

1-1-1992

# Infant Feeding Practices And Attitudes Of Selected Kenyan Mothers In The United States

Mary W. Murimi

*Eastern Illinois University*

This research is a product of the graduate program in [Home Economics](#) at Eastern Illinois University. [Find out more](#) about the program.

---

## Recommended Citation

Murimi, Mary W., "Infant Feeding Practices And Attitudes Of Selected Kenyan Mothers In The United States" (1992). *Masters Theses*. 473.  
<http://thekeep.eiu.edu/theses/473>

This Thesis is brought to you for free and open access by the Student Theses & Publications at The Keep. It has been accepted for inclusion in Masters Theses by an authorized administrator of The Keep. For more information, please contact [tabruns@eiu.edu](mailto:tabruns@eiu.edu).

LB  
1861  
.C57x  
F3  
1992  
M8  
copy 2

INFANT FEEDING PRACTICES AND ATTITUDES  
OF SELECTED KENYAN MOTHERS IN THE  
UNITED STATES

MURIMI

# THESIS REPRODUCTION CERTIFICATE

TO: Graduate Degree Candidates who have written formal theses.

SUBJECT: Permission to reproduce theses.

The University Library is receiving a number of requests from other institutions asking permission to reproduce dissertations for inclusion in their library holdings. Although no copyright laws are involved, we feel that professional courtesy demands that permission be obtained from the author before we allow theses to be copied.

Please sign one of the following statements:

Booth Library of Eastern Illinois University has my permission to lend my thesis to a reputable college or university for the purpose of copying it for inclusion in that institution's library or research holdings.

5/18/92

Date

Mary W. Murimi

Author

I respectfully request Booth Library of Eastern Illinois University not allow my thesis be reproduced because \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Date

\_\_\_\_\_

Author

INFANT FEEDING PRACTICES AND ATTITUDES OF  
SELECTED KENYAN MOTHERS IN THE UNITED STATES  
(TITLE)

BY

MARY W. MURIMI

**THESIS**

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS  
FOR THE DEGREE OF

Master of Science in Home Economics

IN THE GRADUATE SCHOOL, EASTERN ILLINOIS UNIVERSITY  
CHARLESTON, ILLINOIS

1992  
YEAR

I HEREBY RECOMMEND THIS THESIS BE ACCEPTED AS FULFILLING  
THIS PART OF THE GRADUATE DEGREE CITED ABOVE

5-14-92  
DATE

5-14-92  
DATE

5-14-92  
DATE

5-14-92  
DATE

*Ruth M. Dow*  
ADVISER

*Maeda St. Brown*  
COMMITTEE MEMBER

*Frances L. Murphy*  
COMMITTEE MEMBER

*Joyce Crane*  
DEPARTMENT CHAIRPERSON

## ABSTRACT

Murimi, Mary W. (1992) INFANT FEEDING PRACTICES AND ATTITUDES OF SELECTED KENYAN WOMEN IN THE UNITED STATES. Master of Science, Eastern Illinois University. Major professor: Ruth Dow, Ph.D.

Estimates are that 48% of children in Africa are poorly nourished. A recent study of children growing up in rural Kenya showed that food intake appeared to influence cognitive development of the Kenyan toddlers. A major concern is to find adequate foods to supplement breast feeding when breast milk becomes insufficient to maintain normal growth. In developing countries, urban women are often role models for rural women. Therefore the present study is an initial step in determining various feeding practices of Kenyan women, as a basis for subsequent research in Kenya, followed by development of an educational program for urban and rural women in Kenya to improve infant feeding practices. \* The purpose of this research was to examine the infant feeding practices and related attitudes of selected Kenyan women who are currently living in the United States. Data were collected from Kenyan mothers in the eastern half of the United States, using a 42-item self-administered questionnaire and focus group interview to assess attitudes and practices related to breast and bottle feeding and weaning. Infant feeding practices were compared for the Kenyan born and American born children of those mothers. A total of 32 Kenyan mothers returned usable questionnaires. The major results of this study show that the mothers had a positive attitude towards breast feeding and that they breast fed all their children regardless of their country of birth. \*Living in the United States had a positive effect on the weaning diet. For the Kenyan born children, fruit juice and whole milk were introduced earlier than recommended. The weaning foods used by the mothers of children born in

Kenya were rich in carbohydrates, but deficient in proteins, vitamins, and minerals. Educational materials need to be prepared to help Kenyan women improve the weaning diet, using local foods introduced at appropriate times.

## DEDICATION

This thesis is dedicated to my children Baraka, Neema, Justus, and David who I love very much.

## ACKNOWLEDGEMENTS

Sincere appreciation to all my friends whose support, encouragement and prayers kept me going. Thanks to my husband and best friend Samuel for his patience, encouragement and support in the writing of this project. Appreciation is also extended to a dear friend Janet Rennels for babysitting and helping with the tallying of the data. Very special appreciation to Kathy Bayles for typing this thesis. Thanks to Charles Dow for helping with the printing of the graphs and the tables.

Sincere thanks to my committee members for their practical help. Special thanks to Dr. Martha Brown who kept her promise that she would be there for me whenever I needed her. Special thanks to Dr. Frances Murphy whose expertise in child development offered very insightful comments. Sincere appreciation to Dr. Ruth Dow, my advisor, for her guidance, assistance, support, and friendship all through my graduate studies. Without her help this project would not have come to completion.



## TABLE OF CONTENTS

|  |      |
|--|------|
| ABSTRACT.....  | ii   |
| DEDICATION.....  | iv   |
| ACKNOWLEDGEMENTS.....  | v    |
| TABLE OF CONTENTS.....   | vi   |
| LIST OF TABLES.....  | viii |
| LIST OF FIGURES.....   | viii |
| Chapter 1. INTRODUCTION.....   | 1    |
| Definition of Terms.....   | 3    |
| Chapter 2. REVIEW OF LITERATURE.....   | 4    |
| Trends of breast in feeding in developing<br>countries.....                            | 4    |
| Human milk and its protective factors.....   | 5    |
| Breast feeding protection against acute diarrhea<br>and lower respiratory disease..... | 6    |
| Breast feeding and gastrointestinal illness.....                                       | 8    |
| Weaning practices.....   | 9    |
| Breast feeding attitudes.....  | 10   |
| Chapter 3. METHODOLOGY.....  | 13   |
| Population and sample.....   | 13   |
| Instrument.....  | 13   |
| Data collection.....   | 14   |
| Data analysis.....   | 15   |
| Chapter 4. RESULTS AND DISCUSSION.....   | 16   |
| Educational level of parents.....  | 16   |
| Duration of stay.....  | 16   |
| Attitudes toward infant feeding.....   | 16   |
| Feeding practices.....   | 22   |
| Reasons for breast feeding.....  | 22   |
| Sources of information.....  | 22   |
| Reasons for weaning.....   | 24   |

|   |    |
|---|----|
| Diets of lactating mothers.....   | 24 |
| Comparison of feeding practices for Kenyan born<br>babies and United States born babies.....            | 26 |
| Focus group interview results.....  | 32 |
| Discussion.....   | 34 |
| Chapter 5. SUMMARY, CONCLUSIONS, AND IMPLICATIONS.....  | 38 |
| REFERENCES.....   | 41 |
| APPENDICES  |    |
| Appendix A Survey form and cover letter, Kenyan infant/child<br>feeding study.....                      | 44 |
| Appendix B Focus group interview questions.....   | 49 |
| Appendix C Food and liquids reported to increase the quantity<br>and quality of breast milk.....        | 50 |
| Appendix D Frequencies and percentages of foods and beverages<br>avoided because of breast feeding..... | 51 |

## LIST OF TABLES AND FIGURES

## TABLE

|   |  |    |
|---|--|----|
| 1 | Parents' level of education.....   | 17 |
| 2 | Duration of mothers' stay in the United States.....  | 18 |
| 3 | Responses frequencies on self-report attitudinal<br>questionnaire related to breast feeding and<br>bottle feeding..... | 20 |
| 4 | Reported reasons for breast feeding.....   | 21 |
| 5 | Sources of information on infant feeding.....  | 23 |
| 6 | Baby's food when the mother is away from home<br>for the first three months.....                                       | 25 |
| 7 | Reported reasons for avoiding feeding children<br>certain foods.....   | 31 |

## FIGURE

|   |   |    |
|---|---|----|
| 1 | Comparison of first foods given to Kenyan born and<br>United States born children.....                                  | 27 |
| 2 | Comparison of beverages given to Kenyan born and<br>United States born children.....                                    | 28 |
| 3 | Comparison of types solid foods given to Kenyan<br>born and United States born children and age<br>of introduction..... | 30 |

## Chapter 1

## INTRODUCTION

Estimates are that 48% of children in Africa are poorly nourished (Pollitt, 1988). Galler, Ramsey, Sohimano, and Lowell (1983) reported that children who were marasmic in the first year of life have shown increased attention problems during the school year, in contrast to children with no history of malnutrition. A recent study of children growing up in rural Kenya showed that food intake appeared to influence cognitive development of Kenyan toddlers independently of the effects of the home environment (Sigman, Jansen, and Bwibo, 1989).

Despite the fact that breast milk, with its blend of nutrients and anti-infectious properties, is considered the ideal food for infant health, the last two decades saw the beginning of a dramatic decline in the number of urban mothers in the developing world who initiate breast feeding (Schlossman, 1990). Jelliffe (1977) reported that in India, where most mothers still breast feed, there was a trend for its early discontinuance. Guthrie (1988) reported that in the Philippines breast feeding was terminated abruptly as a result of folk beliefs.

Uwaegbute and Nhanyelsgo (1987), in a study done in Nigeria, found that high pressure advertising of infant formula influenced the mothers to bottle feed and cease breast feeding. Industrialization and urbanization in Kenya seem to have affected infant feeding practices in two ways: The removal of the extended family to offer support and women being employed outside the home, leaving children with other caretakers for many hours of the day.

Diamond and Ashworth (1987) reported that traditionally, breast feeding is socially and psychologically accepted as the best method to feed Kenyan children for periods of up to two years or more. However, low income mothers often adopt the practices of well-educated, upper-

income mothers in order to achieve the prestige and sense of "modernness" associated with bottle feeding.

According to the study by Diamond et al. (1987), there was iron deficiency in children over six months, linked with late introduction of iron-rich foods. The study also identified as concerns not only late weaning, but also weaning to inappropriate foods that are low in iron and protein. Such practices are hazardous in rural Kenya because of the poor quality of the weaning foods, poor sanitation, poverty, ignorance, and social taboos.

