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**REVIEW OF THE LITERATURE ON
INFANT FEEDING PRACTICES IN NIGERIA**

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for
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INFANT AND YOUNG CHILD FEEDING PRACTICES IN NIGERIA: A REVIEW OF THE LITERATURE

I. INTRODUCTION

Wellstart International's Expanded Promotion of Breastfeeding (EPB) Program has planned formative research on beliefs and attitudes related to infant feeding practices in Nigeria to guide the development of program and communication strategies. As a first step in the process of developing qualitative research instruments and focusing the formative research, this review of the literature on breastfeeding and other child feeding practices was undertaken.

This review covers child feeding practices in the first two years of life, with an emphasis on breastfeeding practices, but also including complementary feeding and introduction of solid foods. Most of the recently-published research on national and regional samples in Nigeria was reviewed to summarize what is known about young child feeding in Nigeria and identify gaps in current understanding. The review focuses on issues relevant to the promotion of behavior change to improve child nutrition, rather than attempting to be completely comprehensive.

There are numerous reports of studies on breastfeeding and other child feeding practices in various parts of Nigeria, and although the samples and methods are not directly comparable, the results are generally consistent. A relatively clear picture emerges on issues such as what a child is fed, at what age and in what sequence, including significant rural/urban differences and some variation among geographic/ethnic zones. The information on why certain feeding practices are favored is also quite consistent across studies, but is usually based on responses to structured questionnaires and does not include much depth or probing for underlying reasons. This is an area where qualitative research is needed to guide the development of plans for the promotion of improved child feeding behavior. Detailed quantitative data on amounts and frequency of feeding is also limited.

Child feeding issues are covered here in more or less chronological order, beginning with breastfeeding and continuing up to consumption of solid foods. Key issues to be addressed during formative research are summarized at the end of the report.

II. BREASTFEEDING

Almost all rural Nigerian mothers and the majority of urban mothers breastfeed their babies, at least for the first few months. Despite widespread prevalence in Nigeria, breastfeeding is not as effective as it could be in promoting good child nutrition and health because of suboptimal breastfeeding practices. A recent review of global trends in breastfeeding noted that many indicators such as prevalence of exclusive breastfeeding, percentage of six to twelve month-olds breastfeeding, and duration of breastfeeding were much lower in Nigeria, particularly in urban areas, than in most other countries in the African region (32). Some of the specific practices that interfere with the beneficial effects of breastfeeding in Nigeria are discussed below.

Initiation of breastfeeding and use of prelacteal feeds

Only a very small proportion of mothers put the baby to the breast within the first hour after birth, while most studies report that the majority initiate breastfeeding within the first 24 (12, 20, 24) or 48 hours (25). Findings of a national survey, the Nigerian Demographic and Health Survey (DHS) provide a somewhat different picture, with 34% of women reporting initiation of breastfeeding immediately after delivery and 24% within 24 hours. Significantly more rural than urban women reported breastfeeding immediately, whereas more of the urban women stated that they gave colostrum. Babies born at home were less likely to receive colostrum than those born in a health facility or hospital, but a lower proportion started breastfeeding immediately if a nurse-midwife assisted with the delivery, as compared to TBAs, midwives or doctors (7). Some of these findings appear contradictory and are difficult to interpret.

The traditional practice among the Yoruba (the major ethnic group in southwestern Nigeria) has been to provide prelacteal feeds of water or an herbal infusion known as *agbo* (16, 17, 25). The majority of Yoruba babies born in hospitals and maternity centers are given first feeds of water or glucose water (12, 20, 25). In the major urban center of Ibadan, it was found that the majority of women discarded colostrum for the first 24 hours, citing reasons such as hospital advice or an absence of milk in the breast. The author concluded that the practice of discarding colostrum was not based on underlying cultural beliefs (25). However, while the majority of mothers (66%) in Ilorin, Kwara State, said colostrum should be fed, one third said it should not be given because it is dirty and yellow in color (12). Compared to other regions of the country, the southwest has a much lower proportion of mothers who begin breastfeeding immediately after birth (7).

Less than half of a sample of urban Igbo mothers (the major ethnic group in southeastern Nigeria) gave breast milk as the first feed after birth, with water given most commonly. The rural Igbo mothers were more likely to start with breast milk (about 60%) but the remainder gave a commercial glucose beverage, water or a local preparation (30). It has been reported that Igbos traditionally rejected colostrum and gave water feeds instead (16). According to the DHS results, a much higher proportion of women in the southeast gave colostrum (86%) and initiated breastfeeding right after birth (49%) than in any other region of Nigeria (7).

In the northern region, over 40% of mothers reported giving colostrum and about one third began breastfeeding immediately (7). Both the Hausa and the Fulani, the major ethnic groups in this region, reportedly hold strong views of colostrum as dirty, unhygienic and potentially harmful (19). Most women did not begin breastfeeding until two (Hausa) or three days (Fulani) after delivery, and fed the newborn water or animal milk instead. Meanwhile, colostrum was expressed and discarded, and the breasts washed with traditional mixtures (19).

