients in breast milk are not yet understood well enough to add to formula. Breast milk also is easier for a baby to digest than infant formula because of the types and amounts of protein it contains.

A baby also will receive health benefits from breast feeding. Babies who are receiving only breast milk do not get constipated. A breast-fed baby's stools are quite soft and easily eliminated. Breast milk, unlike formula, also provides a baby with active antibodies and other substances. As a result, breast-fed babies have fewer problems with food allergies and respiratory and intestinal infections than do formula-fed babies. They also have fewer skin problems, including less diaper rash and eczema. Finally, the sucking exercise provided by breast feeding promotes good facial development. Babies who are bottle fed from birth may be more likely to have poorly developed dental arches, palates, and other facial features in adulthood.

Breast Versus Bottle Feeding

The sucking action of breast feeding (top left) promotes better dental, palate, and facial development than that of bottle feeding (bottom left). Note the following differences in pressure and thrust:

**Breast Feeding:**
1. Lips clamp firmly around nipple.
2. Tongue actively thrusts upward.
3. Nipple hits the hard palate.
4. Gums compress the areola.
5. Cheek muscles are contracted (not shown).

**Bottle Feeding:**
1. Lips are pushed flat by bottle.
2. Tongue is flat under nipple.
3. Nipple presses baby's soft palate.
4. Gums are mainly relaxed.
5. Cheek muscles are relaxed (not shown).
Benefits for the mother from breast feeding include the fact that breast-feeding mothers usually lose the majority of the weight gained during pregnancy faster than non-breast-feeding mothers. Mothers can thus regain their figures somewhat more rapidly after delivery if they breast feed. Night feedings also are made easier because milk is so available; there is no need to warm the formula while one is half-asleep.

POSSIBLE INHIBITIONS

Although many benefits occur to both a mother and her baby from breast feeding, there are reasons why a woman might, or even should, decide not to breast feed. A woman’s diet, health, environment, and lifestyle are all important factors in a decision concerning breast feeding. Therefore, before you make your decision, think carefully about these aspects of your personal life.

DIET

It is very important that a breast-feeding mother has an adequate diet. Studies have shown that a mother’s diet affects the composition and nutritional quality of her breast milk. Thus, if personal health or financial difficulties might keep you from eating a balanced, nutritious diet while breast feeding, you may need to consider feeding your baby formula.* Examine the recommended diet for breast-feeding mothers that is given on page 19. Discuss any questions you have with your doctor or your local nutrition specialist. He or she will be able to help you determine the adequacies of your diet and plan meals that will fulfill your nutritional needs.

HEALTH

Your physical and mental health also should influence your decision about whether or not to breast feed. As mentioned before,

* When determining your financial ability, compare the cost of buying formula with the cost of maintaining an adequate diet. Also check with your public health department about possible state or federal programs that could help you maintain an adequate diet (and about your qualifications for them). In recent years, financial assistance has been available to low-income women for nutritional needs both during pregnancy and during a child’s first few years.
both tension and fatigue can inhibit a woman's production of breast milk. Some tension and fatigue are normal in most people's lives and should not affect most women's breast milk supply. Honestly assess your own surroundings and attitude. A positive attitude on your part and extra consideration for you on the part of your family, friends, and place of employment should help guide your assessment.

Any personal health problems should be discussed with your doctor. Although recent research indicates that many medications are not passed through the breast milk as was at one time thought, there are definitely some medications that should not be taken while you are breast feeding. If it is imperative that you use any of these medications for your own health, you must not breast feed. Among these medications are oral contraceptives, anti-cancer drugs, and radioactive compounds in therapeutic doses. Consult with your doctor about any treatments or medications you may be taking. He or she can inform you whether substitutes are available that will not influence your breast milk.

To be on the safe side, you should avoid taking any medication, even over-the-counter drugs like aspirin, once you begin breast feeding unless your physician has recommended that you do so.

You should also be careful about the use of alcohol and other mood-modifying drugs. Much research is still needed on the effects of these on the breast-fed baby. It is known, however, that the active compound of marijuana (THC) is excreted in mother's milk. Thus, it is highly advised that breast-feeding mothers not smoke marijuana. It also is a good idea to avoid drinking alcohol during the breast-feeding period or at least to cut down your consumption as much as possible. It is impossible to determine a "safe" amount of alcohol; any may be too much for some babies.

ENVIRONMENT

The breast-feeding mother, like everyone else, is exposed to pollutants in the environment. Because some of these pollutants have been found in small quantities in breast milk, some people have advocated discontinuing breast feeding. At present, most medical professionals do not support this conclusion. What is known as the "risk-benefit ratio" is currently weighted in favor of breast feeding. In other words, the small amounts of contaminants that have been
found in breast milk have not produced any documented adverse or harmful effects, while the benefits of breast feeding are well documented. Thus, most physicians and nutritionists say that except under unusual circumstances, breast feeding should continue.

If you are concerned about any particular feature of your personal environment or if you will be working during the breast-feeding period around any of the chemicals or pollutants that have caused concern, consult with your doctor.

If you are concerned about protecting yourself and your family from pollutants, you may wish to consider the following suggestions. They won’t guarantee that your family will not encounter pollutants or that you will have no environmental contaminants in your breast milk, but they are wise precautionary measures.

☐ Cut down on the use of pesticides and aerosol sprays in and around your home.
☐ Wash fruits and vegetables thoroughly.
☐ Trim away excess fat from meats because most potential pollutants are concentrated in animal fat.
☐ Avoid a sudden, excessive weight loss (for example, a crash diet to lose your pregnancy weight) because any pollutants that may be stored in your body fat could suddenly be released into your breast milk.

