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THE INFANT FEEDING STUDY

SEMARANG SITE REPORT

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I INTRODUCTION AND STUDY DESIGN

This report is part of a larger study that began in 1979, undertaken to explore the determinants of infant feeding practices in four developing countries. The larger study was conducted by a research consortium of the Population Council, Columbia University, and Cornell University in collaboration with investigators in each field site. The Indonesian study was implemented by the Faculty of Public Health, Diponegoro University, Semarang. In addition, to Semarang, data were collected in Bogota, Colombia; Nairobi, Kenya; and Bangkok, Thailand. The institutions representing the other 3 sites are: the Faculty of Interdisciplinary Studies, Javeriana University, Bogota; Central Bureau of Statistics (CBS) and African Medical and Research Foundation (AMREF), Nairobi; and School of Public Health, Mahidol University, Bangkok.

The central objective of the study is to investigate the significance of a broad range of biological, social, cultural and economic factors on infant feeding practices in order to determine the nature and magnitude of their contribution to problems of infant nutrition. The variables examined include the role of the health professions, infant food marketing and distribution strategies, and women's labor force participation. An interdisciplinary research approach has been utilized in order to identify a variety of potential influences on infant feeding decisions and choices.

This approach includes 3 study components: 1) ethnographic field work, consisting of participant observation of infant feeding practices in the home and similar observation in health services settings; 2) a cross-sectional household survey of mothers of infants under one year of age which includes infant feeding practices and consumer behavior relating to infant foods, 3) a marketing study, on a national basis, of the infant feeding market, including the analysis of the development and state of the industry and the structure of the market. The research has been guided by the conceptual framework developed by staff and consultants in early 1981.*

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* Laukaran, V.H., E.K. Kellner, B. Winikoff, G. Solimano, M. Latham, P. Van Esterik, and J. Post. "Research on Determinants of Infant Feeding Practices: A Conceptual Framework, " November 1981, International Progress, The Population Council, Working Paper No. 15.

Ethnography: Site Description and Methods

Semarang and the Community Context

Semarang, located on the north coast of Central Java, is the fifth largest city in Indonesia and the fourth most densely populated city in the nation. It has a long and complex history. Most reports suggest that Chinese traders were settled in the area during the Ming Dynasty in the 1400's. When the Dutch East India Company expanded its commercial activities in Java in the seventeenth century, there was already a substantial group of Chinese merchants and traders there. In 1678, Semarang was turned over to the Dutch East India Company which expanded the port facilities and built a fortress at the site. Around 1850, the central part of Semarang was designated as the Chinese quarter, and resident Chinese were required to live in this sector. Residential segregation has decreased as the city's population expanded and the Dutch residents left, but the central commercial areas of the city are still predominately Chinese.

In 1876, Semarang expanded to include some of the surrounding rural subdistricts within its municipal boundaries. Like other parts of Java, however, the links between rural and urban poor are substantial. In spite of the attempts by city administrations to restrict the flow of rural migrants into Javanese cities, poor migrants continue to flock to the cities for possible employment. Many of these are "circular migrants" who move only temporarily into Semarang and return to their rural families when they have earned some cash. Circular migrants, both men and women, often work as petty traders, supplying ready to eat food and drinks to all areas of the city. These food vendors, common in all three communities studied, provide snacks and infant foods, such as porridges, at very low cost. This constant travel blurs the distinctions between rural and urban households.

Within the city of Semarang, there is great intra-cultural diversity: Chinese merchant families, itinerant peddlers, strict Moslem civil servants, and prostitutes all may live in the same neighbourhoods. In attempting to understand the categories of people within the city, several distinctions are useful. First, among the category of Chinese, there is an important distinction between "totok" or China born-Chinese, and "peranakan," Chinese born in Indonesia usually of Indonesian mothers. The latter do not usually speak Chinese although they may have Chinese names. Secondly, Javanese themselves distinguish among:

1) abangan or wong cilek (small people), peasant farmers who practice a variety of syncretic Javanese rituals, most significantly the slametan or ritual feast.

2) santri, followers of strict Moslem practices, usually richer peasants and merchants.

3) prijaji, the hereditary aristocracy perpetuating Hindu-Javanese court traditions, usually government workers or more educated upper-middle class.

These differences in religious practice are significant because they orient families and households around different key values.

Among the many neighborhoods in Semarang, three were selected for more intensive examination, Kranggan Dalam in the urban center, and Mangkang Kulon, a peri-urban community recently incorporated into Semarang.

Kranggan Dalam

Kranggan Dalam occupies about 25 hectares in the urban center of Semarang. In the past, it was considered an industrial trading area with local cottage industries producing leather and rattan goods for sale. The area is heavily populated with fairly well to do Chinese and low income Javanese.

This is the most densely populated study area with about 2900 households arranged along narrow lanes behind the main streets of downtown Semarang. The brick or wood houses are tightly packed together. Most have electricity for lighting and water from municipal water pipes or wells. The drainage and sewage facilities are poor, particularly around the public lavatories. Transportation in this area is by "becak" (pedicab), bicycle, and motorcycle. In this community, people are small merchants, government officiers, labourers, becak drivers, and housemaids. Women work in shops or sell a variety of items for daily use within the neighborhood. The local markets sell fresh food early in the morning, and there is a wide range of shops in the area.

Kranggan has a variety of health facilities available including a community health center, private general clinic, a number of private physicians, and many Chinese and Javanese traditional medicine shops. The residents also seek care outside Kranggan.

There are three PKK (family welfare groups) in Kranggan. They are most actively concerned with money lending activities (arisan), although they also provide cooking and sewing courses.

Krobokan

Located in the suburbs of west Semarang, this new urban residential area covering 84 hectares has over 17,000 inhabitants. The facilities were provided as part of a city development program and expanded through a Kampung Improvement Project in 1980. Roads are now asphalted, ditches cleaned out, and roads equipped with electric lighting. The suburban community with its wider roads and houseyards has a much more open and prosperous feel than Kranggan Dalam. The homes are a combination of European style brick and simple bamboo and wood village style housing.

Facilities within the community vary by family income. Piped water and electricity are available to those families who can afford them. Around the railway tracks and by the river, however, sanitary conditions are particularly poor with the rivers used for toilet facilities and the public works department dumping garbage in the side streets.

The residents shop at nearby large markets although 'daily needs' can be purchased at local stores. Public transportation to these larger markets is mainly by pedicab.

The area contains educated middle class families with regular income, poorer families who work as daily labourers and some who live as tenants dependent on others. The poor families are active participants in the PKK and make particular use of the revolving credit (arisan) scheme. The PKK also assists with the preparation of traditional ceremonies.

There are also a number of religious organizations in the area. These are strict Islamic groups of men or women meeting for prayer or teaching. However, many community members also practice traditional Javanese rites of passage to celebrate births, pregnancies, birthdays, and weddings.

Mangkang Kulon

This district lies 15 kilometers from the center of Semarang and can be considered a peri-urban settlement. When the Semarang administration expanded, it incorporated several rural hamlets which now border the more densely populated urban settlements. The population of 4,684 persons (1981) is located in village clusters near the irrigated ricefields, fishponds, and garden lands.

The residents live along the highway into Semarang and in inner villages. The former have electricity while the latter do not. Water is obtained from the river, wells, and water pumps. There are public bathing and toilet facilities for every 5-6

families. Dirt roads connect parts of the village. Transportation into Semarang is convenient, particularly for the hamlets bordering on the highway.

The village has several Islamic institutions including a religious training center. Women in particular are actively involved in Koranic recitation groups in this community.

The village contains educated middle class government workers, farmers, and unskilled workers with low incomes and insecure employment. There are schools and three factories in the area. As in the other communities, the PKK provides revolving credit (arisan), skills training, and health lectures for the women in the community.

The area has a Public Health Center although the community also has a number of traditional Javanese healers. Nevertheless, people often go into Semarang for health care, particularly the wealthier families.

Few women in Mangkang Kulon work formally outside the household, although many have opportunities to earn money by selling at home. As in Krobokan, traditional Javanese rituals for pregnancy, childbirth, and curing are still common. Compared with the other two communities, the women of Mangkang Kulon are less interested in family planning and view their children as blessings from God.

Phase I

In Indonesia, the Phase I ethnography was carried out to determine the sociocultural factors relevant to changing infant feeding practices in urban Java. Fieldwork was used to reformulate existing hypotheses and identify new hypotheses to be tested by the cross sectional survey. It was also used to understand how important basic variables, such as rural-urban characteristics and socioeconomic status affect infant feeding patterns. In addition, the ethnographic research was used to adjust the cross-sectional survey instrument to be sure it conformed to the vernacular language and phrasing of the informants and to their values. This initial phase of research was considered exploratory and qualitative and was intended to discover all factors relevant to infant feeding in urban, suburban, and urban fringe areas of Semarang.

To meet these objectives, the ethnographic team spent three months studying in three neighborhoods in Semarang. The first month, two ethnographers resided in the neighborhood; the second month, the fasting month of Ramadan, was used for making home visits to the index mothers in the study; and the third month was used for more focused interviewing using formal analysis techniques.

Study locations were chosen after a survey of available secondary data and visits to a number of sites around Semarang. Three neighborhoods were chosen according to their rural or urban characteristics. Three kelurahan or districts were chosen: Kranggan Dalam to represent the urban center, Krobokan to represent the suburban, and Mangkang Kulon, to represent the rural fringe within the municipal boundaries of Semarang.

In each community, twenty households with children 0-24 months were selected for more intensive study. Preliminary selection of households was made after interviewing key informants and community leaders. On the basis of this selection, representatives of the rich, middle, and poor in the community were identified. The sample was expanded by asking these mothers to introduce the ethnographers to other mothers like themselves. In this way, sample mothers representing different socioeconomic categories, work status, and with infants of different ages were included in the ethnographic study. Other key informants in the community were also interviewed.

Phase II

At the completion of the Phase I ethnography, the University of Diponegoro team identified two topics which required additional in-depth study. These topics were:

1) The influence of the Health Center on infant feeding practices; and
2) The role of shops in disseminating information and offering services related to infant feeding.

Studies designed to address both these issues were carried out in Krobokan, the suburban community where the two junior ethnographers worked during the first phase of fieldwork.

The Health Center substudy, undertaken by Dra. Suci Murti-karini, was designed to discover how information and advice from the Health Center influenced mothers' infant feeding practices. The subject of analysis was the main Health Center (puskesmas) in Krobokan, its staff and their activities, and the people who made use of its services.

The substudy of shops was done by Dra. Rodhiyah in the main shopping area of the Krobokan residents. The study examined three contexts for making purchases of infant foods: a drugstore, a small shop, and a kiosk all strategically located near the local market and easily reached by mothers in the Krobokan area. The subject of analysis was the drugstore, shop, and kiosk, their staff, and the customers who frequented them.

Personnel

The ethnographic study team consisted of three senior staff members in social science fields and eight junior staff from a variety of disciplines: social science, psychology and medicine. The three senior staff members, Dr. Nico L. Kana, Dr. Darmanto Yatman, and Dr. Soesatyo Darnawi, were responsible for the overall supervision and analysis of the ethnographic fieldwork.

The junior staff had no previous training in ethnographic field methods. A training program was therefore carried out stressing formal and informal interviewing techniques, observation, life history, recording food intake, charting kinship, and writing field notes. Training included both classroom teaching and field practice using the field manual for the infant feeding study.

In the second phase of ethnographic fieldwork, the senior staff members supervised two junior staff members, Dra. Suci Murtikarini and Dra. Rodhiyah. These staff members were chosen because of their availability and their successful fieldwork during the first ethnographic phase.

Data Collection Techniques

Phase I

The ethnographic study team prepared a field manual in Indonesian, developed from the manual provided by the consortium. The team in each neighborhood collected the following kinds of information through participant observation and informal interviewing in each household:

Physical Setting
- -household amenities
- -kitchen inventory
- -description of houses (photographs were taken in each household)

Family and Household Composition
- -kinship diagrams of household members
- -life histories of mothers
- -ceremonies performed in household
- -ethnic group
- -education and occupation history

Mother's Activities
- -direct observation of mother's activities at home
- -weekly activity schedule
- -daily activity schedule
- -work history and child care arrangements

-time spent with infant

Community Context

-sketch map of neighborhood
-key informant interviews about neighborhood
-facilities in area, e.g., shops, markets, health care facilities, community events, social organizations

Infant Feeding Practices

-direct observation of meals
-24 hour recall of intake
-food frequency
-shopping behavior
-formal analysis of food categories, ideal infant feeding, techniques of feeding, baby's growth, reasons for breast feeding, etc.

Ethnographers were asked to listen, and watch for clues about mother's knowledge of and attitudes towards infant feeding. Information was first recorded in a small field notebook and later was transferred by topic into a more expanded form. Throughout the data collection stage, the senior staff visited the junior staff in the field to discuss their findings and review their notes. There was also a weekly meeting for the whole team to share experiences and evaluate the progress of the work.

Phase II

Data collection took place over a one month period for both substudies. Both substudies used a combination of data collection techniques including direct observation, informal interviews with service providers and service users ("customers"), secondary data, and photographs taken within the health center and the stores.

The health center substudy collected data on:

1) formal organization of health center
2) types of activities carried out at the health center
3) reasons for these activities
   description of activities

4) service to breastfeeding mothers when:
   mothers were ill
   infants were ill
5) background of individuals visiting health center
   reasons for visits
   types of service received
6) information and advertising at health center

The marketing substudy collected information from the manager, employees, and customers frequenting a drugstore, small shop, and kiosk in Krobokan. Information was collected from the manager or owner of the retail outlet on:

1) organization of store
2) qualifications of staff
3) ways of accumulating the stock of infant foods, e.g., infant formula, weaning foods
4) posters, advertising, and free gifts from infant food manufacturers, including information on why they are accepted
5) information provided by salesmen on special products
6) items of infant food available and reasons for having them
7) most popular kinds of infant foods sold

The salespersons were interviewed about:

1) special information given to customers regarding infant foods
2) kinds of promotion for infant foods
3) knowledge of infant foods
4) educational background, job description, and life history

The customers were asked:

1) what brands of infant foods they chose and why
2) what information they received from the salespersons
3) what promotional material they received
4) how they obtained information on the preparation of infant foods
5) their perception of the information and service provided by the shop personnel

Survey Methods

The survey component of the Infant Feeding Study was designed to investigate the role of a broad range of factors as determinants of infant feeding practices. These factors included, among others, demographic, socioeconomic, women's employment, and health service variables For each of these factors, it would be possible to design a special study to investigate effects on infant feeding practices. If separate, specific studies of this kind were undertaken, the sampling strategies would, in all probability, vary according to the purpose of the analysis. Because of the broad scope of this study and the need to obtain descriptive information for policy purposes, it was decided, in consultation with sampling experts from the consortium, to use a representative cluster sample of women with children under 24 months of age.