Exclusive breastfeeding and early milk supplementation

Exclusive breastfeeding is almost unknown in Nigeria because most mothers introduce water feeds from birth or shortly thereafter (7, 28). It is difficult to assess the practice of exclusive breastfeeding *per se* from the literature because many researchers do not report water feeds as supplements, yet water may form a substantial portion of intake in first few months (16, 24). Given how universal water feeds are, it is probably more useful to discuss the research findings on Nigeria in terms of "full breastfeeding", i.e. giving only breast milk and water. Even full breastfeeding, however, is of short duration. In a national sample, the median duration of full breastfeeding was 2.2 months in the rural areas and only 0.5 month in urban areas (7).



Many mothers report providing very early milk or milk-based supplements, and the social acceptance of this practice among the Yoruba is indicated by the trend of presenting a feeding bottle to the new baby as part of the naming ceremony that usually occurs 8 days after birth (5). About half of the women surveyed postpartum in a maternity home in Ile-Ife said they planned to introduce formula within the first month and most of the rest would do so between one and three months (20).

In the DHS sample, a prevalence of 50% full breastfeeding among infants under four months was found in all zones except the southwest (7). This figure seems high relative to the other studies reviewed and may reflect the fact that the mothers were asked about feeding during the preceding twenty-four hours. It should be noted that the majority of reports available on child feeding have included predominantly Yoruba (southwestern) samples, and as a result this review may give disproportionate weight to some Yoruba practices and under-report the range of practices of other ethnic groups.

Milk supplementation occurs earliest in the urban areas, where most studies have found that the majority of mothers introduce artificial feeding within the first four to six weeks (6, 23, 25, 28, 29). This is likely related to the fact that the statutory maternity leave for women working in the formal sector ends at six weeks postpartum (18, 23). A study in Anambra State found somewhat later supplementation, with a third of urban mothers introducing milk supplements by the end of the first month and another third by three months (30).

In Maiduguri in northeastern Nigeria, about 28% of mothers interviewed in a clinic claimed to rely only on breast milk for feeding their infants until about four months, but water feeds were not investigated. The sample was predominantly of Kanuri ethnicity, from a fairly traditional and isolated urban area and the data were collected more than 10 years ago. Of those mothers using formula at the time of the interview, the majority introduced it between one and three months (15).

Rural mothers tend to introduce milk supplements somewhat later than their urban counterparts, but even so, many begin very early. One study reported that almost half of rural women began using formula or milk powder within the first three months (28). In Anambra State, very few rural mothers began supplements in the first month, but more than 30% did so between one and three months (30). Among rural Igbo mothers, 23% supplemented breastfeeding with artificial feeds by the third month (23).

Mothers' rationale for such early supplementation is unclear because knowledge about the value of exclusive breastfeeding has often been found to be higher than practice. In Lagos, 50% of mothers stated that breast milk alone was best for three to six month-olds, yet 43% supplemented before the end of the first month and 38% between one to three months (6). In a study of trainee health personnel, 87% favored exclusive breastfeeding (2), yet many mothers cite health workers' advice as a reason for non-exclusive breastfeeding. Half of literate fathers in Lagos recommended exclusive breastfeeding for six months whereas the majority of illiterate fathers thought that exclusive breastfeeding should last less than two months (3). More details on timing and reasons for milk supplementation are discussed in later sections.

Frequency and volume of breastfeeding

There is very little data on frequency of breastfeeding, perhaps because most mothers breastfeed on demand (12, 25). Among Igbo mothers, it was found that urban women were more likely (26%) than rural women (9%) to feed according to a time schedule (30).



A study of children aged 6-30 months in a village in Kwara State found a mean of about six feeds and 30 minutes at the breast per twelve hour period. The mean volume of breast milk consumed in twelve hours was about 300 ml for healthy children and tended to be slightly higher during diarrheal illness and convalescence (11). In a 24-hr observational study in a village clinic near Ibadan, most one to three month olds received four to six breastfeeds a day, plus several water feeds. The mean daily breast milk intake was in the range of 350-400 g, with total daily fluid intakes of 620-640 g. (24).

Duration of breastfeeding

The DHS found a median duration of breastfeeding of 19.5 months, varying considerably from 15.3 months in urban areas to 24 months in rural areas (7). Similar patterns of rural/urban differences have been found in surveys of various regions of Nigeria, although some authors report durations that are a few months shorter than the DHS findings (12, 22, 23, 26, 29). These lower figures may reflect a bias due to clinic-based samples or the fact that most of the smaller surveys are of Yoruba or Igbo samples and the northern Hausa/Fulani groups are under-represented. The northern regions have longer durations of breastfeeding, according to the DHS (7).

As expected, urban women working outside their homes or living in elite urban areas report much shorter breastfeeding durations, usually less than six months (12, 26, 28, 29). The majority of the illiterate poor urban mothers or mothers in small towns breastfeed for twelve months or more and many rural mothers continue well into the second year (12, 15, 26, 29).

In a detailed analysis of breastfeeding duration in Ilorin, reduced length of breastfeeding was found to be associated with increasing maternal education, working in the modern sector or not working at all, monogamous marriage, use of contraception, and Christian rather than Muslim religion (26). These findings, particularly on the relationship with education, confirmed results of earlier studies, also on Yoruba samples (1, 22).

Reasons for stopping breastfeeding

In a number of studies that asked mothers their reasons for stopping breastfeeding, the most common response was a feeling that the child was old enough and that breast milk was no longer necessary (10, 28, 30). This may also be the implied reason in cases where the majority of women give no particular reason for stopping, as in Maiduguri (15). The definition of "old enough" obviously varies widely, depending on the types of mothers included in the sample. For example, urban women in Ibadan were reported to consider three months to be adequate (10).