LIFESTYLE

The biggest change that you should anticipate in your lifestyle if you breast feed is the demand on your time. Remember that you need to be available to nurse your baby, unlike the situation in bottle feeding where you can share feeding responsibilities with the baby’s father or others. You must be willing to get up for those night feedings, and you must be able to stop your daytime activities temporarily to feed baby. Most newborn babies need to nurse for about twenty minutes every three hours.

You can hand express or pump your breast milk into a bottle for a family member to use while you are out or during the night, but most of the time you need to nurse your baby personally. As mentioned before, breast milk is produced in response to baby’s sucking. Therefore, if your baby does not suck at your breasts several times every day, your milk supply will decrease and may even cease.
Breast feeding does *not* mean, however, that you must give up all of your normal activities or that you can never go anywhere without your baby. Many working mothers breast feed their babies, and, with a little practice, you will even find that you can do some activities, such as eating, reading, writing, and sewing, while your baby is breast feeding.

Remember: *breast feeding is not difficult* as long as you have good information about it before your baby is born, a strong desire to breast feed, and support from your family and friends. If you are unable to breast feed, however, don’t be dismayed! Perfectly healthy babies have been raised for years on commercial formulas.

**PREPARING FOR NURSING**

Nipple care and conditioning during pregnancy are two of the most important things you can do to prepare for nursing. Although many women do not bother with nipple preparation and have no difficulty nursing, some women, especially those with blonde or red hair or fair complexions, may have difficulty with nipple pain and soreness when they first begin nursing. To guard against nipple soreness, you should take care of your nipples and practice some conditioning exercises during pregnancy.

Nipple care merely means that you bathe regularly to keep your breasts and nipples clean. You should, however, use soap infrequently because soap may dry out your skin and cause your nipples to crack. Many women prefer to use only water to keep their nipple areas clean. If you do use soap, use a mild brand and rinse well.

The conditioning of your nipples can start anytime during pregnancy, but no later than the last six weeks. Try to practice daily the “exercises” outlined below. They won’t take long and will be well worth the effort.

1. After your bath, use a fairly rough towel to rub the nipple area briskly. Rub until you feel slightly uncomfortable, usually just a few seconds when you first begin. You may notice some tingling in your nipples. This tingling is the reaction of your skin to the friction. If the tingling becomes too painful, you have overdone it. Rub your nipples for a shorter period of time on your next attempt. Work up to a 15-second rubbing period.
2 At least twice daily, pull your nipples out (quite firmly) or roll them between your thumb and finger tip as if you were winding a watch. Pull or roll only until you are slightly uncomfortable. Work up to a two-minute session. You may want to use a lubricant, such as cold cream or baby oil, on your nipples for this exercise.

3 Go without a bra for part of each day. Going braless allows your nipples to toughen as they gently rub your clothing and are exposed to the air. If you find that you are uncomfortable without a bra, wear a nursing bra and drop the front panel.

As your pregnancy progresses, you may notice some changes in your breasts and nipples. Your breasts may become larger, fuller, and heavier as they prepare to secrete your breast milk. The nipple area, called the areola, often enlarges and darkens in color, and the nipples themselves may be larger. Early in pregnancy you may discover “pimples” forming on your areola. These are oil glands that have become enlarged and noticeable. They will help lubricate your areola and nipple during pregnancy and breast feeding and will help prevent dryness and cracked skin. These changes are completely normal and are no cause for alarm.

In later pregnancy you may find that your breasts leak occasionally. This fluid is called colostrum and is the “immature” milk that your breasts will secrete during the first few days of breast feeding. While this leaking is annoying, it is not a serious problem. Tuck a
clean handkerchief or a breast pad in your bra to catch any moisture, and don't worry about it.* Leaking is a normal part of pregnancy.

**BREAST FEEDING**

Breast feeding is nature's way of providing nutrition for your child, but that doesn't mean that breast feeding is necessarily automatic and easy to do. Successful breast feeding takes some "know-how" and patience, especially in the beginning. Initially, in fact, breast feeding may seem more difficult than bottle feeding, but once you get the hang of it, it quickly becomes much easier.

Support and help from your physician, nurses, family members, and friends are essential in helping you get started. You may find that you are uncomfortable nursing in front of company, especially in the beginning when you and the baby are still feeling a bit awkward. Don’t feel embarrassed about excusing yourself to find a quiet place to nurse. If you are still at the hospital, ask your guests to leave for a while. Your company will understand. As you become comfortable with breast feeding, you will find ways to nurse your child discreetly and will probably have no trouble nursing with others present.

During the first few days, your milk will be the clear or yellowish fluid called colostrum, which is rich in antibodies and other substances to protect your baby and which has the perfect proportion of nutrients needed in those early days. In a few days (two to ten) your "mature" milk is produced. It will be slightly altered in composition from the colostrum to accommodate baby's changing needs. As you continue to nurse, the composition of your breast milk will continue to change to meet your baby's nutritional needs.

**How to Nurse**

To begin nursing, find a position that will be comfortable for both of you for about 20 minutes. Any position will do as long as your

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* Breast pads are small, contoured pads that fit over your nipple and are held in place by your bra. They are designed to absorb the milk that may leak from your breasts. They are available in almost any store that has a pharmacy or hygiene supply area and do not require a prescription.
1. Cradle your baby so its head is well supported above the level of its stomach.
2. Press the breast back from the nipple with thumb and forefinger. Make sure baby has breathing space!
3. Don't force baby's head against your breast. He or she must be able to turn away.

baby has access to your breasts. Support either of your breasts with one hand, and press the breast back from the nipple with your thumb and forefinger. This support makes your nipple easier for baby to grasp and lets baby breathe more easily. Next, initiate feeding by either placing the nipple and areola in baby's mouth or by touching baby's cheek with your nipple. Your baby will turn its head toward your breast and open its mouth.

