

The Ecological Impact of Bottlefeeding

by Andrew Radford 1991

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Breast milk is one of the few foodstuffs which is produced and delivered to the consumer without any pollution, unnecessary packaging or waste. It is the only food which passes on immunisation and other health benefits to the consumer and its production also benefits the health of the producer. It is a valuable renewable resource which is usually overlooked. The idea that breast milk should be replaced by an artificial substitute has been compared to suggesting that dialysis machines should replace human kidneys.

Both dialysis machines and artificial Baby milks have a role to play and can save lives, but to use them in place of the natural originals provided by the human body is a waste of resources. Thankfully, nobody has suggested that people's kidneys might not be capable of the task of eliminating wastes from the body. Bottlefeeding, on the other hand, has been promoted as a viable alternative to mother's milk. Whilst studies clearly show the benefits of breastfeeding (of which

over 99% of mothers are capable), artificial milks continue to be promoted. Breastfeeding is good for babies and mothers, and breast milk is an ecologically sound product. Bottlefeeding causes the death of one and a half million babies per year and ill health in countless others. This report investigates how ecologically damaging it is:

Toxins in breast milk

Much concern has been expressed at the presence of toxins in breast milk, in particular of dioxins and PCBs. It is not my intention to analyse this aspect of the problem in depth, but any study of ecology and infant feeding must recognise its existence. Dioxins are created and released into the environment through chemical and industrial processes including the production of pesticides and herbicides and the chlorine bleaching of wood pulp. They are also produced by waste incinerators, hazardous waste dumps, smoking, leaded petrol and chemical, plastics and pharmaceutical factories. They have been described as the most toxic compound known and the only effective way of dealing with them is to prevent their production.

Large scale release, leading to numerous casualties, include the Bhopal disaster of 1984 and the use of Agent Orange by the US air force during the Vietnam war. Dioxins both promote and enhance cancers as well as causing birth defects. No safe level has been established: a single drop added to the water in an Olympic-sized swimming pool would prevent the hatching of trout eggs; the same concentration fed to a guinea pig would kill it.

Dioxins are found in the atmosphere, in water and in soil. Once they enter the food chain, they are extremely difficult to eradicate. They have a particular affinity for fats (and thus occur in high levels in fatty fish) but also settle on the surface of plants, fruit and vegetables from where they are ingested by humans and animals. Once ingested, dioxins will accumulate in fat, which explains its

presence in breast milk. Studies on 48 human milk samples in Denmark, Norway and Sweden showed that the average baby would have a dioxin intake considerably higher than a recommended tolerable weekly intake (TWI).

The reliability of any such 'acceptable' level is questionable: if no level has been found which is not toxic, the only acceptable level is zero. However, toxins are present in the environment and we are all exposed to them. A World Health Organisation consultation concluded that a safety margin does exist. The Nordic TWI was estimated assuming a life-long intake, not the limited time a baby is exposed through breastfeeding. Furthermore, as the baby experiences rapid weight gain during breastfeeding, the concentration of toxins in the baby's fat does not increase. The presence of toxins in breast milk could frighten mothers away from breastfeeding. However the role of breast milk in giving babies the best nutritional start in life, as well as providing vital antibodies, is accepted as outweighing any potential danger from the contaminants. Despite toxins in breast milk, WHO recommends promotion and continuation of breastfeeding.

Studies on the effect of PCBs on the intelligence of infants showed that whilst much larger quantities are transferred to the baby through breast milk, the smaller amount transferred in the womb is responsible for any intelligence deficit. Advice to mothers to stop breastfeeding after two or three months is unfounded: the levels of contaminants in breast milk are greatest immediately after birth and decrease as lactation advances.

Giving up breastfeeding in response to dioxin levels is self-defeating as artificial baby milks contain high levels of aluminium and lead. Many of their common ingredients, such as cottonseed oil, sunflower oil and beef tallow, are likely to be contaminated with dioxins, pesticides or other toxins. Moreover, a decision in favour of artificial milk will lead to increased pollution and dioxin levels as this report will show.

