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AN ANALYSIS OF HUTTERITE BREASTFEEDING PATTERNS

by

Christine Smith

B.A. University of Montana, 1999

presented in partial fulfillment of the requirements

for the degree of

Master of Arts

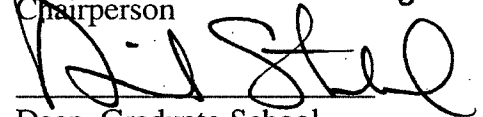
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Smith, Christine M.A., May 2006

Anthropology

An Analysis of Hutterite Breastfeeding Patterns

Chairperson: Kimber Haddix McKay, Ph.D.

UAM

The unique socio-cultural context of the Hutterites can give us valuable insights into determinants of infant feeding practices. As Hutterite women have only recently been exposed to infant formula advertising, one might expect a greater tendency of younger mothers to use breastmilk substitutes. However, this study revealed that supplementation of breastmilk was also common among older mothers. The importance of colony work emerged as a major variable affecting breastfeeding patterns. The constraints work places on infant feeding practices is examined in one conservative Hutterite colony, and the implications of breastfeeding style for milk production are discussed. A biocultural perspective is employed.

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Table of Contents

Abstract.....	ii
Acknowledgements.....	iii
Table of Contents.....	iv
List of Tables.....	v
Introduction.....	1
Chapter 1. Anabaptist History and Social Organization.....	5
Chapter 2. Theoretical Framework: Human Behavioral Ecology.....	26
Chapter 3. Determinants of Breastfeeding Behavior.....	50
Chapter 4. Mountain Hill Colony: A Case Study.....	67
Conclusion.....	88
Appendix 1. Interview Questions for Study of Hutterite Breastfeeding Practices.....	90
Appendix 2. Survey Questions for Study of Hutterite Breastfeeding Practices.....	92
References Cited.....	95

List of Tables

2.1	Costs and Benefits of Exclusive Breastfeeding for Mothers and Infants (McDade 2001).....	45
3.1	Examples of Biological, Socio-Behavioral, and Biocultural Factors Affecting Infant Feeding Practices (Allen and Pelto 1985).....	51
3.2	Obstacles to Breastfeeding for Working Mothers (Baumslag and Michels 1995).....	53
3.3	Cultural Models of Infant Feeding (Van Esterik 1989).....	55
3.4	Detrimental Hospital Policies and Procedures (Brownlee 1990).....	59
4.1	Sample Characteristics.....	70
4.2	Survey Results: Glacier Colony Breastfeeding Practices (in percentages).....	71
4.3	Survey Results: Reasons Given for Infant Formula Use (younger to older mothers).....	72
4.4	Survey Results: Reactions to Seeing Infant Formula Advertisements (younger to older mothers).....	72

INTRODUCTION

Influences on Infant Feeding Decisions among Hutterite Women: The Importance of Maternal Workloads

The anthropological approach to the study of breastfeeding has made a unique contribution to this subject by examining the broad context in which infant feeding decisions are made and by combining both biological and cultural dimensions in a single framework. This approach emphasizes that breastfeeding is a complex process shaped by social and cultural forces interacting with local environmental and political conditions (Van Esterik 2002). I have been interested specifically in the impact of infant formula advertising on maternal decision-making regarding infant feeding. As infant formula marketing and availability become ever greater, their influences have to be included in any complete discussion of infant feeding causes and consequences.

I anticipated that the unique situation of the Hutterites would give me a rare opportunity to study the effects of infant formula advertising on breastfeeding patterns. Exposure to mainstream advertising is very limited among the Hutterites, and only recently do Hutterite mothers have access to baby magazines containing infant formula advertising. Older mothers had virtually no exposure to such advertising when parenting their infants; most of the younger mothers today have a subscription to a baby magazine (*Babytalk*). Thus, comparing infant feeding practices between mothers of different age groups could give us valuable insights about the effects of infant formula advertising. I hypothesized that greater exposure to infant formula advertising would shorten the duration of breastfeeding via supplementation of breastmilk.

Because of my small sample size, the usefulness of quantitative analyses of the data is limited. Instead, I have focused on qualitative methods, reflecting general attitudes toward breastfeeding and infant feeding; these have not supported my prediction (see chapter 4). The importance of colony work has emerged as a main factor affecting infant feeding choices for Hutterite women. From a biocultural perspective, this importance of the economic realm is not surprising. A biocultural, evolutionary analysis of breastfeeding seeks to answer questions such as: What cultural and ecological factors define breastfeeding patterns in this community? Do maternal workloads constrain breastfeeding? What are the important costs and benefits of breastfeeding for both infants and mothers in this context? Do mothers pay high costs for breastfeeding in terms of limited activity, fecundity, and energy (McDade 2001)?

The disregard for the local social and cultural conditions of breastfeeding has led to undue simplification of the issues involved. It is unrealistic and not always desirable to promote accepted medical knowledge in various ecological contexts. It is anthropology's forte to embrace a relativistic perspective, and authoritarian ideas about what is best for women and infants, so common among many international organizations active in the field of healthcare, are not only inappropriate but also ineffective (Raphael and Davis 1985). Rigid rules are unsuited to benefit the breastfeeding context, which, like the personalities of mother and child, is always unique.

In particular, there has been a lack of focus on maternal needs and well-being. Is it feasible for the mother to breastfeed exclusively for six months? How will exclusive breastfeeding or extended breastfeeding affect her health; will it lead to maternal depletion? What are her economic and social obligations, with which exclusive

breastfeeding may be incompatible? An analysis of breastfeeding ecology requires systematic inclusion of the maternal perspective. McDade and Worthman (1998) classify maternal outcomes as follows: energetic and nutritional costs, reproductive costs and benefits, productivity costs, and social costs.

In this thesis, I will argue that productivity costs among Hutterite mothers are the main constraint limiting sustained intensive breastfeeding. Analyzing my data, I will examine the prevalence of Insufficient Milk Syndrome (IMS) in this community and relate this phenomenon to the importance of maternal work. I will explore why the colony's rigidity, including women's work schedules, is essential to the survival of this group, and how this inflexibility results in the desired socialization of children.

Chapter 1 puts the Hutterites into a broader context of Anabaptism. The first part of the chapter summarizes the origins of Anabaptism and provides a historical overview of each major Anabaptist group: the Mennonites, the Amish, and the Hutterites. The second part of the chapter condenses the contemporary social organization of each group, focusing on child rearing practices and socialization. This chapter will show how the Hutterites have withstood continuous persecution, and how this history of oppression has strengthened their social cohesion. Their social organization reflects this strive for survival, and adherence to the colony's rigid rules is essential for their future existence as a distinct social group.

Chapter 2 is dedicated to the theoretical paradigm underlying this thesis, human behavioral ecology. First, a general overview of this theory is given, including historical origins, theory, and method. It is then applied to the broader topic of reproduction, with an emphasis on parental effort, and then specifically to the analysis of breastfeeding. The

biocultural, evolutionary approach to breastfeeding is summarized; this framework emphasizes ecological constraints to breastfeeding, so central to my argument.

In Chapter 3, the various determinants of breastfeeding behavior are presented. I begin the chapter by giving an overview of the socio-behavioral factors, followed by a discussion of health sector and food industry factors. Biocultural determinants are investigated last, concluding with the controversy over the etiology of IMS. These variables of infant feeding variation and the different explanations concerning IMS will serve as a base for the discussion of infant feeding practices and IMS among Hutterite women.

The presentation and analysis of my data gathered at Mountain Hill Colony¹ and from surveys of Mountain Hill Colony mothers will be included in Chapter 4. After a brief description of the site and methodology, my data, presented in tables, will follow. The results are then verbalized, followed by a discussion interpreting the data. My central argument will be that the necessity of Hutterite mothers to contribute to colony work is largely incompatible with the style and intensity of breastfeeding required for successful exclusive breastfeeding. In addition, rigid work schedules facilitate the introduction of breastmilk substitutes, affecting lactation physiology. Thus, my discussion will be a biocultural one, linking the sociocultural with the biological.

¹ The name of the colony has been changed to protect anonymity.

CHAPTER ONE

Anabaptist History and Social Organization

The following review will provide the reader with a very brief overview of the history and social organization of the three major surviving Anabaptist groups: the Mennonites, the Amish, and the Hutterites. Although my personal research centers on the Hutterites, I have included the Mennonites and Amish to furnish a wider social context to embed my research in. Contact between the Hutterites and other Anabaptist groups is limited today; however, they do share an intricate history and common religious beliefs.

I will begin the chapter by exploring the historical origins of Anabaptism in Europe; then I will summarize the historical developments of each group to the present. One cannot truly understand the lives of these traditional people without knowing their historical roots. The order of Mennonites - Amish - Hutterites follows the order of arrival in the New World.

Books have been written on the social organization of each group (e.g., Hostetler 1993, Hostetler 1997, Lee 2000), and I direct the reader to these sources for more detailed information on all aspects of community life. It has been challenging to comprise the vast amount of information into the following section on social organization; thus, my focus will be the family and child rearing practices, as these aspects of social organization are closely linked to my interest of breastfeeding patterns. An emphasis is placed on early childhood socialization.

As this chapter will show, the Hutterites were continually persecuted, and the struggle for cultural survival has created the need for strict colony patterns. Social cohesion has to be maintained, and this is accomplished through the colony's rigid social

structure including the comprehensive socialization of children. Child rearing practices among the Hutterites exemplify the need of the individual to surrender to the community. Children are socialized to adhere to rigid rules and schedules, and the strict pattern of infant feeding is the first step in this socialization. Infants, almost from birth, have to learn that the colony takes precedence over the individual.

Historical Background

Origins and characteristics of Anabaptism

It was the socio-religious climate in the wake of the Protestant Reformation of sixteenth-century Europe that laid the foundation for the emergence of Anabaptism. Much controversy exists around its genesis. According to a monogenetic model, Anabaptism developed in Zurich between 1523 and 1525 as a single, quite narrowly defined movement and then broadened into several distinctive variants (Davis 1977). Recent research favors a polygenetic model, in which Anabaptism emerged as a number of separate movements in Switzerland, in central and south Germany, in north Germany, and in the Netherlands (Goertz 1996).

It is believed that the first adult baptism occurred on January 21, 1525 in Zurich (Blanke 2003). Impatient students of the Protestant pastor Ulrich Zwingli performed this defiant act, which challenged Catholic, Protestant, and civil authorities alike. They were resisting the slow pace of the Reformation, dissatisfied with the indecisive and cautious progress. This critique of infant baptism in favor of a practice of baptism of faith and confession was what all Anabaptist movements had in common. Their followers insisted on rebaptizing adults who had already been baptized as infants in the Catholic Church.

Thus, they were called “Anabaptists”, meaning rebaptizers (*Täufer* or *Wiedertäufer*) (Goertz 1996). Adult baptism being a capital offense in sixteenth-century Europe, thousands of Anabaptists were tortured and killed by religious and civil authorities (Kraybill and Bowman 2001).

Although Goertz (1996) clarifies that Anabaptism can no longer be depicted as possessing a consistent core theology, there are several characteristics that most of these movements shared. They believed in the reconstruction of the church according to the New Testament and entirely separate from the State; adult baptism following repentance and confession of faith; the “priesthood of all believers”, referring to the equality of all men in their communities; a disciplined way of life including only people who are Christian by free decision and excluding those who became defectors; and the practice of nonconformity to the outside world (Hostetler 1997). They refused to participate in war or take oaths, since these acts violated the commandments of the New Testament. Davis writes: “The divine plan of redemption was understood at aiming not just at providing forgiveness of sins but at providing the means actually to live in conformity with the Spirit (or law) of Christ.” (1977: 32)

Mennonite history and U.S. immigration

In 1536, Menno Simons, a Catholic priest in the Netherlands, found the authority of the church tradition and the authority of the Scriptures to be incompatible (Hostetler 1993). He joined the Anabaptists and soon began to preach about the meaning of the Scriptures, emerging as an articulate Anabaptist leader. Simons unified the Anabaptists in the Netherlands, and the group became known as “Mennonites”. His movement spread throughout Europe, emerging in Switzerland, Germany, and France (Towell 2000). As

the convictions of adult baptism, strict pacifism, and the separation of Church and State collided with the prevailing religious and political beliefs, Simons' followers were persecuted and forced underground.

Prior to 1620, Swiss Mennonites sought refuge from political persecution north of Switzerland, in areas known today as Alsace in France, and Rhineland-Pfalz and Baden in Germany (Hostetler 1993). In 1683, however, due to military strife and continued persecution, the Swiss Mennonites began settling near Philadelphia, Pennsylvania (Kraybill and Nolt 1995). The largest migrations of Swiss Mennonites to America took place between 1717 and 1732, when an estimated three thousand came to Pennsylvania (Hostetler 1993).

The Dutch Mennonites first fled to northern Germany, then to Poland and West Prussia. Persecution there led them to the Volka district of the Ukraine in the 1780s, by invitation from Catherine the Great who had just expelled the Turks and needed settlers (Towell 2000). In 1874, however, the first 18,000 migrated from the Ukraine to Canada and the United States, as a result of the threat of assimilation through forced "Russification" of their schools, land collectivization, violent upheaval, and imposed national service (Towell 2000). After the Russian Revolution and World War I, 25,000 more emigrated.

There are some forty different Mennonite groups organized in more than two thousand congregations in North America today (Kraybill & Bowman 2001). Some groups have assimilated into mainstream society, using modern technology, carrying out professional occupations, and dressing in modern clothes (Kraybill & Bowman 2001). Others have retained their traditional separatist lifestyles, rejecting higher education, and

restricting the use of technology. These groups are referred to as “Old Order Mennonites”. Kraybill and Bowman (2001) estimate the adult membership of Old Order Mennonite groups in the United States and Canada at 17,000 compared to an adult membership of other Mennonite groups in the United States alone at 224,000. My discourse on Mennonite social organization will be restricted to Old Order Mennonites, as their way of life relates more closely to the Hutterites.

In Europe, several Mennonite congregations remain, most notably in the Netherlands and in Switzerland, and Mennonites are also found today in Mexico, Bolivia, Paraguay, Belize, and Argentina (Towell 2000).

Amish history and U.S. immigration

The Amish emerged from the Swiss-South German Mennonites in 1693, when a reform-minded elder, Jakob Ammann, who was leading the Mennonite congregations that had migrated to Alsace, instituted a series of reforms (Kraybill and Nolt 1995). Most notably, he proposed celebrating communion twice a year instead of once, and he urged members to practice “shunning” – avoiding excommunicated members in daily life (Kraybill and Bowman 2001). It was disagreement over shunning that ultimately divided the Swiss-South German Mennonites into two separate groups: Ammann’s followers became known as the Amish, whereas most of the other Swiss-South German Anabaptists used the name Mennonite (Kraybill and Nolt 1995).

The first Amish individuals likely arrived in America between 1717 and 1736; in 1737, numerous families that can be established as Amish were passengers aboard the *Charming Nancy* (Hostetler 1993). They were the first Amish to form sizable communities (Kraybill and Nolt 1995). Heavy immigration continued until the 1770s,

when it tapered off, and it was not until the first half of the 1800s, that the second wave of Amish immigration took place (Hostetler 1993).

During this second wave of immigration, between 1816 and 1880, many Amish settled in New Orleans and Baltimore (Hostetler 1993). Once again, economic conditions had played a major role in the decision to emigrate, as well as the realization that American Amish were not persecuted but were prospering. The newly arrived immigrants formed contacts with the existing Amish communities but found these to be more traditional than themselves. Many of the nineteenth-century immigrants' congregations later merged with the Mennonite church (Hostetler 1993).

In Europe, the last congregation dissolved in 1937 (Kraybill and Bowman 2001). European Amish either reunited with the Mennonites or lost their Amish identity otherwise (Hostetler 1993). In contrast, the Amish have flourished in America. In recent years their population has doubled about every twenty years, and in 2001, the Amish lived in more than 250 settlements in the United States and in seven settlements in Ontario, with a total population approaching 200,000 (Kraybill and Bowman 2001).

Hutterite history and U.S. immigration

Hutterite beginnings can be traced back to 1528, when Anabaptist refugees from Tyrol, Switzerland, Austria, Hesse, Bavaria, and Wuerttemberg, who had fled to Moravia, began sharing possessions in common (Hostetler 1997). The Hutterite chronicle describes that this historic occasion marking the beginning of *Gütergemeinschaft* (community of goods) took place in the spring of 1528, when Jakob Wiedemann and his followers decided to pool all their resources (Peters 1965). They were once again forced to migrate, this time from Nikolsburg to Austerlitz. On the way, they spread a cloak on

the ground on which everyone “freely and without compulsion laid his possessions” (Zieglschmid 1943: 87). In time, this feature became the main doctrinal characteristic of this branch of Anabaptism.

