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CONTEMPORARY TRENDS IN INFANT FEEDING RESEARCH

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■ **Abstract** This review examines current research in the subfields of anthropology and related disciplines on the biocultural process of breastfeeding and broader questions of infant and young-child feeding. The themes of sexuality, reproduction, embodiment, and subjective experience are then linked to the problems women who breastfeed face in bottle-feeding cultures. Anthropologists have contributed to policy-relevant debates concerning women's work and scheduling in relation to infant care and exclusive breastfeeding. The extensive ethnographic work on children's transition to consuming household foods demonstrates the need to integrate research on breastfeeding with research on complementary feeding. Current debates around HIV and chemical residues in breastmilk call for a critical examination of the effects of globalization and corporate control on infant feeding practices. The literature shows how the narrow specialty of infant feeding has broad implications for the discipline.

INTRODUCTION

This review examines both the biocultural process of breastfeeding, which intimately connects women's bodies to infants' bodies, and broader questions of infant and young-child feeding, including its relation to sexuality, embodiment, and the important policy issues of women's employment, exclusive breastfeeding, and complementary feeding. The review does not consider the medical literature on the benefits of breastfeeding for child health and growth—topics covered in the 1992 *Annual Review of Anthropology* article by Dettwyler & Fishman.

Those few anthropologists who have researched infant feeding have made a substantial contribution to the subject. Their unique contribution as anthropologists is the examination of the broad context in which infant feeding decisions are made, and the potential for considering both biological and cultural dimensions in a single framework. Breastfeeding is not a discrete behavior but constitutes a range of practices with extraordinary temporal and spatial variation. Paradoxically, the more breastfeeding is valued the more it may be embedded in rules and patterns of interaction unconnected to infant feeding. The more we know about the desirable

properties of the product breastmilk, the greater is its potential to be commodified, and the more breastfeeding may become regulated or embedded in coercive practices.

LOCATING INFANT FEEDING RESEARCH

Most research on breastfeeding and infant feeding is not done by anthropologists but by researchers in the areas of health education, international nutrition, clinical nursing, or public health—fields that have had the most influence on policy. Team research by anthropologists and health professionals can build on these disciplinary differences, producing work that interfaces anthropology and epidemiology (Hundt & Forman 1993). The subjects of breasts, breastfeeding, lactation, and child nutrition are all lodged in specialized disciplines, each drawing on distinct theoretical and practical traditions. These disciplines have not traditionally relied on qualitative research. As a result, breastfeeding has not always been seen as a complex process shaped by social and cultural forces interacting with local environmental and political conditions. On the other hand, some health professionals researching infant feeding have been trained in anthropology and make use of qualitative methods and narrative analysis, often without the abstract theoretical framing perceived to be of less relevance to policy makers. Such work frequently has an explicitly applied focus aimed at increasing breastfeeding rates or achieving compliance around complementary feeding.

The Subfields of Anthropology

Edited collections in the past decade (Maher 1992, Stuart-Macadam & Dettwyler 1995) reflect current theoretical and substantive contributions to infant feeding in biological, medical, and sociocultural anthropology. *Breastfeeding: Biocultural Perspectives* examines breastfeeding from a biocultural and evolutionary perspective, integrating "data from diverse fields to present a more holistic view of breastfeeding" (Stuart-Macadam & Dettwyler 1995, p. 1). Maher's edited collection provides cross-cultural examples of breastfeeding in a number of different countries including Tunisia, Italy, Iceland, Iran, and Nepal.

Few ethnographies focus exclusively on infant feeding; however, many of them include accounts about breastfeeding and infant feeding as a way to explore poverty (Scheper-Hughes 1992), fascism and maternity (Whitaker 2000), development (Kwiatkowski 1999), sexuality and social relations (Howard & Millard 1997), and child rearing (Kurtz 1992). These substantial ethnographies demonstrate the ways that breastfeeding is embedded in gender ideologies and systems of household production and consumption in an increasingly globalized economy. Such ethnographies are a reminder of the futility of many short-term interventions designed to "improve" infant feeding practices without also addressing underlying conditions such as poverty or globalization.

The field of linguistics plays only a small role in infant feeding research; however, language use has relevance in at least two ways. First, advocates have noted the biases built into the way breastfeeding is talked about in Euro-American society—the use of a term such as prolonged breastfeeding rather than premature weaning, for example, and the borrowing of concepts from dairying such as residual milk or emptying the breast. These terms have seeped into the way health professionals and mothers understand maternal bodily processes.

Second, potentially valuable insights on language and self-perception might come from analysis of toddlers who can talk about breastfeeding. Stearns (1999, p. 319) notes the code words for breastfeeding California toddlers use to facilitate discrete breastfeeding in public contexts where extended breastfeeding is rare. In Senegal, Mandinka mothers talk their toddlers into weaning (Whittemore & Beverly 1996, p. 56). A pregnant mother from East Bhutan tells the weanling that her milk has "gone bad," assuming the child is talking and understanding (Bohler & Ingstad 1996, p. 1810). Steingraber, an American ecologist and mother, writes: "As soon as they can talk about it, it's time to stop" (2001, p. 267).

