

GfK. Growth from Knowledge



Review of the effectiveness of the controls on infant formula and follow-on formula

Literature Review

**A research
report for:**



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1 Summary

This literature review was written to help inform the design of a new study for the Food Standards Agency with the following objectives:

- To assess whether infants under 6 months are being fed follow-on formula milk and if so, the reasons why;
- To assess whether the new controls upon the ways in which follow-on formula milk are presented and advertised have been effective; and
- To draw conclusions about what changes, if any, could be made to the presentation and advertising of infant / follow-on formula.

The primary objective of this review was to summarise what existing research tells us about these issues, i.e. what studies indicate about: the incidence of use of follow-on formula milk for feeding infants under six months of age; understanding among those responsible for feeding babies (parents in particular) about use of follow-on formula milk; and the relation between advertising of follow-on formula milk and infant feeding practices.

As the following text makes clear, the literature searches of relevant journals conducted by the authors found there is very little published peer reviewed research about these issues. Use of follow-on formula milk for infant feeding and the effects of advertisements for this product (and for formula milk in general) are not the subjects of much well-designed research. The review also includes discussion of some additional studies of these areas, use of follow-on formula especially. For example findings about follow-on formula milk published in the most recent Department of Health Infant Feeding Survey are discussed.

While not of direct relevance to the new study, the issue of early infant feeding with ordinary formula milk (i.e. before six months) was also considered. The purpose of the review in this regard was to provide a sense of context for the new research about follow-on formula milk, and provide those conducting this research with a balanced assessment of the state - including the gaps - of current research and current thinking on this subject.

The main conclusions drawn by the authors from their review of the literature are:

- The new research should be able to add to existing knowledge about the incidence of early introduction of follow-on formula milk, and assess more thoroughly the incidence of and reasons for this practice.
- The study can generate interesting findings about advertising and how it is perceived. However, the overriding message of the literature reviewed in this area is that research

should not be expected to identify a 'cause and effect' relationship between advertising and behaviour.

- From a sociological point of view, the important relative 'unknown' that future research could usefully consider is how mothers engage with the project of constructing their identities through their feeding relationships with infants. Investigation of this area may emerge as a useful by-product of the present study.

2 Introduction and background

Use of formula milk for infant feeding is commonplace among British mothers. Notwithstanding some variations in how infant feeding practices are defined which create difficulties for data collection the finding of large scale surveys is consistent (Pontin et al 2007). While rates of initiation and duration of breastfeeding have increased somewhat over the past three decades, it remains the case that a large minority use formula milk as the main food for babies from birth, the majority as the main food or in addition to breast milk by around two months, and by six months most babies are given formula milk as their main drink.

The WHO and the Department of Health both emphasise the merits of exclusive breastfeeding; the policy of the latter (and thus that which is relevant for British mothers) is to recommend that mothers exclusively breastfeed (that is, give their baby no other food or drink than breast milk) for 26 weeks. Large scale surveys have sought specifically to assess the incidence of this practice, and a consistent finding is that few mothers follow policy recommendations.

A study of 11 490 infants in the Avon region found that over the 1990s the proportion who were exclusively breastfed ranged from 54.8 per cent to 31 per cent in the first three months, falling to 0.1 per cent by 6 months. These figures are slightly higher than those from the Millennium Cohort Study (MCS), a disparity probably explained by socio-demographic differences in sample. The MCS indicates an exclusive breastfeeding rate of 43 per cent after one month, falling to three per cent at four months and 0.3 per cent by the sixth month (Pontin et al 2007: 7). The Department of Health Infant Feeding Survey (IFS) which is conducted every five years asked questions for the first time about exclusive breastfeeding at specific ages in 2005. It found that 45 per cent of mothers were exclusively breastfeeding at one week, while 21 per cent were doing so at six weeks. At six months, the proportion of mothers who were breastfeeding exclusively was 'negligible' (less than 1 per cent) (DH 2007: vii).

Mothers have also been asked about when they introduce formula milk. The IFS (2005) found that 24 per cent of mothers in the UK did not initiate breastfeeding at birth at all but used formula milk as the sole source of nutrition (a fall from 30 per cent recorded in 2000). Although the majority breastfed initially most only did so for a few weeks before introducing formula. At 4-10 weeks, 38 per cent of mothers who breastfed initially were using formula milk as their baby's only source of milk (63 per cent who breastfed initially were given some formula). This rises to 58 per cent at 4-6 months (with 78 per cent giving some formula), and 78 per cent at 8-10 months (with 88 per cent giving some formula) (DH 2007: 171).

Since follow-on formula milk (FOFM) came onto the market in the early 1980s, a new option for infant feeding has been presented to mothers for feeding babies from six months onwards. Critics of the formula milk industry have claimed this product was only developed in order to get around restrictions on promotion of ordinary formula milk introduced through the International Code of Marketing for Breastmilk Substitutes in 1981. They argue there is no need from a nutritional point of view for FOFM, that parents are confused about when to give it to babies, and that since it (unlike ordinary formula milk) can be advertised to the lay public, it discourages breastfeeding.

The case made for FOFM from a nutritional point of view concerns mainly its potential role in preventing iron deficiency anaemia. The problem of iron deficiency anaemia in babies and toddlers is a long recognised concern (Childs et al 1997; Wharton 1999; Agostoni et al 2008). It causes a range of health problems including psychomotor delay, although the reasons why iron deficiency has this effect is not well understood (Wharton 1997). One of the main differences between ordinary formula milk and FOFM is the higher Fe (iron) content of the latter product (around 13mg/l compared to around 8mg/l for the former). It is suggested that it may be given to babies from six months (when the stocks of Fe babies are born with have become depleted, and which cannot be replaced by breast milk as it is not a good source of Fe). Some argue FOFM should be considered for inclusion in anaemia prevention programmes, especially those aimed at some of the poorest families in the UK (Belton 2005), although meat-rich weaning diets and use of commercially prepared baby foods which are iron supplemented are also discussed as advantageous (Wharton 1999).

The authors of this review make no claim to be especially knowledgeable about nutrition. Our reading of the published literature about prevention of anaemia through use of supplemented FOFM is, however, that results of studies are mixed. Daly et al. compared iron status, growth, and nutritional status of infants receiving cows' milk with those receiving iron-fortified formula milk and found the latter group did better. They concluded, 'Infants and toddlers at high risk

of iron deficiency are...unlikely to become anaemic if receiving a follow-on formula, although the relative merits of follow-on formula compared with ordinary infant formula remain uncertain' (1996: 9). A paper published the following year recruited six-month old infants at 21 centres in the UK and Ireland and compared results for those given fortified formula, non-fortified formula, and cows milk. It found 'significant differences between the groups were observed at 15 months for haemoglobin, serum ferritin, serum iron and total binding capacity'. The largest difference was between babies given cows' milk and the other babies. The conclusion was drawn that, 'Follow-on formula provides an acceptable vehicle for preventing iron deficiency in thus vulnerable groups' (Gill et al. 1997: 681). Wharton drew attention, however, to the 'apparently conflicting results' of studies from the mid 1990s, highlighting one comparison of fortified and non-fortified formulas where feeding babies with the former milk, 'did not result in higher haemoglobin values'. He suggested that study results, 'are consistent, however, with the argument that the haemoglobin-promoting effects of an Fe-fortified formula may be due to other qualities of the formula in addition to the extra intake of Fe' (1997: 117).

A more recent review of iron fortification of infant formula by Moy, prepared for the Standing Committee on Nutrition of the Royal College of Paediatrics and Child Health, explained that overall research on the subject show, 'Fe fortification of infant formula effectively eliminates Fe-deficiency anaemia in young children', but that 'the appropriate level of Fe fortification remains unclear'. He considered the evidence base for the much higher Fe content of milks in the US [similar to FOFM available in the UK] and concluded, 'There are no clearly demonstrated advantages in using 'follow-on' formula with high Fe content (up to 13mg/l) instead of the standard UK formulas with Fe fortification in the range 4-7mg/l after the age of 6 months, although they may provide an important 'safety net' for the prevention of Fe deficiency in communities with weaning diets low in Fe' (2000: 215).

The controversy over FOFM and advertisements for this product is a recent phase of the controversy over formula milk use in general, which stretches back over decades. Over 30 years ago, a British expert group convened as part of the work of the Committee on Medical Aspects of Food Policy (COMA) stated, 'That so many babies are apparently reared successfully on these milks [modified cows' milks] is a tribute to manufacturers', (Working Party of the Panel on Child Nutrition, COMA 1974:v), but noted that, 'The members of the Working Party...deprecate the advertisement or promotion of infant milks in any way which suggests that a substitute milk is equivalent or superior to breast milk as a food for infants' (Working Party of the Panel on Child Nutrition, COMA 1974:19). The promotion and advertisement of formula milk has, since the 1970s, become a particular subject of

controversy (Baker 1985; Taylor 1998), and a raft of international and national controls have developed that regulate these practices.

FOFM is currently subject to less regulation than ordinary formula milk. As noted above, unlike ordinary formula milk, its advertisement to the lay public is not prohibited by law. Claims have been made, however, that as a result of advertising of FOFM, mothers are being pressurised to formula feed before six months, encouraged to believe that formula milk is as good as or better than breast milk, and are using FOFM too early i.e. before their baby is six months old. It is thus suggested that advertising of FOFM is an important factor that accounts for the use of formula milk more generally for infant feeding instead of breastfeeding.

Against this backdrop, the following were defined as the key objectives of the new research:

- To assess whether infants under 6 months are being fed FOFM and if so, the reasons why;
- To assess whether the new controls upon the ways in which FOFM are presented and advertised have been effective; and
- To draw conclusions about what changes, if any, could be made to the presentation and advertising of infant formula milk / FOFM.

As background to research designed to address these questions, in what follows:

1. We summarise what can be directly captured through a review of the literature about these areas. As we discuss further below, there is very little published peer reviewed research about use of FOFM for infant feeding or about the effects of advertisements for this product. Hence discussion of these issues is necessarily brief.
2. Provide an account of the context for research about FOFM, through discussion of the research literature about early infant feeding, specifically use of ordinary formula milk at 0-6 months. In this account we seek to set out a balanced assessment of the state - including the gaps - of current research and current thinking on this subject.

3 Search strategy and study selection process

The primary source of material for this review is articles in peer-reviewed journals discussing social scientific research about infant feeding. The following databases were searched: **Web of Science (Social Sciences Citation Index); Scirus; Google Scholar; Academic Search Complete (Psych/Info/Psych Articles/IBSS selected); Anthropological Index; British Humanities Index; Web of Science (Medline)**. Key words used to

identify articles for potential inclusion were: **Infant feeding; mothers' experiences; bottle feeding; breast feeding; follow-on formula milk; formula milk; infant feeding; information; Britain; United Kingdom; advertising** (See Appendix 1 for further details). The remit of the literature search was deliberately reduced to ensure relevance and possibility of completion of this review in the time available by limiting the timespan of publication to 1970 to the present. It was also reduced by including studies of the UK only, other than for discussion on the relation between advertising of formula milk and infant feeding practices, where the literature discussed includes some from developed countries other than UK.