The Hutterites owe their name to Jakob Hutter, who was the chief pastor of the Tyrolese Anabaptists (Hostetler 1997). As persecution in Tyrol was very severe, Hutter and his followers fled to Austerlitz, Moravia and joined Wiedemann’s congregation there. After repeated disagreements and disputes among several leaders and the discovery that the practice of common ownership was not always followed, Hutter was elected leader in 1533 and held this position for three years (Peters 1965). He was captured in November of 1535 and was sentenced to death by fire. He died at the stake in Innsbruck on February 25, 1536 (Peters 1965). Hutter had proven decisive leadership and was successful in building an economically durable and socially cohesive Bruderhof organization. No further fragmentation took place; as a social movement, integration had been achieved. The group had moved to an integrated ideology, an integrated social structure, and a homogeneous membership (Hostetler 1997). Hutterite identity was born.

Before Hutter’s execution, in 1535, all Anabaptists who had sought refuge in Moravia were expelled from their villages (Hostetler 1997). Hutter left Moravia for Tyrol, where he knew hiding places. It was on this trip that he was arrested. Most of his followers did not flee during this persecution but went into hiding in the surrounding fields and forests or settled on smaller estates of nobles who hid them secretly. Hans Amon, Hutter’s former assistant, became the new leader until his death in 1542 (Hostetler 1997). Amon had named Leonard Lanzenstiel as his successor who asked Peter Riedemann to share the leadership with him. Riedemann served as co-leader until his

death in 1556; Lanzenstiel remained leader until his death in 1565. Even before his leadership, Riedemann had made his most lasting contribution to the Hutterites: In 1540, he wrote his *Rechenschaft (Hutterite Confession of Faith)* which to this day remains the standard doctrinal interpretation for the Hutterites (Peters 1965). Riedemann's great contribution was his ability to translate Hutter's ideal of total communal life into a practical pattern for the "realization of primitive Christianity" (Peters 1965: 16).

Following this period of Hutterite origins was the golden period in Moravia (1565-1592), when Hutterite communities experienced tremendous growth and expansion (Hostetler 1997). This expansion was partly due to natural increase and partly due to the work of missionaries. Besides increased missionary work, other Bruderhof activities essential to Hutterite identity were formed during this period. These include economic organization, ceramic making, medicinal cures and practices, handicrafts, and the development of education (Hostetler 1997). Schools were developed during the first generation of the Hutterite movement. Every Bruderhof had a "little school" and a "big school"; children were placed in the little school as soon as they were weaned, and they attended the big school from the age of six to twelve (Hostetler 1997). Thus, regarding education and childcare, Hutterites were ahead of their time. It was not for another two hundred years that school attendance for children age six to twelve became mandatory in the Hapsburg empire, and modern preschools were founded 270 years later by Friedrich Froebel in Germany (Hostetler 1997). The religious, cultural, and economic entity of the Bruderhof may be regarded as the most lasting Hutterite heritage of the Moravian period (Peters 1965), and modern Hutterites regard this time as sacred. Hutterite identity was formed.

A time of continuous migrations followed. In 1593, the war between Turkey and the Hapsburg Empire both exhausted Hutterite resources and reduced their numbers. Both Protestant and Turkish soldiers were quartered in the colonies, and soldiers from both sides raided colonies, killing and taking colonists into captivity (Hostetler 1997). In addition, the rise of the Counter-Reformation led to the persecution of the Hutterites. In 1618, the Thirty Years' War broke out, destroying many Hutterite households before, in 1622, all Hutterites were expelled from Moravia. Emigration to Hungary followed. Persistent persecution caused the Hutterites to continue migrating within Eastern Europe: first to Transylvania, then to Wallachia in Southern Romania, and finally to Russia (Peters 1965). It was there, in 1859, that the Schmiedeleut and Dariusleut groups were founded. The Lehrerleut branch did not emerge until 1877 in the New World (Brednich 1998).

The decision to emigrate once again was based on the increased nationalism developing in Russia. In 1864, a law was passed making Russian the language of instruction at all schools and placing all schools under the authority of the state. In addition, compulsory military service was to be introduced within ten years (Peters 1965). As a result, the entire Hutterite population left Russia for North America. The first two groups emigrated in 1874 (Schmiedeleut and Dariusleut), the third one in 1877 (to become Lehrerleut) (Peters 1965). They settled in the Dakota Territory, which later became South Dakota. All other Hutterites who were not living communally also emigrated to America; they became known as the *Prairieleut*, eventually joining various Mennonite groups.

The Hutterites thrived, forming daughter colonies in South Dakota and Montana, until the United States became involved in World War I. Hutterite men were faced with serious harassment in the military service, as they, as conscientious objectors, refused to do any work in the service or wear uniforms. Finally, when four men were tortured for months at Alcatraz, and two died, the decision was made to move to Canada. Colonies were founded in Manitoba and Alberta. During the great depression years and after pacifism was not an issue any more, many colonies moved back to the United States. Today, there are a little over 40,000 Hutterites in more than four hundred and twenty-five colonies found in Minnesota, Montana, North and South Dakota, Washington, Alberta, British Columbia, Saskatchewan, and Manitoba (Kraybill and Bowman 2001, Stahl 2003). No Hutterites have survived in the countries of their origin – Austrian Tyrol and Moravia (Hostetler and Huntington 2002).

Contemporary Social Organization

Mennonites

Like the Amish but unlike the Hutterites, Mennonites own private property. They live on farms and in villages interspersed with mainstream American neighbors, distinguishing themselves through speaking Pennsylvania German (like the Amish) and wearing plain clothes, including a devotional head covering for women (Kraybill and Bowman 2001). Traditionally, Mennonites are farmers, though recently, some have opened small businesses and industries.

Social Life

Old Order Mennonite life is organized in three levels: settlement, congregation, and conference (Kraybill and Bowman 2001). A settlement is the geographical area where members live. The congregation is the basic social and religious unit beyond the extended family. The conference is an organizational unit held together by a biannual meeting of ordained leaders; congregations with a common *Ordnung* participate in the same conference. The *Ordnung*, or “Church Discipline”, is an established system of behavioral rules and plays a fundamental role in preserving the integrity of the community (Lee 2000). It serves to differentiate Old Order Mennonites from mainstream Americans by regulating the way they dress, talk, get from one place to another, marry, earn money, entertain themselves, and relate to the outside world (Lee 2000). Members of a conference must conform to the “Discipline”, or they are expelled from the group.

The Mennonite family and socialization

Large extended families that are organized along traditional lines form the foundation of Mennonite society. The entire family carries out work on the farm, with each child performing their own chores. Typically, men and boys operate the dairy, while the women and girls cook, wash clothing, clean the house, and tend to the yard and vegetable garden (Lee 2000).

Among the Old Order Mennonites, fertility is high. In the Groffdale conference, for example, families average between eight and nine children; about ten percent of the families have twelve or more children (Kraybill and Bowman 2001). Stevenson et al. (1989) state that the fertility levels of the Mennonites are the lowest of the Anabaptists, citing a study by Yoder (1985) that found the mean number of children to be around 3 to

3.4 children per woman. It has to be noted, however, that the populations under study were not Old Order Mennonites, but belonged to more progressive congregations. A positive relationship has been established in several studies between religious conservatism and fertility (e.g., Pollack 1978).

Mennonite children are most commonly born at home, although a few mothers prefer to give birth in local hospitals (Lee 2000). Typically, the mother is the primary caretaker of babies and young children. She depends on the support of her husband, older children, and relatives (Lee 2000). Often, older sisters supervise their younger siblings, and because most farm work is performed close to home, the parents are never far. Older children are often brought along, so that they may learn how to be useful by watching their parents work. Child labor contributes considerably to the economic success of a farm (Lee 2000).

As with the other Anabaptists, Mennonite children are taught from an early age to be obedient and respect authority (Kraybill and Bowman 2001). Parents and community members socialize them to become humble members of the community. Physical punishment is an accepted form of discipline, as with the Amish and Hutterites. Children do not attend day care or kindergarten, and they attend primarily private schools from first to eighth grade.

Amish

Charter and community

Hostetler defines the Amish charter as the fundamental values and common ends recognized by the people and accepted by them. The charter encompasses basic beliefs and a body of tradition and wisdom that guide the members in their daily lives (Hostetler

1993). Central to the charter is the concept of *Gemeinde*, referring to all the connotations of church, congregation, and community. The *Gemeinde* is a redemptive community, capable of enforcing disciplinary measures to ensure purity of life and separation from the world. Thus, members strive for salvation not as individuals but as a community. The regulations by which members of each congregation – local church districts of twenty-five to forty families – live are embodied in the *Ordnung*. *Ordnung* can be roughly translated as “rules and discipline”. As among the Mennonites, it defines expected behavior and imparts distinctive identity by specifying certain forms of dress, placing restrictions on technology, and prohibiting immoral behavior (Kraybill and Bowman 2001). For example, all Amish congregations forbid wearing jewelry, owning a television, or filing for divorce. A congregation’s *Ordnung* is usually passed on by oral tradition and practice; it is known by all its members (Hostetler 1993).

Amish communities are found in various geographic locations, and they are not isolated compounds like Hutterite colonies. Their unique structure is based on the following basic social groupings: the household, which consists of the married couple and their children, the settlement, the church district, and the affiliation (Hostetler 1993). A settlement is composed of Amish families living in proximity to one another. A church district is a congregation; this is the basic social and religious unit beyond the family. Baptisms, marriages, ordinations, and funerals are functions of the district (Hostetler 1993). An affiliation is a group of church districts that have a common discipline and observe communion together; it is an exclusive ceremonial group.

The Amish family and socialization

What makes Amish children so nice is the spanking. – Amish mother

The family is central to Amish life. Its influence dwarfs that of the modern nuclear family, as almost all aspects of Amish life are spent in the context of the home and family. Babies are usually born at home, and much of their free time as children is spent playing at home (Kraybill 2001). It is the home or nearby farm where adults and children work, and where meals are eaten. Important events such as marriage, church services, and death take place at home (Kraybill 2001). Contrary to the Hutterites, where socialization takes place by and for the community, socialization among the Amish is a major function of the family (Hostetler 1993).

Marriage is highly esteemed, and the most important family function after marriage is childbearing. As Kraybill phrases it: “[R]aising a family is the professional career of Amish adults.” (2001: 87) In this agrarian economy, children are an economic asset, and, more importantly, they are viewed as a blessing from God (Kraybill and Bowman 2001). Consequently, fertility among the Amish is high, and they are believed to be among the fastest-growing populations in the world (Ericksen et al. 1979). In 2001, the average family yielded 6.5 children, and slightly over ten percent of Amish families had ten or more children (Kraybill 2001).

Yet, their fertility is considerably lower than that of the Hutterites, especially after age 35 (Population Reference Bureau 1968). This more rapid decline in fertility among older Amish women is attributed to their use of birth control, most notably sterilization (Ericksen et al. 1979). This occurs in spite of an informal prohibition of birth control by the church (Kraybill 2001). Although Niemeyer and Kraybill (1993) state that artificial

means of birth control are rarely used and breastfeeding helps to space the children, Erickson et al. (1979) found that birth intervals were only one to two months longer for intensively breastfeeding mothers. Their study indicates that the majority of Amish women in 1979 terminated breastfeeding before six months and supplemented the infant's diet before three months; exclusive breastfeeding was rare. This, of course, may have changed over time, as infant feeding guidelines have been modified (see American Academy of Pediatrics 2005). Virtually all mothers initiate breastfeeding (Niemeyer and Kraybill 1993), but data on breastfeeding style and duration are scarce.

Amish children are socialized to be submissive and obedient to authority; humility is paramount in shaping members who will support the habits and beliefs that generate community (Kraybill 2001). The Amish distinguish between four stages of childhood: babies (from birth to walking), little children (from walking to entering school), scholars (children between the ages of six and fifteen), and young people (from adolescence to marriage) (Hostetler 1993). As with the Hutterites, the first two years of life are happy ones. The infant receives lots of attention and love and is given permissive care. Contrary to the Hutterites, day cares and kindergartens are not permitted, because children are to be taught by their parents (Kraybill 2001). Restrictions and exacting disciplines are continuously imposed upon the child from age two to adolescence. At the age of four, the child begins to help his parents, and at the age of six, he is given limited responsibilities (Hostetler 1993). Most children attend private Amish schools through the eighth grade, but the family continues to be the primary agent of socialization. At the end of the school years, the individual establishes a certain degree of independence from

family and church in order to experience the outside world. Only then can he reject the outside world and decide whether to join the Amish church (Hostetler 1993).

Hutterites

All Hutterites are descendants from eighteen families; five surnames have since died out, so there are only thirteen traditional Hutterite surnames (Ingoldsby and Smith 2005). Hutterite society is patriarchal, patrilineal, and patrilocal (Hostetler 1997).

True community

And all that believed were together, and had all things in common. – Acts 2:44

The word community is derived from the Latin word *communis* meaning common (Webster's New World Dictionary). Hutterite communities exemplify this original meaning, as all things are held in common. Work is performed without wages for the benefit of the colony, and a householder manages capital earnings (Hostetler and Huntington 2002). Hutterites have few personal possessions (they receive a small monthly allowance, which they may use to buy personal items or gifts), as *Gütergemeinschaft* is practiced. Any items of use are redistributed when a member dies (Peters 1965). Hutterites do have personal property, understood as the right to use what is given to the individual from the colony (Hostetler 1997). This usually includes dishes, furniture, and fabric for sewing clothes. Meals are eaten together in the communal dining room, with the exception of children under age two-and-a-half or three and the two preachers, who eat at home (Hostetler 1997). This communalism sets the Hutterites apart from both the Mennonites and the Amish.

Another distinguishing feature of Hutterite communities is the geographic isolation of colonies due to the ownership of large acreages of land. Physical isolation

reinforces the necessary social isolation for communal long-term survival, which is also strengthened by the distinctive German dialect and dress (Hostetler and Huntington 2002). Hutterites are considered one of the most successful and enduring examples of collective agriculture and communal living (Barkin and Bennett 1972). They are the oldest family communal group in the Western world (Ingoldsby 2001) and have been referred to as a *Dauererfolg* (lasting success) of communal longevity with a life span of 123+ years (Kienzler 2005). The colonies have insulated themselves against the macrosocial system of individuality and capitalism, and they have successfully adhered to their traditional basic institutions of communal property, living, and decision-making. This would not be possible without the geographic isolation due to a large, diversified agrarian economy, but it also would not be possible without the colony's exclusionistic ideology.

Worldview

At the psychosocial level, Hutterite communalism manifests itself through the importance of the will of the community. The believing community represents the will of God, and the will of the individual must be surrendered to it (Hostetler 1997). It is only through unconditional obedience and self-renunciation that the individual may receive the gift of grace from God, the only path to eternal life after death (Hostetler 1997). Hutterites consider themselves God's chosen people and compare the colony to Noah's ark, surrounded by vast numbers of unbelieving people (Holzach 1980). Only those in the ark are prepared to receive eternal life.

Hutterites view the world dualistically, the carnal nature being temporal and bringing spiritual death and the spiritual nature being eternal (Hostetler and Huntington

2002). Thus, they aim to live separate from the carnal world in a divinely created fellowship, where they can succeed in living communally and where God can be properly honored, worshipped, and obeyed (Hostetler and Huntington 2002). God is believed to be an omnipotent, single supernatural being with absolute authority. Self-surrender and not self-development of the individual is the divine order. Carnal tendency can only be overcome by submission to the community; this is accomplished by teaching young children the divine discipline.

Socialization

Hutterite culture is adult-oriented, not child-oriented (Peter 1987). The goal of child rearing is voluntary submission of the child's will to the church community. Thus, the Hutterites have developed a highly institutionalized and effective system of formal education. It includes the *Klein-Schul* (preschool/kindergarten), *Gross-Schul* (German school), *Suntag-Schul* (Sunday school), baptismal instruction, and *Gebet* (daily evening sermons which are attended by all adults and school children) (Hostetler and Huntington 2002). These major levels of instruction correspond to the following age sets:

House children: birth to two-and-a-half or three years. The small child is still fed at home (no formal instruction).

Kindergarteners: two-and-a-half or three to six years. These children attend the *Klein-Schul*.

School children: six to fourteen-and-a-half or fifteen years. These children attend the *Gross-Schul*, the English school (taught by a public school teacher), and the *Suntag-Schul*.

Young people: age fourteen-and-a-half or fifteen to baptism. Boys perform the most challenging physical labor; girls do most of the colony painting. They continue to attend the *Suntag-Schul*.