Sampling

The sampling frame for the city of Semarang, Indonesia was obtained from the Provincial Office of Census and Statistics for Central Java and was based on the 1980 census. In 1978, the city of Semarang, which had been divided into five sub-districts, annexed four more districts in nearby rural areas. For sampling purposes, the basic unit was a census block consisting of approximately 100 households. Each of the five original (urban) districts and one of the four new (rural) districts was chosen for complete listing of all the census blocks in Semarang.

In order to obtain a sample size of approximately 1500, a sampling fraction of 3% was calculated based on the estimated birth rate and estimated number of households per block. Sixty-seven blocks were systematically selected from the complete list of all blocks in the six sub-districts.

Data Collection

Every block was visited by two field workers (medical students) and a local village official to determine the physical boundaries of the block. On the following day, the two enumerators returned to list the household composition including the age of each person. After each sub-district was enumerated, the resulting eligible children were totaled to determine the actual sample population. Because the resulting sample was only 70% of the desired sample size it was necessary to correct discrepancies in underlisting of households due to mapping errors. This was done after consultation with the census director for each sub-district and resulted in a sample of the desired size. The interviews took place from February 4 to March 13, 1982. The final number of cases interviewed was 1358.

Instrument Development

The Research Consortium developed a model instrument for all study sites which included information on households, index mothers, and index children. The basis for the selection of these variables was described in a 1981 Working Paper by the consortium.[1] Key variables were to be included in each instrument. Basic household information included income, water supply, electricity, sanitation, refrigeration, number of persons in the household, and recency of urban migration. Information on the index mothers included age, number of live births, number of years of education, and employment of the male head of the household. For each child, information on sex, date of birth, age, birth order, place of birth, name of mother, hospitalization

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[1] Laukaran, et al, 1981.

and morbidity in the last two weeks, as well as height and weight were included. Infant feeding variables included:

* ever breastfed
* currently receiving breast milk
* currently receiving non-human milk
* currently receiving other foods
* duration of exclusive breastfeeding
* age at first breastfeeding
* age at cessation of human milk
* age at introduction of non-human milk
* age at introduction of infant formula
* age at introduction of other foods
* type of other foods given.

Other information elected by the survey included consumer behavior and attitudes towards infant feeding products, utilization of prenatal care and health services, mother's employment, knowledge and attitudes about breast feeding, and determinants of bottle feeding and weaning. A draft instrument was prepared for use in Semarang based on the core instrument developed by the consortium and on the results of the local ethnographic field work. The consortium provided technical assistance for the revision of this instrument after pretesting. Revisions were incorporated after discussion with the ethnographic team, and the final instrument was approved by the consortium prior to use in the field.

Training

Interviewers were selected from the medical students at Diponegoro University and underwent a training program conducted by the principal investigator and research associates on the staff of the project. Training for anthropometric measurement was conducted by the senior staff of the project who had had previous experience in anthropometric fieldwork.

Fieldwork

Fieldworkers were supervised by Dr. Fatimah Moeis of Diponegoro University. Completed questionnaires were audited daily, and incomplete or ambiguous responses were clarified. Where necessary, households were visited the following day to reinterview. A selected number of respondents were reinterviewed by field supervisors to determine accuracy. Regular meetings were held with all interviewers in order to resolve field data collection problems or difficulties encountered in locating respondents or in utilization of the instrument.

Data Preparation

All data were coded and entered on a tape and same was cleaned and edited in Semarang. A copy of this tape, which was delivered to the consortium staff at the Population Council, was further cleaned prior to analysis.

Final data analysis were prepared on the Council's DEC-PDP-11-73 computer. For logistic regression analysis, the Princeton University Computing Center was used to enable the application of the SAS program.

II CHARACTERISTICS OF THE STUDY POPULATION

Household Characteristics

A brief characterization of the Semarang sample household is presented in the following pages. This section provides a contextual background for subsequent detailed analyses of maternal feeding behavior.

A total of 1,356 mothers and their infants under 24 months of age comprise the cross-sectional survey sample for Semarang. Most people in the Semarang study live in a 5-person household. Eighty-four percent of them live in three rooms or less. Table 2-1 presents these data. Most husbands live in the same household as their wives, although 10% did not (Table 2-2). The majority (94%) of the index women indicated that their husbands were the main source of support for their families (Table 2-3). Three percent cited themselves as the predominant income earner. There may be some underreporting here of female income providers because of a strong cultural value placed on the ability of men to support their families.

The median aggregate monthly family income (Table 2-4) is 42,000 Rupiah -- the equivalent of US $67. The monthly minimum wage in Semarang is 16,000 Rp (US $26). Eighteen percent of the households live on an income of 29,000 Rp or less (US $46); twelve percent of the families have incomes of 110,000 Rp or higher (US $176). During the course of the study there was a drastic devaluation. Devaluations increase the cost of imported goods, which include imported brands of infant formula.

Table 2-5 provides other indications of socioeconomic status. Fifty-seven percent of the study families had electricity. Forty-four percent reported using a closed and 17% an open toilet. Rivers, rice fields and homeyards served as toilet facilities for 39% of the families in Semarang. In addition, the availability of refrigeration and running water in the homes was very low. Six percent owned a refrigerator. Only 18% had running water; ten percent of the families relied on a fountain or the river, whereas 27% had open wells, and 10% used pump wells. The largest proportion of families purchased their supply of water on a daily basis (35%). Daily purchase of water is expensive, but probably the only way the poor can afford it.

It cannot be assumed from the statistics on water use that most families have a constant supply of clean water. Water bought daily from a retailer may or may not be clean. A real problem is the cleanliness of the container used to transport the water. Since daily rather than monthly water subscription indicates insecurity in ability to pay, inferior sources were probably used at times and not reported here.

For poor families, the cost of heating water to sterilize bottles is not insignificant. Although 82% of the families had kerosene stoves, 16% (204 households) used braziers with charcoal or firewood purchased from street vendors. Even if wood is gathered, it requires the expenditure of time and physical energy, so it is far from free. Refrigeration and access to uncontaminated water are necessary for safe bottle feeding of infants. The low household prevalence of both suggests a less than optimal condition for bottle feeding of infants in most households.

Ninety-one percent of the households are ethnic Javanese, while 5% of the mothers and 6% of the fathers are Chinese (Table 2-6). The Javanese-Chinese category may be underreported, since it was not a listed choice on the questionnaire asking for father's ethnic background. Only 6 mothers identified themselves as Javanese-Chinese. This low reported number is not unexpected because of the unfavorable social status accorded the Javanese-Chinese minority. Eighty-eight percent of the mothers were Moslem, 10% were Christian and 2% were either Confucian or Buddhist (Table 2-7). Most people speak Javanese (92%), with Indonesian (8%) as the next largest language group (Table 2-8).

Index Mothers

Table 2-9 shows the age distribution of the cohort mothers. They are a young group, two-thirds between the ages of 20-29, with a median age of 26. While most of the women have 2-3 children, 12% have between 6 and 9 (Table 2-10). Fifty-four percent of mothers were born in a city and 46% were not (Table 2-11). It should be mentioned that women born in the subdistrict of Tugu often identified themselves as city-born despite its rural nature, since Tugu was recently incorporated into the city of Semarang. The nature of urbanization in Semarang is such that city districts were built up around rural areas, such as Tugu, incorporating them into Semarang city proper as they grew. Administratively speaking, women born in the Tugu sub-district are regarded as having city origins, but their lifestyles may be much closer to women from rural areas than urban centers.

The Semarang study population has little formal education. Fourteen percent have never been to school. Two-thirds did not go beyond the 7th grade (Table 2-12). Three-quarters of the women list themselves as exclusively housewives (Table 2-13). Of the 25% who report other jobs as well, 41% work as merchants or in business and 27% are laborers or peasant workers. Ethnographic data indicate that the number of women who report holding jobs is most likely an underestimate, particularly among the poorest and wealthiest classes. As mentioned above, Islamic tradition places a value on ability of the husband to support his family. This encourages some women to omit the fact that they work lest this admission compromise the reputation of the

husband. In addition, poor women frequently do not hold formal "jobs," but rather move fluidly from one type of informal work to another with no real "occupation." At the moment of the interview, some of these women may have responded "No" to the question "Are you working now?"

Thirty-three percent of the women were using contraceptives. Forty-one percent of these were using hormonal methods (pills or injectable contraceptives) (Table 2-14). Seven percent of the mothers were pregnant (Table 2-15) at the time of the interview and 62% stated they were still amenorrheic (Table 2-16).

One percent of the mothers reported having a child aged 0-24 months who was living elsewhere at the time of the interview. Five of these children had been separated from their mothers within the first year of life. Although some data were collected for these children, the cross-sectional analysis is based on interview data with mothers whose child lived with her. In the case of twins, (1% of the sample children), only 1 child was interviewed for each mother.

Index Child

The median age of the Semarang index child was 12 months (Table 2-17). Based on their previous experience in conducting field work for anthropometric research, the Indonesian research team made a decision on-site to collect information on age of the index child in a manner that differed from the procedure prescribed by the research consortium. Because weight-for-age tables are based on month-by-month weighing, the Indonesian team wished to be able to compare the average of each months' cohort to the standard weight-for-age tables. They thus classified children who were 15-44 days of age in the one-month group; those who were 45-74 days were classified as two months of age. This procedure was followed for all children in the sample (up to 24 months). The first category was composed of infants 1-14 days of age. These age classifications were established in the field based on mothers' reporting of birthdates, using the Javanese calendar. Because the data were entered on the data collection instruments directly, actual birthdates and true ages were not recorded. The consortium therefore, could not calculate corrected ages in order to make age-specific comparisons with the other sites. Because of the Indonesian procedure for recording age, this sample is approximately two weeks younger at each "month" of age than the other country cohort reports.

There were more girls than boys in the sample: 666 (49%) males and 691 (51%) females (Table 2-18). Forty-four percent of the total number of the cohort children were born at home and 30% at a maternity clinic. The remainder were born at a midwife's home, a community health center or a government hospital (Table

2-19). Table 2-20 presents the distribution of birth attendants. Fifty-eight percent of the total births were attended by licensed midwives, 26% by "dukuns" (traditional birth attendants) and 14% by physicians. A discussion of the health services provided to the children and their mothers is presented in the health services section of this report.

Table 2-1 Family Composition

	(N)	%
1 - 3 persons	258	19
4 - 5	560	41
6 - 7	306	23
8 - 9	156	12
10 -12	62	5
13+	12	-
Total	1354	100

Median 4.7

Table 2-2 Husband in Household

	(N)	%
Yes	1218	90
No	121	10
Total	1339	100%

Table 2-3 Main Provider of Income

	N	%
Husband	1253	94
Respondent	41	3
Parents/Parents-in-law	24	2
Other	15	1
Total	1333	100

Table 2-4 Monthly Family Income

	N	%
10 - 29,000 Rp	228	17.6
30 - 41,000	349	26.9
42 - 60,000	294	22.7
61 - 109,000	270	20.8
110 - HIGH	157	11.9
Total	1295	100%

Median Income 42,000 Rp
US $1.00 to 625 Rp

Table 2-5 Socio-Economic Indicators

	(N)	%
Electricity	750	57
Toilet	803	61
Closed	584	44.1
Open	219	16.5
Refrigerator	84	6
Running Water in Home	244	18
Gas/Stove	24	2
Kerosene	1101	81
Wood	204	15

Table 2-6 Ethnicity of Mother and Father

	MOTHER		FATHER	
	N	%	N	%
Javanese	1219	91	1210	91
Sundanese	16	1	10	1
Chinese	69	5	76	6
Javanese and Chinese	6	-	0	0
Javanese and Arabic	2	-	0	0
Other	21	2	29	2
Total	1333	100%	1325	100%

Table 2-7 Mother's Religion

	(N)	%
Moslem	1164	88
Catholic	83	7
Protestant	48	4
Confucian	19	1
Buddhist	3	-
Hindu	1	-
Other	6	-
Total	1324	100%

Table 2-8 Language Spoken in the Home

	(N)	%
Javanese	1215	92
Indonesian	86	6
Sundanese	7	1
Chinese	3	-
Other	16	1
Total	1327	100%

Table 2-9 Age Distribution of Mothers

	N	%
14-17 years	14	1
18-19	74	6
20-24	437	36
25-29	360	30
30-34	173	14
35-39	95	8
40+	48	4
Total	1201	100%

Median 26

Table 2-10 Parity

No. of Children	N	%
1	216	16
2-3	649	49
4-5	149	11
6-7	148	9
8-9	119	2
10-12	9	1
Total	1323	100%

Median 2.1

Table 2-11 Origin of Mother

	(N)	%
Rural	605	46
City	720	54
Total	1325	100%

Table 2-12 Years of Education of Mother

	N	%
None	182	14
1-4	248	19
5-7	435	33
8-10	233	17
11-12	183	14
13+	55	4
Total	1336	100%

Median 5

Table 2-13 Occupation of Mothers

	N	%
Housewife (exclusively)	1019	75
Other jobs	339	25
Total	1358	100%
Government	52	15
Private Offices	49	14
Merchant/Business	139	41
Labor/Peasant Worker	90	27
Fisherman/Farmer	2	1
Other	7	2
Total	339	100%

Table 2-14 Contraceptive Use

	N	%
None	905	67
Pill	100	7
Injection	85	6
IUD	113	8
Male Sterilization	1	-
Female Sterilization	60	4
Rhythm	24	2
Condom	58	4
Abstinence	3	-
Other	7	1
	451	33%
Total	1356	100%

Table 2-15 Pregnant Now By Age of Child

Age months	Yes N	Yes %	No N	No %	Total N	Total %
0	0	0	19	100.0		
1	0	0	61	100.0		
2	1	1.6	62	98.4		
3	1	1.6	62	98.4		
4	0	0	42	100.0		
5	1	1.6	60	98.4		
6	0	0	62	100.0		
7	0	0	59	100.0		
8	3	4.3	67	95.7		
9	1	2.3	42	97.7		
10	2	3.6	54	96.4		
11	3	9.1	30	90.9		
12	13	9.9	118	90.1		
13-18	36	11.7	272	88.3		
19+	36	14.3	216	85.7		
Total	97	7.3	1226	92.7	1323	100%

Table 2-16 Ammenorhea Now

	N	%
YES	808	62
NO	505	38
Total	1313	100%

Table 2-17 Age Distribution of Index Children

Age in Months	(N)	%
0-15 days	21	2
15-45 days (1 Mo.)	63	5
45-75 days (2 Mo.)	63	5
3 Mo.	66	5
4 Mo.	42	3
5 Mo.	61	4
6 Mo.	62	5
7 Mo.	60	4
8 Mo.	71	5
9 Mo.	44	3
10 Mo.	57	4
11 Mo.	33	2
12 Mo.	137	10
13 Mo.	26	2
14 Mo.	42	3
15 Mo.	23	2
16 Mo.	30	2
17 Mo.	27	2
18 Mo.	166	12
19 Mo.	25	2
20 Mo.	56	4
21 Mo.	25	2
22 Mo.	30	2
23 Mo.	38	3
24 Mo.	88	7
Total	1356	100%

(2 missing cases)

Table 2-18 Sex of Index Children

Sex	(N)	%
Males	666	49
Females	691	51
Total	1357	100%

Table 2-19 Location of Birth

Location	(N)	%
Home	600	44
Maternity clinic	408	30
General Hospital	109	8
Home of Midwife	87	6
Community health center	86	6
Other	34	3
Total	1324	100%

Table 2-20 Birth Attendant

	(N)	%
Licensed midwife	759	58
Traditional birth attendant (dukun)	348	26
Doctor	186	14
Other	22	2
Total	1315	100%

III INFANT FEEDING PRACTICES: OVERALL PATTERN

One striking characteristic of the Semarang study mothers is the high initiation and generally long continuation of breastfeeding. Ninety-five percent of the children were breastfed at some time with no apparent difference by sex (Figure 3-1). Figure 3-2 is a lifetable showing the proportions of children who commence breastfeeding at birth and continue to breastfeed at monthly intervals. Almost eighty percent of the children are breastfed through the first 8 months of life, with a median duration of 20.44 months of breastfeeding in this population.