Archaeology and biological anthropology often demonstrate complementary approaches to breastfeeding and infant feeding. Archaeologists have examined the processes of lactation and weaning from skeletal material (Sillen & Smith 1984, Blakely 1989, Moggi-Cecchi et al. 1994, Katzenberg et al. 1996). Herring and colleagues (1994, 1998) have developed new methods to study childhood diet in adult skeletons from tooth enamel. Using skeletons from Guatemala, Wright and associates confirmed that children shifted to solid foods such as maize before the age of two while continuing to breastfeed (Wright & Schwarcz 1998).

Biological anthropologists have demonstrated an evolutionary basis for a number of processes related to breastfeeding. These include the hormonal responses that stimulate the contraction of the uterus and the production of milk after birth; the efficient mobilization of maternal fat stores for maintaining lactation; the balance between the underproduction and overproduction of milk; physiological mechanisms to reduce the likelihood of overlapping gestation and lactation; and variation in the age at weaning (Dettwyler 1998, Ellison 2001, Stallings et al. 1998). Research on cosleeping with at least one other person demonstrates advantages for infants, including possible protection against sudden infant death syndrome (SIDS) (McKenna & Bernshaw 1995).

Ellison's evolutionary review of human reproduction (2001) includes a chapter on breastfeeding, "The Elixir of Life." He outlines the constraints on the reproductive success of female mammals, including energy and time constraints not placed on male reproductive success (2001, pp. 167–68), and shows the elegant balance between the costs of lactation, maternal maintenance, and a new pregnancy. Recent clinical research by Daly & Hartmann (1995) explores the distinction between breastmilk storage and breastmilk production. They demonstrate that human milk production is controlled by the infant's appetite, the frequency of milk removal, and a mother's ability to produce milk (Daly & Hartmann 1995, p. 22). In fact, the infant controls the amount of breastmilk consumed (Cohen et al. 1994). Some

women can produce more milk than their infants demand. When women raise concerns about breast size in relation to breastfeeding, they are reassured that breast size is poorly correlated with milk production. Daly & Hartmann suggest that larger breasts are in fact capable of storing more milk; mothers with larger milk storage capacity may have more flexibility with regard to their patterns of breastfeeding (1995, p. 32). Research on breast size and symmetry (Manning et al. 1997) is also important for understanding body image.

Even a brief overview of research on infant feeding in anthropology shows that research on breastfeeding in particular and infant feeding in general would benefit from linking the bodies of evidence in the different subfields of anthropology, particularly biological and sociocultural anthropology.

Historical Research

Historical archives have also proven to be rich sources of data on infant feeding. Archival evidence from two Norwegian cities showed the mortality of children not breastfed was three times that of those who were breastfed during the years 1860–1930, and the protective effect on infant survival continued after weaning (Rosenberg 1989, p. 335). The methodological problems in working with historical data are similar to problems reported by ethnographers, including clustering of reports of age of weaning around 3, 6, 9, and 12 months of age and inadequate recording of the distinction between exclusive breastfeeding and mixed feeding.

Treckel's research on breastfeeding and maternal sexuality in colonial America makes use of documents from seventeenth- and eighteenth-century medical authorities to show how changing patterns of breastfeeding reflected changing views about the appropriate roles of women as wives and mothers (1989, p. 25). The humoral theory informed beliefs about the dangers of colostrum and the transformation of menstrual blood into breastmilk. Couples were advised against having sexual relations while women were breastfeeding because "... intercourse encouraged the resumption of menstruation, thereby initiating the transformation of breast milk back into menstrual blood and depriving infants of nourishment" (1989, p. 31). Puritans in particular admonished husbands not to demand a return to sexual relations, which would force their wives to secure wet nurses (1989, p. 33).

Hsiung (1995) reviewed advice on infant feeding from China's Sung dynasty (960–1279). Pediatric texts included practical suggestions about flow, position, regulating times and amounts for feeding, avoiding overfeeding, qualities of breastmilk, the dangers of breastfeeding in bed, and the dietary habits and emotions of mothers and wet nurses. The advice was not sentimental and was devoid of appeals to myth or legend (Hsiung 1995, p. 235).

Parkes (2001) examined milk kinship as a way to establish relations of interdomestic allegiance and tributary patronage in the late nineteenth century in the Hindu Kush of northern Pakistan. The relation between milk siblings and between breastmilk provider and recipient differs from both god-parenting (when no bodily substance is exchanged) and wet nursing (when no permanent relation is established

with the family of the wet nurse; cf. Khatib-Chahibi 1992). Islamic shariah law recognizes three alternative relationships established through blood, affinity, and milk. The milk relation is phrased in terms of male proprietorship—milk as paternal substance—rather than milk as conveyor of maternal substance, a refinement of maternal blood, as is common in the Islamic world and in colonial America (Treckel 1989). The practice of milk fosterage can be used as a strategy to evade patrilateral marriage, force community exogamy, obviate suspicions of adultery, and create alliances under conditions of political instability, later eroded by state formation (Parkes 2001, p. 6). Corporate milk kinship where all infants are suckled by all nursing mothers of the community is another means of strengthening tribal unity (Parkes 2001, p. 10). Historical sources provide additional evidence for the temporal variability of infant feeding practices and can be used with ethnographic evidence to suggest potential hypotheses concerning, for example, class differences and health consequences for infants.