A few moments after your baby begins sucking your breast you will experience the “let-down” syndrome. This is the initial spurt of milk production. Let-down is a distinct tingling in your breasts and the sensation of milk filling (being let down into) both your breasts.

Nurse on each breast for at least ten minutes. Newborns may require up to 20 minutes on each breast because of their awkwardness and lesser strength; they quickly become more efficient, however, soon needing only 10 minutes. Some mothers may find that ten minutes is too long to nurse because their nipples become sore. If your nipples become sore before ten minutes, nurse as long as you comfortably can each time and work up to a ten-minute nursing period. You may have to nurse your baby a little more often until you are able to nurse on each breast for ten minutes.

To remove your baby from your breast, gently insert your little finger into its mouth beside the nipple. This insertion breaks the suction on your nipple and forces baby's gums apart. Your baby will let go readily so you can free your nipple. Remember to allow baby to nurse for the same period of time on your other breast. (Many women like to take the time to burp their babies between breasts.)
At the next nursing period, start baby on the breast that was nursed last in the previous feeding. Alternating will help keep the supply of milk even in both breasts.

Until your milk supply is well established, you may find that your breasts leak occasionally. Or you may discover that when you nurse with one breast, the other may leak. Breast pads inserted into your bra will help absorb this excess moisture.

**HELPING BABY**

Although some babies begin nursing soon after birth, often while the mother is in the delivery or recovery room, other babies show no interest in nursing for the first few days. A baby may refuse its mother’s breast at first and give a convincing show that it would rather starve, preferring the glucose (sugar) water from the hospital’s nursery.

If your baby refuses at first to nurse, don’t take this refusal personally. Your baby is not rejecting you. Keep in mind that nursing may not be automatic for you and your baby. You both are learning a new skill, and that takes some time and practice for some mothers and babies. Maybe your baby just isn’t ready or interested in nursing yet. Be patient, continue to offer your breast, and don’t worry. Your baby won’t starve.

If your baby refuses to nurse during the first few days, he or she may be waiting for your mature milk to come in. Many babies wait until the mature milk is produced before they start nursing. All of the antibodies and nutrition of the colostrum will still be present in your mature breast milk so you can rest assured that your baby will receive everything he or she needs.

If your infant tries to nurse but has difficulties, there are several things you can do to help.

If your breasts are too full, your baby may have a hard time grasping your nipple. To relieve some of the fullness, hand express or pump some of your milk. (Instructions on hand expressing breast milk are given later in this circular. Ask a nurse to help you if you find expressing milk difficult at first.) After expressing some milk, flatten your areola between your thumb and forefinger so that your nipple is drawn out and the rest of your breast is pushed back. Place your drawn-out nipple in baby’s mouth and rub the nipple back and forth to get his or her attention.
If your baby doesn't seem to know what to do with your nipple, gently squeeze the areola to express a little milk onto your nipple. Offer your nipple again. Sometimes a baby only needs to taste the breast milk to begin nursing.

You can also try placing your nipple into your baby's mouth and gently stroking his or her cheek with your hand. Stroking the cheek often triggers a sucking reflex that is instinctive, and your baby will begin to nurse.

As a last resort, you can use an artificial nipple over your own nipple. Your baby will probably have been given sterile or glucose water in the nursery and will have used an artificial rubber nipple. Therefore, if all else fails, place a similar rubber baby bottle nipple snugly over your own and offer that to your baby. A baby will almost always accept this nipple. As your baby nurses on the artificial nipple, he or she will create a suction inside the rubber nipple that will pull your own nipple out. The milk produced by your breast will flow out through the rubber nipple to your baby. After baby has nursed a few minutes with this nipple, gently remove it and insert your own nipple. Often a baby will accept the breast at this point.

Patience will be the key to getting started. Ask the nurses for help if you need it, and, above all, don't quit. Keep trying these techniques. Your baby is not "dumb" and you are not a failure just because it is taking a while to get adjusted. Many, many mothers and babies have the same difficulties at first. Generally, the first week will be the hardest. If you will be patient and keep trying, you and your baby will soon be "pros."

**HOW OFTEN**

Once you get started, you probably will be nursing about every three hours. Every baby is an individual, however, so be prepared to be flexible in responding to your baby's nursing needs. Let your baby be your guide. One of the signs that baby is hungry is "rooting" or nuzzling you in search of your breast.

Frequent nursing (every three hours or less) will help stimulate your breasts to establish an adequate milk supply. A reliable guideline in breast feeding is that the more you nurse, the more milk you will have. A flexible schedule and short intervals between nursings will help a great deal.

Although your baby's sucking does provide the stimulus needed for let-down, let-down can occur unexpectedly (often at incon-
venient times!). Sometimes it happens in response to your baby’s crying, or when you lie down and relax. It also can happen during sexual intercourse or if it has been an unusually long time since you last nursed your baby. Whatever the reason, your breasts may become engorged (overfull of milk) if your baby does not nurse soon afterwards (see figure on page 16). Rest assured that unexpected let-down is a temporary problem and will usually stop occurring after the first month of breast feeding.

Engorgement also can occur if the breast produces too much milk in response to your baby’s sucking. Shorter, more frequent nursing periods will help relieve engorgement and are easier on the nipples, making for more comfortable nursing.

**HOW LONG**

How long you breast feed will depend on your desire to continue, your baby’s desire to nurse, your work schedule, and your milk supply. You should not introduce solid food too early in infancy (before four to six months) because early introduction will lead to less frequent and less vigorous sucking on the part of your baby. As a result, your breasts will not be stimulated enough to maintain the quantity your baby will need in those early months.