Cessation of breastfeeding was often related to employment, especially for women working in the modern sector (10, 12, 16, 18, 23, 30). Maternal illness was cited by some mothers (10, 12, 30) and was a very common response given by both literate and illiterate fathers in Lagos (3). Similarly, pregnancy was a reason reported by a small to moderate proportion of mothers (10, 12, 28, 30) and most frequently by illiterate fathers (3). Other reasons for stopping included a preference for giving bottles, and advice or pressure from husbands, relatives, friends or health workers (10, 12, 30). Insufficient breast milk was reported as a reason in only a few studies and usually involved less than 5% of mothers (10, 28) or in one case, 8% (12).



Cessation of breastfeeding may be sudden or gradual. Gradual weaning is not necessarily better for child nutrition, at least in the Yoruba context where breast milk intake may be reduced gradually for purposes of moral training and not always complemented with additional foods (5). The term "dissynchronous weaning" has been used by authors of an ethnographic study in Lagos to describe situations where there is a "lack of mutuality between mother and child regarding the timing of weaning" (5, p.165). A mother who wishes to stop breastfeeding despite persistent demands of the child may send the child away from home for a while (to stay with a relative), rub a bitter substance on her breasts, have the child sleep separately or use a sleep-inducing substance to prevent the child crying for the breast.

Alternatively, some mothers report that the child decides to stop breastfeeding. The mean age reported for children initiating weaning was 11 months, much earlier than the sample mean, and the authors suggest that some mothers may have interpreted a disturbance in the child's breastfeeding behavior as the child's desire to discontinue breastfeeding (5).

Abstinence and breastfeeding

In many parts of sub-Saharan Africa, there has traditionally been a taboo against sexual intercourse during the period of lactation. This is reportedly based on the belief that the breast milk would not be good for the nursing baby because it would be contaminated by sperm (3, 5, 18, 21). The practice of postpartum abstinence has served to lengthen birth intervals, allow prolonged breastfeeding and promote child survival (1). In one study, a desire for a higher number of children was found to have a positive association with length of postpartum abstinence, suggesting that these women with a more traditional outlook are aware of the role of postpartum abstinence in improving survival of their children (1). The duration of breastfeeding was found to be the strongest predictor of postpartum sexual abstinence. In rich, urban areas and among the more educated, the period of postpartum sexual abstinence was reduced. (1)

It is generally assumed that polygamous marriages make this practice more acceptable, and that the process of urbanization and tendency toward monogamous marriages could result in reduced breastfeeding duration if sexual taboos persist (16). However, in one study the difference in duration of breastfeeding (used as proxy for postpartum sexual abstinence) was found to be only one month longer among polygamous families when compared with monogamous families. When analyzed by region, the difference was only significant in the southwest (4), indicating that the taboo may be strongest among the Yoruba.

This taboo has implications for duration of breastfeeding in cases where a woman is under pressure to resume sexual relations with her husband and, after breaking the taboo, feels she must stop breastfeeding for fear of making her baby ill. For example, the delay in resuming sexual relations was mentioned as the major disadvantage of breastfeeding by illiterate women in Ilorin (12). Even if a woman does continue to breastfeed, a shorter period of abstinence is likely to reduce the birth interval and again shorten breastfeeding duration since breastfeeding during pregnancy is considered unacceptable (3, 18). In Imo State it has been reported that sexual abstinence is no longer strictly observed among rural or urban Igbo women and that pregnancy tends to occur during the period of reduced breastfeeding: three to nine months in urban areas and nine to fifteen months in rural areas (23).

There is some evidence that the taboo is breaking down among the Yoruba elite and it has been reported that substitution for sexual abstinence is one of the most important reasons given by Yorubas for the use of contraception (18). A study in Lagos State reported that among a minority of women, contraception is beginning to be viewed as a way to avoid the dilemma posed by the taboo because practicing



contraception allows sexual relations and continued breastfeeding. These women reported that the practice was introduced by their husbands. It has been suggested that couples who have adopted this approach and confirmed that the mother was able to continue breastfeeding successfully with no ill effects on the child could serve as advocates within their communities (5).

Image of breastfeeding relative to bottle-feeding

The image of breastfeeding is a critical issue for efforts to motivate improved breastfeeding practices in Nigeria. There is relatively little information on this topic, perhaps because of the lack of qualitative research, but the available literature does provide indications that image has a strong effect on practices. As in many countries, it is reported that the increasing tendency to a bottle-feed is related to a wish to imitate elite, modern women and advertisements conferring status on mothers who use formula (15, 18, 23, 26, 30). In some cases, women believe that formula is more nutritious than breast milk (15, 26) but in others, the women's recognition of the high value of breastfeeding does not seem to mesh with their practices.

For example, women interviewed in Lagos felt that "breast is best" but stated that conditions of urban low-income living interfered with breastfeeding. Almost all of these women reported that breastfeeding was being promoted by health staff and, when questioned, they were not unaware of the benefits, yet their practices did not reflect this knowledge (6). Of women surveyed in an Ibadan market, 90% agreed that "breastfeeding is better than bottle-feeding" but many used bottles and baby foods anyway (18), indicating that other motivations may have more influence than knowledge. The information below on the perceived advantages and disadvantages of breastfeeding provides further clues to the image of breastfeeding among various groups in Nigeria.