THEMES IN INFANT FEEDING RESEARCH

The first three themes in this literature review set out below were selected because they relate to current debates in the social sciences on sexuality, gender, and embodiment, and these themes may provide insight into understanding the Euro-American literature on breastfeeding in bottle-feeding cultures; the remaining topics are more policy-driven and are the specific focus of advocacy work, either by governments and international agencies concerned with child health or by nongovernmental organizations. Where possible, the work of both biological and cultural anthropologists is considered, often within the framework of medical anthropology.

Sexuality and Reproduction

Breastfeeding and infant feeding intersect with sexuality in many ways. Among the Chagga of Tanzania, appropriate sexual behavior connects human reproduction to the fertility of plants and animals. Though rituals celebrate sexuality and the reproductive powers of both men and women, they also require conception to take place at the correct time. For example, if the husband fails to make bridewealth payments or if the wife has not been circumcised, the couple should not start childbearing (Howard & Millard 1997, p. 105). Child malnutrition is attributed to parental sexual misconduct, a sign of ancestral displeasure. Continuing to breastfeed while pregnant is considered particularly dangerous because semen would cause breastmilk to spoil. The importance of postpartum abstinence while breastfeeding illustrates the linkages between food and sex: "Feeding the mouth maintains life, while feeding the vagina during intercourse produces new life . . . . The proper sequence of feeding must not be altered; that is, one must not have been feeding the vagina of the mother at the same time that she is feeding the mouth of her child" (Howard & Millard 1997, p. 106).

Postpartum sexual abstinence combined with full breastfeeding results in an expected interval of around three years between births and protects mothers from closely spaced pregnancies. Among the Chagga (Howard & Millard 1997), as perhaps in northeast Brazil (Scheper-Hughes 1992), not breastfeeding is a way for a mother to distance herself from a baby who is likely to die or even to hasten its death. The linkages between breastfeeding and postpartum abstinence are also articulated in Zimbabwe around the beliefs that breastmilk is poisoned by intercourse and that a child must be cleansed after drinking "impure, dirty milk" from a pregnant mother by inducing diarrhea and vomiting (Cosminsky et al. 1993, p. 943). In East Bhutan, children who continue breastfeeding when their mothers are pregnant are considered to be "stealing milk" from their siblings (Bohler & Ingstad 1996). These ethnographic accounts provide context for understanding the appeal of bottle feeding using infant formula in the past few decades (Oni 1987, Aborampah 1985).

Although the connection between breastfeeding and lactation amenorrhea has been well established for some time (Agyei 1984 for Papua New Guinea; Jones 1989 for Indonesia), current research by biological anthropologists seeks more information about the mechanism of fertility control. Stallings and colleagues examined prolactin levels among intensively breastfeeding Nepalese mothers and found that elevated prolactin levels across the interval between nursing bouts increase the odds of maintaining lactation amenorrhea (1996, p. 24; 1994). Their ecology-of-breastfeeding studies explore how culturally mediated differences between groups, including daily work patterns and complementary feeding, result in differences in fertility (1998, p. 191). Links between birth intervals and child mortality were also analyzed in Malawi (Manda 1999) and Nepal (Gubhaju 1986).

Research in developing countries stresses the danger of short birth intervals and the importance of postpartum sexual abstinence for spacing births. In North America, the question commonly asked is whether breastfeeding women are more or less interested in resumption of sexual relations compared to women who are not breastfeeding. According to Shibley-Hyde and colleagues (1996), breastfeeding women resume sexual relations later than women who do not breastfeed; however, research in both developing and industrialized countries generally ignores breastfeeding as a subject relevant to sexuality, reproductive health, or women's reproductive rights.

Embodiment and Subjective Experience

Breastfeeding is accomplished by a gendered body. This obvious fact means that women's decisions on how they use their bodies to nurture their children are framed by attitudes toward their bodies and their breasts that may have nothing to do with breastfeeding. These attitudes were formed long before decisions about child feeding arise. The literature on gender and embodiment—particularly as informed by feminist theory—should shed light on how breasts relate to the self. Though breasts figure prominently in feminist literature on embodiment, they are

seldom lactating breasts, but excised, augmented, reduced, deformed, and screened breasts (cf. Lupton 1999, Price & Shildrick 1999). As a result, breastfeeding remains undertheorized in both medical anthropology and the embodiment literature (Maher 1992; Carter 1995; Van Esterik 1994; Blum 1993, 1999; Gorham & Andrews 1990).

Breastfeeding heightens awareness of body as self and body boundaries; but meanings assigned to bodies and boundaries are neither universally shared nor unchanging, as A. Wright and colleagues (1993) demonstrate among the Navaho. The fluidity of the boundaries of self and other threatens the integrity of the body/self. Narratives of the experiences of the breastfeeding body are few in number and are primarily written by or about English-speaking women in industrialized societies (Beasley 1998, Schmied & Lupton 2001, Carter 1995, McLean 1990). Rarely is the narrator a male. When Roth published *The Breast* in 1972, the book was ahead of its time in representing the fleshiness of gendering (Shostak 1999, p. 317). How does one think like a breast? The male author becomes a breast—a sign of female identity. He imagines he is the object of voyeuristic display, just as North American women report feeling when they are the subject of the male gaze.