This search strategy generated over 2500 articles for potential inclusion. The large majority of these items were quickly excluded since it became rapidly apparent from reading the titles and abstracts that they were either not social scientific studies or were not primarily about Britain. From the remaining items, 79 were selected for inclusion the review, and they are listed in the Bibliography. These items were included on the basis of 1) independent careful reading of abstracts by two researchers; 2) discussion between these two researchers about the relevance and quality of the papers they each identified; 3) careful independent reading of full papers then selected, and 4) the assessment provided by already published peer-reviewed literature reviews in the area, which identified robust, studies. (Efforts were made in this way to ensure that where other scholars have identified certain papers as methodologically robust these were included). This approach to inclusion and exclusion did not follow the recommended stages for systematic reviews described by the Cochrane Collaboration. However, this was the only realistic strategy given significant constraints of time and funding made available for this work.

Four surveys specified by the Panel overseeing the new research programme were also specified as items to include:

The DH Infant Feeding Survey (2005). This is the most recent version of a questionnaire survey carried out every five years. It surveyed a representative sample of mothers in all four countries of the UK. Data were collected in three stages: Stage 1 (babies 4-10 weeks), Stage 2 (babies 4-6 months), Stage 3 (babies 8-10 months). A total of 9, 416 mothers completed and returned all three questionnaires. For the purposes of the present study, the information gathered on FOFM use is especially important. Questions were also asked about feeding intentions and practices more generally.

The DH Attitudes to Feeding Survey (2005). This is a piece of research carried out by GfK NOP (then NOP World) for the Department of Health, comprising 5 minute telephone

interviews with a representative sample by social grade and region of 2000 women in GB. The sample was split equally into pregnant women and women with a child up to 12 months of age. The latter group was split equally by age of the child (under 6 months and 6-12 months). 30 per cent of the sample was first-time mothers or prospective mothers.

The NCT/UNICEF Follow-on milk advertising survey (2005). This is a MORI poll of 1000 pregnant women and mothers that asked six questions whether adverts for formula milk had been seen and what messages the adverts conveyed.

The Millennium Cohort Study. This is a large scale survey, with data collected in sweeps to enable longitudinal study. The first sweep of the survey was carried out in 2001-2002 and the families of nearly 19,000 children aged nine months were interviewed. (A disproportionate number of these children came from families living in areas of high child poverty, and, in England, from areas with relatively high ethnic minority populations. The survey looked at the circumstances of pregnancy and birth, as well as the social and economic background of the families into which these children were born) (Dex and Joshi 2004). This sweep collected information about infant feeding – one question was asked, '*Did you ever try to breastfeed your baby?*' Four peer reviewed papers discussing infant feeding based on the MCS findings have been included in this review (Bartington, S. et al 2006; Hawkins S.S. et al 2007, 2007b; and Kelly, Y.J. and Watt R.G. 2004).

In relation to the research reviewed, in the course of our work we were struck by the absence of systematic non-medical British research into the issues under discussion. This is especially the case for use of FOFM and the relation between advertising and feeding practices. Overall, the literature on infant feeding uses different methodologies, disciplinary approaches and has a wide variety of issues as its focus. This makes comparisons between studies difficult and poses problems for attempts to synthesise findings (the first systematic review of research about mothers' experiences of bottle feeding which considers studies using both qualitative and quantitative methods was published in 2009). This assessment should be borne in mind when reading the text that follows. It also suggests that the proposed study, given its focus on use of FOFM and on advertising, can add in important ways to the existing literature.

4 Use of Follow-on Formula milk

Our first area of discussion concerns use of FOFM. The best source of information that considers this issue is the DH Infant Feeding Survey (IFS); as noted above the most recent survey (2005) asked questions about this issue. In addition data emerged from the DH 2005

Attitudes to Feeding Survey. The NCT/UNICEF Follow-on milk advertising survey (2005) asked two questions about this issue.

The Attitudes to Feeding Survey (DH 2005) appeared to detect relatively widespread misunderstanding about FOFM. It found that of those who were aware of both formula and FOFM, 24 per cent did not consider there to be a difference between the two, and 16 per cent did not know if there was a difference. Just a majority (53 per cent) correctly thought FOFM could be given at around 6-9 months old, but two in ten did not know. Perhaps unsurprisingly pregnant woman rather than women who had babies already were significantly more likely not to know. The proportions thinking it could be given before six months were small however; one per cent thought it could be given at under three months, and five per cent at between three and six months.

The NCT/UNICEF Follow-on milk advertising survey (2005) also appeared to indicate some confusion. 29 per cent of respondents stated they used FOFM with their youngest child. These respondents were asked 'How old was your baby when you started using follow-on milk?' It was found that only 23 per cent said seven months or older. 17 per cent said 'younger than 3 months' and the largest proportion, 57 per cent, said '3 to 6 months'.

The DH Infant Feeding Survey (2007) considered use of FOFM in more detail. The findings relevant for the current study are primarily those which emerge from Stage 2 (4-6 months) since at this point mothers should ideally have not yet introduced FOFM. The survey generated two sorts of information.

First, it asked mothers who were giving their babies milk other than breast milk (that is, mothers who were not exclusively breastfeeding) what type of milk they had given their baby in the last seven days. At Stage 1 (babies 4-6 weeks old) it was assumed that all mothers who were using any milk other than breast milk were using ordinary infant formula. Mothers with older babies, at Stages 2 and 3, were asked a series of questions about the exact type of milk they were using.

It emerged that 85 per cent of these mothers were, at Stage 2, mainly giving their babies infant formula milk. 12 per cent had used mainly FOFM (and one per cent mainly cows milk). The survey notes, 'it is not surprising that infant formula was the main type of milk other than breast milk being used, since this is what is recommended for all babies under six months' (DH 2007: 176). At Stage 3, an increased proportion, 47 per cent, used mainly FOFM. The proportion using mainly ordinary formula had fallen to 43 per cent.

Second, the survey asked questions of all mothers who had ever used Follow-on Milk. They were asked about what age this type of milk was first introduced. In addition, on the grounds that, '....there is some doubt as to whether all mothers fully understand the difference between infant formula and follow-on milk' they were asked if they knew the difference between the two (DH 2007: 177). 70 per cent who had given their baby any sort of milk other than breast milk said they knew the difference, meaning 30 per cent were not sure of the difference. [The questionnaire did not seek to verify whether or not mothers correctly knew the difference. It is also emphasised that respondent error i.e. mothers reporting they had given follow-on when they had not and vice versa may be present].

In regard to use of FOFM, at Stage 2, 11 per cent of mothers who had ever used it said they had already given their baby FOFM. Mothers from routine and manual occupations were almost twice as likely as mothers from managerial and professional occupations to say they had done so (15 per cent and 8 per cent respectively). At this Stage, a difference was also evident by education level, with 14 per cent of mothers with the lowest education level having given their baby FOFM compared with only 8 per cent of mothers with the highest education level. At Stage 3 (8-10 months) 53 per cent reported using it. There were few differences by country. There was no difference by Stage 3 in use by educational level.

Overall, among mothers who had ever used FOFM, a small proportion (4 per cent) reported they had given their baby FOFM at eight weeks, and 10 per cent by four months. 34 per cent had done so by six months, and 51 per cent by nine months. Mothers from routine and manual occupation groups and mothers who had never worked were more likely than mothers from managerial and professional occupations to have first given FOFM at an early age. Thus 16 per cent of mothers who had never worked and 12 per cent from routine and manual occupations had given FOFM by four months compared with 7 per cent from managerial and professional occupations. By six months there were no differences. The survey concluded, 'This suggests that the vast majority of mothers do not introduce follow-on milk before six months as recommended' (DH 2007: 178). The IFS thus appears to detect a rather different picture to that found by the NCT/UNICEF survey, as the incidence of early use of FOFM identified by the former is much less widespread.

The IFS is the only research to consider directly mothers' reasons for use of FOFM before six months. At Stage 2 of the survey (4-6 months) mothers who had ever given their baby FOFM were asked their reasons for giving this milk; answers were picked from a prompted list:

First birth %

Second birth %

All mothers

Reason given:

Previous feeding - experience	48	23
Advised by 25 doctor/health visitor	18	22
Better for baby/more nutrients 24	16	20
Baby still hungry 22 after feeding	14	18
Advised by 19 friend/relative	5	12
Read leaflets /seen 10 information	4	7
Baby not gaining 5 enough weight	5	5
Base: Stage 2 638 mothers who had introduced follow-on	577	1215

Table 5.15: Reasons for introducing follow-on milk at Stage 2 of the survey by birth order (UK) (%s add to more than 100 as mothers could give more than one answer).

Information about reasons for early use of FOFM is thus currently very limited, and the new study should increase understanding of this practice considerably.

5 Advertising of Follow-on Formula milk

We turn now to consider advertising of FOFM. As noted previously, some discussion of formula milk use has centred on the notion that advertising impacts on feeding strategies.

Strong claims are made by some that advertising of FOFM undermines breastfeeding altogether, and encourages misuse of FOFM, in particular its introduction at too early a point (See Appendix 2).

There are two British surveys that provide some data in this area. The NCT/UNICEF Follow-on Milk Advertising Survey (2005) was a MORI poll of 1000 pregnant women and mothers. It found that 60 per cent stated they had seen advertising for formula milk with highest percentages stating they had seen adverts on TV (37 per cent) and in magazines or newspapers (58 per cent). The only other categories where the response rate reached more than 10 per cent were 'Leaflets from health professionals' (13 per cent) and 'Shops' (11 per cent). Of those who had seen adverts, some prompted responses in double figures were obtained in response to the question, 'What types of message were the adverts for infant formula giving?' This was the case for: 'Makes babies healthy' (16 per cent); contains nutrients (16 per cent); 'is as good as breast milk' (31 per cent) and 'Don't know/can't remember' (31 per cent). Only 2 per cent responded that they thought a message was, 'Should only be used after your baby is six months old', although only 1 per cent though a message was, 'Can be used before your baby is six months old'. Five per cent spontaneously responded that they had been given the message that FOFM is, 'Not to replace breast milk/breastfeeding is better'.

The Attitudes to Feeding Survey (DH 2005) found most women – 67 per cent - thought they had seen an advertisement for formula milk. Of those who said they had, similar percentages reported that the advertising was for formula milk and Follow-on Formula (58 and 57 per cent respectively). Women who were pregnant were significantly more likely than mothers to say they were unsure about what sort of milk was being advertised and less likely to state the advertised was for FOFM.

