

Infant Formula Fortification Protocol

A healthy and well nourished mother's breast milk is nature's perfect and complete food for babies and can't even come close to being reproduced. With so many substances known to be present in breast milk, but unable to be replicated in breast milk substitutes (formula), plus all of the as-yet unidentified constituents, it should come as no great surprise that children today are suffering from a vast myriad of illnesses and disorders.

The human brain is infinitely more sophisticated than the world's fastest computer, yet many people naively think that this wondrous organ can be perfectly constructed without any regard to the "raw materials" required. Building a properly functioning brain requires the right materials, just as building a computer would. Imagine trying to build a computer from scratch, without any microchips. Or trying to build a house without any lumber, bricks, steel, or other materials.

However, while there is no way to create a formula equal to breast milk, there are steps that can be taken to improve upon the standard formulas that are available.

One of the nutritional areas that are woefully inadequate with formulas is in regards to their fatty acid content. With all of the anti-fat propaganda going on these days, most people don't realize the critical importance of fat, especially with infants. Not only is the quantity important, but the quality and breakdown of the types of fat supplied as well.

After all, **the brain is 60% lipid (fat).** Of this fat, approximately 12 % is arachidonic acid (AA) and 17% is docosahexaenoic acid (DHA).

Many people have heard about the benefits and importance of the omega-3 fatty acids DHA and EPA, made by ocean algae but found primarily in fish.

The importance of DHA in the infants' diet recently prompted many countries (not including the US) to allow formula producers to fortify their products with DHA, as well as AA. Currently, DHA/AA enhanced formulas are available, although not mandatory, throughout most of Europe.

Unfortunately, this small step still does not provide infants the nutrients they desperately require, due to several problems.

First of all, **the DHA added to the formulas, obtained from microalgae, is highly oxidized (approximately 30%).**

Additionally, **DHA and AA are not the sole fat constituents of breastmilk.** Fortifying

with them is a step in the right direction, but still leaves out plenty of important substances.

In an effort to help people provide their infants with the best possible nutrition, our clinic often instructs mothers to "create" fortified formulas. But of course we insist that mothers breastfeed if at all possible or even obtain fresh breastmilk from a lactating friend or relative, if they have adopted a baby, or can't breastfeed for some reason.

For the infant to remain as healthy as possible, he must obtain a proper balance of all the essential fats, which is difficult to impossible, especially when you are changing mother nature and trying to create a formula.

However, below is a basic daily fat fortification protocol, which attempts to come as close as possible to "the real thing":

- **Shaklee Omega Guard** - one capsule per ten pounds of body weight
- **Organic egg yolk** - 1 yolk daily added at four months of age
- **Organic cream** ideally non-pasteurized and non-homogenized -- If you are unable to find a local dairy farmer who will cooperate with you please try this link: <http://www.realmilk.com/where.html>.
- **Shaklee GLA** – 1 capsule per ten pounds of body weight daily
- **Shaklee Lecithin**. This oil needs to be added both for the inositol but to prevent the other oils from sticking to the bottle. One or two capsules per feeding to keep mixture in solution.

It is important, if not breastfeeding, to use protein as a "base" from which to fortify the infant's diet. Remember, it is dangerous that something could be inadvertently left out or added in too great a quantity. A mistake could cost an infant his life. For these reasons, you may want to use an organic protein formula as a base. Here are some suggestions:

Nutramagen or **Alimentum** can be used as a base infant formula and 'doctored up' with nutritional perks. Both of these formulas are acceptable in regard to the 'allergic' aspect, and are the ones usually used when children cannot tolerate anything. Of course, they are also the most expensive.

FORTIFIED COMMERCIAL FORMULA

Makes about 35 ounces

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

- 1 cup Mead Johnson low-iron, milk-based powdered formula, Nutramigen or Alimentum are best and better tolerated but are more expensive
- 29 ounces filtered water (3 5/8 cups)
- 1 large egg yolk from an organic egg uncooked. Do not give to

- infant unless older than four months of age
- 1 capsule of Shaklee GLA and Omega Guard
- 2 capsules of Shaklee Lecithin

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 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!)

If your baby is premature, one additional area of fortification is in the area of free amino acids, most notably [taurine](#). This nutrient is also critical for infant development and is found in human milk but not in cow's milk. Although many formulas add some taurine, it has been shown that formula-fed infants have lower levels of taurine in their blood than breastfed infants do, even when the formula has added taurine.

Contrary to the advice given by some, **soy milk, almond milk, or carrot juice, even if organic and homemade, are most definitely NOT ACCEPTABLE SUBSTITUTES FOR BREASTMILK.** Parents frequently ask me about the safety of soy protein for infants. Babies who drink soy formula receive significant amounts of processed estrogen-like compounds (phytoestrogens) in the form of damaged soy isoflavones. This happens at a developmental time when permanent effects are theoretically possible. Some have speculated that soy formula might be responsible for early puberty in girls or infertility in boys. We have raised our three children and ten grandchildren on Shaklee soy protein, immediately after weaning with excellent results.

The August 15, 2001 issue of *The Journal of the American Medical Association* (JAMA) contains the results of a study of 811 adults, some of who drank soy formula as children and others who drank milk-based formulas. No statistically significant differences were observed between the groups in either women or men. They followed more than 30 different measures of general health or reproductive health. Breast milk is clearly the ideal food for babies, but this study is quite reassuring that soy formulas are a safe alternative. This is good news for many babies who have cow milk allergies in their parents or do not tolerate cow's milk formulas well.