Breastfeeding benefits

When alternatives are compared from an ecological point of view, both options are usually the source of some degree of damage: there must be studies to find the least harmful in order to limit the damage. The comparison between breastfeeding and bottle-feeding is unique: breastfeeding has a positive effect on the environment whilst bottlefeeding has a negative effect.

Breast milk is a natural, renewable resource which is intended to be fed to babies: artificial baby milks are processed, non-renewable substitutes for this resource. There is no waste from Breast milk as it is produced in quantities according to the baby's needs. Suckling conditions the amount of milk produced, not the mother's food intake. Women need only the smallest amount of extra energy, which is often derived from stored body fat (even malnourished mothers can produce enough quality breast milk to feed a baby) and the average baby needs no other food for six months.

As breast milk is produced in the right amounts and is tailored to the baby's needs, breastfed babies excrete less and often need fewer nappies. Breast milk production does not pollute anything and even removes the need for sanitary protection. Breast milk is free, requires no extra packaging, is ready to use, does not have to be shipped across the world (but is easily transported if necessary), protects against infection and does not need the huge amount of promotional materials produced to sell baby milks. Breast milk is completely environmentally safe; not to use it is a waste of a valuable resource.

Waste

If every baby in the USA is bottlefed, almost 86,000 tons of tin-plate are used up in the required 550 million discarded baby milk tins. If these tins have paper labels, around another 1230 tons of paper are added to the large amounts of glossy paper used to promote the product.

Whilst some of the tins may be reused, the majority of the metal and paper is simply thrown away and rarely recycled.

Baby milks are increasingly being sold ready-to-feed in cartons: these containers are made from a mixture of materials and are therefore impossible to recycle. Bottles, teats and related equipment require plastic, glass, rubber and silicon. These are usually reused but rarely recycled at the end of their lives. The new idea of selling milks ready-to-feed in a bottle, sometimes complete with teat, means that the equipment will not even be reused.

In 1987, 4.5 million feeding bottles were sold in Pakistan alone. The number per baby will be much greater in the industrialised countries (most babies in the USA have at least six). All these products waste natural resources (tin, paper, glass etc), cause unnecessary pollution in their manufacture and in that of the packaging, and result in a waste disposal problem.

Plastics are a particular cause for concern as most are made from oil, a key resource, and their manufacture therefore causes pollution. They are rarely recycled due to lack of facilities and the difficulty in sorting the different types. Plastics are virtually indestructible and remain as a pollutant if dumped (so-called biodegradable plastics are misnamed; they merely have an organic element which biodegrades leaving very small pieces of plastic as pollutants - at least non 'biodegradable' plastics can be picked up and recycled or disposed of properly). If burned, the fumes may contain dioxins and other toxins.

Most lactating women do not menstruate and, therefore, require no sanitary towels, tampons or cloths. This removes the need for fibre, bleaching, packaging and disposal. If the baby is unrestrictedly breastfed for six months before solids are introduced, and if breastfeeding is continued into the second year as a supply of drink and comfort, the average woman will not have a period until her baby is at least 14 months old. In the UK each menstruating woman uses between

286 and 358 towels or tampons per year, 98% of which are flushed down the toilet. Fifty two per cent of these are released untreated into the sea where tampons require six months to biodegrade.

Sanitary towels need longer. The plastic liners on sanitary towels will not biodegrade and remain as a pollutant. If every mother in the UK breastfed her baby, 3000 tonnes of paper alone would be saved every year on sanitary protection products. The toll on the environment due to pulping, bleaching and other chemical processes, cotton and pesticides applied to it, rayon and the dioxins produced during its manufacture must be added to this, as must the damage caused by packaging, transport and disposal.

All these wasted materials, as they are rarely recycled, must be disposed of. The most popular form of getting rid of our waste is dumping it in landfill sites. Most of these are unlined, the theory being that any pollutants will be diluted and dispersed; in practice, this allows the ground water to be polluted. Fears have led to some landfill sites being lined: these are better but can still overflow in heavy rain and any lining will eventually leak. Another method of waste disposal is municipal incineration. This is the source of half of the UK's airborne dioxins. Ironically, a decision not to breastfeed because of dioxins in breast milk will lead to an increase in environmental dioxin levels.