There is, however, almost no peer-reviewed literature that considers perceptions of adverts for formula milk or FOFM and we could find none that analyses the relation between advertising and feeding practices. Of the studies discussed later in this review none have advertising as the main factor they seek to investigate, and only some discuss this issue even briefly as part of a wider discussion about the social context for infant feeding practices. When international literature which considers the developed world is taken into account, and when formula milk *promotion* is included (that is, distribution of free samples and literature by formula milk companies rather than simply advertising in the print and broadcast media), there is more research evidence to go on, however.

A North American study by Howard et al. (1994) did consider specifically the relation between feeding practices and women's prenatal exposure to formula advertising, although it did not consider print and broadcast media. In this survey 136 intrapartum patients were given a questionnaire about their choice of infant feeding methods and prenatal exposure to formula advertising. Of those who had received printed information on infant feeding, 78 per cent reported that it was published by a formula company and 65 per cent recalled receiving offers for free formula during their pregnancy. Thirty-eight percent of women obtained formula through a free offer before their infant's birth. Of the samples that women obtained prenatally, 93 per cent were from companies that advertised only indirectly through hospitals and physicians, whereas 7 per cent were from companies that advertise directly to patients.

The survey was limited in the amount of information that could be obtained and relied on patient recall of events that may have occurred some months previously. The authors however felt that due to the high level of patient recall of formula company involvement, that supplying formula materials through physicians' offices is an effective method of making women aware of formula as an infant feeding option. The survey concluded that the participation of prenatal caregivers in promotion efforts of formula companies provided a negative or ambiguous message about the importance of breastfeeding and could be a barrier to breastfeeding success.

The effects of published materials distributed prenatally on mothers' infant feeding choices were also explored by Howard et al. (2000). The study compared the effect of materials distributed through physicians at the prenatal stage on breastfeeding patterns. In a randomised trial, 547 pregnant women attending for obstetric outpatient care in Rochester, New York, were allocated either formula company ($n=277$) or specially designed educational packs about infant feeding ($n=270$) at their first prenatal visit. Feeding method was then determined at delivery. Breastfeeding duration of the 294 women who chose to breastfeed was ascertained by researchers at 2, 6, 12 and 24 weeks.

The study found that the small difference in breastfeeding initiation between the two groups (1.4 per cent) was not statistically significant, suggesting no effect of the intervention on women's choice of an infant feeding method. Among women who chose to breastfeed their infants, the intervention did not significantly affect the length of personal goals. Breastfeeding termination within the first two weeks was higher in the commercial intervention group and became statistically significant after adjustment for potential confounders (maternal age, planned return to work, previous breastfeeding experience, marital status, and socioeconomic status). Further sub group analyses showed that women in the commercial intervention

group, with uncertain breastfeeding goals or goals of under 12 weeks, were more likely to have stopped breastfeeding at two weeks. With respect to long term breastfeeding, however, the commercial intervention did not significantly affect breastfeeding duration.

Other studies focus on the effects of receipt of leaflets and formula milk samples in discharge packs. Bergevin et al. (1983) aimed to determine whether product promotion by infant formula companies shortened the duration of breastfeeding and hastened the introduction of solid foods. The study involved 406 mothers from the maternity ward at the Montreal General Hospital. Of these women, 212 were randomly assigned discharge packs, which contained formula samples and three small information booklets containing advertising by formula companies, and the remaining 194 women made up a 'no-sample' control group. Three months post partum all the mothers were interviewed by a research assistant, who was unaware of their randomisation status, about their infant feeding practices.

The receipt of the formula sample packs was associated with the early cessation of breastfeeding: 78 per cent of mothers who had received a sample were still breastfeeding at one month versus 84 per cent for those who had not. These results became statistically significant when the groups were further analysed to compare what the authors determined to be more 'vulnerable subgroups', which included less-educated mothers (67 per cent who received samples were still breastfeeding at one month versus 79 per cent of those who had not), mothers who had reported illness since leaving the hospital (67 per cent still breastfeeding versus 88 per cent), and first-time mothers (70 per cent still breastfeeding versus 80 per cent). Comparison of the less vulnerable subgroups found that the results in those receiving, and not receiving, samples were almost identical: 91 per cent versus 88 per cent in mothers with over 14 years' education, 79 per cent versus 82 per cent in those not reporting illness and 86 per cent versus 86 per cent for those with more than one child.

The authors concluded that the receipt of infant formula samples may lead to an earlier cessation of breastfeeding (and hasten the introduction of solid foods). However, they acknowledged that the effects on healthy, well-educated, multiparous women were small and that it was in the more vulnerable groups that the results became clinically and statistically significant. They speculated that women with a lower socioeconomic status may be more affected by formula promotion, including women in developing countries but firmly resisted from extrapolating their findings to these other populations. Furthermore, the authors urged caution in the interpreting of their results stating, 'The differences in duration of breastfeeding and age at introduction of solid foods, though clinically important, are not large, even in the vulnerable subgroups. Furthermore, most well-educated, healthy women,

especially if they are also multiparous, do not seem to be strongly influenced to change their infant feeding practices by the mere receipt of free samples of infant formula' (Bergevin et al 1983: 1150).

A study published four years later by Frank et al (1987) also considered discharge packs. In this study a randomised controlled trial was conducted to determine whether the provision of discharge packs was statistically significant in affecting the uptake and duration of breastfeeding. This research aimed to survey American women who were poorly educated, had a low-income or belonged to an ethnic minority group as it had been found that women belonging to these groups initiated and sustained breastfeeding at lower rates than the national average. The low rates caused concern to public policy makers as breastfeeding had been shown to reduce the risk of infectious morbidity and mortality in high-risk groups in the first year of life. In an attempt to select women who fit the above criteria, the study participants were selected from the maternity ward at Boston City Hospital, a municipal institution serving the medically indigent of inner-city Boston. One of the selection criteria for the women, however, was having a telephone in the home and being able to speak English or Spanish, which excluded the very poor and some ethnic minority groups.

The authors concluded that:

[I]n some, but perhaps not all, high-risk maternity populations, distributing commercially prepared discharge materials shortens the duration of breastfeeding, particularly exclusive breastfeeding and leads to premature introduction of solid food. Second, the mechanism by which this negative effect operates is not simply by ensuring the ready availability of formula as a breast milk substitute but may, in addition, involve providing materials that convey a subtle mixed message to mothers regarding the value and feasibility of breast-feeding (Frank et al. 1987: 852).

A more recent study by Rosenberg et al (2008) considered specifically the relation between exclusive breastfeeding and receipt of discharge packs from formula milk companies. A secondary analysis was conducted of responses from postpartum women to a survey conducted by the state public health department in Oregon, US (n=3895). It was found that there was a statistically significant relation between receipt of discharge packs and the duration of exclusive breastfeeding, with those receiving the packs being more likely to exclusively breastfeed for less than 10 weeks than women who had not received the packs. A range of other factors were also found to correlate significantly with duration of exclusive breastfeeding. The authors conclude that hospital discharge packs are one of several factors

that influence breastfeeding duration and exclusivity, but warn also that the study may be limited by the self-report nature of the data used (Rosenberg et al. 2008).

5 Early infant feeding

We now turn to discuss research about the wider issue that forms the context for these aspects of infant feeding, namely early infant feeding. The authors make no claim that what follows is an exhaustive account of all of the findings of research about British experience of infant feeding at 0-6 months. Such an account is clearly beyond our scope. The next section of this review does seek, however, to set out a balanced overview of the main themes emerging from social scientific research on this subject. In our discussion we do not attempt to make a case as to which of the themes considered emerges as most important for infant practices and maternal experience. Our view rather is that all are significant, and also operate in concert. We thus concur with those who problematise a research strategy which prioritises one area in relation to others.

5.1 Overview

The causes of the unpopularity of, or the incapacity for, breast feeding which have become characteristic of the industrialised countries in this century have not been identified with any precision. There has been a change in the cultural pattern of life with accompanying changes in attitudes of both men and women to female sexuality, motherhood and family life, and to the feminine role in the home, society, industry and the professions. Other factors almost certainly include the provision and promotion of artificial feeds (COMA Working Party of the Panel on Child Nutrition 1974:19).

Falling rates of breastfeeding, and increased use of formula feeding, among British mothers has been the subject of discussion and concern for decades (Cuthbertson 1999). It is widely believed that the majority of British babies were breastfed until the 1930s, although there is evidence that shows the move to artificial milk had started by the 1850s and 1860s. By the mid 1960s around a third of women in Britain never breastfed and a further quarter stopped breastfeeding in the first month. In Scotland, 49 per cent of infants were never breastfed (Campbell and Jones 1996). In response to falling breastfeeding rates, together with broader developments in perceptions of the family, of health, and of women's social role, the 1970s saw infant feeding become more prominent as a health policy concern in Britain (Carter 1995). This decade saw the commencement of national surveys by the Department of Health (Lawson 1998) and infant feeding was one issue considered by the COMA Working Party on Child Nutrition set up in the early 1970s. It postulated, as stated in the quotation above, that

the reasons for formula milk use were likely to be a reflection of complex socio-cultural shifts, and should be considered multi-factorial, but were 'not identified with any precision'.

Subsequent commentaries from the 1980s continued to remark on the absence of clarity about why breastfeeding rates were low. Simopoulos and Grave noted in 1984 that the WHO Code introduced to regulate the marketing of breast milk substitutes and protect breastfeeding, 'acknowledges that a number of social and economic factors affect the decision of women to breast-feed', but that, 'although the Code does not state so, these factors are not fully understood'. The relevant factors have not been well studied, and they are presumably influenced by 'psychological, social, cultural and economic factors', they commented (1984: 603).

In 1988, Maclean also drew attention to the limits of existing research, stating that while the past 15 years had seen a, 'marked increase in research that has examined the psychological, social and cultural influences on decision to initiate breastfeeding and the duration of breastfeeding', there was still, 'a notable lack of research that elucidates the interplay between socio-cultural and personal influences on breastfeeding behaviour, the day-to-day context in which breastfeeding occurs and the way in which this context influences the configurations of meanings that are associated with women's experiences'. Her argument was that the influence of the 'tradition of logical positivism, which assumes human behaviour can be described objectively, manipulated, controlled and studied in the same way as other natural events', was responsible for this deficit, and suggested the need for a more 'interpretive understanding of motives and meanings that individuals assign to their actions' (1988: 355). Bowes and Domokos claimed 10 years later that the literature remained limited in that it, 'shows little consensus, offering varied and contradictory analyses', containing, 'debate about the many influences on women feeding their infants in Britain and other western industrial societies' (1998: 1.4). A further decade on, our reading suggests this observation still holds true.