These studies confirm my experience as a nutritionist in Kenya, as well as findings of an unpublished survey (1980) in Ukambani District by The Kenya Freedom from Hunger Organization. Their survey demonstrated that good nutrition in children resulted in good health, while undernourished children were sickly and performed poorly in their school work. Industrialization and urbanization in Kenya affects the infant feeding methods in the following ways: Since most mothers have to go to work, they stop breast feeding and start bottle feeding. When the mothers are away, somebody else feeds the baby.

#### Purpose of Research

The purpose of this thesis research was to investigate the infant feeding practices of Kenyan women in the United States. It was postulated that the effect of Kenyan women moving to the United States would be somewhat analogous to the effect of rural Kenyan women moving to the cities in Kenya. Urban women are often role models for rural women. The research data obtained will provide an empirical basis for designing an educational program to improve the infant feeding practices.

Four objectives were identified and addressed in this study:

1. To examine the infant feeding practices of selected Kenyan women who currently reside in the United States.

2. To determine the factors influencing their preferred method of infant feeding.
3. To examine the changes in infant feeding practices, if any, that have occurred as a result of the women living in the United States.
4. To examine the factors women cite as influencing those changes.

#### Definition of Terms

For the purpose of clarity, the terms referred to in this study are defined and used as follows:

1. Exclusive breast feeding: the baby is getting only breast milk and water for food.
2. Bottle feeding: use of bottle to feed the baby formula or types of milk other than breast milk.
3. Weaning: transition from exclusive breast or bottle feeding to replacement or supplementation with solid foods.
4. Kenyan born children: born and lived in Kenya for at least four months.
5. United States born children: born in United States and currently living in the United States.

## CHAPTER 2

### REVIEW OF LITERATURE

This review will investigate the trends related to breast feeding in developing countries, the various benefits of human milk to the infant, and the problems associated with poor weaning habits and inadequate weaning foods in developing countries. The attitudes and factors that influence mothers in their choice of infant feeding methods will also be considered.

#### Trends of Breast Feeding in Developing Countries.

Traditionally, breast feeding is socially and psychologically accepted as the best method to feed Kenyan children for periods up to two years or more (Diamond et al. 1987). The community's endorsement of breast feeding as the accepted method of feeding the newborn infant and the support provided by the extended family system promote success in lactation. However, with industrialization and urbanization, there has been a breakdown of the extended family system and removal of their support. Consequently, breast feeding has declined because more and more women are employed outside the home, leaving children behind for many hours in the day.

A study by Diamond et al. (1987) showed that low income mothers often adopt the practices of well-educated, wealthy mothers in order to achieve the prestige or sense of "modernness" associated with bottle feeding. A study done in Nigeria by Uwaegbute, et al. (1987) found that high pressure advertising of infant formulas and other milk products promotes bottle feeding. Furthermore, women have become more modest about breast feeding, as breasts have become more associated with sexuality. In addition to the decline in breast feeding, there is also a trend toward early introduction of solid foods.

According to Diamond et al. (1987), there was iron deficiency in children over six months, linked with late introduction of iron-rich

foods. The study also identified as causes not only late weaning, but also weaning to inappropriate foods that are low in iron and protein. Such practice is hazardous in rural Kenya because of the poor quality of the weaning foods, poor sanitation, poverty, ignorance and social taboos. In their document "State of the World's Children," UNICEF (1985, page 95) states that, "The search for adequate foods to supplement breast feeding once breast milk becomes insufficient to maintain normal growth is of a continuing interest, particularly in developing countries".

After a good start in life, infants in developing countries may start to falter in growth at six to 18 months; according to surveys conducted in the Philippines by Guthrie (1988), the main reasons for the decline in health status were that mothers' breast milk had either ceased or was meeting a decreasing portion of the child's needs. Because the supplements of corn gruel that mothers prepared are of low caloric and low nutrient density, the babies with a limited stomach capacity cannot eat enough to meet their needs. They also found that although mothers were virtually unanimous in their preference for breast feeding over bottles, they often terminated breast feeding abruptly as a result of folk beliefs. Jelliffe (1977), reported that in some of the developing countries such as India, many of the mothers still breast feed their babies, although with urbanization there is a trend for early discontinuance.

#### Human Milk and Its Protective Factors

Research has shown that feeding human milk with its protective immunological factors, non-allergenic character, and superior nutrient availability would constitute a single, but effective pediatric measure to reduce infant morbidity and mortality (Matheny, Picciano, and Birch, 1987). Goldman (1973) reported that human milk is rich in protective factors including a growth enhancer of lactobacilli, antistaphylococcal agent, immunoglobulins, certain complement components, lysozyme,



lactoperoxidase, lactoferrin, macrophages and lymphocytes. In countries where sanitary conditions are poor and infection rates are high, the incidence of enteric bacterial infections is lowest in breast fed infants. In Bangladesh, the effect of breast feeding on nutritional state, morbidity, and child survival was examined by André Briend (1988). He concluded that in communities with a high prevalence of malnutrition, breast feeding may substantially enhance child survival up to three years of age.

Cunningham (1977), in his study on morbidity in breast fed and artificially fed infants, found that episodes of significant illness were uncommon in breast fed infants. Breast milk may offer some protection against infection because of its cleanliness and content of a number of antiinfectious agents (Chen, Yu, and Wan-Xian Li, 1988). This study adds to the increasing evidence that human milk not only has unique advantages in the nutrition of the human infant, but that it is also the best infant food, especially in the areas where water supplies are contaminated and sanitary conditions are poor. In their sample, artificial feeding was associated with more frequent hospitalization for respiratory infections during the first 18 months of life.

#### Breast Feeding Protection Against Acute Diarrhea and Lower Respiratory Disease.

Measles, diarrheal disease, and acute lower respiratory tract diseases are among the leading causes of illness and death in children in developing countries (Walsh and Warren, 1979). The protection provided by breast feeding against infections and death in the young child has been confirmed both for developing and for industrialized countries (Cunningham, 1977).

A study in Rwanda examined the relation between breast feeding and mortality among 2,339 children under two years of age admitted to the hospital with measles, diarrheal disease, or acute lower respiratory disease. The results showed that fatality rates for all three diseases

were significantly lower in the breast fed than in the completely weaned children. In a Bangladesh study, (Hoyle, Yunus, and Chen, 1980) found that breast feeding which was continued during episodes of acute diarrhea protected the child against reduction in protein and caloric consumption during the illness, and human milk seemed to provide a positive nutritional effect until the third year of life. Victoria, Smith, Barros, Vaughn, Lombardi, Fuchs, Gigantes, Nobre, Teixeira, and Moneira (1987) conducted a population-based case-control study of infant mortality from infectious diseases in Brazil. Results suggest that breast feeding offers strong protection against death from diarrhea and respiratory infections in southern Brazil, especially in the first few months of life. Totally weaned infants were at greatest risk, but even partial weaning was associated with an increased risk. For other infections, infants who had been totally weaned had an increased risk of death compared with those exclusively breast fed. However, those receiving breast milk and other milk were not found to have a higher risk.

Breast feeding may directly protect against infant mortality from infectious diseases through the antiinfectious properties of breast milk (Mata and Wyatt 1971), or the effect may be indirect by shielding the child from contaminated food and water sources. Both of these mechanisms may operate, but their relative importance is likely to be different for diarrheal and respiratory diseases. Shielding is probably more important for deaths due to diarrhea. Part of the protective effect of breast feeding may also come from the close and continued contact with the mother. Some infants may be weaned because the mother has to leave the home to work.

Leventhal, Shapiro, Athen, Berg, and Egsrter (1986) conducted a case control study to determine whether breast feeding protects infants from infections. The results suggested that breast feeding is protective.

Lower respiratory tract illnesses are the other main causes of childhood morbidity, and in developing countries, causes of death (Victoria et al. (1987)). A study by Wright, Holberg, Martinez, Morgan, and Taussig, (1989) assessed the relationship between breast feeding and subsequent lower respiratory tract illnesses. In this study breast feeding seemed to protect against wheezing respiratory tract illnesses in the first four months of life, particularly when the risk factors such as malnutrition were present.

#### Breast Feeding and Gastrointestinal Illness

Howie, Forsyth, Ogston, and Florey (1990) assessed the relationships between breast feeding and infant illness in the first two years of life with particular reference to gastrointestinal disease. They concluded that breast feeding during the first 13 weeks of life confers protection against gastrointestinal illness that persists beyond the period of breast feeding itself. Koletzko, Sherman, Corey, Griffiths, and Smith (1989) examined the role of infant feeding practices in development of Crohn's disease in childhood. In this study lack of breast feeding was a risk factor associated with later development of Crohn's disease.

According to a study by Koopman, Turkish, and Monto (1985) on infant families and gastrointestinal illness, bottle feeding was associated with a higher frequency of gastrointestinal illness than was breast feeding. Most formulas are now iron fortified and the iron content of formulas promotes the growth of bacteria (Baltimore, Vecchitto, and Pearson, 1978). Since iron fortification in formula might increase the risk of bacterial growth, and processing in low fat milk might eliminate natural antiviral properties, whole milk, but not low fat milk, was associated with a reduced risk of illness. Both the increased risk of formula and lowfat milk could be due to a lack of antiviral properties in the lipid fractions of these feedings. Such antiviral properties are found in human milk (Koopmen et al. 1985).

Howie et al. (1990) assessed the relationships between breast feeding and infant illness in the first two years of life with particular reference to gastrointestinal disease. In this study babies who were breast fed for the first 13 weeks of life had substantially reduced rates of gastrointestinal illness, and this benefit persisted for up to one year of age. This study strongly suggested that breast feeding has an important part to play in preventing infection among infants.

#### Weaning Practices

Severe protein-energy malnutrition during the early years of life is associated with retarded physical and mental development and behavioral disturbances that persist into adult life (Galler et al. 1983). A recent study of children growing up in rural Kenya showed that food intake appeared to influence cognitive development of the Kenyan toddlers independently of the effects of the home environment (Sigman et al. 1989). A study assessing relationships between nutrition and development in Kenyan toddlers supported the hypothesis that mild to moderate malnutrition has deleterious effects on the physical, cognitive, and motor development of children. Infant feeding practices have long been recognized as one potentially important determinant of specific infections. Gordon, Chitkara, and Wyon (1963), who noted the temporal relationship between the onset of weaning and increased rates of diarrhea, coined the term "weanling diarrhea" to describe this association.