Perceived advantages of breastfeeding

Breastfeeding is generally perceived as good and necessary for the health of the child, although data describing actual perceptions are scarce. In Lagos, almost 100% of fathers said that breastfeeding is essential (3). Interestingly, mothers in Ilorin focused more on the emotional well-being of child and mother. When asked about the advantages of breastfeeding, their most common responses were that it makes babies feel secure and mothers feel capable and adequate. Few respondents were aware of the anti-infective, contraceptive or hypo-allergenic benefits (12, 28). In another study in Ilorin, the majority cited the health and growth of the child, with promotion of love and affection between mother and child as the second most important reason for breastfeeding. Educated mothers were more likely to give nutritional reasons for breastfeeding, whereas illiterate mothers and Muslims stressed that breast milk is the natural food for babies (28).

As noted above, however, awareness of the advantages of breastfeeding does not necessarily lead to practice. In the Ibadan area, only 5% of rural mothers were considered to be aware of advantages of breastfeeding (as specified by the researchers) compared with 93% of the urban elite, yet at twelve months, 100% of the rural mothers and none of the elite mothers were breastfeeding. The author summarized by stating that socio-economic factors often determine attitudes and practices regarding breastfeeding. Rather than being seen primarily as something a mother does because it is important for the health of her baby, it is often viewed as something many women have to do because they are poor (29).



Perceived disadvantages of breastfeeding

Few studies have asked about the disadvantages of breastfeeding, and there is little data on the women who decide not to breastfeed at all. In a study of Igbo mothers, 8% of rural and 22% of urban mothers did not breastfeed and health reasons were given by most women when asked why they made that decision (23). Seven percent of women interviewed in Maiduguri said that it was "medically not possible" for them to breastfeed, but no further explanation was given by the report (15).

As mentioned previously, illiterate mothers in Ilorin stated that the delay in re-establishing sexual relations with their husbands was the main disadvantage of breastfeeding. Among working mothers, the disadvantages included perceptions that breastfeeding is inconvenient, takes too much time, and causes women to lose their figures (12, 28).

The loss of a woman's figure or the association of breastfeeding with sagging breasts was also a concern among trainee health personnel, particularly when questions were phrased to refer to themselves or their wives (2). In Lagos, over a third of fathers responded affirmatively when asked if they would try to prevent their wives from breastfeeding for cosmetic reasons (3). Breastfeeding in public was considered unacceptable by 68% of literate professional fathers and 22% of illiterate fathers, because it was felt to be embarrassing, indecent, unhygienic, or uncivilized (3).

Breastfeeding problems

It is not evident from the literature reviewed what types of problems commonly arise for breastfeeding mothers in Nigeria, nor what they do or whom they consult to resolve these problems. Lactational failure was reported by mothers in Ilorin to be due to poor food and fluid intake (50%), fear (10%), or lack of rest (7%). Also, illiterate women cited *juju* or black magic. Mothers reported that the baby might refuse to breastfeed due to poor milk flow, nipples that are too big, or watery milk (12). There was little mention of mothers worrying that their milk supply is inadequate, although the widespread practice of supplementing breast milk with bottle-feeding would suggest that mothers might be concerned about having enough milk to satisfy their babies.

In relation to breastfeeding during children's illnesses, there are conflicting findings. In a survey in Ilorin, two thirds of mothers reported that they continue breastfeeding when a child has diarrhoea, a few would reduce the frequency of feeding, and over a quarter said that they would stop breastfeeding temporarily (12). However, an observational study of nutritional intake during diarrhea and health in a rural community near Ilorin found no evidence of reduced breast milk intake during illness (11).

Expressed breast milk

Only one study was found on expressed breast milk (EBM); a survey of attitudes about EBM among medical and nursing students. About one third of the students would recommend expressing and storing breast milk in the refrigerator to feed to an infant in the mother's absence, and the most common reason for not recommending EBM was the fear of contamination (2). A feeling that breast milk won't keep, even in the breasts, was also recorded among fathers. A substantial proportion of fathers (37% of literate and 23% of illiterate men) said that milk could become sour or stale in the breast after a few days, and a smaller number said that even a few hours could have a negative effect (3).



Wet-nursing

The single study that asked about this practice found that 75% of mothers in Ilorin opposed nursing by someone other than the biological mother on the basis that it was culturally unacceptable and there was a risk of transferring personality traits to the child. However, if the person breastfeeding the child was a close relative, 40% said that it would be acceptable (12).

III. SUPPLEMENTARY AND COMPLEMENTARY FEEDING

This section will discuss the types of liquids and foods given to children up to the age of about two years. Supplements are considered here to be a category comprising feeds of milk or other liquids given along with breast milk, but before the process of introducing other types of foods. A second category of predominantly non-milk based foods, referred to here as complementary foods, include both semi-solid paps prepared specifically for infants and solid foods from the family diet. These are usually provided later than supplements. It is recognized that these definitions are rather arbitrary and that in practice the food types and feeding patterns overlap and numerous variations occur. They are used here simply as an aid to identifying general patterns and covering the different food types in a more or less chronological order.