Recent years have certainly seen the literature on the subject expand. Studies of various sorts have been published drawing on a variety of disciplines and theoretical and methodological orientations, and their findings overall remain varied and sometimes contradictory.

One growth area is studies of health service interventions that seek to support breastfeeding. The paradigm informing most of these studies is a public health perspective. As Van Esterick has noted, 'most research on breastfeeding and infant feeding...is done by researchers in the areas of health education, international nutrition, clinical nursing, or public health – fields that

can have most influence on policy' (2002: 258). This takes as starting point the premise that rates of breastfeeding are too low. Reported studies then seek to explore why women do not initiate breastfeeding or do not breastfeeding for the recommended length of time, and recommend actions to address the perceived deficit. A smaller, although also growing, literature is explicitly sociological, and to some extent it provides a critique of the public health approach. The question of the role of government in influencing feeding practices through health and education initiatives has been critically explored in literature of this kind. A widely cited article by Murphy uses the concept 'biologico-moral responsibility' derived from Foucault to explore the relation between the State and mother's infant feeding practices. 'The state's attempts to influence mothers' feeding practices operate largely through education and persuasion', she argues, continuing, '[T]hrough an elaborate state-sponsored apparatus, a strongly medicalised discourse is disseminated to mothers [which] warns mothers of the risks of certain feeding practices and the benefits of others'. This discourse, she concludes, 'constrains mothers through a series of 'quiet coercions'' (2003: 433). Other literature, some of which explores the experience of 'quiet coercion', seeks to investigate the nature of contemporary experience of infant feeding, rather than advocate behaviour change (Earle 2000; Lee 2007/200b; Miller et al 2007; Murphy 1999).

As we noted above, it is difficult to synthesis research findings, and one reason for this is that methodologically, most research either quantitative or qualitative methods. (The mixed methods approach of the new study constitutes in this sense a useful departure from the norm). Quantitative, survey-based studies appear overall to highlight complexity, in that their findings have been identified as inconsistent. One review of the literature based on survey data, for example, considered studies of Western women employing multivariate analysis. It found that, 'the associations between breastfeeding and many of the factors commonly investigated were not consistent'. Strong associations reported in univariate studies were not evident in studies which employed multivariate analysis to control for covariates and confounding factors. It determined: 'While there was a strong and consistent association with demographic factors such a maternal age and level of education, there was less consistent association with factors such as marital and socioeconomic status.' They noted also that previously reported factors such as parity and method of delivery were less consistent, but that psychosocial factors such as the father's role in the breastfeeding decision may be important (Scott and Binns 1999: 5).

The amount of qualitative research continues to grow, but few studies integrate the findings of this style of research with larger scale studies (an exception is work by Lee 2007/2007b). Findings from recent qualitative studies appear, however, to have re-enforced one point from

earlier such literature. A message of most recent qualitative work is that the attempt to identify singular 'causes' of infant feeding practices will illuminate little, as infant practices are the result of many, complex influences. From their review of qualitative research from the 1980s, 1990s and early 2000s, Miller et al. thus found that, 'women's' practices in relation to infant feeding are shaped by multiple and complex factors' (2007:223). Almost without exception, they indicate that papers using qualitative methods identify a host of factors at play when women make infant feeding decisions.

Given the issue identified above, of the variety of disciplines, theories and methodologies drawn upon by researchers, we have opted for the sake of clarity to divide discussion that follows according to methodology; hence we discuss quantitative work in one section of what follows, then qualitative studies. As a whole this body of work does, however, commonly discuss a large number of influences that shape infant feeding practices. Our reading suggests these are:

- Socio-economic and demographic factors and their relation to the incidence of breastfeeding (surveys and qualitative studies)
- Antenatal intention in regard to feeding practices (surveys and qualitative studies)
- Breastfeeding advice and support/healthcare practices (surveys and qualitative studies)
- Breastfeeding problems/breastfeeding as difficult work (surveys and qualitative studies)
- Attitudes to breastfeeding / embarrassment about breastfeeding (surveys and qualitative studies)
- Employment (surveys and qualitative studies)
- Feeding 'in public' (surveys and qualitative studies)
- The moralisation of infant feeding practices and maternal identity (qualitative studies)
- Tensions between motherhood/womanhood (qualitative studies)
- Information provision about formula feeding (surveys and qualitative studies)

5.2 Surveys (questionnaire and interview based)

The main large scale surveys of British women and infant feeding are those mentioned above, in Section 2. The DH IFS (2007) is particularly important given its scale and quality. Our searches also identified smaller scale studies which use primarily questionnaires (but sometimes interviews) to collect data, from which statistical relationships between feeding

practices and a range of factors are proposed. (No claim is made that we have considered all such studies). The discussion that follows concentrates mainly on the findings of the bigger studies – it is organised primarily around themes discussed in the most recent IFS published in 2007. These themes, from the IFS, are:

- Incidence of breastfeeding and relation to socio-economic and demographic variables
- Breastfeeding intention and relation to breastfeeding rates
- Attitudes to breastfeeding and relation to feeding practices
- Breastfeeding advice and support/healthcare practices and relation to feeding practices
- Breastfeeding problems
- Employment and feeding practices
- Feeding 'in public'

The following text also summarises the major points to emerge from all quantitative investigations reviewed in these areas.

Incidence of breastfeeding and relation to socio-economic and demographic variables

The IFS (DH 2007) found that the highest incidences of breastfeeding were among mothers from managerial and professional occupations, those with the highest educational levels, those aged 30 or over and first time mothers. It found these variations were consistent in all countries in the UK and conformed to the patterns found in the IFS in previous years.

The relation between breastfeeding rates, socio-economic status, age, and educational levels, is commented on in research over many years (Jones and Belsey 1977; James 1981; Jones 1986/1986b; Hoddinott et al. 2000; Kelly and Watt 2004; Wright et al 2005). Some similar issues are mentioned. Based on data from the MCS, Kelly and Watt found, 'Clear social class differences in breast-feeding initiation and exclusivity for the first 4 months were apparent in this large UK sample' (2004: 417). Wight et al found initiation of breastfeeding in Britain to be 'strongly determined' by socio-economic background (2005: 686). Hoddinott et al (2000) found young age and, for white women, leaving full-time education at age 16 year or below to be two of the three factors significantly associated with not breastfeeding at three months (the other was poor emotional support as assessed by the woman's health visitor).

Breastfeeding intention and relation to breastfeeding rates

The IFS (DH 2007) found that, when mothers were asked to think back to before they had their baby, 70 per cent in the UK said they intended to breast feed their baby with most intending only to breastfeed rather than to mix breast and bottle feeding. Breastfeeding intention was found to be strongly correlated with behaviour, at least at the outset. Rates of intention to breastfeed were highest for mothers in England, first-time mothers, second-time mothers who had breast fed their previous child for six weeks or more, and mothers who had been themselves breastfed.

Breastfeeding intention has been the subject of other research, with an early decision to breastfeed (i.e. one made in pregnancy or earlier) identified as associated with higher breastfeeding rates (James 1981). The ALPSAC study, 'confirms the strength of the relationship between maternal prenatal intention to breastfeed and both breastfeeding intention and duration'. Notably, it was found that, 'maternal intention was a stronger predictor than the standard demographic factors combined' (Donath et al 2002: 352).

The disparity between reported feeding *intention* and *outcome* identified in the IFS has also been discussed elsewhere. Data collected in a study reported by Lee (2007/2007b) included that from a telephone survey of 503 mothers carried out by GfK NOP (then NOP World) whose babies were under 6 months old. It was found that 314 stated they had intended, when pregnant, to breastfeed, with three quarters of this group intending to do so for more than three months. 86 per cent exclusively breastfed for the first two weeks, but only 29 per cent were doing so at interview.

Attitudes to breastfeeding and relation to feeding practices

Some studies consider 'attitudes' to infant feeding practices, defined as perceived benefits of those practices. Research indicates that mothers have a positive attitude to breastfeeding, in so far as the idea that this practice has health benefits is accepted. The IFS (DH 2007) found that over eight in 10 mothers said they were aware of the health benefits of breastfeeding and most were able to spontaneously give at least one benefit. Mothers in Scotland and Northern Ireland, older mothers, and mothers from managerial and professional occupations were most likely to be aware from the benefits of breastfeeding. This suggests, notably, that there is no consistent relation between 'awareness' and behaviour; not all of these groups of mothers have higher than average breastfeeding rates.

'Attitudes' have been the subject of other studies. Overall, research suggests a complex relationship between attitudes and behaviour. Charbol et al. (2004) analysed questionnaire returns from 225 mothers to look at what perceptions of infant feeding predicted feeding

choices. They found that only one strongly predicted a preference for breastfeeding, namely 'physiological advantages for mothers'. 'Attitudes' are presented by some as only one factor among many other influences associated with infant feeding practices (Jones and Belsey 1977). Others, however, who tend to advocate educational interventions on the basis of their research findings, suggest 'attitudes' are especially significant. Shaker et al. surveyed 108 couples using the Iowa Infant Feeding Survey and found that fathers overall were more likely than mothers to disapprove of breastfeeding in public, and that, 'parents of breastfed infants had more positive attitudes towards breastfeeding than parents of formula fed infants' as they were, 'more knowledgeable about the health benefits and nutritional superiority of breast feeding'. They advocate that health professionals should have discussions parents to address their 'misconceptions' about breastfeeding (2003: 260). A study comparing attitudes of breastfeeding and bottle-feeding couples found that socio-demographic factors were associated with feeding choices, but that 'knowledge' and 'attitudes' distinguished the groups. It found that fathers in general were less 'knowledgeable' and less 'aware' about the benefits of breastfeeding, and that breast feeding mothers were more supportive of breastfeeding than others mothers or fathers. It concluded that, 'bottle-feeding mothers and all fathers could be better prepared in many aspects of breastfeeding' (Shepherd 2000: 660).

Breastfeeding advice and support/healthcare practices and relation to feeding practices

The large majority (79 per cent) of mothers in the IFS (DH 2007) said they had received some advice whilst pregnant about the health benefits of breastfeeding, most often from a midwife. A correlation was identified between receipt of such advice and an intention to breastfeed. The IFS also states that mothers who received such advice were more likely than those who had not to initiate breastfeeding. The survey also identified a correlation between intention to breastfed and discussion of feeding or education about how to position the baby at antenatal classes (28 per cent reported discussion of this kind).

In regard to healthcare in hospital and in the early weeks, the IFS found that mothers who have early skin-to-skin contact with their baby were more likely to initiate breastfeeding than those who had no such contact. This policy (amongst others) is central to the approach of the UNICEF Baby Friendly Initiative, and it has been found that mothers who deliver in hospitals accredited by this scheme are more likely to initiate breastfeeding than those born in non-accredited hospitals (Bartington et. al 2006; Hoddinott et al 2008).