Inadequate food intake and recurrent infection, both symptoms of poverty, are the two most commonly proposed causes of chronic growth retardation among children in developing countries (Brown, Black, Lopez de Romaña, and Creed de Kanashiro, 1985). Other factors like infrequent feeding, food bulkiness and lack of encouragement of the child to eat may operate via culturally appropriate yet insalubrious child weaning practices. Another contributing factor is care-givers' ignorance of

proper diet (Uwaegbute et al. 1987). Most Nigerian staples to which children are weaned contain a lot of spices, especially hot pepper, as well as vegetables that make these foods very bulky. Consequently, young children can consume only small amounts of these foods (Uwaegbute et al. 1987).

The effects of poor nutrition as described in the literature cited above have been documented by studies to have long lasting effects on the child (Hertzog et al. 1972). They found that survivors of severe malnutrition in early childhood have poorer levels of mental development than their peers or siblings several years later. In the same way, mildly to moderately undernourished Ugandan children were observed to be less active than adequately nourished expatriot children. A study by Sigman et al. (1989) showed that the well fed children from more educated families who participated for longer periods in school were more cognitively developed than undernourished children from less educated families and with less school experience. A study by Chavez and Martine (1976) on nutritional supplementation showed that supplemented children were more active and explored their environment more than unsupplemented, undernourished children.

Chwang, Soemantri, and Pollitt (1988) assessed the effect of oral iron supplementation on blood iron levels and physical growth in 119 rural Indonesian school children. The results showed a significant improvement in academic subjects, hematological status, growth velocity, and level of morbidity. In this study children with iron deficiency anemia weighed less and were shorter than children classified as normal.

#### Breast Feeding Attitudes

A study by Black, Blair, Jones, and Durant (1990) on the infant feeding decision among pregnant women from a Women Infant and Children (WIC) supplemental food program in a United States population in Georgia, showed that the positive attitudes toward breast feeding had a stronger impact on the choices to breast feed than the knowledge about

breast feeding. Matheny et al. (1987) in their study on attitudinal and social influences on infant feeding preferences found that direct attitudes toward breast feeding and formula feeding surfaced as the predominant and significant predictors of infant feeding intervention, indicating that personal attitude was more important than perceived social pressure on the mother. High pressure advertising of infant formula and other milk products seemed to promote bottle feeding in Nigeria, according to Uwaegbute et al. (1987).

Bee, Baranowski, Rassin Richardson, and Mikrut (1991), in their study on breast feeding initiation in a tri-ethnic population, reported that ethnicity was the variable most closely associated with breast feeding initiation, with the implication that something about cultural practices or relationships was strongly affecting this important infant feeding practice. Baranowski, Rassin, Brown, and Bee (1986) in their study on attitudes toward breast feeding found that emphasizing the benefits for the infant, and providing strategies for minimizing personal inconveniences should promote breast feeding in their subjects. While the study by Baranowski et al. (1983) examining social support, social influence, ethnicity and the breast feeding decision implied that social support may be an important intervention variable, the potentially supportive individual to be reached by an intervention program varies by ethnic groups.

The above studies show that most mothers in developing countries initiate breast feeding. However, the trend is to discontinue lactation abruptly because of urbanization or various cultural beliefs. These studies have shown that breast feeding confers nutritional, anti-infective, anti-allergic, biochemical and psychological advantages for the child (Lawrence 1980). The task force commissioned by the U.S. government in 1981 (Report of the task force, Pediatrics 1984) to review the scientific evidence relating infant feeding practices in infant health concluded that breast feeding prevented infantile

gastrointestinal infections in all settings and improved infant survival rates in poor countries. Several studies showed that, after a good start in life, infants in developing countries start to falter in growth once breast feeding is discontinued. The weaning diet is often a problem in developing countries, either because of ignorance as to what is good and appropriate for the child, taboos, poverty, or mothers leaving children with caretakers or even siblings. Strong bottle feeding and formula advertising seemed to influence most mothers' attitudes toward infant feeding, and most discontinue breast feeding to bottle feed. Several studies concluded that mothers should be made aware of the many benefits of breast feeding, in an effort to encourage both the incidence of breast feeding and to prolong the duration. Practical alternatives to the weaning dilemma could include education on gradual transition from exclusive breast feeding to the consumption of solid foods, as well as the composition and age of introduction of weaning foods.

This review of literature has investigated the trends related to breast feeding in developing countries, the various protective factors of human milk to the human infant, the problems associated with poor weaning habits and inadequacy of weaning foods in developing countries, as well as the attitudes and factors that influence mothers in their choice of infant feeding methods.

### Chapter 3

#### METHODOLOGY

The purpose of this research was to investigate the infant feeding practices of Kenyan women in the United States. Specific objectives were (1) to examine the infant feeding practices of selected Kenyan women who currently reside in the United States; (2) to determine the factors influencing their preferred method of infant feeding; (3) to examine the changes in infant feeding practice, if any, that have occurred as a result of the women living in the United States; and (4) to examine the factors influencing those changes. Data were collected using a multi-part, self-administered questionnaire (Appendix A) and a focus group discussion (Appendix B) to facilitate indepth probing of specific areas that could not be adequately addressed by the questionnaire.

#### Population and Sample

The participants in this study were Kenyan mothers who had children born in Kenya, in the United States or in both countries. Contact was made with all the Kenyan families who were known by the researcher. They were requested to provide names, addresses and telephone numbers of other Kenyan mothers they knew. The total number of questionnaires mailed was 53. A focus group of eight mothers was conducted three weeks after the last response from the questionnaire was returned.

#### Instrument

A questionnaire containing 42 items was designed with four sections. Section A had eleven items assessing attitudes towards breast feeding and bottle feeding. The participants were asked to check the answers that best described their opinions with agree/disagree answers. Questions were arranged to avoid a pattern of answers. Section B had 12 items which included demographic information, such as parents' level of education, and duration of stay in the United States. Items in this



section also included actual practices related to breast feeding. Section C had 10 items which assessed the infant feeding practices, weaning foods used, age of introduction of foods, and any supplements used for children born in Kenya. Section D compared the same practices for children born in the United States with those of children born in Kenya.

As a followup of the questionnaire, a focus group consisting of eight of the Kenyan mothers was conducted. The focus group discussed each interview question in detail (Appendix B).

#### Data Collection

The Kenyan infant/child feeding questionnaire was pilot tested for clarity, comprehension and reliability with three African mothers who were not included in the sample. The questionnaire was validated by three nutrition and child development specialists at Eastern Illinois University, and minor changes were made.

The questionnaires were mailed to 53 Kenyan families with a self-addressed, business-reply envelope to expedite a response. To encourage honesty, respondents were assured confidentiality in a cover letter (Appendix A). However, questionnaires were coded with identification numbers to facilitate a second mailing to non-respondents and for focus group follow-up contacts. A total of 35 questionnaires was returned, a 66% response rate. As three questionnaires were mostly incomplete, 32 usable surveys remained. The initial plans were to conduct a telephone interview as a follow up to the questionnaire. In an attempt to meet the mothers at their convenience, an appointment was made to interview each mother. However, the mothers gathered in one home and individual interviews did not seem feasible. The method was adapted to a focus group discussion that worked very well and proved very beneficial. Focus group members allowed the researcher time to write notes after discussion of each question. The focus group was conducted three weeks after receiving all the questionnaires. The focus group interview is a

qualitative research method that is used to understand the situation as a whole. Therefore, the focus is not on how many participants identified the factors, but instead focuses on what factors were identified and to what extent. Achterberg (1988) suggests that nutrition educators are becoming increasingly aware of the inadequacy of the evaluation of results that are exclusively based on quantitative data. The focus group in this study was very beneficial as the mothers opened up and an indepth, spontaneous discussion on infant feeding practices occurred.

#### Data Analysis

All responses were tallied and converted into percentages. The focus group notes were reviewed, rewritten, and evaluated in order to classify the responses into larger general themes identified for each question.

Data from the self-administered questionnaire were tabulated and frequency distributions and percentages calculated for sample description purposes.

## Chapter 4

## RESULTS AND DISCUSSION

The major findings of this study were as follows: The mothers in this study had a positive attitude towards breast feeding and breast fed all their children for an average of one and a half years. Coming to the United States had a positive effect on the infant feeding practices, especially on the weaning diets. Mothers had a tendency to introduce beverages earlier than the recommended time of six months. The weaning foods used for children born in Kenya were rich in carbohydrates but poor in protein, vitamins, and minerals. The objectives of this study were to examine the infant feeding practices of selected Kenyan women who currently reside in the United States; to determine the factors influencing their preferred method of infant feeding; to examine the changes in infant feeding practices, if any, that have occurred as a result of the women living in the United States; and to examine the factors influencing those changes. A total of 32 usable questionnaires was returned from Kenyan mothers living in different parts of the United States.

Educational Level of Parents

The fathers attained a higher educational level than the mothers, as shown in Table 1, with 13% of the fathers indicating Ph.D. as their highest grade in school. All the mothers participating in this study, as well as the fathers, had completed high school education.

Duration of Stay

The data show that 72% of the mothers have been in the United States for at least three years. Table 2 shows the duration of stay and the number of mothers in each category.

Attitudes Towards Infant Feeding

Mothers were asked to respond to eleven attitudinal statements using a two point agree/disagree scale. There were no correct or wrong answers. The questions assessed the attitudes of the mothers toward

Table 1. Parents' level of education.

| Highest grade completed | Number | Mother<br>Percent | Number | Father<br>Percent |
|-------------------------|--------|-------------------|--------|-------------------|
| High school             | 13     | 41                | 6      | 19                |
| Two year college        | 12     | 38                | 9      | 28                |
| Baccalaureate degree    | 5      | 16                | 7      | 22                |
| Master's degree         | 2      | 6                 | 6      | 19                |
| Ph.D.                   | --     | --                | 4      | 13                |

Table 2. Duration of mothers' stay in the United States.

| Years in United States | Number | Percent |
|------------------------|--------|---------|
| 11-12                  | 3      | 9       |
| 6-8                    | 6      | 19      |
| 4-5                    | 8      | 25      |
| 3                      | 6      | 19      |
| 2                      | 3      | 9       |
| 1                      | 6      | 19      |

breast feeding and bottle feeding. Frequency distribution of the attitudinal responses is listed in Table 3.

