



## Chapter 7

# Nourishing Your Baby

**I**t is assumed that any pregnant woman reading this book plans to breastfeed her baby. Mothers who recognize the importance of diet in the physical health of their infants will opt for mother's milk—a food uniquely designed for the infant—rather than commercial formula based on powdered milk, industrial oils, refined sweeteners, questionable additives and artificial vitamins.

The trend towards more natural methods of child-rearing began with a comeback for breastfeeding during the 1970s, as much a reaction to a medical establishment deemed paternalistic and insensitive to women's needs as a recognition, backed by many scientific studies, of breastmilk's amazing properties.

For most women, breastfeeding comes easily. Immediately after birth, baby is put on mom's chest. He turns his head to the breast—he may even wiggle up her torso to the breast—roots his head back and forth to find the nipple and latches on. If the baby is healthy and strong, he will latch on with a tremendous, sucking grip, giving first-time mothers something of a shock. As baby sucks, mom feels a let-down reflex and the milk begins to flow. Baby nurses only a few moments at first, then longer and longer with each nursing. Within a few weeks, baby nurses for twenty minutes every two to three hours, steadily gains weight, and is contented between

nursings. Mom and baby settle into a routine and all is well.

But for some women, even many women, all does not go well. Breastfeeding may be painful, mom may develop sores, baby may not latch on properly, and most seriously, baby does not gain weight, cries a lot and is obviously hungry. Or, mom may be exhausted or sick; breastfeeding may make her feel resentful, or even embarrassed; she may need to return to a work environment that makes breastfeeding difficult if not impossible. Or, she may not have any milk at all—due to illness, surgery or the fact that she has adopted her baby.

Most of this chapter will be dedicated to addressing these problems—not because we don't think breastfeeding is important, but because little needs to be said about normal, successful breastfeeding. After all, women have been breastfeeding for thousands and thousands of years. Those for whom breastfeeding goes smoothly will not even need this chapter; those who are struggling need detailed and specific advice.

Unfortunately, discussions about infant feeding today have become polarized, even acrimonious. Whereas fifty years ago, the medical community pressured women into giving formula as the scientific and modern thing to do, today many women



feel pressured into continued breastfeeding even when baby is obviously not doing well. Breastfeeding literature tends to be judgmental—often implying that lack of breastfeeding success is the mother’s fault, and that if she switches to formula, she is a bad mother.

We need to accept as a fact of life that breastfeeding is not always successful, in spite of the best efforts of the mother. In fact, it would be amazing that out of all the organs in the body, women’s breasts had the unique property of working well under all circumstances.

Fortunately, we now have homemade alternatives to breast milk that are much healthier than commercial formula. The important thing is to provide the information needed to maximize either breastfeeding or formula-feeding success. Let’s keep in mind that breastfeeding is not some kind of contest between moms to see who can do it longest and best, but a way of providing maximum nutrition to the infant; and that our role as parents, mentors, advisors and friends of a new mother is to provide information in a calm and rational way, and then to support her in whatever decision she may make.

#### THE AMAZING QUALITIES OF MAMMALIAN MILK

Under a microscope, the appearance of human or animal milk inspires wonder and awe. Although milk is a fluid, it has a structured appearance, with nutrients and bioactive components sequestered into various compartments. For example, the fats in milk are enveloped in a membrane, the milk-fat globule membrane, which is constructed in the milk ducts. Baby uses portions of this membrane to build his own cell membranes.

Often referred to as “white blood,” milk contains a range of antibodies to protect the infant against pathogens. These antibodies are specific to the flora and antigens of the mother. Maternal antibodies derived from her gut and respiratory immune surveillance systems are transported to the mammary gland. In this way, baby receives immune factors to protect him against the antigens of the mother.

In addition, these immune factors are packaged with a component that protects them from stomach acids,

allowing the immune factors to reach the small intestine intact.

Other protective and immune-enhancing components in milk include lactoferrin, which binds to iron, thus making it unavailable to iron-loving pathogenic bacteria; lysozyme, which enhances the bactericidal activity of immunoglobulins; mucins, which adhere to bacteria and viruses and help eliminate them from the body; interferon and fibronectin, which have antiviral activities; leukocytes, which help build the immune system; and many others. Together these factors protect the immature infant from infection, create the immune system, weed out toxins and support the formation of a healthy gut wall.

In addition, the various proteins and enzymes in milk facilitate the absorption of fats, vitamins, including vitamins A, D, and B<sub>12</sub>, and minerals, including calcium, iodine, magnesium, zinc and iron.

The wonders of milk include complex sugars, long thought to have no biological significance; however these sugars constitute the perfect food for the bi-fido strain of bacteria, the ideal bacteria for baby’s gut. The sugars are similar to those found on the surface of human cells and are constructed in the breast by the same enzymes. Many toxic bacteria and viruses will bind to these sugars to be carried out of the body. Meanwhile the beneficial bacteria, thriving on the complex sugars, form a protective biofilm throughout the entire small intestine.

During the first week or so after birth, babies receive colostrum in their mother’s milk. Colostrum has a very high concentration of protein and antibodies from mom’s immune system, which protect the infant from illness for the first few days. It also acts as a laxative to help move the meconium—baby’s first stools, composed of materials ingested while in the womb—out of baby’s digestive system.

High levels of some vitamins and minerals in colostrum may further protect the infant and may be important in the continued development of the heart, brain and central nervous system.

Milk composition changes according to the stage of breastfeeding and the age of the baby. The “hind” milk, the last milk out of the breast, is higher in fat

than the fore milk. Over the first few weeks, the fat content in the milk increases while protein content declines.

#### BENEFITS OF BREASTMILK: CONFLICTING STUDIES

As science reveals the wonderful composition of breast milk, one would expect equally wondrous results in breastfed children compared to formula-fed children. Lower rates of asthma and allergies, fewer infections, fewer cavities, better growth and higher IQ are some of the claims made for breastfeeding. But to the surprise and disappointment of breastfeeding advocates, the scientific studies do not point to a resounding success for mother's milk. Studies comparing the results of breast and bottle feeding are conflicting; any benefit they show for breastfeeding is a small one, and some show no benefit at all.

For example, a study published in July 2001, found that breastfed children in Japan had more asthma than bottle-fed infants.<sup>1</sup> A study from New Zealand found that breastfed children were significantly more likely to be allergic to cats, dust, mites and grass pollen.<sup>2</sup> A European study found that breastfeeding was not positively related to iron status in one-year-old children. Those with the best iron status were those who received iron-fortified formula.<sup>3</sup>

A Swedish study found that breastfed infants were just as likely to develop childhood cancer as formula-fed babies.<sup>4</sup> In fact, babies breastfed for one month or more had a higher risk of non-Hodgkins lymphoma, although this finding was based on a low number of cases.

A study from Norway found that breastfeeding did not provide protection against frequent ear infections.<sup>5</sup> A report in *Pediatric Clinics of North America* noted that many breastfed babies suffer from failure-to-thrive and dehydration.<sup>6</sup> The author warned: "Those who enthusiastically promoted breastfeeding for its many health benefits must confront the reality of breastfeeding failure and implement necessary changes in medical education and support services to foster successful outcomes in breastfed infants."

Only one study carried out during the past few years

found a clear-cut benefit for breastfeeding. Researchers at the Harvard Medical School found that children who were breastfed were much less likely to be overweight as adults.<sup>7</sup>

Studies on the relationship between breastfeeding and cognitive skills are mixed. Some studies have shown that breastfed infants are more intelligent while others show no difference.<sup>8</sup> Critics contend that better cognitive scores in breastfed infants are due to the fact that mothers with higher levels of educational attainment are more likely to breastfeed.

Formula manufacturers are quick to use the lackluster performance of breastfed children as proof that formula is "just as good" as breast milk. Breastfeeding advocates retort that the studies were designed to give results that benefit the formula makers. Our interpretation is the following: the diet of modern American women is so appalling, and their preparation for successful breastfeeding so lacking, that their breast milk may provide no better nourishment for their infants than factory-made formula.

#### THE ROLE OF NUTRITION

"Breastfeeding mothers do not need to worry about their diets. As long as they are getting enough calories, their milk will be fine." This is the dogma of many groups promoting breastfeeding throughout the world. "The message that diet has an influence on milk quality will discourage mothers from breastfeeding," they contend.

When books on breastfeeding do include nutrition advice for lactating women, that advice is usually woefully lacking: "Include fruits, vegetables, grains, meat or meat alternative and lowfat milk products in your diet every day. Avoid caffeinated beverages and alcohol." Lactating women are advised to eat "vitamin-A rich foods" such as "carrots, spinach, sweet potatoes and cantaloupe." Above all, say the so-called experts, "don't worry too much about what you eat. Your diet does not have to be 'perfect' to nourish your baby well."<sup>9</sup> Some breastfeeding advocates even insist that "breast milk is never deficient in nutrients."

Those who claim that diet has no effect on the quality of mothers milk cite one study, which found no difference in certain immune components of breast

## CAN BREASTFEEDING PREVENT DENTAL DEFORMITIES?

Does bottle feeding contribute to poor palate development? Many insist that it does, that the breast acts as a kind of orthodontic apparatus. The theory is that bottle-fed babies have significant mechanical and structural challenges due to the abnormal muscular action bottle feeding imposes on the tongue. According to this point of view, when babies are breastfed, the infant obtains milk by a natural peristaltic, or wave-like motion of the tongue in order to compress the soft breast nipple against the hard palate, which in infants is actually quite malleable. This natural tongue movement is said to mold the palate into a “U” shape and support the proper development of the jaw.<sup>10</sup> By contrast, according to this theory, the bottle-fed infant must employ a more forceful squeezing or “piston-like” tongue movement to obtain milk or formula from an artificial nipple, leading to a narrow and unnatural “V-shaped” hard palate. Bottle-feeding is also said to disrupt normal swallowing habits.

Proponents of this theory point to a 1981 study published in the *American Journal of Preventive Medicine*, “Does Breastfeeding Protect Against Malocclusion? An Analysis of the 1981 Child Health Supplement to the National Health Interview Survey.”<sup>11</sup> This study did find an association of bottle feeding with malocclusion: children breastfed twelve months or more had a reported malocclusion incidence of about 16 percent, whereas those breastfed zero to three months had a reported malocclusion incidence of 33 percent. A serious flaw with the survey is the fact that the incidence of malocclusion was self reported by the parents, not determined by an orthodontic examination. The authors cite another study, carried out in Czechoslovakia, which found a slight association between bottle-feeding and dental occlusions: among those breastfed less than three months or not at all, 36.4 percent had anomalies; among those breastfed four to six months, 32.1 percent had anomalies; and among those breastfed longer than six months, 24.2 percent had anomalies.<sup>12</sup>

By contrast, an informal survey of WAPF members or children of WAPF members who were adopted and fully bottle fed found that six out of seven had naturally straight teeth. The holistic dentist Raymond Silkman of Los Angeles reports little correspondence between cranio-facial development and the length of time the child was breastfed. He has seen severe dental malocclusion in some fully breastfed children, noting that this usually occurs when the mother is a vegetarian or vegan.

The problem with the published surveys is that it is impossible to separate the physical effects of bottle feeding from the nutritional deficiencies of the formula. The real question: is it the bottle that causes dental deformities or what’s in the bottle? Clearly bottle-feeding does not necessarily condemn a child to having a narrow palate—nor does breastfeeding guarantee normal development. The experience of mothers feeding nutrient-dense raw milk baby formula to their adopted infants indicates that the key factor to normal facial development is nutrition, not the physical action of sucking on a bottle.