Overall, research emphasises that special attention to both initiation and continuation of breastfeeding by health professionals, broadly termed 'support', does impact on breastfeeding rates (Jenner 1988; Bruce and Griffioen 1995; Swanson and Power 2005). One systematic

review of the literature considered, '20 randomised or quasi-randomised controlled trials' that compared extra breastfeeding support interventions with standard care, which together involved 23 712 mother-infant pairs. It found evidence for, 'the effectiveness of extra support on the duration of any breastfeeding, although the strength of its effect on the rate of exclusive breastfeeding is uncertain' (Sikorski et al 2003: 407).

Issues have been raised in some studies about 'ambivalence and concerns among maternity unit midwifery staff about promoting breastfeeding', on the grounds that they fear inducing guilt among mothers who bottle feed (Bruce and Olsen 1991). Differences in how positively mothers who bottle-feed and who breast-feed rate information and support from health professionals have also been noted, with the latter rating professionals more highly than the former (Bishop et al 2008). We return to the issue of information provision and formula feeding below.

Lay support (where breastfeeding mothers are supported by others mothers who have breastfed, and who volunteer to be involved in breastfeeding support scheme which provides them with training) is a relatively new innovation, and has not been the subject of a great deal of research (Ingram et al 2004). It has been found to be, 'effective in promoting exclusive breastfeeding although the strength of its effect on the duration of any breastfeeding is uncertain' (Sikorski et al 2003: 407). Ingram et al. appear to concur, reporting on the basis of a questionnaire study of 35 mothers involved in a peer support scheme, that, 'peer supporters combined with a breast-feeding support group are an effective way of increasing breastfeeding prevalence in areas with low continuation' (2004: 111).

Finally, breastfeeding support for adolescents has been the subject of specific studies. While their review of the literature did not consider only surveys, Hall Moran et al. found that, 'emotional, esteem and network components of support', have been identified as most helpful, with 'support from an expert individual who is skilled in both lactation support and working with adolescents', emerged the most significant aspect of formal support (2006: 157). A 'lack of knowledge' about the benefits of breastfeeding has been discussed as a problem that needs to be addressed by policy (Dewan et al. 2002; Greene et al. 2003).

Breastfeeding problems

One third of mothers who said they had breastfed reported to the IFS (DH 2007) some kind of feeding problem either in hospital or in the early weeks. It found (perhaps unsurprisingly) mothers who were mixed-feeding experienced the highest levels of breastfeeding problems – around one half of such mothers reported this. Over 8 in 10 mothers who experienced

problems reported they were offered help or advice. The minority who did not report this were more likely to have stopped breastfeeding within two weeks.

The IFS found that about one in eight mothers had experienced feeding problems between Stage 1 (4-10 weeks) and Stage 2 (4-6 months), and one in ten between Stage 2 and Stage 3 (8-10 months). Mothers who breast fed between the first and second stages were more likely to report problems than mothers who formula fed throughout. The highest rate of problems was found among mothers who continued to breast feed after the early weeks, but who introduced formula milk. They reported inability to satisfy the baby by breastfeeding, a need to top up with formula milk, and blocked milk ducts. Overall 'insufficient milk' was the most important factor behind mothers giving up breastfeeding between one week and four months, while giving up in weeks one and two was associated with rejection of the breast and pain or discomfort.

Breastfeeding difficulties have also been identified by other surveys, recent and older, as significant for breastfeeding cessation rates in the early weeks (James 1981; Wright et al 2005). Physical problems with lactation were reported by many women of the 906 who participated in one study as one reason for stopping breastfeeding within three months. 'Despite evidence of the benefits of breastfeeding, this remains an unacceptable long-term option for many women', conclude the authors (Bick et al 1998: 242). In addition to 'insufficient milk' and 'frequent feeding', mothers have reported tiredness, wanting others to help with feeding, inconvenience, leaking and bodily discomfort, and wanting to re-establish routines as reasons for reducing or stopping breastfeeding at one to four months (Lee 2007/2007b). Finally, some research has pointed to a relationship between maternal mood and infant feeding. Hellin and Waller (1992), in their questionnaire study of 152 mothers, found depression in pregnancy and anxiety after delivery were associated with physical difficulties breastfeeding and with earlier introduction of solids. A high score on the Edinburgh Postnatal Depression Scale (EPDS) was found to be a predictor of early cessation of breastfeeding by Bick et al. (1998).

Employment and feeding practices

The IFS (DH 2007) found that employment began to feature as a reason mothers gave for stopping breastfeeding 'in later months', but also notes that this was a less significant factor in 2005 compared with 2000. By Stage 3, 45 per cent of mothers had returned to work. Eight in 10 mothers returning to work did so after their baby five months old, with 57 per cent returning to work after their baby was six months old. Most mothers worked part time: 14 per cent working less than 15 hours per week and a further 56 per cent working between 15

and 30 hours. These data seem to suggest that employment operates in tandem with other factors, as an explanation for breastfeeding rates; it is not the predominant cause of patterns identified.

In relation to breastfeeding among those mothers who do work, at the point at which more mothers returned to work – after five months – some working patterns were associated with a higher than average propensity to breastfeed. These patterns were: mothers working less than 15 hours a week, mothers in managerial or professional occupations, and mothers given access to facilities at work to breastfeed. One in seven mothers said they were provided with facilities to either express milk or breastfeed at work; such facilities were particularly associated with mothers using a workplace crèche.

Other research seems to posit a stronger relationship between work and infant feeding practices, although differences may be explicable through reference to the sample. Bick et al. (1998) found return to work within three months [a minority practice] to be a predictor of early cessation of breastfeeding (within three months), and the ALSPAC study identified planning to return to employment prior to 6 weeks after childbirth [also unusual] to reduce the likelihood of breastfeeding (Noble 2000).

Analyses of data from the MCS highlight a relationship between employment and breastfeeding (Hawkins et al 2007/2007b). The authors conclude that policies to increase breastfeeding should address the relation between breastfeeding initiation and returning to work, and that policies encouraging mothers to return to work after childbirth need to be re-assessed, in favour of 'more supportive work arrangements'. One paper based on the MCS found women employed full-time were less likely to initiate breastfeeding than women who were not employed or were students, although there were no differences between mother employed part-time, self-employed, and those not employed/students. Those who returned to work within four months were less likely to start breastfeeding than women who returned at five months or later and women who returned within six weeks were much less likely to initiate breastfeeding (Hawkins et al 2007). Hawkins et al (2007b) also found mothers employed part-time or self-employed were more likely to breast-feed for at least four months than those employed full-time, and the longer a woman delayed her return to work after childbirth, the more likely she was to breastfeed for this length of time. It was also found that mothers were less likely to breastfeed for at least four months if they returned to work for financial reasons or used informal day care arrangements rather than care by themselves or their partner. Work and pay arrangements – employer provision of family-friendly working, flexible working, and receipt of Statutory Maternity Pay (SMP) plus additional pay rather than

SMP alone – were all associated with breastfeeding for more than four months. These findings were independent of socio-economic status and maternal education.

Feeding 'in public'

The IFS (DH 2007) reported on breastfeeding 'in public', and states that 51 per cent of mothers breastfeeding initially had done so, this proportion increasing from four per cent of mothers breastfeeding for less than two weeks to 86 per cent breastfeeding for at least six months. Only three per cent said they had been stopped or asked not to breastfeed in public, although 13 per cent said they had been made to feel uncomfortable. Only eight per cent of breastfeeding mothers said that they wanted to breastfeed in public but had been deterred from doing so. Embarrassment (although not necessarily only about feeding in public) is, however, identified in other surveys as a reason why women do not breastfeed, or stop breastfeeding (Jones 1986/1986b).

5.3 Qualitative research

In recent years, studies have accumulated that consider infant feeding using qualitative data (Dykes 2003). Research of this kind has sought to counter what is considered a sometimes 'deterministic' account of infant feeding practices, where accounts of what mothers do may emerge as insufficiently nuanced (Earle 2002). Most commentaries of this type note also that mothers generally do possess knowledge of the health benefits of breastfeeding communicated to them by a wide range of agencies. Behaviour cannot therefore be accounted for by reference primarily to a lack of knowledge of this sort (Earle 2000; Miller et al. 2007). 'Infant feeding decisions are shaped by a wide range of economic, cultural and physical circumstances', note Pain et al (2001: 261). It has also been argued that qualitative research is needed to ensure that the voices of mothers themselves inform debate about this issue (Bowes and Domokos 1998).

One review of such literature about breastfeeding in the UK suggests, however, that the quality of this sort of research is variable. The authors finally reviewed 38 studies from 587 abstracts first identified, and commented of these 38 that while 'no paper was deemed 'fatally flawed'...many papers were categorised as 'weak'. Quality issues included: failure to specify methodological approach; lack of clarity about methods of analysis; insufficient detail about sampling approaches or characteristics of participants; lack of explicitness about data gathering;...and lack of reflexivity about ethical and other issues' (Miller et al 2007: 197).

The authors identified two main themes in the published work they considered to be best designed. The first theme was women's experiences of infant feeding and feeding decisions

and the second theme was healthcare practices and support for breastfeeding. The authors of this review concur with this assessment that these areas do emerge as the major themes, and note that discussion of them also considers through alternative methodology some of the issues considered by large-scale surveys discussed above. In this light we now summarise what emerges from qualitative studies in these areas.

5.3.1 Women's experiences of infant feeding

Problems of morality and identity

Miller et al (2007) suggest that a dominant theme which emerges from the better qualitative literature is that infant feeding is often experienced by mothers as a moral problem. Infant feeding attitudes and practices are experienced as a measure of motherhood: 'The literature suggests that perceived societal and peer pressure, the expectations of health professionals, and feelings of guilt and concern over the need to be a 'good' mother profoundly shape not only the decisions and practices of women but also the accounts they offer of these' (2007: 216). For example, note Pain et al., the mothers in their study, 'felt under pressure to live up to certain ideas about good mothering. Frequently they felt judged by others, including health professionals, friends, family members and strangers' (2001: 265).

For this reason, it has been identified that infant feeding decision making and practices constitute an important aspect of the formation of maternal identity. The evidence, 'points to the struggles that women engage in to maintain their status as 'good mothers' which lead them to produce accounts of infant feeding aimed at protecting the moral defensibility of their decisions and practices, regardless of what these are', suggest Miller et al (2007: 224). Mothers perform 'identity work', suggests Murphy (1999), as they engage in defending themselves as 'good mothers' in relation to how they feed their baby.

