

# Infant Formula / Baby Milk ingredients, additives and contamination.

precis of an article by Ann Sinnott

The belief that breastmilk substitutes have equal benefits and are a safe alternative to breastfeeding, which leads to that method of feeding being seen as essentially a lifestyle choice, needs to be countermanded.

Artificial feeding has real and serious health risks yet we seldom hear of them.

Globally, governments spend millions on the promotion of breastfeeding but the risks, in infancy and beyond, of artificial feeding are less well publicised. To do so, would mean going up against the commercial interests of, and losing taxes from, the multi-billion-earning infant formula industry; one of the biggest global business sectors in existence. Moreover, the breastmilk substitutes industry also funds health research projects, which ensures that the scientific community, while proclaiming the benefits of breastfeeding, rarely speaks about the disadvantages of artificial feeding.

## **The International Code**

Low breastfeeding rates are, in large measure, due to the substitutes industry's claim that its products are health-promoting and a safe alternative to human milk with equivalent benefits. In recognition of the harm done to infants by a lack of breastfeeding, the International Code of Marketing of Breast-Milk Substitutes was issued by WHO in 1981, which contains measures to control the promotion of artificial feeding. Unfortunately, not all WHO signatory member states have instituted the Code and breastmilk substitutes continue to be promoted around the world, though there have been successes in some locations for example in the UK, where the advertising of infant formula is banned.

The breastmilk substitutes industry has vigorously resisted implementation of the Code. It now pays lip service to 'breast is best' in some locations because it has found a way round bans by producing, and freely advertising, 'follow-on' milk for infants aged six months and older

## **Regulations and approval**

Breastmilk substitutes are classified as food and are not subject to the more vigorous regulations applied to pharmaceuticals.

## **Ingredients**

The attempt to replicate human milk has produced increasingly complex concoctions. Most formulations are based on cow's milk, which must be modified. The protein and mineral content is reduced and carbohydrate content increased, usually by the addition of sugars such as lactose, fructose, glucose and maltodextrin. Infant formula therefore contains high levels of sugar.

Other ingredients added to modified cow's milk include carbohydrate (corn maltodextrin, modified corn starch, corn syrup solids), protein (casein, whey, soy protein isolate), fat (soy oil, coconut oil, corn oil, sunflower oil, palm or olein oil), vitamins, folic acid, pantothenic acid, calcium, minerals, phosphorus, iodine, sodium chloride, potassium chloride and other nutrients.

These other nutrients are aimed at controlling the side effects of the formula such as rice starch to reduce regurgitation. They may also attempt to copy properties of natural milk for example added nucleotides mimic the immune system growth and repair properties of breastmilk.

Unfortunately the scientific basis for these additions is often not clearcut. Recently as a result of research which showed the positive effect of certain fatty acids on brain function the industry synthesised similar products from plant sources and extracted then using a petroleum refining by-product known to be neurotoxic. Although concerns have been expressed concerning the safety and efficacy of such additives, their presence can allow the manufacturers to charge a premium for their products.

## **Side effects**

Adverse reactions in infants to these formulations have now been reported – including diarrhoea, vomiting, bloating, gastrointestinal discomfort, rashes and seizures (fits). Although there have been calls for clear labelling of these reactions, this has so far not been carried out.

## **Yet more ingredients**

There are other disturbing ingredients in breastmilk substitutes. Marsha Walker, an executive director of NABA (National Association of Breastfeeding Advocacy) USA, has produced a fully referenced compilation of research studies that reveal a cocktail of chemicals in infant formula. Those listed below are derived from Walker's list unless stated otherwise.

- Aluminium: interferes with cellular metabolic processes.
- Silicon: effect of large amounts on infants unknown.
- Cadmium: a highly toxic metal; can cause kidney and brain damage
- Phytoestrogens in soy formulas: endocrine disrupters.
- Genetically engineered soybeans. Effect unknown.
- Phthalates and Bisphenol-A, a plasticiser and lacquer respectively, endocrine-disrupting industrial chemicals that leach into infant formula from metal packaging and feeding bottles.

