PREVALENCE AND DURATION OF BREAST FEEDING AND WEANING PRACTICES IN UTAH

by

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I have read the thesis of Susan Louise Kaufman Thomforde in its final form and have found that (1) its format, citations, and bibliographic style are consistent and acceptable; (2) its illustrative materials including figures, tables, and charts are in place; and (3) the final manuscript is satisfactory to the Supervisory Committee and is ready for submission to the Graduate School.

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ABSTRACT

This study analyzed the incidence of breast feeding and reasons for weaning among women in Utah. A convience sample population of 274 was obtained from women who were 3 months to 1 year postpartum.

The time of weaning was found to be significantly associated with the following reasons for weaning: breast and nipple problems (t=.760, p<.01), the physician advising a woman to stop breast feeding (t=.741, p<.01), and a baby eating a good diet and taking liquids from a cup (t=.613, p<.01). The rural sample was too small in comparison to the urban group to analyze differences between these two groups.

Supportive individuals, especially the husband or partner, were important to most women. In the majority of situations, the support person decreased the incidence of early weaning. Sociodemographic variables were also found to be associated with specific reasons for weaning. Finally, those who enjoyed breast feeding, weaned later.

The incidence of breastfeeding a youngest child within the sample was 83.9%. Only 37% were still breastfeeding after 6 months. A higher incidence of breast feeding was found among women with higher educational achievements,

within Protestant and Latter-Day Saints (LDS) religious groups and among married and divorced women. If a woman had breast fed previous children, she was more likely to have breast fed her youngest child (t=.438, p<.01).

Regressional analysis showed the best predictors of breast feeding were a woman having breast fed a previous child, accounting for 22.28%, and educational level (7.36%). The best predictors of the time of weaning were the enjoyment of breast feeding (12.07%) and the incidence of breast and nipple problems (9.33%).

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Chapter I

INTRODUCTION

Breast feeding is an ancient and natural phenomenon performed by all mammals. Humans have nursed their young for some 2 million years, providing them with nutrients teleologically designed for the infants' proper growth and maturation. It has only been in the last century that large numbers of women elected not to breastfeed and provided their infants with milk from other mammals or with vegetable milk substitutes.

Literature Review

In the United States, the trend toward bottle feeding was extensive in the 1950s. This trend was also seen in Europe and Scandinavia. Sjolin, Hofvander and Hillervik (1977) stated that in 1944 in Sweden, 56% of all infants were breast fed at 6 months, while in 1970 the rate dropped to 7%. In Third World countries, the impact of formula feeding was not felt as early. In Chile, between 1960 and 1968, the percentage in infants nursed at 13 months dropped from 95% to 10% (Jelliffe & Jelliffe, 1975).

The trend toward bottle feeding reversed in recent years in developed countries. Martinez and Nalezienski

(1979) identified the turning point as 1971 in the United States. After the early 1970s, the number of women breast feeding steadily increased, and women are continuing to nurse for longer periods of time. This is especially true in the western states (Table 1). Ross Laboratories (1979) found the highest percentage of women breast feeding in the state of Utah (Table 2).

This increase in breast feeding represents a clear reversal in the trend towards bottle feeding. There are many factors to consider when evaluating this phenomenon. Economic and social concerns, as well as physical and emotional factors, influence a mother's actions in breast feeding and weaning her baby.

Economic and Social Considerations

It is well documented that a greater percentage of women with more education breast feed their infants (DeBlieck, 1972; Sjolin et al., 1977; Hirschman & Hendershot, 1979; Bergman & Feinberg, 1981; Dalsing, 1981). It is not clear as to the reason for this difference. Other factors that have been correlated with an increased incidence of breast feeding are: 1. being in the upper social class (Sloper, McKean & Baum, 1975; Sjolin et al., 1977; Hirschman & Hendershot, 1979), 2. being a primipara or having fewer children at home (DeBlieck, 1972; Bergman & Feinberg, 1981), 3. having 4 or more children at home

Table 1

Breast Feeding in the United States in 1979 by Region

Region	Breast feeding in the hospital (%)	Change from 1978 (%)
New England	47.6	+ 5.4
South Atlantic	47.8	+ 4.4
Middle Atlantic	44.9	+ 5.4
East South Central	41.2	+ 7.4
East North Central	49.8	+ 3.4
West South Central	43.4	+ 5.9
West North Central	52.7	+ 4.7
Mountain	71.1	+ 4.7
Pacific and Alaska	65.7	+ 1.6

Table 2

Breast Feeding in the United States in 1979 by State

State	Breast feeding in the hospital (%)	Breast feeding at 5-6 months (%)	Percent change
Utah	85.4*	37.9	47.5*
Oregon	82.7	44.4	38.3
Colorado	81.4	47.6*	33.8
Alaska	80.0	44.2	35.8
Rhode Island	36.5**	19.5	17.0**
Mississippi	43.6	15.5**	28.1

Note. *=highest
**=lowest

(Bergman & Feinberg, 1981), 4. having been breast fed themselves (Sloper et al., 1975), 5. not being part of an ethnic minority (Hirschman & Hendershot, 1979), 6. increasing religiousness in a Jewish population (Bergman & Feinberg, 1981), and 7. being born in Europe but living in a Jewish population of Tel Aviv (Bergman & Feinberg, 1981).

In the World Health Organization (WHO) Collaborative Study (1975-1978) it was found in Sweden that breast feeding was positively correlated with increased education while in Guatemala it was negatively correlated with increased education (Hofvander & Petros-Barvazian, 1978). These data indicate the importance of delineating specifically the population studied when investigating the factors that are correlated with the prevalence of breast feeding.

In most countries, women with less education and lower incomes may not breast feed as often as those with more education but the present trend toward increased breast feeding is also seen in these populations. From 1971 to 1978 in the United States, Martinez and Nalezienski (1979) found that among women with incomes of less than $7,000 per year, the incidence of breast feeding at 2 months postpartum increased from 10.2% to 23.1%. There was also an increase of 17.7% in breast feeding in women with high school educations - from 9.8 to 28.5 in that same 7 year period. This represents a widening in the appeal of breast

feeding within the population of the United States.

The opinions of health care professionals have always had an influence on women. In Oxford, England, Sloper et al. (1975) found that as the attitude of the nursing staff in the hospital grew more positive towards breast feeding, the number of breast feeding women increased. Fifty percent of these women stopped nursing by 2 months postpartum, but this trend was reversed when a health visitor, district nurse or licensed midwife visited the woman at home at regular intervals.

Another example of the influence of the health professional was found in Dallas, Texas, in 1972. A significantly higher number of women breast fed if their pediatricians felt positively about that method of infant feeding (Cole, 1977). Ament (1973) found that 75% of a group given teaching and support by a student nurse midwife were breast feeding at 6 weeks postpartum, compared with 58.3% of the control group not provided that extra support. Sjolin et al. (1977) found a significantly greater number of women breast fed when attending one of two clinics studied. The researchers hypothesized that the major difference between the two clinics was the attitude of the health care personnel in regard to breast feeding.

In the 1970s, the American Academy of Pediatrics strongly promoted breast feeding as nutritionally best for an infant (American Academy of Pediatrics, 1982). This may

have had some impact on the steady increase in breast feeding in the United States during the 1970s and 1980s.

The support which a woman is given at home also has an impact on the incidence of breast feeding. DeBlieck (1972) found that more women nursed if their husbands had a positive attitude toward this method of infant feeding. Seipert (1974), in an extensive review of the literature, demonstrated the impact the husband has on the decision to breast feed. Sjolin et al. (1977) found that women who were married or were cohabiting with the child's father breast fed longer than those who were not.

A nonsupportive atmosphere can cause anxiety in a mother and inhibit her ability to breast feed. The milk ejection reflex, triggered by the infant's suckling, is inhibited by anxiety and nervousness. Oxytocin is then not released from the posterior pituitary, milk is retained in the alveoli, and is unobtainable by the infant when nursing (Newton & Newton, 1948).

Voluntary support groups have been very successful in assisting women in efforts to breast feed. La Leche League International (LLLI), which was started in 1956, grew to include 200 breast feeding support groups in the United States and 200 overseas groups by 1974 (Jelliffe & Jelliffe, 1978a). Ladas (1970) stated that women who attended LLLI preparation classes demonstrated more confidence in breast feeding techniques, and the support

from the groups was the single most important factor leading to success in breast feeding.

The economic realities associated with the decision to breast feed are important to some mothers. Breast feeding is thought to be less expensive than bottle feeding because of the relative cost of the extra 500 kcal in food for the mother versus the cost of commercial formulas. Worthington, Vermeersch and Williams (1977) made a detailed comparison of the cost of a nutritionally well balanced supplement of 500 kcal and the cost of formula in the Seattle, Washington area in 1976. They found that formula feeding cost approximately twice as much per day as did breast feeding. An analysis of this sort depends on the economic conditions of the area where the mother lives. In Third World countries formula is prohibitively expensive, and such a comparison also leads to the conclusion that it is far less expensive to breast feed (Almrothr & Greiner, 1979).

Physical Affects of Breast Feeding on the Mother

In the natural sequence of events following the birth of a child, the woman places her infant to her breast to nurse. This nipple stimulation triggers oxytocin release from the posterior pituitary. In turn, oxytocin stimulates contraction of the uterus to prevent excessive uterine bleeding and aides in a more rapid involution of the uterus

during the postpartum period. Breast feeding assists in preventing engorgement when the woman's breasts fill with milk on the second or third day postpartum.

In the western world, exogenous oxytocin and ergotrate may be administered to the mother after delivery, which obviates the need for the suckling to cause the uterus to contract. N. Newton (1971) stated that a more rapid involution of the uterus with breast feeding has not been substantiated if exogenous oxytocins are administered after delivery. Large doses of estrogens have in the past been given as milk suppressants to decrease breast engorgement, but recently this practice has declined due to the increased incidence of thromboemboli in these women (Niebyl, Bell, Schaaf, Blake, Dubin & King, 1979). Bromocriptine, a prolactin inhibitor, is now being used by some health professionals as a milk suppressant (Hutchinson & Hall, 1981).

The relationship between lactation and subsequent breast cancer is controversial. It was originally thought that the incidence of breast cancer was 5 times greater in women who had not breast fed for 4 to 6 months (Schaefer, 1969). A large international WHO study of 1970 found little if any effect of breast feeding on the incidence of breast cancer (Miller & Bulbrook, 1981). The latter view is now the most prevalent among health care providers.