The literature tends to emphasise that the contemporary context is one which has seen an intensification of pressure to breastfeed in industrialised countries, with women perceiving 'good motherhood' and breastfeeding to be inextricably linked (Murphy 2003; Lee 2007; Stapleton et al 2008). Thus it is emphasised that it is when they formula feed that mothers often struggle to defend the notion that they are a 'good mothers' (Murphy 1999/2003, Lee 2007/2007b, Stapleton et al 2008). Variations in the degree to which mothers feel they need to stage this act of defence have been noted, however, with first-time mothers appearing most defensive, and some mothers responding with anger, rather than guilt, to the suggestion they are second-rate mothers because they use formula milk (Lee 2007/2007b). As discussed further below, it has also been suggested that it is women from middle-class

circles who most clearly experience formula feeding as a moral problem (Pain et al 2001). Finally, it has been argued that although abstractly 'breast is (always) best', in practice, breastfeeding and 'good motherhood' are only experienced as coterminous when breastfeeding goes well, the baby always appears happy and settled, and the mother does not embarrass others by breastfeeding. In other words, mothers who breastfeed as well as those who formula feed do not always feel like good mothers (Marshall et al 2007).

Breastfeeding as difficult work

Accounts of women's experiences report that while some mothers find breastfeeding highly pleasurable and associate it with joy others often find breastfeeding to be physically difficult and painful, associated with tiredness and discomfort. Mothers' accounts of these problems are frequently cited in qualitative articles to explain why women stop breastfeeding (Bailey and Pain 2001; Lee 2007/2007b). In common with large scale surveys, qualitative work identifies problems of pain and discomfort as important for early cessation of breastfeeding. Cessation at latter stages is also discussed. Mothers being unsettled by their experience of what breastfeeding demands of them, as they attempt to meet the growing baby's need for food, is highlighted (Britton 1998; Lee 2007)

One theme in the literature is of women, 'being unprepared for the reality of breastfeeding' (Miller et al 2007; Pain et al 2001). Breastfeeding is idealised but the hard work involved comes as a shock to some mothers, and the gap between expectation and reality itself is disorienting for some (Lee 2007). The counter position of 'commitment to breast-feeding and high expectations of success', with 'unexpected difficulties' feature in commentaries on Post-Natal Depression (Shakespeare et al 2004). Stories of women persisting and struggling in order to do 'what is best' also feature, with comments made about the way in which women place what they perceive their babies' well-being above their own. One striking account of women with eating disorders feeding their babies highlights this issue (Stapleton et al. 2008).

Male partners have been identified as in part, 'involved' in baby feeding in order to assist with this hard work (Earle 2000). They have been identified as non-judgemental about breastfeeding or supportive of bottle feeding because they want to find ways to relieve their partner's pain (Lee 2007). Paternal involvement through bottle feeding is also identified in some work as a positive and pleasurable aspect of maternal experience, since sharing baby care is deemed important by some mothers (Earle 2000) and paternal involvement and 'bonding' is discussed as important and as a source of pleasure for them (Pain et al 2001; Lee 2007). 'Involving fathers' has been represented as additional work mother feel they have to perform however (Murphy 1999). In some circumstances fathers' 'altruism' is directed mainly

at the baby; where it is clear the mother will not breastfeed successfully they advocate bottle-feeding to make sure the baby gets enough food (Stapleton et al. 2008).

Explanations for feeding practices among groups with low breastfeeding rates

Large scale surveys highlight a relation between socio-economic and demographic characteristics and infant feeding practices. Some qualitative studies confirm this association (Sloan et al 2006), but seek to consider further the relation between breastfeeding rates and factors such as age, social class, and education attainment by exploring the experiences of groups known to have relatively low rates of breastfeeding (Hoddinott and Pill 1999/1999b; Scott and Mostyn 2003; McFadden and Toole 2006). They sometimes compare the experience of these groups to that of parents with higher breastfeeding rates who tend to be middle class (Bowes and Domokos 1998; Bailey and Pain 2001; Pain et al 2001).

It is suggested that in some contexts breastfeeding is problematic for women, because a strong expectation prevails that it is difficult and/or undesirable to breastfeed at all, or beyond the early days (Dykes et al 2003; McFadden and Toole 2006). Some work draws attention to the difference in the context for 'middle class' women, and other groups, in this regard. Where for the former the expectation is that babies will be breastfed and that breastfeeding is ideal for baby and mother (leading to the identity problems discussed above when breastfeeding 'fails') for the latter, the expectation is that babies will be bottle-fed, if not from the outset, from an early point. The term 'bottle-feeding culture' is used to describe this prevailing norm (or as Bailey et al. (2004) put it, a 'give it a go breast-feeding culture', which assumes women will try breastfeeding but it will cease after a short time).

This culture, it is suggested, means that historically and in the present there is little lived experience of breastfeeding among some groups of mothers. This impacts on how babies are fed from the outset, and on the expectations mothers hold (Hoddinott and Pill 1999/1999b; Scott and Mostyn 2003). It also means that where 'middle class' mothers will often persevere and struggle to breastfeed, in concert with their partners, peers and other vectors of 'breastfeeding support', mothers from other social groups are less likely to do so. They more rapidly 'do what is easy' and give up trying to breastfeed.

A range of factors have been described and discussed as aspects of a 'bottle feeding culture'. These include (lack of) access to breastfeeding support (see below); the prospect of returning to work; embarrassment about breastfeeding 'in public' outside the home; and a presumption held by male partners that breastfeeding at home in front of family or friends is unacceptable as it may cause embarrassment (Pain et al 2001). Conversely, 'individual and

social environmental' factors associated with breastfeeding being successful for low income women have been identified as, 'positive attitudes; realistic expectations; greater levels of self-esteem; a supportive mother/friend; a partner who was not against breastfeeding; and the ability to cope with perceived temporary social isolation' (Whelan and Lupton 1998: 94).

People in mothers' informal circles (fathers in particular, but also older relatives, for example mothers' own mothers) emerge as playing a part in the formation of this bottle-feeding culture. Where middle class fathers, for example, are prepared to more or less comfortably support and assist with breastfeeding, working-class fathers find this far harder (Pain et al 2001). They thus tacitly or overtly communicate the idea that bottle feeding is better, since it is less painful, not such hard work, does not cause awkward, embarrassing moments when socialising, and makes the resumption of activities including work and sex more straightforward. The case made in many papers is that the more extensive provision of 'breastfeeding support' through professional or lay contact is the best way to counter a 'bottle feeding culture' (Bailey and Pain 2001; Bailey et al 2004).

The picture painted by most literature tends to suggest that 'two worlds' can be identified which operate under the influence of contrasting cultural norms. Some literature suggests overlapping issues, however. For example, the way the demand/wish to return to work fairly soon after childbirth impacts on some middle-class/professional women is discussed. While childcare tends to be provided formally (in nurseries or by childminders) rather than informally (by relatives) the prospect of stopping breastfeeding relatively soon is part of the experience of this group of women as well as that of some working-class mothers (Pain et al 2001, Lee 2007/2007b). Some research suggests that experience is more diffuse overall, with distinctions between middle class and other women less clear. Anxiety about bottle feeding based on the internalisation of the message that it presents risks for child health has been identified as diffused across social groups, even if practice conforms to class-based distinctions (Lee 2007/2007b).

Breastfeeding as embarrassing

A 'bottle-feeding culture' has also been considered to include wider cultural forces. For example media portrayals of infant feeding have been the subject of some research, which has suggested that breastfeeding is not always presented in a wholly positive way. One study found that the media conveyed a mixed message, with breast feeding represented as better and more natural than bottle feeding, but also as difficult in practice (Henderson et al. 2000). While they are not numerous, studies of Britain and other countries have contended the

media has some power in shaping infant feeding practices, and that messages are not always positive about breastfeeding (Britton 1998; Foss and Southwell 2006; Dodgson et al. 2008).

In regard to cultural influences shaping infant feeding, the cultural association between breasts and sexual activity is discussed (Mahon-Daly and Andrews 2002). Discussion of this area tends to suggest it can account in part at least for the experience of embarrassment reported by mothers of breastfeeding. The evidence is not singular; not all data finds that embarrassment is a commonly reported or dominant reason for avoiding breast-feeding (Bowes and Domokos 1998). A cultural context in which breastfeeding appears as problematic or embarrassing has been considered by others as important for mothers' experience (Dykes 2003, Stewart-Knox et al 2003).

This influence has been detected at an individual level. Mothers opt not to breastfeed 'in public', but also at home in front of family members or friends because they consider the display of breasts embarrassing as breasts are considered primarily sexual (Bailey and Pain 2001; Pain et al 2001; Mahon-Daly and Andrews 2002). It is also suggested that the cultural presumption that breastfeeding causes embarrassment leads women to find ways to ensure others' do not feel this way. They see it as their responsibility to hide their breasts (Murphy 1999; Pain et al 2001; Stewart-Knox et al 2003; Bailey 2007). This culture also influences institutions it is suggested – mothers who want to hence find it difficult to breast feed outside of the home because adequate places for them to do so are not provided, even in places such as children's hospitals (Scott and Mostyn 2003). The IFS (DH 2007) appears to suggest, as noted above, that women do not mostly experience negative public attitudes which prevent them from breastfeeding, outside the home at least. The disparity between large scale surveys and qualitative research may be accounted for by selective reporting in the latter; it is the minority of others that surveys suggest experience problems whose experience is highlighted.

Tensions between being a mother and a woman

This theme did not emerge from the review of qualitative studies by Miller et al (2007). Our reading indicates discussion of the ways women attempt to manage often competing demands of motherhood, and womanhood, is an important feature of qualitative studies.

Employment features as part of this area, with work identified as partly shaping decisions mothers make about feeding babies, with returning to work associated with stopping breast feeding (Earland et al 1997; Stewart-Knox et al 2003; Sloan et al 2006). Going back to work quite soon after birth is described as a necessity for many working-class mothers, making

bottle feeding from a fairly early point after birth appear to be an inevitability (Pain et al 2001). This outcome also reinforced by the acceptability of bottle-feeding on the part of relatives who look after the babies of the women interviewed (Bailey and Pain 2001). Some studies report a positive identification on the part of mothers in professional/managerial jobs with work, with bottle feeding considered a means to an end, facilitating the transition back to work (Lee 2007b). Others suggest more negative valuations on the part of such mothers since some experience considerable difficulties trying to combine paid work and breastfeeding (Gatrell 2007). It is suggested, however, that the dominant presumption working mothers will not be breastfeeding impacts on the duration (rather than initiation) of breastfeeding among mothers.