Your breast milk can provide all the necessary nutrients for your baby’s first four to six months of life. At that age, baby may need supplemental foods to insure proper growth. Also at that age, a baby is ready to learn different eating techniques, such as drinking from a cup or chewing pureed foods. For a detailed discussion of infant feeding, be sure to read Extension Circular 1216, *Feeding Your Baby during the First Year*.

Even though your baby may begin eating solid foods at four to six months, breast milk still continues to be an important part of his or her diet. The American Academy of Pediatrics recommends breast feeding until your baby is at least one year old, if possible. If you are not able to breast feed that long, it is recommended that you switch to an infant formula until your baby is one year old. *Cow’s milk is not recommended at all before age one.* There is no problem with nursing longer than one year if you and your baby desire. It is not uncommon for mothers to breast feed their child up to two or three years of age.
Engorged Breasts

An external and internal comparison of a normal nursing breast and an overfull (engorged) breast. Note the easy-to-grasp, extended nipple versus the recessed nipple in the external comparison. The internal comparison shows how the milk ducts have become swollen in the engorged breast. Note how the ducts nearest the nipple are pooled with milk, pushing the breast out and recessing the nipple.

Weaning your child should be done gradually. Start by eliminating one daily feeding every couple of weeks and substituting drinking from a cup. Your milk production will decrease gradually as nursing demands decrease. Most women will have little or no discomfort from extra milk pressure in their breasts if they follow this gradual procedure.

Other Aspects

Water. If your baby is completely breast fed, he or she should not need extra water. Increased nursing will usually take care of baby's need for fluids, even in hot weather. Feel free to offer unsweetened water, especially during hot weather, but don't be concerned if baby refuses it and demands to be nursed more often.

Fluoride. If your baby does not drink much water or if your water does not have adequate fluoridation (one milligram or more per liter for infants), he or she should probably be given a fluoride supplement. Ask your doctor about the need for fluoride drops.

Vitamin D. Some questions currently exist about whether breast milk can provide adequate vitamin D. Research is inconclusive at this point, and it is very unusual to see any deficiency of vitamin
D in a breast-fed baby. However, because vitamin D can be made by our bodies when skin is exposed to sunlight, babies who do not get some outdoor sunlight daily may experience a vitamin deficiency. Urban areas where tall buildings or air pollution exist may not allow sufficient penetration by the sun to give a breast-fed baby the vitamin D it needs. Also, babies whose mothers are strict vegetarians (avoiding all animal products, including dairy products) may need extra vitamin D since the mother’s milk may not contain adequate amounts. Follow your doctor’s recommendations.

If your doctor does prescribe any vitamin D, fluoride, or other supplements, use only the amount required.

**Overfull breasts.** If your baby is small or does not nurse well enough to empty your breasts sufficiently, you may need to empty them by hand expressing milk or by using a breast pump. A section later in this circular gives information on how to hand express your breast milk. The extra milk can be frozen in bottles for later use.

**Weight gain.** You may be concerned that your baby isn’t gaining enough weight on your breast milk. It will be natural for your baby to lose some weight after birth (weight loss occurs in both breast- and bottle-fed babies), and it may take a baby a few weeks to regain that weight. Your pediatrician will be able to tell you if your baby’s weight gain is acceptable. A general rule of thumb is that babies double their birth weight at six months and triple it at one year. If you feel that your baby is not gaining enough weight, try nursing more often. Shorter, more frequent feedings will usually help your baby gain more weight. If you are still concerned, consult with your physician.

**Spitting up.** Most babies, whether breast or bottle fed, occasionally spit up some milk. The milk just seems to burble out of the baby’s mouth and may be partially curded. Although this spitting up alarms most parents, it is perfectly normal and does not mean that your baby is sick. As long as your baby is gaining enough weight for his or her height, don’t worry.

There are a few things you can try to stop the spitting up, but they won’t always work with all babies. Some babies continue to spit up no matter what their parents do (such babies usually quit when they begin walking). If your baby is spitting up, you can try burping him or her halfway through the feeding, at the end of the
feeding, and a few minutes after the feeding. You can also try propping your baby in an infant seat or crib with the head higher than the stomach for 10 to 15 minutes after feeding.

**TAKING CARE OF YOURSELF**

Sufficient rest and a good diet are of primary importance. Being healthy and relaxed will be the keys to successful breast feeding.

Over-fatigue may decrease your milk supply at first. Consider asking or hiring someone to help you around the house for a few days after you take your new baby home. Limit visitors for the first few weeks. Hard as it may be, close your eyes to some of the less essential details of housekeeping. Break large housekeeping chores up into several days. Take naps when you can, and get to bed early. Get out daily for a walk, and use other simple diversions to help you maintain a relaxed and happy attitude.

A proper diet is essential for the health of a nursing mother and her baby. The most important factors are fluids and calories. If a nursing mother does not get enough of either, her milk supply will decrease no matter how vigorously her baby nurses. A nursing mother will require about 500 extra calories each day over and above what she normally needs. These extra calories should come from foods of good nutritional quality that have lots of protein, vitamins, and minerals. Research has shown that a nutritional deficiency in a mother may be reflected in her breast milk. Milk, meat, fruits, vegetables, and enriched or whole grain breads and cereals, therefore, are especially good. Rich desserts, alcoholic beverages, and snack foods such as potato chips or soft drinks supply extra calories but few nutrients and thus should be avoided. To be sure that you are getting the nutrition that you and your baby need, use the Daily Food Guide on the following page. Take vitamins only if your physician prescribes them; too many vitamins can be as harmful as too few.