Different parts of the body have been of interest in different historical periods; breasts caught the attention of eighteenth-century medical practitioners. Breasts as visible signs of femininity symbolized women's role in the family and incorporated the assumption that sexual attraction was founded on the breast in a fusion of aesthetic, medical, and social arguments; "The breasts of women not only symbolized the most fundamental social bond, that between mother and child, but they were also the means by which families were made since their beauty elicited the desires of the male for the female" (Jordanova 1999, p. 162).

Research on embodiment and the subjective experience of breastfeeding is deeply Western in its philosophical assumptions. There is great need for more detailed narratives on the experience of self in relation to breastfeeding from non-Western perspectives. Interdisciplinary research in both semiotics and history may provide new perspectives on embodiment and how breastmilk creates social relationships.

Breastfeeding in Bottle-Feeding Cultures

Another research direction, dominated by more sociological and applied approaches, draws attention to attitudes toward breastfeeding in localities where bottle feeding is more common. In North American society, it is not uncommon for women to begin breastfeeding without ever having observed a breastfeeding couple (Millard 1990, p. 212). This is particularly true for teenage mothers (Ineichen et al. 1997, p. 505). Not surprisingly, research on breastfeeding in Euro-American communities where these conditions apply addresses very different questions and is embedded in very different discourses than research in developing countries.

To complicate matters further, infant feeding, and particularly breastfeeding, is a popular topic in the media, where heartfelt discussions of women who wanted

to breastfeed but failed are common; a British woman reported "trying breastfeeding just to shut people up" (Murphy 1999, p. 194). Problems such as feeling "tied down" are ranged against more sentimentalized and romanticized accounts of breastfeeding as a sacred trust and natural pleasure. An analysis of British television and print media concluded that the media rarely present a positive image of breastfeeding (Henderson et al. 2000, p. 1196).

Research in Euro-American contexts reveals how breastfeeding has been rendered pathological, the normal medicalized, and the breastfeeding body has been turned into a site of conflict and struggle. In France, where 60% of infants are artificially fed from birth, cultural resistance to breastfeeding reduces women's access to technical and emotional support for breastfeeding (Castro 2000, p. 234). Murphy explores how British women negotiate the charge of maternal deviance when they choose to bottle feed with infant formula instead of to breastfeed (Murphy 1999, p. 189). An important observation from this study is mothers' interpretations of breastfeeding as risky behavior if the mother is stressed or poorly fed; under these conditions mothers argue that bottle feeding becomes the moral and correct choice (Murphy 1999, p. 197). Mothers' concerns about propriety and breastfeeding in public are generally irrelevant in breastfeeding cultures (Beasley 1998). British women distance themselves from immodest breastfeeding behavior, referring to women who display their bodies as exhibitionists—"flashing your flesh . . . flicking it out" . . . "I know it's natural but it's not very nice for other people" (Murphy 1999, p. 203). Carter's research on working-class women immigrants in the north of England also portrays breastfeeding as a problem, associated with exhaustion, poverty, discomfort, embarrassment, restriction, and authoritarian hospital practices (1995, p. 90).

In North America it is breastfeeding mothers who are told they are violating public morality when they breastfeed in public, not bottle-feeding mothers. Stearns (1999) explores how mothers in Sonoma, California negotiate the act of breastfeeding in front of others—breastfeeding as public performance. In the words of one informant, "Well, I always felt like the biggest accomplishment that you could make (was) if no one even knew you were breastfeeding" (Stearns 1999, p. 313). In Euro-American societies, where breasts are displayed and if necessary improved, women are aware that breastfeeding in public might lead to negative feedback or even legal action, even though legislation decreed that breastfeeding in public is legal behavior and not public nudity (Stearns 1999, pp. 309–12). As a result, the need for a "tricky public performance" mutes somewhat the pleasure of breastfeeding; women breastfeed "with constant vigilance to location, situation and observer" (1999, p. 323), with an eye to not offending or arousing men. Consequently breastfeeding is work that is rendered invisible both by not counting it and by requiring that it be hidden; "to be expected to hide breastfeeding is to hide much of the early work of mothering" (Stearns 1999, p. 323).

Umansky (1998) reviews the American case of a mother charged with "sexual abuse in the first degree, mentioning 'breast to mouth contact' and 'hand to breast contact' when she mentioned inadvertently on a phone hotline her concern about feeling arousal while breastfeeding. The charges were eventually dropped, but the

mother was later charged with abuse and neglect. The case reflects ambiguities concerning how mothering and female sexuality intersect with breastfeeding. The evidence against her included breastfeeding the child "beyond apparently a time when that would be necessary," at times sharing her bed with her two–year-old daughter, and taking a rectal temperature from a frontal position (to maintain eye contact and comfort the child) (Umansky 1998, pp. 300–4).

