Background

A key question that has been inadequately explored is: to what extent does or might complementary feeding affect breast milk intake and total breastfeeding duration? We assume that maintaining breastfeeding is desirable, but in designing interventions to improve complementary feeding, the potential impact on breastfeeding frequency and breast milk intake is often ignored.

To understand this issue, one needs to recognize what is already known:

a. Recent estimates of the energy needs of infants, based on energy expenditure data, are 9% to 39% lower than previous estimates. The average requirements for breastfed infants, who require less energy than formula-fed infants, are 80 to 90 kcal/kg/d depending on age. Providing too much energy from complementary foods may result in a low intake of breast milk.

b. Energy intake from breast milk averages between 375 and 500 kcal/d at 6 to 11 months and between 300 and 350 kcal/d at 12 to 24 months. To meet energy requirements, the estimated need from complementary foods is about 250 kcal/d at 6 to 8 months, 450 kcal/d at 9 to 11 months, and 750 kcal/d at 12 to 24 months, depending on the amount of breast milk consumed.

c. There is little impact of maternal malnutrition on breast milk volume unless the mother is both very lean and is losing weight. Although milk fat concentration is lower in leaner women, infants usually compensate by consuming a higher volume of milk if they are allowed to nurse ad libitum.

d. Breast milk production is very "plastic" and is regulated primarily by infant suckling behavior. In early lactation, milk production can respond rapidly to changes in "demand" by the infant. The degree of plasticity in later lactation is not as well-understood.

e. Breastfed infants decrease their intake of breast milk when
given nonbreast milk foods and fluids. In the first 6 months of life, each kcal from nonbreast milk sources displaces about 0.6 to 1.7 kcal of breast milk; after 6 months the proportion displaced appears to be lower (about 0.3). However, the latter estimate is based on only one study. The timing of breastfeeds (before or after meals) does not appear to influence the degree of displacement. However, if infants are fed complementary foods by bottle, and develop a preference for an artificial nipple, complete weaning off breastfeeding can result.

f. In 2 experimental studies in Honduras, the age at which complementary foods were introduced did not affect breastfeeding frequency at 12 months, but these mothers were strongly encouraged to continue breastfeeding. There is little information on whether the amount or timing of complementary foods affect total breastfeeding duration.

Research Questions

1. How "plastic" is milk production after the first 6 months? How long can it meet energy needs if other foods are not introduced? How quickly can it recover from a temporary decrease attributable to maternal illness/absence or reduced infant demand?

2. How much do complementary foods displace breast milk at 6 to 24 months? How can we "protect" breast milk intake as long as possible? Does meal frequency matter? Does energy density of the foods matter? Does the timing of breastfeeds (before or after meals) matter? Does the mode of feeding complementary foods (cup, spoon, bottle) matter?

3. Does the timing of introduction or amount of complementary foods affect total breastfeeding duration?

4. What is the "optimal" ratio of energy from breast milk versus complementary foods at various ages (or is there one)? Does this vary in different environments? Is exclusive breastfeeding beyond 6 months desirable in certain environments? Does prolonged exclusive breastfeeding beyond 6 months adversely affect speech development or acceptance of complementary foods?

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The online version of this article, along with updated information and services, is located on the World Wide Web at:
/content/106/Supplement_4/1301.full.html