Baptism (about age twenty) to marriage: Baptism, which signifies membership in the colony, is usually followed fairly closely by marriage.

Marriage and adulthood: The adult man is now eligible for leadership positions; the adult woman produces all the clothing and bedding for the family in addition to carrying out rotating or non-rotating (e.g., head cook) jobs.

Aged: Women usually retire from rotating jobs between the ages of forty-five and fifty. Non-rotating jobs are usually continued until the responsibilities can no longer be fulfilled. Older women distribute the colony allotments and help care for the babies. Men usually transition from economic positions to council positions, so that their conservative influence is constructive rather than impeding economic development that requires constant change. I will now take a closer look at infant and early childhood socialization patterns. Hutterite breastfeeding patterns will be discussed in chapter 4.

Pregnancy and childbirth are given little attention, and they are rarely discussed, even among women (Hostetler 1997). Most children are born in hospitals today, though in some colonies, home births still take place (personal communication). The neonatal period is a very special time for both mother and child; a maternal relative (typically the woman's own mother) comes for four weeks to care for and mother the woman, so that she may, in turn, care for and mother her new infant (Huntington 1981). The new mother is given special foods for the first five weeks, including zwieback, omelets, rich chicken soups, milk puddings, and chicken roasted in butter (Hostetler and Huntington 2002). She

is relieved of all colony work for six weeks and gradually resumes colony responsibilities until the infant is thirteen weeks old, when she once again becomes a full participant². Hutterite women rarely bring their house children along when they are doing colony work, thus a babysitter (*Sorgela*) is chosen to care for the child. This is usually a girl between the ages of ten to fifteen (Hildebrand 1993), although she may be as young as six or seven, if she is responsible (Wilson 2000). For the next two-and-a-half or three years, the colony schedule sets the times the infant will be fed, played with, left alone, and when he should sleep. This strongly affects infant feeding patterns, as I will discuss in chapter 4. When it is time for church or the adult meal, the parents leave, and the infant is placed in his crib (Huntington 1981). Only when the infant is old enough to climb out of the crib, is he watched by a babysitter during those times (Hostetler 1997).

The child's life changes dramatically when he turns two-and-a-half or three. He now enters the *Klein-Schul* and finds himself falling from a desirable position to the very lowest. This age set experiences the most restricted, most regimented, and least varied program (Huntington 1981). Riedemann states in his influential *Hutterite Confession of Faith*, translated by Friesen:

Our practice is as follows. After the child is weaned, the mother takes the child to school. Women, recognized as competent and conscientious in this task, have been appointed by the church to care for the children. As soon as the little ones can speak, they are taught about God's Word and learn to speak God's Word. They are also taught about prayer, and such things as children can understand. The children remain with these women until their fifth or sixth year, that is, until they are able to learn to read and write. (Friesen 1999: 151)

Children have to memorize Bible quotations, songs, moral tenets, and other religious material. Other aspects of socialization in the *Klein-Schul* include discipline,

² At Mountain Hill Colony, a new mother resumes full colony responsibilities at ten weeks.

modesty, respect for elders, sensitivity to others, pacifism, sense of duty, and obedience (Peter 1987). One of the main objectives is to break the will of the child (Hildebrand 1993). Huntington quotes one *Klein-Schul* mother who was swatting a child for licking his boot: "He's only three years old and still very young. He'll need many *britschen* before his will is broken." (Huntington 1981: 40) The kindergarten child is introduced to his peer group and taught how to function within this group by learning how to tolerate a limited, restricted environment and by being rewarded for cooperative, docile responses to correction and frustration (Hostetler 1997). He now starts to form his identity as a member of the group.

Conclusion

The reader is now familiar with Anabaptist history and has a general understanding of Mennonite, Amish, and Hutterite social organization. My discussion of the social organization of the three groups has focused on socialization, being closely connected to my interest of infant feeding practices. Hutterite socialization for the greater good of the community is intimately linked to issues of survival, both cultural and economic. Thus, the rigid child-rearing practices of the Hutterites, including scheduled infant feeding patterns, reflect both the necessity of mothers to adhere to their strict work schedule and the necessity of children to learn their submissive position as individuals.

CHAPTER TWO

Theoretical Framework: Human Behavioral Ecology

In this chapter, I will provide an overview of the theoretical paradigm underlying this thesis. Adhering to a biocultural approach to the study of infant feeding practices, I am attracted to models, which combine biological and sociocultural aspects. Human behavioral ecology is such a model, addressing the significance of cultural behaviors in modern humans from an evolutionary standpoint. Belonging to the rubric of biocultural approaches, human behavioral ecology is well applied to the study of breastfeeding, an exemplary biocultural phenomenon. The interrelationship between biology and culture becomes apparent, when analyzing such complex issues as IMS. These cannot be adequately understood without taking both biological and cultural components into account. The focus on the mother's perspective of this thesis is another characteristic of a biocultural framework.

Evolutionary ecology is the application of natural selection theory to the study of adaptive design in ecological context. When the features under examination involve human behavior, the term *human behavioral ecology* is used (Winterhalder and Smith 1992). Its main concern is to discover the ways in which the behavior of modern humans reflects our species' history of natural selection (Cronk 1991a). Natural selection is defined as "a difference, on average, between the survival or fecundity of individuals with certain phenotypes compared with individuals with other phenotypes" (Freeman and Herron 2004: 775). How can a concept so biological in nature be applied to the social sciences and the study of human behavior in particular? Frankly, the behavior of an animal is a strategy of survival (Foley 1987); human behavioral ecology is the study of

the survival value of behavior. Behavior is a response to the constraints and requirements of ecological conditions; behavioral ecologists investigate the extent to which behavior enhances survival and reproduction.

The evolutionary biological study of human behavior has many designations. It is also called biosociology, biocultural science, biosocial science, human ethology, sociobiology, socioecology, evolutionary biological anthropology, and evolution and human behavior studies (Cronk 1991a). Though there are differences in foci, these disciplines share an interest in a variety of topics. These range from the logic of different systems of production, the relation between subsistence and social relations, the causes of variation in gender roles, the problem of collective action in nonstate societies, the forces generating equality and inequality, to the relationship between culture and natural selection (Smith and Winterhalder 1992). More specifically, typical areas of research are population regulation, foraging, reciprocity, redistribution, kinship, marriage, descent, childcare, and sociocultural change (Cronk 1991a).

First, I will provide the reader with a background in human behavioral ecology, including its historical origins, and a brief explanation of its theory and method. Then I will discuss one of the two main subjects of human behavioral ecology: reproductive effort. The other main, original area of interest to human behavioral ecologists - foraging strategies - will not be explored, as it does not directly relate to my research questions. A discussion of the significance of breastfeeding within an evolutionary context will conclude this chapter.

Principles of Human Behavioral Ecology

Historical origins

Styles of thought both evolutionary and ecological in nature predate the formation of an integrated theory of evolutionary ecology. Darwin himself could be considered the first evolutionary ecologist, as his formulation of the concept of natural selection is the basis of evolutionary ecology. Neo-Darwinism is thus the theoretical foundation of human behavioral ecology (Winterhalder and Smith 1992).

More recent forerunners of human behavioral ecology can be categorized into three main traditions: the evolutionary biological approach to animal behavior that developed in the 1960s and 1970s; earlier types of ecological anthropology; and the development within anthropology of actor-based, methodologically individualistic approaches and the use of game theory (Cronk 1991a). Ethology, which had previously been concerned mostly with the immediate functions and proximate determinants of behavior, and population biology, which had developed theoretical models of the natural selection of behavior, contributed to the formation of the evolutionary biological approach. This new approach became interested in topics such as theories of reciprocity, parental investment, foraging strategies, and mating systems (Cronk 1991a). The debate over levels of selection and Hamilton's theory of kin selection were instrumental in this development.

Cultural ecologists such as Steward, Carneiro, and Netting established the relationship between human societies and their environments as an important area of study; this is the foundation of the ecological study of behavior. In the *Handbook of the South American Indians*, Steward writes:

Potentialities are a function of the local ecology, that is, the interaction of environment, exploitative devices, and socioeconomic habits. In each case, the exigencies of making a living in a given environment without a specific set of devices and methods for obtaining, transporting, and preparing food and other essential goods sets limits to the dispersal or grouping of the people and to the composition of settlements, and it strongly influences many of their modes of behavior. (Steward 1949: 674)

The focus on individual-level selection and strategies of individual organisms in evolutionary biology and animal behavior studies coincided with a similar development in anthropology, which paved the way for the formation of human behavioral ecology. Barth and Bailey's studies are examples of this integrated approach. Barth's social exchange approach is similar to reciprocity theory, and Bailey's use of the game metaphor is similar to the use of game theoretical models in evolutionary biology and animal behavior studies (Cronk 1991a).

Theory

First, we need to define "environment", as its role in human behavioral ecology is paramount. Several definitions are possible. Geist defines it as "the sum total of factors impinging on an organism" (Geist 1978: 18). A more specific definition to which most behavioral ecologists subscribe is everything external to an organism that impinges upon its probability of survival and reproduction (Winterhalder and Smith 1992). It can be physical, biological, or social; thus the environment includes individuals' cultural and social situations. A distinction is made between *strategic* and *parametric* environmental contexts (Elster 1986). In strategic contexts, the consequences of a behavior depend on the frequency of that behavior and alternative behaviors in the population; there are no truly independent variables in the analysis. Typically, an individual's social environment is a strategic one. Strategic processes are studied using the concept of evolutionary stable

strategies, with concepts and models that are based in game theory (Winterhalder and Smith 1992) (see below). Decisions made in a parametric context, on the other hand, do not yield different outcomes depending on their own frequency, and independent variables may be deterministic or probabilistic. Typically, the physical environment is a parametric one. Parametric situations can be analyzed with simple optimization models (Winterhalder and Smith 1992) (see below).

The attention of evolutionary ecology to the great complexity of an individual's environment distinguishes it from sociobiology. Thus, evolutionary ecology models predict diverse and flexible behavior, contingent on localized and often changing conditions. Variations in human behavior are seen as expressions of a human genotype that is essentially similar across human populations, but that has endowed humans with psychological predispositions, mental capacities, and physical abilities that have tended to be adaptive in the environments of human evolution. The ability and propensity to vary behavior in response to environmental differences is itself an adaptation (Irons 1979). Human behaviors are seen as phenotypes that are the combined outcomes of interactions between genes and environments; our capacity for culture is seen as an outcome of our evolutionary history (Cronk 1991a).

The principle of natural selection is the foundation of human behavioral ecology. I will provide a quick overview of the basic premises of this concept. Elaborating on the one-sentence definition above, the process of natural selection requires three conditions: There must be phenotypic variation; some of this variation must be heritable; and variants must differ in their ability to survive and reproduce (Smith and Winterhalder 1992). Phenotypic variation among humans may be due to differences in genotype, the

environment, or culturally acquired information. If it is not attributable to differences between the environments of individuals and is transmitted to offspring, even by non-genetic means, it is said to be *heritable*. The lower heritability is, the slower or less effective selection will be. As a result of natural selection, less “fit” variants will be replaced by those with higher rates of replication.

So what is “fitness”? Mills and Beatty define the fitness of an organism as “its *propensity* to survive and reproduce in a particularly specified environment and population” (1984: 42). Thus, fitness refers to the *expected* number of descendants rather than the *actual* number of descendants, which might be influenced by factors unrelated to adaptive design. An organism’s fitness is the product of interactions between the environment (including other organisms) and the organism being studied (Smith and Winterhalder 1992), and it is this interrelationship that evolutionary ecologists and human behavioral ecologists are interested in.

Behaviors can be explained in a variety of different ways. Proximate explanations consider the physiological and psychological mechanisms; ontogenetic explanations focus on the life course of behavioral patterns; ultimate or distal explanations illustrate the adaptive significance of behaviors; and phylogenetic explanations demonstrate the evolutionary histories of traits (Cronk 1991a). Human behavioral ecology concerns itself mainly with the ultimate causes of behaviors by examining their reproductive consequences in living populations and by determining their adaptive significance for our ancestors. Proximate explanations are needed for these analyses, but increasingly, an integrated approach of explanations at different levels of causation is sought by behavioral ecologists.

Method

The general research strategy for evolutionary ecologists is the hypothetico-deductive method, which involves a cyclical movement between the creation of abstract models and their testing against the empirical evidence (Winterhalder and Smith 1992). Simple models, such as optimization models and games, are used, as they define the problem, organize thought about it, understand data, test the understanding, and make further predictions (Winterhalder and Smith 1992).

Optimization studies are especially appropriate when analyzing causal and functional accounts of behavior (Krebs and McCleery 1984). Optimization models are created around a hypothetical actor who is faced with a range of behavioral options and a set of constraints. The actor's success is measured in terms of a currency, often reproductive success, and his strategies - the tactics for optimization of benefits - are analyzed. This method allows researchers to generate testable hypotheses about the actor's options, constraints, and goals (Cronk 1991a). Optimization models are easiest applied when the actor's environment is relatively fixed regardless of the actor's own behavior. They have been used most extensively to analyze foraging behavior, as the components of cost and benefit in simple foraging models are relatively easy to measure using standard techniques, and closely related problems have been studied by psychologists, providing an additional extensive data base (Krebs and McCleery 1984).

Game theoretical models are used when the actor's environment consists largely of other actors whose behaviors are contingent upon the actor's own behavior (Cronk 1991a). In this milieu of social interactions, selection operates in a reflexive manner: The fittest strategy must do well in competition with itself, not just in competition with other

strategies (Smith and Winterhalder 1992). Evolutionarily stable strategies (ESS) play an important role in evolutionary game theory. The principal idea in ESS theory is that the outcome favored by natural selection depends on which alternatives are unbeatable over evolutionary time rather than on which has the highest average payoff (Smith and Winterhalder 1992). When a common strategy in a population cannot be replaced by specified alternative strategies, then it is an ESS.

Evolutionary Ecology of Human Reproduction

Reproduction takes place in a behavioral ecological context, as reproductive preferences and decisions of individuals are influenced to a great degree by their personal life circumstances. The subset of evolutionary ecology termed evolutionary reproductive ecology studies the biological evolution of diversity and variability in reproduction. It focuses on the adaptive function of reproductive differences in diverse biographical, social, cultural, historical, and ecological contexts (Voland 1998). Reproductive effort is divided into three categories: mating effort, parental effort, and nepotistic effort. I will take a brief look at each, elaborating on parental effort.

Mating effort

Mating systems are the outcome of interactions between male and female strategies; mating effort comprises the stakes of an organism in intra- and intersexual competition (Voland 1998). Analyses of mating effort include the following topics: causes of polygamy and monogamy, variations in marriage transactions, divorce, sex differences in mate preferences and sexual behavior, physical sexual dimorphism, sex differences in spatial ability, and sociocultural change (Cronk 1991a). Variability in

mating systems is the outcome of adaptive adjustments of males and females to the specifics of their social and ecological environments, as well as to variations in individual capabilities (Borgerhoff Mulder 1992). To illustrate the applicability of human behavioral ecology to the analysis of mating effort, I will cite two studies examining polyandry.

Among Tibetans, fraternal polyandry is a means of dealing with a shortage of arable land and a lack of economic options (Cronk 1991a). However, younger brothers often partition their marriage, as they suffer reproductively from the arrangement. In a Tibetan community in northwestern Nepal, two observations have been made: First, the more evenly a set of brothers' wealth is invested across economic spheres, the less likely they are to partition and remarry monogamously. Second, wealth increases the probability of partitioning, particularly in low-diversity households (Haddix 2001).

Another study involving polyandry in Nepal investigated the demographic consequences of this kind of marriage arrangement. Polyandry inevitably leads to "excess women" who are excluded from reproduction. The result of polyandry, then, is reduced total fertility rates and population growth maintenance at very low levels (Haddix and Gurung 1999).

Parental effort

The fascinating topic of parental effort has received much attention from human behavioral ecologists. It designates the efforts directly linked to producing and raising offspring (Volland 1998). Major areas of research are sex-biased parental investment, inheritance practices, paternal behavior, parent-offspring conflict, acculturation practices, and adopting out as a parental strategy (Cronk 1991a). Fertility also falls under this category.

Parental investment is defined as any parental action that increases the fitness of offspring at the cost to some aspect of parental fitness, including costs to fecundity and mating success, health and survival, and costs to the fitness of other offspring or relatives (Clutton-Brock 1991). The range of possibilities exhibiting differences in parental care includes intrauterine care of the embryos and fetuses, abortion and infanticide, postnatal parental care, upbringing and education, endowment with social opportunities, and material endowment through dowry or inheritance payments (Voland 1998). The focus of this paper will be immediate postnatal parental care, which primarily includes breastfeeding.