Another aspect of the influence of breast feeding on

maternal physiology is its contraceptive effect. This effect is evident within the context of populations rather than on an individual basis, but there is a clear relationship between extended breast feeding and delayed ovulation (Van Ginneken, 1975; Howie & McNeilly, 1982). Howie and McNeilly (1982), in Edinburgh, Scotland, found that mothers who suppressed ovulation for more than 40 weeks maintained breast feeding for the greatest number of weeks, and breast fed more frequently for a longer total time. They also continued with one or more night feedings for a longer period of time than those who ovulated earlier.

Physical Effects of Breast Feeding on the Infant

In the last decade, extensive study and information have been generated concerning the specific constituents of human milk and their effect on the infant. These influences include the following: the differences in composition of formula and human milk, immunologic protection for the baby from human milk, its protection against allergies, protection against obesity, protection of premature infants against necrotizing enterocolitis, protection against hypocalcemia, recurrent otitis media, neonatal convulsions, worsening of neonatal hypothyroidism, protection against acrodermititis enteropathica, iron deficiencies, hyperosmolarity, enamel hypoplasia of the

teeth, hypernatremia, and inadequate vitamin intake (Evans & Glass, 1979; Waletzky, 1979; Ross, 1981; Saarinen, 1982). Each of these claims has controversial elements.

The presence of immunoglobulins, especially immunoglobulin A (IgA) in breast milk has been well established. IgA is found in the greatest quantities in colostrum, but is present in mature human milk. Bifundus factor is also found in the intestine of breast fed infants and promotes the development of Lactobacillus bifundus, a gram positive anaerobic bacteria which produces large amounts of acetic and lactic acid. These acids discourage the growth of E. coli and other more pathogenic bacteria which are the main floral constituents in the intestine of a bottle fed baby (Harris & Highland, 1977). IgA and bifundus factor are important in guarding an infant against infection, protecting the premature infant from necrotizing enterocolitis, and defending the infant raised in unsanitary conditions against gastroenteritis.

Early bottle feeding has been strongly associated with recurrent otitis media, in contrast to prolonged breast feeding (Saarinen, 1982). Long term breast feeding was found to have a protective effect up to 3 years of age. The etiology of this protection is not well understood and is conjectured to be associated with either the protection afforded by breast milk against infection or allergy, or the avoidance of the harmful effects caused by cow's milk.

Some infants develop allergic reactions to cow's milk formulas. In predisposed children, the gastrointestinal tract is not sufficiently mature to guard against the absorption of foreign proteins. Wheezing, vomiting, transient rashes and eczema are manifestations of the allergic reaction to cow's milk. Breast feeding has been found to decrease the incidence of these reactions in predisposed infants (Ross, 1981; Gerrard, 1982). Hyperosmolarity and hypernatremia are more often seen in formula fed children because the formula may be too concentrated, causing hyperosmolarity. Additional salt is sometimes added to baby foods and given to formula fed children at an early age and may contribute to hypernatremia (Ross, 1981).

Investigating the comparative morbidity of breast and bottle fed infants, Sauls (1979) pointed out that this area is very difficult to research because of many confounding variables. These variables include self-selection of bottle and breast feeding mothers, demographic, socioeconomic, educational, ethnic, cultural, psychological, and maternal and infant physiologic and emotional health variables. He stated that caution should be used in evaluating data related to this issue.

An apparently increased incidence of obesity in infants fed formula is also controversial. Crow, Fawcett and Wright (1980) stated that bottle fed infants have less

control over the amount they ingest. Mothers may give them the 'rest of the bottle', causing increased weight gain in infancy, and predisposing them to obesity in later life. This was supported by Shukla, Forsyth, Anderson and Marwah (1972) but refuted by Wilkinson and Davies (1978) and Saarinen and Siimes (1979). The latter two groups found no difference in weight and skin fold measurements in bottle and breast fed infants at 6 months of age. Hofvander, Hagman, Hillervik and Sjolin (1982) found that the amount of milk consumed by 1 to 3 month old breast and bottle fed infants was very similar. They concluded that infants themselves largely regulate the intake they require.

An interesting aspect of this controversy is a proposed appetite control mechanism associated with breast feeding. Hall (1975) proposed that the fluctuation in the lipid and protein content of human milk during a session of breast feeding may act to curb the appetite of a baby as it nurses. More data are needed to substantiate this theory.

Finally, the composition of human milk varies from that of formula. Calorically, they are very similar, but differ in protein and lipids. Human milk contains a higher concentration of cholesterol than formula, the protein in human milk is absorbed more easily and the amino acid profile differs from that of formula. Human milk contains many substances specific to humans and their newborn infants such as certain enzymes, coenzymes, hormones, trace

elements and cells (Waletzky, 1979; Evans & Glass, 1979).

Unsanitary conditions place a great burden on bottle fed infants and greatly predispose the infant to gastroenteritis. The pheonomenon of large numbers of bottle fed infants in Third World countries developing gastroenteritis and diarrhea, leading to subsequent kwashiorkor and marasmus, has been highly publicized in the last 10 years. The controversy over which is better for infants, bottle or breast, may be a lethal question in areas where contaminated water is used to mix formulas. Breast feeding should definitely be encouraged in these areas (Jelliffe & Jelliffe, 1975).

Evans and Glass (1979) suggested a few physical disadvantages of breast feeding to the infant. They are the following: slow growth rate of very small premature infants, the transmission of environmental pollutants found in mother's milk, including oral contraceptives, nicotine, dichloro-diphenyltrichloroethane (DDT) and polychorinated bi-phyenyl (PCB), and the rare case of true breast milk jaundice.

When environmental pollutants are suspected in breast milk, the milk should be tested and breast feeding ceased if pollutant levels are dangerous to the infant (Harris and Highland, 1977). In the case of breast milk jaundice, breast feeding should be discontinued for 48 to 72 hours in order for the bilirubin level to drop sharply and a

diagnosis established. Resumption of breast feeding should then take place since the infant will no longer be greatly effected by the high levels of pregnanediol in the maternal milk (Korones, 1981).

Emotional Impact of Breast Feeding on the Mother

Literature concerning the emotional effects of breast feeding on the mother is limited, but most of what is available is concentrated on the positive aspects involved. It is the opinion of Waletzky (1979), a noted scholar in the area of breast feeding, that most breast feeding women describe nursing as a pleasurable experience. There is a sense of extreme closeness to the infant because of the close contact and nipple stimulation. A sense of peace and contentment is often described by nursing mothers.

The delay in renewed ovulation and menstruation because of breast feeding can be of benefit to many women, especially those who usually have significant mood swings and premenstrual tension with the menstrual cycle, or those who are anemic (Waletzky, 1979).

There is also a sensual gratification gained by the mother from breast feeding. Newton and Newton (1967) found that women experienced nipple erection, vascular changes in the skin, uterine contractions, raising of the body temperature and orgasm while breast feeding.

Each of these positive factors that influence the

experience of a breast feeding woman tends to make infant feeding a more positive experience. Klaus and Kennel (1976) viewed these as being powerful influences in promoting maternal-infant attachment. They found that women who had an increase in the physical contact with their infants soon after birth showed more attachment behaviors at 1 month and 1 year. Swedish research also demonstrated that an extra 15 minutes of skin to skin contact after the birth made a significant difference in attachment behavior at 3 months (Klaus & Kennel, 1976).

These studies are controversial but they may demonstrate that increased contact with an infant will promote maternal-infant bonding and good mothering habits. Breast feeding promotes increased skin to skin contact by the very nature of the act. An infant is fed more frequently when breast feeding than bottle feeding, every 2 to 3 hours rather than every 4 to 5, and in this fashion has more extended contact with her or his mother. The contact is also physically closer in breast feeding, although women who bottle feed can also achieve skin to skin contact while feeding if they wish.

A few psychological disadvantages of breast feeding for the mother were noted by Waletsky (1979). Women may not like the added size and weight of the breasts associated with lactation. They reported guilt feelings because of the sexual arousal they were experiencing. Some

reported disinterest in sexual intercourse, which lead to marital tension. Also, some women stated that they did not necessarily enjoy the dependence of the infant on them every few hours over a long period of time. These are all important issues when assessing a woman's breast feeding experience.

Emotional Impact of Breast Feeding on the Infant

Montagu (1971) described breast feeding as the first socializing experience of the child. He theorized that it may establish the foundation for the development of all human social relationships. Communication is made with the mother through skin contact associated with breast feeding and makes the eating experience more pleasant for the infant. Also, the nipple is softer than an artifical plastic nipple and more readily fits the infant's mouth. The milk is always the right temperature and immediately available (Waletzky, 1979).

Many researchers have compared bottle and breast fed infants later in life. Hughes and Hawkins (1975) used the Institute for Personality and Ability Testing (IPAT) anxiety scale and Eysenck Personality Inventory (EPI) neuroticism test to study female students with a mean age of 19. They found significantly higher scores in the completely bottle fed group compared with those who had been breast fed for varying lengths of time. Kennell and

Bergen (1966) reported that abrupt and impulsive weaning led to babies who were particularily likely to feel oppressed. Maslow and Szilagyi-Kessler (1946) found the lowest security scores with those students who had been nursed for 6 to 9 months, while the most secure were those breast fed for more than 1 year, 3 months or less, or not at all.

N. Newton (1971) cited other research contending that breast fed babies manifest a greater sucking response at 4 days old, a greater activity level at 3 and 4 days, more advanced walking behavior at 1 year and higher scores on the Stanford achievement test, Pintner Patterson performance scale and the revised Binet-Simon intelligence test in school children who had been breast fed.

The evidence given above for the increase in security, activity level and IQ in breast fed babies may easily by confounded by other variables and may not solely be caused by breast feeding. This is echoed by Newton, who stated that no groups of breast and bottle feeding women are likely to be equal in other aspects of their lives. This is because infant feeding involves a large amount of personal choice, which is related to attitudinal and personality factors. For this reason the correlation of breast feeding with any specific psychosocial measurement may not be judged in relation to cause and effect but only as the result of differences in the uncontrolled

covariables (N. Newton, 1971).

Weaning Practices

For thousands of years, weaning has taken place between the ages of 2 and 3. At the present time, there is no consensus as to a recommended time that a mother wean her infant. The American Academy of Pediatrics recommends breast feeding for at least 6 months in order to obtain the greatest nutritional value of breast milk for the baby, but provides no recommendation for the exact time of weaning. Ross (1981) advised that weaning should take place between the ages of 4 to 6 months, or 6 to 8 months since this seems easier on the infant.