When properly nourished, a child will grow to conform to the genetic blueprint of a U-shaped palate and wide jaw. This pattern can be interrupted by the application of constant pressure—think of foot-binding in Asia or the custom of flattening the baby’s head with a board in South America. However, bottle feeding is not a constant activity and when the baby is well-nourished, it is unlikely to contribute to palate deformation; but when the baby is not properly nourished, the physical action of bottle feeding may be a contributing factor, especially if the baby also sucks his thumb or a pacifier for many hours of the day. However, regarding thumb sucking, at least three large studies found no significant difference in thumbsucking habits between bottle-fed and breastfed infants.<sup>13</sup>

The wide variation in dental malformations does not point to bottle feeding or thumb sucking as a major cause of palate malformation, in spite of what the dentists might believe. It is interesting to note that most baby mammals suck on a very narrow nipple, not a full breast, yet malocclusion is rare in the animal kingdom.

milk between mothers of “marginal nutritional status” and those of “poorer nutrition status.” These factors are the immune-protecting compounds sIgA, lysozyme and lactoferrin.<sup>14</sup> Another study found that postpartum vitamin A supplementation did not increase milk concentrations of these immune factors in Bangladeshi women.<sup>15</sup>

One could question whether there is any great difference between “marginal nutritional status” and “poorer nutrition status,” but even if maternal nutrition status has little effect on the concentrations of certain immune factors, there can be large variations in other nutrients depending on what the mother eats. As early as the 1940s, Weston Price observed a decline in the quality of human breast milk, as evidenced by the extensive dental problems he found in his breastfed patients.<sup>16</sup> Today dentists are reporting narrow palates, severe crowding and extensive decay in fully breastfed children, noting that these problems are most common in the fully breastfed children of vegetarian mothers.

#### FATS IN HUMAN MILK

A mother’s diet has a significant influence on the fat content of her milk. Traditional dietary fat in mom’s diet increases milk fat as well as the enzymes lipase, esterase and alkaline phosphatase—all necessary for baby’s optimal assimilation and digestion.<sup>17</sup> *Trans* fats found in processed and commercial fried foods will lower the fat content of mother’s milk, a discovery made in research on mice.<sup>18</sup> In humans, margarine containing *trans* fat reduces milk fat in lean women whereas butter consumption increases the levels of anti-microbial short- and medium-chain fatty acids as well as cholesterol in breast milk.<sup>19</sup> So important is cholesterol to the developing infant that mother’s milk contains a special enzyme to ensure that baby absorbs one hundred percent of it.<sup>20</sup> Cholesterol is critical to the formation of the brain and nervous system, as well as the “second brain”—the digestive tract.

Mother’s milk contains long-chain polyunsaturated fatty acids that babies need for the development of their nervous systems. These special fats accumulate in the brain and retina. If they are absent in the infant diet, the child is likely to suffer from learning disabilities and reduced visual acuity. The most important of these are arachidonic acid (AA or ARA)

of the omega-6 family and docosahexaenoic acid (DHA) of the omega-3 family.

The presence of AA and DHA in the tissues of growing infants is largely determined by the levels in the milk the baby consumes.<sup>21</sup> The recognition that these fatty acids are vital for the optimal development of the infant has led to their inclusion in commercial formula.

What is less well known is the fact that the levels of AA and DHA in human breast milk greatly depend on the mother’s diet. An important 1997 study compared the fatty acid composition of breast milk of mothers in two Chinese provinces with that of Canadian mothers.<sup>22</sup> Mothers in the traditional province of Chongqing had higher levels of milk fat than those from westernized Hong Kong, and higher levels of AA, due to a period of special feeding for the first four weeks after the birth, during which Chongqing mothers consume up to *ten* eggs per day and large amounts of chicken and pork. The diet of Hong Kong mothers was much lower in fat and calories, but because of high fish consumption, their levels of DHA were as high as those of Chongqing mothers. But breast milk levels of AA and DHA in both provinces were much higher than those of Canadian mothers eating a westernized diet.

The Chinese breast milk study proves that the levels of important fatty acids in mother’s milk are strongly influenced by the mother’s diet. Likewise, harmful fats will show up in breast milk if the mother is consuming industrial fats and oils. Eurcic acid, a long-chain monounsaturated fatty acid considered harmful, increased in the milk of Chongqing mothers during the later weeks of lactation, reflecting a dietary switch from animal fats to rape seed oil. Adversely high levels of omega-6 linoleic acid were found in the milk of Hong Kong mothers, reflecting their use of high-omega-6 vegetable oils derived from corn and soy.

Ideal breast milk contains high levels of saturated fat as well. Adequate DHA, AA and saturated fat can be obtained by consuming high levels of animal fats plus eggs, cod liver oil and oily fish throughout the lactation period. Saturated fats in mother’s milk stimulate the immune system and work synergistically with DHA and AA to maintain them in the tissues where they belong.<sup>23</sup> Levels of fat in

a mother's milk will decrease with each baby unless she takes special care to consume high levels of nutrient-dense fats between pregnancies, during pregnancy and during each lactation.<sup>24</sup> Babies born to vegetarian women have lower levels of DHA and AA in their blood.<sup>25</sup>

Dietary carbohydrates can be converted to beneficial short- and medium-chain fatty acids. This conversion takes place in the breast. So, while women should not overdo carb consumption during breastfeeding, some carbohydrate intake is beneficial. Women whose diets are based largely on carbohydrates tend to have lower levels of calories in their milk, due to lower levels of fat.<sup>26</sup>

When the meat and dairy products in a mother's diet come largely from pasture-fed animals, her milk is likely to be rich in conjugated linoleic acid (CLA), believed to have a positive effect on the immune system in the prevention of excess weight gain.<sup>27</sup>

While protein levels in human milk remain constant from the third week onward, at about 11 percent, levels of fat—essential for the development of the nervous system—vary widely. Levels of lactose—also essential for nervous system development—also have a wide range.<sup>28</sup> Even the various anti-inflammatory and antibacterial compounds in a mother's milk vary markedly according to her diet.<sup>29</sup>

## VITAMINS AND MINERALS

A recent study found that breast milk did not meet the minimum requirements for many nutrients.<sup>30</sup> Vitamin D was especially low. A study in Nigeria found that calcium and potassium levels in human milk varied by a factor of two, magnesium and copper by a factor of three, chloride levels by a factor of four, iron and selenium by almost five, iodine and sodium by almost seven, and zinc, which is vital to the nervous system, by over seven.<sup>31</sup> In other words, some mothers had seven times more zinc in their milk than others.

Another survey found large variations in the levels of B vitamins.<sup>32</sup> Vitamin B<sub>6</sub> concentrates in breast milk, and B<sub>6</sub> requirements are increased in lactating women.<sup>33</sup> More B<sub>6</sub> is required if the woman is exercising—an important reason to refrain from heavy

exercise during the nursing period. The same study found that vitamin C ranged from 0 to 11.2 mg per 100 grams and vitamin A from 15 to 226 IU per 100 grams of breastmilk.

Levels of choline in mother's milk are dependent on her dietary intake.<sup>34</sup> Choline is essential for the development of the brain and nervous system. The best sources are egg yolks and liver.

Vitamin D levels are so low in the milk of some women that their breastfed infants develop rickets. Adequate intake of vitamin D can increase breast milk concentrations to 400 IU per liter.

Dr. Catherine Gordon of Children's Hospital Boston recommends regular supplementation of vitamin D to nursing mothers after finding widespread deficiency in mothers and cases of rickets in their breastfed infants.<sup>35</sup>

Vitamin A is vital for the development of the infant. Vitamin A is found only in animal fats. Mothers can convert some of the precursors in fruits and vegetables into true vitamin A, and these will then show up in their milk, but adequate supply can only be met with consumption of animal foods rich in the true form of this nutrient.<sup>36</sup> A 1992 study carried out in Indonesia found that mothers who received vitamin A supplementation had higher levels in their blood and milk than those who received a placebo, and that the infants of the supplemented group were less likely to be vitamin A deficient.<sup>37</sup> Deficiency was measured by the presence of conjunctivitis in the eyes. Incidence of conjunctivitis fell in infants nursing from mothers taking a vitamin A supplement.

The authors noted that vitamin A status was lowest in women who were thin and who had had many babies—a warning not to lose weight too quickly after the birth of a baby and to put sufficient space between children so that vitamin A stores can be rebuilt.

Confirmation of the importance of adequate vitamin A and child spacing comes from a recent European study, which found that one-third of women with short birth intervals or multiple births had borderline deficiencies in retinol. "If the vitamin A supply of the mother is inadequate," they warned," her sup-

ply to the fetus will also be inadequate, as will later be her milk. These inadequacies cannot be compensated by postnatal supplementation.”<sup>38</sup>

Adequate B<sub>12</sub> is essential for the development of the infant. One study found a B<sub>12</sub> deficiency in the breastfed infant of a strict vegetarian.<sup>39</sup>

Magnesium concentrations in breast milk vary over a wide range, from 15 to 64 mg per liter.<sup>40</sup> Levels of trace minerals, such as iodine and selenium, can be extremely variable. Iodine levels depend on maternal dietary intake. Iodine is critical during periods of brain development.<sup>41</sup> The best sources of selenium are animal foods like pastured beef and dairy; iodine is obtained from seafood and butterfat.

Thus, the science makes it abundantly clear that a mother’s diet has a profound effect on the quality of her milk.

#### BAD THINGS IN BREAST MILK

*Trans* fats from partially hydrogenated vegetable oils are present in margarine, shortening, processed foods and fried foods. The accumulated evidence indicates that *trans* fats are bad news indeed. They interfere with many enzymatic processes, cause reduced learning ability, disrupt the endocrine system,

and contribute to allergies, asthma and many other diseases.<sup>42</sup> However, small amounts of one form of *trans* fats naturally occurring in butter and meat fats are beneficial, not harmful.<sup>43</sup>

If exposure to *trans* fats is bad for adults, it is even worse for babies and children during their growing years. Formula makers know better than to put *trans* fats into baby formula—yet human milk will contain *trans* fats if the mother consumes margarine, fried foods and commercial baked goods. The Chinese study described above found that Canadians had thirty-three times more *trans* fats in their milk than the traditional Chongqing mothers who did not consume processed foods! Hong Kong mothers had four times more *trans* fats in their milk than the Chongqing mothers, reflecting the inroads that processed foods have made in westernized Hong Kong.

Many other bad things can end up in mother’s milk, including pesticides, flame retardants, fabric treatments like Scotchgard, Teflon from non-stick pans, mercury from amalgam fillings, and high levels of phytoestrogens, if the mother is eating soy foods or animal foods fed a lot of soy (such as chicken)—however, phytoestrogens in the milk of mothers who eat a lot of soy are still about three thousand times less than levels in soy-based formula.<sup>44</sup> Failure to thrive on mother’s milk may be due to the presence of environmental toxins.

#### MYTHS AND TRUTHS ABOUT BREASTFEEDING

MYTH: Every woman can breastfeed successfully.

TRUTH: Even in traditional societies, a portion of the women did not have adequate milk supply. Babies of mothers with inadequate milk supply were nursed by other women in the village or given milk of cows, goats, sheep, water buffalo, camels, reindeer or llamas.

MYTH: Most diets provide adequate nutrition for nursing mothers. There is no need for nursing women to add special foods to their diets. All human milk is equally nutritious.

TRUTH: Human milk will be lacking in vitamins A, D, B<sub>12</sub> and many other nutrients if the mother’s diet is poor. Human milk will also lack long-chain fatty acids if these are not present in adequate amounts in the mother’s diet. In addition, mothers on calorie-restricted diets will have lower levels of fat and lactose in their milk. Weston Price found that in traditional societies, women continued to consume special nutrient-dense foods during the lactation period.

MYTH: Breastfeeding can prevent dental problems such as cavities, crowded teeth and underdeveloped jaw.

TRUTH: The development of the face and jaw depends on the nutrients available to the child from preconception through childhood. Breastfed children can have dental deformities if their nutrition in the womb and the breastmilk they receive provides inadequate nutrients.

One study discovered peanut proteins in mother's milk and warned that lactating women who eat peanuts may cause peanut allergies in their infants!<sup>45</sup> Even mother's milk can cause allergies. Many mothers report fussiness in their babies after mom eats certain foods, especially foods containing MSG or gluten.

Thus a superlative maternal diet, one that contains plentiful amounts of nutrient-dense foods and is devoid of foods likely to contain industrial fats and oils, pesticides, MSG and empty carbohydrates, is essential if baby is to obtain maximum benefit from breastfeeding. Those who assure nursing mothers that all breastmilk is equally nutritious have done a great disservice to a whole generation of children.