#### Breast Feeding

A majority of the mothers, as noted in Table 4, had a positive attitude towards breast feeding. Seventy-five percent of the mothers considered breast feeding convenient, while 91% disagreed with the statement that breast feeding would not provide enough milk to satisfy their babies. Most of the mothers, 30 (94%), agreed that breast feeding is more nutritious than bottle feeding. A total of 28 mothers (90%) disagreed with the statement that breast feeding away from home would be embarrassing. Most of the mothers, 31 (97%), demonstrated some knowledge of immunological factors in breast milk by agreeing that breast milk helps protect babies from infections. The same number of mothers, 31 (97%), agreed that breast feeding would bring mother and baby closer.

#### Bottle Feeding

Bottle feeding, as defined in this study, was feeding the baby with a type of milk other than breast milk. Twenty one mothers (66%) disagreed that bottle feeding would give them more time to see friends. Nevertheless, a total of 22 mothers (69%) of the sample agreed that bottle feeding would make it easier for them to have a job. Only five mothers, 16%, agreed that bottle feeding helps the husband/male partner know the baby. All the mothers unanimously disagreed that bottle feeding would save money.

Table 3. Response frequencies on self report attitudinal questionnaire related to breast feeding and bottle feeding.\*

| Attitudes   | Agree  |         | Disagree |         |
|---|--------|---------|----------|---------|
|   | Number | Percent | Number   | Percent |
| <u>Breast feeding</u>   |        |         |          |         |
| Breast feeding would be convenient to me  | 24     | 75      | 8        | 25      |
| Breast feeding would not provide enough milk to satisfy my baby                           | 3      | 9       | 29†      | 91      |
| Breast feeding is more nutritious than bottle feeding                                     | 30     | 94      | 2        | 6       |
| Breast feeding away from home would be embarrassing to me                                 | 3      | 10      | 28†      | 90      |
| Breast feeding helps protect babies from infection  | 31     | 97      | 1        | 3       |
| Breast feeding would bring mother and baby closer together                                | 31     | 97      | 1        | 3       |
| <u>Bottle feeding</u>   |        |         |          |         |
| Bottle feeding would take too much of my time   | 13     | 41      | 19†      | 59      |
| Bottle feeding would give me more time to see my friends and do other things I want to do | 11     | 34      | 21       | 66      |
| Bottle feeding would make it easier for me to have a job                                  | 22     | 69      | 10       | 31      |
| Bottle feeding would help my husband/male partner to really know our baby                 | 5      | 16      | 11       | 34      |
| Bottle feeding would save money   | --     | --      | 32       | 100     |

\*Some response totals do not equal 32 as not all mothers responded

†Denotes positive attitude toward the specific practice

Table 4. Reported reasons for breast feeding.

| Reason                                 | Number | Percent* |
|--|--------|----------|
| Breast milk more nutritious            | 17     | 53       |
| Brings mother and child close together | 13     | 41       |
| Is more convenient                     | 7      | 22       |
| Gives baby special immunities          | 5      | 16       |
| Is more natural                        | 4      | 13       |
| Prevents infections                    | 4      | 13       |
| Less expensive                         | 4      | 13       |
| Comforts the baby                      | 1      | 3        |

\*Total greater than 100% due to multiple reasons reported.



### Feeding Practices

All children, both those born in Kenya and those born in the United States, were breast fed for an average of 15 months, with two months being the shortest duration and three years the longest. The initiation and duration of breast feeding did not seem to be affected by moving to the United States. The major difference noted was the duration of breast feeding among siblings. A mother would report breast feeding one child for only two months, and yet report breast feeding another for three years. These differences occurred regardless of the country of birth. This variation in breast feeding practice indicates that some reason other than moving to the United States caused the differences in duration of breast feeding.

The majority of the mothers, 69%, reported no problem with breast feeding. One mother indicated that she did not have enough milk; another had breast infection. Two mothers reported sore breasts, while one indicated that she had no time to breast feed. One mother reported that other people's negative attitude to breast feeding created a problem for her while breast feeding outside the home. In general, coming to the United States did not affect either the incidence or the duration of breast feeding of the Kenyan mothers.

### Reasons for Breast Feeding

The belief that breast milk is more nutritious was a factor that influenced 53% of the mothers to breast feed. Closeness between mother and child was the second most important reason given for breast feeding. Table 4 lists the reasons reported in a decreasing order.

### Source of Information

Baby and nutrition books were most often cited (78%) as the sources of information on infant feeding, while community/society was the least cited by the mothers as a source of nutrition information. Table 5 shows the sources reported in a decreasing order of frequency.

Table 5. Sources of information on infant feeding.

| Source                   | Number | Percent* |
|--------------------------|--------|----------|
| Baby and nutrition books | 25     | 78       |
| Doctors                  | 23     | 72       |
| Mother                   | 18     | 56       |
| Nutrition class          | 14     | 44       |
| WIC program              | 13     | 41       |
| TV/radio                 | 7      | 22       |
| Husband/male partner     | 6      | 19       |
| Mother-in-law            | 5      | 16       |
| Friends                  | 2      | 6        |
| Experience               | 2      | 6        |
| Nurses                   | 1      | 3        |
| Society/community        | 1      | 3        |

\*Total greater than 100% due to multiple sources reported.

### Reasons for Weaning

Weaning was initiated for a variety of reasons. Thirty eight percent of the mothers weaned their children because the children were considered old enough to eat other foods. Twenty two percent of the mothers indicated that they did not have enough milk, while 19% reported that the children refused to breast feed. One mother stopped breast feeding because of medication, while another one stopped because she started working.

The most important factor for choosing to bottle feed was convenience and to make it easier to go to school or work. The other major reason was to supplement breast milk. A total of nineteen mothers (59%) combined breast feeding and bottle feeding.

In response to the question about type of food for their infants, if the mothers went to work or school in the infants' first three months, 11 (34%) of mothers indicated they would express breast milk. Table 6 shows other food choices for the infant in a decreasing order of frequency.

### Diets of Lactating Mothers

Based on their responses, mothers in this study seem to practice healthful eating habits. Nevertheless, their cultural background has influenced their choices of foods cited to increase the quantity and quality of breast milk. Many mothers 12 (38%) chose vegetables, then grains and cereals (34%), while fish, poultry, and meat were cited by five mothers in each category. Dairy products were the least chosen as a food, and yet milk was the most important drink reported (56%). First juice and then porridge [thin maize (corn) meal gruel fortified with milk] were the next drinks chosen to increase the quality and quantity of breast milk. A complete list of foods and liquids reported is in Appendix C.

Among the foods avoided because of breast feeding, spicy foods were the most unpopular 7 (22%). Soda pop was the most unpopular beverage

Table 6. Baby's food when the mother is away from home for the first three months. 25

| Food                    | Number | Percent |
|-------------------------|--------|---------|
| Expressed breast milk   | 11     | 34      |
| Formula                 | 10     | 31      |
| Fruit juice             | 9      | 28      |
| Water                   | 4      | 13      |
| Baby food               | 2      | 6       |
| Potatoes                | 1      | 3       |
| Sugar water             | 1      | 3       |
| Strained vegetable soup | 1      | 3       |

while mothers were breast feeding. Tea with milk was avoided by only one mother. A complete list of foods and liquids avoided during lactation is in Appendix D.

Comparison of Feeding Practices for Kenyan Born Babies and United States Born Babies

A total of 25 (78%) mothers had children born and reared in Kenya for at least four months, while 24 (75%) mothers had children born in the United States, and 19 (59%) mothers had both Kenyan born and United States born children. Forty percent (10) of mothers reported using breast milk as the only first food for their children born in Kenya. Seventy one percent of mothers with children born in the United States used breast milk as the first food for their children. Thus there was an increase in exclusive breast feeding of children born in the United States compared to children born in Kenya. Figure 1 shows the percentages of Kenyan and United States born children who received various types of first foods. At a very early age, Kenyan born children were introduced to a wider variety of foods than were the United States born children. More Kenyan born children were given formula than were United States born children.

A total of 15 (60%) mothers gave their Kenyan born children vitamin/mineral supplements at some time, while 10 (40%) of the mothers gave their United States born children vitamin/mineral supplements. The major difference was the age of the infant when the supplements were given. Mothers of the United States born children gave their infants supplements at an average age of two weeks, while the Kenyan infants were not given them until they were 2.5 months.

Figure 2 compares types of beverages given to Kenyan and United States born children. Fruit juice was the most popular drink given to the children. The average age of introduction for the Kenyan born children was 1.5 months, but some children were given juice as early as their first day of life. For the United States born children, the

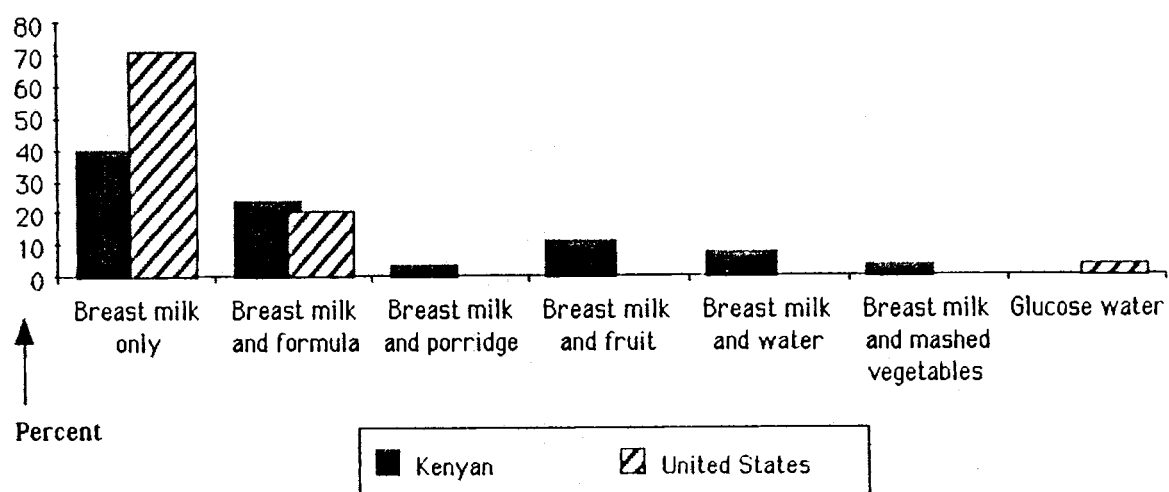


Figure 1. Comparison of first foods given to Kenyan born and United States born children.