Figure 3-3 shows the percentages of children who are currently breastfeeding, those who are exclusively breastfeeding, those who breastfed but stopped and those who never breastfed, according to the age of the child at the time of the survey. This confirms what was illustrated earlier: that almost all children initiate breastfeeding. Ninety-five percent of the women are currently breastfeeding children of 1 month of age and 80% are breastfeeding at 9-11 months. The percentage currently breastfeeding declines below 50% only at 18-20 months.

In Figure 3-4, feeding patterns among the Semarang children have been regrouped into three categories, depending on source of milk: breastfeeding only, breastmilk and milk substitutes, and milk substitutes only. The data reveal a slow increase in the number of children receiving milk substitutes as their only source of milk from a low of 10% at 0-2 months to 17.0% at 6-8 and 30% at 12-14 -- not reaching 50% of the population until ages 19-24 months or more. The use of other milks either in combination with or to replace breastmilk remain low until after 1 year of age. Nonetheless, more than 25% of all infants do receive breastmilk substitutes even at the earliest age intervals (Fig.3-4). Breastmilk as the sole source of milk does not drop below 50% until 15-18 months of life.

A pattern of prolonged breastfeeding was also discerned in answers to direct questions about the length of time a mother should breastfeed. Thirty-six percent of the women who had <u>ever breastfed</u> their children suggested that 12-18 months was appropriate, while another 35% responded that 24 months was the ideal time to breastfeed. Several of the women in the in-depth interviews commented that it was traditional for some women to breastfeed their children until the age of 5 years, especially if the women did not intend to have any more children.

Children in Semarang were classified by current diet into one of seven possible feeding patterns constructed from combinations of breastmilk, breastmilk substitutes (cow's milk or infant formula) and food supplements, as shown in Table 3-2. Exclusive breastfeeding starts at 46% of the children less than

one month of age and declines precipitously as more mothers add food supplements and/or breastmilk substitutes to the diet. By the third month only 12.5% are solely breastfed. Feeding with breastmilk substitutes alone was rare in any age group. No children were fed solely on food supplements (semisolid and solid foods) until the 12th month of life. Only 12% of the children between 0 and 7 months were being fed breastmilk substitutes and food supplements without any breastmilk.

An important finding is the very early introduction of foods along with breastfeeding (Figure 3-5 and Table 3-2). Fifty-six percent of the children 0-2 months are eating various foods, rising to 86% of children aged 3-5 months. Once again, (Table 3-6) indicates a predominant pattern of breastmilk and food supplements in early months. At 9-11 months, a shift occurs with a gradual but steady decline in breastfeeding thereafter.

The major feeding pattern appears to be breastmilk supplemented with foods. Food supplementation does not interfere with breastfeeding, even of long duration. Early introduction of foods is a general phenomenon in Semarang. The specifics of food supplementation will be described below. It should, however, be mentioned that introduction of specific foods may carry with it an important symbolic or ritual meaning as well as having nutritional value or use for health maintenance purposes.

Table 3-1 Initiation of Breastfeeding by Sex of Child

	MALE		FEMALE		TOTAL (N)	
	(N)	%	(N)	%	(N)	%
Yes	613	94.6	644	95.7	1257	95.2
No	35	5.4	29	4.3	64	4.8
Total	638	100%	673	100%	1321	100%

Table 3-2 Type of Feeding by Age of Child

Age in Months		Exclusive Breastmilk		Breastmilk & B.Milk Subs.		Breastmilk Subs. Only		Breastmilk, B.Milk Subs. & Foods		Breastmilk & Foods		Foods Only		B.Milk Subs. & Food Supps.	
	(N)	(N)	%	(N)	%	(N)	%	(N)	%	(N)	%	(N)	%	(N)	%
0*<2wk.	13	6	46.1	2	15.4	-	-	-	-	3	23.1	-	-	2	15.4
1	62	17	27.4	5	8.1	1	1.6	9	14.5	26	41.9	-	-	4	6.5
2	61	20	32.8	7	11.5	2	3.3	6	9.8	21	34.4	-	-	5	8.2
3	64	8	12.5	1	1.6	1	1.6	13	20.3	31	48.4	-	-	10	15.6
4	41	4	9.8	-	-	-	-	9	22.0	23	56.1	-	-	5	12.2
5	60	8	13.3	-	-	1	1.7	13	21.7	32	53.3	-	-	6	10.0
6	60	5	8.3	1	1.7	-	-	8	13.3	34	56.7	-	-	12	20.0
7	58	5	8.6	-	-	-	-	10	17.2	32	55.2	-	-	11	19.0
8	70	5	7.1	1	1.4	-	-	8	11.4	47	67.1	-	-	9	12.9
9	43	1	2.3	-	-	1	2.3	7	16.3	26	60.5	-	-	8	18.6
10	56	2	3.6	-	-	-	-	16	28.6	32	57.1	-	-	6	10.7
11	32	1	3.1	-	-	-	-	3	9.4	15	46.9	-	-	13	40.6
12	134	6	4.5	-	-	2	1.5	11	8.2	71	53.0	4	0.3	40	29.9
13-18	304	6	2.0	2	0.7	3	1.0	39	7.8	136	45.0	20	6.6	98	32.2
19-24	246	1	-	-	-	-	-	27	11.0	74	30.0	42	17.0	102	41.5
TOTAL	1304	95		19		11		179		603		66		331	

*0 months throughout the Indonesian report means up to 2 weeks of life. Thus, 1 month refers to 3-6 weeks, 2 months 7-10 we
week difference in the Indonesian age data and the other 3 sites.

Figure 3-1

Percentage of Children Initiating Breastfeeding

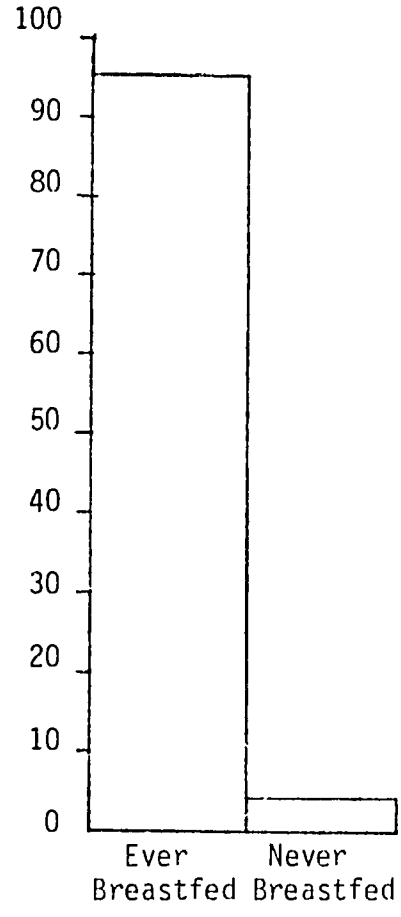
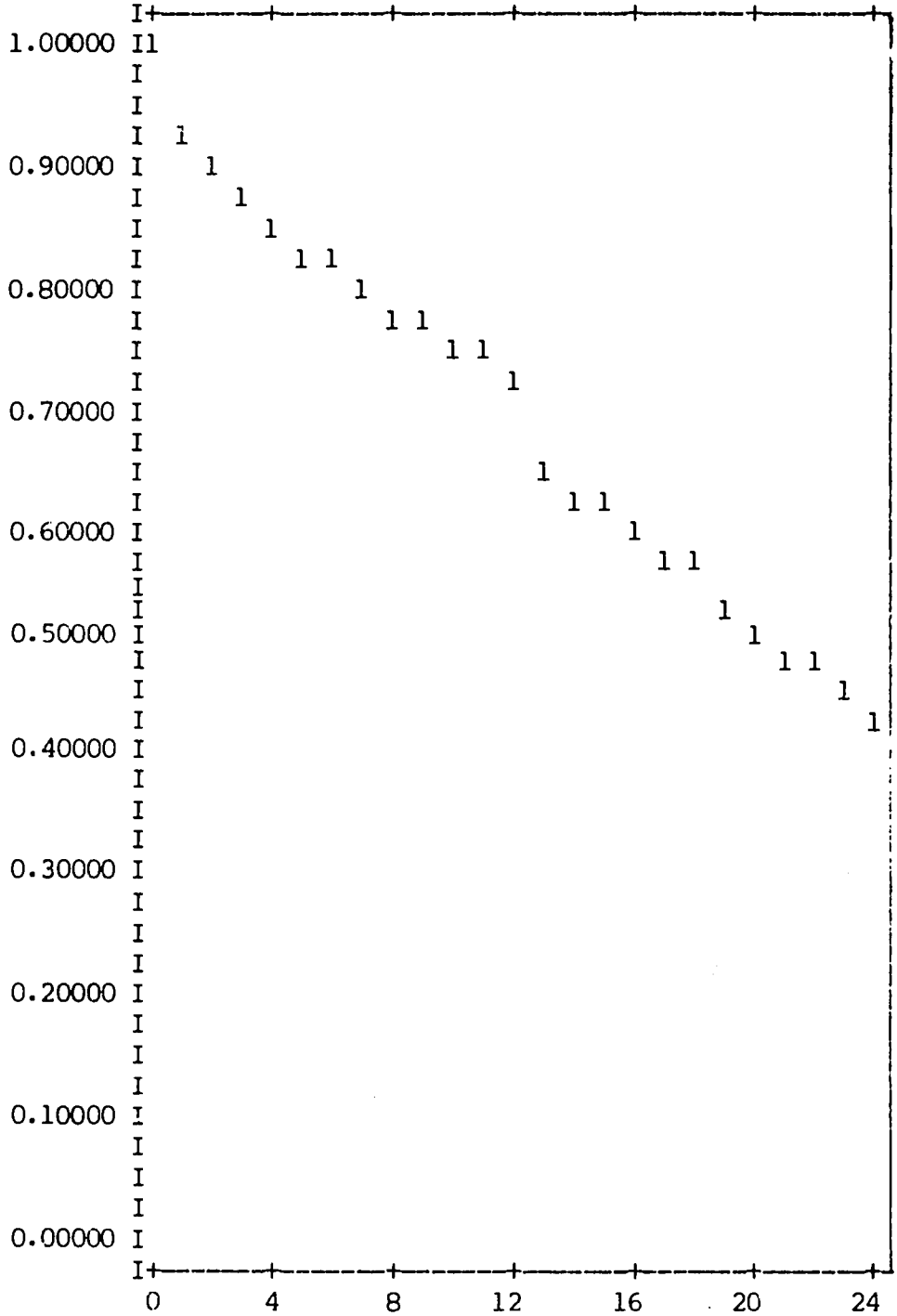


Figure 3-2

Duration of Breastfeeding by Last Breastfeed

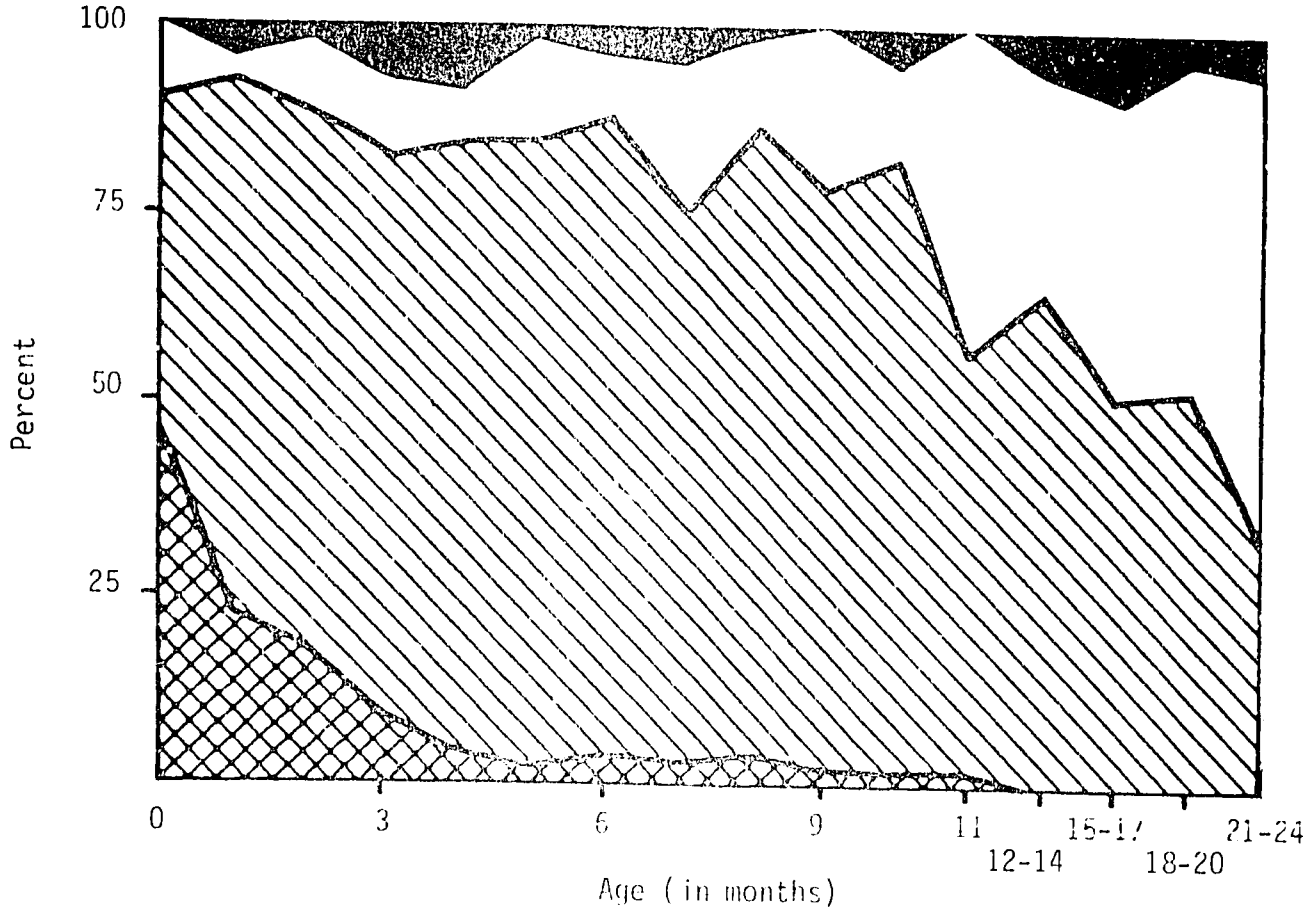


Key:

N	Median Survival
1318	20.44

Age (in months)

Figure 3-3
Breastfeeding Patterns



Key:

Never breastfed (n = 64, 4.8%)

Ever breastfed but stopped (n = 355, 26%)

Currently breastfeeding (n = 939, 69%)

Exclusively breastfeeding (n = 95, 7%)

Figure 3-4

Percentage of Children Consuming Different Milks by Age of Child

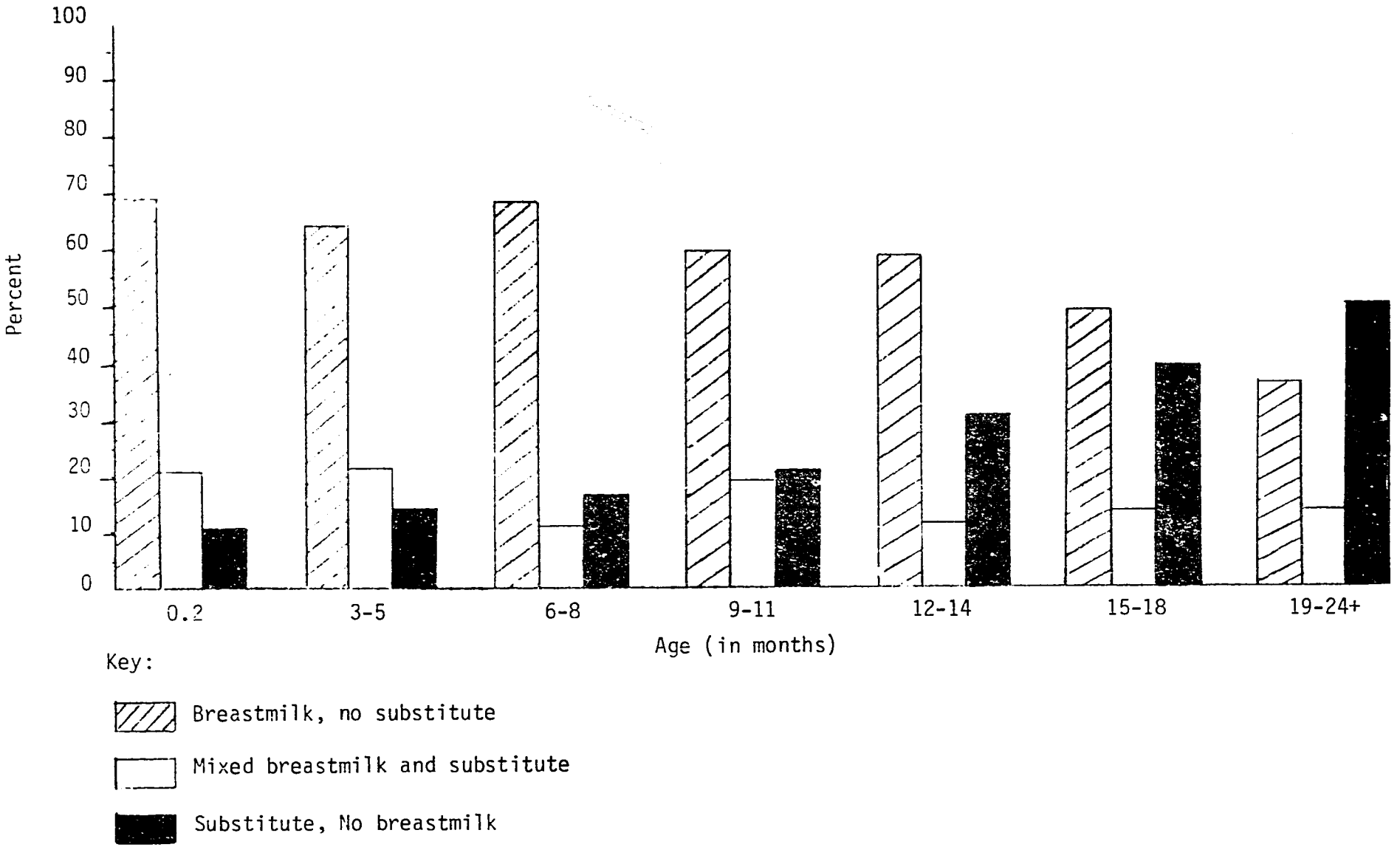
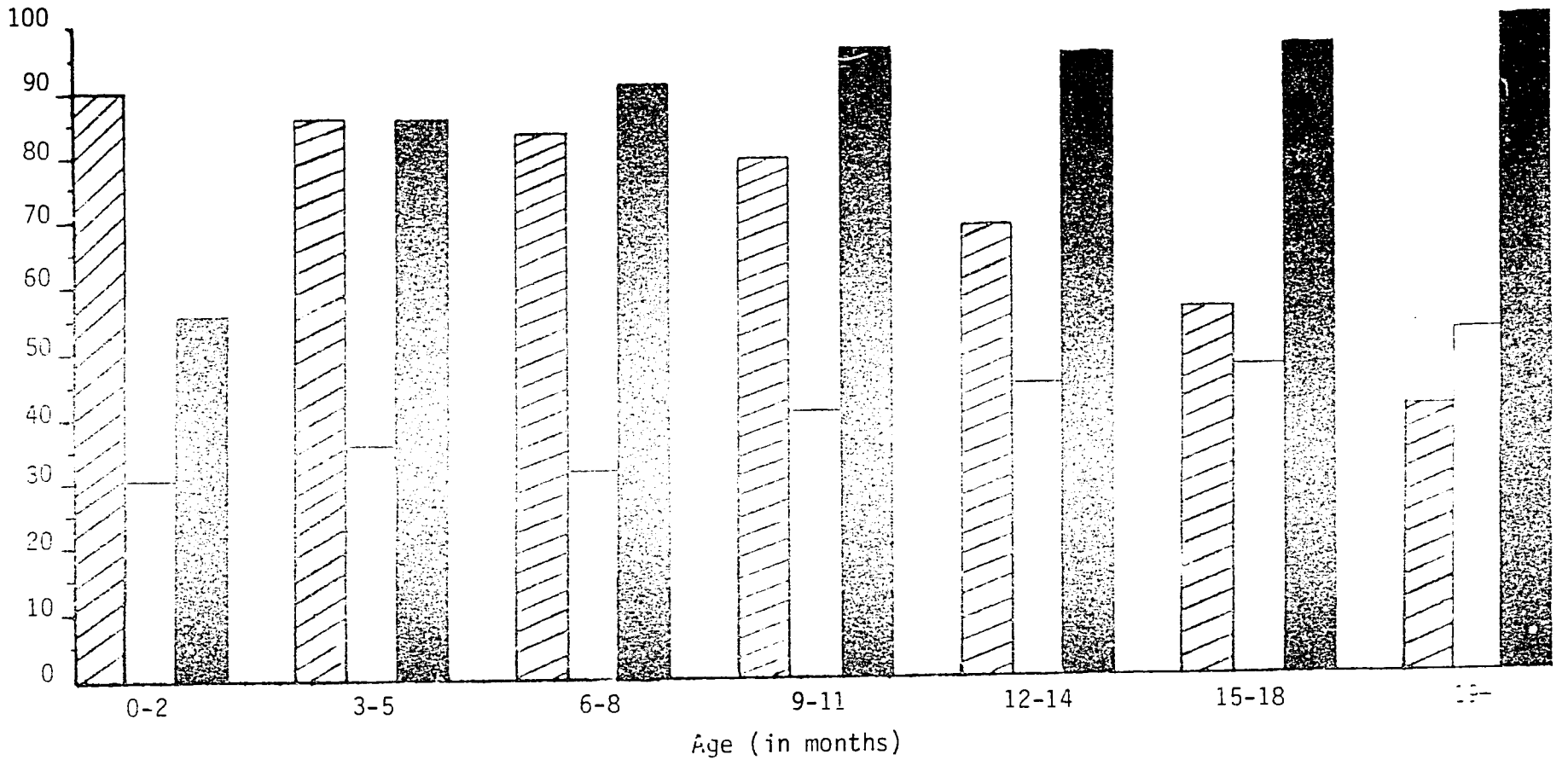


Figure 3-5

Percentage of Children Consuming Different Infant Foods
by Type of Food and Age of Child



Key:

Any breastmilk

Any breastmilk substitute

Any other food

IV INFANT FEEDING PRACTICES: DETAILS OF BREASTFEEDING

Patterns of Breastfeeding

Breastfeeding initiation is high in Semarang and has a long duration, although supplementation with various foods and milk is well established by the third month of life. Figure 4-1 presents the percentages of the entire sample who have breastfed for certain intervals (see also Lifetable 3-2 above). The various durations were constructed from date of the last breastfeeding. Seventy-five percent of the children are still breastfeeding at one year and 59% at 18 months of life. These findings suggest that breastmilk is a very significant nutrient for Semarang children.

In the preceding section of this paper, it was indicated that exclusive breastfeeding may last for long durations, in some cases beyond 9 months. Since withholding supplements beyond six months may compromise the child's nutrition, some of the reporting of exclusive breastfeeding beyond 6 months (27 children) may represent an error: only 7 children in the range of 6 months to 18 months are being exclusively breastfed and are also below the weight for height norm.[1] In contrast to Figure 3-3, which showed the proportion of exclusively breastfed children among the total sample, Figure 4-2 presents the proportion of exclusively breastfed children among those currently breastfed. True exclusive breastfeeding (with no breastmilk substitutes or other foods) is widespread during the first 2 weeks, with 55% of the mothers reporting this pattern. This declines to 30% in the first month of life and to 15% among children aged three months. A precipitous drop does not occur again until the 8th month.

The mean daily frequency of breastfeeding for the whole population is 11 feedings per day, a high number considering that 31% of these children are between 13 and 24 months of age (Figure 4-3, Table 4-1). In fact, the mean frequency of breastfeeding is essentially unchanged from 1-23 months, ranging from about 9-11 times per day. This implies a cultural norm of frequent breastfeeding provided on demand. Only 5% of the women use a schedule to feed their children (Table 4-2). Table 4-3 indicates that 98% of the cohort women reported breastfeeding at night, even though almost one-third of the children were over a year old. Eighty-eight percent of breastfeeding women stated they nurse every time their child cries. All of the twins (16) in the study had been breastfed at some time during their life.

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[1]These range from 63% of standard weight for height for 2 children aged 6-8 months to between 82 and 88% for 4 children aged 9-14 months.

Although extended breastfeeding is a cultural value in Semarang, the feeding of colostrum to the infant is not. Table 4-4 shows that 72% of the sample did not give colostrum to their index child. This is more or less in agreement with the fact that 64% of 1,001 women responded "no" to the question of whether "the early milk is very good for the baby." Watery milk, including colostrum, can be caused by the mother drinking too much water, according to some middle income women in the Krobokan District. These women believe if the mother gives this milk to the baby, the infant will get a swollen stomach. The breastmilk is thrown away until it becomes thick.

Failure to give colostrum may have long-term consequences including greater susceptibility to infection from foods given to neonates.[2] A study by Fildes[3] indicates that major declines in infant mortality in the 18th century in the British Isles may have been due to an increase in the practice of giving colostrum in place of purges and food to neonates.

Lactation and Amenorrhea

Length and frequency of lactation are associated with amenorrhea and, hence, natural contraception. The following is a discussion of the effect of lactation on postpartum amenorrhea with respect to (1) frequency of breastfeeding, and (2) supplemented versus exclusive breastfeeding among these sample mothers.

The length of postpartum amenorrhea is an important component of a birth interval, and is a major determinant of fertility in natural fertility populations. This study obtained unusually detailed information on infant feeding practices for fairly large representative samples and hence, provides valuable information for an examination of how infant feeding practices, particularly breastfeeding, affect the length of postpartum amenorrhea.

There were 1358 women interviewed in the Indonesia sample. One hundred and four cases were excluded from the examination of the relationship between breastfeeding and amenorrhea because of obvious reporting errors or potentially misleading information. For example, there were 27 cases reporting a length of amenorrhea

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2"Breastfeeding and Fertility: The Socio-Cultural Context," Valerie Hull. Digest of Demography, Australian Ltd., Canberra, Australia, unpublished manuscript., Nov. 1981.

3V. Fildes, 1980: "Newborn Feeding practices and Infant mortality during the 18th century," Journal of Biosocial Sciences 12: 313 - 324.

longer than the current age of the child: 9 other cases reported a length of breastfeeding longer than current age of the child. Sixteen women were pregnant before their first postpartum menstruation, hence no valid length of postpartum amenorrhea could be obtained from these women. Certain hormonal contraceptives interfere with normal menstruation; if the use of these contraceptives was initiated before a woman's first postpartum menstruation, her first menstruation might be artificially delayed or induced by the hormone. Twenty-seven women had initiated the use of injection contraceptives which may delay menstrual bleeding, before first post partum menstruation. There were 25 women who started using oral contraceptives which will induce menstrual bleeding, at least one month prior to the reported start of menstruation. These cases were therefore excluded from the analyses of the relationship between breastfeeding and amenorrhea length.

The estimated median length of breastfeeding is beyond 24.00 months, while the estimated median length of amenorrhea is 10.00 months. Among those women who had weaned their child (currently not breastfeeding, and with known length of breastfeeding), there was a positive relationship between the known length of breastfeeding and median length of amenorrhea (Table 4-5).

The mean frequency of breastfeeding among currently breastfeeding women and the proportion still breastfeeding for each postpartum month is presented in Table 4-6. While the proportion breastfeeding decreased over time, the mean frequency of breastfeeding among still breastfeeding women remained fairly stable at about 10 to 11 times of breastfeeding per day throughout the first 20 months, as noted above. In order to assess the effect of frequency of breastfeeding on amenorrhea status, the proportion amenorrheic between the "high frequency" (frequency 6 times or more per day) and the "low frequency" (frequency 5 times or less per day), breastfeeders is compared. The results are presented in Table 4-7. At almost all postpartum month periods, the proportion amenorrheic is higher for the "high frequency" breastfeeders. It is also of interest to note that the number of women breastfeeding at less than 6 times per day is very small throughout the entire observation period for this sample.