### SUCCESSFUL BREASTFEEDING

First and foremost, continue with the nutrient-dense diet described in Chapter 1. Optimal nutrition is the fundamental requirement for optimal development in the breastfed baby.

A number of other practices can contribute to successful breastfeeding. Mom should insist on keeping baby with her immediately after the birth, with no separation for any exams or interventions. Even

if parents opt for various interventions, these can wait until after the first breastfeeding. Immediate skin-to-skin contact facilitates a flood of oxytocin and other hormones that tell mom to produce milk. Baby should be allowed to root, latch on and nurse for as long as he wishes.

These practices have been confirmed by studies demonstrating that early skin-to-skin contact improves bonding between mother and infant, and that infants who have early maternal contact nurse more effectively at the first feeding. In one study of infants separated from their mothers during the early stage of the hospital stay, only 37 percent were still breastfeeding at three months compared with 72 percent of infants not separated from their mothers.<sup>46</sup> Even premature infants benefit from skin-to-skin contact with the mother. To prevent heat loss during this bonding period, cover baby's back and head with a blanket.

It's important to let baby root out the breast on her own rather than force her to nurse. So be patient as baby roots around and finally latches on without assistance—baby's first accomplishment! This may take up to an hour—all the better for maternal bonding to take effect.

There are many positions that mom can use to

### SIGNS OF SUCCESSFUL BREASTFEEDING

- On-demand schedule of eight to twelve feedings per twenty-four hours.
- Infant mouth opens wide before latch-on.
- Latch-on includes entire nipple and most of the areola.
- Infant tongue placed under the nipple.
- Brief pauses in sucking with audible or visible swallowing.
- Infant breathing coordinated with suck and swallow cycle.
- Visible movement of jaw joint during active nursing.
- Wet diapers at least six to eight times per day.
- Baby seems content, with little crying.
- Adequate infant weight gain, with the following approximate milestones:
  - Return to birth weight by two weeks;
  - Weight gain of 4-7 ounces (112-200 grams) a week during the first month;
  - An average of 1-2 pounds (1/2-1 kilogram) per month for the first six months;
  - An average of one pound (1/2 kilogram) per month from six months to one year;
  - Growth in length by about one inch a month (2.5 cm) during the first six months.



breastfeed her baby, none of which has been shown to be better than any other for breastfeeding success. You should try a variety of holds to find the one that is most comfortable. Lightly brushing the breast against the cheek of your infant should provoke the rooting reflex followed by latch-on. If you are feeling nervous about the procedure, be sure to get help from your doula or midwife; in a hospital setting you can call on the services of a lactation consultant.

One very good reason for a natural childbirth, without anesthetics or drugs, has to do with the negative effect these drugs have on breastfeeding success. As early as 1961, researchers demonstrated that anesthetics given to the mom resulted in disorganized behavior in the infant and a delay in effective breastfeeding and weight gain.<sup>47</sup> These effects are greatest when the drugs are administered more than one hour before delivery (and hence in mother's bloodstream longer).<sup>48</sup>

Such drugs are delivered in spades during a C-section. Nevertheless, if an infant is put to the breast within the first two hours following delivery, long-term breastfeeding success is unaffected.<sup>49</sup> If you end up needing a C-section, be sure to insist on the same postpartum bonding that you would be afforded in a normal delivery.

Some women have reported that administration of magnesium sulfate (for the prevention of seizures in preeclamptic patients) hinders breastfeeding, al-

though no study data is available to evaluate these observations. Many more infants are exposed to Pitocin (synthetic oxytocin), used to induce labor; fortunately the drug has not been shown to interfere with breastfeeding.

Women who have a long labor have lower milk volumes five days after delivery;<sup>50</sup> likewise women who score higher in an exhaustion scale following labor have similar difficulties.<sup>51</sup> All the more reason to prepare yourself for labor with superlative nutrition and some of the techniques outlined in Chapter 4, so that labor is short and energy levels remain high.

During the first few days after birth, frequent breastfeeding leads to better long-term success.<sup>52</sup> This is best accomplished by having baby remain in mom's room for the entire postpartum stay, a practice referred to as rooming-in. Mom should nurse baby as often as baby indicates. In the case of a birth at home or a birth center, help at home during the first week or two allows mom to devote herself to nursing baby, eating well and getting enough rest. In some countries, home help is provided for one month after the birth. Exhaustion and stress can definitely have a negative effect on milk supply.

With rooming-in, mom can put a stop to any attempts by hospital staff to give a pacifier or bottle to her baby. Pacifier use has been associated with a fourfold drop in breastfeeding rates at six months compared to nonusers.<sup>53</sup> It is thought that both bot-

### NATURAL CANNABINOIDS IN BREASTMILK

In recent years, scientists have made the amazing discovery that the body produces cannabinoids, the same compound that is found in marijuana; and cannabinoids have been detected in human breast milk as well as bovine milk.<sup>54</sup>

Cell membranes in the body are naturally equipped with receptors which, when activated by cannabinoids, protect cells against viruses, harmful bacteria and cancer. The cannabinoids also stimulate hunger and promote growth and development. Other attributes of these natural feel-good chemicals include boosting immune function, protecting the brain and nervous system, relieving pain and protecting against inflammation.

There are none of these helpful compounds in infant formula. Breastfeeding supplies your baby with these appetite-stimulating yet soothing biochemicals, which the body assimilates and then clears without side effects; and if you can't breastfeed, a formula based on raw milk will supply them as well.

tles and pacifiers cause “nipple confusion” and contribute to breast refusal and less efficient sucking, especially when given in the very early days.

Signs of successful breastfeeding include a good latch-on, visible sucking and swallowing by the infant, frequent wet diapers and, most importantly, adequate weight gain. A small amount of weight loss after birth is normal. Infants should begin to regain weight by the fourth or fifth day of life and should exceed their birth weight by days ten to fourteen. If you have any doubts or concerns about weight gain, purchase or rent an infant scale and weigh your baby each day. Be sure to weigh your baby at the

same time every day, without diaper or clothes, and under the same circumstances, for example after a wet diaper and just before nursing.

#### DIAPER WATCH

Baby’s bowel movements can give a good indication of whether she is getting enough to eat and digestion is proceeding normally. For the first few days after delivery, the baby passes meconium, a dark green, almost black substance composed of materials ingested while in the womb. Meconium is passed during the first few days, and by the third day, the bowel movements start becoming lighter.

### SOME NATURAL REMEDIES FOR BREASTFEEDING PROBLEMS

Most important for breast health is a diet rich in saturated fats. Saturated fats will keep the nipples and breast tissue strong, resilient and resistant to infection. Arachidonic acid (AA) in animal fats helps create tight cell-to-cell junctures, so important for healthy skin.

**ENGORGEMENT:** Nursing after a hot shower can help with engorgement that causes poor milk flow. Massage breasts with thumbs toward the nipple as baby nurses to work out any lumps. If engorgement results in too much milk, a very strong sage tea can reduce the flow of milk. It is taken sip by sip, up to three cups a day. (See sidebar on Oversupply, page 137.)

#### MASTITIS

- Tincture of propolis, 10 to 15 drops twice a day.
- Tincture of echinacea, two dropperfuls, as often as twelve times a day. Continue taking echinacea for at least a week after all symptoms have cleared.
- Tincture of poke root (*Phytolacca americana*), no more than two drops of the tincture daily. May be combined with echinacea for acute and severe infections.

**POULTICES, COMPRESSES AND SOAKS FOR SORE BREASTS:** A poultice consists of fresh or cooked herbs placed directly on the breasts. A compress is prepared by soaking a cloth and applying it to the breasts. A soak is the application of hot water to the breasts.

Hot water alone has beneficial effects for women dealing with sore breasts, no matter what the cause. Hot water stimulates circulation and eases the tension in taut, swollen breast tissues. Herbs infused in the water used to compress or soak increase the effectiveness. Soak the breasts in a sinkful of warm water. Fill the sink, lean over, and immerse one or both breasts. You can massage the milk out while soaking to further relieve engorgement and ease pain.

When applying external remedies, frequent, consistent, short applications work better than sporadic, lengthy treatments. That is, six or seven treatments of five minutes each spread over the day will be more effective than one treatment lasting for thirty minutes. If infection is present, discard any plant material and wash the poultice cloths after each use so as to prevent the spread of the infection.

For a compress, place a handful of fresh or dried parsley or comfrey leaves in a clean cotton diaper and tie it closed with a rubber band. Put in a pan of water and simmer for ten to fifteen minutes. Apply the

Usually by the fifth day, the bowel movements take on the appearance of the normal breastmilk stool.

The normal breastmilk stool is pasty to watery, mustard colored, and usually has little odour. Curds from digested milk should be visible, in fact, the stool should look like yellow cottage cheese. There may be variations in color and consistency, but a baby who is breastfeeding only, and is starting to have bowel movements which are becoming lighter by the third day of life, is doing well.

Without becoming obsessive about it, monitoring the frequency and quantity of bowel motions is one

of the best ways of knowing whether your baby is getting enough milk. After the first three or four days, the baby should have increasing bowel movements so that by the end of the first week he should be passing at least two to three substantial yellow stools each day. Many infants have a stained diaper with almost every feeding.

Some breastfed babies, after the first three or four weeks of life, may suddenly change their stool pattern from many each day, to one every three days or even less frequently. Some babies have gone as long as fifteen days or more without a bowel movement. As long as the baby is otherwise well, and the stool

### SOME NATURAL REMEDIES FOR BREASTFEEDING PROBLEMS

hot (fresh) parsley as a poultice or use the (dried) herbs still tied in the diaper as a compress to ease swollen and painful breasts.

A cold poultice of grated raw potato can draw out the heat of inflammation, localize infection and unblock clogged tubes. Grated raw potato is applied directly to the breasts and covered with a clean cloth. When dry, it is removed and replaced with fresh grated potato.

Marshmallow roots can soothe tender tissues and sore nipples, open clogged ducts and tubes, powerfully draw out infection, and diminish the pain of engorged, inflamed breasts. Steep two ounces of dried marshmallow root overnight in half a gallon of water just off the boil. The texture of the finished brew should be slippery and slimy. Heat as needed, pouring the hot liquid into a sink or basin and soak your sore and aching breasts.

Infused herbal oils—such as those made from the flowers of calendula, elder or dandelion, or from the roots of yellow dock—can ease the pain of tender breasts and sore nipples. Buy them ready-made, or make them yourself: Gently warm a handful of dried or fresh blossoms in just enough olive oil to cover; keep warm for twenty minutes. Strain, cool and rub into nipples and breasts whenever there is pain or sensitivity.

#### SORE NIPPLES

- Crushed ice wrapped in a wet cloth, or a frozen gauze pad, applied to the nipples is a good local pain killer.
- Comfrey ointment softens and strengthens nipples at the same time. It is exceptionally soothing to sensitive nipples and rapidly heals any fissures or bruises.
- Yarrow leaf poultices—or yarrow infused oil—provide almost instantaneous pain relief and heal cracked nipples rapidly.
- Any of the poultices described for painful breasts may be used advantageously. Comfrey and marshmallow are especially effective. Many brief poultices work better than one or two lengthy sessions.
- The gel from a fresh aloe vera leaf will soothe and heal sore and cracked nipples.
- Calendula ointment is an old favorite to heal and strengthen the nipples.

SOURCE: susunweed@hvc.rr.com

is the usual pasty or soft, yellow movement, this is not constipation and is of no concern. No treatment is necessary or desirable. However any baby between five and twenty-one days of age who does not pass at least one substantial bowel movement within a twenty-four-hour period should be seen by a pediatrician. Generally, small, infrequent bowel movements during this time period mean insufficient intake.

### BREASTFEEDING CHALLENGES

Even if you have a plentiful milk supply, there are numerous challenges that breastfeeding moms may face. We describe a few of the major ones below.

#### WEAK SUCK

Premature or very small babies may have a weak sucking reflex, due to overall weakness or respiratory problems. The breast may continually come out of the baby's mouth, particularly when the mother shifts even slightly. Also, milk may leak out of the

baby's mouth while he is nursing. Assisting the baby to have a stronger suck and increasing the flow of milk are the keys to overcoming a weak suck.