Schmied & Lupton (2001) provide one of the few accounts dealing with ambiguity and resistance to the imperative to breastfeed. Based on interviews with middle-class women from Sydney, Australia, who viewed breastfeeding as a crucial part of their maternal identity, they explore the intensely embodied experience of breastfeeding (2001, p. 239). Whereas some found the experience pleasurable and intimate, others found it unpleasant and disruptive. The fluidity of the boundary between infant and mother can enhance the harmonious embodied experience of breastfeeding or encourage a sense of loss of self and agency. Leaking breasts epitomize the ambiguity of inside and outside and discomfort with the uncontrolled flow of milk. Britton (1998) documents the revulsion British women feel when they experience the letdown reflex, an embodied sensation they were unprepared for and unable to interpret.

Considering the problems many Euro-American women associate with breastfeeding, and how deeply breastfeeding is culturally embedded in body image, it is understandable that some women who choose to bottle feed and not to breastfeed their infants face special challenges. Often they lack social support systems and other resources for breastfeeding or are literally in transition. Migrant workers, refugees (Tuttle & Dewey 1994, Reeves & Dewey 1994, Townsend & Rice 1996), immigrants (de Bocanegra 1998), Native Americans (Houghton & Graybeal 2001, Wright et al. 1993, Martens 1997, Martens & Young 1997), African Americans, and teenage mothers (Peterson & Da Vanzo 1992, Ineichen et al. 1997), among others, have been identified by health professionals as at-risk groups because of their low incidence of breastfeeding (McLorg & Bryant 1989). They thus become targets for interventions by the health care system. The motivation for such research is often to provide advice for improving compliance among particular immigrant groups, for example, South Asian immigrants (Kannan et al. 1999, p. 90), or low-income African Americans (Bronner et al. 1999), assisted, if possible, by anthropologists (who are valued for their facility in eliciting folk beliefs).

Work and Scheduling

In both developing and industrialized countries, women must find ways to integrate infant care and feeding into their daily activities. This is both a scheduling and a resource problem and is deeply affected by gender ideologies. The congruence of breastfeeding with other activities has been examined from different perspectives and demonstrates the many ways women have synchronized their workloads with child care (Nerlove 1974, Levine 1989, Galtry 2000, Draper 1996). Until recently, health professionals in industrial countries assumed breastfeeding and work away from home were incompatible, and researchers looked to employment as a reason

for not breastfeeding. Breastfeeding and women's work cannot be examined independently of the economic and political context of maternity entitlements, health insurance, wages, and child-care arrangements.

In North American studies, Gjerdingen & Froberg found that women's readiness to work postpartum was negatively associated with breastfeeding (1991, p. 1401). Killien (1998) found employment patterns were unrelated to parental stress; however, infant feeding was not considered. Western assumptions about the incompatibility of breastfeeding and women's work are easily communicated cross-culturally; for example, the decline in breastfeeding in China has been related to the fact that 90% of urban women of working age are in the labor force. Gottschang's detailed ethnographic research on baby-friendly hospitals in urban China demonstrates how economic reforms and women's status intersect with the dramatic expansion in the infant food market, particularly American-Chinese joint ventures to produce infant formula (Gottschang 2000, pp. 267–78). Pasternak & Ching argue that "the recent development of a milk industry in China has been a response to the breastfeeding decline rather than its cause" (1985, p. 436). Women working in small neighborhood-run collectives breastfeed longer, confirming that type of work is also relevant. Before returning to work, mothers want infants to become accustomed to milk cakes made from grain and soybean (Pasternak & Ching 1985, p. 437). The introduction of complementary foods is part of the strategy that mothers in many societies use to integrate child care with other work (see also Moffat 2001).

Ethnographic work by Panter-Brick spans medical, cultural, and physical anthropology. Her intensive fieldwork in Nepal included keeping a minute-by-minute time record of activities on a sample of Tamang (Tibeto-Burman) and Kami (Indo-Aryan) women throughout the day and in different seasons to see how a mother's workload influences infant feeding or is influenced by infant feeding (1992, p. 137). She found that among the Tamang, duration of and intervals between breastfeeding sessions vary little by season or work context. Infants are carried to work and fed on demand an average of 8.1 minutes at intervals of 87 minutes; women may work slightly shorter hours in the fields when they are breastfeeding. On the other hand, Kami women have lighter workloads and are less mobile, and their infants are often under paternal supervision (1992, pp. 137–40).

Work as an activity and as a microenvironment varies across socioecological contexts and throughout a woman's life. A new direction for research on breastfeeding and women's work explores the influence of sex hormones and stress hormones on work and health outcomes (Panter-Brick & Pollard 1999, pp. 139–41). In developing countries and resource-poor environments, women are unlikely to be able to discontinue subsistence activities when pregnant or lactating. Workloads affect time available for breastfeeding and supplementary feeding. Although women working in a carpet factory in Kathmandu, Nepal supplemented their infants' diet with gruel or milk-based products by three months, the supplementation did not result in early cessation of breastfeeding (Moffat 2001, p. 330). Many studies examine whether working has a negative impact on breastfeeding, but few ask

how breastfeeding impacts on work. Thai women who resumed urban office work by six months postpartum cited problems such as decreased productivity, exhaustion, and lack of concentration on work (Yimyam et al. 1999, p. 964). When obstacles such as rigid schedules and expectations of the modern workplace were encountered, no working women quit work in order to breastfeed.