Waletzky (1979) contended that one should not wean when the child is between 2 and 3 years old since the child is already stressed at that time. It is better to wean later, between 3 and 3 1/2 when separation anxiety is receeding. Pryor (1973) stated no specific recommendation for the time of weaning, but advised that it is important that one or the other in the breast feeding couple is ready to stop before weaning takes place.

Hood, Faed, Silva and Buckfield (1978) found that infants who initiated weaning, weaned between 37 and 51 weeks of age. Waletzky (1979) distinguished between regulated breast feeding, where a schedule is imposed and there is an early introduction of solids, and unrestricted breast feeding. In regulated breast feeding, the infant

usually self weans between 6 and 9 months, while in unrestricted breast feeding this does not occur until 18 months to 3 1/2 years.

During the last century, a pattern of early weaning has followed the increase in bottle feeding. Evidence was given previously concerning early weaning in Chile, and Wilkinson and Davies (1978) stated that in England between the years 1976 and 1978 the mean age for weaning was 14 weeks. In Israel, Bergman and Feinberg (1981) found the mean months for breast feeding was 2.03. Hirschman and Hendershot (1979) stated that less than 10% of breast feeding women were still nursing by 3 months in the United States. They found 20% of those with college degrees and/or upper socioeconomic status were breast feeding at 3 months.

The recent increase in the incidence of breast feeding in the United States has been followed by an increase in the duration of breast feeding (Table 3). This increase was found to cut across all levels of income and education (Martinez & Dodd, 1983).

Reasons for Weaning

Women give diverse reasons for weaning. In a study in Boston, the three most frequent reasons given for weaning were that they did not have enough milk, they were always tired, or their pediatricians told them to stop (Cole, 1977). Wilkinson and Davies (1978), in England, found the

Table 3

Breast Feeding in the United States

Breast feeding	1971(%)	1981(%)
in the hospital	24.7	57.6
at 2 months	13.9	44.2
at 3 to 4 months	8.2	35.2
at 5 to 6 months	5.5	26.8
at 8 months	-	18.3
at 10 months	-	12.6
at 12 months	-	9.0

primary reason given was that the baby was hungry and not satisfied with breast milk. Another English study outlined a close association between weaning before 6 months and a delay of 2 hours or more in the first suckling or an instrumental delivery (Whichelow, 1982).

The three most common reasons given for weaning in Sweden (Sjolin et al., 1977) were the woman was anxious about the child, anxious for other reasons, or lacked the motivation to continue. Stress and mental tiredness were also significant reasons. Bergman and Feinberg (1981) found similar reasons in Tel Aviv. The three most frequent reasons they gave for weaning were maternal problems of stress, tiredness and feeding problems of the baby crying excessively.

Other factors which might lead a woman to wean her baby from breast milk were discussed by Waletzky (1979). The woman may have pressure from friends, relatives or her health professional to stop. Her baby might seem too old to be still nursing or the woman might be bored with nursing. She might be tired of having large breasts or wearing nursing clothes, or might have other things she wants to do which are interfered with by nursing. If the woman develops anger and resentment against the child because of breast feeding, Waletzky strongly advocated weaning.

Many factors which are associated with the choice to

breast feed are also important in determining the length of time a woman nurses. Many of these are social and economic reasons, such as level of education, religiousness, economic necessity, and rural versus urban populations. Martinez and Dodd (1983) found an association between maternal employment and early weaning. It is also very important to be specific as to the locations to which findings are generalized. The WHO Collaborative study of breast feeding (1975 to 1978) found in Chile, Ethiopia, Hungary, India, Nigeria, the Philippines, and Zaire, the traditional rural women breast fed the longest when compared to the urban elite and urban poor. Sweden, the only western country included in the study, showed a reversal of the phenomenon. In Sweden the urban women weaned latest (Hofvander & Petros-Barvazian, 1978).

There is also a correlation between early introduction of formula and solids, and early weaning (Cole, 1977; Dalsing, 1981). The sooner formula and solids are introduced, the sooner a woman will stop nursing completely.

Sousa (1975) outlined four vulnerable periods when cessation of breast feeding in Argentina is common. The first vulnerable period is during the initial postpartum minutes. If immediate nursing does not take place, there is a tendency towards less successful breast feeding. The second period of increased vulnerability is the

posthospitalization period. Changes in patterns of communication are occurring between the mother and father of the new infant as they acquire their new roles. The third vulnerable period occurrs approximately 6 weeks postpartum. Sousa speculated that this often coincides with the first sexual intercourse after childbirth, and the increase in anxiety in the mother and decrease in milk flow may be associated with changes in the maternal-infant relationship. The final time at which there is an increased incidence of weaning is the first menstrual period. This may be psychologically difficult for the woman since she is linking her maternal and reproductive roles.

In the present study the prevalence of breast feeding in four counties in Utah was evaluated and the reasons for weaning given by Utah women addressed.

Problem Statement

The purpose of this research was to investigate the incidence and duration of breast feeding in Utah, and the major reasons for weaning.

Research Questions

1. At what age are infants weaned, and what is the relationship between time of weaning and specific reasons given for weaning?

2. What is the relationship between the time of and reason for weaning among rural versus urban populations?

3. What is the relationship between the reason for weaning and a woman's emotional support system?

4. What is the relationship between selected demographic variables and reasons for weaning?

CHAPTER II

METHODOLOGY

Design

Infant feeding and weaning practices were retrospectively surveyed. A questionnaire was administered to each woman who qualified and consented.

Subjects

The convenience sample consisted of women who attended immunization clinics and well child conferences in Summit and Salt Lake counties, Southeast and Central Districts, and Women-Infant-Children (WIC) clinic in Salt Lake City. Data were collected between September 29, 1983 and February 20, 1984. The women were between 3 months and 1 year postpartum and had a living child from that pregnancy.

Instrumentation

The data collection instrument was a questionnaire designed by the researcher for this survey, utilizing the literature review. The instrument was administered to six women from the Salt Lake County system at 6 months postpartum to assess the questionnaire's reliability.

Procedure

An educational program was provided to public health nurse supervisors in Summit and Salt Lake counties and in Southeast and Central districts, and to the supervisor of the WIC clinic in Salt Lake City. This was completed prior to the start of data collection. These nurses were instructed about the purpose of the research and the method of distribution of the questionnaire. A copy of the instructions was provided to them, along with an abstract of the study, questionnaires, optical scanner answer sheets and pencils.

Questionnaires were then distributed by the public health nurses to all women who qualified and consented verbally. The researcher also distributed questionnaires to qualifying subjects in Salt Lake County.

Definitions

The key variables defined for this study were breast feeding and weaning. Breast feeding is defined by Webster's Third New International Dictionary (1966) in the following manner: "to feed (a baby) from a mother's breast rather than from a bottle: to suckle" (p. 273). Operationally, a breast feeding woman was defined as one who had breast fed her baby at least once.

Ross (1981) provided an insightful description of the word weaning: "the time when a food other than milk is

successfully introduced into the diet and the milk is being replaced by other foods" (p. 9). This definition includes weaning the infant from formula to solid foods. For this study, a more stringent definition of weaning was used, to include only weaning from breast milk to formula or solid foods. Tabor's Cyclopedic Medical Dictionary (1977) includes this element: "to accustom an infant to discontinuation of breast milk by substitution of other nourishment" (p. W-4). In this research, weaning was defined operationally as the last time breast feeding occured.

Limitations

The following limitations were recognized:

1. The sample data were obtained only 5 months out of the year. The effects of seasonal variations therefore cannot be adequately evaluated.

2. Data were collected when women were between 3 months and 1 year postpartum. The time lag between the time of weaning and the data collection could induce memory lapses.

3. The questionnaire did not have well established validity and reliability.

4. The questionnaire was relatively long considering the short length of time spent by the average person in an immunization clinic where most of the data were collected.

5. The use of optical scanning answer sheets could

have been a deterant for prospective subjects and/or the public health nurses in distributing the questionnaire.

6. In using a questionnaire, there was a possibility that only those women interested in infant feeding consented to complete it.

7. The questionnaire was only provided in English and only one data collection location had interpreters (WIC). This could bias the sample population away from non-English speaking persons.

8. Data evaluation of rural versus urban populations was not optimal owing to the much larger sample in the urban population. The public health nurses were unable to collect as much data as was expected due to busy schedules. This resulted in the researcher collecting most of the data in urban Salt Lake City.

Assumptions

1. Each subject answered the questions truthfully, and to the best of her knowledge.

2. Women answered only one questionnaire.

3. During the collection period of 5 months, the subjects were a representative sample of those women attending the aforementioned clinics all year round.

Human Subjects Considerations

1. Participation in this survey was voluntary. Implied consent was obtained if a woman accepted the

questionnaire.

2. This was a noninvasive study. No intervention was implemented and participation in the investigation had no bearing on the individual's care.

3. All data obtained remained anonymous.

4. Efforts were made not to imply that breast feeding is optimal thereby engendering guilt among women who did not breast feed or had already weaned.

5. Data collected will be used in developing educational programs for breast feeding women and their support persons. This could include family, friends, the community in general, and health care personnel, thereby providing an indirect benefit to the general population of breast feeding women.

Analysis of Data

A chi-square analysis was performed to determine relationships between breast feeding, sociodemographic data, support factors, time of weaning, and time when supplements were added to a breast feeding diet. Significant relationships were assessed by means of a Kendall's tau procedure to determine the strength of the relationships. Kendall's tau (t) is similar and comparable to a Spearman rho statistic, but used when evaluating nonparametic data. Finally, a stepwise regression analysis was performed for key variables to

determine the most important predictors of breast feeding and the time of weaning.

CHAPTER III

RESULTS AND DISCUSSION

Description of the Sample

During the 5 months of data collection, 274 questionnaires were completed. Demographic data for the sample are compiled in Tables 4 and 5. The majority of subjects were between the ages of 20 and 30, and had completed some college or had higher educational achievements (57.6%). Most women were white, married, and considered themselves a member of the Church of Jesus Christ of Latter-Day Saints. The largest number of women had incomes of between $10,000 and $15,000, with approximately 20% below $5,000 and above $20,000. The majority of women had 1 or 2 children at home, with the largest number having a baby between 5 and 6 months old. Most of the data were collected in the Salt Lake City area at WIC and immunization clinics. Twenty percent were collected in the rural Utah areas of Summit county, and Central and Southeast districts.