Aside from ensuring that the baby's latch-on and positioning are correct, cheek and jaw support are essential. You will need to hold baby's face right up to the breast and help close the mouth onto the nipple. If baby really is too weak to suckle, you can give expressed breast milk with a syringe or eye dropper until he gains enough strength to breast-feed.

One cause of weak suck is the condition of tongue tie. When a baby has a restrictive or tight frenulum (tongue tie), it can impair the ability of the tongue to move properly to effectively breastfeed. The frenulum is a piece of tissue that attaches the tongue to the floor of the mouth.

A tight frenulum can be remedied with a procedure called a frenotomy, in which the frenulum is clipped. It can be performed in the pediatrician's of-

### WHEN BREASTFEEDING MAY NOT BE BEST

**GALACTOSEMIA:** This is a rare genetic disorder in which the infant cannot digest galactose. The child will die if it is breastfed. A cautionary note: If your baby has been diagnosed with galactosemia, be sure to have the test done again. False positives from this test are common. Our liver-based formula, made with sugar instead of lactose, can be used for cases of galactosemia.

**VEGANISM:** The milk of vegan mothers will be lacking in vitamin D, vitamin B<sub>12</sub>, and important long-chain fatty acids. If a vegan mother insists on breastfeeding, her baby's diet should be supplemented with cod liver oil, egg yolks and liver, all animal foods.

**JUNK FOOD DIET:** Junk foods full of *trans* fatty acids will reduce the fat content of mothers' milk and cause *trans* fatty acids to be present in mothers' milk. Homemade whole food baby formula will be more nutritious than the milk of mothers on a junk food diet.

**INSUFFICIENT MILK SUPPLY:** This is uncommon, but not as rare as is indicated in the medical literature. A supplemental homemade formula should be given using the Lact-Aid breastfeeding aid ([www.lact-aid.com](http://www.lact-aid.com)).

**ADOPTED BABIES:** It has been reported that breast milk has been stimulated in non-biologic mothers, but this phenomenon is rare. Strong hormonal drugs that stimulate breastmilk can be given, hormones that can come through the milk—not a good idea! Adopted babies should be given homemade baby formula.

**IN VITRO PREGNANCY:** Many hormones are given to mothers who get pregnant by these high-tech methods, and these hormones can pass into breastmilk. As with adopted babies, babies born from in vitro fertilization should be given the homemade formula.

fice and often results in immediate resolution of the latch-on problem.<sup>55</sup> Dentists report that the tongue tie is best dealt with in the newborn period.<sup>56</sup>

### POOR LATCH-ON

This is a common breastfeeding challenge. A baby who does not take the breast correctly will not get as much milk and mom will probably end up with sore nipples. If baby has poor latch-on, you will need to help her. Sit in a relaxed, comfortable position and position baby's head and body to face your breast with her mouth at the level of your nipple. Pull her in close so she does not have to turn her head or strain her neck to reach your nipple.

Cup your breast in your hand, with your fingers and palm underneath and thumb on top, well behind the areola. Avoid holding the nipple itself between your two fingers as this will interfere with latch on. Express a few drops of milk. Using your milk-moistened nipple, gently massage your baby's lips,

encouraging her to open her mouth wide. As she opens wide, direct your nipple slightly upward and toward the center of her mouth while pulling her close to you, so that her mouth will close down over your areola. The important thing is to get baby's mouth on the nipple when the mouth is wide open and then keep baby pressed close to you so that the nipple is still in the mouth when she closes it.

Make sure your baby feeds from the areola, not just the nipple. To prevent painful breastfeeding, her gums should take in a one-inch radius around the nipple as she latches on.

### CLOGGED MILK DUCTS

If you develop a tender lump somewhere in your breast, it may mean that a duct leading from the milk-producing glands to the nipple is blocked with milk. This is a condition that needs immediate treatment as a clogged milk duct can easily become infected. To treat a clogged duct, apply a warm moist

## WHEN BREASTFEEDING IS FINE, IN SPITE OF CONTRARY MEDICAL ADVICE

**PHENYLKETONURIA:** This is a rare genetic disorder in which the infant must avoid phenylalanine, an amino acid. With careful medical supervision, these children have been successfully breastfed in combination with a phenylalanine-free protein substitute.

**HIV POSITIVE:** Mothers who test HIV positive are told not to breastfeed. But a South African study found that the HIV virus is much less likely to be passed to breastfeeding infants when the mother's diet contains sufficient vitamin A.<sup>57</sup> So cod liver oil is a must if you have HIV and are nursing an infant. Other studies indicate that breast milk antibodies help neutralize HIV.<sup>58</sup>

**DIABETES:** Although diabetic mothers are often warned not to breastfeed, breastfeeding actually diminishes complications in the infants of diabetic mothers. Once again, adequate maternal nutrition is vital.

**JAUNDICE:** Breastfeeding actually helps clear jaundice in the infant. As long as bilirubin levels are less than 20 milligrams, no special supplements are needed. You should not be put off by any suggestions to stop breastfeeding for a day or two or that your milk is somehow bad for your baby. As long as your baby is otherwise healthy, jaundice is short-lived and harmless. If your baby's jaundice is related to other health problems, your milk is very valuable for him and you should continue to breastfeed.

**BREAST INFECTION:** Going for long stretches between nursing or failing to empty the breast completely may contribute to mastitis. In most situations, breastfeeding can continue even though there is a breast infection—in fact breastfeeding may help to clear up the infection faster. For dietary suggestions and other holistic remedies, see pages 130-131.

**LYME DISEASE:** Women with Lyme disease are told they can pass the illness on to their babies if they breastfeed. But several studies show that the Lyme organism is not passed through human breast milk.<sup>59</sup>

washcloth to the area for a few minutes before feeding.

Breastfeed on the sore side first as baby is more likely to dislodge the plug at the beginning of a feeding when her sucking is strongest. As baby nurses, gently massage the area down toward the areola to encourage the plug to clear.

Plugged ducts often occur when your infant is nursing less frequently, for example, when you start back to work, or when baby sleeps longer at night. Even if you are nursing less frequently, be sure to completely empty the breasts by expressing milk or using a breast pump. Avoid tight bras and sleeping on your stomach, as both can put unnecessary pressure on your breasts.

## CRACKED AND SORE NIPPLES

In the case of sore nipples, an ounce of prevention is worth a pound of cure. A suggested preventive measure for cracked and sore breasts from the old days is the daily application of rubbing alcohol (methylated spirits) or diluted lemon juice to the nipples, starting about a month before the birth. If you can, expose the nipples and breasts to sunlight each day, gradually increasing from thirty seconds to three minutes. Olive oil, sweet almond oil, lanolin or comfrey ointment rubbed into the nipples throughout the later part of pregnancy can also help. Most importantly, do not wash the nipples with soap, which can cause drying, chapping and tearing.

Breastfeeding may be uncomfortable during the first few days, but it should not lead to cracked and sore

## PROBIOTICS FOR BABY

Probiotics are beneficial bacteria that proliferate in the digestive tract. In a healthy human being, the entire digestive tract is lined with a biofilm composed of billions of beneficial microorganisms. These play many important roles, protecting the digestive tract, preventing the absorption of pathogens and toxins, protecting against infection, and aiding in digestion and the production of nutrients. In fact, digestion is impossible without beneficial bacteria.

Before birth, baby's digestive tract is thought to be sterile. During a normal birth, to a mother with healthy intestinal flora, baby's gut is colonized by the beneficial bacteria he picks up in the birth canal. Mother's milk also provides beneficial flora, plus factors that encourage the growth of this flora, including special sugars, called oligo-saccharides, that the bacteria feed on.

Colic, fussiness, poor digestion and frequent bouts of infectious disease in infants may be signs of inadequate intestinal flora. Infants born by C-section or to mothers who have used antibiotics, suffer from *Candida* overgrowth or who otherwise have less-than-healthy intestinal flora may need a probiotic supplement. In the premature infant, use of probiotics greatly reduces the incidence of serious infection<sup>60</sup> and encourages weight gain.<sup>61</sup>

In a recent study, one week of supplementation with a probiotic microorganism called *Lactobacillus reuteri* *Protectis* reduced crying time in colicky babies by 74 percent, compared with 38 percent with placebo. These results are in line with other studies.<sup>62</sup> Thus, for the colicky baby, a good probiotic supplement should be the first line of treatment. They are also recommended for babies suffering from diarrhea and other digestive disorders, as well as frequent infections. In response to a growing body of evidence demonstrating the effectiveness and safety of probiotics for infants, some formula makers are adding them to commercial infant formula. Our own homemade formula contains probiotics specifically beneficial to infants.

When choosing a probiotic for your baby, be sure that the supplement is designed for infants, who have a different balance of organisms in their guts than adults (see Sources).

nipples. A common cause of persistent nipple pain is poor latch-on by baby. Make sure that baby takes your breast with her mouth wide open and closes it on the entire areola, not just the nipple. Be sure your baby's tongue is between his lower gum and your breast—if you pull down gently on baby's lower lip, you should be able to see her tongue. A lactation consultant can often help with latch-on problems that lead to nipple pain. Avoid using creams containing steroids, antibiotics and painkillers, as these can have a negative effect on both mother and baby. For natural remedies, see Sidebar on page XX.

## BREAST INFECTIONS

Breast infections—called mastitis—commonly occur between two and six weeks after birth, but they may appear at any time after delivery, or even before delivery. Typical symptoms of mastitis are painful engorgement, hot and tender breasts, redness, fever, an overall flu-like feeling, headache and reduced milk supply. The best treatment for breast infections is prevention through diet—with liberal amounts of saturated fat, strictly limiting sugar and including lacto-fermented foods on a daily basis.

Although mastitis can be painful, mom can continue nursing in spite of the infection. There is no danger of the infection being passed on to the infant through nursing. In fact, continued nursing will benefit the mother, as infections tend to clear up more rapidly when breastfeeding is continued. However, occasionally the infant may not want to nurse at the affected breast because the milk tastes sour. In such cases, mom can still nurse from her unaffected breast and express or pump the milk from the breast with mastitis.

The conventional treatment for mastitis is antibiotics, but there are also dietary and herbal remedies (see pages 130-131). Get plenty of rest, increase your dose of cod liver oil and drink bone broths frequently. A tablespoonful of coconut oil added to a mug of broth is an excellent remedy. You may also benefit from taking a natural form of vitamin C.

In addition, make sure your bra gives full support. You will be most comfortable if your infected breast is properly supported in a nursing bra. When you nurse, offer your infected breast first so that it is emptied fully, reducing pressure from fullness. Do

not suddenly wean because of a breast infection as this may contribute to the formation of an abscess, complicating the mastitis and possibly even requiring surgery.

## BREASTFEEDING JAUNDICE

Jaundice, also known as hyperbilirubinemia, causes a yellow tinge in the skin and eyeballs of newborn infants, especially during the first week or two. Jaundice happens because babies are born with more red blood cells than they need. When the liver breaks down these excess cells it produces a yellow pigment called bilirubin. Because the newborn's immature liver can't dispose of bilirubin quickly, the excess yellow pigment is deposited in the eyeballs and skin of the newborn. Jaundice tends to be more common in breastfed babies and to last a bit longer, but this is no reason to discontinue breastfeeding. Jaundice is also more common in premature infants, who are less able to cope with excess bilirubin.

Most cases of jaundice are not harmful and will clear on their own. Once the newborn's bilirubin-disposal system matures and the excess red blood cells diminish, the jaundice subsides, with no harm to the baby.

In some situations, such as an incompatibility of blood types between mother and baby, jaundice may be the result of problems that go beyond the normal breakdown of excess red blood cells. In rare instances, the bilirubin levels can rise high enough to damage baby's brain. For this reason, if the physician suspects that something more than normal physiologic jaundice is the cause of baby's yellow color, bilirubin levels will be monitored more closely using blood samples. If the bilirubin level gets too high, your doctor may try to lower the bilirubin level using phototherapy, special lights that dissolve the extra bilirubin in the skin, allowing it to be excreted in the urine.