Remember to drink lots of fluids, from eight to ten cups per day. Milk, water, juice, soups, and decaffeinated coffee and tea are all acceptable. Because caffeine is a diuretic, caffeinated products will not add fluids to your body. You may want to have a beverage close at hand when you nurse because watching your baby drink often will heighten your own thirst.
## Daily Food Guide

<table>
<thead>
<tr>
<th>Food group</th>
<th>Number of servings per day</th>
<th>Equivalents of one serving*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Milk</td>
<td>4 to 5</td>
<td>1 cup (8 oz.) milk (whole, 2%, skim, and nonfat dry)</td>
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<tr>
<td></td>
<td></td>
<td>2 ounces of cheese (could count as a &quot;meat&quot; instead)</td>
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<tr>
<td></td>
<td></td>
<td>1 1/2 cups cottage cheese</td>
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<td></td>
<td></td>
<td>1 cup yogurt, pudding, or custard</td>
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<tr>
<td>Meat</td>
<td>3</td>
<td>2 to 3 ounces cooked lean meat</td>
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<td></td>
<td></td>
<td>2 eggs</td>
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<tr>
<td></td>
<td></td>
<td>1/4 cup or 4 tablespoons peanut butter</td>
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<tr>
<td></td>
<td></td>
<td>1 cup dried beans, peas, or lentils</td>
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<tr>
<td>Vitamin C fruits and vegetables</td>
<td>1</td>
<td>1 citrus fruit or 1/2 cup citrus fruit juice</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3/4 cup strawberries</td>
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<td></td>
<td></td>
<td>1/2 cup broccoli, cabbage, green peppers, or tomatoes</td>
</tr>
<tr>
<td>Vitamin A fruits and vegetables</td>
<td>several times every week</td>
<td>1/2 cup carrots, broccoli, brussels sprouts, cabbage, greens, spinach, green peppers, sweet potatoes, or asparagus</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 halves dried apricots</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1/4 small cantaloupe</td>
</tr>
<tr>
<td>Other fruits and vegetables</td>
<td>2</td>
<td>1 medium size piece of fruit</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1/2 cup vegetables</td>
</tr>
<tr>
<td>Breads and cereals</td>
<td>4 to 6</td>
<td>1 slice bread or dinner roll</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3/4 cup dry cereal or 1/2 cup cooked cereal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1/2 cup cooked rice, spaghetti, noodles, or other pasta</td>
</tr>
</tbody>
</table>

* For more equivalents and for a more thorough list of vitamin C and A fruits and vegetables, see the charts in Extension Circular 1215, *Eating Right during Pregnancy.*
You may occasionally find that certain things you eat are affecting your baby. Chocolate and alcohol have been known to cause diarrhea in nursing babies, and some mothers feel that caffeine irritates their babies. Onions, garlic, cabbage, and other strong-flavored vegetables seem to irritate or cause gas in some babies. If you notice an unusual reaction in your baby after nursing, examine your diet for anything that might have been the cause and steadfastly avoid that food while you are breast feeding.

Although you will be eating more food than usual, you will probably lose the majority of the weight you gained during pregnancy faster than a non-breast-feeding mother. For one, breast feeding stimulates your body to release a hormone called oxytocin, which causes your uterus or womb to contract to its normally small size. In addition, you will use up many of the extra calories in nursing.

Clothing is also an important consideration for the nursing mother. Washable garments that open down the front or that can be pulled up from the waist (for example, t-shirts) are most practical. A good nursing bra will support one breast while baby is sucking at the other. You should have three or four such bras, change them frequently, and launder them by hand. Half slips are handy, but a regular one, slit down the front, can be fitted with snaps or a zipper. Some clothing stores even carry special nursing dresses and blouses.

**ALLEVIATING NIPPLE SORENESS**

If you have conditioned your nipples, you probably will have little trouble with soreness. Some pain may be present during the very first few pulls on your nipple, but it seldom lasts more than a few seconds. Even if the initial pain does persist longer, it will usually clear up in two or three days without any medication or special treatment. Even so, some women have occasional problems with nipple soreness.

There is no question that sore, tender nipples are most uncomfortable and that they hinder enjoyment of nursing. If sore nipples do become a problem, take heart; there are ways to reduce and eliminate even the most painful nipple soreness.

Putting ice on the breast is a very rapid and effective method of reducing nipple soreness. Place ice in a small plastic bag or wash
cloth and apply it to the breasts. The coldness will temporarily stop even the most severe irritation. You can leave the ice packs on as long as you wish; some mothers with badly cracked and bleeding nipples use them all night and use a towel to catch the moisture.

Sometimes a mild ointment will help. Ask your physician to recommend one for you that will not be harmful to your baby.

Aspirin also may help to relieve your pain, but be careful. Check with your doctor first for approval.

One of the most effective ways of treating soreness is to expose the nipples to air. If possible, go without a bra and wear a soft, loose blouse. If you are uncomfortable without a bra, use a nursing bra (making sure that it is not too tight) and drop the flap.

Another way to treat soreness is to nurse more frequently. This treatment may contradict your desire to wait as long as possible between feedings, but it actually will be better on your nipples to nurse your baby every two or three hours. Baby won't be as hungry and thus won't tug as hard at your nipples. Also, your breasts won't get overfull and be as tender as they might be if you delay nursing.

Nipple shields are also available for severe soreness. They are essentially rubber nipples that fit over a mother's nipples and reduce the pressure on her nipples during nursing. Check a local pharmacy if you need them.