Presumably, the more the infant's diet is dependent on the mother's breast milk, the more suckling stimulus, necessary for the maintenance of amenorrhea is provided. In all postpartum months, the proportion amenorrheic is lowest for those women who have weaned their child (NO BF group), and the proportion amenorrheic is highest among the exclusive breastfeeders (BF only group). Mixed feeding regimes show intermediate values. The results are presented in Table 4-8.

The median length of breastfeeding and median length of amenorrhea by age of the mother are seen in Table 4-9. In general, older women tended to breastfeed longer and have longer duration of amenorrhea. In particular, women aged 30 and older have a markedly longer duration of breastfeeding and amenorrhea. Median breastfeeding and amenorrhea lengths are assessed by parity groups (Table 4-10). Women of parity four and higher showed a longer duration of breastfeeding than women of lower parity.

Breastfeeding Problems, Insufficient Milk, and Weaning

The types and frequencies of problems associated with breastfeeding are enumerated in Table 4-11. Insufficient milk was the most common problem cited (40% of 907 respondents) with problems of breast engorgement the next most frequent (19%). Of the 113 mothers who responded to questioning as to how they knew their breastmilk had decreased, 35% stated the child was uneasy after breastfeeding, and 37% indicated that the breastmilk was either not good or was diluent. Only 22% suggested a noticeable physiological change in themselves (21%) or the infant (1%) (Table 4-12).

Attempts to increase the breastmilk supply seem quite commonplace. Ninety-three percent of the mothers stated that they tried to increase their milk supply (Table 4-13). Of these, 81% drank jamu (a medicinal herbal infusion) and 15% responded by increasing the amount of fruits and vegetables they ate (Table 4-14). Of the women using jamu, 59% drank the ready-made liquid sold by peddlers and 30% used a brand name powder herb (Table 4-15). Table 4-16 presents the effect of drinking jamu as experienced by the women. Eighty-eight percent indicated that it successfully increased their milk supply. Ethnographic evidence indicates that some women curtail the use of jamu - and other liquids - because they fear dilution of their milk, that will affect its quality. Valerie Hull[4] in her work on Javanese women, discusses the potential uses of jamu in preventive health care. Along those lines, fuller analyses of pharmacological agents identified in the various jamu used and an assessment of their relative effectiveness would be helpful.

Methods of increasing milk supply differed somewhat among districts and between classes, according to the ethnographers. In rural Mangkong Kulon, drinking medicinal herbs (jamu) was the most popular method of increasing both quality and quantity of

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[4]Valerie Hull, Studies in Family Planning, Vol. 10, No. 11/12, "Women Doctors and Family Health Care: Some Lessons from Rural Java," pp. 315-325.

breastmilk for all classes. The lower and middle income groups[5] also used specific foods, e.g., vegetables, young fried corn and fried beans. Vegetables are considered useful for increasing milk production, whereas beans are for quality. In urban Kranggan, jamu was also used by all classes. The upper classes supplemented this with rice water and vegetables. All women here avoided foods that were either hot, salty or too cold and never took ice. Likewise, in Krobokan, jamu was popular among all categories of individuals. Both rich and poor used vegetables. Young fried corn and papaya leaf jamu were more popular among the poor, while other vegetables, beans and milk were often used by wealthier women. Vegetables were more varied in Krobokan and included tapioca leaves, sweet potatoes, spinach, long beans, and cabbage. It is interesting that almost no mothers knew or chose to breastfeed more often to increase milk supplies as is recommended in most breastfeeding education materials.

In sum, the predominant responses to a decrease in breastmilk were for the mother to drink jamu or increase her intake of fruits and vegetables. Both are consistent with the humoral theory of illness and health in Java; the mother is considered to be experiencing an imbalance in body elements, and health can be restored by increasing specific nutrients. This is quite different from the possible response of providing additional milk and food supplements to the baby. For example, the ethnographer has documented in the district of Krobokan, that papaya leaf jamu is both taken by the mother and given to the infant soon after birth. Mothers there claim it stimulates breastmilk and increases the appetites of their babies.[6] The use of jamu underscores the cultural consensus regarding breastfeeding in Semarang. Indeed, a corollary to this is the interpretation of jamu as a psychological support which provides an objective, positive way to respond to fluctuations in milk supply.

Most (62%) of the women alternated, either in a pattern or randomly, between the right and left breast when feeding their infants. Eighteen percent, however, indicated they used their

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[5]The ethnographers have used family income as a baseline for class distinctions. However, they have also identified cultural and material differences which Indonesians use to judge class status. They, in turn, are reflections of the type and nature of employment and associated social status. For example, in the interior of the village of Mangkong Kulon upper class people not only own livestock and land, but they hold elaborate life cycle ceremonies which are prohibitively expensive to people of other classes.

[6]It is worth noting that papain in papaya leaves is a proteolytic enzyme which is said to aid digestion.

left breast only (Table 4-17). Eleven percent of those who used one breast only indicated that they did so because there was a decreased supply of milk in the other one: 87% stated that the child refuses milk from the unfavored breast (Table 4-18). In all three districts where indepth interviewing was conducted, preference for the left breast was noticed. In addition to idiosyncratic and health-related reasons (i.e., the right breast was engorged or the baby rejected it), the ethnographers indicated that poorer women generally held this preference. It is common throughout Java for women to use a selendog or sling to carry babies on their hips. It may simply be that use of the left breast correlates with use of a left sided sling for poorer women who do not stop their work to breastfeed.[7]

About one-third of the women who complained about insufficient milk supply used contraceptives (Table 4-19). This represents about the same proportion as in the entire sample population. The percentages of women in each contraceptive category who complained of insufficient milk are fairly equal, and the distribution of contraceptive use is similar to that of the entire population of contraceptive users (Table 4-20), providing no evidence for an association between contraceptives in general - or any particular contraceptive - and the perception of insufficient milk. In a society that places a high value on children and where women consider their role as mother and nurturant to be paramount, contraception may be viewed as interfering with these roles.[8] On the other hand, women who are

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[7]Many cultures have different values and functions accorded to the right and left hand. The right hand is frequently the appropriate one for eating. By extension, some Semarang women may use their right hands to offer food (including their breasts) to their children which would be unwieldy if the child was not being carried on the left side of the body.

[8]The ethnographers did mention that contraceptive use has come under attack in Mankong Kulon by certain religious groups, who have reaffirmed the view that all children are to be considered a blessing from God. There is an indication that earlier success by the family planning program there has been eroded through this religious revitalization. Contraceptive use and other expressions of social change may produce negative valuations of a woman's performance as a mother and are expressed as insufficient milk. Research in other Islamic societies has demonstrated a pattern between contraceptive use and complaints of heart problems. The psychosocial and cultural dimension of such an illness or "problem" can be considered a syndrome comprising symbolic and experiential aspects of life for women in Semarang. It is the pattern of associations which really provides the meaning of "insufficient milk": a reinterpretation of potentially stressful experiences into the term "insufficient

likely to accept contraception easily may be less "traditional" and may engage in other feeding practices which tend to diminish milk supply such as low frequency of feeding and/or early introduction of bottles.

More than 80% of the entire sample agreed that they should not take drugs while breastfeeding a baby including 90% of women using contraceptives who also reported insufficient milk. Contraceptives may not be considered "drugs" by Semarang women or the discrepancy may represent a selective use of the dual medical system, where pills and injectables have not been interpreted in terms of the Javanese humoral theory of disease.

When women who were using bottle milks were asked why they introduced this supplement, the most commonly cited specific reason was a decrease in breastmilk (Table 4-21). Forty percent of the women using artificial milk stated they came to the decision by themselves. Midwives (18%) and husbands (14%) were the next most frequent category of individuals who influenced choice (Table 4-22).

The ethnographic data indicate that rural, lower and middle class women prefer weaning in the second or third year. They stated they "did not have the heart to stop" before that time. Insufficient milk and pregnancy were reasons for earlier weaning. In the urban district of Kranang, women suggested that breastfeeding delayed pregnancy and that insufficient milk was a reason for weaning a child. Women of all classes in the urban district mentioned that exclusive breastfeeding up to 3-4 months was the norm with supplement thereafter. In Krobokan district, women suggested that [illegible] wean before 2 years, if they were pregnant, had insufficient milk, or the baby was slow to develop on breastmilk alone.

In comparison, the cross-sectional data show that the 3 most frequent reasons for weaning were that the baby refused breastmilk (23%), the age of the child (23%), insufficient milk (19%) (Table 4-23). Eighty percent (32 out of 40) of the mothers who weaned their children because of insufficient milk and 55% (26 out of 47) who weaned because "baby refused breast" did so by 6 months of life. Forty-nine percent of the women reported having made the decision to wean themselves. A parent-in-law (12%) and physician (11%) were the next most frequently cited individuals who influenced the decision (Table 4-24).

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milk" may be what is occurring. The degree to which this is a syndrome and how it is shaped by such symbolic and social experiences is an empirical question. Without an understanding of the meaning of contraceptives, childbearing among other changing mores, to Javanese women, must remain in the realm of speculation.

In response to direct inquiry about techniques of weaning, only 5% of the sample indicated that they had a deliberate method of weaning. Of these, 42% each either put something bitter on the nipple or took the baby to a traditional healer for therapeutic technique (Table 4-25). The ethnographer indicates that asking a traditional midwife to pray for the baby to make it separate from its mother's breast was one method in Mankong Kulon and Kranggan districts for some mothers. In Kranggan District a mother can ask a dukun to blow on the baby while reciting prayers to help the baby forget breastfeeding and not to cry when he does not receive breastmilk. Placing turmeric on the nipple was another method of choice in Krobokan. Putting bitter substances such as jamu pahit, kunyit brotowali or a crushed quinine pill on the breast was another method cited as well as painting the nipple black. In Mankong Kulon, individuals cited separation of child from the mother as the least desirable method. This agrees with the cross-sectional data, where only 16% use separation as the weaning method of choice. Middle class mothers in Kranggan district suggested introducing artificial formulas slowly as a method of weaning. Poor mothers gradually replace breastmilk with tea or water in a cup. This technique is assumed to be easier than an abrupt separation, and the baby is prevented from the habit of sucking a pacifier or thumb, which is considered humiliating for the mother.

At first, there appears to be some discrepancy between the survey answer (only 5% having a weaning method) and the ethnographer's description of various methods. In view of the lengthy duration of breastfeeding among most Semarang mothers, it is likely that only a small percentage of the sample consciously use a method to wean their children. Many, if not most, women added supplements of foods and artificial milk according to a developmental schedule. Weaning from the breast was gradual and simply related to the quantity and scope of supplementation. The ethnographer has implied that ritual methods are resorted to only if a child does not eat or among rural mothers who believe their child is sickly.

The concept of "weaning interval" was developed for the analysis of these data to help describe the dynamics of breast/bottle interrelationships. "Weaning interval" is defined here as the difference between age at first supplementation and age at last breastfeeding. Table 4-26 shows that weaning interval appears to vary with age at first bottle supplement. Of (114) children receiving a bottle by the end of the six weeks, one-third were weaned within two months of the event. In comparison 94% of (36) children receiving a bottle later than 4 months took more than 6 months to wean and therefore breastfed longer durations after supplementation. This pattern of weaning is not surprising since Semarang children are breastfed at high frequencies (11 per 24 hours) and for long durations (up to 30 months of life). Bottle-feeding is predominantly used as a

supplement or, with a few children, for very early weaning. It is not used as a milk replacement for most children, but when the bottle is introduced early, the child is weaned quickly from the breast. Some of these mothers may be introducing bottles with the conscious intention of weaning, but for others, the early weaning may be inadvertent. These interpretations are related to the "insufficient milk" syndrome. A woman who introduces milk supplement may find her breastmilk decreasing, causing her to increase the intake of artificial milk and hastening the weaning of her child.

The study also explored knowledge and attitudes about breastfeeding as possible clues to behavioral choices of mothers. Table 4-27 indicates the percentage of women who ever or never breastfed and who agree with various statements regarding breastfeeding. All women appear positively oriented towards breastfeeding: 65% of those who breastfed and 56% of those who did not stated they would recommend exclusive breastfeeding to their daughter or neighbor. There is a strong belief among all women that breastfeeding is nutritious (93% and 98% of those who breastfed and 98% of those who did not!) and confers immunity to disease on their children (77% of those who breastfed and 72% of those who did not). Both mothers who had and had not breastfed had similar ideas about the relationship of contraception to lactation: slightly more than one-third of both groups thought breastfeeding always makes it difficult to conceive and about one-fourth thought it never did. Mothers who breastfed did seem to feel more strongly that nursing strengthens the bond between mothers and children. They were also less negative about the possible effects of breastfeeding on breast aesthetics: 49% agreed that breasts never became ugly because of breastfeeding, whereas only 21% of women who did not breastfeed held this opinion.

As one might expect, some of these attitudes appear to affect length of breastfeeding more strongly than others. For example, 20% more women who felt they should not breastfeed in a public place had weaned their children by the 6th month as compared with those who said there were no restrictions. With respect to the duration of breastfeeding, (asked as, "When should a mother wean her infant?") of the ever breastfeeding mothers, 45% suggested between 12-18 months. In comparison, of women who never breastfed, 32% recommended weaning of 12-18 months. About one-third of both groups recommended 24 months of breastfeeding.

Table 4-28 provides percentages of all women responding to questions regarding other values or norms associated with breastfeeding. Ninety-nine percent of all respondents agreed that breastfeeding was a Moslem woman's destiny and that Islam prescribes that breastfeeding be continued until 2 years of age. In accordance with religious beliefs, 84% thought that the father knew what food was best for the child. This is concordant with

results above: where 9% of the women who had weaned their children and 14% who were giving them artificial milk said they had been influenced in their decisions by their husbands.

With respect to the relationship between breastfeeding and children's health, 60% of the women believed that if they were ill they should cease breastfeeding their child. Almost half the women thought they should stop breastfeeding when a child had diarrhea. When asked directly, 44% stated they did not know at what age nutrition was inadequate with exclusive breastfeeding.

The ethnographers found that class, religious and geographical factors influenced attitudes about breastfeeding. For example, among upper and middle class women in suburban Krobokan, it was suggested that it was shameful for women to breastfeed in public. It is possible that wealthier Krobokan women have greater restrictions on their public behavior or must adhere more strictly to them than women of other classes. Such behavior may reflect on their husband's social position within the community. If this is so, it would follow that these women would be more vocal about such observances. On the other hand, if they have the ability to hire babysitters, the notion of shamefulness, if associated with breastfeeding in public may serve to reinforce a desire to leave their babies when traveling. In comparison, the survey identified 70% of all women who stated that there were no restrictions on where or when a woman could breastfeed.