In most cases, however, it is not necessary to treat jaundice when bilirubin levels are less than 20 milligrams, and you can continue to breastfeed. In fact, it helps to breastfeed as frequently as possible. The more often you breastfeed, the more quickly bilirubin will exit your baby's body via his stools. Resist any attempts to give your baby bottles of sugar water. The practice has been shown to be ineffec-

tive and may even aggravate the jaundice, because babies whose tummies are full of glucose solutions may nurse less often, reducing their milk intake and the opportunities for bilirubin excretion in stools.

If high bilirubin levels make phototherapy treatment necessary, talk to your healthcare provider about alternatives to placing baby in the hospital nursery under phototherapy lights. For most babies a photo-optic bilirubin-blanket (phototherapy lights that wrap around the baby) works well (see Sources). You can hold and breastfeed your baby at home while the lights dissolve the bilirubin.

Brief daily exposure to the sun, with baby in diaper only, is also very effective.

### FUSSINESS, GAS AND SPITTING UP

Babies are sometimes fussy after eating. They may spit up, have gas or discomfort, or may squirm as they have a bowel movement.

The most important way to prevent discomfort is to burp your baby! Yes, even the most experienced baby nurse or lactation consultant may forget to tell new mothers about this old fashioned but most important practice. Place a towel or diaper on your shoulder and place baby upright against your body with her head facing over your shoulder. Gently rub baby's back until she burps. She may also spit up a small amount. None of this is anything to worry about and the burping will quickly ease most discomfort.

Another important tip: be sure that baby empties your breast when he nurses. The hind milk is much richer in fat than the fore milk, and that fat will keep baby contented for longer. If mom has lots of milk, she should only nurse one breast per nursing. If mom is struggling with supply, she can nurse both breasts, but she should be sure that each breast is completely emptied.

Babies may be fussy because of something mom has eaten. Some mothers find that baby will be fussy after they have eaten garlic or crucifers like cabbage, or gluten-containing foods like wheat. If you eat processed food, the MSG it contains may well make baby cranky—just another reason to avoid processed foods! Pasteurized dairy in mom's

diet can also cause lots of gas and spitting up.

Babies are often fussy at certain times of the day—often in the late afternoon or evening when mom may be tired also. Having someone else to hold and walk around with baby may offer welcome relief during this “witching hour.” Baby may want to nurse more frequently at this time, or, she may just want to observe the goings-on in a busy household. A baby seat on the kitchen counter where baby can watch you prepare a meal may be just the ticket. (Be sure baby is strapped in and *never* turn your back on baby. If you must leave the room momentarily, place the baby seat on the floor.) On the other hand, some babies may become overloaded with unfamiliar sights and sounds. Too much activity and noise during baby's day may make him fussy by evening.

### COLIC

If baby cries loudly after feeding, it's a sign that he is either still hungry or in pain.

If you know that baby is getting enough milk, but cries vigorously for long periods of time, despite your best efforts to console, baby may be crying due to the pain of colic. Often the crying occurs around the same time each day or night, usually after feedings. Baby may show signs of gas, discomfort and abdominal bloating or have a hard, distended stomach. She may cry with knees pulled to the chest, clenched fists, flailing arms and legs, and an arched back.

Experts disagree on the causes of colic. The best explanation is that the newborn digestive system is not mature enough to function properly. Muscles that support digestion have not developed the proper rhythm for moving food efficiently through the digestive tract. A lack of benevolent bacterial flora may exacerbate the problem.

To make matters worse, infants often swallow air while feeding or during strenuous crying, which increases gas and bloating, further adding to their discomfort.

Gentle rubbing of baby's stomach may ease her pain. Rub gently from the lower right hand side of the abdomen up to the bottom of the rib cage, then across to the left and down, in the direction of the



colon; or, put baby on your shoulder and rub her back.

Mom may find that avoiding certain foods like onions or garlic helps relieve the cry of colic in her baby. Pasteurized dairy in mom's diet can lead to colic. Sometimes increasing probiotic foods in mom's diet can help, even taking a probiotic supplement. (One suggestion is to put the probiotic powder, mixed with a little water, on your nipple while you are breastfeeding.) And while some mothers will need to avoid gluten-containing grains, soaked and cooked grains such as oats in mom's diet have relieved fussiness in their nursing babies in more than a few instances. Mom should be on a full diet while breastfeeding, not a diet that eliminates important carbohydrate foods, such as the GAPS diet.

A homeopathic remedy called Colic Calm Gripe

Water, available online and in select health food stores and health practitioners' offices may help with baby's colic (see Sources). Be sure to avoid products containing sodium bicarbonate as this will raise the natural pH of baby's stomach acid and make digestion more difficult. In addition, products containing essential oils should not be taken internally.

Gentle chiropractic treatment can help with colic in some cases.

Whatever the cause, colic usually resolves by twelve to sixteen weeks.

#### MILK SUPPLY

Persistent crying after nursing, or at any time, should raise the suspicion of inadequate or under-

### OVERSUPPLY

Although concern about not having enough milk is the number one reason that mothers wean their babies early, having too much milk can also be a problem. When you consider the fact that many women can't produce enough milk for their babies no matter what they do, then having too much milk is a relatively good breastfeeding problem to have, and is usually fairly easy to resolve.

Babies whose moms have too much milk will often exhibit symptoms such as fussing, pulling off the breast, colicky crying, gassiness, spitting up and hiccupping. They may want to nurse frequently, and they may gain weight more rapidly than the average baby, or they may gain weight more slowly than the average baby. Their stools may be green and watery, and their bottoms may be red and sore. The mother's letdown reflex may be so forceful that the baby chokes, gags and sputters as he struggles with the jet of milk that sprays too quickly into his mouth.

Mothers who produce too much milk may suffer from full, engorged breasts, plugged ducts and mastitis. Sometimes they feel a few seconds of intense pain as the letdown reflex occurs, because it is so forceful.

When mom has an oversupply of milk, baby may end up getting too much foremilk, which is rich in lactose, and not enough hind milk, which is rich in fat. The overabundance of lactose may be hard for baby to digest, leading to gas and fussiness; and the lack of fat may lead to low blood sugar, crankiness and the need to nurse frequently. The solution is to give one breast only during a feeding so that it is emptied completely. You may want to express a small amount of milk before nursing so that your letdown reflex is not so strong.

A suggested herbal remedy is sage tea, which contains a natural form of estrogen that can decrease your milk supply. Discontinue use when your supply begins to level out.

Moms who produce a lot of milk may want to donate to a milk bank or even give or sell their milk to mothers who do not produce enough. For information on donating milk, contact the Human Milk Banking Association of North America at [www.hmbana.org](http://www.hmbana.org). Moms with bountiful supply should also keep some on hand frozen for emergencies.

nutritious milk supply. You would cry also if you were not being fed enough or not receiving adequate fat and other nutrients and had no other way to express yourself.

According to most breastfeeding proponents, insufficient milk supply is rare. The problem, they say, is not a deficiency in the mammary gland, but a “shared belief” among women or health workers “that insufficient milk is a common phenomenon.” Baby’s frequent crying, they say, should not be interpreted as a sign of insufficient or poor quality milk—even though this is what a mother’s instincts tell her. According to a La Leche League handbook, “The word ‘insufficient’ is like the word ‘inadequate’—once it has been directed at a mother it can never be retracted, and her confidence in her body’s ability to nurture and nourish at the breast often plummets.”

Yet ancient medical literature abounds in treatments for lactation failure.<sup>63</sup> Concern about milk supply is not a modern phenomenon, inculcated by evil formula manufacturers in order to sell more formula—although the formula makers are indeed quick to exploit this concern. Most traditional cultures use special foods or “galactogogues” in the belief that they increase milk flow, ranging from powdered earthworms in India, to fish soup in China and Japan, to a variety of special teas. Soup made from roosters is a galactogogue used in several areas of the world. Weston Price recorded the practice of special feeding for pregnant and lactating women. The foods given were animal foods rich in fat-soluble vitamins and, in a few cases, soaked cereal gruels.

Mothers from all societies and in all ages have naturally been concerned about having enough milk for their infants. An 1885 votive painting from Japan depicts a mother praying for an abundant milk supply for her newborn infant.<sup>64</sup> The adjoining painting shows her prayer answered, as milk flows from her breast to a bowl. If adequate milk were automatic for all women, they would have no need to offer prayers. In fact, there is a large variation in the amount of milk that women produce—some women can squirt their milk across the room while others manage to extract only a couple of ounces total after using a breast pump throughout the day.

Until recently, breastfeeding literature dismissed the notion of galactogogues as mere superstition, but these attitudes are changing. Many websites now recommend herbs like fenugreek and milk thistle to increase milk supply, and galactagogue herbal formulations are widely available.

The production of milk is a complicated process governed by a complex interaction of hormones, involving the hypothalamus, pituitary gland and thyroid gland. It would be amazing if this were the one system in the body that functioned well at all times; the claim that most, or almost all women can successfully breastfeed their babies is especially inappropriate in this era of industrial food and ubiquitous endocrine disruptors.

Thyroid hormone and iodine are essential to initiate breastfeeding, and the need for thyroid hormone and iodine is increased during pregnancy. If you have a history of poor thyroid function, breastmilk production may indeed be inadequate. Foods that support thyroid healing include cod liver oil (for vitamin A, needed for the production of thyroid hormones), butter (a source of iodine) and seafood, including seaweed (also sources of iodine). You may need treatment with thyroid hormone to get breastmilk flowing.

The two hormones that govern the last stages of milk production are prolactin and oxytocin. Milk production occurs in the epithelial cells of the mammary gland in response to prolactin activation of prolactin-receptors. Prolactin production is inhibited by a number of compounds including bromated pharmaceuticals and dopamine antagonists.<sup>65</sup> Women under stress and fatigue produce more dopamine, norepinephrine or both, which inhibit prolactin production. This is why the environment for the nursing mother should be as relaxed and as stress-free as possible; but for many women, burdened by domestic strife or financial worries, a stress-free environment may be impossible to achieve.

The other important hormone involved in milk ejection or the let-down reflex is oxytocin. When the newborn begins suckling, oxytocin is released from the posterior pituitary gland—or should be—after synthesis in the hypothalamus; its physical effects in women include uterine contractions to facilitate labor. During the first few weeks of breastfeeding,

## THE SCANDAL OF COMMERCIAL FORMULA

In addition to the slew of industrially produced macro-nutrients in commercial formula, manufacturers have begun adding compounds claimed to render formula more like breast milk. Two of these are the long-chain fatty acids DHA (an omega-3 fatty acid) and arachidonic (AA or ARA, an omega-6 fatty acid). High levels of these fats in mother's milk are associated with optimal brain development; unfortunately, the DHA and ARA added to commercial formula are extracted from algae and soil fungus using chemicals such as hexane, acid and bleach. Formula makers insist that no traces of these chemicals have been found in the infant formula to which they are added. However, the real concern is rancidity. DHA and ARA are extremely fragile and likely to be highly damaged during the manufacturing process. This may explain high rates of diarrhea observed by nurses in babies put on these formulas. And there is no evidence whatsoever that these additives will make babies smarter, as the formula makers imply.

According to FDA edict, all formulas today contain added iron, which is contraindicated in the first six months because it competes with zinc, needed for neurological function and the formation of many important enzymes. Another potential source of toxins in formula is the packaging. Lining of the cans may contain bisphenol-A (BPA), shown to alter hormone levels. BPA can leach into both liquid and powdered formulas, although much lower levels are found in powdered formulas. A final concern is contamination with pathogens. There have been many recalls of commercial formula, due to contamination with harmful microorganisms and other substances—including broken glass! Listed below are the ingredients in two popular brands of formula:

**MOM-TO-MOM MILK-BASED INFANT FORMULA WITH IRON.** "This formula provides complete nutrition for my baby's first year." Essential Nutrition Based on Milk with DHA & ARA, nutrients found naturally in breast milk; Prebiotic dietary fiber to support babies' immune system; Meets FDA Requirements: Nonfat milk, lactose, vegetable oil (palm olein, soy, coconut and high oleic safflower or sunflower oil), whey protein concentrate, maltodextrin, galacto-oligosaccharides. And less than 1%: mortierella oil (a source of arachidonic acid ARA), crypthecodinium oil (a source of docosahexaenoic acid DHA), vitamin A palmitate, beta-carotene, vitamin D<sub>3</sub>, vitamin E acetate, mixed tocopherol concentrate, vitamin K<sub>1</sub>, ascorbyl palmitate, thiamine hydrochloride, riboflavin, vitamin B6 hydrochloride, vitamin B<sub>12</sub>, niacinamide, folic acid, calcium pantothenate, biotin, ascorbic acid, choline chloride, inositol, calcium carbonate, calcium chloride, calcium hydroxide, magnesium chloride, ferrous sulfate, zinc sulfate, magnesium sulfate, cupric sulfate, potassium bicarbonate, potassium iodide, potassium hydroxide, potassium phosphate, sodium selenite, sodium citrate, taurine, l-carnitine, monoglycerides, soy lecithin, nucleotides (adenosine-5'-monophosphate, cytidine-5'-monophosphate, disodium guanosine-5'-monophosphate, disodium inosine-5'-monophosphate, disodium uridine-5'-monophosphate). \$4.99 for 8 ounces, 227 grams, about two days' worth.