But what are the underlying causes for variations in parental investment? Voland (1989) maintains that such differences are the results of specific ecological experiences of the population. He argues that the degree of fatalism or responsibility with which parents regard their newborns depends on the amount of stress (e.g., epidemics, wars, subsistence crises) the population has been exposed to. Thus, differential parental effort could be interpreted as a biological adaptation to the more or less severely fluctuating environments, and cultural norms and models for reproduction and investment have an eminently biological function: They support parents in their striving for fitness maximization. I will now further analyze sex-biased parental investment, one of its manifestations being sex-biased lactational practices.

Sex-biased parental investment is often explained by the Trivers-Willard model. This model states that if the condition of mothers during the period of parental investment correlates with the probable reproductive success of their offspring, natural selection should favor the ability of parents to adjust their investment in the sexes to favor the sex

with the best reproductive prospects (Dickemann 1979). Both male- and female-biased parental investments exist, and I will limit myself to a brief analysis of female-biased parental investment.

Cronk (1991b) contents that the Trivers-Willard model does not provide acceptable explanation for female-biased investment among some societies. He maintains that female biases in parental investment may also exist wherever females are more economically productive than males, attract large bridewealth payments, are used in direct exchange mating systems, or where fathers, sons, and brothers are the main competitors for the resources required for mating (Cronk 1991b). Margulis et al. (1993), studying the Hutterites, argue that this community's collective social and economic system, which results in low variance in resources among individuals, leads to a lack of male-biased care. Rather than sex-unbiased investment, however, female-biased investment through longer lactational duration was observed in their study. This phenomenon is explained by the theory of local resource enhancement, as daughters traditionally assist their mothers with childcare and other household duties and are thus a more valued asset to the mother (Margulis et al. 1993). Another study exploring the role of breastfeeding in sex-biased parental care was conducted by Scott and Duncan (1999). These authors found that the elite class of a historic population in northern England favored daughters by wet-nursing them for an average of eight months, whereas sons were breastfed by their mothers for an average of two months only and given supplementary foods earlier. However, Scott and Duncan assume that this investment strategy was probably meant to be male-biased (1999).

Fertility is another major area of interest among human behavioral ecologists. One might expect that natural selection has designed humans to maximum fertility. However, fertility and genetic fitness do not necessarily correlate. The biological evolutionary process cannot favor both maximum fertility and maximum offspring fitness (Voland 1998). Consequently, there is a trade-off between the quantity and the quality of offspring. This optimal quantity/quality balance is shaped by a series of factors affecting both the costs and benefits of parental investment.

Dramatic changes in demographic patterns, such as the “demographic transition” and the observable fertility decline of the Hutterites, stir much controversy over their underlying mechanisms. Voland (1998) maintains that from an evolutionary ecology perspective, these population effects are the consequences of numerous adaptive individual decisions and not the manifestation of biological self-regulation, as is often argued (e.g., Lee 1994). In view of the “selfish gene”, arguments such as group benefit, preservation of the species, and ecological balance cannot be biologically evolved motives of animal or human behavior. Thus, there is neither a proximate mechanism nor an ultimate cause for population self-regulation (Voland 1998).

Nepotistic effort

Nepotistic effort refers to the investment made in the reproduction of genealogical sidelines (Voland 1998). Indirect reproduction is accomplished through helping kin reproduce. Selection will favor such behavior when the costs to the actor in terms of reproduction are less than the benefits to the recipient (Cronk 1991a). Humans are generally nepotistic; adoption provides us with an example of inclusive fitness theory. Adoption practices in Oceania and the North American Arctic, for example, fit a number

of theories derived from the theory of kin selection. In these societies, children are exchanged among kin, and surviving parents often maintain contact with their children after adoption (Silk 1990).

Even in situations where aid to consanguineal kin is given through intermediaries, such as affinal kin, nepotism theory can be applied. Although affines do not share genes by common descent, they share a genetic stake in their common descendants and are thus expected to cooperate (Hughes 1988).

The Evolutionary Significance of Breastfeeding

The essential characteristic of a mammal is not the capacity for gestation, but the further manifestation of maternal care, the possession of mammae to secrete milk for the young. – Alan Parkes (1966)

Lactation is an extremely ancient physiological function, probably dating back some 200 million years, certainly antedating the evolution of placental gestation (Jelliffe and Jelliffe 1978). The existence of many thousands of species in the mammalian class attests to the functional value and adaptability of lactation. “Adaptive suckling” refers to the modification of the process of nursing, the composition of the milk, and the “lactatory apparatus” to suit the needs, circumstances, and way of life of the particular species (Jelliffe and Jelliffe 1978). In all mammals, lactation constitutes the most energetically costly form of postnatal parental care (Prentice and Prentice 1988).

A biocultural, evolutionary framework acknowledges that there are both biological and cultural components to human behavior. This is exemplified by the study of breastfeeding. Stuart-Macadam explains: “Breastfeeding is the ultimate biocultural phenomenon; in humans breastfeeding is not only a biological process but also a

culturally determined behavior.” (1995: 7) Breastfeeding practices must be understood from an evolutionary perspective, and they are often manifestations of adaptive behavior. The biocultural, evolutionary approach to the field of breastfeeding encompasses a variety of topics. These include the evolution of infant feeding, infant feeding variations as strategies of sex-biased investment (see above), the cultural ecology of breastfeeding and weaning, the analysis of parent-offspring conflict, and the applicability of research undertaken from this framework to issues of public health. I have already examined sex-biased investment, and I will investigate the other topics below.

The hominid blueprint for infant feeding

What is the underlying biological basis for breastfeeding and weaning behavior in modern humans? The evolutionary role in infant feeding becomes apparent beginning at birth. The period immediately following birth has been influenced by natural selection to favor mechanisms, hormonal and otherwise, which insure that each mother-infant dyad has optimal opportunity to initiate breastfeeding and its accompanying bonding process (Trevathan 1987). Without this bonding, survival was unlikely in the past, and today, successful breastfeeding depends heavily on its initiation within the first hour after birth. Subsequent breastfeeding style and duration have also been shaped by evolution.

Breastfeeding style

Two main distinctions are made with respect to breastfeeding style and timing: demand-feeding³ and scheduled feeding. Demand-feeding means “that an individual nursing couple is encouraged to settle on the pattern or routine that suits them best.”

³ “Demand-feeding” can have negative connotations. Other terms, such as feeding “on cue” (Small 1998) and “baby-led” feeding (Woodridge 1995) have been proposed. As there is no uniformity of agreement, and “demand-feeding” has gained widespread acceptance and usage, I will use this term.

(Woodridge 1995: 219). Woodridge (1995) goes on to clarify that this means the infant becomes the principal determinant of when a mother initiates a breastfeed, and the infant's behavior is the most specific cue in regulating the process. Scheduled feeding implies that some arbitrary, external, or culturally prescribed definition of what constitutes an acceptable feeding regimen has been imposed on the nursing couple (Woodridge 1995).

Shaul (1962) has demonstrated that there is a direct relationship between maternal food getting procedures and the composition of an animal's milk. Primates are classified as animals whose young are near them at all times. This group's strategy is the easy accessibility of mother and milk and frequent feeding of the young. Consequently, the milk composition in this group is dilute, with a low fat and protein content. An analysis of human milk confirms this composition (Shaul 1962). Human milk is specifically adapted to the needs of an infant who will be able to nurse for a few minutes several times an hour (Hrdy 1999). Thus, the pattern of continuous contact and feeding has been selected for.

Infants born to early hominids were indeed in constant access to their mother's nipples, as they must have been carried all the time. It can be assumed that during 99 percent of human history, as nomadic hunter-gatherers, infants slept with their mothers and fed frequently throughout the day and night (Small 1998). Studies of breastfeeding among contemporary hunter-gatherers, who likely exhibit a lifestyle close to our early ancestors, confirm an intense style of infant feeding. !Kung infants, for example, feed every thirteen minutes on average, although each feeding lasts for only a minute or two (Konner and Worthman 1980). They also nurse frequently at night, even when the mother

is asleep (Short 1984). Humans' closest living relatives, the chimpanzee and the gorilla, also suckle their young several times an hour in the wild and sleep with them at night (Short 1984). It has become clear that demand-feeding is the biological norm for humans.

Breastfeeding duration

Dettwyler (1995) dedicates the chapter *A Time to Wean⁴: The Hominid Blueprint for the Natural Age of Weaning in Modern Human Populations* to this inquiry. Based on an examination of comparative non-human primate data, she suggests the range of weaning age for humans to be between 2.5 and 6 years (Dettwyler 1995). This broad range is due to various methods used by Dettwyler to estimate natural weaning age: by gestation length, as a function of birth weight, adult weight, or adult body dimension, or by timing of eruption of first permanent molar. Accordingly, she advocates that medical professionals and the general population recognize that human children are designed to expect all the benefits of breastfeeding for a minimum of 2.5 years. Thus, three or four years of breastfeeding, or even longer, is both normal and appropriate for human infants; this information needs to be disseminated to health care professionals and parents.

An evolutionary perspective allows us to realize that “natural selection has favored those infants with a strong, genetically-coded blueprint that leads them to expect nursing to continue for a number of years after birth, and that results in the urge to suckle remaining strong for this entire period.” (Dettwyler 1995: 65) Short (1984) clarifies that genetically humans are still hunter-gatherers, as plant and animal domestication are too recent to have had any appreciable effect on the human genetic makeup.

⁴ In this context, Dettwyler uses the term “weaning” to denote the final cessation of breastfeeding.

The cultural ecology of breastfeeding and weaning

In any given context, a range of cultural-ecological determinants of breastfeeding practices exists. The physical, social, ideological, and political environments that define a given culture all affect maternal decisions about breastfeeding behavior. Breastfeeding supports and constraints within the physical ecology are linked to subsistence patterns, maternal workload, lactation, and reproductive patterns (McDade and Worthman 1998). I will now take a closer look at the relationship between modes of subsistence and modes of breastfeeding.

Yovsi and Keller (2003) compare parental ethnotheories in two groups with different subsistence strategies of rural Cameroon: the sedentary Nso farmers and the nomadic Fulani pastorals. Differences in their breastfeeding behaviors are related to secondary socialization goals, which are assumed to differ according to different modes of subsistence (for a similar discussion, see below, Fouts et al. 2005). Whereas the Nso displayed more tight body contact, maternal concentration or involvement, and tactile stimulation, the Fulani demonstrated more distance and less affection with their infants during breastfeeding (Yovsi and Keller 2003). The authors conclude that these contrasts are indicative of cultural values that are adaptive for the child in the particular ecological and cultural environment.

Weaning

Weaning is a complex concept. "It is a process involving both the ecological transition from mother's milk to other foods (which are symbolically loaded, socially embodied sources of nutrition) and the sociobiological transition from attachment to the mother to attachment to other individuals." (Sellen 2001: 3). The second part of this

definition is often overlooked, and weaning is considered to be of merely nutritional consequence. Yet, it is an interactive process that also involves behavioral change, not only by the mother-infant pair, but also by other individuals.

Fouts et al. (2001) demonstrate that the concept of weaning needs reformulation. Their study among the Bofi foragers of Central Africa revealed that other adults besides mothers were involved in the weaning process as well. Weaned children in their sample spent 32% of the total observation time, on average, in physical contact with adults other than their mothers (Fouts et al. 2001). These were mainly fathers and maternal grandmothers. Thus, the authors question underlying assumptions about weaning practices in western scholarly literature, one of which presumes that weaning is a process involving mothers and infants exclusively.

The relationship between age at weaning and subsistence is often explained with the “weaning food availability hypothesis”. It predicts that “introduction of foods other than breast milk and cessation of breastfeeding will tend to occur at earlier ages in populations with greater access to regularly available, easily digestible, nutrient-rich foods appropriate for weaning with minimum health risk to the child.” (Sellen and Smay 2001: 49). Consequently, it is assumed that weaning occurs earlier in agricultural and pastoral populations, because dairy and cereal production increase the availability of easily digestible, nutrient-rich foods appropriate for weaning. However, an analysis of the available data on weaning practices in pre-industrial populations demonstrates that this is not the case. Sellen and Smay (2001) discovered that indicators of the broad timing of the transition to non-breastmilk foods, the general qualities of these foods, and the style of feeding were not considerably different among populations grouped by mode of

subsistence. Several studies of contemporary populations, however, indicate that differences in breastfeeding behaviors exist among groups with different subsistence strategies (e.g., Yovsi and Keller 2003, Fouts et al. 2005).

The importance of maternal attitude toward breastfeeding, and weaning in particular, becomes transparent when looking at the nomadic Turkana pastoralists of Kenya. Their weaning patterns are investigated from the perspective of human adaptation. Gray writes: "Because the choice of strategies for each component of the weaning process depends on the operating environmental constraints, reproductive demands on women, and prevailing levels of infant and weanling mortality, it is appropriate to examine weaning practices as human adaptive strategies (1996: 437). She argues that problematic aspects of weaning practices in Turkana, such as premature introduction of supplemental foods and abrupt termination of breastfeeding, represent rational strategies for enhancing reproductive success in this stressful environment. These weaning practices have evolved from the necessity of reconciling the needs of the breastfeeding child with the demand of the next pregnancy (Gray 1996). This leads us to the next topic: parent-offspring conflict.

Parent-offspring conflict

The theoretical foundation of parent-offspring conflict is as follows: The infant is 100 percent related to itself but only 50 percent related to its mother. Thus, the infant bears only 1/2 of the costs of parental investment and can be expected to attempt to extract longer and more intense care than the parent (usually the mother) wants to provide (McDade 2001). Put simply: "After all, milk is energetically costly to produce, and at some point, the mother will do better in terms of her own fitness if she stops investing in

her current child and prepares to put precious resources into another.” (Barash 2001: 171). For the mother, the cost of lactation continues to rise, while for the infant, the benefit of lactation eventually begins to decline. Ultimately, their interests coincide again, when the fitness costs to the mother are more than twice the benefit to the infant, as the infant also has an interest in the mother’s investment into current or future siblings, to whom it is 50 percent related (McDade 2001).

The costs and benefits given in table 2.1 are not fixed in the human species; they are sensitive to a range of environmental and social cues, and they shift across time and

Table 2.1 Costs and Benefits of Exclusive Breastfeeding for Mothers and Infants (McDade 2001)

Benefits to Infant

- Nutrition
Supplies appropriate macro- and micronutrients
Promotes fluid and electrolyte balance
- Developmental regulation
Provides growth factors and regulatory hormones
- Health
Nearly pathogen-free
Delivers anti-microbial agents (nonspecific and specific immune factors)
- Birth spacing
Lower morbidity
Higher quality of care
- Attachment
Promotes maternal-infant bond, maintains maternal attentiveness

Costs to Mother

- Energetic (2,000 – 3,000 kJ/day for milk production)
May contribute to “maternal depletion”
 - Constraints on activity
 - Suppressed ovarian function/fecundity
-

place. The locally defined costs and benefits of breastfeeding are weighed against each other to set up the timing and duration of weaning conflict (McDade 2001). A prolonged period of conflict can be predicted when the benefits of breastfeeding to the infant are high, and maternal costs of breastfeeding are also high. This scenario is common in many

developing countries, where infant infectious disease risk is high, and the risk of maternal depletion due to undernutrition is also high. On the other hand, a shortened period of conflict can be predicted when the benefits of breastfeeding are relatively low, and maternal costs of breastfeeding are also low. This may be the case in developed countries with low occurrence of infectious disease and maternal over- rather than undernutrition (McDade 2001).

The reality of parent-offspring conflict among two populations of Central Africa, the Bofi farmers and the Bofi foragers, is investigated by Fouts et al. (2005). They examined children's responses to weaning⁵ and discovered that differences in child care practices associated with weaning contributed to considerable variation in these responses. Bofi farmer children were weaned abruptly between 18 and 27 months and exhibited high levels of fussing and crying. Among the Bofi foragers, children initiated weaning between 36 and 53 months and showed no marked signs of distress (Fouts et al. 2005). As parent-offspring theory predicts, children who nursed infrequently and children with pregnant mothers exhibited higher levels of fussing and crying than other children, confirming that children compete with their siblings (unborn infants) to maintain maternal investment (breastfeeding).

⁵ Fouts et al. use the term "weaning" to denote the final cessation of breastfeeding.