A last-resort measure in cases of severe soreness is to hand express your breast milk or use a breast pump and feed your baby the breast milk from a bottle. Routinely expressing your breasts will allow you to maintain a good milk supply until you are able to return to nursing. Extra breast milk can be frozen after expression and stored up to three months (instructions for hand expressing are given in the next section).

While nipples are sore, do not use soaps or alcohol preparations because they are too drying and will only aggravate the problem. Use only clear water to cleanse nipples.

You also may want to limit baby's nursing to no more than seven to ten minutes on each side. Your baby will receive all the nourishment it needs; studies show that 90 percent of all the milk needed by an infant for nutrition is consumed during the first seven minutes on each breast. Baby's sucking needs may not be satisfied, however, so use a pacifier after you have finished and hold your baby
for as long a period of time as you normally would.* As your breasts heal, you will be able to nurse for longer periods of time until you finally resume your normal schedule.

Note that there are other reasons for nipple soreness besides baby's sucking. Occasionally, sore nipples are caused by a fungus infection called thrush that your baby may have. You can suspect thrush if your soreness is persistent, if your baby develops white spots inside its mouth, if your baby develops persistent diaper rash, or if you develop vaginitis. If any of these symptoms develops, consult with your doctor. The treatment is simple, and you will not need to stop nursing.

Another possible cause of your nipple soreness could be your laundry detergent. Some mothers have developed nipple soreness because of an allergy to the detergent they use to wash their bras. Switch to a different detergent. If you have developed allergies to most detergents, use disposable nursing pads. (If you want to save money, take the plastic backing off disposable diapers, cut up the nonplastic portion, and insert the cut-up portion into your bra. Remember to take the plastic backing off. Otherwise, moisture will be held against the nipple, air won't be able to circulate, and a rash could result.)

**HAND EXPRESSING BREAST MILK**

Hand expressing may be useful if your breasts are overfull or if you are feeding your breast milk from a bottle because of your work schedule or because of nipple soreness.

Hand expressing is painless and very easy to learn. It may take a few times before you can easily express your milk, but don't worry. Just relax, take your time, and keep trying. At first you may only get a few drops, but the more you practice, the more milk you will be able to produce. Once you learn how to hand express milk, you should be able to collect milk almost anytime.

When you express your milk, you are usually expressing the milk that has collected in the breasts between nursings. This is called "foremilk" and is not as rich in *necessary* fats as the "hindmilk" *Pacifiers that are shaped like a mother's nipple when baby is nursing on it are recommended. Check with your doctor about the correct shape.*
created by the let-down reflex produced by baby’s sucking or other stimuli mentioned earlier. As a result, if you plan to feed baby the expressed milk, you must collect hindmilk to mix with the foremilk in equal proportions in each bottle of expressed milk you give baby.

**PROCEDURE FOR HAND EXPRESSING**

Before expressing your milk, you will need to sterilize your equipment. Any glass or plastic container that can be sterilized can be used. A widemouth jar or wide-brimmed cup is convenient for collecting milk. If you desire, the milk can then be poured into a baby bottle and stored in the refrigerator or freezer. Remember, anything that touches the milk should be sterilized in boiling water for at least five minutes and cooled before using.

The next step is to massage your breasts. Massaging your breasts before hand expressing milk will help you to get more milk out by moving the milk forward from the back of the breast to the nipple. To massage, follow the instructions given on the next page.

To collect hindmilk, and thus a greater volume of milk, also try gently rolling your nipples for a few minutes, as when conditioning (see page 10). Many mothers find that rolling stimulates the let-down reflex.

After you have massaged your breasts, lean over your sterilized container and follow the procedures given on page 25.

If your breasts are overfull, breast massage may be uncomfortable. In that case, stand under a warm shower with your back to the shower and let the water run over your shoulders and breasts, or use warm compresses on your breasts. Then gently proceed with hand expressing your milk.

**STORING AND USING HAND-EXPRESSED BREAST MILK**

Chill the collected breast milk immediately in the refrigerator. Milk can be kept for 24 hours in the refrigerator. If you want to store the milk for any longer period of time, you must freeze it. Frozen breast milk should be used within three months.

You can collect milk an ounce at a time (or even less). Just add the new milk to that in the refrigerator or to the already frozen milk as a new layer. Remember, however, to count the 24-hour storage
Breast Massage

1. Wash your hands and breasts with mild soap and water. Rinse well.
2. Stroke your breast gently but firmly with the palms of both hands.
3. Alternate your hands as you work your way around each breast. Massage from the shoulder down, from under the arm and over, from the waist up, and then from the center of the chest over to the nipple.
4. Massage each breast several times.

Time in the refrigerator from when the first milk was put into the empty jar. When you add to frozen milk, the milk will look layered but will all blend together when thawed.

Because you must eventually mix equal proportions of hindmilk and foremilk for baby, keep track of how much of each milk you add to a particular container, or collect hindmilk and foremilk in different containers and mix them equally when you make baby's bottle. If you are freezing the milk, consider the convenience of freezing the foremilk and hindmilk in amounts that can easily be thawed and mixed for one feeding, or mix enough of the two for one feeding before freezing. Never fill a container to the top, however; allow room for the milk to expand as it freezes. For example, put 3½ ounces in a 4-ounce bottle.

When the milk is to be fed to the baby, take the container of mixed milk (or one each of foremilk and hindmilk) from the freezer, hold it under warm running water, and shake it gently.
Hand Expressing

1. Cup your breast in your hand, placing your thumb above and your forefinger below the areola. Press your hand inward towards your chest. At the same time, gently squeeze together your thumb and finger.
2. Press and squeeze only to the edge of the areola. Do not squeeze the nipple. Milk will spurt from the untouched nipple.
3. Release your breast and repeat, rotating your hand to reach all your milk ducts (they radiate out from your nipple).