Breast feeding statistics are presented in Table 6. A large majority of women in the sample breast fed their infants. At the time of the investigation, approximately

Table 4

Demographic Data

Group	Total Number	Percentage
Age		
19 or younger	20	7.3
20 to 24	98	35.8
25 to 29	92	33.6
30 to 40	60	21.9
41 or older	4	1.4
	274	100.0
Education		
Did not complete high school	46	16.8
Completed high school	70	25.6
Attended some college	99	36.1
Completed college or technical school	54	19.7
Competed graduate school	5	1.8
	274	100.0
Race or ethnic background		
Native American Indian	2	.7
Black	1	.4
White	252	93.3
Mexican-American or Hispanic	14	5.2
Southeast Asian	1	.4
	270	100.0
Religion		
Catholic	23	8.6
LDS	209	78.6
Protestant	10	3.7
Jewish	2	.8
Other	22	8.3
	266	100.0

Table 5

Additional Demographic Data

Group	Total Number	Percentage
Present marital status		
Single	23	8.4
Married	222	81.3
Separated	9	3.3
Divorced	17	6.2
Widowed	2	.8
	273	100.0
Average income during the past 12 months		
Below $5,000	52	19.7
$5,000 to $10,000	49	18.6
$10,000 to $15,000	74	28.0
$15,000 to $20,000	42	15.9
over $20,000	47	17.8
	264	100.0
Number of children at home		
1	79	28.8
2	81	29.6
3	49	17.9
4	41	14.9
5 or more	24	8.8
	274	100.0
Age of youngest child		
3 to 4 months old	74	27.7
5 to 6 months old	86	32.2
7 to 8 months old	66	24.7
over 8 months old	41	15.4
	267	100.0
Site of data collected		
Urban	219	79.9
Rural	55	20.1
	274	100.0

Table 6

Breast Feeding Statistics

Group	Total Number	Percentage
Breast fed the youngest child		
yes	229	83.9
no	44	16.1
total	273	100.0
Breast fed older children		
yes	162	80.6
no	39	19.4
total	201	100.0
Decision to breast feed made before baby's birth		
yes	218	94.0
no	9	3.9
uncertain	5	2.1
total	232	100.0
Still breast feeding at time of study		
yes	122	52.8
no	109	47.2
total	231	100.0
When mothers stopped breast feeding		
1 to 2 wks	10	8.7
3 to 4 wks	26	22.6
5 wks to 3 mos	38	33.0
4 to 6 mos	28	24.4
over 6 mos	13	11.3
total	115	100.0
Of those mothers still breast feeding, Ages of children		
3 to 4 mos	47	39.1
5 to 6 mos	41	34.2
7 to 8 mos	24	20.0
over 8 mos	8	6.7
total	120	100.0

50% were still breast feeding. Of those with older children at home, 80.6% had breast fed at least one of those children. Most women who did breast feed, decided to do so before their infant was born. The greatest number of women who had breast fed and had already weaned the child, did so between 5 weeks and 3 months of age. Of those women who were still breast feeding their infants, only 26.7% were 7 months old or older.

Research Questions, Relevant Data, and Interpretation

The first research question was: At what age are infants weaned and is there a relationship between time of weaning and specific reasons given for weaning?

The specific age groups in which sampled infants were weaned in shown in Table 6. The largest percentage of infants were weaned between 5 weeks and 3 months (33.0%). Approximately the same percentage were weaned between 3 and 4 weeks, and between 4 and 6 months, leaving 11.3% weaned after 6 months of age. This figure can be added to the 26.7% who were still being breast fed after 6 months at the time the questionnaire was completed. This results in 37.0% of the sample's infants being breast fed after 6 months. Unfortunately this figure cannot be strictly compared to that of Ross Laboratories (1979) since the latter presented data for those women still breast feeding at 5 to 6 months postpartum. They found that 37.9% of

women in Utah were still breast feeding at that time, a percentage very similar to this finding. Dalsing (1981) found 25.5% of women breast feeding in a rural area of Utah after 6 months.

The questionnaire included 10 possible reasons for weaning an infant and 5 possible reasons for starting formula, juice or cereal on a regular basis (Appendix B). These two questions are very closely related, since when formula, juice or cereal is started on a regular basis, breast stimulation and breast milk production will soon decline. Mothers were asked to choose as many of these reasons as they felt applied to the way they handled their infants. Each of these reasons was compared to the time of weaning in a chi-square analysis.

Five items were found to be significantly related to the time of weaning (Table 7). Breast and nipple problems were seen in the first two weaning times in greater numbers than expected if a normal distribution is assumed. These problems were found less often than expected in the later three time periods. These data are important for health professionals to consider when counseling breast feeding women during the early part of the breast feeding experience. Breast and nipple problems are seen mostly in this time, and are a cause of infants being weaned, even though they are preventable and treatable problems.

There is a signficant relationship between weaning

Table 7

Time of Weaning Versus Reason for Weaning

Group - subjects responding yes	Weaning Times 1-2wks	3-4wks	5wks-3mos	4-6mos	>6mos
Reasons for weaning					
Breast or nipple problems					
Total Number	3 >	7 >	3 <	3 <	0 <
Percentage +	2.9	6.7	2.9	2.9	0
		chi-square 17.9**		t=.760	
Baby eating a good diet and taking liquids from a cup					
Total Number	0 <	0 <	0 <	2 >	3 >
Percentage +	0	0	0	1.9	2.9
		chi-square 14.4**		t=.613	
My doctor advised me to stop breastfeeding					
Total Number	3 >	5 >	3 <	1 <	1 <
Percentage +	2.9	4.8	2.9	1.0	1.0
		chi-square 18.2**		t=.741	
Reasons for starting formula, cereal or juice on a regular basis					
My baby was old enough to have more					
Total Number	2	10 <	12 <	14 >	10 >
Percentage +	4.2	20.8	25.0	29.2	20.8
		chi-square 9.8*		t=.761	
My doctor or nurse said I should					
Total Number	4 >	7	10	7	2 <
Percentage +	13.3	23.3	33.3	23.3	6.7
		chi-square 10.9*		t=.788	

Note. * $p<.05$
** $p<.01$
+ percentage of women who weaned
< fewer than expected
> more than expected

because a baby is eating a good diet and taking liquids from a cup, and the time of weaning. This is more likely to happen when an infant is greater than 4 months old, as opposed to younger infants.

The reason 'my doctor advised me to stop breast feeding' was given by women during the first 4 weeks of breast feeding in greater numbers than expected. This reason was given less often than expected in the later three time periods. The strong influence of the physician is seen here, and supports the findings of previous studies (Cole, 1977). Also, these data indicate that either physicians advise mothers to stop breast feeding more often during the early weeks of breast feeding, or that women take their advice more often during that time period.

In evaluating significant reasons for starting formula, cereal or juice on a regular basis, the reasons are very similar to those found significantly associated with reasons for weaning. The reason 'my baby was old enough to have more' was positively correlated with weaning after 4 months, and the reason 'my doctor or nurse said I should' was found more often than expected during the 1 to 2 week time period. It was found less in the over 6 month old group. Between 3 weeks and 6 months, the number of responses approximately equalled that expected with a random distribution.

The second research question was: What is the

relationship between time of and reason for weaning among rural versus urban populations?

The sample obtained was 79.9% from an urban area and 20.1% from rural areas. Considering this large discrepancy, the sampling error when evaluating differences between groups is very great. For this reason, differences found can not carry much weight, even if found to be statistically significant.

The urban and rural populations were first compared to evaluate any significant differences in the demographics of the populations. Only one difference was found. The age of a mother's youngest child at the time of the data collection was found to be significantly higher in the rural population (chi-square = 20.93, $\underline{t}$ = .547, $\underline{p} < .001$). The rural sample contained a larger number of infants over 8 months of age as compared to the urban sample. This difference is conjectured to be a result of the data collection method rather than the mean ages of infants in the rural areas. Public health nurses collected all the data in the rural areas, while the researcher collected most of the data in the urban area.

No difference was found between the time of weaning in rural and urban areas. Two reasons for weaning which were statistically significant between the two groups were that the baby was eating well and taking liquids from a cup, and secondly, that the baby was ready to stop (Table 8). More

Table 8

Urban and Rural Samples as Compared to Reasons for Weaning

Reason - subjects responding yes	Urban Total Number	Urban Percentage+	Rural Total Number	Rural Percentage+
Baby was ready to stop	8 <	7.4	7 >	6.8
	chi-square = 4.5*		t=.531	
Baby was eating well and taking liquids from a cup	1 <	.9	4 >	3.7
	chi-square = 6.9**		t=.664	

Note. * $p<.05$
** $p<.01$
+ percentage of women who weaned.
< fewer than expected
> more than expected

women from the rural sample cited these reasons for weaning than did those in the urban sample. It is conjectured that these differences in reasons given for weaning are the result of the older population of infants contained in the rural group. With older infants at home, these reasons for weaning were more recently important to the rural women. A larger sample of a rural population is needed to substantiate this theory and to further evaluate differences between rural and urban populations as to weaning practices.

The third research question was: what is the relationship between the reason for weaning and a woman's emotional support system?

Table 9 gives a profile of the support systems of those women in the sample who breast fed. The large majority of women who breast fed felt that it was important to have other people around them who were supportive of breast feeding. Husbands or partners were found to be supportive to most mothers (76.9%), while a mother or mother-in-law, friends, nurses and physicians were found to be supportive to approximately half the population. A large majority of women had a close friend or relative who had a successful breast feeding experience, and a smaller majority had their own mothers available to talk with them about breast feeding. A small percentage (19.6) reported they would have breast fed longer if they had had more

Table 9

Support Systems

Variable	Total Number	Percentage of women who breast fed
Is it important to have other people around you who are supportive of your breast feeding?		
yes	90	80.4
no	22	19.6
Who was supportive or encouraging to you while you were breast feeding?		
My mother or mother-in-law		
yes	59	54.6
no	49	45.4
My husband or partner		
yes	83	76.9
no	25	23.1
My friends		
yes	52	48.1
no	56	51.9
The nurses		
yes	45	41.7
no	63	58.3
The doctor		
yes	56	51.9
no	52	48.1
Do you have close friends or relatives who had a successful breast feeding experience?		
yes	102	90.3
no	11	9.7
Was your own mother available to talk with you about breast feeding?		
yes	73	64.0
no	41	36.0
If you had had more encouragement to breast feed, would you have continued longer?		
yes	20	19.6
no	82	80.4

encouragement.