Again, in Krobokan more affluent women stated that the mother kept "beautiful" if she did not breastfeed and that breastfeeding "displeasingly" changed the shape of the breasts. Despite these feelings, all women in this district's ethnographic subsample emphasized that breastfeeding was a way to "ensure love and spiritual ties" between themselves and their children and some went so far as to say that "canned milk" cannot produce such closeness. The selected women from Krobokan appear to adhere more strictly to Islamic tenets than elsewhere. On the other hand, while the ideals appear orthodox, they may also be discordant with actual behavior. To illustrate, some women from this district made reference to the kodrait or innate responsibility of a mother to breastfeed. They also admitted that their children "liked canned milk" and were receiving it as a supplement. The ethnographic material reveals the diffusion of the idea of bottle feeding among wealthier, traditionalist Islamic women. The decision to bottle feed may not agree, in a fundamental respect, with the kodrait, but for these women it does provide an acceptable solution to the covert religious proscription against breastfeeding in public.

In the urban area of Kranggan, wealthier women felt embarrassed to breastfeed while they travel. Since they can afford to use "canned" milk, they do. In comparison, poorer women in

all districts believed that mother's milk or cow's milk as opposed to artificial formulas were better. Such women complained that working interfered with ideal breastfeeding, but they did so when they returned home. In the rural area of Mangkong Kulon, women were more negative about "canned milk," suggesting that babies are less healthy, do not grow as well and fail to develop an emotional bond, if given formula.

In conclusion, the ethnography suggests that women in all three districts tended to give similar reasons for breastfeeding including the quality of breastmilk as an infant food, its economy, and its contribution to the development of an emotional bond between mother and child. Variations in breastfeeding patterns, however, occur and appear to be associated with class as well as differential adherence to religious beliefs. The determinants section of this report will examine more carefully socioeconomic and class distinctions that may affect infant feeding behaviors.

Characteristics of Women Who Never Initiated Breastfeeding:

Since breastfeeding of long duration is the norm in Semarang, it was considered instructive to examine the 4.8% (64 women) who did not breastfeed their index children to discern underlying patterns for the rejection of breastfeeding which might be utilized in health intervention programs. Tables 4-29 and 4-30 summarize the findings. In terms of birth experiences, children born in Maternity Clinics were slightly less likely to be breastfed; as were those attended by a physician. An examination of the children who were ill at birth and placed in a special "couvens" room for care revealed that 27% of these children were never breastfed as compared to only about 5% of the whole population. Almost 30% of those who remained in the hospital after their mothers went home were not breastfed. This accounted for 6% of all the infants who were never breastfed.

An examination of the ever/never breastfeeding in terms of socioeconomic factors reveals the following: eleven percent of women over 35 years of age and 12.5% of those 40 and above, never breastfed their infants compared with 3.5% of the women 20-29 years of age, the median age. Six percent of the higher income women never breastfed compared with 4.0% of the lower income category. Schooling of mother reveals a skewed pattern, with five percent of the women with the least and the most years of education never breastfeeding. Working women have very slightly lower rates of initiation of breastfeeding. Eight percent of the day laborers-peasant workers never initiated breastfeeding. In sum, we have identified several groups of women who are at risk for never breastfeeding:

1) Mothers with babies ill at birth are at highest risk for never initiating breastfeeding (and for having their infants rehospitalized).
2) Older mothers constitute another category of women who have higher non-initiation rates.
3) Working women - in particular laborers/peasants and, to a lesser degree, merchantwomen - have slightly lower rates of duration of breastfeeding.

Table 4-1 Mean (S.D.) Daily Frequency of Breastfeeding Episodes by Age Groups

Age in Months	Breastfeeding Frequency		
	(Mean)	(S.D.)	(N)
0 - 2	11.2	3.8	115
3 - 5	10.6	3.6	134
6 - 8	11.5	3.9	148
9 - 12	11.1	4.5	182
13 - 16	10.6	3.9	69
17 - 24	10.5	4.2	197
Total Population	10.9	4.0	845

Table 4-2 Is Infant on a Feeding Schedule?

Response	(N)	%
No	817	95
Yes	46	5
Total	863	100%

Table 4-3 Nightfeeds by Age of Currently Breastfed Children

AGE	YES	%
0	11	100
1	53	98.1
2	49	98
3	48	96
4	33	97.1
5	50	100
6	47	100
7	42	97.7
8	58	100
9	30	96.8
10	49	100
11	17	100
12	82	97.6
13	17	94.4
14	24	92.3
15	10	90.9
16	13	92.9
17	12	100
18	88	98.9
19	12	100
20	24	100
21	11	100
22	10	100
23	25	100
24	20	87
Total: 843	825 =	98

Table 4-4 Was Colostrum Fed to Infant?

	(N)	%
No	649	72
Yes	253	28
Total	902	100%

Table 4-5 Length of Breastfeeding and Median Length of Amenorrhea

Known length of breastfeeding	Median length of Amenorrhea
0 < Length ≤ 3	4.36
4 ≤ Length ≤ 7	7.78
8 ≤ Length ≤ 11	10.69
12 < Length ≤ 15	11.75
16 < Length ≤ 19	12.63

Table 4-6 Grouped Mean Frequency of Breastfeeding and Proportion Breastfed

Months	Mean Frequency of BF	Proportion BF
0-4	10.60	86.2
4-8	10.86	83.7
8-12	10.33	81.3
12-16	10.12	66.7
16-20	10.30	54.2

Table 4-7 Proportion Amenorrheic by Frequency of Breastfeeding

Postpartum Months	Freq ≤ 5 times		Freq ≥ 6 times	
	Prop (AM)	n	Prop (AM)	n
0,1	-	-	87.7	65
2,3	50.0	6	71.3	94
4,5	50.0	4	67.5	80
6,7	66.7	6	59.5	84
8,9	20.0	5	60.7	84
10,11	33.3	3	52.4	63
12,13	33.3	6	43.3	97
14,15	-	1	29.4	34
16,17	50.0	2	33.3	24
18,19	14.3	7	18.1	94
20,21	-	3	21.9	32
22,23,24	11.1	9	15.8	38

Table 4-8 Proportion Amenorrheic by Patterns of Feeding

Feeding Patterns	Months 0-4	5-9	10-14	15-19	20-24	(n)
BF Only	83.6	66.7	50.0	40.0	-	95
BF+Food	77.9	66.7	42.2	29.4	19.0	603
BF+Milk	(93.0)	(0.0)	(100.0)	(0.0)	-	19
BF+FD+MK	51.4	34.8	46.3	3.1	8.7	179
No BF	42.3	10.9	2.5	6.4	10.4	386

Table 4-9 Median Length of Breastfeeding and Amenorrhea by Age of the Mother

Age of Mother	Median BF Length	Median AM Length
<20	20.31	7.01
20-24	18.70	7.60
25-29	18.42	7.51
30-35	>24.00	10.12
35+	>24.00	9.72

Table 4-10 Median Length of Breastfeeding and Amenorrhea by Parity of Mother

Parity of Mother	Median BF Length	Median AM Length
One	18.62	6.11
Two/Three	18.81	7.88
Four/Five	23.81	12.33
Six/Seven	> 24.00	12.17
Eight	> 24.00	12.22

Table 4-11 Mothers' Problems During Breastfeeding

Problem	Yes	%	No	%	(N)
Breastmilk stopped	28	3.0	879	97.0	907
Breastmilk decreased	342	37.7	565	62.3	907
Breasts engorged/dripped	134	14.8	773	85.2	907
Breasts engorged/blocked	37	4.1	870	95.9	907
Pregnant	98	7.0	1227	93.0	1325
Mothers ill	76	8.4	830	91.6	906
Child ill - refused	73	8.1	832	91.8	906
Healthy child - refused	79	8.7	827	91.2	906
Child vomits	40	5.0	822	95.0	862

Table 4-12 How Mother Knew if Breastmilk Decreased

	(N)	%
Told by someone	3	3
Breast became loose/small	24	21
Child was uneasy after breastfeeding	40	35
Breastmilk was not good or was diluted	42	37
Child's weight did not increase	1	1
Other	3	3
Total	113	100%

Table 4-13 Did Mother Try to Increase Milk

	(N)	%
Yes	830	93
No	58	7
Total	888	100%

Table 4-14 How Did Mother Try to Increase Milk

	(N)	%
Jamu (herbs/teas)	684	81
Fruits/vegetables	131	15
Drink a lot	3	-
Rice water drink	1	-
Green bean water	21	3
Breast massage	1	-
Breastfeed more often	1	-
Other	9	1
Total	851	100%

Table 4-15 Type Jamu Used

	(N)	%
Boiled	81	11
Ready-made liquid (sold by peddler)	416	59
Brand name - powder herbs	212	30
Total	709	100%

Table 4-16 Effects of Jamu

	(N)	%
Increased breastmilk	624	88
No change	28	4
Physically better	56	8
Total	708	100%

Table 4-17 What Breast Is Used to Feed Baby

	(N)	%
Left	161	18
Right	16	2
Alternates	563	62
No pattern	164	18
Both at first, one later	3	-
Total	907	100%

Table 4-18 Why Use One Breast Only

	(N)	%
Child refuses to nurse from other breast	103	87
Decreased breastmilk in other breast	13	11
Inverted/cracked nipple in other breast	2	2
Total	118	100%

Table 4-19 Contraceptive Use Among Women Reporting "Insufficient Milk"

Contraceptive Use	(N)	%
No	204	62.4
Yes	123	37.6
Total	327	100%

Table 4-20 Type of Contraceptives Used by Mother with Insufficient Milk and All Users

	Mothers with Insufficient Milk		All Users	
	n	%	n	%
Pill	28	23	100	22
Injectable	28	23	85	19
IUD	24	20	113	25
Female Sterilization	18	15	60	13
Other	25	20	88	20
Totals	123		358	

Table 4-21 Why Use Other Milk

Code	(N)	%
Decreases in breastmilk	50	27
Child's weight too low	04	02
Return to work	12	07
To ease weaning later	21	11
Other	98	53
Total	185	100%

Table 4-22 Who Influenced Introduction of Artificial Milk

	(N)	%
Doctor	19	10
Midwife	35	18
Traditional Birth Attendant	21	11
Neighbor	13	07
Husband	27	14
Self	80	40
Other	3	--
Total	198	100%

Table 4-23 Reason for Weaning

Reason	(N)	%
Insufficient milk	65	19
Child health problem	15	04
Baby refuses	84	23
Age of child	81	23
Mother's health	30	08
Pregnancy	61	17
Other	23	06
Total	359	100%

Table 4-24 Person Who Influenced Decision to Wean

	(N)	%
Doctor	40	11
Nurse/midwife	31	09
Trad. Birth Attendant	11	03
Parent-in-law	41	12
Neighbor	15	04
Husband	31	09
Self	171	49
Other	9	03
Total	349	100%

Table 4-25 Mother's Weaning Method*

Method	(N)	%
Put something bitter on nipple	31	42
Took baby to traditional healer	30	42
Child is temporarily separated from mother	12	16
Total	73	100%

*Only 5% of total population stated that they had a "method of weaning when asked.

Table 4-26

Weaning Interval By Age at First Bottle

First Bottle Age in Months	Weaning Interval in Months: 0 - 1 (n)	0 - 1 %	2 - 3 (n)	2 - 3 %	4 - 5 (n)	4 - 5 %	6+ (n)	6+ %	Total
0 - 1	37	(32.4)	34	(29.8)	12	(10.5)	31	(272)	114
2 - 3	0		5	(18.5)	5	(18.5)	17	(63)	27
4 - 5	0		0		1	(6)	16	(94)	17
6 - 10	0		0		0		11	(100)	11
11 - 18	1	(12.5)	0		0		7	(87.5%)	8
TOTAL	38	(21.5)	39	(22.0)	18	(10.2)	82	(46.3)	177

Table 4-27 Knowledge and Attitudes About Breastfeeding Among Mothers Who Ever and Never Breastfed

	Ever Breastfed (n = 1257) %	Never Breastfed (n = 64) %
Breastfeeding is always nutritious	93	98
Breastfeeding can make a women fat	26	35
Breastfeeding confers disease immunity on children	77	72
Breastfeeding increases mother-child bond	95	77
Breastfeeding never makes breasts ugly	49	21
Breastfeeding always makes breasts ugly	23	27
Breastfeeding always makes it difficult to conceive	38	37
Breastfeeding never makes it difficult to conceive	30	25

Table 4-28 Values Regarding Breastfeeding

	(N)	Yes	No	Didn't Know
Mother believes breast-feeding until 2 years according to Moslem teaching	1314	1027(78%)	192(15%)	95(07%)
Is it a Moslem woman's destiny to breast-feed?	1329	1321(99%)	8(.01%)	-
Father knows what food is good	1331	1114(84%)	123(09%)	94(07%)
Husband thinks breast-feeding makes breasts ugly	1324	147(11%)	978(74%)	199(15%)
Breastfeeding should be four months only	1311	299(23%)	856(65%)	156(12%)
Breast better than bottle	1332	1273(96%)	34(03%)	25(02%)
Bottle is a status symbol	1320	318(24%)	874(66%)	128(10%)
Jamu can increase breastmilk	1338	1227(92%)	51(04%)	60(04%)
Mother should be care-full of medicines if breastfeeding	1145	1101(96%)	44(04%)	-
If child gets diarrhea should breastfeeding stop?	1327	650(49%)	620(47%)	57(04%)
If mother is ill is it better not to breast-feed?	1261	761(60%)	495(39%)	5(01%)
Do you know up to what age a baby will remain healthy by only breastfeeding?	1321	722 (55%)	579 (44%)	2(0.1%)