**SIMILAC ADVANCE INFANT FORMULA, Complete Nutrition for your Baby's 1st Year. Closer Than Ever to Breast Milk.** Nonfat milk, lactose, high oleic safflower oil, coconut oil, galacto-oligosaccharides, whey protein concentrate. Less than 2%: Cohni oil (a source of docosahexaenoic acid DHA), alpine oil (a source of arachidonic acid ARA), beta-carotene, lutein, lycopene, potassium citrate, calcium carbonate, ascorbic acid, soy lecithin, potassium chloride, magnesium chloride, ferrous sulphate, choline bitartrate, choline chloride, ascorbyl palmitate, sodium chloride, taurine, m-inositol, zinc sulphate, mixed tocopherols, d-alpha-tocopheryl acetate, niacinamide, calcium pantothenate, l-carnitine, vitamin A palmitate, cupric sulfate, thiamine chloride hydrochloride, riboflavin pyridoxine hydrochloride, folic acid, manganese sulphate, phyloquinone, biotin, sodium selenite, vitamin D<sub>3</sub>, cyanocobalamin, calcium phosphate, potassium phosphate, potassium hydroxide and nucleotides (adenosine-5'-monophosphate, cytidine-5'-monophosphate, disodium guanosine-5'-monophosphate, disodium inosine-5'-monophosphate, disodium uridine-5'-monophosphate). \$13.29 for 12.4 ounces, 352 grams, about three days' worth.

## THE TRAGEDY OF SOY INFANT FORMULA

Just say NO to infant formula based on soy. Soy is a toxic plant, with many entries in the FDA toxic plant database.<sup>66</sup>

- High levels of phytic acid in soy reduce assimilation of calcium, magnesium, copper, iron and zinc. Phytic acid in soy is not neutralized by ordinary preparation methods such as soaking, sprouting and long, slow cooking, but only with long fermentation. High-phytate diets have caused growth problems in children.
- Trypsin inhibitors in soy interfere with protein digestion and may cause pancreatic disorders. In test animals, soy containing trypsin inhibitors caused stunted growth.
- High levels of oxalic acid in soy can cause kidney stones, or stones anywhere in the body.
- Soy phytoestrogens disrupt endocrine function and have the potential to cause infertility and to promote breast cancer in adult women.
- Soy phytoestrogens are potent antithyroid agents that cause hypothyroidism and may cause thyroid cancer. In infants, consumption of soy formula has been linked to autoimmune thyroid disease.
- Vitamin B<sub>12</sub> analogs in soy are not absorbed and actually increase the body's requirement for B<sub>12</sub>.
- Soy foods increase the body's requirement for vitamin D. Toxic synthetic vitamin D<sub>2</sub> is added to soy milk.
- Fragile proteins are over-denatured during high temperature processing to make soy protein isolate and textured vegetable protein. Thus the protein in soy is less available to the infant.
- Processing of soy protein results in the formation of toxic lysinoalanine and highly carcinogenic nitrosamines.
- Free glutamic acid or MSG, a potent neurotoxin, is formed during soy food processing, and is present even if not labeled.
- Soy formula contains high levels of aluminum, which is toxic to the nervous system and the kidneys.
- Babies fed soy-based formula have 13,000 to 22,000 times more estrogen compounds in their blood than babies fed milk-based formula. Infants exclusively fed soy formula receive the estrogenic equivalent of at least four birth control pills per day.
- Male infants undergo a testosterone surge during the first few months of life, when testosterone levels may be as high as those of an adult male. During this period, baby boys are programmed to express male characteristics after puberty, not only in the development of their sexual organs and other masculine physical traits, but also in setting patterns in the brain characteristic of male behavior.
- In animals, studies indicate that phytoestrogens in soy are powerful endocrine disrupters. Soy infant feeding—which floods the bloodstream with female hormones that inhibit testosterone—cannot be ignored as a possible cause of disrupted development patterns in boys, including learning disabilities and attention deficit disorder. Male children exposed to DES, a synthetic estrogen, had testes smaller than normal on maturation and infant marmoset monkeys fed soy isoflavones had a reduction in testosterone levels up to 70 percent compared to milk-fed controls.
- Almost 15 percent of white girls and 50 percent of African-American girls show signs of puberty, such as breast development and pubic hair, before the age of eight. Some girls are showing sexual development before the age of three. Premature development of girls has been linked to the use of soy formula and exposure to environmental estrogen-mimickers such as PCBs and DDE.
- Intake of phytoestrogens even at moderate levels during pregnancy can have adverse affects on the developing fetus and the timing of puberty later in life.

For more information and references: [www.westonaprice.org/soyalert](http://www.westonaprice.org/soyalert)

this dual action of oxytocin can cause mildly painful contractions in the uterus.

Oxytocin analogues like Pitocin are sometimes used to encourage uterine contractions and to help placental coagulation after the baby is delivered. Pharmaceutical oxytocin inhibitors do exist—used in some countries to suppress premature labor—so it is safe to assume that oxytocin production and release can be inhibited in a variety of ways, starting with problems in the hypothalamus. Oxytocin nasal sprays are marketed for the treatment of fearfulness and anxiety, with the suggestion that they could be used to stimulate the letdown of milk for easier breastfeeding.

Consumption of *trans* fats lowers the overall fat content of mother's milk.<sup>67</sup> The poor quality of the American diet, including *trans* fatty acids in commercial foods, is another reason why so many mothers abandon breastfeeding after the first few weeks—even if milk flow is abundant, baby is not happy with the quality of milk that she is getting from the breast.

A Norwegian study found that higher levels of testosterone in women during pregnancy and postpartum negatively affect the development of glandular tissue in the breast, leading to lower milk output.<sup>68</sup>

According to a University of Rochester Medical Center study, exposure to dioxins during pregnancy harms the cells in rapidly changing breast tissue, leading to lower milk supply. Researchers found that dioxin alters the induction of milk-producing genes, which occurs around the ninth day of pregnancy, and decreases the number of ductal branches and mature lobules in the mammary tissue. When exposure occurs very early in pregnancy, but not

later, sometimes the mammary glands can partially recover from the cellular injury.<sup>69</sup>

According to B. Paige Lawrence, PhD, an author of the study, three to six million mothers worldwide are either unable to initiate breastfeeding or unable to produce enough milk to nourish their infants.

According to Marianne Neifert, MD, author of *Great Expectations: The Essential Guide to Breastfeeding*, about fifteen percent of women experience inadequate breastmilk supply. She notes that about four percent of women experience lactation failure due to insufficient glandular tissue in the breasts. Absence of typical breast changes during pregnancy and failure of postpartum breast engorgement are signs of congenital inability to breastfeed. It's important—and usually a relief—for these women to understand that lactation failure is not due to poor technique.

According to Neifert, “Preserving the ‘every woman can nurse’ myth contributes to perpetuating a simplistic view of lactation and does a disservice to the small percentage of women with primary causes of unsuccessful lactation.”<sup>70</sup>

According to Diana West, IBCLC, a coauthor of *The Breastfeeding Mother's Guide to Making More Milk*, “We're seeing a dramatic increase in the number of women who have primary problems, possibly because of environmental contaminants. Lactation consultants around the world are reporting increases in the numbers of women who can't produce enough milk.” West also notes that interventions are allowing women to get pregnant when they wouldn't otherwise, causing babies to be born to women who might not have fully functional reproductive systems. For example, women with

### RECIPE FOR LACTATION TEA

1 ounce blessed thistle, dried  
 1 ounce raspberry or stinging nettle leaf, dried  
 1 teaspoon per cup aromatic seeds such as anise, caraway, coriander, cumin, dill or fennel

Place the leaves in a half gallon jar and fill to the top with boiling water. Cap tightly and let steep overnight. Strain and refrigerate the liquid. Before nursing, heat 1 cup of the brew to near boiling and pour over 1 teaspoon of any of the aromatic seeds. Allow to brew for five minutes. Sip slowly during the nursing period.

SOURCE: Susun Weed

polycystic ovarian syndrome (PCOS) tend to have lower amounts of functional breast tissue.

Even women who start off with a good supply of milk may have ups and downs. When your period starts again, milk supply may drop, and also drop before the beginning of each period; it soon picks up again. Sometimes babies have a growth spurt when they are ravenously hungry, and it may take a few days for mom to catch up. The important thing is to keep nursing, keeping the breast stimulated, and, if need be, pump to encourage more production. You can also give the homemade formula using a breastfeeding aid. With the breastfeeding aid, the formula is put into a plastic bag that has a small tube which allows the baby to suck both from the tube and the breast (see Sources).

### INCREASING BREAST MILK SUPPLY

Your baby has a very good way of telling you that she is not getting enough to eat: it's called crying! Crying may also be baby's way of telling you that she not getting enough nourishment from your milk, even though your supply may be good. If baby cries after nursing, and in addition is not gaining weight, it's a sure sign that either the amount or the quality of your milk is inadequate—a situation that calls for immediate attention.

Increasing caloric intake—especially intake of good fats—and nursing frequently can sometimes solve the problem, especially during the first few weeks after birth. Nurse every hour if need be, and at least once at night. Remember that the hind milk, the last milk out of the breast, contains the most fat and therefore is the most satisfying milk for baby. In addition, it is important for the breast to completely

drain in order to stimulate increased milk production.

Carry your baby a lot to get the oxytocin flowing, but not to the point of exhaustion.

Manual expression of milk may help get milk flowing. In the case of a small baby with a weak suckling reflex, expressed milk may be given with an eyedropper or a syringe until baby becomes stronger and can nurse effectively.

To express milk manually, gently massage the breast to start the milk moving down the ducts. Work evenly around the breast, stroking repeatedly downward toward the areola. Then, starting about halfway up the breast, run your thumb firmly down. As it reaches the edge of the areola, press in and up and the milk will squirt from the nipple. You will want a scrupulously clean container to catch the milk. You can even express milk directly into baby's mouth as she nurses, to increase your supply. Repeat all the way around the breast. Do not squeeze the nipple as this will close the ducts, nor continue expressing until you think the breast is empty. Stop when the milk starts coming in drips rather than jets.

Don't hesitate to call in the help of a gentle and understanding lactation consultant—some consultants can leave mothers in tears, with the impression that low milk supply is due to faulty technique. But a good lactation consultant can be just the ticket to increasing your confidence and ensuring that the breastfeeding goes smoothly.

### THE BREAST PUMP

In situations of low breastmilk supply, the breast

### DONATED BREASTMILK

One solution to inadequate supply, or for babies who have been adopted or whose mother has died, is shared human breastmilk. Unfortunately, the human milk in breastmilk banks is pasteurized, but there are many informal sharing networks that can help you find direct donations of breastmilk (see Sources).

The downside is that the donating mother's diet may be very poor and her milk, albeit plentiful, inadequate to fully nourish an infant. You will want to make inquiries about the mother's diet before using her milk; and you should carefully observe her baby. If baby is rosy and robust, it's a sign that mother's milk is nutrient-dense. But if baby is pale and whiney, it's best to look for another source or use our homemade formula.

## COW'S MILK FORMULA

Makes 36 ounces.