Relevance to applied research

While millions survive without ever having tasted their mothers' milk, many more millions depend on it for a better chance to live. The influence of appropriate weaning practices on health and well-being has increased to a degree perhaps unprecedented in human history. Compared with the past of our foraging ancestors, the differential consequences of weaning practices emerge as one more marker of an increasing divide between the "haves" and the "have-nots" in our species. – Daniel Sellen (2001)

In the developing world, patterns of breastfeeding, weaning, and young child care crucially influence the health, growth, and intellectual development of children and the health and survival of their younger siblings and their mothers (Pelto et al. 1999). In the developed world, patterns of breastfeeding, weaning, and young child care are associated with infection rates among preschool children, jaundice, and Sudden Infant Death Syndrome (SIDS) (Sellen 2001). Thus, even in western industrialized nations, breastfeeding may have a direct survival value. It has been observed cross-culturally, that breastfeeding and infant-parent co-sleeping protect against SIDS (McKenna and Bernshaw 1995). Consequently, even under optimal conditions, young child care and feeding practices would be enhanced if we could better specify infant reaction norms and quantify the long-term phenological response to different combinations of environment and caregiver input (Sellen 2001).

Applied research aimed at developing strategies for health intervention must take an evolutionary perspective into account. It is only from a Darwinian standpoint, that measures of the influence of all the key participants can be successfully integrated and that variables relevant to the process of weaning can be stated (Sellen 2001). Evolutionary analyses challenge health researchers to recognize fitness maximization as a motivating force in health-related behavior. Thus, practitioners can evaluate how the

social and economic costs to mothers of “ideal” infant feeding practices are weighed against the clinical benefits to children in different settings.

Biocultural models also bring to attention the fact that gains in infant health may come at the expense of maternal well-being, whereas biomedical research has focused mostly on child health. Both mother and infant benefit when the net costs of breastfeeding are reduced. When taking into account local breastfeeding costs and benefits, as well as supports and constraints, this can be accomplished, and trade-offs can be anticipated, so that action can be taken to lower breastfeeding costs, such as increasing maternal nutrition (McDade 2001). Any health intervention that seeks to promote recommended breastfeeding practices needs to consider the consequences of maternal depletion and mobilize to limit maternal burden (McDade and Worthman 1998).

Optimal infant feeding choices depend on the specific ecological conditions and must be sought through biocultural modeling of these conditions. A biocultural, evolutionary framework enables us to make rapid *in situ* assessments of which variables have the highest local importance and should, therefore, receive priority in designing programs and interventions (McDade and Worthman 1998).

Conclusion

This chapter provided a summary of human behavioral ecology’s basic premises, with an emphasis on reproductive strategies. The role of breastfeeding, in particular, has been examined with respect to biocultural, evolutionary models. Applying these models, I argued that there is an evolutionary basis for demand-feeding, and that this breastfeeding style has been selected for by natural selection.

A biocultural framework will provide the foundation for my analysis of Hutterite breastfeeding practices. My study will illustrate the complex interrelationship between human behavior and its environment, as Hutterite infant feeding patterns are very much influenced by ecological constraints. The resulting biological feedback loop between feeding frequency and milk production will be examined in the Hutterite context. In the next chapter, I will take a look at how the social milieu of a given population affects infant feeding choices.

CHAPTER THREE

Determinants of Breastfeeding Behavior

This chapter will focus on the socio- and biocultural contexts of breastfeeding. It is paramount that cultural influences are understood, so that policies can be developed which are culturally appropriate and thus accepted by a particular population or sub-population. Although my research among the Lehrerleut Hutterites has no direct applied consequences, I hope that my findings will contribute to a greater understanding of how infant feeding decisions are made in diverse socio-cultural contexts. This knowledge can then be utilized to improve maternal and infant health. Thus, this thesis is written from an applied standpoint.

Different factors play a role in the decision to initiate and continue breastfeeding. An understanding of these different variables is needed for guidance in interventions aimed at promoting initiation and longer full and partial breastfeeding. These determinants can be classified differently. Adair et al. (1993) divide factors affecting the duration of breastfeeding into the following categories: biological, sociodemographic, health sector, and food industry. Infant feeding determinants may also be grouped according to biological, socio-behavioral, and biocultural factors (Allen and Pelto 1985). As this categorization is based on a biocultural framework, which I share, I will loosely adhere to it. In addition, I will briefly survey health sector and food industry factors. Biological factors are included in table 3.1 but will not be further discussed, as most of them *per se* cannot be modified by external forces. Since the focus of this paper is of an applied nature, I will concentrate on those factors that may potentially respond to various intervention programs.

Table 3.1 Examples of Biological, Socio-Behavioral, and Biocultural Factors Affecting Infant Feeding Practices (Allen and Pelto 1985)

Biological	Socio-behavioral	Biocultural
Maternal anthropometry	Work status	Hospital feeding practices
Infant anthropometry	Occupation	Anxiety
Infant sex	Support	Perception of milk adequacy
Prolactin levels	Advice	Perception of infant growth
Time of first milk	Income	Perception of infant satisfaction
Milk volume	Education	Feeding frequency
Maternal malnutrition	Desire to breastfeed	Feeding schedule
Breast problems	Desire to lose weight	Supplementary foods
Maternal illness	Desire for freedom	Breast preparation
Infant illness	Intended duration	Previous experience
Parity	Public comfort	
Smoking	Previous experience	

One aspect of the biocultural analysis of breastfeeding patterns is the occurrence of “Insufficient Milk Syndrome” (IMS), the most common reason given by mothers today for early termination of breastfeeding in both developing and developed countries (Gussler and Briesemeister 1980). This phenomenon is particularly prevalent in the urban, industrialized West. As IMS was also common in my study population, I will provide the various explanations that have been offered to understand this complex complaint. These can then be applied to the Hutterite case in chapter 4.

Socio-Behavioral Factors

These variables are characterized by having an environmental (cultural) or psychological origin and by affecting the mother’s behavior with respect to infant feeding, in particular decisions about whether to initiate breastfeeding or continue breastfeeding (Allen and Pelto 1985). The influence of the social environment is exerted through *external* factors: support network, prenatal class, advice, home help, education,

socioeconomic status, income, and work outside the home. Behavioral factors represent maternal attitudes and experience, for example: purchased bottles during pregnancy, desired weight loss, desire to breastfeed, intended duration, previously observed others breastfeed, public comfort, high desire for freedom, reading, more anxiety, prenatal class (Allen and Pelto 1985). Maternal attitudes and values are deeply embedded in the specific cultural context.

Work status and occupation

Maternal work has been cited as a major reason for the global decline in breastfeeding. I will give this variable considerable attention, as it also emerged as the major factor affecting infant feeding decisions in my research (see chapter 4).

Women's work is divided into domestic or productive, private or public, and traditional or modern (Van Esterik and Greiner 1981). Domestic work includes child-care, cooking, and maintenance of clothing and shelter, and it is seldom paid. It is performed in the private domain, while productive work usually takes place in the public domain, where activities have an impact beyond the family unit. Traditional work includes some agricultural activities, cottage industries, and small-scale marketing. Modern work is found largely in urban industrial contexts, involving clerical, factory, and professional jobs (Van Esterik and Greiner 1981). Employment refers to opportunities to earn money by labor (Van Esterik 1992).

Contrary to the common assumption that work in traditional societies (traditional work) is organized in ways compatible with child-rearing, cross-cultural studies have found the existence of long-standing, traditional patterns of early supplementation to facilitate mothers' work (Levine 1988). These patterns are even more pronounced in

urban settings of paid wage labor (modern work), both in developing and developed countries. A cross-cultural comparison of infant feeding practices in settings of modern work in Thailand, Colombia, Kenya, and Indonesia discovered a significant association between employment outside the home and either early bottle use or early cessation of breastfeeding (Winikoff and Castle 1988). The separation of mother and infant, rather than working for pay, seemed to produce a reliance on bottles. It becomes clear that a distinction needs to be made between work that requires regular sustained separation between mother and infant, and work that does not.

A woman who takes formal, modern employment is almost always separated from her child, leaving part of the responsibility for her children to others. Thus, it is modern work in urban and urbanizing areas that is least compatible with breastfeeding. Table 3.2 lists the common obstacles to breastfeeding in the modern workplace.

Table 3.2 Obstacles to Breastfeeding for Working Mothers (Baumslag and Michels 1995)

-
- Early return to work
 - Limited opportunities for part-time work
 - Distance to work
 - Type of work
 - Job security
 - Stringent work schedule
 - Hostile attitudes from management and peers
 - Hostile attitude of health care workers
 - Lack of suitable day care
 - Low status of women in the workforce
-

Research results concerning the impact of maternal work patterns on breastfeeding practices are often contradictory, however. Several studies have indicated that employment and breastfeeding are not incompatible. A study among the Navajo, for example, revealed that breastfeeding rates of employed Navajo women equal or exceed those of unemployed women, particularly if employment is postponed (Wright et al.

1993). More research regarding the complex relationship between women's work and infant feeding is clearly needed.

Support and advice

Social networks and support systems include traditional *doulas* ("mother's helper"), mothers, mothers-in-laws, husbands, friends, and medical professionals (Brownlee 1990). Successful breastfeeding mothers are more likely to be influenced by friends and relatives, whereas mothers terminating the breastfeeding relationship early often lack this support system. The role of health professionals will be examined below.

Behavioral factors

While external factors do have considerable influence on breastfeeding initiation and duration, as shown above, anthropological studies have demonstrated that maternal attitudes and experience are probably of greater importance in predicting infant feeding decisions. Referring to mothers who want to breastfeed and cannot and to mothers who do not want to breastfeed and do not, Van Esterik explains: "The difference between these two categories of women lies not only in their demographic characteristics but also in their heads – the ideas, beliefs, and assumptions about infant feeding that make up the cognitive and affective dimensions of human behavior." (1988: 189)

Gabriel et al. (1986) propose that a cultural value of self-reliance guides the different choices mothers make about infant feeding. Their study of mothers in Upstate New York indicates that a change in American culture toward concepts such as "return to nature" and "control over one's body" has prompted the recent increase in breastfeeding among middle-class Americans (Gabriel et al. 1986). This is one example of the importance of cultural values.

The interrelationship between external factors and maternal attitude is exemplified through the demonstrated effect of maternal education (classified as external). Maternal education, besides being a primary predictor of infant feeding behavior, may also be a secondary predictor through attitudes and values (Dusdieker et al. 1985, Quandt 1985). The beliefs and values of American mothers with more formal education are more supportive of extended exclusive breastfeeding, for example (Quandt 1985). In the developing world, on the other hand, education exerts the opposite effect on breastfeeding. Women with more formal education breastfeed less (Jelliffe and Jelliffe 1978). However, high levels of education are usually closely linked to other factors that are associated with lower levels of breastfeeding in developing countries. These include increased income, greater exposure to infant formula advertising, greater likelihood of working in formal employment settings, and less likelihood of living in traditional households where support for breastfeeding is high (Brownlee 1990).

Table 3.3 Cultural Models of Infant Feeding (Van Esterik 1989)

Breastfeeding Model	Bottle Feeding/Infant Formula Model
Renewable resource	Nonrenewable resource
Living product	Inert substance
Satiation principle (as demand increases, the supply increases)	Scarcity principle (limited good, as demand increases, supply decreases)
Non-measurable (stress on satisfaction)	Measurable (stress on quantity)
Orientation to time: reinforcement of continuity between reproductive phases (pregnancy, birth, lactation, weaning)	Orientation to time: divisible into components and measurable sequences
Cyclical recurrent rhythms	Scheduling
Individualized process (adapted to age of child, viruses of mother, etc.)	Standardized product (formula for a constantly improving product)
Personalized primary links between mother and infant (or rarely other adult female)	Generalized primary links with any male or female, adult or child
Infant is active and in control	Infant is passive and controlled by others
Empowerment	Dependency (consumer from birth)

Interpretations of infant feeding practices may be guided by cultural models of breastfeeding or by cultural models of bottle-feeding (table 3.3). Cultural models frame experience, have directive force, occur at different levels of abstraction, and include general purpose, folk, and expert models (Holland and Quinn 1987). The models shown in table 3.3 are general purpose models of breastfeeding and bottle-feeding; they may have wide applicability and little relation to expert models of each (Van Esterik 1989).

Health Sector and Food Industry Factors

Health sector factors

The milk is very light or clear, it is not thick. The doctor from La Victoria told me that my milk is clear because it is not good. – Bogota mother (Castle et al. 1988)

Hospital practices affecting infant feeding decisions will be discussed below; here, I will focus on professional advice given to mothers by health care providers. Studies have demonstrated that health care professionals exert significant influence on infant feeding decisions. Among periurban mothers of Mexico City, for example, doctors were ranked as the most important source of infant feeding advice (Guerrero et al. 1999). Yet, there is concern over health care providers' knowledge and practices regarding breastfeeding. A study in a metropolitan area near Manila in the Philippines found that the majority of health personnel reported they would wait at least 24 hours after birth to initiate breastfeeding, with more than half recommending bottle-feeding until the mother's milk "comes in" (Burgess 1980). Forty-two percent of the periurban Mexico City mothers indicated that at some time while they were breastfeeding, a doctor had advised them to cease doing so (Guerrero et al. 1999). A study from the 1980s suggests

that in the U.S., the percentage who advocate breastfeeding may be higher among women of the general population than among health practitioners (Lawrence 1982).

It comes as no surprise then, that advice from health care personnel is often negatively correlated to breastfeeding rates. Conversely, a study conducted in France demonstrated improved exclusive breastfeeding rates at four weeks postpartum and longer breastfeeding duration among mothers who received breastfeeding support by a trained clinician during a preventive visit (Labarere et al. 2005). Another huge obstacle to successful breastfeeding is the medical profession's conception of mothers and infants as belonging to separate fields of practice, and thus, the partners of the mother-infant dyad are dealt with by different specialists (Maher 1992).

Food industry factors

Similac Advance helps support both brain development like breast milk and the developing immune system. (...) So much like breast milk in so many ways. – Similac Advance advertisement in *Babytalk* magazine

The food industry employs several channels to reach mothers. These primarily include mass media advertising, retail outlets, direct promotion to mothers through brochures/gifts/samples, hospitals, and doctors/nurses/midwives (Brownlee 1990). The impact of distribution of free formula samples to mothers has been investigated in the Philippines. Whereas Stewart et al. (1991) found no effect of receiving free infant formula samples on the initiation of breastfeeding, Adair et al. (1993) found a strong effect of receiving free infant formula samples on the duration of breastfeeding. Mothers who received free formula samples stopped breastfeeding 1.4 months earlier than mothers who did not.

It has been argued that infant formula has been transformed from a functional product to a status product through direct advertising to the consumer (Van Esterik 1989). Advertisement images involve the ego of the mother that connotes membership in a higher social stratum: "The advertising is primarily a question of presenting a model of the smart, urbanized, attractive mother bottle feeding." (Mead 1979) This is especially true in developing countries, where infant formula use and bottle-feeding are associated with wealth, science, and modernity.

The commercial marketing of infant formula is a highly interactive system. The consumer is neither completely reactive and passive (as many breastfeeding advocates claim), nor completely independent in making product choice judgements (as many infant food industry representatives claim). However, the success of infant food companies in influencing mothers cannot be denied.

Biocultural Factors

The classification of these variables is based on the theoretical premise that an effect is probably mediated by interactions between biological and socio-behavioral processes (Allen and Pelto 1985). In the case of infant feeding, socio-behavioral factors most often have biological consequences, but sometimes (as in the case of infant fatness affecting infant feeding practices) biological factors have behavioral consequences.

Hospital feeding practices

A study of hospital practices in Jamaica revealed that more breastfeeding education did not necessarily translate into higher breastfeeding rates, as is so often assumed by policy-makers. Rather, specific institutional and individual practices within

the hospital setting that supported early initiation of breastfeeding were found to influence maternal behavior more directly and lastingly (Cunningham and Segree 1990).

Is this linkage behavioral or biological? A later first feed could result in a permanent reduction in milk volume, breast engorgement, or infant suckling problems, all of which entail biological explanations for reduced breastfeeding rates. Alternatively, an earlier first feeding may optimize mother-infant bonding or change the mother's perception of the importance of breastfeeding, entailing attitudinal and behavioral explanations for improved breastfeeding rates (Allen and Pelto 1985).

Table 3.4 Detrimental Hospital Policies and Procedures (Brownlee 1990)

- Routine use of drugs during childbirth
 - Automatic separation of the normal mother and infant immediately after birth
 - Use of glucose water as a prelacteal or first feed
 - Routine use of infant formula for feeding in the hospital
 - Use of separate nurseries for normal infants rather than organizing "rooming-in" alternatives
 - Distribution of free formula samples on discharge
 - Performance of Caesarian sections when not medically indicated
 - Lack of arrangements for providing breastmilk to premature newborns and sick infants through breastmilk banks or other mechanisms
-

Fundamental to the successful establishment of breastfeeding is the practice of rooming-in. Rooming-in assists mothers by providing the mother and infant with the necessary time together to properly initiate lactation, establish a healthy emotional bond, and provide the needed experience in infant care that will increase maternal confidence after leaving the hospital (Hull et al. 1990).