Water

When a mother makes up artificial baby milk, she has to sterilise the water and the utensils. Water and the energy to boil it are usually easily available in the industrialised world, but this is no reason to waste them. The energy usually comes from polluting nuclear and conventional power stations.

Water shortages are common in the developed countries but in 1975 the World Health Organisation estimated that 60% of people in less developed countries do not have access to enough water. It is

not uncommon in some parts of Africa for women to spend five hours per day fetching water. A three-month-old bottlefed baby needs one litre of water per day for mixing feeds and another two litres for boiling teats and bottles. The water for washing and rinsing the equipment must be added to this.

Firewood is also a precious resource in the developing countries and is being used up at an alarming rate. It takes 200g of wood to boil one litre of water, so in one year an artificially fed child would use up at least an extra 73 kilos of valuable wood. Commercial sterilising fluids are commonly used to clean most bottles in many industrialised countries. Most of these fluids are based on chlorine bleach. Chlorine production is linked to dioxin emissions. If the infant is weaned onto commercial weaning foods rather than cheap, locally available produce, more water, fuel and packaging will be wasted.

The dairy industry

It would take 135 million lactating cows to replace the milk of the women of India alone. Cows need pasture - around 10,000 square metres each. This means that to replace the milk of the women of India, 43% of the surface area of the country would have to be devoted to pasture (this is an area six times the size of Great Britain). Where cows are reared, wooded land has to be cleared for the pasture, leading to deforestation and thereby depletion and erosion of the soil and an increase in the gases which contribute to the greenhouse effect, not to mention the reduction in flora and fauna species caused by the change in land use.

To produce a kilogramme of baby milk in Mexico costs 12.5 square metres of rainforest. The gas given off from cows' flatulence and excretion adds to atmospheric pollution in the form of methane, a significant greenhouse gas. Cattle produce 100 million tonnes of methane per year, 20% of the total annual methane emissions. The disposal of the excretion

is a problem in itself and often leads to serious river and ground water pollution.

Rearing of cows also contributes to the problem of acidification or 'acid rain'. Ammonia from open slurry tanks and cowpats reacts with sulphur dioxide (commonly present in the air in developed countries) to produce ammonium sulphate which attacks leaves. When this reaches the earth, it converts into sulphuric and nitric acids.

This problem is exacerbated when the cows are reared intensively, as is common in the countries where most artificial baby milk is produced. The nitrate fertilisers used to grow feed for dairy cows are highly soluble: they leach into rivers and may contaminate the ground water — 1.5 million people in Great Britain have drinking water with nitrate levels in excess of the levels stipulated by the EEC.

Nitrate fertilisers and animal sewage are the two main causes of eutrophication: a lake or stream gets richer in plant nutrients until plants overgrow and their decomposing remains cause deoxygenation of the water which in turn becomes foul smelling and virtually lifeless. It is estimated that the cost of cleaning the nitrate-polluted waters of just one agricultural region of Britain will be £200 million.



Processing and transport

Most artificial baby milk is heat-treated cows' milk which is converted into powder. Skimmed milk is filtered and then heated to 95—105°C for 15—20

seconds, homogenised, cooled and then spray-dried by heating to around 73°C and sprayed into an atmosphere of 160°C.

Soya baby milks are manufactured to a similar process. The energy required to reach the high temperatures and to create the mechanical procedures required in this process will cause air pollution (acid rain-causing agents and greenhouse gases) as well as requiring natural resources in the form of fuel. Milk of soya is the main ingredient in artificial baby milks, but it is added to a cocktail of factory-processed substances.

The milk often travels considerable distances before processing and the tin, paper and bottles also have to be transported. Once packaged, the milk is transported to the consumer. In Ecuador, for example, the main countries from which baby milks are imported are the USA, Ireland, Switzerland and Holland. Other significant baby milk exporting countries include Japan, France, Germany, Denmark, the UK and New Zealand. Most countries import baby milks from thousands of miles away. No exact data on the pollution caused by such unnecessary transport are available but it will be considerable.