Our milk-based formula takes account of the fact that human milk is richer in whey, lactose, vitamin C, niacin and long-chain polyunsaturated fatty acids compared to cow's milk but lower in casein (milk protein). The addition of gelatin to cow's milk formula will make it more digestible for the infant. Use only truly expeller-expressed oils in the formula recipes, otherwise they may be rancid and lack vitamin E.

The ideal milk for baby, if he cannot be breastfed, is clean, whole raw milk from old-fashioned cows that feed on green pasture, produced in clean conditions. For sources of good quality milk, see [www.realmilk.com](http://www.realmilk.com) or contact a local chapter of the Weston A. Price Foundation. For a video on formula preparation, visit [westonaprice.org/childrens-health/recipes-for-homemade-baby-formula](http://westonaprice.org/childrens-health/recipes-for-homemade-baby-formula).

### INGREDIENTS

- 1 7/8 cups filtered water
- 4 tablespoons lactose<sup>1</sup>
- 2 teaspoons gelatin<sup>1</sup>
- 2 teaspoons coconut oil<sup>1</sup>
- 1/4 teaspoon high-vitamin butter oil (optional)<sup>1</sup>
- 2 cups whole raw cow's milk, preferably from pasture-fed cows
- 1/4 cup homemade liquid whey (See recipe for whey, page 45) Note: Do *not* use powdered whey or whey from making cheese (which will cause the formula to curdle). Use only homemade whey made from yogurt or kefir.
- 1/4 teaspoon *Bifidobacterium infantis*<sup>1</sup>
- 2 or more tablespoons good quality cream (preferably not ultrapasteurized), more if you are using milk from Holstein cows
- 1/2 teaspoon unflavored high-vitamin fermented cod liver oil or 1 teaspoon regular cod liver oil<sup>1,2</sup>
- 1 teaspoon expeller-expressed sunflower oil<sup>1</sup>
- 1 teaspoon extra virgin olive oil<sup>1</sup>
- 2 teaspoons Frontier brand nutritional yeast flakes<sup>1</sup>
- 1/4 teaspoon acerola powder<sup>1</sup>

1. Available from Radiant Life 888-593-8333, [www.radiantlifecatalog.com](http://www.radiantlifecatalog.com).
2. Use only recommended brands of cod liver oil. See <http://westonaprice.org/cod-liver-oil/cod-liver-oil-basics#brands>.

### INSTRUCTIONS

- Put 2 cups filtered water into a pyrex measuring pitcher and remove 2 tablespoons (which will give you 1 7/8 cups water).
- Pour about half the water into a pan and place on a medium flame.
- Add the gelatin and lactose to the pan and let dissolve, stirring occasionally.
- Stir in the coconut oil and optional high-vitamin butter oil; stir until melted.
- When the gelatin and lactose are dissolved, remove from heat and add the remaining water to cool the mixture.
- Meanwhile, place remaining ingredients into a blender.
- Add the water mixture and blend about three seconds.
- Place in glass bottles or a glass jar and refrigerate. You may also use the formula with a breastfeeding aid (see Sources).
- Before giving to baby, warm bottles by placing in hot water or a bottle warmer. NEVER warm bottles in a microwave oven.

pump is a mother's best friend. Very small babies may not have enough strength to nurse effectively; the breast pump will help keep the milk flowing until baby gets stronger. Many mothers produce more milk in the morning than in the evening, when they are tired. With a breast pump, she can give some of her morning milk to baby in the evening. And for working moms, the breast pump used several times during the day will ensure that mom continues to produce breastmilk and baby continues to enjoy its advantages.

There are many brands of breast pumps on the market, and in general the more expensive ones are worth paying for. If you will be using the breast pump every day, purchase a larger, heavier model as the smaller compact models may not be strong enough to maintain your milk supply, nor sturdy enough to last through the months of breastfeeding. For occasional use, however, the smaller breast pumps may be adequate (see Sources).

Often left out of the promotional literature is the fact that the "horns" that fit on the breast come in different sizes. Having a suction horn that fits your breast will make a big difference in how much milk you get. Horns of different sizes are available on the Internet (see Sources).

Milk extracted with a pump can be given with a bottle or with a breastfeeding aid (see Sources). If you use a bottle, be sure to use a nipple that best approximates that shape of the breast—these often come with the breast pump. The breast feeding aid is a plastic bag that you fill with the pumped milk (see Sources). It has a small tube that is placed on the breast so that baby gets the extra milk while

nursing. With baby continuing to nurse at the breast, plus the extra milk extracted by the pump, many mothers can get over the hump of low milk supply that may occur during the early weeks, or even later, when baby goes through a growth spurt and is especially hungry.

Most importantly, the breast pump provides an accurate picture of how much milk a mother is producing. If, after pumping consistently, mom still only produces an ounce or two of milk per day, she will know for sure that supplementation is an absolute necessity.

Pumped breast milk should be stored in very clean glass bottles. It will keep up to six hours at room temperature, up to twenty-four hours in a cooler with ice packs and five to eight days in a refrigerator. It may also be frozen for up to several months. If you are freezing the milk, don't fill the bottle too full, but leave some space at the top for air expansion.

To warm the milk, set in a bottle warmer or pan of simmering water. Never, *never* heat baby's bottle in a microwave oven.

## GALACTAGOGUES

A galactagogue is a substance that promotes lactation in humans and other animals, usually an herbal preparation such as fenugreek, blessed thistle or alfalfa. Others include anise, astragalus root, burdock, nettle, fennel, flax, soapwort, vervain and red raspberry leaf. These may be formulated with marshmallow root, which increases the absorption rate. The classic European remedy is fenugreek seed

### GOAT MILK FORMULA

Although goat milk is rich in fat, and in some cases more digestible for the infant, it must be used with caution in infant feeding as it lacks folic acid and is low in vitamin B<sub>12</sub>, both of which are essential to growth and development. Inclusion of nutritional yeast will provide folic acid. To compensate for low levels of vitamin B<sub>12</sub>, (as well as folic acid) if preparing the Cow's Milk Formula (page 123) with goat's milk, add 2 teaspoons organic raw chicken liver, frozen for 14 days, finely grated or 1/2 teaspoon desiccated liver (see Sources) to the batch of formula.

Once baby is eating solid foods, which should include liver, the goat milk formula can be made exactly as the cows milk formula.



and blessed thistle. Formulations of fenugreek and blessed thistle are widely available, both as dried herbs and as a tincture (see Sources).

Pharmaceutical galactagogues, available usually by medical prescription, include domperidone and metoclopramide. Domperidone, a dopamine antagonist, is available in the U.K. but not approved for enhanced lactation in the U.S. Some drugs, primarily atypical antipsychotics such as Risperdal, may cause lactation in both women and men. Most of those discovered have been found to interact with the dopamine system in such a way to increase the production of prolactin. Obviously, such drugs should be used with great care as all drugs have side effects.

Foods reported to increase milk supply include raw milk, bone broths, soaked porridge such as oatmeal, lacto-fermented beverages such as kombucha and unpasteurized beer.

Acupuncture has also proven effective for increasing milk supply.

#### HOMEMADE FORMULA

“Nature does not always confer upon a woman the important capacity for nursing her baby, but the women who are able should do so. Every pregnant

woman should not only be impressed with the importance of this duty on her part, but with the essential preparation for accomplishing it. However, there are women who for some reason cannot perform this natural function—for these, it is necessary to learn to take advantage of the way now available to them to feed the infant artificially. The logical substitute for human milk is cow’s milk (or goat’s milk).” So wrote F T Proudfit in *Nutrition and Diet Therapy*, published 1942. All books on infant feeding published before the Second World War recommended cow or goat milk—usually certified raw cow or goat milk—when mother’s milk was not sufficient.

In fact, until the Second World War, part of the preparation for women during pregnancy, aside from a diet enriched by special animal foods, was the scouting out of a cow that would be given the best of pasture and whose milk would be available to the infant throughout his childhood. Today we know that for infants, we should dilute the milk and add other whole foods in order to approximate the nutrient profile of human milk, but even before we knew these things, millions of babies thrived on rich whole milk from a variety of animals. Yet some of the strongest words in the medical literature today are aimed at commercial formula’s only competition—homemade formula based on raw cow or goat milk.

#### HOMEMADE WHEY FOR HOMEMADE INFANT FORMULA

Makes about 5 cups.

Homemade whey is easy to make from good quality plain yogurt, kefir or buttermilk. Ideally, use yogurt, kefir or buttermilk that you have made from whole raw milk. Second choice would be commercial brands of yogurt or kefir listed in the Shopping Guide from the Weston A. Price Foundation.

You will need a large strainer or colander that rests over a bowl and a linen kitchen towel.

Place 2 quarts yogurt or kefir in a strainer or colander lined with a linen kitchen towel set over a bowl. Cover with a plate and leave at room temperature overnight. The whey will drip out into the bowl. Place whey in clean glass jars and store in the refrigerator.

The thick yogurt or kefir that is left is delicious mixed with maple syrup or raw honey—a great food for mom while she is nursing and a good food for baby once he begins solid food. (Note: do not give the thick yogurt or kefir mixed with raw honey to baby until he is at least one year old; use maple syrup instead.)

## LIVER-BASED FORMULA

Makes about 36 ounces.

Our liver-based formula also mimics the nutrient profile of mother's milk. It is extremely important to include coconut oil in this formula as it is the only ingredient that provides the special medium-chain saturated fats found in mother's milk. As with the milk-based formula, all oils should be truly expeller-expressed. This formula has been a life-saver for babies with severe allergies to milk of all kinds.

## INGREDIENTS

- 3-3/4 cups homemade beef or chicken broth (see Recipes)
- 2 ounces organic calf or beef liver, cut into small pieces; or chicken, duck or turkey liver
- 5 tablespoons lactose<sup>1</sup>
- 1/4 teaspoon *Bifidobacterium infantis*<sup>1</sup>
- 1/4 cup homemade liquid whey (See recipe for whey, page 145)
- 1 tablespoon coconut oil<sup>1</sup>
- 1/2 teaspoon unflavored high-vitamin fermented cod liver oil or 1 teaspoon regular cod liver oil<sup>1,2</sup>
- 1 teaspoon unrefined sunflower oil<sup>1</sup>
- 2 teaspoons extra virgin olive oil<sup>1</sup>
- 1/4 teaspoon acerola powder<sup>1</sup>

1. Available from Radiant Life 888-593-8333, [www.radiantlifecatalog.com](http://www.radiantlifecatalog.com).

2. Use only recommended brands of cod liver oil, See [www.westonaprice.org/cod-liver-oil/cod-liver-oil-basics#brands](http://www.westonaprice.org/cod-liver-oil/cod-liver-oil-basics#brands).

## INSTRUCTIONS

- Simmer liver gently in broth until the meat is cooked through.
- Liquefy using a handheld blender or in a standing blender.
- When the liver broth has cooled, stir in remaining ingredients.
- Store in a very clean glass or stainless steel container.
- To serve, stir formula well and pour 6 to 8 ounces in a very clean glass bottle.

Our recipes for homemade baby formula were developed with Mary G. Enig, PhD, nutritionist and expert in lipids. Since first published, in the first edition of *Nourishing Traditions*, 1996, the formula has nourished hundreds if not thousands of infants, almost always with excellent results. In fact, babies who cannot tolerate commercial formula and who seem to be lactose intolerant often thrive on the raw milk formula.

Based on whole, unpasteurized cow or goat milk, the formula provides similar immune-stimulating, health-promoting and antimicrobial components as human breast milk. Some specific human proteins and maternal immune factors will be missing, but these can be obtained with a hybrid formula-breast-milk program.

Our first choice is formula based on cow's milk. Although goat milk is easier for some babies to digest, it is low in folic acid and vitamin B<sub>12</sub>. There are several reports in the scientific literature of problems developing in infants fed goat milk exclusively.<sup>71</sup> If you use goat milk and the formula is baby's only food, then it is imperative to add a little liver to supply folic acid and vitamin B<sub>12</sub>. Once baby is eating solid foods, which should include liver, then goat milk formula can be made exactly as the cow's milk formula.