For those mothers who are breastfeeding, it is important to realize that the essential fatty acid content of her breast milk coincides with what she eats. Therefore, her diet is very important for the health of her baby. One of the most important things that a breastfed mother can do is to avoid foods containing trans fats, such as margarine and anything with hydrogenated or partially hydrogenated oils.

While one can't guarantee that taking the steps outlined above will completely eliminate problems such as ADD/ADHD and other behavioral problems, developmental problems, autism, visual difficulties, and others, I believe it is a strong possibility that it could help to reduce their incidence, although it is important to always remember that:

BREAST IS BEST.

SHAKLEE SOY-BASED FORMULA Makes 36 ounces

Our Shaklee soy based-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 soy protein. Shaklee Energizing Soy Protein is used in place of Cinch Shake because there is too much Leucine in Cinch for the protein needs of an infant. (Note: Cinch should not be used as a primary protein for children under 12 years) Use only Shaklee oils in the formula recipes.

- 3 3/4 cups Best Water
- 1/4 cup Shaklee Energizing Soy Protein
- 1/4 teaspoon Shaklee Liqui Lea
- 1 teaspoon Shaklee Citriboost
- 1 capsule Shaklee Omega Guard
- 1 capsule Shaklee GLA
- 2 perles Shaklee Lecithin
- 2 teaspoons Knox gelatin

Add gelatin to water and heat gently until gelatin is dissolved. Place all ingredients in a very clean glass or stainless steel container and mix well. To serve, pour 6 to 8 ounces into a very clean glass bottle, attach nipple and set in a pan of simmering water. Heat until warm but not hot to the touch, shake bottle well and feed baby. (Never, never heat formula in a microwave oven!) Note: You may prefer to mix all ingredients well in a blender.)

Variation: Goat Milk Formula

The ideal milk for baby, if he cannot be breastfed, is clean, whole raw milk from goats. Although goat milk is rich in fat, it must be used with caution in infant feeding as it lacks folic acid and is low in vitamin B12, both of which are essential to the growth and development of the infant. Inclusion of Liqui Lea and Citriboost for folic acid is essential. Otherwise, to compensate for low levels of vitamin B12, add 2 teaspoons frozen organic raw chicken liver, finely grated to the batch of formula. Be sure to begin egg-yolk feeding at four months.

You may like to review my DVD titled “Nutrition for Pregnancy and Lactation” available at our educational website: www.sunnysidehealthcenter.com or phone at (503) 631-4184.

“Cows milk is a perfect food for a fast growing, large animal with a small brain.”

COMPARISION TABLE::

Basic Properties:

Breast Milk	Cow's Milk Formula
Variable content and flavour	Unchanging content and flavour
Non-sterile – active Doderlin’s bacillus (normal flora)	Sterile
Contains live human cells	No live components
Contains human hormones and growth factors (gut hormones like cholecystikinin and gastric inhibitory peptide, peptide hormones such as TSH and growth hormone, steroid hormones etc.)	No human hormones or growth factors
Contains active digestive enzymes (lipase, amylase, protease)	No active enzymes
Contains factors that help the gut mature (glutamine, putrescine etc.)	No such factors
Contains factors that are immunoprotective (Secretory IgA, lactoferrin, lysozyme, Bifidus factor, Oligosaccharides, antibacterial lipids, leukocytes, cytokines)	No immunoprotective factors
Calories = 70-75 kcal/100cc	Calories = 67 kcal/100cc

Protein:

Breast Milk	Cow's Milk Formula
Less total protein (0.9% protein)	More total protein (~3% protein)
40% curds = casein which binds Calcium and Phosphate so that it is absorbable	may be manipulated to 40% casein or considerably more (80%)
60% whey = alpha-lactoalbumin, lactoferrin, IgA, lysozyme, bifidus factor	may be manipulated to 60% whey or considerably less (20%)
alpha-lactoalbumin (less allergenic than beta-lactoalbumin)	beta-lactoalbumin (more allergenic than alpha-lactoalbumin)

lactoferrin to bind iron (deprives microbes of iron therefor it is bacteriostatic, as well lactoferrin increases iron absorption by the baby)	no lactoferrin--destroyed in formula making process
Secretory IgA to rotavirus, giardia, H. influenzae, campylobacter, E.coli, shigella, HIV, etc.	No IgA, IgG instead.
Lysozyme is a natural nonspecific antibiotic	One thirtieth of the amount of lysozyme in breast milk

Fats:

Breast Milk	Cow's Milk Formula
Animal Fats total 40g/L	Vegetable Oils total 38g/L
Cholesterol	No cholesterol
Long Chain Fatty Acids (arachiadonic acid--used in the brain) 1-2% of total fat	No Long Chain Fatty Acids
Less MCT than formula	More MCT than mature breast milk
Increased variety of fats	Reduced variety of fats

Carbohydrates

Breast Milk	Cow's Milk Formula
Lactose: well tolerated even in diarrheal illnesses	Lactose
50% of calories	50% of calories

Miscellaneous:

Breast Milk	Cow's Milk Formula
Less Iron but it is 49% bioavailable	More Iron but it is only 4% bioavailable
Less NaCl, K, Ca, PO4	More NaCl, K, Ca, PO4
Calcium/Phosphate ratio 2.2	Lower Calcium/Phosphate ratio 1.5
Low Phenylalanine and tyrosine content: PKU babies, if monitored closely, may be breast-fed	Regular formula contraindicated in PKU, use low Phenylalanine formula instead.
Contains the amino acid Taurine (?significance)	Contains no Taurine
May concentrate environmental pollutants such DDT, PCBs, PBBs in women who eat large numbers of sport fish or who are environmentally exposed. (NOTE: follow detoxification for 1 year prior to conception)	Processing should reduce or exclude most inorganic contaminants

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