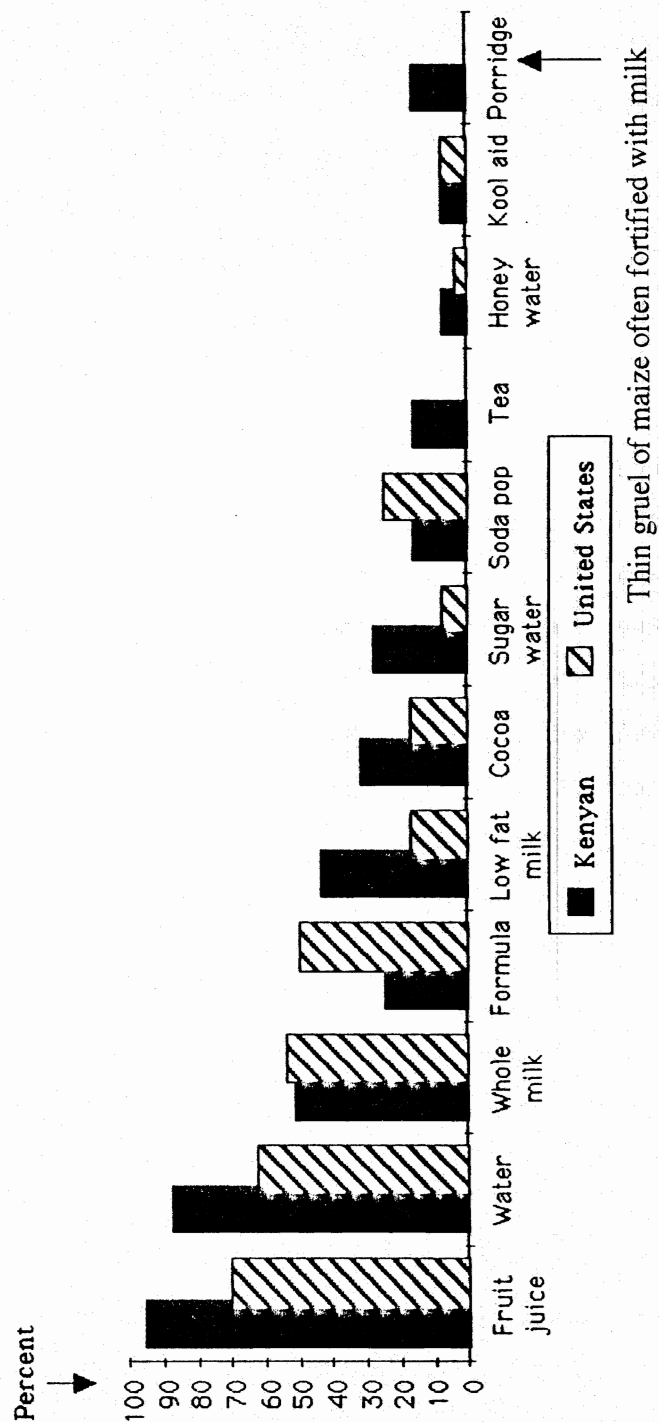


Figure 2. Comparison of beverages given to Kenyan born and United States born children.

average age of introduction was four months, but one child was given juice at two days and another at two weeks of age.

Whole milk was the second most popular drink. The United States born children were introduced to whole milk at the recommended time, (after the first year of the infant's life) an average of 18 months. The Kenyan born children were introduced to whole milk as early as the first three days of their lives, at an average age of one week. Tea with milk and porridge were given only to the Kenyan born children. This could be because of cultural influence, as maize meal porridge fortified with milk is the most popular weaning diet, while tea with milk is a popular beverage for adults.

For both Kenyan and United States born children, the average age for introducing the cup was eight months, but the Kenyan born children were introduced as early as the first month. There was no major difference in types of solid food offered. All categories listed on the questionnaire were reported with homemade mashed/blended and table foods cited most often, 68% and 60% respectively, for the children born in Kenya, and 63% each for children born in the United States.

Figure 3 shows a comparison of the kinds of solid foods the Kenyan and United States born children were given and the age of introduction. Kenyan born children were introduced to solid foods earlier than the United States born children. Both groups seemed to start solid foods at the recommended time (four to six months). Kenyan children were also introduced to a wider selection of foods than were the United States born children. Homemade foods were started much later for the United States born children. The availability of commercial junior foods could contribute to the delay. Most mothers did not report any foods that their children should not eat. Table 7 lists foods cited by a few mothers as foods that their children should avoid.

Sore throat and/or ear infections and diarrhea were cited by two mothers in each category as frequent problems. A total of eight mothers



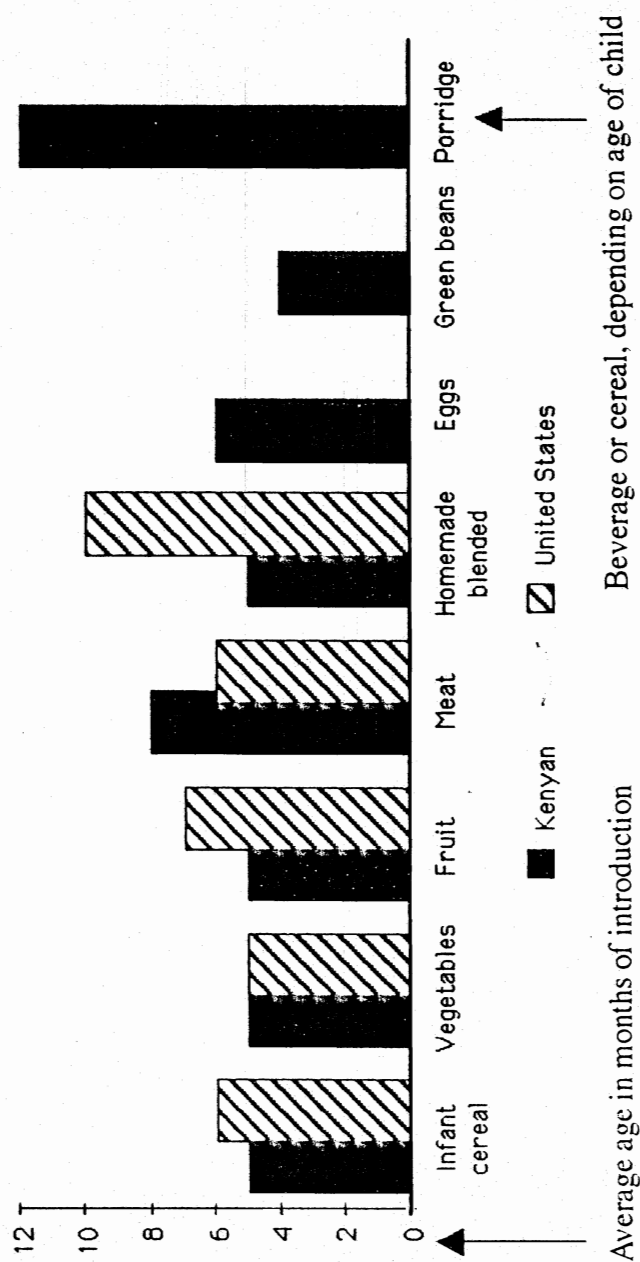


Figure 3. Comparison of types of solid foods given to Kenyan born and United States born children and age of introduction.

Table 7. Reported reasons for avoiding feeding children certain foods.

| Food         | Number | Reason                    |
|--------------|--------|---------------------------|
| Pork         | 4      | Religion; causes diarrhea |
| Sugar        | 1      | Nutrition                 |
| Chocolate    | 1      | Allergy                   |
| Fish         | 1      | Allergy                   |
| Nuts         | 1      | Allergy                   |
| Soy products | 1      | Allergy                   |

treated diarrhea by omitting solid foods and giving the child fluids. Others indicated that they avoided milk beverages, giving sugar water or taking the child to the doctor. Based on the responses on this section, children in this study did not experience frequent childhood infections.

#### Focus Group Interview Results

A follow-up of the mailed questionnaire was conducted in a focus group interview. The eight mothers in the focus group are from different parts of Kenya. Five of the mothers had children born in Kenya. Five of the mothers had children born in Kenya and in the United States, while three of the mothers had children born only in Kenya. The investigator prepared five open-ended questions (Appendix B) to give direction to the focus group interviews. The purpose of this focus group was to stimulate discussion that would enable the investigator to gain insights from the participants' experience. It was also intended for the purpose of indepth probing and asking questions that were not possible in the mailed questionnaire.

In response to how coming to the United States affected their infant feeding practices, most mothers stated that their being in United States did not affect the duration of their breast feeding. However, it did affect the amount of time spent during each breast feeding. The mothers reported that without extra help from extended families, it was very hard to sit down and breast feed for 15-30 minutes. The identical type of weaning food introduced to children in Kenya was not available in the United States. Convenient infant cereals were available free through WIC (Women, Infants and Children Supplemental Food program). The mothers indicated that the availability of infant cereal from WIC encouraged early introduction of solid foods. Culture and education were the most important factors that influenced mothers of Kenyan born children on their choice of infant feeding method. For children born in the United States, availability of time and specific foods were the most important factors. For example, most mothers used infant cereal

provided through WIC, whereas traditionally they would blend food. In the United States mothers had little time to blend food.

Lack of help from the extended family affected the mothers' infant feeding practices in the following ways:

1. Mothers spent shorter times feeding the children because they had other pressing responsibilities, while in Kenya help from the extended family would be available.
2. Mothers were under stress and felt that they transferred tension to the children during meals. Meals were always served in a hurry.
3. Mothers also indicated that though they had their children with them all the time, they did not spend quality time with them as they would do back in Kenya.

The mothers indicated appreciation of the availability of fortified infant cereal through WIC, while in Kenya availability of specific foods is seasonal. Children born in the United States had a variety of foods throughout the year.

On the other hand, based on focus group responses, the children born in Kenya were reared in a more relaxed atmosphere. The mothers further explained that, for the children born in Kenya, they gave them fresh food prepared daily, while most of them used baby jar foods from the stores for the children born in the United States. These results show that mothers in this study had a positive attitude towards breast feeding and breast fed their children. Coming to the United States had a positive influence on the weaning diet. For the Kenyan born children, fruit juice and whole milk were introduced earlier than recommended. Results further show that the weaning foods used by the mothers of children born in Kenya are rich in carbohydrates but poor in proteins, vitamins, and minerals.