### **Water contamination**

The most basic ingredient added locally to infant formula is water. WHO estimates that, where water is contaminated by micro-organisms a bottlefed child is up to 25 times more likely to die as a result of diarrhoea than is a breastfed child. Even in developed countries, contamination of water supplies by parasites (cryptosporidium and giardia) and bacteria such as (E coli) can be very dangerous for an infant whose undeveloped immune system cannot tolerate exposure to these disease-causing invaders.

Chlorine by-products, as well as arsenic, solvents, insecticides and weed killers, are other common water contaminants. In rural areas, water contamination by nitrate runoff from fertilizers is common. When added to infant formula powder and ingested, nitrates can interfere with the oxygen carrying capacity of the blood.

### **The manufacturing process**

Bacterial contamination can also occur in the manufacturing process and many instances have been documented. Clusters of infections and deaths of newborns fed infant formula have been reported worldwide since 1961. Infant formula is not produced in sterile conditions. Infant formula is not sterile – the powder provides an excellent medium for the growth of bacteria and fungi.

### **Human Error**

Because manufacture is prone to human error, infant formula can be a serious risk to health and life in other ways.

### *Contamination*

Foreign objects, including broken glass and fragments of metal are frequently found, necessitating product recalls:

- In 2006, both Nestlé and Mead Johnson recalled infant formula because of contamination with metal fragments. If ingested, these particles present a serious risk to a baby's respiratory system, throat and gut.

Vital ingredients can also be added to excess, or even left out. Instances include:

- Carnation Follow-on formula was recalled in 2001 as a result of excess magnesium (can give rise to low blood pressure and irregular heartbeat).
- In 2003 a soy-based formula lacking vitamin B1 entered the marketplace – many infants suffered severe central nervous system damage; several suffered irreparable damage and two died.
- Ross Products recalled two products in 2006, involving hundreds of thousands of units, which were deficient in vitamin C (infant deficiency would result if consumed for 2–4 weeks), and in 2007 recalled products deficient in iron (infant-anaemia would result if consumed for a month).

### *Labelling*

Labelling can also be a source of risk. Cans with wrong labels, or misprinted labels (ingredients not listed, with a possibility of infant allergic reaction), were recalled by several manufacturers, involving millions of product units, throughout 2000 and 2001.

### **Criminal actions**

Scurrilous practices in pursuit of profits also endangers lives.

- The practice of re-labelling formula, to alter the sell by date or to disguise contents, caused the FDA/CFSAN Office of Nutritional Products, Labelling and Dietary Supplements, to issue a warning to parents in 2002.
- In 2004, dozens of babies in China died as a result of being fed counterfeit formula, which contained as little as one-sixth of the nutrients required for proper development.
- In 2008, 300,000 Chinese infants suffered acute kidney failure and six died, as a result of a toxic industrial chemical, melamine, being added to formula to make it appear higher in protein – the death sentence was subsequently handed out to three of the people involved and two others were imprisoned for life.

But even when infant formula is perfectly produced, free from contaminants and honestly marketed there is still danger.

## **The developing world should not be complacent**

Those who believe that it is only in the developing world that infant mortality is linked to the consumption of infant formula should think again. Health and childhood expert, Dr Linda Folden Palmer, author of *Baby Matters*, has examined research studies and compared several countries' infant mortality rates of formula-fed and breastfed babies. Below are a few elements of her report.

- Necrotizing enterocolitis affects around 4% of low birth-weight babies and 1% of full-term infants; about one-third of low-birth weight infants and 20% of full-term infants die. For infants who were exclusively breastfed, it occurred six to ten times less often than among wholly formula fed infants.
- Sudden Infant Death Syndrome (SIDS) accounts for 10% of US infant deaths. Several studies in the US and other industrialized nations reveal increased risks of SIDS among formula fed infants. A 2003 US study found a five-fold risk factor for formula fed infants over breastfed infants. A 1997 German study found a 7.7 fold risk and a 2002 Scandinavian study found a risk range from 1.6 to 5.1.
- A WHO study reports a risk of diarrhoea for formula-fed babies in developing nations averaging more than six times that of breastfed infants and an average triple risk in the developed world. In the US, four studies indicate a doubled risk of illness or death from diarrhoea for formula fed infants, compared to those breastfed.