Research on breastfeeding and women's work is used by both breastfeeding advocates and policy makers to develop strategies for improving working conditions for mothers. In June 2000, the International Labour Organization (ILO) adopted a new Maternity Protection Convention (183) and Recommendation (191) giving employed women longer maternity leaves and lactation breaks during the work day, following substantial lobbying by breastfeeding and workers' groups.

Exclusive Breastfeeding

In May 2001, the World Health Assembly passed Resolution 54.2, which confirmed that the optimal length for exclusive breastfeeding is six months (also after substantial lobbying by breastfeeding advocacy groups). Yet research confirms that exclusive breastfeeding for six months is rare in both industrialized and developing countries, in spite of the evidence for its advantages, particularly in resource-poor settings (Obermeyer & Castle 1996, p. 39; Davies-Adetugbo 1997; Guerrero et al. 1999; Nath & Goswami 1997). Elsewhere in Latin America, Perez-Escamilla and colleagues found that women who delivered in hospital wards in Brazil, Honduras, and Mexico with breastfeeding promotion programs were more likely to breastfeed exclusively (1995, p. 2972). Less than 5% of low-income urban mothers in Costa Rica breastfed exclusively at 4 months, although conditions were quite favorable—high feeding frequency, no use of infant formula, and available time (Munoz & Ulate 1991, p. 59). Over half the mothers were using mixed feeding by 15 days. Exclusive breastfeeding was lower among higher-income groups. Women valued breastfeeding highly but not exclusive breastfeeding. To these mothers, exclusive breastfeeding means denying children something mothers or others think they should have.

Exclusive breastfeeding will be particularly hard to implement where supplementary food and drink products are interpreted as good and effective remedies and not as barriers to exclusive breastfeeding. However, peer counseling programs have increased exclusive breastfeeding in many areas. An intervention in Bangladesh (Haider et al. 2000) found peer counselors trained during a 40-hour course were effective in increasing duration of exclusive breastfeeding. The women they helped initiated breastfeeding earlier and were less likely to give prelacteal and postlacteal foods such as honey and mustard oil, often given by family members in keeping with traditional custom. Unfortunately, the project paid the peer counselors, and when the project ended so did the pay; consequently, the counselors stopped counseling mothers (2000, p. 1647).

Although UN agencies put substantial emphasis on exclusive breastfeeding, and clinical and epidemiological research both confirm the benefits, still more detailed

ethnographic work would be valuable for understanding the constraints that make exclusive breastfeeding difficult in both developing and industrialized countries.

COMPLEMENTARY FEEDING

Research and policy on breastfeeding is often separated from research and policy on complementary feeding, as if breastfeeding advocates who integrate their work with complementary feeding dilute the message of the importance of exclusive breastfeeding. From the perspective of mothers and households, the two issues must be considered together. The World Health Organization's (WHO) new global strategy to improve child feeding integrates policies on breastfeeding with recommendations for appropriate complementary feeding, and it acknowledges the problem of aggressive marketing of processed complementary foods as well as breastmilk substitutes.

Around six months of age, infants are ready to begin the process of ingesting foods other than breastmilk. In some parts of the world, this process starts long before six months; in other parts of the world, much later (Bentley et al. 1991, Jarosz 1993). The transition is culturally significant, often stressful, and sometimes accompanied by a growth decline between 6 and 18 months of age (Michaelson & Friis 1998, p. 763).

Dettwyler (1998) explores the idea that current infant feeding practices in the United States and elsewhere conflict with underlying evolutionary adaptations. Using primate data and ethnographic sources, she proposes that the natural duration of breastfeeding for humans might be somewhere between 2.5 and 7 years, and she also demonstrates that the duration of breastfeeding directly affects human health over the entire lifespan and not just infant survival.

Weaning refers to both the introduction of food products other than breastmilk and the cessation of breastfeeding (sevrage). Anthropologists have generally chosen to focus on the weaning interval or the weaning process, stressing the multiple transitions involved. The weaning dilemma refers to these difficult, complex tradeoffs. Nutritionists and health professionals argue that food provides extra needed nutrients to the growing infant but increases the potential for introducing pathogens (Williams 1991, Martines et al. 1994); to demographers and evolutionary anthropologists, the infant's nutritional needs for breastmilk compete with the mother's nutrient needs for herself and perhaps for starting another pregnancy (Charnov & Berrigan 1993, Rashid & Ulijaszek 1999, Lee 1996); to cultural anthropologists, sevrage also completes the separation begun at birth, ending a special period of bodily intimacy with the mother and introducing a new and separate individual into the household and community.

Transition to Household Foods

The transition to complementary foods presents particular challenges in low-income households (Almedom 1991, Guttman & Zimmerman 2000, Harrison et al.

1993). In periurban Peru, women would return to breastfeeding if children strongly resisted weaning or were in poor health. Mothers would initiate weaning if they had concerns about their own health, including weight loss, and the time commitment of breastfeeding (not the minutes spent feeding the child but the continuous interruption of work tasks) (Marquis et al. 1998, p. 651). Mothers make careful observations of infants' appetite, and infant characteristics may influence their decisions about introducing an item of food or drink into an infant's regular diet (Piwoz et al. 1994, p. 854).