Table 4-29 Never/Ever Breastfed According to Hospital Experience

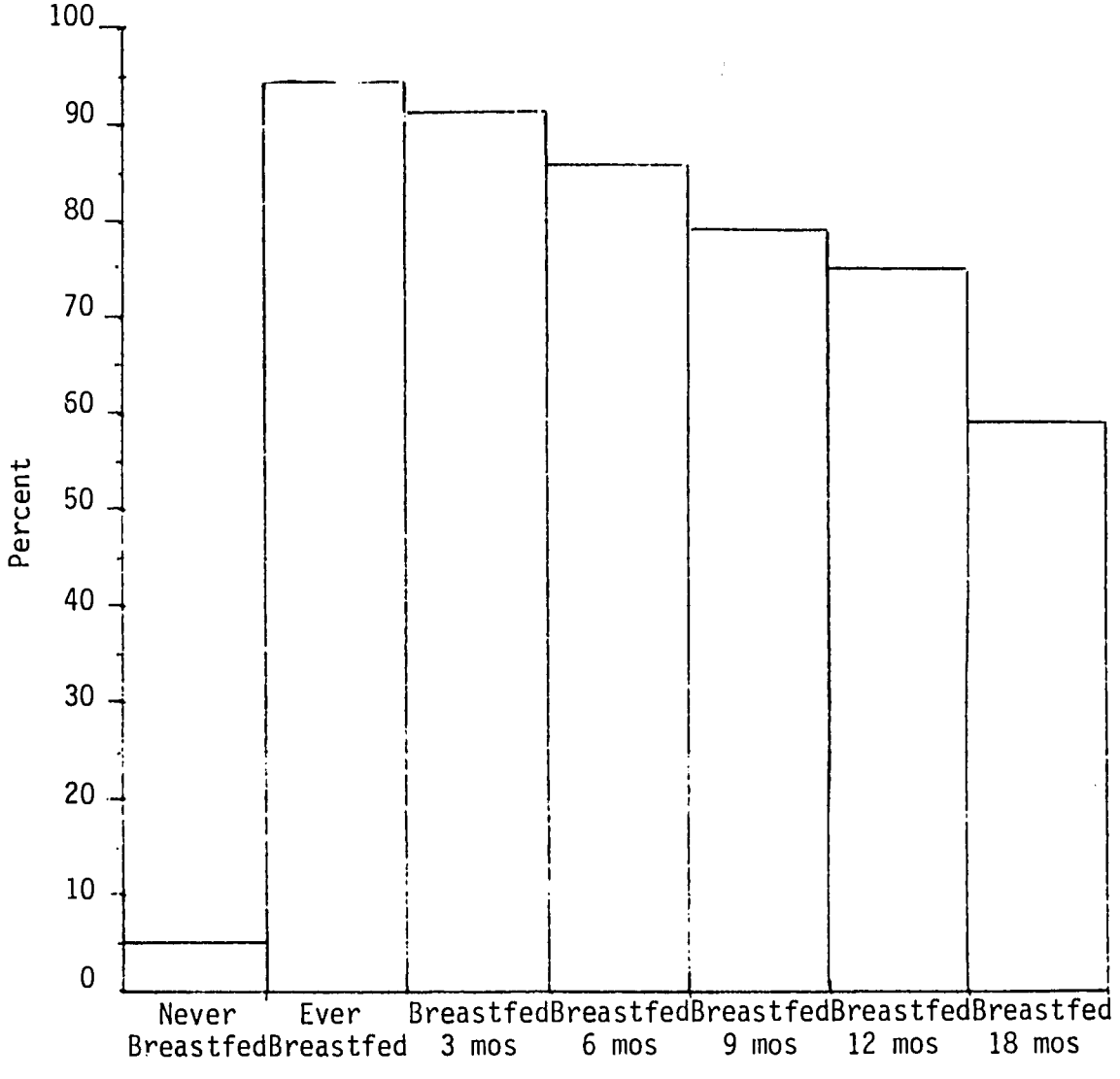
	Ever Breastfed		Never Breastfed	
Home	655	96.0	27	4.0
Maternity Clinic	383	93.9	6	3.1
Private Hospital	187	96.9	27	4.0
Birth Attendant				
TBA	334	96.3	13	3.7
Midwife	723	95.4	35	4.6
Physician	174	93.5	12	6.5
Other	22	100.0	0	0
Placed in Couvens at Birth				
YES	8	72.7	3	27.3
Remained in Hospital after Mother left	10	71.4	4	28.6
Rehospitalized Babies				
Ill at Birth:	2/8	25.0	1/3	33.0
Not sick at Birth:	25	76	8	24

Table 4-30 Never/Ever Breastfed According to Socio-Economic Parameters

	Ever Breastfed		Never Breastfed	
Age of Mother				
20 - 29	755	96.7	26	3
35 - 39	86	92.5	7	7.5
40 +	42	87.5	6	12.5
Education				
None	170	94.4	10	5.4
1 - 4	230	96.6	8	3.4
5 - 7	407	96.2	16	3.8
11 - 12	174	96.7	6	3.3
13 +	52	94.5	3	5.5
Working Now				
YES	313	94.6	18	5.4
NO	939	96.6	33	3.4
Occupation				
Civil Servant	50	96.2	2	(3.8)
Office Worker	43	95.6	2	(4.4)
Merchant	132	95.0	7	(5.0)
Laborer/(Peasant Day Worker)	79	91.9	7	(8.1)

Figure 4-1

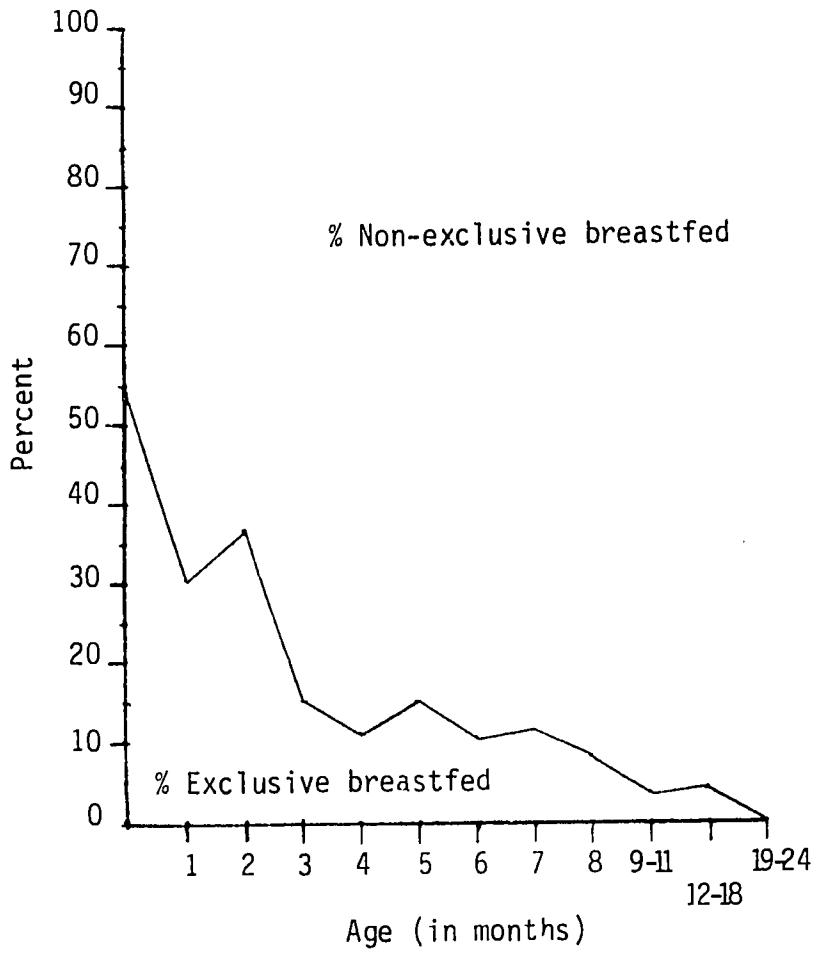
Percentage of Sample Breastfeeding for Various Durations[1]



[1]Based on current and retrospective data

Figure 4-2

Exclusive Versus Non-Exclusive Breastfeeding
by Age of Child of Currently Breastfeeding Children



Key:

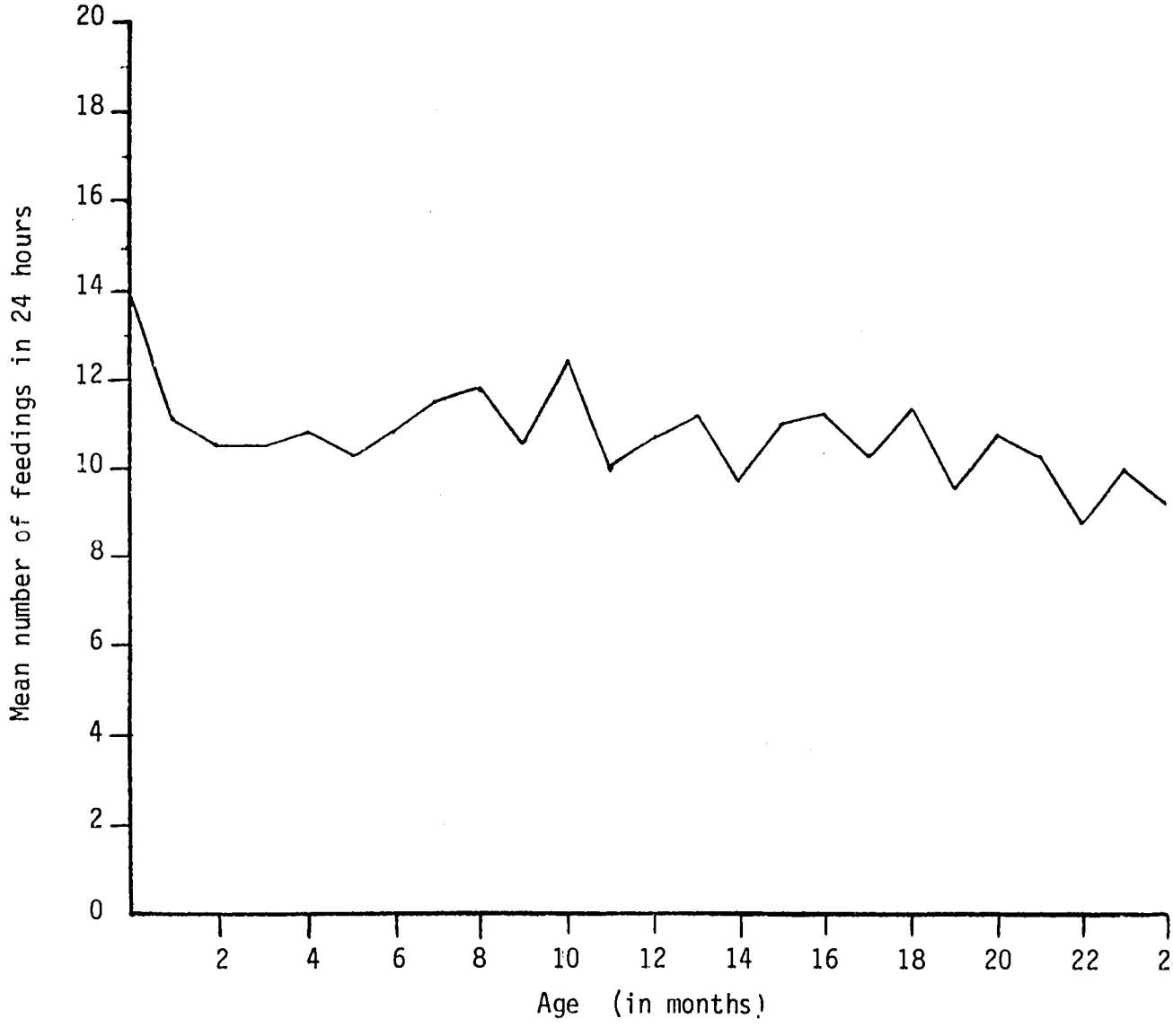
Exclusive n = 95 (10.6%)

Non-exclusive n = 801 (89.4%)

Total n = 896

Figure 4-3

Daily Mean Frequency of Breastfeeding by Age of Child



Key:

N = 845
Population mean = 10.9

V INFANT FEEDING PRACTICES: DETAILS OF SUPPLEMENTATION

Table 5-1 presents feeding patterns categorized according to seven possible combinations of breastmilk, bottle, and food use for grouped ages of the index children. The most significant finding is that patterns of unsupplemented bottle feeding and breast and bottle feeding as the sole source of nutrients are rare among Semarang families. With the exception of the 0-2 month cohort, where 10% use the bottle-and-breast milk pattern, very few children are fed in this manner. Moreover, only 5% of the children are fed only foods. The most frequent pattern is a combination of breastmilk and food supplements, followed by bottle and foods and lastly by a combination of breast, bottle and food supplementation.

Table 5-2 shows that 61% of all children in Semarang were given "prelacteal feeds" prior to initiation of breastfeeding. Twenty-nine percent of the prelacteal feeds were either honey or sugar water, and 70% milk. Seventy-nine percent of all children born in hospitals (i.e., maternity hospitals, general hospitals or health centers) were given milk as a prelacteal feed. In a different survey question (Table 5-3) it appears that one half of the children who were given non-hospital "prelacteal feeds" were fed by a midwife. Another 37% were fed by the child's parents. Honey is considered a purifier in Koranic belief and, therefore, is felt to be needed as a first food. The feeding of honey, by poor women, and sugar water, by wealthier ones, on the first day of life may replace colostrum, which was discarded by 72% of the women until the breastmilk appeared. According to the ethnographers, the color and consistency of colostrum is associated with unclean products. The use of bottle-milk as the first food in the hospital may reinforce an already established belief of some women that colostrum is not good for their infants. For example, the ethnographer identified Mrs. M, a young Javanese woman from a lower class family in Kranggan Dalam, who chose to give honey to her newborn for the first few days until her breastmilk appeared.

Figure 5-1 compares the current pattern of food and bottle intake among the never and ever breastfed children. Food is given to 38.5% of 0 - 2 week old breastfed children in the first 2 weeks. Those children who were never breastfed appear to receive foods even earlier. That is to say, 83% of the never breastfed children are fed foods at 2 months--rising to 100% at four months whereas 50% of the breastfed children have foods at 2 months, increasing to 84% at 3 months. It is not until the tenth month of life that 95% of the ever breastfed children are eating foods.

Figure 5-1 shows that 100% of the never breastfed children receive bottle feedings from birth onwards. Among breastfed

children, however, bottle-feeding at 0 month of life is 31%. It remains fairly steady throughout, with a 10% rise at 11 months, a culturally correct weaning time, but never exceeds 50%.

Tables 5-4 through 5-7 present comparative data for women using milk who continue to breastfeed (Tables 5-4 to 5-7)and who have discontinued breastfeeding (Tables 5-8 and 5-9). One-half of the breastfeeding women use other milks when they are away from home in contrast to 7% who offer it immediately after breastfeeding, presumably to supplement a still hungry child. The large "other" category may reflect the fact that these , may rely on bottles when they take the baby out and in places where they feel breastfeeding is not possible for them. It may be in response to a child's or mother's illness. Seventy-three percent of these mothers using milk as a supplement offer it in a bottle (Table 5-5). One-half of them prepare and 35% of them serve the milk bottle to their child (Table 5-6 and 5-7). The next most common person to prepare and serve the bottle is another adult woman in the household. Fourteen percent of the children are said to "serve themselves." For women no longer breastfeeding, 76% of them prepare and 42% serve milk themselves (Table 5-8 and 5-9). In contrast, 35% of these children themselves take their own bottles, which implies that the children using milk only tend to be older than those on a diet of mixed feedings.

Table 5-10 gives an idea of the percentage of women who prepare and serve other liquids to their children. Almost 40% of the respondents give sugared tea to their babies, 28% plain water, 13% green bean water and 12% honey water. Again, between 60% and 75% of the mothers prepare the additional liquid for their children, with an older adult in the household as the second most common individual to prepare and serve these liquids.