Inappropriate use of land and resources

The difference between production-for-need and production-for-greed is central to many green policies. The link between ecology and economy is important. The Earth's resources can support the needs of its inhabitants; the same is true of practically every inhabited area on Earth.

On the other hand the Earth, or an individual part of it, cannot provide indefinitely for the greed of a small proportion of the planet's people. The Earth's resources are often exploited and ecosystems destroyed in the search for economic gain by a greedy few. These resources would contribute far more to the world's economy in the long term if they were managed on a renewable basis.

Much of our present wealth (mainly the industrialised countries) is due to the exploitation of our environment (commonly the developing countries).

Wealth is generally judged by materialist values: more possessions mean more wealth. Sadly, the quality of life is rarely taken into account. Economic principles which do not value the environment can be ecologically damaging in two ways: firstly, resources are needed to make the items required for material wealth; secondly, governments which borrow money in order to try to attain similar wealth must exploit their own resources in an effort to pay back their debts.

In common with an increasing area of the developing world's forested regions, the Awash valley in Ethiopia has been stripped of trees: 22% of the land is now a sugar plantation. In 1984 Ethiopia exported 10,000 tons of molasses to the UK mostly for cattle feed. The starving of Ethiopia who have seen valuable land appropriated to have cash crops grown on it have suffered another injustice.

Milk production is an uneconomical use of land: ten acres will support two people if cattle are raised on it, 24 people if it is under wheat and 61 people if soya is grown. Development programmes often introduce breeds of cow which are ill-adapted to local conditions. In such cases huge spending may be required on feed, shelters, clean water and medical protection from local diseases.

Soya beans are the base of a number of artificial baby milks and are commonly used for cattle fodder. In Brazil, the Cerrado (savannah forest) is cleared and burned, and soya bean plantations replace the forests. Soya beans comprise up to 10% of Brazil's exports. Soya is also a high-input crop requiring artificial fertilisers and irrigation.

Increased bottle-feeding rates contribute to the debt crisis in the less developed countries. Most bottles, teats and artificial milks are imported as are the extra resources required by the health system for the treatments of babies who fall ill because they are bottlefed. Even when the milk is labelled as manufactured in a

developing country the raw materials are usually from the West. The country must therefore spend scarcer hard currency. Furthermore, the baby milk market is usually controlled by multinationals from the industrialised world.

Cost to national economies

The Mozambican Ministry of Health calculated in 1982 that if there were a mere 20% rise in bottlefeeding, this would cost the country 10 million US dollars in just two years, not including the costs of fuel, distribution and damaged health. It was also calculated that the fuel for boiling the water would use up the entire resources from one of the major forestry projects. Indonesian mothers produce one billion litres of milk per year; to replace this with imported baby milk in 1982 would have cost over 400 million US dollars. The country would also have lost another \$120 million to make up for the savings in health and fertility reduction provided by breastfeeding.

In 1987 28% of Indonesia's export earnings was used to pay interest on foreign debts. Fortunately 97% of Indonesian mothers breastfeed for at least six months (76% for 12 months) but the country's economy will suffer if these figures fall — and the baby milk companies are moving in on the market. In an analysis of breast milk in relation to the Indonesian economy, Jon Eliot Rohde wrote: "Its value exceeds twice the annual national budget for health and roughly equals the cost of imported rice for which Indonesia has become, unenviably, the world's largest buyer. This great resource is not only renewable but also equitably distributed, benefits consumer and producer alike and gives far-ranging, non-monetary benefits to society."

Breastfeeding prevents births and passes valuable immunising agents to the infant and leads to healthier babies. With increased breastfeeding rates, child

health is improved and fertility lowered, reducing population pressure and dependency on expensive family planning programmes and services, thus benefiting the economy.

Malnutrition caused by over-diluted formula or diarrhoea caused by contamination of feeding bottles can be treated but at a very high price, and Only if the baby is treated soon enough. Although oral rehydration therapy is cheap and effective, a severely malnourished infant may need intravenous rehydration which can cost as much as \$100. Even in the wealthy USA, the cost for hospital treatment of bottlefed infants is 15 times higher than the cost of treating breastfed babies.