Pattern of introduction of liquid and solid foods

The general pattern of infant feeding can be summarized as follows:

1. Breastfeeding and water from birth, for varying durations (usually about six months in urban areas and at least twelve months in rural areas).
2. Milk supplements beginning one to three months after birth, earlier among some urban groups, with use peaking around three to six months followed by a gradual decline (16, 28).
3. Dilute semi-solid paps and soft foods, usually beginning around three to six months, but earlier among the urban educated mothers and later among the Hausa.
4. Gradual introduction of a variety of family foods, such that child is accustomed to many foods by about one year of age and consuming a diet similar to adults by about two years (18).

Milk supplementation

As discussed in relation to exclusive breastfeeding, the majority of mothers in Nigeria give bottles as well as the breast. Most commonly, bottle-feeds (other than water, glucose water, etc.) consist of infant formula, tinned, evaporated, or powdered milk (6, 25, 30). Fresh animal milks are also used for infant feeding among northern ethnic groups with access to dairy animals.

Mothers' reported reasons for and advantages of giving milk supplements include:

- Working outside the home (6, 16, 23);
- Perceived insufficient supply of breast milk (6);
- Ability of formula to "satisfy" the child (16, 28);



- Belief that formula feeding is more nutritious than breast milk or promotes faster growth (6, 15);
- Wish to gain status or copy others who are bottle-feeding (6, 15, 16, 23); and
- Encouragement by husbands who bring home tins of powdered milk or formula (23).

It has also been suggested that since the Yoruba tend to use formula feeding in a way similar to the traditional use of "agbo" (herbal infusion used to prevent or treat illnesses), formula feeding may be motivated by perceptions of medicinal rather than nutritive value (18). Finally, although not mentioned specifically in these studies, the widespread promotion of a great variety of brands of milk and milk-based products must also contribute to the desirability of artificial feeding (18).

No studies were found that asked mothers about the disadvantages of bottles and milk supplements, although there were some references to mothers' awareness that a lack of hygiene in formula preparation can lead to illness (18). A few authors noted the traditional Yoruba belief that feeding cow's milk to an infant may cause the child to grow up to have "brutish" behavior (18, 26). It was suggested that perhaps some mothers using formula and condensed milk do not realize that they are made from cow's milk (18).

The timing of introduction of supplementary milk feeds was discussed above, in conjunction with exclusive breastfeeding, and will not be repeated here. There is a scarcity of data on the frequency and volumes of supplementary milk feedings. The mode of feeding is generally by bottle (25), although one study in an Igbo area found that over 30% of the rural women were using a cup (30). Infants who refuse liquid feeds may be force-fed (25). A number of authors cite evidence that milk feeds are not prepared properly, with a tendency to over-dilute, re-use leftovers, and not use hygienic methods (18, 26, 28, 30) but no observational data are available.

Types of complementary foods

Overwhelmingly, the first food other than milk and liquids given to an infant in Nigeria is a thin gruel made from maize, sorghum, or millet, commonly known as pap.¹ Pap was the most common complementary food to be introduced by all income and education categories of mothers in an Ilorin sample, although higher income and education was associated with a greater tendency to add milk to the pap. These cereal products are also preferred in Lagos and Anambra (6, 30, 5).

In a survey of ethnic differences in weaning foods, it was found that the majority of Hausa (96%), Yoruba (90%) and Igbo (83%) mothers start with pap and 100% in all groups mentioned pap when asked to name a good weaning food. One important reason is the belief that pap is easily digested. Uwaegbute concluded that pap is a "cultural superweaning food" that people feel they cannot do without (31). Unfortunately, this pap is watery and of low energy density, typically providing less than 30 kcal/100 unless fortified with ingredients such as milk or sugar (11).

Among the Yoruba, the processing of corn or sorghum to make *ogi*, the base from which pap is prepared, includes repeated washing and sieving that essentially purify the cereal to little more than starch. Although these populations have traditionally relied on pap as an infant food, modern techniques allow *ogi* to be much more finely ground and sieved, and result in reduced nutrient content (17). Advantages of the pap include its availability, affordability, ease of preparation and feeding. Also, the traditional

¹ The composition of pap is similar across ethnic groups, although local names differ and there tends to be a greater reliance on millet and sorghum in the north, and on maize in the south.



practice of fermenting the cereal slurry to make *ogi* results in a weaning food with low pH, which may reduce the risk of bacterial contamination (9).

A traditional complementary food used by the Kanuri, Hausa and Fulani in northern Nigeria is known as *kunu* and is usually made from a cereal (sorghum, rice or wheat) combined with groundnuts or *tsamya* (a sour fruit). About half of the mothers interviewed in Maiduguri mixed this cereal pap with formula, and about a quarter combined formula with commercial cereals (15).

Other foods given to children in the first year include rice, beans, tubers, and other cereals, including commercial preparations (5, 6, 15, 25, 28, 30, 31). Sometimes meat, eggs, and other animal proteins are added to the child's diet in the first year (6, 31), although these foods tend to be given later (5). Urban children receive a greater variety of foods, including more fruits (30). Almost all rural and urban mothers surveyed had heard of commercial baby cereals and 90% of urban mothers recalled hearing advertisements for them on radio or TV. The general perception was that brand name cereals were expensive but more nourishing than traditional cereals (28).

When asked why certain foods were good for babies, the most important reasons were related to the fact that a food was considered to be nourishing. Other reasons included "lightness", tradition, and the fact that the baby liked it (31). More detail on the concept of "lightness" is included below.