Introducing infant foods involves choices made in the context of environmental constraints, reproductive demands on women, and levels of infant and child mortality (Gray 1996, p. 437). Gray's research with the pastoral Turkana of Kenya explores the adaptiveness of early supplementation with solids in harsh ecological conditions, where there are heavy labor demands on mothers who may also be in poor health and where cow's milk is available. There is a culturally prescribed order for introducing foods to infants beginning with the forced feeding of camel butterfat at a few weeks of age, a practice the author identifies as adaptive because it enhances infant fat storage. Mothers wean their infants with more confidence after the weanling had accepted the taste of blood cooked with milk or porridge (1996, p. 444). Gray argues, "Exclusive breastfeeding in the first 4–6 months confers no health advantage to infants other than immunological effects, which are passed on to the infant regardless of early introduction of non-breast-milk foods" (1996, p. 451), a conclusion that many might challenge.

Tamang (Nepali) mothers often breastfeed their children while they have their meals; thus the breastfeeding infant or toddler is integrated into the system of commensality, joining the mother at the table, so to speak. Tamang toddlers who do not accompany their mothers to work may be fed cold leftovers of hastily prepared maize gruel often contaminated in the heat. These conditions facilitate sevrage (Panter-Brick 1992, pp. 138–39). Mothers in rural Senegal adjust their feeding practices in response to the growth and nutritional status of their infants, giving watery maize gruel to small thin infants as a response to perceived milk insufficiency (Simondon & Simondon 1995, p. 179). But here, as in other communities, the early introduction of complementary foods does not necessarily result in milk insufficiency or sevrage.

Taste is a critical dimension but seldom considered in research on infant feeding. An exception to this is the work of Mennella (1995). Her research confirms that human milk, unlike infant formula, is not a food of invariant flavor but is flavored by ingested compounds such as garlic, mint, vanilla, peppers, and alcohol, to give the infant varying sensory experiences. The past exposure of infants to these flavors in utero may affect their response to the flavors in breastmilk. The sensory attributes of breastmilk may influence the patterning and duration of suckling (1995, p. 41). The opportunity for infants to become familiar with the foods eaten by their mothers is another benefit of breastfeeding. Amniotic fluid, also flavored by the foods consumed by the pregnant woman, acts as a flavor bridge to breastmilk, and breastmilk as a flavor bridge to solid foods (1995, p. 43). In another study, Mennella

& Beauchamp found that infants consumed more cereal when it was mixed with mother's milk than when it was mixed with water (1997, p. 188). Mothers who ate new foods and were not neophobic had infants who consumed more of the cereal/breastmilk mixture, possibly because the infants had been exposed to a wider variety of taste experiences in utero. The research suggests that the process of accustoming an infant to the food and flavor of its culture begins in utero (Mennella & Beauchamp 1997, p. 191).

Overwhelmingly the responsibility of mothers, complementary feeding is time-intensive work. Gryboski (1996) recorded time allocated to breastfeeding and other infant care activities in a Central Javanese village. Her research demonstrates how breastfeeding, complementary feeding, and household provisioning are interconnected. Consider one woman who sold fried bananas in a local market. She brought her daughter with her in order to breastfeed. In addition she received discounted prices on foods purchased for her family from other traders. They also provided extra snacks for her daughter, pampering her in part because of her endearing qualities (Gryboski 1996, p. 213).

Based on local market prices in rural Bangladesh, it would cost at least an additional 21% of the daily wage to provide adequate nutrient intakes for lactating women, but only 8% of the daily wage to provide adequate complementary foods for children (Brown et al. 1993). Nutrition education messages on improving complementary feeding were effective, but those directing women to improve their own diet were not effective (1993, p. 100), as they contradicted cultural assumptions about the sacrificing mother who restricts her own food intake.

These latter two studies are a reminder that understanding child feeding and developing nutrition interventions to improve child feeding require a deep understanding of concepts such as reciprocity, commensality, nurture (Van Esterik 1997), and household meal cycles. Generally, research interests in complementary feeding have shifted to these broader social issues, away from a focus on food prescriptions and proscriptions and the classifications of food suitable for infants (cf. Sukkary-Stolba 1987).

CHALLENGES TO ADVOCACY AND POLICY

"It is said that at night a serpent may crawl surreptitiously into the bedroom where an infant and its nursing mother may be sleeping. When the child awakens from hunger and begins to cry, the serpent suckles the mother's breast and inserts its tail into the infant's mouth. In this manner the serpent draws nourishment from the mother's body at the expense of the infant . . ." (Brandes 1980, p. 82). This Andalusian folk tale expresses a masculine view of breastmilk as a vulnerable product in short supply and implies a devaluation of the mothers producing it.

Among the squatter settlements and rural villages of Pakistan, breastmilk is regarded as a potential source of destruction as well as nurturance (Mull 1992). Although highly valued, breastmilk is considered susceptible to being tainted by

spirits, the evil eye, black magic, the effects of the next pregnancy, and the mother's diet. A woman knows that her breastmilk will be blamed for a child's sickness and death, and if the quality of her breastmilk is questioned, she will have strong incentive to stop breastfeeding until she can have her milk tested for "poison." Both folk healers (who float an insect in the milk) and hospital pathology laboratories (who perform pseudoscientific analyses for "bacteria" and "pus cells") provide these services to address women's anxieties about the quality of their milk (Mull 1992, p. 1286).