Perception of milk adequacy, infant growth, and infant satisfaction; feeding frequency and schedule; supplementary foods

These variables are all interconnected and will also be further discussed below; they may be of biological or of behavioral origin. If demand-feeding, perceptions of inadequate milk quantity or quality is rarely a biological problem. In the majority of

cases, milk volume and composition is nutritionally adequate to meet the infant's needs, and the mother's perceptions reflect her lack of self-confidence. If, on the other hand, feeding frequency is constrained, and a more scheduled approach to breastfeeding is practiced, perceptions of insufficient milk quantity or quality and a resulting perceived infant dissatisfaction may well be of biological origin (see below for an explanation of this relationship).

A great example of the interactions between biological and behavioral factors is the positive feedback loop, rather than a unidirectional causation link, between greater infant fatness and the style of more frequent feedings (Quandt 1985). Larger infants, who have greater nutrient requirements, may make more demands for feeding or are believed to need more frequent feedings, thus establishing a style of breastfeeding which produces a larger volume of more high-fat milk, which in turn contributes to continued infant fatness.

The variable of perception of infant satisfaction cannot be underestimated here. Satiety must be interpreted from the infant's behavior, and based on this behavior, the mother must judge the effects of her breastfeeding on the infant (Quandt 1986). If she decides the infant is not satisfied, she will probably act to change the feeding pattern. She may change her breastfeeding style to one, which is more lactogenic, or she may feel the need to supplement with breastmilk substitutes or complementary foods. This transition may lead to premature cessation of breastfeeding. Anderson et al. (2001) found in their study of Scottish mothers that the infant's behavior was the main stimulus for changing feeding practices. Mothers believed that the introduction of solids was baby-led and initiated by some physical characteristic or behavioral action of the infant.

The importance of infant agency in changing feeding behaviors has also been observed in Brazil. A study of 148 mothers in a periurban community of Rio Branco suggests that infants there play a significant and active role in shaping infant feeding patterns. The most frequently cited reason given by mothers for terminating breastfeeding was the child's refusal to breastfeed (Wayland 2004b). In four out of every ten cases, infants were reported to have weaned themselves before one year of age (Wayland 2004a). The consequences of mothers' perceptions and interpretations of infant behaviors cannot be more apparent.

The Insufficient Milk Syndrome

Why do so many women in affluent countries say they have no milk for their babies? –
Meredith Small (1998)

The term *Insufficient Milk Syndrome* (IMS) was coined in 1980 by Gussler and Briesemeister, whose influential article sought to explain the etiology of this complex occurrence. It is estimated that only five percent of the world's women cannot breastfeed for physiological reasons (one of them being insufficient milk production) (Raphael 1976), yet IMS is the most commonly given reason for the termination of breastfeeding cross-culturally (Gussler and Briesemeister 1980).

While severe malnutrition does affect a woman's lactational performance, it appears that even moderately malnourished women are generally able to produce enough milk to provide for the normal growth and development of their infants for at least four months (Jelliffe and Jelliffe 1978). In addition, the global pattern of maternal malnutrition is not congruent with that of IMS reports, which are mainly given by mothers in affluent populations.

Thus, it becomes apparent that for the majority of reported IMS cases, the etiology cannot be physiological. In that sense, these instances of IMS are not “real”, yet most mothers perceive them as real. Therefore, for the remainder of this thesis, IMS will refer to real or perceived insufficiency of milk production and does not imply a biological inability to lactate sufficiently. The following hypotheses seek to explain the etiology of IMS with respect to behavioral effects.

Breakdown of traditional social support network

It has been proposed that IMS is a symptom of the breakdown of traditional patterns of social support for breastfeeding (Raphael 1979). In urban and urbanizing areas, where IMS is most common, the nuclear family has become the norm, where female relatives are no longer in proximity to provide the new mother with information and encouragement necessary for successful breastfeeding. In the extended family, a mother who was concerned about her milk supply could be reassured and advised by female family members. The lack of this support can potentially lead to overwhelming anxieties about milk supply.

Biocultural explanation

This position is based on a feedback loop between biological and behavioral/cultural factors and is well defined by Gussler and Briesemeister (1980). As proposed in chapter 2, evidence suggests that human infants are evolutionarily “designed” to be demand-fed with close mother-infant contact. However, there is a lack of understanding of this natural pattern of breastfeeding – what Gussler and Briesemeister call *biological* breastfeeding – in urban, industrialized societies. It is not uncommon for mothers to expect that the infant will only want to nurse every three or four hours, often

based on the advice of doctors (Dettwyler and Fishman 1992). Since this widely spaced feeding pattern (*nonbiological* breastfeeding) is considered “normal”, more frequent demand by the infant is often interpreted as an indication of inadequate milk supply (De Carvalho et al. 1983). The urban lifestyle hinders close mother-infant contact, a prerequisite for biological breastfeeding, according to Gussler and Briesemeister.

Frequent and unrestricted breastfeeding increases milk production (De Carvalho et al. 1983), and few feeds do indeed lower milk supply and fat concentration. “The ‘modern’ pattern of infrequent feeds may, therefore, provide a direct pathway to reduced milk production, perceived and reported by mothers as insufficient milk.” (Gussler and Briesemeister 1980: 160). Thus, the authors argue that nonbiological breastfeeding results in real or perceived milk insufficiency, and the pattern of supplemented breastfeeding may then represent women’s attempts to satisfy their infants’ nutritional requirements.

Local prevalence of IMS and importance of supplemental feedings

Greiner et al. (1981) propose in their response to Gussler and Briesemeister’s article that a distinction should be made between IMS when it occurs during exclusive breastfeeding, and when it occurs once supplemental feeding has begun. They argue that IMS is largely a cultural phenomenon when it occurs during exclusive breastfeeding, and largely a physiological response to reduced nipple stimulation once supplemental feeding has begun.

In the first case, maternal attitudes toward breastfeeding and in particular socially agreed-upon beliefs about the local prevalence of IMS determine its pervasiveness. Women who are educated to think that insufficient milk is a common problem, to which they are susceptible, may accept it more quickly as an explanation for various

breastfeeding difficulties. Raphael maintains that “there are innumerable variations [of infant feeding] without any apparent loss of milk. A mother’s perception of the outcome may be a significant factor.” (1984: 207) In addition, as a result of this concern or fear of insufficient milk, these mothers may actually experience a psychologically mediated failure of the milk ejection reflex, which may then lead to the introduction to or increased reliance on supplementary bottles or other feeds (Greiner et al. 1981).

This leads to the second case (other factors also may), where this reduction in frequency and vigor of sucking due to supplementation causes a true hormonally-mediated reduction in milk supply. The complexity of this issue is made clear. In this case, IMS is secondary to the replacement of breastmilk with formula or some other breastmilk substitute. The earlier the introduction of supplemental feeding is initiated, the larger its quantity, and the more it is fed by bottle, the greater is the impact on breastmilk production. Greiner et al. also include infant food companies’ promotional activities as a contributing cause of IMS:

First, “insufficient milk” can result from infant food company promotional activities that undermine a mother’s confidence in the quality or quantity of her own milk, especially when these promotional efforts are channeled via trusted health professionals. Second, promotional activities can help create and extend socially held beliefs about the likelihood of a woman suffering from “insufficient milk”. Again, this can be especially powerful if health professionals as well as mothers are anxiously waiting for the slightest sign of “insufficient milk”. Third, infant food companies can extend the availability and awareness of their products to ever wider markets. This is often combined with promotional activities to ensure that the response to “insufficient milk”, when perceived, is to supplement rather than attempt to increase the volume of breast milk. (Greiner et al. 1981: 241)

Rationalization

This explanation maintains that women who are no longer interested or motivated to breastfeed must have an acceptable reason for the termination of

breastfeeding and thus claim an inadequate milk supply. These mothers are unwilling to admit their desire to terminate breastfeeding for personal reasons (don't enjoy breastfeeding, find it too tiring or constraining, husband objects), as they generally know breastfeeding is the preferred method of feeding their infants (Tully and Dewey 1985).

IMS is seen as a rationalization for using alternative feeding methods. While this explanation probably represents some cases of claimed IMS, it is an inappropriate explanation for the experiences of anxious mothers who genuinely fear their milk supply is insufficient.

Interference with the let-down-reflex

This hypothesis posits that situations, which involve anxiety, stress, and pain, inhibit the hormone oxytocin necessary for the functioning of the let-down-reflex (Hillervik-Lindquist 1991). Since the let-down-reflex causes the milk stored in the alveoli to be ejected, these stresses consequently inhibit milk deliverance (Gussler and Briesemeister 1980). This emotional interference with the let-down-reflex has been termed a "confidence trick", explaining why some healthy, well-nourished women with normal full-term infants experience lactation failure (Hillervik-Lindquist 1991). Stress and anxiety are inherently more common in an urban environment.

Conclusion

This chapter has provided a general overview of the most salient sociocultural and biocultural determinants of breastfeeding behavior. I have made references to studies cross-culturally in order to give the reader a broad understanding of infant feeding practices in diverse cultural contexts. Not all of the factors discussed will be relevant to

my discussion of Hutterite breastfeeding patterns, yet I felt it was important to provide a holistic analysis. An analogy can be drawn between mothers in developing countries and Hutterite mothers; neither have a choice regarding return to work.

It has become clear that breastfeeding is constructed both biologically and culturally, and that it cannot be understood without reference to varying levels of analysis including individual, household, community, institutional, and world industrial capitalism (Van Esterik 1995).

The phenomenon of Insufficient Milk Syndrome exemplifies the complex interplay between biology and culture, as it is rooted in a feedback loop between the two. It is also a superb example of how the different levels of analysis intersect at one specific issue. Its widespread prevalence was confirmed by my own research, and the unique situation of the Hutterites can give us valuable insight into its etiology.

128

CHAPTER FOUR

Mountain Hill Colony: A Case Study

I will present my own research in this last chapter. My fieldwork at Mountain Hill Colony greatly enriched my understanding of Hutterite life and Hutterite infant feeding practices in particular. Although I had completed a thorough literature review of Hutterite social life, it was difficult to grasp this unique way of life until I could actually see and experience it. Thus, my fieldwork served as a supplement to my literature-based thesis. It was not intended to establish a Hutterite or even Lehrerleut norm of breastfeeding and infant feeding behavior.

Data obtained from interviews and surveys requiring recall of past breastfeeding behavior, such as one retrospective interview or survey questionnaire covering the entire feeding history of an infant, are subject to recall biases and are thus inherently problematic (Winikoff 1981). Mothers tend to heap events, such as weaning, onto convenient ages (i.e., whole months, half-years) or socially expected times. Consequently, the standard for anthropological breastfeeding studies is based on participant observation of nursing mothers over an extended period of time, such as several months or years. Examples of such studies are the firsthand observations of breastfeeding practices in eleven cultures conducted over a period of three months supervised by Raphael (Raphael and Davis 1985) and the investigations carried out by Zeitlyn, observing breastfeeding behaviors in Bangladesh over a period of several years (Zeitlyn and Rowshan 1997). As these methods were not possible during my fieldwork, my study is of limited use in representing Hutterite breastfeeding patterns at large.

Although I provide some descriptive statistics, my main argument is derived from qualitative data. Focus group and in-depth interviews, in addition to survey responses, contributed to the following analysis of infant feeding practices at Mountain Hill Colony. A physician's perspective on general Hutterite infant feeding practices complemented my study. After a brief description of the site and methodology, I will present my data. Following is a discussion of the results, including an analysis of IMS among Hutterite mothers.

Site Description

Mountain Hill Colony is located in north central Montana. It is a Lehrerleut colony, belonging to the most conservative of the three Hutterite groups. Mountain Hill Colony has a membership of 152, and it is in the process of branching and building a daughter colony in the near vicinity. The colony's economic activities center on agriculture. Sold for profit are grains, milk, eggs, pork, chicken, turkeys, geese, and various items from the garden. Other sources of income include the manufacture of electronic switchboards and brooms.

I chose Mountain Hill Colony as my research site, because my academic adviser, Dr. Kimber Haddix McKay of the University of Montana, had already established an ongoing research relationship with the colony. Although the possibility that Mountain Hill Colony differed in a significant way from other Lehrerleut colonies with respect to infant feeding practices should not be ignored, there was no such indication. My findings confirmed earlier studies regarding infant feeding practices. As the Lehrerleut group is the most conservative of the three Hutterite groups, the analysis of a Lehrerleut colony

should be most representative of traditional Hutterite customs. I aimed for a more focused analysis of a single colony rather than a more superficial analysis of several colonies.

Methods

Focus group and in-depth interview

I carried out fieldwork at Mountain Hill Colony during early August of 2005, spending two consecutive mornings at the colony. The first day, I initiated a focus group discussion with a small number of interested women, eliciting general attitudes toward infant feeding and breastfeeding in particular. The second day, I conducted an in-depth, semi-structured interview with my key informant (see Appendix 1). As my initial contact did not have any children and thus had no breastfeeding experience, I was introduced to her older sister (27 years of age), who had two children. She was very interested in my research, an avid breastfeeding mother herself, and became an invaluable informant. Two of her other sisters were present during the interview, and although they had no children, I welcomed their comments on infant feeding practices at Mountain Hill Colony. Some additional data have been collected since this initial fieldwork, as I have been keeping in contact by phone with my informant.

Surveys

I sent surveys for all mothers at Mountain Hill Colony to my key informant, who gave them to all the mothers (see Appendix 2). I sent 34 surveys, including quite a few extra copies, as I did not know the exact number of mothers, and I received 17 surveys back. Confidentiality of all respondents was protected; my survey questionnaire did not include names.

Sample

Most but not all mothers filled out my surveys. This may have biased my data favoring mothers who breastfed longer or more successfully, as other mothers perhaps felt they could not contribute much to a breastfeeding study. Three of the surveys were filled out by relatives and friends of my informant from two other Lehrerleut colonies. Although these women were not from Mountain Hill Colony, I decided to include them in my sample, as significant differences in infant feeding practices between these colonies were unlikely. The gain of a larger sample size seemed to outweigh the unlikely loss of homogeneity. With the exception of one survey (of the only relatively young mother who delivered at home), I did not know which surveys these were.

Table 4.1 Sample Characteristics

	All mothers n=17	Mothers over the age of 45 n=6
Age range	27-73 years	
Mean age	42.4 years	
Median age	38 years	
Mean completed family size (number of surviving children of women over 45 years of age)		5.5

The total number of mothers who responded to my survey was 17, ranging in age from 27 to 73, with a mean age of 42.4 and a median age of 38 years. These mothers had a total of 83 children; two children died during infancy. Thus, not all data were available for all children. In addition, mothers did not always completely fill out the surveys. In these cases, percentages were calculated using the number of children for which the data were available.

Phone interview with physician

The third data collection method was a semi-structured phone interview with an anonymous family practitioner from a similar rural Montana setting. This physician had twenty years of experience with Hutterite patients. I consulted him to gain insights about Hutterite breastfeeding practices and infant formula use from a medical perspective. In particular, I was interested to know if he had made similar observations about the prevalence of IMS and what his explanation was of its etiology among Hutterite mothers.

Data

Table 4.2 Survey Results: Glacier Colony Breastfeeding Practices (in percentages)

Children born at home/hospital	13	87
Mothers born at home/hospital	59	41
Children breastfed for any length of time	99	
Mothers who received breastfeeding support from hospital staff/other mothers	76	82
Mothers who responded positively to having experienced IMS	53	
Mothers who consulted professional for breastfeeding problems	0	
Children breastfed on demand/on schedule	72	28
Children who used pacifier/no pacifier	48	52
Children who slept in crib in parents' room/in separate room	91	9
Mothers breastfed children at night at some time	94	
Mothers who expressed breastmilk/used infant formula	35	53
Mothers who thought exclusive breastfeeding/combination of breastfeeding and formula-feeding is best for baby	82	18
Mothers who had read baby magazines	65	
Mothers who had seen infant formula advertisement	82	
Mothers who thought advertisements had affected the way they thought about feeding their children	0	

Table 4.3 Survey Results: Reasons Given For Infant Formula Use (younger to older mothers)

“She didn’t seem to be satisfied with only breastmilk sometimes.”

“Not enough milk with first child, second child was tongue-tied.”

“Because I didn’t have enough breastmilk of my own.”

“Breastfeeding wasn’t enough for baby.”

“With child one I had a bad infection – child seven because she was so restless.”

“I felt I didn’t have enough breastmilk.”