The majority of urban Yoruba (75%) and Igbo (83%) mothers and a substantial proportion (40%) of Hausas claimed to prepare foods specially for the child, usually because it was felt that the child was not ready for adult foods. Foods for infants, such as beans, tend to be prepared without (or with less) hot pepper or oil (25). The most important reason for giving family foods was so that the child would get used to them.

Some foods are considered taboo or not good to feed to young children. Eggs, in particular, are believed to lead to cravings and undesirable behavior in the child, such as stealing, and the same belief is sometimes held about other animal proteins such as meat, fish and snails (5, 31). Bananas are believed by some to cause worms, and beans and groundnuts, while not actually taboo, are felt to be difficult for young children to digest (31).

According to one study, most of these taboos (except for eggs) were not held by the majority of people and, in fact, these foods were sometimes given to and considered good for young children (31). However, a study in Lagos found that two thirds of mothers stated that a child of two years should not have more meat (relative to current serving size) even if the family could afford it and the same proportion thought that giving more meat, eggs or fish would spoil the child's moral character (5).

This is a Yoruba perspective, based on the traditional practice of distributing foods (especially prestige foods such as animal proteins) according to seniority and status within the family. It is believed that this is an important way of teaching the child his or her proper place in the hierarchy. Thus, meat is not actually taboo, but receiving too large a share of meat can be harmful to a child by interfering with socialization and moral training. This is a complex belief system which cannot be fully described here, but it is important to consider its potential impact on Yoruba child feeding practices. It is also worth noting that there may be ways to overcome the limits placed on children's intake. For example, Zeitlin observed mothers reporting that their husbands would sometimes "spoil" the child by giving extra meat from the men's own portions. The women claimed to disapprove of this practice but reported it with evident pride (33).



Timing and decisions about the introduction of complementary foods

There is no special ritual associated with beginning to feed paps or solid foods (25, 31) but decisions about timing may be based on developmental milestones such as crawling, walking or vocalizing (31). The most important reasons mothers reported for introducing complementary feedings were apparent hunger of the child as indicated by crying after a feed or demanding more frequent feeds, belief that breast and bottle were not enough, belief that the baby was old enough (likely related to developmental milestones), medical advice, advice of a more experienced friend or relative, tradition and past experience (13, 31). Mass media as a source of information on child feeding was relatively more important among Igbo mothers than among Hausas or Yorubas (31). The choice of weaning diet was most commonly influenced by economic factors and availability (13).

Most Yoruba and Igbo mothers were found to introduce foods between three and six months, although a small proportion start even earlier (25, 31). Higher education and income are associated with earlier introduction (31), as is urban residence (5). A substantial proportion of Yoruba and Igbo mothers also introduce foods at about six months and some as late as nine to twelve months (7), but this is more common in the north, and particularly the northeast (7, 15). One study found that while 38% of Hausa mothers started feeding complementary foods at three to six months, 26% waited until six to nine months, and 33% until nine to twelve months (31).

Most studies do not distinguish the time of introduction of different types of complementary foods, but the data noted above refer primarily to semi-liquid pap, the first complementary food to be introduced. Very generally, these data can be summarized as indicating that pap is often begun too early, especially in the south, and sometimes too late, especially in the north.

Solid foods and foods from the family diet tend to be introduced a few months later, and this has nutritional implications since solids have much higher nutrient densities than pap. Less data are available on solids and the results vary. One study of a Yoruba low-income urban sample found that a few infants received solids as early as two months, about half by six months, and most of the rest by nine months. In a survey of Kwara State, the majority of children did not receive solid foods before twelve months, with the exception of rice and beans in urban areas.

Ethnographic research found a strong resistance to feeding solid foods to children at six months, based on beliefs that a young child cannot swallow such foods, and that the child would become "heavy" and not develop properly (8, 17). However, in Lagos, other researchers noted a trend toward feeding solids earlier and concluded that this behavior is not as resistant to change as expected, at least in urban areas (5).

Frequency of feeding, amount consumed, and nutritional adequacy

The impact of the introduction of complementary foods on actual nutrient intakes in Nigerian children is difficult to ascertain given the practice of giving very small tastes of spicy foods to babies until the child becomes accustomed to the hot pepper and no longer cries. There is relatively little quantitative data on observed feeding frequencies, serving sizes, and actual consumption of complementary foods. However, the chronic inadequacy of young children's dietary intake can be ascertained from the high rates of poor growth in early childhood. The DHS reports that 44% of children aged 18 to 23 months are underweight (low weight-for-age) and more than half are stunted (low height-for-age). The rate of acute undernutrition, indicated by low weight-for-height, is about 15% for this age group (7).



One study that estimated adequacy of energy intake found that children aged 6 to 30 months consumed only 60-70% of the standard recommended energy intakes (14) when calculated according to the ideal weights for these ages. Estimates based on the recommended calories per kilogram of actual body weight appear much more adequate, because these children are already underweight. By this method, the older children were estimated to be receiving about 86% of the recommendation and younger children (obtaining more of their nutrients from breast milk) were receiving 94% of the recommendation, on average (11).

This quantitative study in Kwara State also measured feeding frequency and found a mean of 3.6 feeds of pap per day and, among those receiving solids, about two feeds of "other foods" per day (these means are not additive because they were estimated from different groups). An average serving of pap was over 200 g, of which about 85% was consumed, whereas mean servings of other foods were less than 100 g and, on average, about 70% of the serving was consumed. These differences are partly due to the method of feeding, discussed below, and to the much higher energy density of these other foods (about 80 kcal/100 g.) relative to pap (about 30 kcal/100 g.) (11).