### Discussion

The results of this research show that the mothers involved had a positive attitude towards breast feeding. All the mothers breast fed their infants from between two months to three years, with an average duration of 1 1/2 years. This is reasonably consistent with the findings of a study by Whitehead, R.G. (1979) that concluded that, in rural areas of Africa, breast feeding until two years is common.

A study by Black et al. (1990) on infant feeding decisions among pregnant women from a WIC population in Georgia concluded that positive attitudes toward breast feeding had a stronger impact on the choice to breast feed than did the knowledge about breast feeding. While this study agrees with that report, based on their responses to the breast feeding questions, these mothers demonstrated adequate knowledge about the benefits of breast feeding. The participants in this study did not indicate any important social pressures relative to breast feeding. These results agree with Matheny et al. (1987) that direct attitudes toward breast feeding and formula feeding surfaced as the predominant and important predictor of infant feeding intention, indicating that personal attitude was more important than the perceived social pressure of the mother. Rassin et al. (1984) reported that ethnicity was the variable most closely associated with breast feeding initiation, with the implication that something about cultural practices or relationships was strongly affecting this important infant feeding practice. On the other hand, Kurinij, Shiono, Pitt, Rhoads (1988) reported that education and social class were more closely associated with breast feeding initiation than was ethnicity, implying that social class was the primary determining factor. Though the mothers in the present study cited education as one of the factors that influenced their choice of infant feeding practice, mothers of all levels of education breast fed all their children. This study did not address social class. Bottle feeding was cited as convenient when mothers went to school or to work.

For this sample group, coming to the United States did not seem to affect either the incidence or the duration of breast feeding. The focus group indicated that for the children born in United States, lack of extended family to help them affected the time spent nursing the baby. Mothers explained that lack of support left them too busy and stressed to give the child quality time.

Mothers in the present study were not only well educated, all being having completed high school education, but also reported using literature as the most popular source of infant feeding information. This finding agrees with a study by Sigman et al. (1989) in Kenya, that concluded that well fed children from more educated families who participated for longer periods in school were more cognitively developed than undernourished children with less school experience from less educated families. The focus group interview cited education as one of the factors that influenced their choice of infant feeding practices.

All the mothers who bottle fed their children (59%) did so to supplement breast milk, or when they were out of the home at school or at work. Weaning was initiated for various reasons. Many mothers (38%) did so because they considered their children old enough to eat other foods. The study shows that the mothers of both groups introduced solid food between the fourth and the fifth month of the babies' life. The Kenyan born children were offered juice earlier than recommended, at an average age of one and a half months, but as early as the first day of life. The recommended time to introduce fruit juice is six months of age. Whole milk was also introduced early to the Kenyan born children. The average age of introduction was one week, but as early as three days old was cited. This is of some concern, as the recommended time to introduce whole milk is one year. This early introduction of other drinks and milk, while breast feeding is unfortunate because in Kenya, such beverages are expensive. There is a consensus that under

conditions in which a mother is motivated, healthy, and relaxed, breast milk alone is adequate fully to support infant growth for at least four months and often for six months (Underwood, B.A., Hofrander T. (1982).

The solid foods used for weaning were similar for both groups, but Kenyan born children had a wider variety of foods. The foods cited were foods rich in carbohydrates but poor in protein - like porridge and cooked green bananas, including plantains. These foods alone would not be nutritionally adequate. They would need to be fortified or mixed with other nutritious foods. For the children born in the United States, the weaning diet was narrowed to the infant cereal and baby jar foods. Availability of vouchers to obtain these foods through WIC was a great contributing factor. Convenience of the pre-prepared foods for the busy mother was a contributing factor, too.

The data concerning infant feeding practice indicated universal initiation of breast feeding, early introduction of other liquids and milk, while continuing to breast feed during the first year of the infant's life. This pattern is generally consistent with observations from Gambia in Africa, where infants receive supplements to breast milk within the first month after birth (Whitehead, R.G. (1979)). This concern is further expressed by Umo, E.J. (1991), whose study showed that the majority of parents in Nigeria lacked nutrition knowledge to prepare weaning foods, to plan a well balanced diet with limited resources, and to supplement the diet with enriched foods.

From the focus group interview it was clear that the children born in the United States enjoyed both breast feeding and an appropriate weaning diet. The mothers, however, felt they did not have enough time to breast feed their children due to lack of help from the extended family. Coming to the United States did not affect the breast feeding incidence or duration, but it affected the weaning diet.

Several studies agree that a logical approach to improve inadequate weaning diets would be nutrition education of the mothers as to what

kinds of complementary food were appropriate and locally available. Many locally available foods like cowpeas and other varieties of beans and legumes, can be used to wean the infants. Encouraging exclusive breast feeding would be vital to avoid early introduction of other drinks.

It appears that the infant feeding practices of the Kenyan mothers participating in this study show both strengths and areas for improvement. It would be important to reinforce the commitment to breast feeding, while promoting the use of more nutritious weaning foods introduced at appropriate times in the children's lives.



## CHAPTER 5

## SUMMARY, CONCLUSION, AND IMPLICATIONS

The purpose of this study was to investigate the infant feeding practices of Kenyan women in the United States. Four objectives were identified and addressed in this study: To examine the infant feeding practices of selected Kenyan women who currently reside in the United States; to determine the factors influencing their preferred method of infant feeding; to examine the changes in infant feeding practice, if any, that have occurred since living in the United States; and to examine the factors women cite as influencing those changes.

Data were collected from a sample of 32 Kenyan mothers currently living in the United States. A multi-part self-administered questionnaire was mailed to the mothers. The questionnaire contained 42 items, designed with four sections. Section A assessed attitudes towards breast feeding and bottle feeding. Section B had open-ended questions on the actual practice of breast feeding. Section C and D compared the feeding practices for the children born in Kenya and those born in the United States. A focus group interview was conducted with eight mothers from the study, as a follow-up of the questionnaire.

The results of this study indicate that all mothers had a positive attitude towards breast feeding. All the mothers in this study breast fed all their children for an average age of 1/2 years, with a range of two months to three years. There was an early introduction of fruit and whole milk for children born in Kenya. Though there was a wider selection of weaning foods for children born in Kenya, some of the foods were rich in carbohydrates but deficient in protein, vitamins and minerals. Thus common weaning foods would need to be supplemented to be nutritionally adequate as a weaning diet. Fruit juice was the most popular drink given to both Kenyan born and United States born children.

Coming to the United States did not affect either the mother's

initiation of breast feeding or the duration, but it affected the specific time spent nursing the baby. The mothers found the availability of vouchers from WIC, for infant cereal and baby foods encouraged them to use those foods for a nutritious weaning diet. Mothers indicated that they did not have a similar substitute of a weaning food in Kenya. The Kenyan born children, on the other hand, were weaned in a more relaxed atmosphere. The mothers felt they had time to nurse their infants without the pressures of doing other things. Though they did not have the convenient foods, they had time to prepare homemade fresh foods daily.

#### Limitations

The findings and patterns reported in this study must be considered preliminary. The study relied on memory for the infant feeding practices, especially for the Kenya born children. Study participants had more education than do most Kenyan women. Thus it would be somewhat difficult to generalize to other Kenyan women. As in many questionnaire responses, there might be a possibility of the mothers writing the expected responses rather than accurate answers.

#### Conclusions

Several conclusions related to infant feeding practices of Kenyan women living in the United States have been drawn based on the findings from this study.

1. Kenyan women living in the United States have a positive attitude towards breast feeding, following this practice with all their children for extended periods. periods.
2. Though the mothers were well educated, some cultural factors seemed to interfere with following recommended weaning practices. There was a tendency to introduce other beverages too early.

3. The weaning foods cited for children born in Kenya would need to be supplemented. Mothers would need education on how to use local foods to complement proteins and improve the weaning diet.
4. Coming to the United States was advantageous to the children born in the United States, due to the availability of more nutritious weaning foods.

#### Implications

1. The importance of breast feeding cannot be overemphasized and since these Kenyan mothers have a positive attitude encouragement should be given whenever possible.
2. It would be necessary to develop a weaning diet, using local foods for the mothers still in Kenya. Simple printed materials could be used as a reference for the mothers with suggestions on weaning foods, and methods of supplementing and complementing the weaning foods using local ingredients. Also important would be child development information that explains the right time to introduce solid foods and beverages.
3. Mothers living in the United States should be encouraged to be a support for each other whenever possible. Through shared child care, baby sitting and other forms of mutual support, the mothers' stress could be reduced.
4. The international offices in their respective universities can introduce them to American families or voluntary organizations that may help them out and offer support. Due to their strong positive attitude and practice in breast feeding, Kenyan women could be used as a resource by organizations that are promoting breast feeding.

## REFERENCES

- Achterberg, C. (1988). Qualitative methods in nutrition education evaluation research. Journal of Nutrition Education, 20 (5), 244-250.
- Baltimore, R.S., Vecchitto, J.S., Pearson, H.A. (1978). Growth of Escherichia Coli and concentration of iron in an infant feeding formula. Pediatrics, 62, 1072-1073.
- Baranowski, T., Bee, D.E., Rassin, D.K., Richardson, C.J., Brown, J.P., Guenther, N., and Nader, P.R. (1983). Social support, social influence, ethnicity and breast feeding decision. Social Science Medicine, 17, 1599-1611.
- Baranowski, T., Rassin, D.K., Richardson, C.J., Brown, J.P., and Bee, D.E. (1986). Attitudes toward breast feeding. Journal of Developmental and Behavioral Pediatrics, 7 367-372.
- Bauchner, H., Leventhal, J.M., and Shapiro, E.D. (1986). Studies of breast-feeding and infections: How good is the evidence. Journal of the American Medical Association, 256, 887-892.
- Bee, D.E., Baranowski, T., Rassin, D.K., Richardson, C.J., and Mikrut, W. (1991). Breast feeding initiation in a triethnic population. American Journal of Diseases of Children, 145, 306-372.
- Black, R.F., Blair, J.P., Jones, V.N., Durant, R.H. (1990). Infant feeding decisions among pregnant women from a WIC population in Georgia. Journal of American Dietetic Association, 90, 575-578.
- Briend, A., Wojtyriak, B., and Rowland, M.G.M. (1988). Breast-feeding, nutritional state, and child survival in rural Bangladesh. British Medical Journal, 296, 879-882.
- Brown, K.H., Black, R.E., Lopez de Romaña, G., and Creed de Kanashiro, H. (1989). Infant feeding practices and their relationship with diarrhea and other diseases in Huascar (Lima), Peru. Pediatrics, 83, 31-40.
- Chavez, A., Martine, Z.C. (1979). Consequences of insufficient nutrition on child character and behavior. In: Levitsky, D.A., ed. Malnutrition, environment and behavior. (pp. 238-55) New York: Cornell University Press.
- Chen, Y., Yu, S., and Li, W. (1988). Artificial feeding and hospitalization in the first 18 months of life. Pediatrics, 81, 58-62.
- Chwang, L., Soemantri, A.G., Pollitt, E. (1988). Iron supplementation and physical growth of rural Indonesian children. American Journal of Clinical Nutrition, 47, 496-501.
- Cunningham, A.S. (1977). Morbidity in breast fed and artificially fed infants. Journal of Pediatrics, 90: 726-29.