“Was handier and easier once I started working and milk supply was lower when I worked all day.”

“no other way”

Table 4.4 Survey Results: Reactions to Seeing Infant Formula Advertisements (younger to older mothers)

“Nothing really, cause I wanted to breastfeed, I only used it when I had to.”

“indifferent”

“surprise”

“I was glad because my baby needed lots of it.”

“I felt impressed because not all mothers have a sufficient milk supply.”

“I was anxious to learn more about babies and nursing mothers.” (This probably referred to baby magazines.)

“I wasn’t too excited, cause I never used much formula.”

“I don’t need it.”

“I thought it looks handier and easier to give a bottle but breastmilk is God’s way of feeding baby and best for him.”

“I think formula advertisements are ok in their place, whenever breastfeeding is not possible.”

“good and other”

“I did not have a reaction cause I had enough milk to feed them.”

Results

Focus group and in-depth interview

Focus group

All women present in the focus group discussion agreed that there was great variability in infant feeding and that this mainly depended on the babies. Breastfeeding was considered to be both the best and the normal way to feed an infant. Nursing was encouraged, and all mothers initiated breastfeeding, but no milk at all, not enough milk,

or weak milk were given as reasons for switching to formula. Another reason given by a man we met during our tour of the colony was persistent colic and failure to grow. He said the milk his wife had pumped was very clear and thin; it could not possibly have many nutrients, and he concluded that with the use of formula, the colic subsided and the child grew better. Some of the mothers with low milk supply were given pumped milk by mothers with a plentiful milk supply, though this was just a supplementation to formula. I was told that breastfeeding took place only at home, and infants were not breastfed in the presence of others, with the exception of immediate family.

Mothers or other female relatives who came after the birth of a child to help the mother also assisted with breastfeeding. The first ten weeks after birth (14 weeks after a C-section), when the mother was relieved of all colony work, the infant was breastfed on demand. After that, the infant had to adjust to the colony schedule, as mothers joined the colony for meals, church and work, now spending her day just like all the other women. During those times, infants were left at home with a babysitter, usually younger girls. Depending on the type of work, mothers might be able to come home every 2 1/2 to 3 hours to nurse a child.

I included a question about sex-biased duration of breastfeeding, as female-biased investment through longer breastfeeding duration had been observed among Hutterites (Margulis et al. 1993). The women showed surprise at this question and uniformly agreed that there were no differences in breastfeeding duration according to gender.

Concerning weaning, there did not seem to be a "Hutterite method"; the age of introduction of solid food among the focus group participants varied from seven weeks to six months. Women were aware of the current recommendation to introduce solid food at

four to six months, yet I was told that many mothers introduced foods earlier. Both mothers in the focus group discussion, who complained of not having a sufficient milk supply, introduced Gerber infant cereal at seven weeks. Among exclusively breastfeeding mothers, early supplementation also seemed to be the norm, yet one mother did not introduce solids until six month, having read not to in order to keep the milk supply ample.

The age of final cessation of breastfeeding also varied considerably, from a few months to fourteen months. There did not seem to be a norm, but mothers explained that breastfeeding was usually terminated when mothers became pregnant again, or otherwise by twelve to fourteen months. Women did not tandem-nurse, although one woman said women used to do so. Others were not aware of this practice.

In-depth interview with key informant

In this section, I will limit myself to interview responses pertaining to infant feeding practices at Mountain Hill Colony at large, rather than responses of her own practices, not all of which I think are typical of Hutterite mothers. Responses of my informant's own infant feeding practices were included in the survey results.

As she had also participated in the focus group discussion, some of her responses were repeated during the in-depth interview. She confirmed that mothers only used infant formula, when they experienced a problem with breastfeeding and that all mothers wanted to breastfeed. Besides insufficient milk quantity, she stated that the perception of breastmilk being too weak or colic-causing also motivated mothers to use infant formula. The maximum common length of breastfeeding, according to her, was fourteen months. She negated any sex-biased breastfeeding practices.

She thought that about fifty years ago, the transition from home births to hospital births took place. There used to be Hutterite midwives, but this was no longer so.

Hutterite women, who deliver at home today, use the services of an “outside” midwife.

She confirmed the pattern of demand-feeding until the infant was ten weeks old and scheduled feeding thereafter. Breastfeeding was confined to the home. Typically, babies slept in a crib in the parents’ room until the next baby was born or until they reached an age of two or three. Her children did not use a pacifier, though pacifier use was common. She had not heard of “wearing” a baby, such as in a sling; this was not practiced.

Infants were not brought along to work, unless no babysitter could be found. At age ten weeks, children were left with another caretaker; this was usually a younger girl (*Sorgela*) or an older woman. Sometimes, children under the age of two-and-a-half were dropped off at the *Klein-Schul* for a few hours. If women were not able to return home to nurse their children, infants were given a bottle, preferably of expressed milk, or of infant formula. Infant formula was purchased by the colony, buying whichever brand was cheapest. A lot of colony purchases were made at Wal-Mart.

Most mothers received a free baby magazine (*Babytalk*), which contained infant formula advertisements. Infant formula was not considered as beneficial as breastmilk, but it was valued for its use for mothers, who did not have enough milk to breastfeed exclusively or whose infants were not thriving on breastmilk. Husbands did not seem to have much of an opinion about infant feeding-related issues; this seemed to be the women’s domain.

Water was commonly introduced before six months, especially in the hot summer months, and it was usually given by bottle at this age. The age of introduction of solids varied widely, as the focus group discussion had elicited, mostly depending on the baby and the mother's milk supply. Most mothers introduced Gerber infant cereal (rice cereal) first and then switched gradually to pureed regular food (vegetable soups, whatever the colony might be eating that was suitable for infants). Baby food jars were not used much. My informant did not seem to be aware of allergy-related food restrictions. When I told her that some mothers "outside" did not give wheat, dairy, etc., she seemed surprised. Regarding baby food, she said that homemade baby food was much tastier than the commercial jars, which tasted too bland.

My informant believed that the reason for the termination of breastfeeding among most of the women was lack of energy for it. Often, this took place after a woman became pregnant again. She mentioned the physical demands of work adding to the lack of energy for continued breastfeeding. Most children ate well by that time and did not resist the cessation of breastfeeding vehemently. The weaning process varied greatly from woman to woman and from child to child. Tandem-nursing was not common.

Surveys

All but two women in the sample gave birth to their children at the hospital. The oldest woman in the sample (73 years) gave birth to all but one of her children at home, and one woman from one of the other colonies (where direct-entry midwifery assisting home births is an available service in a nearby town) delivered three of her six children at home. The percentage of children born at home was 13%. In comparison, the percentage of mothers themselves born at home was 59%.

With the exception of one child, all children were breastfed for some time. Due to the small sample size and the unreliable recall of breastfeeding duration, as explained above, the mean duration of breastfeeding in this sample (8.3 months) could not be considered representative of general Lehrerleut breastfeeding duration. The shortest duration of breastfeeding was two weeks; the longest duration of breastfeeding was 18 months. One woman reported having tandem-nursed (breastfed an older child in addition to an infant), although her responses regarding duration of breastfeeding and age of children did not support this. Twenty-four percent of mothers reported having heard of Lehrerleut mothers tandem-nursing in the past.

All mothers except one reported having received support for breastfeeding for at least one of their children from either hospital staff (76%) or other Hutterite mothers (82%). It was interesting that the one mother who reported no such support was the oldest woman in the sample. One woman also reported support from her midwife.

Fifty-three percent of the mothers responded that they felt they did not have enough breastmilk for at least one of their children. This included one response of “sometimes”. Insufficient milk supply was given as the main reason to supplement with or switch to infant formula in five cases. In addition, one mother who responded negatively to having experienced insufficient milk gave lowered milk supply as one of the reasons for using formula. One mother’s response to reason for using formula was “no other way”; she had responded positively to having experienced insufficient milk. No mother sought the help of a professional, such as a lactation consultant, for any breastfeeding problems, including insufficient milk.

With respect to breastfeeding style, 72% of the children were reported to have been breastfed on demand; 28% were breastfed on a schedule. Forty-eight percent of children used a pacifier; 52% did not use a pacifier. One woman checked “yes” for pacifier use and wrote “thumb” for three of her children; these were included in “no pacifier”, as I was interested in commercial pacifier use.

Almost all infants (first year) (91%) slept in a crib in the parents’ room. Nine percent slept in a separate room. One mother checked both “family bed” and “crib in parents’ room” for one of her children; this child was excluded from the analysis. Only one mother did not nurse her children at night. However, several mothers checked “soothing other than nursing, such as rocking” and one mother “ignore, let baby cry” in addition to “nursing”. My question did not take variance of behavior over time into account.

Thirty-five percent of mothers reported expressing breastmilk for bottle use; 53% of mothers reported using infant formula. One mother reported using cows milk with her first four children. Eighty-two percent of mothers thought exclusive breastfeeding was best for baby; 18% thought a combination of breastfeeding and infant formula use was best for baby. No mother thought using infant formula exclusively was best for baby.

Sixty-five percent of mothers had read a baby magazine, such as *Babytalk*, and 82% had seen an advertisement for infant formula. None of the mothers responded that infant formula advertisements affected the way they thought about feeding their infants.

Phone interview with physician

The family practitioner I contacted had extensive experience with Hutterite patients. Responding to the occurrence of IMS among Hutterite mothers, he maintained

that “it is a psychological, not overt, defense mechanism for projecting the lack of desire to breastfeed due to reasons such as work and maybe convenience.” (personal communication) He emphasized the importance of work for Hutterites, stating that colony work was very competitive and a source of great pride. Thus, women were eager to return to full-time work. Because the colony wanted mothers to breastfeed, as infant formula was expensive, and because breastfeeding was the ideal, mothers needed a reason for using formula. This then became insufficient milk. If the “excuse” of IMS worked for some mothers, others followed this lead, augmenting its prevalence. He concluded that Hutterite mothers were generally not motivated to breastfeed.

Women who breastfed, weaned around one year, when children ate and drank well. Toddler nursing was not common. He also offered some interesting insights into gender relations, maintaining that under the surface, women were in charge at colonies. They were not only in control of family issues, but men followed their advice on many aspects of colony life.

Discussion

I wouldn't consider formula if I have enough milk, because I feel that nothing man can do or make even comes close to what God can. Breastfeeding is surely God's way. – Hutterite mother

Literature on Hutterite breastfeeding patterns

First, I will relate my data to existing discussions on Hutterite breastfeeding patterns. Several books on Hutterite life mention breastfeeding practices. Hostetler (1997) writes in *Hutterite Society* that most infants are breastfed for about a year or until the mother becomes pregnant again. He also notes that pacifiers are widely used. Brednich

(1998) remarks that because of the need of mothers to return to work soon after birth, breastfeeding is terminated early, though he gives no specific age. In *The Hutterites in North America*, we read:

Nursing is accepted as a matter of fact by Hutterite mothers. No special help or modification in colony schedule is given the nursing mother other than the reduced workload for the first three months. Nursing periods are short, rarely longer than ten minutes, and pacifiers are widely used. Most babies are nursed for about a year or until the mother becomes pregnant again. Occasionally, babies are not weaned until they enter kindergarten. A few mothers only give their babies formula. (Hostetler and Huntington 2002: 66)

Two articles, which specifically address breastfeeding, are *A Note on Nursing Practices in an American Isolate with a High Birth Rate* by Huntington and Hostetler (1966) and *Sex-biased lactational duration in a human population and its reproductive costs* by Margulis et al. (1993). *A Note on Nursing Practices* provides detailed information regarding infant feeding practices. The authors describe that after the first six weeks, no allowance is made for any extra time to breastfeed; they also note that pacifier use is common and that this satisfies the infant's sucking needs rather than long nursing. Solid food is given to the infant before nursing. The duration of breastfeeding is assumed to be a little over a year, unless the mother becomes pregnant before; duration of breastfeeding among healthy mothers ranged from four months to three years. A slight tendency for younger mothers to terminate breastfeeding sooner than older mothers was noticed. The most frequent reason for the final cessation of breastfeeding was that the infant weaned himself or that the mother's milk dried up (sometimes due to ensuing pregnancy, but often not). It is concluded that infants spend relatively little time at the breast. This is due to rigid colony schedules, which give mothers little opportunity for

relaxed nursing, women not finding breastfeeding particularly enjoyable or rewarding, and pacifiers instead of long periods of breastfeeding satisfying the infants' need to suck.

Margulis et al., as already discussed in chapter 2, encountered that daughters were breastfed significantly longer than sons (12.9 months versus 8.3 months, respectively); the mean duration of breastfeeding was 10.3 months. They comment that, with few exceptions, all Hutterite women breastfeed and that there is little variability in social or nutritional factors that could affect nursing duration. Their article also states that Hutterite mothers breastfeed their infants at night, even after supplemental feeding has begun.

My own research validates most of these findings, yet I also discovered some discrepancies. Concerning duration of breastfeeding, my data revealed that even among mothers who experienced no breastfeeding difficulties, the length of breastfeeding was usually shorter than a year. However, there was great variability, even among siblings. A few mothers breastfed all of their children for a year or more. With the exception of one woman, who nursed one of her children until eighteen months, nursing past fourteen months was not practiced. Female-biased breastfeeding duration was not supported by my data.

My interview data confirmed that pregnancy was often the cause for terminating breastfeeding. Accounts of self-weaning were not given. Although, the exact phrase "milk dried up" was not stated as a common reason for the termination of breastfeeding, inadequate milk supply was. The tendency of younger mothers to terminate breastfeeding earlier than older mothers could not be tested quantitatively due to the small sample size, but interview and survey responses did not reveal this tendency. The only mothers who

used infant formula exclusively, did so because of stated breastfeeding difficulties, such as IMS.

My data also suggested that breastfeeding was considered the norm and that mothers were not given any extra time or flexibility to accommodate breastfeeding, once they returned to colony work. About half of the children in my sample (48%) used pacifiers. Almost all mothers in my sample breastfed their children at night at some time.

The importance of work

Hostetler writes: “The Hutterite woman is far more restricted than the American woman, though her role is clearly defined and satisfying. Since work is not done for money, work becomes religion.” (1983: 22) My fieldwork demonstrates that colony work is of utmost importance to Hutterite women. Interview data from the phone conversation with the physician first revealed work as a crucial factor in breastfeeding behavior. His observation that Hutterite women are often not motivated to breastfeed because of incompatibility with work was confirmed by a subsequent phone conversation with my informant.

When I asked about breastfeeding during a work day, she explained that with some labor-intensive jobs, such as helping with butchering, women were not able to leave their work easily, and children were left alone or with babysitters for longer periods of time. And although she took the extra time to go home to breastfeed, most mothers did not. She also told me that her mother, when asked why she had introduced a bottle, replied that it had been easier to give a bottle when working, and that, while nursing, she had found herself thinking about the work she could be doing instead of breastfeeding. I think this illustrates well the dedication of women to colony work.

A biocultural analysis of breastfeeding states that breastfeeding competes with time and energy for other tasks and goals: “Depending on the nature and importance of women’s productivity for domestic economy, pressure to maintain work output and thus to wean early may be strong.” (McDade and Worthman 1998: 294) This definitely applies to the Hutterite case, as women’s contribution to colony economy is essential for the colony’s survival, and mothers have to follow colony specifications regarding “maternity leave” and subsequent work schedules.

As the constraints on breastfeeding due to the demand of productivity were not part of my original research interests, my surveys did not elicit responses regarding work. Nonetheless, one woman’s response to why she used infant formula expressed the impact of work on infant feeding and introduces us to another aspect of the influence of rigid work schedules on breastfeeding: “[Using infant formula] was handier and easier once I started working and milk supply was lower when I worked all day.”

Etiology of IMS among Hutterite mothers

As my data revealed, more than half of my sample (53%) of Hutterite mothers responded positively to having experienced IMS. IMS and infant dissatisfaction with breastmilk were the most frequently given reasons for the introduction of breastmilk substitutes, mainly infant formula. As explained in chapter 3, the causes of reported IMS are rarely physiological. Of the various explanations regarding the etiology of IMS (see chapter 3), we can eliminate two in the case of the Hutterites: breakdown of traditional social support network and interference with the let-down-reflex.

Hutterites have extended family close by and maintain a strong traditional social support network. Usually a mother’s own mother or another close female relative comes

for four weeks after the birth of an infant to support the new mother. Eighty-two percent of mothers in my sample received breastfeeding support from other Hutterite mothers. Thus, this hypothesis cannot explain IMS among the Hutterites. Neither can an interference with the let-down-reflex, as colony life is no more stressful than other rural contexts. It lacks the anxiety and stress that are characteristic of urban life.