Support factors were compared with reasons reported for weaning using a chi-square analysis. The statistically significant associations are reported in Table 10. When a husband or partner was supportive, fewer women than expected stated that they were under too much stress, or that they were ready to stop. The data support previous research assessing the impact of a supportive husband on breast feeding (DeBlieck, 1972; Seipart, 1974). Also, when a husband or partner was supportive of breast feeding, formula, juice or cereal was started on a regular basis more frequently than expected during the first 2 weeks postpartum. These supplements to breast feeding were started less frequently during the third and fourth week. Following the fourth week, a supportive husband or partner did not greatly effect the starting of supplements. These seem to be conflicting data, and need more study to clarify the association, but do support the contention that a supportive husband or partner has a significant effect on a breast feeding mother.

Women who stated they received support from nurses reported less frequently that breast feeding was too inconvenient and confining. This association was not very strong ($\underline{t}$ = .108) but does suggest the influence which nurses can have on a breast feeding mother.

Women who had a close friend or relative who had a

Table 10

Support Systems and Weaning Factors

Weaning factors - subjects responding yes	Support	Total Number	Percentage of women who weaned
		Husband or partner	
Reason for weaning			
I was under too much stress		11 <	10.2
	chi-square 5.2 *		t=.454
I was ready to stop		25 <	23.1
	chi-square 5.8**		t=.510
When I first started formula, juice or cereal on a regular basis			
1 to 2 wks		12 >	11.1
3 to 4 wks		10 <	9.3
5 wks to 3 mos		32	29.6
4 to 6 mos		21	19.4
more than 6 mos		8	7.4
	chi-square 10.2*		t=.805
		Nurses	
Reason for weaning			
It was too inconvenient and confining		3 <	2.8
	chi-square 5.1*		t=.108
		Do you have close friends or relatives who had a successful breast feeding experience?	
Reason for weaning			
My baby was always hungry		30 <	78.9
	chi-square 5.7**		t=.425

Note. * $p<.05$
** $p<.01$
< fewer than expected
> more than expected

Table 10 (continued)

Weaning factors - subjects responding yes	Support	Total Number	Percentage of women who weaned
	Was your own mother available to talk with you about breast feeding?		
When I first started formula, juice or cereal on a regular basis			
1 to 2 wks		4 <	3.5
3 to 4 wks		14	12.3
5 wks to 3 mos		24	21.1
4 to 6 mos		22 >	19.3
more than 6 mos		9	7.9
	chi-square	9.2*	r=.624

Note. * p<.05
** p<.01
< fewer than expected
> more than expected

successful breast feeding experience cited less frequently that they weaned because their baby was always hungry. Lastly, when a mother was available to talk with a breast feeding woman, fewer women reported that they started formula, juice or cereal on a regular basis between 1 and 2 weeks postpartum. This had the opposite effect at 4 to 6 months, when more women than expected reported starting formula, juice or cereal on a regular basis.

Specific supportive individuals were found to decrease significantly the frequency with which women reported certain reasons for weaning a child. Support variables were compared with the times of weaning, and no statistically significant relationships were found.

The fourth research question was: What is the relationship between selected sociodemographic variables and the reasons for weaning?

Sociodemographic variables selected are presented in Tables 4 and 5. They were each compared with the reasons for weaning and the reasons for starting formula, juice or cereal on a regular basis using a chi-square analysis. The results are shown in Tables 11 and 12. Eleven correlations were found to be significant.

Age was found to be significantly associated with 4 reasons for weaning. There were no linear relationships between any of these factors, as can be seen in Table 13. No generalizations can be made from these data, but it is

Table 11

Significant Chi-square Relationships Between Reasons for Weaning and Sociodemographic Variables

Reasons for weaning	Age	Education	Race	Religion	Marital	Income
Breast/nipple problems	-	-	-	-	11.4**	-
Always tired	9.3* t=.401	9.9* t=.298	-	-	-	-
Baby always hungry	10.9* t=.634	-	-	-	-	-
Too much stress	-	-	-	9.8*	-	-
Baby ready to stop	-	-	7.8**	-	-	-
Use birth control pills	-	-	-	-	-	10.6* t=.237
Doctor advised to stop	15.4** t=.417	-	-	-	-	-
Nurse advised to stop	-	-	-	11.9**	-	-
Mother/in-law advised to stop	13.9** t=.391	9.3* t=.262	-	-	-	-

Note. * $p<.05$
** $p<.01$

Table 12

Significant Chi-square Relationships Between Reasons for Starting Formula, Juice or Cereal on a Regular Basis and Sociodemographic Variables

Reasons	Age	Education	Race	Religion	Marital	Income
Baby always hungry	12.5* t=.713	-	-	-	-	-
Friends/relatives advised to start	-	-	-	10.8**	-	-
So others could help with feeds	-	-		-	-	11.0* t=.231

Note. * $p<.05$
** $p<.01$

Table 13

Sociodemographic Variables Associated with Reasons for Weaning

Reason - subjects responding yes	Group				
	Age				
	<20	20-24	25-29	30-40	>40
I was always tired					
Total number	1	1 <	9 >	7 >	0
Percentage +	.9	.9	8.3	6.5	0
My baby was always hungry					
Total number	7 >	12	11 <	6 <	2 >
Percentage +	6.5	11.1	10.2	5.6	1.9
My doctor advised me to stop					
Total number	0 <	5 >	5	2 <	2 >
Percentage +	0	4.6	4.6	1.9	1.9
My mother-in-law/ mother advised me to stop					
Total number	0 <	2 >	1 <	0 <	1 >
Percentage +	0	1.9	.9	0	.9
	Education				
	Did not complete HS	complete HS	some college	completed college	graduate school
I was always tired					
Total number	2 <	1 <	6	7 <	2 >
Percentage +	1.9	.9	5.6	6.5	1.9
My mother-in-law/ mother advised me to stop					
Total number	0	0	2	1	1
Percentage +	0	0	1.9	.9	.9

Note. + percentage of women who weaned
< fewer than expected
> more than expected

Table 13 (continued)

Reason - subjects responding yes	Group				
	Race or ethnic background				
	White		Hispanic		
My baby was ready to stop					
Total number	11 <		4 >		
Percentage +	10.5		3.8		
	Religion				
	Catholic	LDS	Protestant	Jewish	Other
I was under too much stress					
Total number	0 <	14 <	2 >	1 >	3 >
Percentage +	0	13.6	1.9	1.0	2.9
The nurse advised me to stop					
Total number	1 >	0	0	0	0
Percentage +	1.0	0	0	0	0
	Marital status				
	Single	Married	Separated	Divorced	Widowed
I had breast or nipple problems					
Total number	2 >	11 <	2 >	0 <	1 >
Percentage +	1.9	10.2	1.9	0	.9
	Income				
	<5,000	5,000-10,000	10,000-15,000	15,000-20,000	>20,000
I wanted to use birth control pills					
Total number	5 >	5 >	1 <	0 <	2 <
Percentage +	4.9	4.9	1.0	0	1.9

Note. + Percentage of women who weaned
< fewer than expected
> more than expected

important to realize that women of different ages do have different reasons for weaning. A larger sample could delineate in a more specific way any trends that might exist.

Education was associated with two reasons to wean an infant. 'I was always tired' was cited less frequently by each age group except those with a graduate education. It could be conjectured that the latter group expected more of themselves than did the other age groups. Those with some college, college or graduate school educations cited that their mothers or mothers-in-law advised them to stop breast feeding more often than did the other groups, and this was one of the reasons they weaned.

Race or ethnic background was important in determining those who stated that the baby was ready to stop breast feeding. Hispanics responded to this reason more frequently than expected, and whites responded less frequently than expected. No other ethnic groups were included in this analysis since all were either bottle feeding or were still breast feeding at the time.

Stress was important to the Protestant, Jewish and 'other religion' groups. The LDS and Catholic women cited this as a reason for weaning less often than expected. A nurse's advice to stop breast feeding seemed important to one Catholic woman, but this is of very little value, as there was only one Catholic respondant.

Marital status was associated significantly with breast or nipple problems. Single, separated and widowed women noted this problem in greater frequencies than expected, while married and divorced women responded less frequently.

Increased income is associated with either not using oral contraceptives, or not thinking their use was a reason to stop breast feeding. Those women with average yearly incomes of below $10,000 reported this reason for weaning more frequently than expected, while those with incomes above $10,000 reported this less frequently than statistically expected.

Sociodemographic variables significantly associated with specific reasons for starting juice, formula or cereal on a regular basis were age, religion and income (Table 14). Age was associated with the reason 'my baby was always hungry'. Only those women under 20 responded more frequently than expected to this reason for weaning. This could be a result of lack of education about breast feeding among younger women.

Women of the Mormon religion stated less frequently than expected that 'friends advised them' to start supplements. Protestant women and those of other religions stated this reason to a greater extent than expected statistically.

Income was clearly associated with the reason 'so

Table 14

Sociodemographic Variables Associated with Reasons for Starting Juice, Formula or Cereal on a Regular Basis

Reason - subjects responding yes	Group				
			Age		
	<20	20-24	25-29	30-40	>40
My baby was always hungry					
Total number	9 >	15 <	12 <	8 <	1
Percentage +	8.3	13.9	11.1	7.4	.9
			Religion		
	Catholic	LDS	Protestant	Jewish	Other
Friends adivsed me to start					
Total number	0	2 <	1 >	0	2 >
Percentage +	0	1.9	1.0	0	1.9
			Income		
	<5,000	5,000-10,000	10,000-15,000	15,000-20,000	>20,000
So other people could help with feedings					
Total number	0 <	1 <	2 <	5 >	3 >
Percentage +	0	1.0	1.9	4.9	2.9

Note. + percentage of women who weaned.
< fewer than expected
> more than expected

other people could help with feedings'. Those women with incomes of less than $15,000 yearly cited this reason less than those with incomes above $15,000. The latter group did not return to work sooner than the former group and did not have more children at home, as evidenced by a chi-square analysis. The reason for this economic difference cannot be determined by these data and needs clarification in further research.

Additional Data

Other data concerning breast feeding and weaning practices were collected. The following is an analysis of additional factors which influence the time of weaning, the most frequent reasons given for weaning, significant variables associated with breast feeding a youngest child, and a regressional stepwise analysis of predictors of breast feeding and of weaning.