In another study, the majority of mothers surveyed in Ilorin reported feeding complementary foods three to four times a day, based on the family eating patterns. Only a small number (8%) fed more often, as dictated by the baby's appetite. Although the majority continued to give breast milk and/or other milks, these were provided in much reduced quantity and frequency (13). This confirms a point raised by Aina et al. that one of the "dangerous weaning practices" is the tendency to begin withholding access to the breast long before complete cessation of breastfeeding, and yet provide inadequate amounts of complementary foods (5).

Method of feeding

The method used for feeding complementary foods has significant implications for child nutrition and morbidity. The traditional Yoruba practice of hand-feeding requires dilution of pap to a liquid form, thereby lowering the energy density. The mother uses her hand as a funnel to pour liquid pap (or other liquid) into the child's mouth, while holding the child supine on her lap. Although discouraged by health practitioners, this technique is still widely practiced among Yoruba women, regardless of mother's age, education and urban or rural residence (27). The technique is popular because it is traditional, very quick, and allows the mother to "force-feed" if the child refuses to eat (8). But the desire for a very liquid consistency is a serious constraint on efforts to fortify pap and increase its energy density (8, 27).

Cereal paps may also be mixed with milk products and given by bottle (16), leading to the risks of diarrheal morbidity associated with use of feeding bottles. Half of the women surveyed in Ilorin used feeding bottles to feed complementary foods, a quarter used a cup and spoon and the other quarter used force-feeding (13).

Concepts of child health and its relationship to diet

Yoruba mothers have a preference for wiry, agile babies who learn to walk early (33). Such active, playful babies are described as "light" (*fiye*), a term which refers to health, vigor and motor development. Mothers believe it is important to feed "light" foods, such as pap, to keep young children healthy. "Heavy" foods, such as pounded yam, make the child "heavy" (*wiwo*), both in the sense of being heavy to lift, but also in terms of being lethargic, miserable, and slow to learn to walk (8, 17, 33).



Some of the characteristics of a "heavy" child are descriptive of kwashiorkor. It is also recognized that being "too thin" represents ill health (8).

Being fat or plump is distinguished from heaviness. Infant formula is believed to make babies plump and this is considered a good thing by some younger mothers, perhaps due to advertisements with pictures of chubby babies. However, older women caution that a child should not be "too fat", and that formula will not make the child strong. Pap and breast milk are considered to be the best foods for children under one year, giving them strength and power, yet keeping them light (8).

Another important term, used by Hausas and other northern groups as well as some Yorubas, is *alafia*, usually translated as health. A more comprehensive definition covers physical, mental, and emotional well-being as well as material prosperity (33).

Mothers are aware of a relationship between adding new foods to a child's diet and the occurrence of illness. In a study of mothers in Ilorin, the illnesses associated with foods included diarrhoea (56%), constipation (22%), malnutrition (10%), anemia (9%), and vomiting (2%). Beans (cowpeas) and artificial milk were the foods most commonly believed to cause these illnesses (13).

IV. SUMMARY AND RECOMMENDATIONS FOR FORMATIVE RESEARCH

Interest in infant feeding in Nigeria has generated a substantial number of research studies, primarily surveys of knowledge, attitudes and practices, and this literature provides a descriptive overview of common practices. However, there has been relatively little use of in-depth qualitative and observational methods and, as a result, the detailed information needed to understand the perceptions, motivations and constraints that underlie these practices is lacking. Differences in rural and urban settings have been described, but few studies have investigated feeding practices *across* regions and ethnic groups in the country, and the majority of studies focus on Yoruba areas.

In order to develop effective strategies to motivate improved infant and young child feeding, there is a need for qualitative research with mothers, family members and health workers. Generally, formative research intended to guide communication efforts on child feeding needs to address the reasons why certain behaviors are adopted or sustained, the barriers to changing behavior, the people who play a role in influencing decisions about feeding, and the perceived problems and successful outcomes associated with various approaches to child feeding. Based on the gaps in our current knowledge of child feeding in Nigeria, a number of specific questions can be identified for further study. The key issues related to infant and young child feeding are summarized below, with particular emphasis on aspects that could be clarified with focused qualitative and observational research.

Key issues related to breastfeeding

It is clear that current breastfeeding practices in Nigeria are far from optimal. Many mothers discard colostrum, initiate breastfeeding 24 hours or more after delivery, fail to breastfeed exclusively for any significant period, provide many feeds of water, and use milk supplements and feeding bottles in the first few months. On the other hand, most mothers do breastfeed and regard breastfeeding as important for the health of the baby. Rural mothers in particular breastfeed frequently and continue for one to two years.



Women generally expressed positive attitudes and appropriate knowledge about breastfeeding, but their practices often differed. An important objective for formative research would be to probe into underlying beliefs and images related to breastfeeding that are apparently shaping behavior. This may best be done using projective techniques rather than the direct questions that are likely to elicit socially-acceptable "breast is best" responses. Further probing into the perceived disadvantages of breastfeeding will be necessary to identify true constraints to behavior change. The views of not only mothers but also fathers and other influential people will be important here. Information is lacking on the attitudes of health workers, for example.