Accepting the physician's point of view, we could consider the claim of inadequate lactation among Hutterite mothers as a culturally appropriate interpretation of infant behavior. Thus, rationalization could be argued for. However, this explanation denies any relationship between rigid breastfeeding schedules and the resulting physiological decline in breastmilk production. Whether or not Hutterite women are motivated to breastfeed, the rigid work schedules that they have to adhere to do not allow them to breastfeed on demand to maintain adequate lactation. It is important to note here that 72% of mothers claimed to have breastfed on demand. This could have referred to the first ten weeks, as I worded my question generally without reference to the age of child, or these breastfeeding patterns may be based on "perceived demand", as true demand-feeding is characterized by fairly continuous close physical contact between mother and infant (Quandt 1986). Although rationalization may account for some Hutterite mothers' lack of desire to breastfeed, I do not believe that it explains the majority of IMS cases. Interestingly, Greiner et al. (1981) remark that there is a tendency among medical practitioners to dismiss insufficient milk as a real phenomenon.

I propose a synthesis of the biocultural explanation and the explanation offered by Greiner et al. to explain the prevalence of IMS in my sample. Certainly, the biological feedback loop between frequency of breastfeeding and breastmilk production applies to

the situation of Hutterite mothers. As already discussed, after ten weeks, new mothers return to their rigid work schedules to which infant feeding has to be adjusted. This, then, may lead to reduced milk production, which, in turn, is likely to lead to supplementation of breastmilk, further reducing the frequency of nipple stimulation and thus worsening the problem.

Greiner et al.'s argument that the local perception of the prevalence of IMS affects mothers' beliefs about their milk supply and infant satisfaction based on infant behavior is supported by the physician's view that mothers "catch on" to the prevalence of IMS. I do not think that this is necessarily a conscious response, but the cultural acceptance of the existence of IMS predisposes Hutterite mothers to interpret breastfeeding difficulties as such. This explains any perceived IMS before the mother returns to work. Once she has to adjust breastfeeding to colony schedules, even before any possible supplementation, physiological insufficiency of milk production may set in due to reduced nipple stimulation.

I find the inclusion of infant food companies' promotional activities as a cause of IMS in Greiner et al.'s article appropriate. In the population under study, survey responses indicated that infant formula was accepted as a satisfactory solution to breastfeeding problems such as IMS. Advertisements seemed to play a role in that awareness, as suggested by the survey responses to question 21. There appeared to be less of an overt influence of infant formula advertising on Hutterite breastfeeding patterns than I had anticipated, but there was certainly a relationship. As Hutterites may be influenced more by outside forces, such as mass media advertisements, in the future, it will be interesting to see if this relationship strengthens.

The bigger picture

So why is individualism suppressed, and mothers are not allowed to make their own decisions on how and when to feed their infants? Besides the economic importance of mothers' full work contribution, the social cohesion of the colony depends on this practice in two different ways. First, Hutterites are expected to give up their individual will and conform to the will of the colony. Deviance from colony authority patterns would lead to the erosion of the rigid social structure, so central to community integration.

Second, scheduled infant care and feeding play an important role in the socialization of children. Almost from birth, the infant has to adapt to the colony time schedule. Through this, he learns that the colony takes precedence over the individual and that he has little control over his environment. These socialization practices are essential to the survival of Hutterite life.

Conclusion

I hope to have demonstrated with my research on Mountain Hill Colony breastfeeding patterns, that maternal work demand should not be underestimated when analyzing infant feeding practices. I discussed the importance of colony work to Hutterite women, and my data revealed that Hutterite mothers' return to full-time colony work at ten weeks postpartum has notable consequences on infant feeding. Rigid colony work schedules impede demand-feeding the infant, decreasing milk production due to a reduced frequency of feedings and increasing the likelihood of supplementation, which, in turn, further decreases milk production. The prevalence of IMS is thus relatively high.

These findings were related to existing explanations of the etiology of IMS. Finally, I connected the existence of rigid work schedules and resulting rigid infant care to the cultural survival of Hutterite life.

CONCLUSION

Although my original research inquiry focused on the impact of infant formula advertising on Hutterite breastfeeding patterns, my fieldwork at Mountain Hill Colony revealed that Hutterite mothers, both young and old, have relied on supplementation of breastmilk. Whether this supplementation is given in the form of infant formula (younger mothers) or cows' milk (older mothers), it is the colony's structured, rigid work schedule that creates its necessity.

Depending on the type of work of the women, mothers may not be able to come home for several hours to breastfeed their children. Thus, babysitters give supplemental bottles instead. This practice has the potential to create IMS through the reduced nipple stimulation accompanying infrequent feeds, creating the need for further supplementation with breastmilk substitutes. Even if Hutterite mothers are aware of the need for more frequent feedings to increase milk production, their work schedules do not allow for this adjustment to take place. Even without supplementation, IMS may occur, as scheduled breastfeeding is the norm once mothers return to work at ten weeks postpartum. The cultural acceptance of IMS among Hutterites further augments its prevalence.

These rigid patterns of work and infant care have to be analyzed within the larger historical and socio-cultural contexts of Hutterite life. Continued persecution has created the need for established survival techniques, including community integration and comprehensive socialization. These techniques are accomplished through the equal economic participation of all colony members and the rigidity of infant care. Hutterites

are conditioned from birth to value the well-being of the community over that of the individual.

According to evolutionary models, breastfeeding patterns are conditioned by complex trade-offs between infant and maternal needs and constraints. Hutterite mothers' economic contribution to the colony is needed for its survival, and mothers are eager to return to work, giving them a source of accomplishment and pride.

Although the socio-cultural context of the Hutterites is quite unique, this analysis can nevertheless give us insights regarding maternal infant feeding decisions and the etiology of IMS. It reminds us that women's economic contributions are easily overlooked and that there is a narrow focus in applied health research on infant well-being at the expense of mothers' needs. As the world is increasingly urbanizing, and women's economic contributions are becoming more productive, public, and modern (and thus more incompatible with breastfeeding), more research in diverse socio-cultural contexts is clearly needed to adequately identify all variables affecting mothers' infant feeding choices.

Appendix One

Interview Questions for Study of Hutterite Breastfeeding Practices

1. What is your age?
2. What is the custom among Lehrerleut Hutterite women for feeding infants?
3. Did you nurse your babies? For how long?
4. Did you nurse each one for the same length of time, and if not, how did this vary, by child?
5. Are there any Hutterite beliefs about how long baby boys vs. baby girls should nurse, or is it all the same?
6. Where and how did you give birth (home/hospital, C-section, painkillers)?
7. How soon after birth did you nurse your baby?
8. Did you nurse on-demand or on a schedule? How many times a day did you nurse? Did you nurse for a set period of time, or just as long as the baby wished?
9. Where did you breastfeed?
10. Describe where your babies slept.
11. How did your babies fall asleep (crying, nursing, rocking etc.)?
12. Did you nurse at night, and if so, how often?
13. Describe when your babies slept through the night.
14. Did your babies use a pacifier?
15. Did you wear your baby, such as in a sling?
16. During the day, did your baby stay with you as you worked?
17. At what age did you start to leave your child with another caretaker?
18. How did you handle your babies' nursing needs after they started staying with another caretaker?
19. Did you use bottles?
20. Did you express milk? How?
21. Did you use formula?
22. What kind of formula? Why that kind? Where did you purchase it? How did you purchase it (personal allowance, colony money)? Where did you hear about it?
23. Have you ever seen or heard an advertisement for infant formula?
24. Please describe your thoughts about infant formula – positives, negatives, what kind of mother uses formula, benefit or harm to babies of using formula, and so on.
25. Does your husband have an opinion about breastfeeding vs. bottle-feeding?
26. For each child, at what age did you start formula, if any?
27. For each child, at what age did you introduce liquids other than breastmilk? What was it?
28. For each child, at what age did you start solids of any kind?
29. What foods are good to feed a baby that has just started to eat solids?
30. Are there any foods to avoid feeding a baby that has just started solids (wheat, dairy etc.)?
31. What method did you use to wean your child?
32. Was weaning baby-led? If not, why did you wean? Did your child resist weaning?
33. Is there a "Hutterite method" of weaning, or does each woman use her own approach?
34. How long was it until your menstruation returned after giving birth?

35. Were you still nursing when you became pregnant again? If so, did you continue to nurse? Did you ever continue to nurse an older child in addition to a newborn?

Appendix Two

Survey Questions for Study of Hutterite Breastfeeding Practices

1. What is your age? ___ years
2. How old are your children (including adult children)?

Child 1	Child 2	Child 3	Child 4	Child 5	Child 6	Child 7	Child 8	Child 9

3. Did you nurse your babies? If yesy, please indicate for each child for how long (in months on bottom row, please indicate with a star * if you are still nursing a child). If no, leave bottom row blank.

Child 1	Child 2	Child 3	Child 4	Child 5	Child 6	Child 7	Child 8	Child 9
_ boy	_ boy	_ boy	_ boy	_ boy	_ boy	_ boy	_ boy	_ boy
_ girl	_ girl	_ girl	_ girl	_ girl	_ girl	_ girl	_ girl	_ girl

4. Where did you give birth to most of your children?

Child 1	Child 2	Child 3	Child 4	Child 5	Child 6	Child 7	Child 8	Child 9
_ home	_ home	_ home	_ home	_ home	_ home	_ home	_ home	_ home
_ hospital	_ hospital	_ hospital	_ hospital	_ hospital	_ hospital	_ hospital	_ hospital	_ hospital

5. Where were you born? _ home _ hospital
6. How soon after birth did you nurse each baby?

Child 1	Child 2	Child 3	Child 4	Child 5	Child 6	Child 7	Child 8	Child 9

7. Did you receive support for nursing from hospital staff and/or other Hutterite mothers?

Child 1	Child 2	Child 3	Child 4	Child 5	Child 6	Child 7	Child 8	Child 9
_ hospital	_ hospital	_ hospital	_ hospital	_ hospital	_ hospital	_ hospital	_ hospital	_ hospital
staff	staff	staff	staff	staff	staff	staff	staff	staff
_ other	_ other	_ other	_ other	_ other	_ other	_ other	_ other	_ other
mothers	mothers	mothers	mothers	mothers	mothers	mothers	mothers	mothers

8. Did you feel that you didn't have enough breastmilk with any of your children?

Child 1	Child 2	Child 3	Child 4	Child 5	Child 6	Child 7	Child 8	Child 9
<input type="checkbox"/> yes	<input type="checkbox"/> yes	<input type="checkbox"/> yes	<input type="checkbox"/> yes	<input type="checkbox"/> yes	<input type="checkbox"/> yes	<input type="checkbox"/> yes	<input type="checkbox"/> yes	<input type="checkbox"/> yes
<input type="checkbox"/> no	<input type="checkbox"/> no	<input type="checkbox"/> no	<input type="checkbox"/> no	<input type="checkbox"/> no	<input type="checkbox"/> no	<input type="checkbox"/> no	<input type="checkbox"/> no	<input type="checkbox"/> no

9. If you encountered any nursing difficulties, including insufficient milk supply, did you ever consult a professional, such as a lactation consultant? yes no

10. How did you nurse each child?

Child 1	Child 2	Child 3	Child 4	Child 5	Child 6	Child 7	Child 8	Child 9
<input type="checkbox"/> on demand	<input type="checkbox"/> on demand	<input type="checkbox"/> on demand	<input type="checkbox"/> on demand	<input type="checkbox"/> on demand	<input type="checkbox"/> on demand	<input type="checkbox"/> on demand	<input type="checkbox"/> on demand	<input type="checkbox"/> on demand
<input type="checkbox"/> on a schedule	<input type="checkbox"/> on a schedule	<input type="checkbox"/> on a schedule	<input type="checkbox"/> on a schedule	<input type="checkbox"/> on a schedule	<input type="checkbox"/> on a schedule	<input type="checkbox"/> on a schedule	<input type="checkbox"/> on a schedule	<input type="checkbox"/> on a schedule

11. During the first year, where did each baby sleep most of the time?

Child 1	Child 2	Child 3	Child 4	Child 5	Child 6	Child 7	Child 8	Child 9
<input type="checkbox"/> family bed	<input type="checkbox"/> family bed	<input type="checkbox"/> family bed	<input type="checkbox"/> family bed	<input type="checkbox"/> family bed	<input type="checkbox"/> family bed	<input type="checkbox"/> family bed	<input type="checkbox"/> family bed	<input type="checkbox"/> family bed
<input type="checkbox"/> crib in parents' room	<input type="checkbox"/> crib in parents' room	<input type="checkbox"/> crib in parents' room	<input type="checkbox"/> crib in parents' room	<input type="checkbox"/> crib in parents' room	<input type="checkbox"/> crib in parents' room	<input type="checkbox"/> crib in parents' room	<input type="checkbox"/> crib in parents' room	<input type="checkbox"/> crib in parents' room
<input type="checkbox"/> own room	<input type="checkbox"/> own room	<input type="checkbox"/> own room	<input type="checkbox"/> own room	<input type="checkbox"/> own room	<input type="checkbox"/> own room	<input type="checkbox"/> own room	<input type="checkbox"/> own room	<input type="checkbox"/> own room

12. When did each baby sleep through the night (six consecutive hours)? Please indicate age in months.

Child 1	Child 2	Child 3	Child 4	Child 5	Child 6	Child 7	Child 8	Child 9

13. If your baby cried at night, how did you respond (n = nursing; s = soothing other than nursing, such as rocking; i = ignore, let baby cry)?

Child 1	Child 2	Child 3	Child 4	Child 5	Child 6	Child 7	Child 8	Child 9
<input type="checkbox"/> n	<input type="checkbox"/> n	<input type="checkbox"/> n	<input type="checkbox"/> n	<input type="checkbox"/> n	<input type="checkbox"/> n	<input type="checkbox"/> n	<input type="checkbox"/> n	<input type="checkbox"/> n
<input type="checkbox"/> s	<input type="checkbox"/> s	<input type="checkbox"/> s	<input type="checkbox"/> s	<input type="checkbox"/> s	<input type="checkbox"/> s	<input type="checkbox"/> s	<input type="checkbox"/> s	<input type="checkbox"/> s
<input type="checkbox"/> i	<input type="checkbox"/> i	<input type="checkbox"/> i	<input type="checkbox"/> i	<input type="checkbox"/> i	<input type="checkbox"/> i	<input type="checkbox"/> i	<input type="checkbox"/> i	<input type="checkbox"/> i

Did your babies use a pacifier?

Child 1	Child 2	Child 3	Child 4	Child 5	Child 6	Child 7	Child 8	Child 9
<input type="checkbox"/> yes	<input type="checkbox"/> yes	<input type="checkbox"/> yes	<input type="checkbox"/> yes	<input type="checkbox"/> yes	<input type="checkbox"/> yes	<input type="checkbox"/> yes	<input type="checkbox"/> yes	<input type="checkbox"/> yes
<input type="checkbox"/> no	<input type="checkbox"/> no	<input type="checkbox"/> no	<input type="checkbox"/> no	<input type="checkbox"/> no	<input type="checkbox"/> no	<input type="checkbox"/> no	<input type="checkbox"/> no	<input type="checkbox"/> no

14. Did you use bottles of expressed milk and/or infant formula with any of your children? If so, please indicate at what age (in months) this was introduced.

Child 1	Child 2	Child 3	Child 4	Child 5	Child 6	Child 7	Child 8	Child 9
Expressed milk	Expressed milk	Expressed milk	Expressed milk	Expressed milk	Expressed milk	Expressed milk	Expressed milk	Expressed milk
—	—	—	—	—	—	—	—	—
Infant formula	Infant formula	Infant formula	Infant formula	Infant formula	Infant formula	Infant formula	Infant formula	Infant formula
—	—	—	—	—	—	—	—	—

15. If you used infant formula, why did you do so? _____

16. What do you think is best for baby? breastfeed exclusively use infant formula exclusively use a combination of both

17. Have you ever read the magazine *Babytalk* or a similar baby magazine? yes no

18. If yes, when was the first time you ever saw such a magazine? Please indicate calendar year. _____ Where did you see it? _____

19. Have you ever seen an advertisement for infant formula in such a magazine? yes no

20. What was your reaction to seeing such an advertisement?

21. Do you think that seeing advertisements for infant formula has affected the way you think about feeding your babies? yes no

If yes, please explain: _____

22. How long was it until your menstruation returned after giving birth (in months) for each child?

Child 1	Child 2	Child 3	Child 4	Child 5	Child 6	Child 7	Child 8	Child 9

23. Did you ever continue to nurse an older child in addition to a newborn? yes no

If no, have you heard of Lehrerleut mothers doing this in the past? yes no

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