A third formula, based on liver and broth, is provided for the rare baby that cannot tolerate the cow or goat milk formula. We have several reports of babies thriving on this formula. In the days before soy-based infant formula, Gerber produced a meat-

## BREAST MILK AND HOMEMADE FORMULA NUTRIENT COMPARISON CHART

Based on 36 ounces.

These nutrient tables were derived from standard food nutrient tables and do not take into account the wide variation in nutrient levels that can occur in both human and animal milk, depending on diet and environment.

	BREAST MILK	COW'S MILK FORMULA	GOAT MILK FORMULA	LIVER-BASED FORMULA
Calories	766	856	890	682
Protein	11.3 g	18 g	18 g	15 g
Carbohydrates	76 g	79 g	77 g	69 g
Total Fat	48 g	52 g	54 g	36 g
Saturated Fat	22 g	28 g	30 g	16 g
Mono Fat	18 g	16 g	16 g	12 g
Poly Fat	5.5 g	5.6 g	5.7 g	5.6 g
Omega-3 FA	.58 g	1.3 g	1.2 g	1.0 g
Omega-6 FA	4.4 g	4.2 g	4.4 g	4.5 g
Cholesterol	153 g	137 mg	166 mg	227 mg
Vitamin A*	946 IU	5000 IU	5,000 IU	20,000 IU
Thiamin-B <sub>1</sub>	.15 mg	1.05 mg	1.1 mg	19 mg
Riboflavin-B <sub>2</sub>	.4 mg	1.2 mg	1.2 mg	1.9 mg
Niacin-B <sub>3</sub>	1.9 mg	2.5 mg	4.4 mg	14.2 mg
Vitamin B <sub>6</sub>	.12 mg	.51 mg	.6 mg	.65 mg
Vitamin B <sub>12</sub>	.5 mcg	1.9 mcg	.8 mcg	39 mcg
Folate	57 mcg	236 mcg	284 mcg	159 mcg
Vitamin C	55 mg	57 mg	59 mg	62 mg
Vitamin D	480 IU	450 IU	525 IU	460 IU
Vitamin E***	9.9 mg	6.2 mg	4.7 mg	4.9 mg
Calcium	355 mg	532 mg	548 mg	NA**
Copper	.57 mg	.38 mg	.58 mg	1.9 mg
Iron	.33 mg	1.4 mg	2.2 mg	5.4 mg
Magnesium	37.4 mg	91.3 mg	96.1 mg	34.5 mg
Manganese	.29 mg	.034 mg	.12 mg	.24 mg
Phosphorus	151 mg	616 mg	729 mg	344 mg
Potassium	560 mg	949 mg	1228 mg	750 mg
Selenium	18.8 mcg	15.4 mcg	18.7 mcg	31.1 mcg
Sodium	186 mg	308 mg	320 mg	NA**
Zinc	1.9 mg	2.8 mg	2.7 mg	2.5 mg

\* Vitamin A levels in human milk will depend on the diet of the mother. Nursing mothers eating vitamin A-rich foods such as cod liver oil will have much higher levels of vitamin A in their milk. Commercial formulas contain about 2400 IU vitamin A per 800 calories.

\*\* Calcium and sodium values for homemade broth are not available.

\*\*\* Vitamin E values are derived from commercial vegetable oils. The vitamin E levels for homemade formulas will be higher if good quality, expeller-expressed oils are used.

## FORTIFIED COMMERCIAL FORMULA

Makes about 35 ounces.

This stopgap formula can be used in emergencies, or when the ingredients for homemade formula are unavailable.

### INGREDIENTS

- 1 cup milk-based powdered formula<sup>1</sup>
  - 29 ounces filtered water (3 5/8 cups) Note: never use fluoridated water for baby formula!
  - 1 egg yolk, preferably from a pastured hen
  - 1/2 teaspoon unflavored high-vitamin or high-vitamin fermented cod liver oil or 1 teaspoon regular cod liver oil<sup>2</sup>
1. The best choice for commercial formula today seems to be Baby's Only Organic Dairy Formula (see Sources). Unfortunately, it contains iron (mandated by FDA) but otherwise contains higher quality ingredients than any of the other commercial formulas. It is also the only brand on the market at this time without added oils containing industrial ARA and DHA (see page 139). If you are forced to use commercial formula, make sure that baby is getting cod liver oil, either added to the formula or given separately with an eye dropper or syringe. As soon as possible, introduce solid foods like egg yolk, liver, meat and bone broths.
  2. Use only recommended brands of cod liver oil. See [www.westonaprice.org/cod-liver-oil/cod-liver-oil-basics#brands](http://www.westonaprice.org/cod-liver-oil/cod-liver-oil-basics#brands).

### INSTRUCTIONS

- Place all ingredients in a blender or food processor and blend thoroughly.
- Place 6-8 ounces in a very clean glass bottle. (Store the rest in very clean glass bottles or a very clean glass jar in the refrigerator for the next feedings.)
- Attach a clean nipple to the bottle and set in a pan of simmering water until formula is warm but not hot to the touch, shake well and feed to baby. (Never heat formula in a microwave oven!)

based formula for babies who could not tolerate milk-based formula.

### THE COMBO: FORMULA AND BREAST MILK

Many moms who have trouble with supply settle into a combo or hybrid solution, both breastfeeding and giving baby homemade formula using a bottle or breastfeeding aid (see Sources). The breastfeeding aid is the better way to give the milk, as it keeps baby stimulating the breast by nursing, and never poses the problem of nipple confusion. Stay-at-home moms can easily use the breastfeeding aid to give formula at the same time as the breast. Sometimes the relief of seeing her baby nourished and content will be enough to increase a mother's supply to the point where she no longer needs to supplement.

Breastfeeding advocates warn against giving baby the breast and a bottle alternately because baby may prefer the bottle to the breast and refuse to nurse. Some lactation consultants recommend giving pumped breast milk or formula with a syringe or even from a cup. However, many babies easily adjust to both bottle and breast.

Working moms will need to have someone give either formula or pumped milk—or a combination—using a bottle during the day, and many have succeeded in getting baby to accept both breast and bottle. Use a nipple with a small hole so baby has to work at getting the formula, preferably one with a shape comparable to a human nipple. One trick is to always have someone other than mom give the bottle, with mom giving the breast only.

Sometimes babies will go on a nursing strike, re-

fusing the breast in an obvious play for the bottle. But if you are firm, you can get over this hump. Babies may fuss and even scream but don't give up. Try expressing milk directly into baby's mouth, or even putting a little bit of formula on your nipple to get him started. You might try giving the bottle to get baby started, then switch craftily to the breast. Pumping for a few minutes will get milk flowing so nursing is easier. Baby may even cry himself to sleep, but then be ready to nurse when he wakes up. The important thing is not to get upset—watch TV, zone out, take your focus off the baby and he may start nursing. Most babies soon learn to switch hit without any problem.

Conversely, some babies refuse the bottle. Try different nipples, different people, different angles of the bottle. Have someone else feed baby while you leave the house. One trick is to warm the nipple in your bra before putting it on the bottle!

## WORKING MOTHERS

A large portion of mothers work today, with many of them continuing to breastfeed for many months. Baby will need to get bottles during the day, either of pumped breast milk, homemade formula, or a combination.

The important thing is to prepare for your return to work well in advance, pumping and storing milk. Baby needs to get used to taking a bottle from someone else—and mom needs to get used to leaving someone else in charge. Mom will return to work in a more relaxed frame of mind if she has prepared herself and baby in advance, and has a supply of breastmilk in the fridge and freezer. If she is supplementing her breastmilk with homemade formula, she needs to get the formula-making routine down pat, and be assured that baby is doing well on it.

Most states require workplaces to provide breaks for pumping and a place to do so that is not a bathroom. In practice this means that lawyers, editors and other white collar workers, who know their rights, can manage the breastfeeding-pumping in a flexible, supportive environment. For teachers, bus drivers and other service workers, it might be much more difficult to juggle the pumping with the job. (For help and encouragement, visit [workandpump.com](http://workandpump.com).)

A typical schedule for a working mother goes like this:

- Wake up, immediately nurse baby.
- Shower, dress, breakfast.

## CONSTIPATION IN BABY

One problem occasionally reported with the homemade formula is constipation—indeed, even breastfed babies can become constipated. The following are suggestions for relieving this uncomfortable condition.

- Constipation is more frequent with the goat milk formula than the cow's milk formula. If baby is constipated on the goat milk formula, switch to cow's milk if you can.
- Use homemade kefir or yogurt made from raw milk in place of the sweet milk in the formula.
- Use 1/2 cup fresh whey and reduce the amount of water by 1/4 cup.
- Increase the *Bifidobacterium infantis* from 1/4 teaspoon to 1/2 teaspoon.
- Add 1 teaspoon molasses to the formula; add to the hot water-gelatin mixture.
- Add 1 tablespoon additional cream or 1 tablespoon coconut oil to the formula.
- Give baby Digestive Tea (see Recipes) in a bottle.
- Give baby a little diluted prune juice in a bottle.
- Homemade chicken broth in a bottle can soothe the digestive tract and help relieve constipation.

If none of these work, use an infant suppository on your baby as a last resort. Bear in mind that babies vary in how often they move their bowels; however once every two days should be considered a minimum.

- Nurse baby again before you leave for work or when you drop her off at daycare.
- Pump at work midmorning, just after lunch and in the afternoon—this might take about one hour in all—keeping the milk in a small refrigerator or a freezer bag with a cold pack.
- Nurse immediately when you get home.
- Nurse before baby's bedtime.
- 

Pumped milk should be stored in bottles for baby's feeding the next day. If you do not produce enough milk for three to four daily feedings, you can supplement with homemade formula. (And it might be a good idea to have the formula ingredients on hand for emergencies.)

Although the formula is ideally made fresh every day, you can make it every other day or even just twice a week, storing it in the coldest part of the refrigerator.

Be sure to bring enough bottles and parts with you so you don't have to do any washing of bits and pieces at work. Breastfeeding while working sounds complicated and requires you to be organized, but lots of dedicated moms have made it work.

#### PROBLEMS WITH HOMEMADE FORMULA

Overall, mothers who have used our homemade formula have reported excellent success, but sometimes there are problems.

If baby cries, seems to be suffering from indigestion, or vomits, you can eliminate some of the ingredients that might be problematic, such as nutritional yeast or gelatin. Cod liver oil can be given separately, with an eye dropper. Some mothers have reported excellent results replacing cream with melted ghee or even raw colostrum. If baby becomes constipated, follow the suggestions on page 149.

If the cow's milk formula is not working, the second choice is formula made with goat milk. If the formula is baby's only food, the baby must get an additional source of folic acid and vitamin B<sub>12</sub>. This can be achieved by adding liver to the formula. If you are using the breastfeeding aid, the powdered liver is probably a better choice as it is difficult to

blend the grated liver fine enough to pass through the plastic tube.

Once baby begins eating solid food, which should include puréed liver, then the goat milk formula can be made exactly as the cow's milk formula.

Making the formula may seem like a lot of trouble, but you will soon get into the routine. It takes about twenty minutes to make a fresh batch every morning.

Heat gently by setting the bottle into simmering water or a bottle warmer—never in a microwave. Test the temperature of the milk by shaking a few drops on your wrist.

Please note that you should only use fresh whey in the formula—this is easily made using whole yogurt or kefir. Powdered whey is an industrial product—it will not contain good bacteria and the whey proteins are damaged by the powdering process. Cheese whey will cause the formula to curdle. If the baby is only getting formula, you will need to make fresh whey from one quart yogurt or kefir about once a week. The by product is a delicious quark cheese, a wonderful food for mom and the rest of the family, as well as a good weaning food for baby.

#### FOR FURTHER INFORMATION

*The Nursing Mother's Companion* by Kathleen Huggins.

*Breastfeeding Answer Book* by Nancy Mohrbacher.

*Wise Woman Herbal for the Childbearing Year* by Susun Weed.

[www.westonaprice.org/childrens-health/recipes-for-homemade-baby-formula](http://www.westonaprice.org/childrens-health/recipes-for-homemade-baby-formula), includes frequently asked question, testimonials and a video on making the homemade baby formula.