- Diamond, H.J., Ashworth, A.A. (1987). Infant feeding practices in Kenya. Journal of Nutrition Education, 41A, 412-421.
- Galler, J.R., Ramsey, F., Solingno, G., Lowell, W.G. (1983). The influence of early malnutrition on subsequent behavioral development: 11. classroom behavior. Journal of the American Academy of Child Psychiatry, 22, 16-22.
- Goldman, A.S., and Smith, C.W. (1973). Host resistance factors in human milk. Journal of Pediatrics, 82, 1082-1090.
- Gordon, J.E., Chitkara, I.D., Wyon, J.B. (1963). Weanling diarrhea. American Journal of Medical Science, 130, 345-377.
- Hanson, L.A., and Winberg, J. (1972). Breast milk and defense against infection in the newborn. Archives of Disease in Children, 47, 845-847.
- Hertzog, M., Birch, H., Richardson, S., and Tizard, J. (1972). Intellectual levels of school children severely malnourished during the first two years of life. Pediatrics 49, 814-823.
- Howie, P.W., Forsyth, J.S., Ogston, S.A., Clark, A., and Florey C. du V. (1990). Protective effect of breast-feeding against infection. British Medical Journal, 300, 11-16.
- Hoyle, B., Yunus, M., Chen, L.C. (1980). Breast feeding and food intake among children with acute diarrheal disease. American Journal of Clinical Nutrition, 33, 2365-71
- Koletzko, S., Sherman, P., Corey, M., Griffiths, A., and Smith, C. (1989). Role of infant feeding practices in development of Crohn's disease in childhood. British Medical Journal, 298, 1617-1618.
- Koopman, J.S., Turkish, V.J., and Monto, A.S. (1985). Infant formulas and gastrointestinal illness. American Journal of Public Health, 75, 477-480.
- Kurini, N., Shing, P.H., and Rhoads, G.G. (1988). Breast feeding incidence and duration in black and white women. Pediatrics, 81 (3), 365-371.
- Lawrence, R.A. (1980). Breast feeding, A guide for the medical profession St. Louis, MO: C.V. Mosby.
- Lepage, P., Munyakazi, C., Hennart, P. (1981). Breast feeding and social influences on infant feeding. Journal of Nutrition Education, 19, 21-25.
- Leventhal, J.M., Shapiro, E.d., Aten, C.B., Berg, A.T. and Edgerter, S.H. (1986). Does breast-feeding protect against infections in infants less than 3 months of age? Pediatrics, 78, 896-903.
- Mata, L., Wyatt, R.H. (1971). Host resistance to infection. American Journal of Clinical Nutrition, 24, 976-86.
- Matheny, R.J., Picciano, M.F., Birch, L. (1987). Attitudinal and social influences on infant feeding preferences. Journal of Nutrition Education, 19, 21-30.

- Narayanan, L., Prakash, K., and Gujral, V.V. (1984). The value of human milk in the prevention of infection in the high-risk low-birth-weight infant. Pediatrics, 74: 579-762.
- Nutrition Office, Kenya Freedom from Hunger Organization (1980). Nutrition survey in Ukambani. Unpublished manuscript.
- Pollitt, E. (1988). A child survival and development revolution. SRCD Newsletter, 4.
- Rassin, D.K., Richardson, C.J., Baranowski, T., Nader, P.R., Guenther, N., Bee, D.E., and Brown, J.P. (1984). Incidence of breast-feeding in a low socioeconomic group of mothers in the United States: Ethnic patterns. Pediatrics, 73, 132-137.
- Report of the task force on the assessment of the scientific evidence relating to infant feeding practices and infant health (1984). Pediatrics, 74: 579-762.
- Schlossman, N.P. (1990). Breast feeding promoted for improved infant nutrition. Fortune, 30, 4.
- Sigman, N., Jansen, A.A.J., Bwibo, N. (1989). Cognitive abilities of Kenyan children in relation to nutrition, family characteristics and education. Child Development, 60, 1463-1474.
- Sigman, M., Neuman, C., Baksh, M., Bwibo, N., and McDonald, M.A. (1989). Relationship between nutrition and development in Kenyan toddlers. J. Pediatr., 115, 357-364.
- Umoh, Enoch, J. (1991). Nigerian dietitian shares data on malnutrition in children. Journal of the American Dietetic Association, 91, 655.
- Underwood, B.A., Hofvander, Y (1982). Appropriate timing for complementary feeding of the breast fed infant. Acta Paediatric Scandinavica Supplement 294, 1-32.
- UNICEF (1985). State of the world's children. New York. UNICEF.
- Uwaegbute, A.C., Nhayelrgo, K.O. (1987). Differences in the infant feeding practices in urban and rural Nigeria. Journal of Nutrition Education, 19, 83-89.
- Victoria, C.G., Smith, P.G., Vaughan, J.P., Nobre, L.C., Lombardi, C., Teikeira, A.M.B., Fuchs, S.M.C., Moreira, L.B., Gigante, L.P., and Barros, F.C. (1987). Evidence for protection by breast-feeding against infant deaths from infectious diseases in Brazil. Lancet, 2:3, 319-322.
- Walsh, J.A., Warren, K.S. (1979). Selective primary health care: An interim strategy for disease control in developing countries. New England Journal of Medicine, 301, 697-74.
- Whitehead, R.G. (1979). Infant feeding practices and the development of malnutrition in rural Gambia. United Nations University food nutrition bulletin, 1: 36-41.
- Wright, A.L., Holberg, C.J., Martinez, F.D., Morgan, W.J., Taussig, L.M., and Group Health Medical Associates (1989). Breast feeding and lower respiratory tract illness in the first year of life. British Medical Journal, 299, 946-949.

## Appendix A. Questionnaire and cover letter.

## KENYAN INFANT/CHILD FEEDING STUDY

## Section A Please check the answers that best describe your opinions.

1. Bottle feeding would take too much of my time.  
☐ agree      ☐ disagree
2. Bottle feeding would give me more time to see my friends and do other things I want to do.  
☐ agree      ☐ disagree
3. Breastfeeding would be more convenient for me.  
☐ agree      ☐ disagree
4. Breastfeeding would not provide enough milk to satisfy my baby.  
☐ agree      ☐ disagree
5. Bottle feeding would make it easier for me to have a job.  
☐ agree      ☐ disagree
6. Breastfeeding is more nutritious than bottle feeding.  
☐ agree      ☐ disagree
7. Breastfeeding away from home would be embarrassing to me.  
☐ agree      ☐ disagree
8. Bottle feeding would help my husband/male partner to really know our baby.  
☐ agree      ☐ disagree      ☐ does not apply
9. Bottle feeding would save money.  
☐ agree      ☐ disagree
10. Breast milk helps protect babies from infections.  
☐ agree      ☐ disagree
11. Breastfeeding would bring mother and baby closer together.  
☐ agree      ☐ disagree

## Section B Please answer questions as indicated.

12. Mother: Last school grade completed \_\_\_\_\_ Year came to United States \_\_\_\_\_  
 Father: Last school grade completed \_\_\_\_\_
13. What have been your sources of information about feeding your child/children? Check ALL that apply.  
☐ mother      ☐ husband/male partner      ☐ TV/Radio  
☐ mother-in-law      ☐ doctor      ☐ nutrition class  
☐ WIC nutritionist      ☐ books, other reading material  
☐ other (explain) \_\_\_\_\_
14. Have you ever breast fed one or more babies?  
☐ yes      ☐ no (Skip to Question 23.)
15. Number of babies breast fed \_\_\_\_\_ How long for each baby? \_\_\_\_\_
16. Why did you choose to breast feed?
17. How long does [did] the baby breast feed on the average? \_\_\_\_\_

18. List foods or liquids that you have used to increase the quantity or the quality of your milk?

Foods:

Liquids:

19. List any foods or liquids that you avoid because you are breastfeeding.

Foods:

Liquids:

20. If you plan to go to work or school [or did so while breastfeeding] what will your baby be fed [or was fed] for the first three months you are [were] away from home?

21. Have you had any problems with breastfeeding? EXPLAIN.

22. When you stopped breastfeeding (if you have stopped), what is the most important reason you stopped?

23. If you chose to bottle feed, why did you choose bottle feeding?

**Section C Please answer questions as indicated.**

23. Do you have any children who were born in Kenya and who lived in Kenya at least four months?

\_\_\_yes

\_\_\_no (Skip to Section D, Question 33.)