Heat the milk to body temperature in a pan of water. Throw away any thawed milk that baby does not drink.

BREAST FEEDING AND SPECIAL SITUATIONS

BREAST FEEDING AND INVERTED NIPPLES

Inverted nipples are nipples that fold back into the breast instead of protruding outwards. Truly inverted nipples are rare, and although they can make nursing more of a problem, they do not make it impossible.

If you have inverted nipples, do the same conditioning exercises during pregnancy already described. Then, when you begin nursing your baby, try to draw your nipple out even part way; your baby will usually be able to pull it out the rest of the way by sucking. Most inverted nipples can be temporarily drawn out by pinching...
the areola between your forefinger and thumb just behind the nipple as in hand expressing. Often, hand expressing breast milk will draw the nipple out.

If you find that you are unable to draw out even part of your nipple, you can buy breast shields, which are specifically designed to draw out inverted nipples. They are worn during pregnancy or between feedings and consist of two sections: a bottom part that fits over the breast with a hole for the nipple and a top part that does not touch the nipple but holds the bra away from it and catches any leakage. (Breast shields are different from nipple shields, which have rubber nipples that fit over real nipples; nipple shields are used when nipples are very sore.) Breast shields are available at local stores.

Occasionally after a baby is born, the mother’s nipples can be very hard to grasp. This difficulty is usually due to engorgement, although some women find that their nipples have temporarily retracted. If your nipples have retracted or are difficult to grasp, try hand expressing a little milk. This should relieve pressure around the nipple and draw it out. Placing ice on your nipples will usually serve the same purpose. If the problem persists, you may find breast shields a help.

**BREAST FEEDING AND CESAREAN BIRTHS**

At one time it was thought that a woman who delivered by cesarean could not breast feed. Patients were restricted to prolonged bed rest, and their strength and bodily functions returned slowly. In recent years, however, routine procedures after a cesarean have emphasized getting up and about as early as possible, and earlier recoveries have occurred. It is now known that women who have had a cesarean can nurse just as well as women who have had vaginal deliveries, as long as they take extra care in the beginning.

If a woman knows ahead of time that she will be delivering by cesarean, she still should condition her nipples and care for her breasts as discussed earlier. She should also inform her doctor of her desire to breast feed. He or she may be able to offer additional advice. After delivery, most cesarean mothers are allowed to begin nursing as soon as they wish. If a woman has been given a general anesthetic during delivery, however, she will have to wait until the effects of the anesthetic have worn off.
There are several ways for a cesarean mother to nurse her baby, but most cesarean mothers find nursing easiest to do while lying down. If you deliver your baby cesarean, try the following method. When the nurse brings your baby to you for the first time, have her show you how to lower the bed to an almost, but not quite, flat position. Have her help you arrange your pillows until you are comfortable. Gently roll to one side (use the side rails or have the nurse help you), place your baby on his or her side with its mouth at the level of your nipple, and allow your breast to touch baby’s cheek. This will promote your baby’s rooting reflex, and he or she will begin to nurse.

You don’t have to sit up to burp your baby. Gently roll your baby onto your chest and rub its back. As you recover, you will be able to change your position to feed from your other breast without the nurse’s help. Simply place baby on your chest, hold him or her securely, and roll over together.

Sometimes women who have had cesarean deliveries find that their “mature” milk comes in a little later than that of women who have delivered vaginally. This delay is no problem since a baby continues to benefit from the colostrum or “early” milk in those first few days.

Some mothers are concerned that the medication given for their pain will affect their baby through their milk. Most medication given for pain will not affect the baby, but consult with your doctor if you are concerned.

Once you are home, you will find that you can continue breast feeding exactly as if you had delivered vaginally. Remember to get lots of rest and to watch your diet so that you can complete your recovery from surgery and establish a good milk supply.

**Breast Feeding and Premature Babies**

The baby who is born prematurely or at a low birth weight (less than 4½ pounds) can be breast fed, but the mother may need extra patience. The infant weighing 4½ to 6 pounds can usually be breast fed like a normal-weight baby, but may require shorter, more frequent nursing periods because it may tire very quickly.

Infants that are smaller than 4½ pounds will probably require extra feedings of glucose or “sugar water” during the first few days.
Often, a high-calorie, high-nutrient formula is also given until the infant has gained enough weight and strength to nurse on its own.

Breast milk is being recognized more and more as the ideal food for the premature infant. It has been shown that breast milk changes in composition as an infant grows to provide the most beneficial blend of nutrients at each stage of growth. When a baby is born prematurely, the mother’s milk has a different proportion of nutrients than it would have if the baby had been born full-term. The milk is especially suited to the premature infant’s needs.

If the mother is willing, many physicians will encourage her to express her milk, store it in a clean container, and bring it to the hospital daily. The milk is then fed to the infant. This procedure requires a lot of work from the mother and, of course, is not really as satisfying as personally nursing her baby. Nevertheless, most premature infants thrive on breast milk, and expressing it several times daily will help the mother keep up a good milk supply until the time when baby will be able to nurse directly from her.

If you have a premature infant and wish to breast feed, tell your physician immediately so he or she can help you get started. If you have a local La Leche League in your town, contact it. Its members can offer much needed support and practical advice.

Some women give up hopes of nursing their premature baby because they fear that their milk will “dry up” with the delay between delivery and nursing. A mother will not dry up as long as she expresses her milk daily and continues to eat well. If a woman’s milk supply does stop, it can usually be started again with a little patience.