Time of Weaning

When women enjoyed breastfeeding a great deal there was a significant association with weaning after 4 months (Table 15). Those who enjoyed breast feeding somewhat, weaned primarily during the 5 week to 3 month postpartum period. Those who did not enjoy breast feeding very much, or not at all, had higher levels of weaning between 1 and 4 weeks. This should be considered when counseling breast feeding women. If they really do not enjoy it, they will

Table 15
Enjoyment of Breast Feeding and Race
as Compared to Times of Weaning

Group - subjects responding yes	Weaning Times 1-2wks	3-4wks	5wks-3mos	4-6mos	>6mos
Did you enjoy breast feeding?					
A great deal					
Total Number	5 >	9 <	15 <	20 >	9 >
Percentage	4.5	8.0	13.4	17.9	8.0
Somewhat					
Total Number	0 <	7 <	19 >	5 <	3 <
Percentage	0	6.3	17.0	4.5	2.7
Not very much					
Total Number	2 >	6 >	3 <	2 <	1 <
Percentage	1.8	5.4	2.7	1.8	.9
Not at all					
Total Number	2 >	3 >	1 <	0 <	0 <
Percentage	1.8	2.7	.9	0	0
	chi-square 29.0**		t=.438		
Race or ethnic background					
Native American					
Total Number	0	0	1	0	0
Percentage	0	0	.9	0	0
Black					
Total Number	0	1	0	0	0
Percentage	0	.9	0	0	0
White					
Total Number	8 <	19 <	37 >	27 >	12 >
Percentage	7.1	16.8	32.7	23.9	10.6
Hispanic					
Total Number	1	5 >	0 <	1 <	0 <
Percentage	.9	4.4	0	.9	0
South East Asian					
Total Number	1	0	0	0	0
Percentage	.9	0	0	0	0
	chi-square 28.2*		t=.004		

Note. * p<.05
** p<.01
< fewer than expected
> more than expected

wean early in any case, and should not be pushed into breast feeding longer than they wish.

The time of weaning was found to be significantly associated with race or ethnic background. The sample population did not contain sufficient numbers of Native Americans, blacks, or Southeast Asians to evalute these groups within this variable. White women were found to wean more often than expected in the later three time periods, while Hispanic women weaned more in the 3 to 4 week time period.

Most Frequent Reasons Given for Weaning

An evaluation of the most frequent reasons given for weaning is shown in Table 16. The reasons most often cited were that the woman did not have enough milk (43.3%) or that the baby was always hungry (36.5%). These data are supported by similar findings by previous researchers (Cole, 1977; Wilkinson & Davies, 1978). The two items mentioned above are probably associated with one another, as a baby will be always hungry if a mother does not have enough milk. The incidence of a woman trully not being able to produce enough milk is very rare (Mead & Newton, 1967). More often the problem is in educating the mother to handle problems in breast feeding, rather than an actual decreased capacity to lactate.

It is interesting to note that the most frequent

Table 16

Reasons for Weaning Most
Frequently Mentioned

Reason - subjects responding yes	Total Number	Percentage of women who weaned
I did not have enough milk	45	43.3
The baby was always hungry	38	36.5
I was ready to stop	26	25.0
I was under too much stress	20	19.2
I was always tired	18	17.3
It was too inconvenient and confining	18	17.3
I had breast or nipple problems	16	15.4
My baby was ready to stop	15	14.4
So others could care for my baby	14	13.5
My doctor advised me to stop	13	12.5

reasons cited by women for weaning an infant are not those significantly associated with specific weaning times. Each of the reasons is important in terms of counseling a breast feeding mother, but women wean for these reasons at any time.

Reasons most frequently cited for starting supplements on a regular basis are more concurrent with the times of weaning (Table 17). The reason 'my baby was old enough' was cited by 46.2% of all women who weaned and was also associated with weaning after 4 months of age. Each of these reasons, whether associated with a specific time of weaning or not, can provide important guidelines to the health care professional when counseling breast feeding mothers. The fact that the advice of a physician or nurse is mentioned frequently in reasons for weaning and reasons to give an infant supplements indicates the large impact which these professionals can have on breast feeding women.

The Incidence of Breast Feeding

Using a chi-square analysis, four variables were found to be significantly associated with whether or not a mother breast fed her youngest child (Table 18). Those women who completed some college, or finished technical school or graduate school breast fed at a rate greater than expected. Those who did or did not finish high school breast fed less often. This was found to be a very strong relationship

Table 17

Reasons for Starting Formula, Cereal or Juice on a Regular Basis Most Frequently Mentioned

Reason - subjects responding yes	Total Number	Percentage of women who weaned
The baby was old enough to have more	48	46.2
My baby was always hungry	44	42.3
My doctor or nurse said I should	30	28.8
So other people could help with feedings	10	9.6
My friends or relatives said I should	5	4.8

Table 18

Breast Feeding and Associated Significant Variables

Group	Breast feeding Responding yes Number		Percent	Total Number	Total Percentage
Education					
Did not finish HS	29	<	64.4	45	100
Finished HS	57	<	81.4	70	100
Some college	88	>	88.9	99	100
finished college or tech. school	50	>	92.6	54	100
graduate school	5	>	100.0	5	100
			chi-square 18.7**		t=.628
Religion					
Catholic	17	<	73.9	23	100
LDS	177	>	85.1	208	100
Protestant	9	>	90.0	10	100
Jewish	0	<	0	2	100
Other	18		81.1	22	100
			chi-square 12.3*		
Present marital status					
Single	16	<	69.6	23	100
Married	191	>	86.0	222	100
Separated	5	<	55.6	9	100
Divorced	15	>	93.8	16	100
Widowed	1	<	50.0	2	100
			chi-square 12.9*		
Breast fed older children					
yes	150	>	92.6	162	100
no	20	<	51.3	39	100
			chi-square 38.0***		t=.254

Note. * $p<.05$
** $p<.01$
*** $p<.001$
< fewer than expected
> more than expected

($\underline{t}$ = .628) and is supported by many previous investigations (Sjolin et al., 1977; Hofvander & Petros-Barvazian, 1978; Hirschman & Hendershot, 1979; Dalsing, 1981).

Religion was also found to be significantly related to the incidence of breast feeding. Protestant and LDS women breast fed more often than expected, while Catholic and Jewish women breast fed less often. Other religions did not have an impact on the incidence of breast feeding. It is very interesting that Jewish women breast fed less often in this population. Bergman and Feinberg (1981) found that an increase in religiousness in a Jewish population was correlated with an increase in breast feeding. Hirschman and Hendershot (1979) found that women who were not part of an ethnic minority breast fed more often. The fact that Jewish women in Utah breast feed less often may arise from the fact that they are not very religious, or that they are an ethnic minority in this state. This factor needs further study with a larger sample of Jewish women to clarify the issue.

Married and divorced women tend to breast feed more often than do single, separated or widowed women. Married women breast feeding more often is concurrent with findings of other studies (Sjolin et al., 1977). Also, these divisions between marital status were exactly those found when comparing women who had experienced breast or nipple

problems as a reason for weaning. It may be conjectured that these two factors are related. Married or divorced women are more apt to breast feed and also take the extra initiative to solve breast or nipple problems if they experience them, so these problems do not lead to a reason for weaning.

Lastly, women who have breast fed infants in the past, are more likely to breast feed a subsequent infant. This could be said to contradict other findings proposing that the incidence of breast feeding is higher in primiparas or in women who have fewer children at home (DeBlieck, 1972; Bergman & Feinberg, 1981). The incidence of breast feeding was not increased by having previously breast fed a larger number of children.

Factors Predictive of Breast Feeding

A stepwise regressional analysis was completed on all variables associated with the incidence of breast feeding to determine the most predictive items (Table 19). Having breast fed an older child was found to be the best predictor of breast feeding a youngest child. This accounted for 22.28% of those breast feeding. Education was the next best predictor, accounting for 7.36% of those breast feeding when taken by itself, or adding 2.71% when combined with those who breast fed an older child. Income and age added very little predictive value.

Table 19

Stepwise Regressional Analysis
of Breast Feeding

Predictors	Percentage of breast feeding	Additional percentage
Breast fed older children	22.28	
add education	24.99	2.71
add income	25.40	.41
add age	25.42	.02
Education	7.36	
add income	7.96	.60
add age	8.06	.10

As can be seen, the predictors in this study only account for 25% of breast feeding women. Either other factors not included in this study are of great importance, or there are a myriad of predictors to breastfeeding, each adding just a small amount of predictive ability. It is the researcher contention that the latter is true but further research is needed to evaluate this problem.

Factors Predictive of the Time of Weaning

The factors which predict the time of weaning are quite different from those which predict the incidence of breast feeding (Table 20). Enjoying breast feeding is the best predictor of the time of weaning, accounting for 12.07% of those who weaned their babies. The next three predictors (when a baby was eating well and taking liquids from a cup, a woman having breast or nipple problems, and a physician advising her to stop breast feeding), the predictive value increased to 28.76%.

If the two best predictors were not included, breast or nipple problems and the fact that the baby was always hungry, were very significant factors. The latter two gave a predictive value of 17.91% when examined together. When three other variables were added (a mother returned to work, the physician advised her to stop, and the infant was born prematurely), the predictability equalled 28.13%

Education, which is so influencial in determining who

Table 20

Stepwise Regressional Analysis of the Time of Weaning

Predictors	Percentage of time of weaning	Additional percentage
Enjoy breast feeding	12.07	
add baby eating well	19.14	7.07
add breast/nipple problems	25.19	6.05
add physician advised her to stop	28.76	3.57
Breast/nipple problems	9.33	
add baby always hungry	17.91	8.58
add returned to work	23.17	5.26
add physician advised her to stop	26.07	2.90
add infant premature	28.13	2.06
Education	3.21	
add age	3.24	.03
Own mother available to talk about breast feeding	3.76	
add nurses supportive	8.72	4.96
add husband/partner supportive	10.73	2.01
add mother/in-law supportive	11.56	.83
add friend/relative had successful experience	11.88	.32
add physician supportive	12.01	.13

will breast feed, was not very important when determining when a woman will wean. No single support variable was found to be of large predictive value, but 6 variables taken together were able to account for 12.01% of those who weaned.

As in the case of predicting the incidence of breast feeding, variables assessed in this study did not predict the majority of factors important in the time of weaning. It is the researcher's contention that there are a myriad of factors which predict the time of weaning. Further study is needed to substantiate this theory.

