Some effects of breast-feeding on mortality. Alan Macfarlane

The way in which breast-feeding lowers mortality seems to be the result of two factors. We are told that 'The importance of breast-feeding may be due not only to the provision of clean and nutritious food, but to the important bacteriostatic effects of breast milk, too.'[1] That is to say, the milk is both an ideal food in terms of nutrition, and also contains elements that reduces the level of harmful bacteria. Dubos has reported that 'In general, breast-fed children suffer little up to weaning time even in the areas where protein malnutrition is prevalent...'[2], and the absence of suffering will particularly apply to the various gastro-enteric diseases which cause so much infant mortality. He continues 'Of obvious interest are the claims that breast-fed infants are more resistant than bottle-fed infants to all sorts of respiratory and gastrointestinal infections.'[3]

The important medical constituents of breast-milk, and particularly the first milk or colostrum, are becoming increasingly apparent. When an infant is born, its gut contains dangerous micro-organisms. 'The gut contents after birth are a most important source of antigen challenge, as they include potentially pathogenic bacteria and viruses, some, such as E. coli, capable of causing fatal gastroenteritis.'[4] These are cleared out by the mother's milk. In general, we are told, 'that an exclusive diet of its mother's colostrum is the best way of improving in infant's life expectancy. In the first place, colostrum has a laxative effect which helps to empty the infant's bowel system of the meconium. Colostrum also contains - and this is even more important - considerable concentrations of antibodies, especially antibodies which counteract bacterial infections of the bowel.'[5] Colostrum, we are told 'contains very large concentrations of the iron binding protein **lactoferrin**. Lactoferrin has a strongly bacteriostatic (i.e. multiplication-preventing) effect, especially against those pathogenic strains of **Escherichia coli** (E. coli) which cause serious bowel infections in new-born infants.'[6] The benefits continue over the first two weeks, when 'breast milk contains a high level of cells with phagocytic (i.e. bacteria-eating) properties. These cells also secrete immunoglobin a, the enzyme **lyozyme** (which attacks the cell walls of bacteria), **lactoferrin** and **interferon**, all of which are particularly effective in protecting the new-born infant from illnesses of the bowel. Interferon is effective against viruses.'[7]

Another description of the complex links, featuring immunoglobulin A (IgA) and **lactoferrin** is given by Poston. 'The bacteriostatic effect of milk IgA antibody on E. Coli has recently been found to depend on synergy with another anti-bacterial factor, lactoferrin. This is an iron binding protein, with exceptional avidity for the metal, which deprives the bacteria of iron essential to their metabolism.'[8] Human milk

[1] Kunitz, Speculations (xerox), p.357
[2]Dubos, Adapting, 171
[3]Dubos, Adapting, 158
[4]Postoon, Immunity (xerox), 187
[5]Benedictow, Milky (xerox), 26
[6]Benedictor, Milky (xerox), 26/27
[7]Benedictow, Milky (xerox), 27

[8]Poston, Immunity (xerox), 189

contains much more lactoferrin than cow's milk, which is 'therefore no substitute for the former in this convection.'[9] Furthermore, human milk contains other essential nutrients. 'Breast milk also contains substantial quantities of such special and important nutrients as iron, zinc and vitamins. It has been demonstrated that the zinc element is of great importance for counteracting infections in new-born infants. Zinc is particularly important for growth.'[10]

The difference between breast-fed and non-breast-fed populations has been demonstrated. For instance 'Studies in Russia at the end of the nineteenth century showed that infant mortality increased during the summer, when mothers often worked long hours in the fields, generally leaving their children at home where they could not be nursed.'[11] Likewise in eastern Prussia, an inability to breast feed due to changes in agriculture led to a high rate of infant mortality.[12] In England in 1903 the mortality of bottle fed babies was three times as high as breast-fed babies.[13] Or again, in Blankenberghe in Flanders in the seventeenth century, where mothers tended not to breast feed their children, there were higher than average rates of infant mortality.[14] A number of studies suggests that 'where mothers were required to work long hours they were unable to breast feed, and because of this either put their infants out to nurse or weaned them,'[15] ...'mortality rates seem to have been higher compared with those where infants were breast-fed.'[16] Examination of the regional variations in breast feeding and infant mortality in Bavaria at the start of the twentieth century 'revealed that infant mortality was 148 per thousand in areas where breast feeding was consistently practiced and 355 per thousand in areas where it was not.[17]

The situation is, of course, complicated by a number of other factors. If the child is breast-fed, but by a wet nurse and not its mother, there may be added dangers, as we shall see. This may raise rather than lower mortality rates. Secondly, if the child is given breast milk but also fed other foodstuffs, 'pap' or artificial milk, these may undermine the value of the milk. For instance, studies in Brazil 'found that breast-fed infants who received even **supplemental** bottles of infant formula were at four times greater risk of dying than were breast-fed-only infants. The mortality risk jumped to fourteen times greater for infants who received no breast milk at all (Victoria et al 1989).'[18] As an example of one situation, we could note an observation about early twentieth-century China. 'It was said there are many customs and practices which determine this high mortality among children, one of which is that of feeding them meat before they have teeth, the mother masticating for the children, with the result that often fatal convulsions follow.'[19] The situation is complicated by the fact that the mother's saliva may, in fact, be beneficial in

[9]Benedictow, Milky (xerox), 27
[10]Benedictow, Milky (xerox), 27
[11] Kunitz, Speculations (xerox), p.357
[12]Kiple (ed), Diseases, 290
[13]Smith, People's Health, 100
[14] cited in Wilson, Prominate, p.225
[15] Kunitz, Speculations (xerox), p.359
[16] Kunitz, Speculations (xerox), p.359; cf also Aberle, Child Mortality, p.345; U.N. 1, p.67
[17]Benedictor, Milky (xerox), 28
[18]Scheper-Hughes, Without Weeping, 317

[19] King, Farmers, p.331

certain respects. 'Giving infants pre-masticated food is a widespread practice in most cultures. The mother's saliva contains ptyalin, an enzyme which infants lack. Ptyalin turns insoluble starches into soluble and digestible sugars.'[20] Further evidence for the complex interactions is given by Lewis in relation to Africa.[21]

The protection afforded by breast-feeding is gradually withdrawn at weaning. Thus the age at which this is done, how it is done, and onto what foods the child is weaned are of considerable importance. There is characteristically a peak of mortality at weaning. As Kunitz has summarized the situation; 'in less developed countries the diet to which children are transferred at weaning is of crucial importance. Too often they are given diluted versions of the adult diet, which is insufficient both in essential proteins and in calories. The result is the syndrome known as weaning diarrhoea.'[22] It is not just that the diet is insufficient. The food is often filled with new and dangerous bacteria, and the 'bacteriostatic' protection of the milk is simultaneously withdrawn.

[20]Benedictow, Milky (xerox), 38
[21] Lewis in Mascie-Taylor (ed.), Anthropology and Disease, pp.85-7.
[22] Kunitz, Speculations (xerox), p.360