Some literature suggests that mothers' perceptions of bottle-feeding are sometimes associated with complex of issues related to 'womanhood' – described by mothers as 'getting back to normal' and 'having freedom' from the baby, and re-establishing their identity as 'non-mothers' (Earle 2002; Stewart-Knox et al 2003; Lee 2007/2007b). Together with responding to pain and discomfort associated with breastfeeding, 'convenience', 'ease', 'sharing feeding', 'getting my body back', 'getting back to normal' were all terms used by women in a study by Lee, of reasons for formula feeding (2007/2007b). One focus group study of Northern Irish mothers found that in addition to 'embarrassment both in self and perceived in others', 'issues surrounding partner and family support', 'the presence of other children', and 'lack of public facilities', spontaneous themes arising out of focus group discussion included 'perceived lack of freedom and independence', 'inconvenience' and 'return to work' as barriers to breastfeeding (Stewart-Knox et al. 2003: 267).

5.3.2 Healthcare practices

As noted above, it is contended on the basis of quantitative studies that professional intervention in the form of breastfeeding support does have some discernable effect on breastfeeding rates. Some qualitative work confirms this finding – Bowes and Domokos for example found, 'breast-feeding appears to be a lonely struggle....Successful breastfeeding projects are most likely for white, middle class women who have effective stocks of knowledge, *and can negotiate concerted action with health professionals*' (1998, abstract, our emphasis). Qualitative work has, however, also drawn attention to other issues. One review of the qualitative literature about breastfeeding support found it considered a wide range of themes: the mother-health professional relationship, skilled help, pressures of time, medicalisation of breastfeeding, and the hospital ward as a public place. It also found that, 'mothers tended to rate social support as more important than health service support. Health

service support was described unfavourably with emphasis on time pressures, lack of availability of healthcare professionals or guidance, promotion of unhelpful practices and conflicting advice' (McInnes and Chambers 2008: 407). In other words, qualitative research about professional intervention/support considers not only its effects for breastfeeding rates but also mothers' experiences. In addition it has considered how professionals experience their interactions with mothers, as they attempt to increase breastfeeding rates.

A complex picture

Discussion in the qualitative literature about healthcare practices is mainly concerned with whether and how well health professionals (midwives especially) meet mothers' needs (Stein et al 2000). There is some criticism of the extent to which midwives do, in practice, adopt a mother-centred approach. For example, midwives may use language that can patronise mothers to, 'direct women towards decisions [they] thought best, without prior exploration of the woman's understanding and beliefs of baby feeding', suggest Furber and Thomson (2008, in press). Bowes and Domokos argue that while mothers 'remain active in the negotiation of breastfeeding', they are 'generally subordinate to health professionals' (1998, abstract). Lack of time is also raised as significant barrier to midwives doing the best they can for mothers (Dykes 2005). Two major themes appear to emerge however; first discussion of midwives 'deviant' behaviour when they help mothers to formula feed, and secondly what makes for successful breastfeeding support.

According to Miller et al (2007) some better qualitative work draws attention to dilemmas faced by health care professionals, midwives especially, charged with responsibility of increasing breast feeding rates, but confronted with the reality of maternal experience. Furber and Thomson thus suggest their research with midwives detected, 'a management strategy termed 'breaking the rules' for supporting mothers with baby feeding. The concept 'breaking the rules' represented practices that were not congruent with evidence-based, baby-feeding policy and recommendations' (2005: 365). 'Contemporary midwives are in a difficult position with regard to advising childbearing women', note Stapleton et al., since they must encourage breastfeeding, but also, 'strive to be 'with' women (and the 'bad' choices they make)' (2008: 110). Some studies highlight how midwives contravene what is considered good practice, and help mothers formula feed, since, 'Midwives were reported to become distressed by the mother's' tiredness, anxiety or sore nipples, and were motivated to support them' (Miller et al 2007: 221). Mirroring mothers' sense of deviance when they formula feed, midwives want to help alleviate tiredness and pain, but are aware that in doing so they are contradicting what is deemed 'best' (Cloherty et al. 2003)

Such 'deviant' behaviour on the part of midwives is unsurprisingly welcomed by some mothers. Those who decide antenatally they will formula feed, and those who find breastfeeding difficult and painful, experience such behaviour in a positive way. Considered most important of all by mothers who formula feed is when health professionals appear non-judgemental and seek to respond to the concerns expressed by the mother as an individual, rather than meet targets (Lee 2007). Not all mothers who formula feed report finding this response forthcoming. Stapleton et al. note some eating-disordered women in their study could not marry breastfeeding with their feeding/purging routines, and so formula fed. They, 'wanted reassurance from midwives that formula milk would not compromise their baby's development but most failed to receive the encouragement they sought' (2008: 110).

Other qualitative research discusses which practices and interventions are most associated by mothers with successful breastfeeding. Graffy summarises these as, 'information about breastfeeding and what to expect; practical help with positioning the baby to breastfeed; effective advice and suggestions; acknowledgement of mothers' experiences and feelings, and reassurance and encouragement' (2005: 179). Some similar findings emerge from other studies, and appear to cross-cut socio-economic variations. Advice and practical help are, in particular, frequently mentioned. Among their sample of low income mothers, Whelan and Lupton found that receiving good advice, especially with regard to positioning the baby at the breast, greater continuity of midwifery input, and sufficient quality time with a midwife allowing an opportunity to solve problems were all associated with successful breastfeeding (1998: 94). A study reporting the experience of mainly educated, higher-socio-economic status mothers attending a support group for breastfeeding mothers found they experienced a variety of problems, but contact with others mothers experiencing similar problems, and practical 'hands-on one-to-one' support were reported as important if mothers were not to give up breastfeeding (Berridge et al 2005). Hoddinott and Pill endorse the latter of these points in particular, through their finding that for mothers wanting to breastfeed, 'words alone encouraging them to breastfeed were insufficient', and being 'shown skills rather than told how to do them' was important (2001: 224).

5.4 Information about formula feeding

The focus of the new research is in part on parents' understanding of how to use FOFM. The issue of information about formula feeding in general – its provision and levels of comprehension – is implied. While information provision can be considered an aspect of 'support', it is for this reason now considered separately. Only a small number of British studies were identified that address this issue, and only three of these consider

information/support for mothers who bottle-feed specifically. One obvious conclusion is that, certainly relative to breastfeeding, this area is under-researched.

One theme raised is an information deficit. Based on a reading of information provided by health professionals, Wall makes the strong claim that despite formula feeding being a majority practice, 'mothers are often denied information on an appropriate formula to use, how to prepare formula correctly or how to sterilise and store bottles of formula or expressed breastmilk' (2006: 81). Cairney and Barbour concur, counterposing the attention paid to informing and supporting women about breastfeeding, to activity surrounding bottle feeding. 'As a consequence of the lack of published evidence about bottle feeding, health professionals may feel uncomfortable about, or lack knowledge in, providing assistance to bottle feeding mothers. This view has been enhanced by some NHS Trusts in Scotland who have actively discouraged health professionals from providing information about bottle feeding to mothers unless they specifically request it', they state (2007: 30).

Where mothers have been asked about information provided to them, it does appear that many, sometimes a majority, have not been provided with information about bottle-feeding. A study considering the provision of information to Scottish mothers found that fewer than 50 per cent of women reported being given information about sterilising equipment, making feeds and offering the right quantities, before the birth of their baby. Of women considering bottle feeding, 42 per cent had been given information on sterilising equipment before their baby's birth. Of women who had begun to breastfeed but were bottle-feeding at one month postnatally, fewer than 40 per cent had been given information antenatally and less than 56 per cent reported receiving information postnatally (Cairney and Alder 2001). Lee's paper reports findings of a study that considered post-natal experience. It combined a telephone survey of 503 mothers conducted by GfK NOP (then NOP World) with qualitative interviews with 33 mothers, with information provision considered in both parts. The former part of this study found that 80 per cent of mothers had received information about breastfeeding compared with 47 per cent about formula milk use. Even where mothers had decided antenatally they would bottle feed, 'the proportion that received information about feeding this way was still relatively low at 55 per cent (73 per cent of this group received information about breastfeeding)'. Patchy provision of information appeared confirmed by the latter component of this study, with mothers reporting they did not get information from health professionals but rather were 'self-sufficient' relying on information provided with the milk they purchased (2007: 9).

The effects of lack of information are also discussed in the literature. The relation between lack of information and unsafe preparation of bottles is raised by Wall (2006), and is the main emphasis of the commentary by Cairney and Barbour: 'Only where HIV infection is present in mothers is there explicit guidance for professionals helping mothers with bottle feeding but here there is only scant reference to ensuring bottle feeding is carried out in such a way as to minimise safety concerns' (2007:30). The possibility of a link between incidence of gastroenteritis in bottle-fed babies and lack of information is suggested.

How mothers feel, in a context where information is not forthcoming, is also considered. In a study of mothers feelings about professional support in general, Cairney et al. (2006) found midwives were perceived as 'more likely to favour breastfeeding women', and that this was especially the case at one month postnatally for women who were giving some or exclusive formula feeds. Lee contends that maternal experience of not being provided with information or discussing formula feeding with health professionals plays its part in the formation of identity problems for mothers, discussed above. Some mothers interviewed in this study, when they discussed not being provided with information by health professionals about formula feeding, 'appeared to experience this as a slight to their identity as mothers who wanted to 'do their best'' (2007: 12). Overall, feeding babies was experienced, especially by first-time mothers, as a rule-bound activity with formula feeding experienced as a practice that broke the rules, a finding that mirrors that of Cloherty et al (2004), about midwives, discussed previously. The particular contribution of not being provided with information about this feeding strategy for maternal behaviour appeared to be the encouragement of 'guilty behaviour'. Some mothers reported they lied to health professionals about how they were feeding their babies in response to experiencing the absence of any official recognition that their behaviour was legitimate (2007: 10).

A recently published systematic review on the subject of mothers' experiences of bottle-feeding by Lakshman et al (2009) has confirmed that the points made above are those that emerge from robust studies. This review identified English language publications following recommendations for systematic reviews described by the Cochrane Collaboration. Its scope was such that it considered studies of English speaking countries other than Britain (USA, New Zealand and Australia). Studies of British experience by Lee (2007), Cairney and Alder (2001), Cairney and Barbour (2006), Cairney et al (2006) and Colherty et al (2004), discussed above, were included in this review. In regard to information, it was found, in line with the points made above, that 'Mothers reported receiving little information on bottle-feeding and did not feel empowered to make decisions. Mistakes in preparation of bottle-feeds were common'. The conclusion was drawn that, 'Inadequate information and support for mothers

who decide to bottle-feed may put the health of their babies at risk. While it is important to promote breastfeeding, it is also necessary to ensure the needs of bottle-feeding mothers are met' (Lakshman et al 2009: 596).