There is some congruence between these expressed anxieties about the quality of breastmilk and contemporary concerns about a number of substances that may pass from mother to child through breastmilk. These include HIV and chemical residues. Both subjects require a careful weighing of public health risks and attention to the needs of mothers. In both cases, there are significant information gaps and widely contested claims. For example, we do not know the rate of HIV transmission in exclusively breastfed, formula-fed, and mixed-fed babies, or the mortality rates related to feeding methods in infected and uninfected babies. In the case of chemical residues in breastmilk, we do not know the long-term health consequences for infants and children. Yet public discourse around these subjects has great potential for influencing women's infant-feeding decisions.

HIV/AIDS transmission from mother to child can occur through breastfeeding, although there is a greater chance of transmission during pregnancy and delivery; it is difficult to make a distinction between intrauterine, perinatal, and postnatal transmission. A child breastfeeding from a woman who is HIV-positive has about a 14% risk of infection through breastfeeding (Dunn et al. 1992). Considering communities with a 20% HIV infection rate, only three infants out of 100 are likely to be infected with HIV through breastfeeding, leaving 97 infants who would benefit from breastfeeding. Researchers in South Africa suggest that "it may be more pertinent for health workers to quote a risk of about 5% if breastfeeding is practiced for 6 months . . ." (Coovadia & Coutsoudis 2001, p. 1). For HIV-positive mothers who have chosen to breastfeed or for whom breastfeeding is the only option available (particularly in resource-poor settings where mothers cannot bottle-feed safely), it is possible to support women in their choice to breastfeed and continue effective treatment for them (Castro & Mukherjee 2002); women can be informed of the dangers of mixed feeding and helped to breastfeed exclusively; breast problems can be prevented or treated early, and the use of condoms during intercourse can help avoid further transmission of HIV during the period of lactation (Linkages 1998). Other options include the use of heat-treated expressed breastmilk. In some countries, health care workers are required to advise HIV-positive mothers not to breastfeed, ignoring evidence that exclusive breastfeeding may have as good an outcome as exclusive use of infant formula (Coutsoudis et al. 1999, Coovadia & Coutsoudis 2001). However, no one has been able to show conclusively whether avoiding breastfeeding in low-income, resource-poor settings leads to increased infant survival. Considering that infants in developing countries who are not breastfed have a sixfold greater risk of dying from infectious diseases in the first

two months of life than do breastfed infants (WHO 2000), the widespread use of replacement feeding is a questionable solution. Anthropologists already active in AIDS research need to enter these debates and bring a more critical approach to this complex problem.

Similarly, because of widespread chemical contaminants in both rural and urban environments, toxic substances such as polychlorinated biphenyls, dioxins, and heavy metals have been found in samples of breastmilk (Johansen 2000, Guillette et al. 1998). Although more contaminants are passed in utero than through breastmilk, media reports of breastmilk contamination highlight breastfeeding women as the source of contamination rather than the chemical industries (Van Esterik 2001), and demonstrate the extent to which risk discourse is laden with morality (Murphy 2000, p. 321). The unspoken discourse in much of this literature on contaminants in breastmilk is premised on women's bodies—particularly their breasts—as risky environments, sources of problems and impurities. Thus, even complex public health policy issues such as HIV and contaminants in breastmilk need to be linked to considerations of embodiment, power, and gender.

Globalization and Corporate Initiatives

The breastfeeding movement, a single-issue social movement with broad implications for understanding issues of women's reproductive rights, corporatization, poverty, and food security, provides a concrete and easily understood example of how globalization affects infant feeding. It is one of the only advocacy movements to have succeeded in getting an international code that addresses the inappropriate marketing of a consumer product: the International Code for the Marketing of Breastmilk Substitutes, WHO/UNICEF 1981. For those who supported the Nestlé boycott in the 1970s and 1980s or use this example of consumer activism in their teaching (Van Esterik 1989, Pettigrew 1993), updated information can be found on the websites of advocacy groups monitoring code compliance (or lack thereof). Globalization puts these accomplishments at risk through free trade agreements and corporate strategies that undercut national legislation to limit the aggressive promotion of infant feeding products. Other corporate strategies that need to be monitored include the development of genetically modified cow's milk formula made with proteins from human breastmilk. When the female body is valued for its reproductive potential and therefore regulated, women are special targets of commodification (Sharp 2000, p. 293). Who will own the DNA for reproductive products such as breastmilk? Should it be the "life industries" who value human milk proteins more than human milk itself and who have little interest in the women who produce that milk?

CONCLUSION

Although breastfeeding and child feeding remain narrowly specialized domains of inquiry, these subjects raise questions of fundamental importance to the theory

and practice of anthropology. The fragmentation of research agendas across subfields and disciplines makes it difficult to address broad questions about the political economy of child feeding. Anthropology has the potential to make explicit the interconnections between social relations, resources, sexuality, embodiment, power, nurturance, and commensality implicated in the challenge of feeding a newborn infant. No other discipline is positioned to ask and answer such fundamental questions about what makes us human.

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