CHAPTER IV

SUMMARY AND DISCUSSION

The sample consisted of 274 women in Utah who were 3 months to 1 year postpartum. The sample was found to be fairly homogenous. Most women were between 20 and 30 years of age, white and were affiliated with the LDS Church. They also had attended some college, had an income of between $10,000 and $15,000 yearly, and lived in an urban area. A large majority (83.9%) had breast fed the youngest child and 37.0% weaned the child after 6 months of age.

Statistically significant results were found within each of the areas covered by the four research questions. The time of weaning was found to be significantly associated with the following reasons for weaning: breast and nipple problems, the physician advising a woman to stop breast feeding, and a baby eating a good diet and taking liquids from a cup. These findings direct the health care provider to the type of problems encountered by breast feeding women. They also point out the importance of the provider's advice to clients. Physicians can have a definite impact on the time at which mothers wean their infants.

Research question 2, comparing urban and rural women, could not be fully answered since the urban sample was approximately four times as large as the rural sample. Valid comparisons could not be made because of the large sampling error in a small sample.

Support systems for breast feeding were found to be important to most nursing women. A husband or partner was supportive to the most women (76.9%), while half of those sampled found health professionals supportive to breast feeding. This is a small percentage considering that the Academy of Pediatrics (1982) has strongly endorsed breast feeding as the best nutrition for an infant. A small percentage (19.6%) stated they would have breast fed longer if they had had more encouragement to do so. This is the population at which the majority of breast feeding support and information should be aimed. They will benefit the most when compared with the effort needed to sponsor support groups and publish imformation.

In research question 3, specific support persons were found to be significantly associated with specific reasons for weaning. In the majority of situations, the support person was found to decrease the incidence of early weaning. The woman's husband or partner, nurses, a close friend or relative and her own mother were all found to be supportive to breast feeding. These individuals should be the target of programs to further promote breast feeding.

Sociodemographic variables were found to be associated with specific reasons for weaning. Age was associated with four reasons, religion and education with two, and race or ethnic background, income and marital status with one. A yearly income of below $10,000 was associated with an increased use of oral contraceptives as a reason for weaning. No other generalizable trends were found in relation to these variables.

Another factor found to be associated with the time of weaning was the enjoyment of breast feeding. Those who enjoyed breast feeding, weaned later. With more education in solving problems as they arise, breast feeding could be made more enjoyable for women. It is the role of the health care provider to assist women with these problems, if late weaning is a goal for them.

White women were found to wean later than Hispanic women. This is congruent with a previously mentioned study which determined that women of an ethnic majority breast fed more (Hirschman & Hendershot, 1979).

Reasons for weaning most frequently mentioned by women were the lack of enough milk, and the fact that the baby was always hungry. Both of these problems are preventable and treatable, and clearly point to the need for more educational programs for breast feeding mothers and their support persons in handling problems as they arise.

Breast feeding was found to be associated with three

sociodemographic variables. A higher incidence of breast feeding was found among women with higher educational achievements, within Protestant and LDS religious groups and among married and divorced women. If a woman had breast fed previous children, she was more likely to have breast fed her youngest child. These factors can lead the health care provider to target the sociodemographic groups who are not breast feeding as often. Also, if one can encourage a woman to try breast feeding with one child, she is much more likely to continue with a subsequent child.

Lastly, a stepwise regressional analysis of breast feeding and the time of weaning was performed. The best predictor of breast feeding was found to be a woman having breast fed a previous child. This again emphasizes the importance of encouraging women to start nursing a child. The best predictor for the time of weaning was the enjoyment of breast feeding. If a health care provider can enhance this enjoyment, the incidence of early weaning can be decreased considerably.

Recommendations for Further Study

Further research is needed in the area of breast feeding and weaning to clarify the significant relationships found in this research. The following are recommendations for the expansion of this study.

1. A larger sample is needed in rural areas to increase the ability to analyze the differences between

urban and rural populations.

2. An optimum sample would consist of a narrower age group of infants. A sample of mothers between 6 and 8 months postpartum would be ideal. Those mothers who are less than 5 months postpartum and still breast feeding are lost to the analysis of length of breast feeding. Mothers who are more than 8 months postpartum will have a higher incidence of memory lapse in relation to weaning if they have already weaned.

3. The researcher should speak directly with the public health nurses distributing the questionnaire, rather than with their supervisors. This would enhance the collection process.

4. Questionnaires should be distributed only at immunization and WIC clinics. There is a higher volume of the target population in these locations than in well-child conferences, and the researcher could concentrate more specifically on fewer collection sites.

5. The use of optical scanning sheets should be analyzed to determine if they are a deterant to the public health nurses in distributing the questionnaires, or to the women in completing them.

6. The women who refused to complete the questionnaire should be assessed to determine if they are significantly different from the sample population.

7. The study should be replicated with a larger sample

size from a larger number of counties in order to increase the generalizability of findings.

APPENDIX A

INSTRUCTIONS FOR DISTRIBUTING QUESTIONNAIRES

INFANT FEEDING STUDY

This survey of infant feeding and weaning practices in Utah is being done as a masters thesis research in conjunction with the Bureau of Maternal and Infant Health. Utah has the highest rate of breast feeding in the hospital in the nation (85.4%), but at 5 to 6 months this percentage drops off to 37.9. We are trying to find out when and why women wean their infants. The results of this study will help in developing educational programs to support those women who would like to continue breast feeding.

Here are some guidelines to follow when distributing the questionnaire.

1. Participation in the study is completely voluntary. If a woman does not want to fill out a questionnaire, she is under no obligation to do so.

2. This study is for all women (breast feeding and bottle feeding) who are between 5 1/2 and 6 1/2 months postpartum and have a living child by that pregnancy.

3. This questionnaire should be filled out only once by each woman. Please ask each person if she has filled it

out before.

4. Women should mark on the answer sheets provided, not on the actual questionnaire. Use the number 2 pencils provided.

5. One person should be delegated to collect the completed questionnaires once a month and mail them in the envelopes provided to Susan Thomforde at the address provided.

6. If you have any questions or need further supplies, please call or write to me at:

Susan Thomforde
2154 S Texas St.
Salt Lake City, Utah 84109
tel. (801) 467-8144

or leave a message at: University of Utah College of Nursing (801) 581-8274. I will be periodically contacting each of you to see how the project is progressing. We both appreciate your involvement in this project. Thank you.

Susan Thomforde R.N.
Master's Candidate
University of Utah College of Nursing
Parent-Child Program

Gail Evans R.N. M.S. C.N.M.
Maternal Health Consultant
Bureau of Maternal and Infant Health
Utah Health Department

APPENDIX B

QUESTIONNAIRE

Infant Feeding Practices

This is a study of different ways mothers feed their babies. Please fill out this form concerning the way you feed your baby. Completing this questionnaire is completely voluntary and will not influence in any way the health care you receive. Anonymous research information will be collected and used in a University of Utah masters thesis and in health care planning by the State Health Department. This form will take approximately ten minutes to complete.

Thank you very much.

1. How old are you?
    1. 19 or younger
    2. 20 to 24
    3. 25 to 29
    4. 30 to 40
    5. 41 or older

2. What is your highest level of education?
    1. I did not finish high school
    2. I finished high school
    3. I attended some college
    4. I finished college or technical school
    5. I completed graduate school

3. What is your race or ethnic background?
    1. Native American Indian
    2. Black
    3. White

4. Mexican-American or Hispanic
5. Southeast Asian

4.
1. Pacific Islander
2. Other, please specify _____

5. What is your religious affiliation?
1. Catholic
2. LDS
3. Protestant
4. Jewish
5. Other, please specify _____

6. What is your marital status now?
1. Single
2. Married
3. Separated
4. Divorced
5. Widowed

7. What was your average income during the past 12 months?
1. Below $5,000
2. $5,000 to $10,000
3. $10,000 to $15,000
4. $15,000 to $20,000
5. Above $20,000

8. How many children do you have?
1. 1
2. 2
3. 3
4. 4
5. 5 or more

9. How old is your youngest child?
1. 3 or 4 months old
2. 5 to 6 months old
3. 7 to 8 months old
4. over 8 months old

10. What type of birth did you have with your youngest child?
1. vaginal delivery (normal childbirth)
2. forceps delivery
3. cesarean section

11. Was your baby born prematurely?
1. yes
2. no

12. Were you sick after your delivery?
1. yes

2. no

13. Was your baby sick after your delivery?
    1. yes
    2. no

14. Did you breast feed any of the older children?
    1. yes
    2. no
    3. I do not have any older children

15. If yes, how many?
    1. 1
    2. 2
    3. 3
    4. 4 or more

16. Are you breast feeding, or did you breast feed your youngest at any time?
    1. yes
    2. no

17. If you are bottle feeding your youngest child, what type of milk are you using?
    1. cows milk
    2. commercial formula (Similac, Enfamill or others)
    3. evaporated milk
    4. condensed milk
    5. other, please specify _____

If you did not breast feed your youngest baby at any time, please return your answer sheet to the receptionist. Thank you very much.

If you did breast feed your youngest, please continue.

18. Did you make the decision to breast feed before the baby was born?
    1. yes
    2. no
    3. uncertain

19. Are you still nursing your youngest baby?
    1. yes
    2. no

20. If you are not still nursing, when did you stop breast feeding completely?
    1. 1 to 2 weeks after the baby was born
    2. 3 to 4 weeks after the baby was born
    3. 5 weeks to 3 months after the baby was born

4. 4 months to 6 months after the baby was born
5. more than 6 months after the baby was born

21. Do you, or did you not enjoy breast feeding?
    1. I enjoyed it a great deal
    2. I enjoyed it somewhat
    3. I did not enjoy it very much
    4. I did not enjoy it at all

22. When did you first give your baby formula, juice or cereal on a regular basis?
    1. 1 to 2 weeks after the baby was born
    2. 3 to 4 weeks after the baby was born
    3. 5 weeks to 3 months after the baby was born
    4. 4 months to 6 months after the baby was born
    5. more than 6 months after the baby was born

If you are still breast feeding your youngest baby, please return your answer sheet to the receptionist. Thank you very much.

If you have stopped breast feeding, please continue.