Relactation, as it is called, can be accomplished if the mother is healthy and adequately nourished, if the baby has a good sucking reflex, and if the mother has the support of those around her. To stimulate relactation, a baby is fed a formula supplement but is also allowed to suck on the mother’s breast several times a day for as long as desired. Within a few days, the breast milk will come in. If this procedure does not work, there are safe drugs available to stimulate the return of breast milk. Consult your physician for his or her help.

**Breast Feeding and Working**

“Can I work and still breast feed my baby?” is a question that concerns many of today’s mothers. Because of financial pressures,
some women have no choice but to return to work; others are hesitant to postpone career opportunities. The answer is “yes, a mother can work and breast feed successfully, although it may not be as simple or as easy as it would be if she were able to stay at home.”

Many women who work find that breast feeding has the special advantage of bringing them closer to their baby and of continuing their bond. Another advantage of breast feeding for the working mother is that she is more likely to remain clearly defined as “mother” in her baby’s mind because nursing is associated only with mother. If a sitter is providing a substantial amount of care, the baby, in confusion, might turn to him or her for mothering. Nursing will help establish who mother is.

If you are a working mother, successful breast feeding will begin at home. During those early weeks or months before you return to work, relax and enjoy your baby. Use the techniques discussed earlier to gain confidence in your nursing abilities. Feed your baby on demand; don’t worry about schedules. Practice expressing a little milk now and then so you will know how to express your milk.

Some mothers, anticipating the coming separation, have tried to “get baby ready for it.” This preparation is generally not a good idea. Don’t try to get your baby adjusted to taking a bottle. Don’t imitate being away by avoiding nursings in advance or by substituting a bottle for your breast. Mothers who have tried such tactics have found that they don’t work and are confusing to the infant.

If you have a part-time job or a job that only keeps you from your baby four or five hours a day, you will probably find it fairly easy to adjust your breast-feeding routine. Nurse your baby just before leaving and immediately upon returning. With this routine, most infants will require only one intermediate feeding.

If you are working full time and are not able to nurse during the day, more supplemental feedings will be needed. The extra feedings can come from your expressed milk or supplemental formula.

Use coffee breaks or lunch hours to express extra milk for your baby. Expressing your milk daily will not only provide extra food for your infant but also help keep your breasts from becoming overfull and help keep your breast milk supply established. Find a quiet, comfortable place where you can relax, perhaps an unused office. Relaxing is very important. If you feel too pressured, it may interfere with your ability to produce.
Hand express or use a breast pump to express milk into a clean container. Sterile plastic liners that fit into nursing bottles are a good choice because a fresh one can be used each time, and the small, individual amounts are convenient at feeding time (remember to keep track of foremilk and hindmilk as discussed on page 24). Your sitter can warm the milk by running the liner under hot water, placing it in a bottle, and feeding the milk to your baby. Do not use plastic liners, however, if you are going to freeze the milk. They are not made for freezing and have been known to split open.

Remember to keep the expressed milk cold. Find a refrigerator or a freezer to use at work. If none is available, use a large thermos bottle filled with ice to store the milk. Use the breast milk within 24 hours or freeze it.

By hand expressing breast milk at work, many working women are able to meet all their baby's feeding needs adequately, and some even build up large surplus supplies. If you are not able to express all the milk your baby needs, you can supplement his or her diet with formula. Check with your doctor to see what kind he or she recommends. Don't feel guilty about using formula. Formula is an acceptable substitute for breast milk, and your baby will be able to adjust to receiving both breast milk and formula.

It is important for you to keep up your milk supply since expressing milk won't produce as much as a baby's sucking will. One way to keep up your milk supply is to encourage night feedings. Night feedings will also give you a special time to be alone with your child. Following a nutritious diet, drinking plenty of fluids, and frequently nursing your child at other times during the day will also help keep your milk supply adequate.

Some working mothers arrange to spend their lunch hours with their babies. This arrangement can be very satisfying, but if you do choose to be with your baby during your lunch hour, remember that your baby does not operate on a schedule. Baby may be sound asleep when you arrive, or he or she may have demanded a feeding from the sitter only an hour ago. Thus, be prepared for the fact that your baby may not be hungry or ready to nurse when you arrive.

If working causes you to be separated from your baby all day, you should try to breast feed him or her immediately when you return home. If the baby's father works or if you have older children with demands of their own, you will need their understanding and
cooperation. If it is impossible to delay preparations for dinner while you nurse your baby, perhaps the baby’s father or your older children (or even friends or relatives) could start fixing the meal. Then after you have finished nursing, they could cuddle and play with baby while you finish any necessary details.

Don’t be surprised if baby wants a great deal of your time when you are home through increased fussiness and nursing demands. Most mothers go back to full-time nursing on days off and weekends, using no bottles or supplements even if these are used during the week. Your milk supply should be adequate on these days provided that your diet is good and that you have been expressing milk during the week. Although it has not been scientifically proven, some mothers report that increasing their intake of nutritious beverages (for example, milk and fruit juices) towards the end of the week helps them maintain a larger milk supply on the weekends. One thing is for certain: your baby’s increased nursing demands on weekends and days off will help increase your milk supply.

Working and breast feeding can go together, if you are willing to do some extra planning and work. One working mother who breast fed her child summarized the experience as follows: “It is not easy to work and be a breast-feeding mother. In fact, it can be absolutely grueling. But the joy and fulfillment of knowing you are giving of yourself makes it worth all the fatigue you feel.”

A NATURAL CONCLUSION

Nursing is the natural conclusion to conception, pregnancy, and delivery. Your body’s adjustments after delivery and the recovery of your reproductive organs are more rapid and complete if you nurse your baby. Your relationship with your child will benefit too. As you gain practice and are successful with breast feeding, you will develop a natural pride and pleasure in nursing your baby.

Urbana, Illinois September, 1983

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