Birth date/s of child/children born in Kenya: \_\_\_\_\_  
month year month year month year month year

24. What did you **first** feed your baby/babies (born in Kenya and who lived in Kenya at least four months)?

\_\_\_Breast milk only

\_\_\_Combination breast milk and other (explain) \_\_\_\_\_

\_\_\_Formula only

\_\_\_Soy milk

\_\_\_Other (explain) \_\_\_\_\_

25. Does the child/children take vitamin-mineral supplements? **Check ALL that apply.**

\_\_\_infant multi vitamin/mineral

\_\_\_child multi vitamin/mineral

\_\_\_adult multi vitamin/mineral

\_\_\_vitamin C

\_\_\_iron

\_\_\_other (explain)

If vitamins/minerals were used, what was the child's age when they were introduced? \_\_\_\_\_

Were the vitamins/minerals prescribed? \_\_\_yes \_\_\_no



26. What does your child/children drink [or has your child drunk]?

| <u>Beverage</u>                       |             | <u>Age when introduced</u> |
|---------------------------------------|-------------|----------------------------|
| formula                               | ___yes___no | ___days___weeks___months   |
| sugar water                           | ___yes___no | ___days___weeks___months   |
| honey & water                         | ___yes___no | ___days___weeks___months   |
| Kool aid or "Fruit Drink" like "Hi-C" | ___yes___no | ___days___weeks___months   |
| soda pop                              | ___yes___no | ___days___weeks___months   |
| fruit juice (real juice)              | ___yes___no | ___days___weeks___months   |
| water                                 | ___yes___no | ___days___weeks___months   |
| whole milk                            | ___yes___no | ___days___weeks___months   |
| lowfat milk                           | ___yes___no | ___days___weeks___months   |
| tea with milk                         | ___yes___no | ___days___weeks___months   |
| cocoa                                 | ___yes___no | ___days___weeks___months   |
| other _____                           | ___yes___no | ___days___weeks___months   |

27. Does the child drink from a cup? \_\_\_yes\_\_\_no At what age did the child begin drinking from a cup? \_\_\_months

28. Does the child eat "solid" foods (cereal, fruit, vegetables, etc.)? \_\_\_yes\_\_\_no

29. If the child eats solid food, indicate **ALL** types eaten

\_\_\_infant strained/junior foods \_\_\_infant cereal in jar or box \_\_\_homemade mashed/blended foods \_\_\_table foods

30. List the first kinds of solid foods you gave your child/children (cereal, vegetables, fruit, meat, others) and infant age at introduction. Foods Infant age when introduced

31. Please list any foods your child/children should not eat for medical, religious, or personal reasons.

Foods Reason not eaten (specify medical and/or religious and/or personal)

32. Does the child/children have frequent problems with (Check **ALL** that apply.)

\_\_\_sore throat and/or ear infections \_\_\_stomach pain, vomiting \_\_\_diarrhea

If the child has diarrhea, how many times per month? \_\_\_

If the child starts to have diarrhea, what do you do for him or her?

Section D **Please answer questions as indicated.**

33. Do you have a child/children born and reared in the United States?

\_\_\_yes \_\_\_no (You have completed the questionnaire. THANK YOU!)

Birth date/s of child/children born in United States: \_\_\_\_\_  
month year month year month year month year

34. What did you **first** feed your baby/babies (born and reared in the United States)?

- ☐ Breast milk only  
☐ Combination breast milk and other (explain) \_\_\_\_\_  
☐ Formula only  
☐ Soy milk  
☐ Other (explain) \_\_\_\_\_

35. Does the child/children take vitamin-mineral supplements? **Check ALL that apply.**

- ☐ infant multi vitamin/mineral    ☐ child multi vitamin/mineral    ☐ adult multi vitamin/mineral  
☐ vitamin C    ☐ iron    ☐ other (explain) \_\_\_\_\_

If vitamins/minerals were used, what was the child's age when they were introduced? \_\_\_\_\_

Were the vitamins/minerals prescribed? ☐ yes ☐ no

36. What does your child/children drink (or has your child drunk)?

| <u>Beverage</u>                       |  | <u>Age when introduced</u>   |
|---------------------------------------|--|--|
| formula                               | <input type="checkbox"/> yes <input type="checkbox"/> no | <input type="checkbox"/> days <input type="checkbox"/> weeks <input type="checkbox"/> months |
| sugar water                           | <input type="checkbox"/> yes <input type="checkbox"/> no | <input type="checkbox"/> days <input type="checkbox"/> weeks <input type="checkbox"/> months |
| honey & water                         | <input type="checkbox"/> yes <input type="checkbox"/> no | <input type="checkbox"/> days <input type="checkbox"/> weeks <input type="checkbox"/> months |
| Kool aid or "Fruit Drink" like "Hi-C" | <input type="checkbox"/> yes <input type="checkbox"/> no | <input type="checkbox"/> days <input type="checkbox"/> weeks <input type="checkbox"/> months |
| soda pop                              | <input type="checkbox"/> yes <input type="checkbox"/> no | <input type="checkbox"/> days <input type="checkbox"/> weeks <input type="checkbox"/> months |
| fruit juice (real juice)              | <input type="checkbox"/> yes <input type="checkbox"/> no | <input type="checkbox"/> days <input type="checkbox"/> weeks <input type="checkbox"/> months |
| water                                 | <input type="checkbox"/> yes <input type="checkbox"/> no | <input type="checkbox"/> days <input type="checkbox"/> weeks <input type="checkbox"/> months |
| whole milk                            | <input type="checkbox"/> yes <input type="checkbox"/> no | <input type="checkbox"/> days <input type="checkbox"/> weeks <input type="checkbox"/> months |
| lowfat milk                           | <input type="checkbox"/> yes <input type="checkbox"/> no | <input type="checkbox"/> days <input type="checkbox"/> weeks <input type="checkbox"/> months |
| tea with milk                         | <input type="checkbox"/> yes <input type="checkbox"/> no | <input type="checkbox"/> days <input type="checkbox"/> weeks <input type="checkbox"/> months |
| cocoa                                 | <input type="checkbox"/> yes <input type="checkbox"/> no | <input type="checkbox"/> days <input type="checkbox"/> weeks <input type="checkbox"/> months |
| other _____                           | <input type="checkbox"/> yes <input type="checkbox"/> no | <input type="checkbox"/> days <input type="checkbox"/> weeks <input type="checkbox"/> months |

37. Does the child drink from a cup? ☐ yes ☐ no    At what age did child begin drinking from a cup? \_\_\_\_\_ months

38. Does the child eat "solid" foods (cereal, fruit, vegetables, etc.)? ☐ yes ☐ no

39. If the child eats solid food, indicate **ALL** types eaten

☐ infant strained/junior foods    ☐ infant cereal in jar or box    ☐ homemade mashed/blended foods    ☐ table foods

40. List the first kinds of solid foods you gave your child/children (cereal, vegetables, fruit, meat, others) and infant age at introduction.

| <u>Foods</u> | <u>Infant age when introduced</u> |
|--------------|-----------------------------------|
|--------------|-----------------------------------|

41. Please list any foods your child/children should not eat for medical, religious, or personal reasons.

| <u>Foods</u> | <u>Reason not eaten</u> (medical and/or religious and/or personal) |
|--------------|--|
|--------------|--|

42. Does the child/children have frequent problems with (**Check ALL that apply.**) ☐ sore throat and/or ear infections

☐ stomach pain, vomiting    ☐ diarrhea    If the child has diarrhea, how many times per month? \_\_\_\_\_

If the child starts to have diarrhea, what do you do for him or her?

**THANK YOU FOR YOUR HELP!!**



EASTERN ILLINOIS UNIVERSITY  
CHARLESTON, ILLINOIS 61920

College of Applied Sciences  
School of Home Economics  
(217) 581-6076

February 3, 1992

Dear Kenyan Mother,

I probably met you in person or talked with you over the phone recently. My name is Mary Murimi. I am a Kenyan graduate student at Eastern Illinois University where I am majoring in Foods/Nutrition-Dietetics.

I am doing my thesis in the area of infant feeding practices and attitudes among Kenyan women. This study was prompted by a personal realization of the the dismal state of infants and children suffering malnutrition when I worked as a nutritionist in Kenya. This study is conducted in order to address this problem.

I am writing to kindly solicit your participation in this important study by responding to the enclosed questionnaire. All responses will be **confidential**. As only a small number of Kenyan women are available for this study, YOUR personal feedback will ensure the necessary native nature and usefulness of the study, especially in Kenya.

I need your response by FEBRUARY \_\_\_\_\_ in order to complete the study in time to graduate in May. The questions take an average of about 10 minutes to answer. Please use the enclosed stamped and self-addressed envelope to return the questionnaire. If you are interested in the results, please indicate that on the questionnaire.

Thank you very much for taking your time to provide important information. I look forward to receiving your feedback soon.

Sincerely,

*M. Murimi*  
Mary Murimi

## Appendix B

## TELEPHONE INTERVIEW AS A FOLLOW-UP OF THE MAILED QUESTIONNAIRE

1. How did coming to the United States affect your infant feeding practices in the following areas?
  - a. duration of breast feeding
  - b. introduction of solid foods
    - 1) age of introduction
    - 2) type of food introduced
2. Which is the most important factor that influenced your method of infant feeding?
  - a. culture
  - b. education
  - c. coming to the United States
  - d. availability of time
  - e. availability of food      Explain.
3. Did lack of support and help from the extended family affect your infant feeding method? Explain.
4. What advantages do the children born in the United States have over those born in Kenya?
5. What advantages do the children born in Kenya have over those born in the United States?

Appendix C. Frequencies and percentages of food and liquids reported to increase the quantity and quality of breast milk.

|  | Number | Percent* |
|--|--------|----------|
| <u>Foods</u>                             |        |          |
| Vegetables                               | 12     | 38       |
| Carbohydrates<br>(rice, potatoes, maize) | 11     | 34       |
| Fruits                                   | 5      | 16       |
| Fish and poultry                         | 5      | 16       |
| Meat                                     | 5      | 16       |
| Dry beans                                | 4      | 13       |
| Balanced diet                            | 4      | 13       |
| Dairy products                           | 1      | 3        |
| <u>Liquids</u>                           |        |          |
| Milk                                     | 18     | 56       |
| Fruit juice                              | 13     | 41       |
| Porridge                                 | 13     | 41       |
| Meat stock                               | 12     | 38       |
| Tea                                      | 11     | 34       |
| Water                                    | 8      | 25       |
| Milo (chocolate drink)                   | 4      | 13       |
| Cocoa                                    | 3      | 9        |
| Coffee                                   | 1      | 3        |

\*Percentages do not total 100% due to multiple responses, or no responses from some mothers.

Appendix D. Frequencies and percentages of food and beverages avoided because of breast feeding. 51

|                     | Number | Percent* |
|---------------------|--------|----------|
| <u>Foods</u>        |        |          |
| Spicy foods         | 7      | 22       |
| None                | 6      | 19       |
| Gas-producing foods | 4      | 13       |
| Fatty foods         | 4      | 13       |
| Chocolate           | 4      | 13       |
| Onions              | 2      | 6        |
| Pork                | 1      | 3        |
| <u>Beverages</u>    |        |          |
| Soda                | 12     | 38       |
| Caffeine            | 8      | 25       |
| Alcohol             | 7      | 22       |
| Coffee              | 6      | 19       |
| None                | 4      | 13       |
| Orange juice        | 1      | 3        |
| Tea                 | 1      | 3        |

\*Percentages do not total 100% due to multiple responses, or no responses from some mothers.