Studies cited by Folden Palmer, demonstrate not only higher rates of illness in formula fed infants, but also illnesses of greater severity and duration, which result in proportionately more deaths.

In an impressive statistical analysis, Folden Palmer calculates that, of the 28,000 infant deaths in the US in 1999, the lives of 9,335 infants could have been saved if they had been breastfed. Interestingly, her analysis also reveals that, contrary to popular opinion, illness and death as a result of being fed infant formula occurs irrespective of socioeconomic status or level of parental education.

## **One bottle won't hurt – will it?**

Some breastfeeding mothers give their babies the occasional bottle of formula to 'give myself a break', or so someone else can feed the child. 'It's only one bottle, from time to time, it won't harm'. However, according to Walker, it might well. Her fully referenced piece, *Supplementation of the Breastfed Baby*, makes sobering reading. Here are a few points:

- Breastfed and formula fed infants have different gut flora.
- Breastfed babies have a lower gut pH (acidic environment), 5.1 to 5.4, and gut flora is dominated by beneficial bifidobacteria (47%), with a low level of 'pathogenic (disease causing) microbes.
- Formula-fed babies have a high gut pH, 5.9 to 7.3, only 15% bifidobacteria, with a variety of putrefactive bacterial species,.
- Relatively small amounts of formula supplementation (one supplement per 24 hours) will result in shifts from a breastfed to a formula-fed gut flora pattern. Once dietary supplementation begins, the dominance of bifidobacteria is lost, and the development of anaerobic bacterial populations occur.
- The neonatal GI tract matures and undergoes rapid growth and change following birth. It takes weeks for junctions of the infant's GI mucosa to mature and close the gut to whole proteins and pathogens. Open junctions and immaturity play a role in the acquisition of necrotizing enterocolitis diarrhoea and allergy (eg cow's milk sensitization). This state of gut permeability decreases faster in breastfed babies than in formula fed infants.
- Infant formula should not be given to a breastfed baby before gut closure occurs.

### **After babyhood**

Nor do the disadvantages of infant formula stop at infancy. Drawing again on Folden Palmer:

- Studies show a sizeable increase in illnesses throughout the whole of childhood for those who were never breastfed or prematurely weaned .
- An increased risk of death throughout life has been documented for people who were formula-fed.
- Higher blood pressure, more heart disease, obesity, diabetes and artery disease, a nearly doubled rate of Crohn's disease and tripled rates of celiac disease have all been associated with early formula feeding.

### **Informed choice**

In all likelihood, many mothers who chose to feed their children with infant formula were **NOT** aware of the full implications. Mothers are not in a position to make an informed choice, because information about risk factors is not made readily available. Effective breast feeding may not be easy to establish, particularly in an environment where limited education and support is available. Mothers considering themselves to be failures fall easily into the arms of the formula milk industry.

Profits are put before people, in this case the most vulnerable. Revenue and budget deficits are put before newborns and infants, and research-driven career interests are skewed toward producing the results the breastmilk substitutes industry wants and away from revealing information that would jeopardize its interests.

A Government, however, has a duty of care to its citizens. By not making information about issues surrounding breastmilk substitutes (from which revenue is earned) as readily available as information about breastfeeding (from which nothing is earned), governments are in dereliction of their civil duty. It's must only be a matter of time before an enraged parent decides to sue.

References have intentionally not been appended to this precis article. If you wish to read the whole article then go to the Lactivist website:

[:http://www.lactivist.net/?p=1307](http://www.lactivist.net/?p=1307)

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