23. What are some of the reasons you stopped nursing your baby? Please mark all that apply to you.
    1. I did not have enough milk
    2. I had breast or nipple problems
    3. I returned to work
    4. I was always tired and run down
    5. The baby was always hungry

24.
    1. I was under too much stress
    2. I was ready to stop
    3. The baby was ready to stop
    4. It was too inconvenient and confining
    5. I became pregnant again

25.
    1. The baby seemed too old
    2. I was tired of wearing nursing clothes
    3. I wanted others to care for the baby
    4. I wanted to use birth control pills
    5. The baby was eating a good diet and taking liquids from a cup

26.
    1. My doctor advised me to stop
    2. My nurse advised me to stop
    3. My husband or partner told me to stop
    4. My mother or mother-in-law told me to stop
    5. My friends told me to stop

27. What are some of the reasons you first started giving your baby juice, formula or cereal?
    1. My baby was always hungry
    2. My baby was old enough to have more
    3. My doctor or nurse said I should
    4. My friends or relatives said I should
    5. So other people could help with feedings

28. Do you believe that it is important to have other people around you who are supportive of your breast feeding the baby?
    1. yes
    2. no

29. Who was supportive or encouraging to you while you were breast feeding?
    1. My mother or mother-in-law
    2. My husband or partner
    3. My friends
    4. The nurses
    5. The doctor

30. Do you have close friends or relatives who had a successful breast feeding experience?
    1. yes
    2. no

31. Was your own mother available to talk with you about breast feeding?
    1. yes
    2. no

32. If you had had more encouragement to breast feed, would you have continued longer?
    1. yes
    2. no

Thank you very much for your time. Please return this and your answer sheet to the receptionist.

REFERENCES

Almroth, S. & Greiner, T. (1979). The economic value of breast-feeding. Rome: Food and Agriculture Organization of the United Nations.

Ament, C. J. A. (1973). Nurse-midwifery support at home and success with breastfeeding. Unpublished Master's Thesis, University of Utah.

American Academy of Pediatrics. (1982). The promotion of breast feeding. Pediatrics, 69, 654-661.

Appel, J. A., & King, J. C. (1981). Energy needs during pregnancy and lactation. Family and Community Health, 1 (4), 7-18.

Bergman, R. & Feinberg, D. (1981). Working women and breastfeeding in Israel. Journal of Advanced Nursing, 6(4), 305-309.

Cole, J. P. (1977). Breastfeeding in the Boston suburbs in relation to personal-social factors. Clinical Pediatrics, 16(4), 352-356.

Crow, R. A., Fawcett, J. N., & Wright, P. (1980). Maternal behavior during breast and bottle feeding. Journal of Behavioral Medicine, 3(3), 259-277.

Dalsing, C. W. (1981). Breast-feeding practices in a rural community. Unpublished Master's Thesis, University of Utah.

Danforth, D. N. (Ed.). (1982). Obstetrics and gynecology. (4th ed.). Philadelphia:Harper & Row.

DeBlieck, Sr. P. (1972). Factors affecting the decision to breast feed and success with breast feeding. Unpublished Master's Thesis, University of Utah.

Evans, H. E., & Glass, L. (1979). Breastfeeding: Advantages and potential problems. Pediatric Annuls, 8(2), 92-105.

Foman, S. J., Filer, L. J., Anderson, T. A., & Ziegler, E. E. (1979). Recommendations for feeding normal infants.

Pediatrics, 63(1), 52-59.

Gerrard, J. W. (1982). Untowards effects of weaning, Canadian Medical Association, 126(10), 1133-1134.

Hall, B. (1975). Changing composition of human milk and early development of an appetite control. Lancet, 1 (7910), 779-781.

Harris, S. G., & Highland, J. H. (1977). Birthright denied: the risks and benefits of breast feeding. Washington, D.C.: Environmental Defense Fund.

Hirschman, C., & Hendershot, G. E. (1979, November). Trends in breast feeding among American mothers. Vital Health Statistics (23), 3, 1-39.

Hofvander, Y., & Petros-Barvazian, A. (1978). WHO Collaborative study on breastfeeding. Acta Paediatrica Sandinavica, 67(5), 556-560.

Hofvander, Y., Hagman, U., Hillervik, C., & Sjolin, S. (1982). The amount of milk consumed by 1 to 3 months old breast- or bottle-fed infant. Acta Paediatrica Scandinavica, 71(6), 953-958.

Hood, I. J., Faed, J. A., Silva, P. A., & Buckfield, P. A. (1978). Breastfeeding and some reasons for electing to wean the infant: A report from the Denedin Multidisciplinary Child Development Study. The New Zealand Medical Journal, 88(621), 273-276.

Howie, P. W., Houston, M. J., Cook, A., Smart, L., McArdle, T., & McNeilly, A. S. (1981). How long should a breast feed last? Early Human Development, 5(1), 71-77.

Howie, P. W., & McNeilly, A. S. (1982). Breastfeeding and postpartum ovulation. International Planned Parenthood Federation Medical Bulletin, 16(2), 1-3.

Hughes, R. N., & Hawkins, A. B. (1975). EPI and IPAT anxiety scale performance in young women as related to breastfeeding during infancy. Journal of Clinical Psychology, 31(4), 663-665.

Hutchinson, P., & Hall, H. (1981). Lactation suppression with bromocriptine, New Zealand Medical Journal, 94 (694), 309-310.

Jelliffe, D. B., & Jelliffe, E. F. P. (1975). Human milk, nutrition and the world resources crisis, Science, 188 (4188), 557-561.

Jelliffe, D. B., & Jelliffe, E. F. P. (1978a). Human milk in the modern world. Oxford: Oxford University Press.

Jelliffe, D. B., & Jelliffe, E. F. P. (1978b). The volume and composition of human milk in poorly nourished countries. A review. American Journal of Clinical Nutrition, 31(3), 492-515.

Kennell, J. H. & Bergen, M. E. (1966). Early childhood separations. Pediatrics, 37(2), 291-298.

Klaus, M. H., & Kennell, J. H. (1976). Maternal-infant bonding. St. Louis: C. V. Mosby.

Korones, S.B. (1981). High-risk newborn infants. St. Louis: C. V. Mosby.

Ladas, A. K. (1970). How to help mothers breast feed. Clinical Pediatrics, 9(12), 702-705.

La Leche League. (1963). The womanly art of breastfeeding. Franklin Park, Ill: La Leche League.

Lawrence, R. A. (1981). Successful breastfeeding. American Journal of Diseases of Children, 135(7), 595-596.

Martinez, G. A., & Nalezienski, J. P. (1979). The recent trend in breastfeeding. Pediatrics, 64(5), 686-692.

Martinez, G. A., & Nalezienski, J. P. (1981). 1980 Update: The recent trend in breastfeeding. Pediatrics, 67 (2), 260-263.

Martinez, G. A., & Dodd, D. A. (1983). 1981 Milk feeding patterns in the United States during the first twelve months of life. Pediatrics, 71(2), 166-170.

Maslow, A. H., & Szilagyi-Kessler, I. (1946). Security and breastfeeding. Journal of Abnormal Social Psychology, 41, 83.

Miller, A. B., & Bulbrook, R. D. (1981). Epidemiology and etiology of breast cancer. New England Journal of Medicine, 304(12), 730-731.

Montagu, A. (1971). Touching. New York: Columbia University Press.

Newton, M. (1971). Mammary effects. American Journal of Clinical Nutrition, 24, 987-990.

Newton, N., &.Newton, M. (1948). The let-down reflex in

human lactation. Pediatrics, 33, 689-704.

Newton, N., & Newton, M. (1967). Psychologic aspects of lactation. New England Journal of Medicine, 277, 1179-1187.

Newton, N. (1971). Psychologic differences between breast and bottle feeding. American Journal of Clinical Nutrition, 24, 993-1004.

Niebyl, J. R., Bell, W. R., Schaaf, M. E., Blake, D. A., Dubin, N. H., & King, T. M. (1979). The effect of chlorotrianisene as postpartum lactation suppression on blood coagulation factors. American Journal of Obstetrics and Gynecology, 134(5), 518-522.

Pryor, K. (1973). Nursing your baby. New York: Harper and Row.

Ross, L. (1981). Weaning practices. Journal of Nurse-Midwifery, 26(1), 9-14.

Ross Laboratories. (1979). National Mothers Survey. Unpublished manuscript, Paluszek & Leslie News Associates, 122 East 42nd Street, New York, N. Y. 10017).

Saarinen, U. M., & Siimes, M. A. (1979). Role of prolonged breast feeding in infant growth. Acta Paediatrica Scandinavica, 68(2), 245-250.

Saarinen, U. M. (1982). Prolonged breast feeding as prophylaxis for recurrent otitis media. Acta Paediatrica Scandinavica, 71(4), 567-571.

Sauls, H. S. (1979). Potential effects of demographic and other variables in studies comparing morbidity of breastfed and bottle fed infants. Pediatrics, 64, 523-527.

Seipert, L. R. (1974). Paternal attitudes towards breastfeeding: The development of a tool. Unpublished Master's Thesis, University of Utah.

Shaefer, O. (1969). Cancer of the breast and lactation. Canadian Medical Association Journal, 100(13), 625-626.

Shukla, M., Forsyth, H. A., Anderson, C. M., & Marwah, S. M. (1972). Infantile overnutrition in the first year of life: A field study in Dudley, Worchestershire. British Medical Journal, 4, 507-513.

Sjolin, S., Hofvander, Y., & Hillervik, C. (1977). Factors related to early termination of breast feeding. Acta Paediatrica Scandinavica, 66(4), 505-511.

Sloper, K., McKean, L., & Baum, J. D. (1975). Factors influencing breast feeding. Archives of Disease in Childhood, 50(3), 165-170.

Sousa, L. R. (1975, August). Vulnerable periods of lactation - A view on breast feeding practices in Brazil. Environmental Child Health, 216-217.

Stanway, P. (1978). When and why are babies weaned. Correspondence. British Medial Journal, 2(6142), 958-959.

Tabor's Cyclopedic Medical Dictionary. (13th ed). (1977). Philadelphia: F. H. Davis Company.

Van Ginneken, J. K. (1975, April). Prolonged breastfeeding as a birth spacing method. Environmental Child Health, 59-66.

Waletzky, L. R. (1979). Breastfeeding and weaning: Some psychological considerations. Primary Care, 6 (2), 341-355.

Webster's Third New International Dictionary. (1966). Springfield, Mass: G. & C. Merriam Company.

Whichelow, M. J. (1982). Factors associated with the duration of breastfeeding in a priviledged society. Early Human Development, 7(3), 273-280.

Wilkinson, P. W., & Davies, D. P. (1978). When and why are babies weaned? British Medical Journal, 1, 1682-1683.

Worthington, B., Vermeersch, J., & Williams, S. R. (1977). Nutrition in pregnancy and lactation. St. Louis: C. V. Mosby.