6 Conclusions

The following main conclusions emerge from this review of the literature:

1. FOFM may be best considered in relation to discussion of *weaning and the toddler diet* rather than breast/bottle feeding, from a nutritional point of view. The medical literature contains mixed findings on its utility when included in the weaning diet for prevention of iron deficiency anaemia in babies over six months of age and in toddlers. Only a small amount of non-medical research about FOFM has been published to date. In so far as non-medical research has already considered use of FOFM, it appears to suggest that use of the product before six months is not widespread. No well-designed studies have explored knowledge about FOFM and how this knowledge is formed. No clear picture reemerges from the available evidence about why those who feed babies FOFM before six months do so.
2. It appears difficult to draw any conclusions about the impact of advertising of any formula milks for breastfeeding duration from the research reviewed. There is little British research about the relation between advertising and mothers' experiences and practices in relation to early infant feeding or use of follow-on milk. The research that gives the strongest indication that formula feeding promotion may have an effect on breastfeeding duration considers commercial discharge packs. Even here the authors of the relevant papers indicate the studies had several design flaws which may have affected the research results. For advertising in the print and broadcast media specifically, the literature tells us almost nothing reliable. Preconceptions, rather than evidence, seem to inform most discussion; the literature (especially the grey literature) is replete with assertions but contains little evidence. This can be illustrated through a brief summary of comments regarding advertising of infant formula taken from this literature, set out in Appendix 2. As this indicates, the forum for discussion is often the letters pages of journals or through comment articles and editorials, rather than research papers.
3. In regard to early infant feeding, our reading of the research identifies that there is no deficit in regard to the diffusion of the message 'breast is best'. It is not 'lack of knowledge' in this respect that explains infant feeding behaviour. The key message from the literature is that *a complex range of factors* best accounts for infant feeding attitudes

and practices. The discussion above indicates how these range from the socio-economic, to the cultural and personal. The point is emphasised in much work, however, that a range of practical and cultural pressures confront mothers making feeding decisions. In regard to the project of increasing breastfeeding rates, it is unlikely these can be successfully addressed at an individual level.

4. The literature seems to suggest that in the current socio-cultural and economic context breastfeeding for longer than a few weeks, and certainly for many weeks, requires mothers adopt a certain attitudinal and lifestyle orientation in tandem with others in their support network. Breastfeeding, exclusive breastfeeding in particular, demands that women adopt, preferably in advance of childbirth, a certain perspective on tolerating pain and discomfort, and also come to view sexuality and its expression, masculinity, womanhood, and parenting (in particular help-seeking from professionals on the part of parents) in a particular way. This holds not only for the mother, but also for fathers and others in her informal network, with whom she interacts with on a routine basis.
5. Qualitative research especially suggests that mothers experience making decisions about infant feeding as a tense and fraught aspect of baby care. One contribution of some work in this regard is to indicate tensions between mothers' self reported experience of formula feeding, and some discussion of the practice. Some of the literature indicates that where much discussion of baby care is only negative about formula feeding, mothers can experience the practice differently, as a way of resolving difficulties and conflicts associated with being a mother.

The new research by GfK NOP should be able to add much to the existing knowledge about the incidence of early introduction of FOFM, and assess more thoroughly the incidence of and reasons for this practice. The study can generate interesting findings about advertising and how it is perceived. However, the overriding message of the literature summarised above is that research should not be expected to identify a 'cause and effect' relationship between advertising in print and broadcast media and behaviour. Useful evidence regarding the role of public policy and healthcare professionals, and how this might be improved, may also emerge. From a sociological point of view, the important relative 'unknown' that future research could usefully consider is how mothers engage with the project of constructing their identities through their feeding relationships with infants. Investigation of this area may emerge as a useful by-product of the present study.

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8 Appendices

Appendix 1: Literature searches

1. Web of Science (Social Sciences Citation Index)

Search 1:

Infant feeding; mothers' experiences

70 items

Search 2:

Bottle feeding; breast feeding; mothers' experiences

6 items

Search 3:

Breastfeeding; mothers experiences

93 items

Search 4:

Follow-on formula milk; infant feeding, advertising

93 items

Search 5:

Bottle feeding; information; mothers

46 items

Search 6:

Formula milk, information; mothers

56 items

2. Scirus

Search 1:

Bottle feeding; breastfeeding, Britain; mothers' experiences

42 items

Search 2:

Follow-on formula milk, Britain

320 items (first 50 selected for examination)

Search 3:

Infant feeding, mothers, Britain

1173 items (first 100 selected for examination)

Search 4

Bottle feeding, information, Britain, mothers

240 items (first 50 selected for examination)

Search 5

Formula milk, advertising, Britain

273 items (first 50 selected for examination)

3. Google Scholar

(Both searches produced many hundreds of apparently relevant items)

Search 1:

Follow-on formula milk; bottle feeding; United Kingdom

First 100 selected for examination

Search 2:

Mothers' experiences; bottle feeding; formula milk; United Kingdom

First 500 selected for examination

Search 3

Formula milk, advertising, Britain

First 100 selected for examination

4. Academic search complete (Psych Info/Psych Articles/International Bibliography of Social Science selected)

Search 1:

Formula milk, breast feeding, mothers, Britain

17 items

No new items produced by further searches (including where the term 'advertising' was used)

5. Anthropological index

Only search to produce items was 'breastfeeding / Britain'

1 item

6. British Humanities Index

Search 1:

Breastfeeding, Britain

8 items

Search 2:

Formula milk

1 item

7. Search results: Web of Science (Medline)

Search 1:

Breastfeeding, Britain

44 items

Search 2:

Bottle Feeding, Britain

92 items

Search 3

Formula milk, advertising, Britain

37 items

Appendix 2: Commentaries on advertising

The following statements are from individuals who are against the banning of the promotion of infant formulas:

"The breast feeding rates in the UK have remained static for over ten years, despite advertising and promotion of baby milks. The Government should spend more money on promoting breast feeding rather than banning the alternatives". i

"To my knowledge, there is no such evidence that direct public advertising of infant formula will cause a decline in breastfeeding. Until some is found, we would be premature to ask Congress to treat formula advertising and tobacco advertising as analogous."ii

"Our experience indicates that formula advertising plays an insignificant role in reducing the frequency of breast-feeding among new mothers ...in fact, denying newborn infants oral fluids during the first few days of life has no physiologic basis since newborn infants continue to require water for normal bodily functions. Not giving neonates water is based more on emotion than on science...Such factors as returning to work, fatigue, and the frequency of breast-feedings were much more significant factors than the mothers' decision to discontinue because formula was available on a free basis. Some of the most successful breast-feeding mothers were those who supplemented their breast-feeding with formula feeding, thereby permitting a less restrictive social life. The conflict over differences between breast-feeding and formula feeding would be greatly simplified if those involved would understand that two words "nourish" and "nurture", mean two different things. There are many ways to nourish an infant. Breast-feeding is the best way to combine nourishing and nurturing. However, flexibility in nourishing and nurturing infants would be best for infants and produce the happiest mothers." iii

"Once a mother has decided to bottle feed she has every right to receive product information in the form of advertising." "Provided advertisements are factually correct and do not promote bottle feeding as superior to breastfeeding, advertising to mothers should be permitted."iv

"If [the government] wants to promote breastfeeding it should spend more money on it, not ban the alternatives. We think breast is best for babies but some mothers cannot or will not breastfeed and they should not be penalised for that."v

The following statements are from individuals who are against the promotion of infant formulas on principle:

“Research suggests marketing of artificial breast milk does influence mothers to give up breastfeeding. In countries where there is little or no advertising, breastfeeding rates are very high.” vi

“Companies that manufacture infant formulas would not bother to buy advertising space such as posters on hospital walls if it was not effective. One company has spent £3m promoting two brands of infant formula in the United Kingdom so far this year. In the United Kingdom the whole market for baby milk grew in value by 21% in the 12 months to October 1990 ...The choice of a substitute for breast milk should be based on clinical criteria and not be influenced by commercial pressures.”vii

“ Recently a new infant formula marketing strategy has evolved in which formula advertising, formula samples, and business reply cards for free cases of infant formula are being distributed to expectant mothers through obstetrical offices. We believe this is not in the best interest of the infants and mothers....With the advent of these attractive hospital discharge packs for formula-fed infants, breast-feeding mothers who do not receive a pack may see themselves as being denied a free baby gift because they choose to breast-feed...Commercial interest should not be passively allowed to abuse the physician-patient relationship to assist in the antepartum marketing of infant formula.”viii

“By far the most common reason for women giving up breastfeeding is not that women want to bottle feed but that they think they don't have enough breastmilk...advertising is just one aspect of companies' promotional activities; sponsorship, gifts and 'education' of health workers and parents have all succeeded in misleading us about the physiology of breastfeeding. Once the product is tried, the companies are on to a winner. The mother will blame herself for her failure successfully to breastfeed; advertising reassures her that failure is normal, and that formula milk is almost as good as breastmilk...Health workers, desperate for accurate information and worried about new developments, sometimes think commercial promotion is necessary. They forget that its primary aim is not to inform, nor to warn of problems, but to sell.” ix

“ Free samples [of formula] to mothers are prohibited by the WHO, yet allowed by the FMF code. Knowledgeable midwives know that during the neonatal period, unnecessary bottles interfere not only with the stimulation of breastmilk, but also sabotage the mother's confidence, which is so crucial to breast feeding. A free sample given by a health worker

implies endorsement of that brand... Poverty is the main cause of poor infant health, but while we 're squabbling over the politics of how to combat this, the WHO code is one cost-free, available method of health protection." x

ⁱ Cohen, P. Bottle battle heats up *Health Visitor.*, (1994), 67, (5), pp153-4

ⁱⁱ Duncan, K. P. The effect of lay advertising on breast-feeding prevalence *Journal of the American Medical Association*, (1990), 264, (16)

ⁱⁱⁱ Lane, D. M., Antenatal formula advertising [2] *Pediatrics*, (1995), 95, (3), p.453

^{iv} Messenger, H. Advertising--who needs it? *Health Visitor.*, (1994), 67, (5), p171

^v Helen Messenger, as quoted in Cohen, P. Bottle battle heats up *Health Visitor.*, (1994), 67, (5), pp153-4

^{vi} 'Boycott Nestle' UCL Green Action Society – Ecoguide
<http://www.ucl.ac.uk/~uczxcia/ecoguide/boycotts/nestle.htm>

^{vii} Amery, J. and Tomkins, A. Advertising infant formulas in hospitals. *British Medical Journal*, (1991), 303, (6813), p.1336

^{viii} Howard, C. R., Howard, F. M., Weitzman, M. and Lawrence, R. Antenatal formula advertising: Another potential threat to breast-feeding *Pediatrics*, (1994), 94, (1), pp102-103

^{ix} Rundall, P. Advertising-who needs it? *Health Visitor.*, (1994), 67, (5), pp171

^x Palmer, G. Midwives' journal. Who needs advertising? *Nursing Times.*, (1987), 83, (20), pp61-2