The developing countries are often dependent on the industrialised countries for their health system equipment. In the developing countries, national governments tear down forests, degrade land, pollute air and water, and cut back environment and poverty programmes in an attempt to raise hard currency in order to pay off foreign debts. In such cases the people of the country suffer as the land where they used to grow food crops for their own consumption is often used for cash crops.

The quick-fix solution for governments faced with large foreign debts is to liquidise their natural resources: forests, fisheries, grazing lands and soil. With few exceptions, this exploitation has been destructive and non-sustainable leading to flooding, drought, erosion, landslides and climatic change. In Brazil and Bolivia debt has led to recession with thousands losing their jobs as a result. The unemployed are often forced to invade forests to survive.

The economic medicine offered by the lending organisations, such as the International Monetary Fund and the World Bank, includes encouraging large-scale ranching and soya bean production. This causes deforestation and pushes the landless poor further into the forest. It is clear that more factors than the costs of bottlefeeding are responsible for the economic and environmental catastrophe currently being faced by countries like

Brazil, but the above facts demonstrate that increased bottlefeeding rates will damage the economy of any developing country often leaving the government no choice other than to exploit the country's resources.

Population

Overpopulation in developing countries is sometimes blamed for many of the current environmental problems. In fact overpopulation in the wealthy industrialised world is the real culprit as it is the people there who consume the vast majority of the Earth's resources. A smaller population will mean less ecological destruction, especially if the reduction is in the developed world.

Breastfeeding prevents more births than all other forms of contraception put together (it is also one of the few methods not requiring resources, packaging and health worker time). If this protection is removed, the obvious result is more and closer-spaced births. This means that the health of women and of existing children will suffer, especially in regions where other forms of contraception are unavailable or unacceptable.

Baby milk is expensive: in Sierra Leone, for example, to feed a baby for one month with artificial milk costs 90% of the legal minimum monthly wage. It is not uncommon for many people in developing countries, especially women, to earn less than the legal minimum wage. A greater number of children means that the family may suffer as its income has to feed more mouths and meet more doctor's bills. More natural resources will be needed to support the increased population.

In Africa breastfeeding prevents an average of four births per woman; in Bangladesh it prevents an average of 6.5 births. A study in Chile found that one of the exclusively breastfeeding women had become pregnant within six months of birth, compared to 72% of non-breastfeeding women. Unfortunately the contraceptive effect of breastfeeding in developed countries is lessened by shorter duration of breastfeeding and,

commonly, the custom of restricted feeds and separation of mother and baby.

Conclusion

More bottlefed babies means more deforestation, soil erosion, pollution (including by dioxins and other toxins) climatic changes and wasted resources. Breastfeeding has a positive effect by providing a renewable resource and by preventing other forms of damage to the environment in the form of increased population and wasted materials for example.

Baby milk companies realise that they only have a market if mothers do not breastfeed. To create and maintain a demand for their artificial milks, companies undermine breastfeeding using methods such as free supplies to maternity hospitals, free samples to others, misleading information, advertising and promotion to health workers.

There is a WHO/UNICEF International Code of Marketing which prohibits these practices but the companies rarely do anything more than pay lip service to it. The International Code was adopted to protect mothers and babies from unethical and aggressive company practices and to help save the lives of the one and a half million infants who die every year because they are bottlefed, but a natural consequence of its successful implementation would be considerable ecological benefits.

Instead, baby milk companies are contributing to the current global ecological crisis. The undermining of breastfeeding is the destruction of a natural resource and should therefore be seen in the same light as logging in the rainforests or overfishing our seas and rivers. Commercial greed has no respect for ecology. Companies involved in logging or fishing continually need more wood or fish to maintain their profits. In order to maintain their markets, baby milk companies need to ensure that more babies are bottlefed.

Fortunately the majority of the world's

babies are still breastfed, a situation which is against the baby milk companies' interests. The percentage of breastfed babies is in decline. If the companies continue to be successful in their attempts to increase sales, the problems caused by bottlefeeding today will reach catastrophic proportions. Clearly, companies which undermine breastfeeding are damaging the environment as surely as the companies which chop down rainforests. It remains for this to be taken on board by green pressure groups, politicians and all consumers.

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