There are many issues related to breastfeeding that have not been adequately investigated and will need to be addressed during formative research. It is not useful to list them all here, but a few examples will be noted. Detailed information is lacking on patterns of breastfeeding such as frequency of feeding, time at breast, who initiates and terminates each feed, and practices of women working outside the home. Belief in the need for supplementation indicates that mothers feel breast milk is not enough for their children, but the reasons why are not well understood. It is also not clear who mothers consult when they have difficulties or concerns about breastfeeding, what advice they are likely to receive, and what problems are most common or of greatest concern. A more complete understanding of the perceptions of breastfeeding in relation to postpartum abstinence and contraception would inform the process of integrating the promotion of breastfeeding into family planning programs.

A number of studies provided clues but not detailed information on the complexity of mothers' feelings about breastfeeding. The sense that breastfeeding is not compatible with the stresses of urban life, the issues related to embarrassment and sexuality, and the association of breastfeeding with feelings of maternal competence all need to be investigated to understand how these perceptions will constrain or contribute to efforts to promote breastfeeding.

Key issues related to supplementary and complementary feeding

The widespread use of supplementary milk feedings is a major programmatic issue and is likely related to the image of breast milk relative to images promoted in formula advertisements. Again, better understanding of these motivations is needed. For example, what specific benefits do mothers believe formula provides for their children? How is this linked to nourishment, health, development, satisfaction and status? What disadvantages do they perceive?

The most common complementary food is a semi-liquid cereal pap that is of poor nutritional quality and yet very highly regarded within the culture. Clearer understanding of the positive qualities of pap, such as "lightness", will provide important clues to the concepts that should be used to promote improved child feeding. Recommendations to improve child feeding in the home are likely to involve suggestions to fortify pap with additional ingredients, so it will be important to obtain mothers' (and other family members') opinions on what options are feasible and acceptable, likely through household trials of the recommended new practices.

Depending on a variety of factors, semi-solid foods are often introduced either too early or too late, indicating a need to target advice carefully to different groups or regions of the country. More information is needed on motivations and constraints for introducing foods at the appropriate time and these practices will apparently differ by ethnic group. Perceptions of the nature of the transition from



breast milk to complementary foods need further investigation, given their impact on the timing, types, and amounts of foods added to the child's diet.

The solid foods introduced after pap are more nutritious, although they tend to be high in dietary bulk and are introduced relatively late. Observational data is needed on frequency and size of servings, as well as on methods and ingredients used in preparation. Understanding of attitudinal barriers to earlier introduction of solid foods, including ethnic and rural/urban differences and the role of perceptions of health and developmental cues, will inform program development. The ethnographic studies reviewed on perceptions of child health, "lightness", and the role of feeding in moral training have all been on Yoruba samples. These issues need further clarification, and should be investigated among different ethnic groups and other relevant segments of the population.

It is clear from this review that a great deal of meaningful research has been conducted on infant and young child feeding practices in Nigeria, and yet there are a number of crucial issues that require further investigation. It is hoped that the wealth of information currently available can be used to direct future research to the questions most relevant to planning and implementing programs that will be effective in improving child nutrition and promoting the health and well-being of Nigerian children.



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WELLSTART INTERNATIONAL

Wellstart International is a private, nonprofit organization dedicated to the promotion of healthy families through the global promotion of breastfeeding. With a tradition of building on existing resources, Wellstart works cooperatively with individuals, institutions, and governments to expand and support the expertise necessary for establishing and sustaining optimal infant feeding practices worldwide.

Wellstart has been involved in numerous global breastfeeding initiatives including the Innocenti Declaration, the World Summit for Children, and the Baby Friendly Hospital Initiative. Programs are carried out both internationally and within the United States.

International Programs

Wellstart's *Lactation Management Education (LME) Program*, funded through USAID/Office of Nutrition, provides comprehensive education, with ongoing material and field support services, to multidisciplinary teams of leading health professionals. With Wellstart's assistance, an extensive network of Associates from more than 40 countries is in turn providing training and support within their own institutions and regions, as well as developing appropriate in-country model teaching, service, and resource centers.

Wellstart's *Expanded Promotion of Breastfeeding (EPB) Program*, funded through USAID/Office of Health, broadens the scope of global breastfeeding promotion by working to overcome barriers to breastfeeding at all levels (policy, institutional, community, and individual). Efforts include assistance with national assessments, policy development, social marketing including the development and testing of communication strategies and materials, and community outreach including primary care training and support group development. Additionally, program-supported research expands biomedical, social, and programmatic knowledge about breastfeeding.

National Programs

Nineteen multidisciplinary teams from across the U.S. have participated in Wellstart's lactation management education programs designed specifically for the needs of domestic participants. In collaboration with universities across the country, Wellstart has developed and field-tested a comprehensive guide for the integration of lactation management education into schools of medicine, nursing and nutrition. With funding through the MCH Bureau of the U.S. Department of Health and Human Services, the NIH, and other agencies, Wellstart also provides workshops, conferences and consultation on programmatic, policy and clinical issues for healthcare professionals from a variety of settings, e.g. Public Health, WIC, Native American. At the San Diego facility, activities also include clinical and educational services for local families.

Wellstart International is a designated World Health Organization Collaborating Center on Breastfeeding Promotion and Protection, with Particular Emphasis on Lactation Management Education.

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