In sum, it appears that almost all Semarang children over age 2 months (75 days) are consuming foods in conjunction with breastmilk or breastmilk substitutes. Food consumption is so high (100% by month 4) among the never breastfed children that it is safe to assume that the mothers consider it to be an essential complement to artificial milk for dietary adequacy.

Figure 5-2 indicates the percentage of children consuming six different (non-milk) foods by age group. The primary foods introduced at 0-2 months and increasing throughout infancy (i.e., up until 30 months of age) are grains, fruit and sugars. Vegetables do not seem to be an important food item in the diets of any of the children, and are fed to less than one-third of the children even in the older age category.

Rice has been the major staple in Indonesia for millennia. In light of the place of rice as an ancient source of complex carbohydrates, one can safely assume that its early introduction (fed to 20% of the children at 0-2 months, 54% of them at 3-5

months), represents both a nutritional and ritual sign. Rice porridge is an important preferred dish mixed with vegetables and other foods for all children (Table 5-11). Fruits are the second most important food item in the Indonesian children's diet, fed to about one quarter in the first few months of life and increasing steadily (although more slowly than grains) throughout the first 30 months.

Finally, sugar is an interesting sumptuary item of some significance. Considering the history of sugar cane production in Indonesia, it is not surprising that sugar is included as part of the basic diet for infants. It is, of course, a cheap source of calories. Sugar is fed to 4% of the babies at 0-2 months, rising slowly to 25% by age 6-8 months and to almost 60% of all children over the age of 1 year. It is clear that sugar satisfies some ritual need among Semarang mothers. For example, a wealthy Javanese woman interviewed by the ethnographer described the touching earth ceremony (the tedak siti ceremony) where the child is brought into contact with the earth for the first time. Part of the ceremony consists of an artificial ladder of sugarcane which is constructed by the child's grandmother. The traditional midwife helps the baby step up and down the sugarcane ladder and, finally, places his/her foot on a plate of red rice porridge. Here both rice and sugarcane appear in an important ceremonial context for infants and their families.

The ethnographic data suggest a feeding pattern for Semarang infants which women consider appropriate for different stages of infant development. All women interviewed in the three districts appear to introduce various solid foods in accordance with the baby's age and growth. Variations in types of food and non-human milk consumption appear to reflect certain social, cultural, and economic differences among women. For example, middle and upper class women from Krobokan stated that "traditional" foods of mashed rice and bananas are less clean, not nutritious and inconvenient. Some felt that their infants do not like this food. They also view the traditional custom of a mother chewing the food before feeding it to an infant as a habit that contributes to "disease" in the infant. In fact, prechewing by the mother begins enzymatic breakdown. For some traditionally prescribed foods, prechewing may be a necessity for adequate use of nutrients and for the prevention of digestive difficulties.

Mothers who avoid the traditional food and prechewing habit replaced them with "modern" canned foods such as Cerelac, and Nestum. Some of the upper class mothers also believe that "canned milk" makes babies healthier than breastmilk and "adds immunity" after weaning.

Inaccurate or incomplete information appears to influence some mothers' decisions to modify or abandon traditional feeding

patterns. These and other issues will be explored in the following sections on the determinants of infant feeding practices. Social, economic and cultural variations among women will be evaluated with respect to differential impact on infant feeding practices in Semarang.

Table 5-1 Feeding Pattern by Grouped Age

Age in Months	Breast Only		Breast & Bottle		Bottle Only		Breast, Bottle & Other		Breast & Other		Bottle & Other		Food Only		N =	
	(N)	%	(N)	%	(N)	%	(N)	%	(N)	%	(N)	%	(N)	%	(N)	%
0-2	43	32	14	10	4	3	15	11	50	37	11	8	-	-	136	10.4
3-5	20	12	1	-	1	-	35	21	86	52	21	13	-	-	165	12.7
6-8	15	8	2	1	-	-	26	14	113	60	32	17	-	-	188	14.4
9-12	10	4	-	-	3	1	37	14	144	54	67	25	4	2	265	20.3
13-18	6	2	2	1	3	1	39	13	136	45	98	32	20	7	304	23.3
19-24	1	-	-	-	-	-	27	11	74	30	102	41	42	17.1	246	18.9
TOTAL	95	7.3	19	1.5	11	.08	179	13.7	603	46.2	331	25.5	66	5.1	1304	100.0

Table 5-2 Pre lacteal Feeds (first 3 days)

FOOD	TOTAL N	%	
None	428	39	
Honey	170	25%	=61
Sugar water	29	4%	
Milk from Hospital	476	70%	
Total	1103	100%	

Table 5-3 Who Gave Pre lacteal Foods

PERSON	TOTAL N	%
Mother and Father	392	37
Grandparents	59	6
Midwife	533	50
Trad. Birth Attendant	70	7
Relative	3	-
Other	4	-
Total	1061	100%

Table 5-4 Breastfeeding Mothers Who Give Milk as Supplement: When is Milk Given

	(N)	%
After breastfeeding	13	7
Only when mother goes to work	100	50
Other	86	43
Total	199	100%

Table 5-5 Breastfeeding Mothers Who Give Milk as Supplement: How is Milk Given

	TOTAL N	%
Glass bottle	19	9
Plastic bottle	129	64
Cup, spoon	50	24
Other	5	3
Total	203	100%

Table 5-6 Breastfeeding Mothers Giving Milk as Supplement: Who Prepares Milk

	TOTAL N	%
Mother	117	58
Other adult woman	60	30
Adult man/husband	6	3
Older sibling	3	2
Maid	13	7
Babysitter	1	-
Other	1	-
Total	201	100%

Table 5-7 Breastfeeding Mothers Giving Milk as Supplement: Who Serves Milk

	TOTAL N	%
Child him/herself	29	14
Mother	70	35
Grandparent/adult relative	66	33
Husband/adult male	6	3
Older sibling	10	5
Maid	18	9
Babysitter	2	1
Total	201	100%

Table 5-8 Mothers Who Have Stopped Breastfeeding and Who Give Other Milks Only: Who Prepares the Bottle

	TOTAL N	%
Mother	258	76
Mother-in-law/adult woman	52	15
Father/other adult man	6	2
Older child	2	1
Maid	18	5
Babysitter	2	1
Total	338	100%

Table 5-9 Mothers Who Have Stopped Breastfeeding and Who Give Other Milks Only: Who Serves the Bottle

	TOTAL N	%
Child	120	35
Mother	141	42
Mother-in-law/adult woman	55	16
Father/adult man	5	2
Older child	2	1
Maid	14	4
Babysitter	1	-
Total	338	100%

Table 5-10 Other Liquids Given

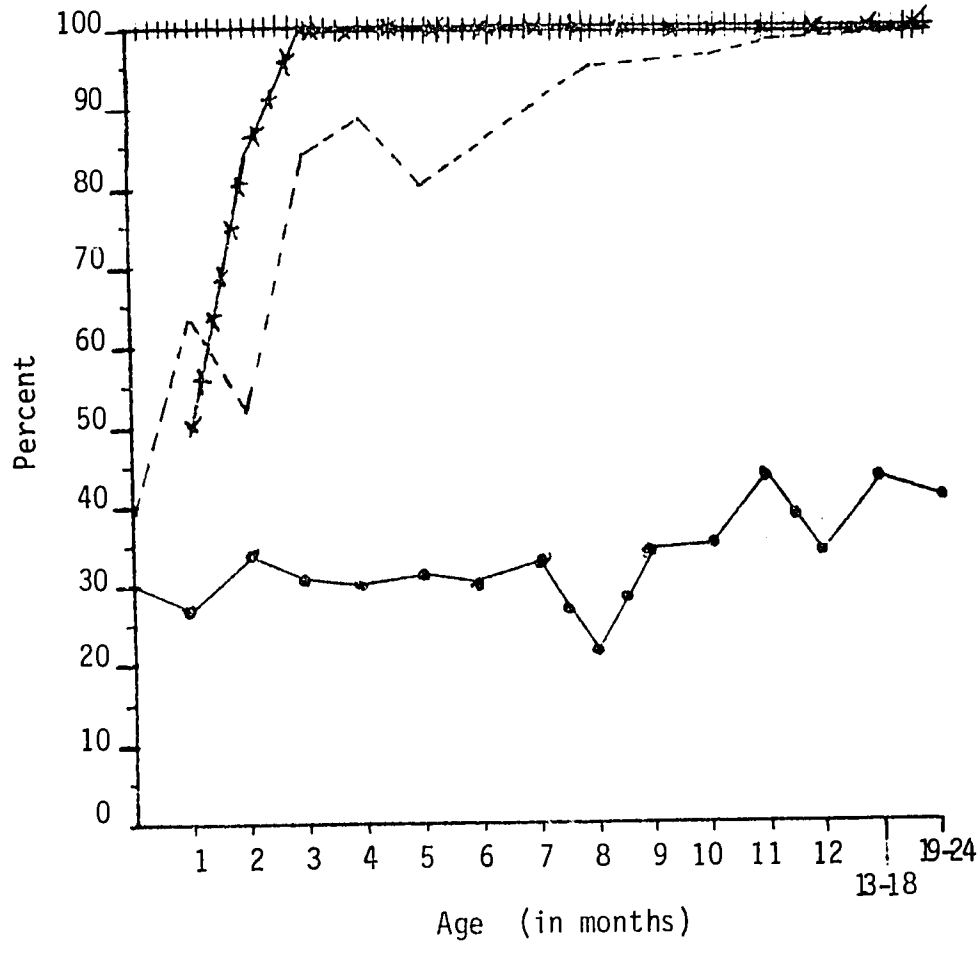
	Yes (N)	Yes %	No (N)	No %	Total (N)
Honey water	16	12	1295	98	1311
Plain water	366	28	944	72	1301
Tea without sugar	127	10	1182	90	1309
Sweet tea	507	39	803	61	1310
Green bean water	168	13	1143	87	1311
Rice water	33	3	1276	97	1309
Coffee	91	7	1206	93	1297
Juice: Tomato	87	7	1224	93	1311
Orange	67	5	1242	95	1309

Table 5-11 Percentages of Food Combinations Given Index Children

	(N)	YES	%	NO	%
Rice and banana	851	326	38	525	62
Rice porridge	849	303	36	546	64
Milk porridge	847	62	7	785	93
Rice, milk, and factory porridge	852	225	26	627	74
Rice porridge and vegetables	415	352	84	63	15
Rice porridge and vegetables and side dish	854	388	45	466	55
Fruit	852	507	60	345	40

Figure 5-1

Current Use of Bottle Formula and Foods According to Whether Child was Ever or Never Breastfed



Key:

Never breastfed; bottle now

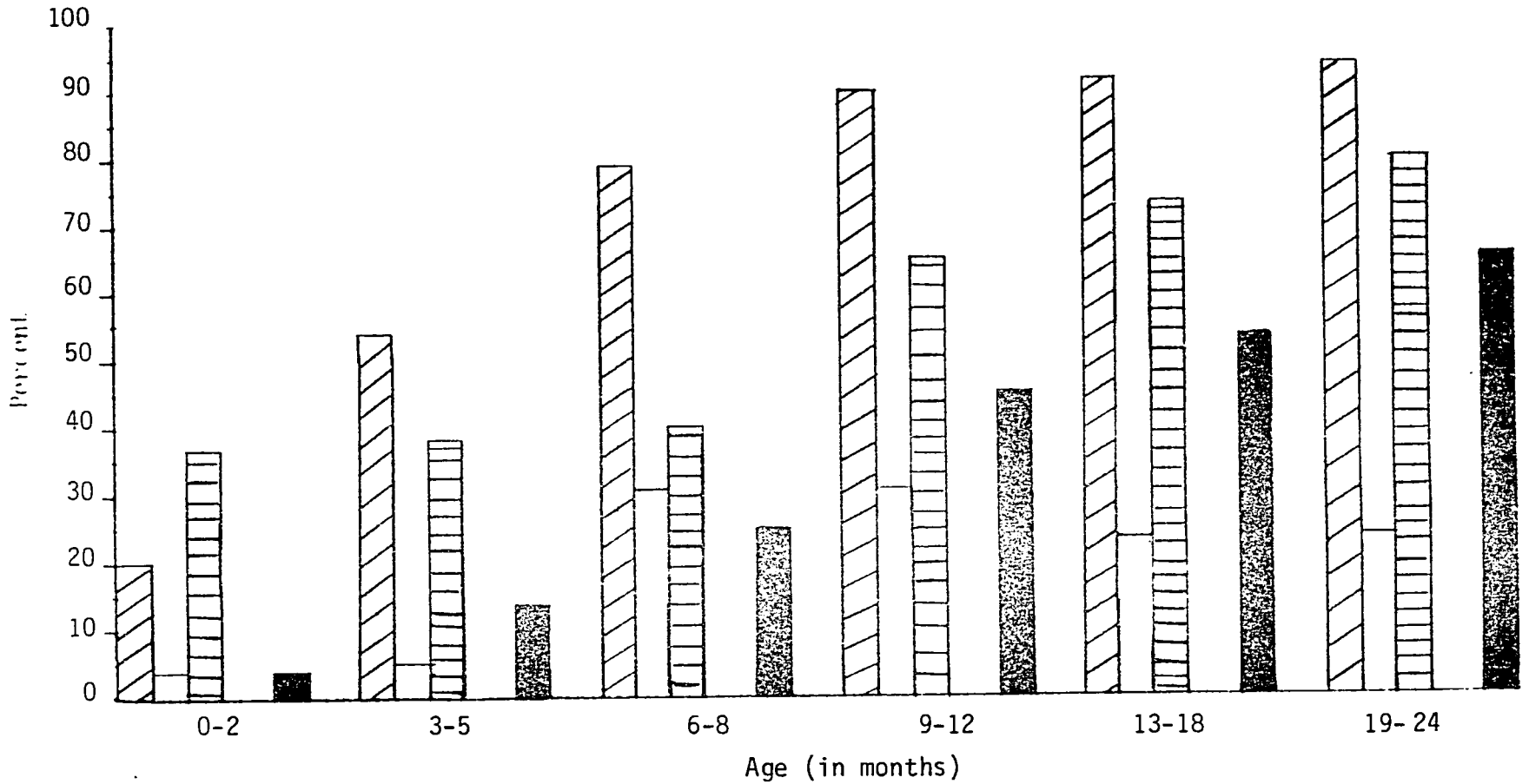
Never breastfed; foods now

Ever breastfed; foods now

Ever breastfed; bottle now

Figure 5-2

Percentage of Children Consuming Different Foods by Age Group



Key:

Grain

Fruit

Vegetables

Sugar

VI DETERMINANTS OF INFANT FEEDING PRACTICES: BACKGROUND VARIABLES

The choice of a particular infant feeding practice is based on preference and needs, which can only be understood in a social and economic context. Table 6-1 presents the associations between six socioeconomic parameters (mother's age, mother's birthplace, mother's parity, mother's education, family income, and number of person in the household) and a set of dichotomous variables which are representative of various infant feeding behaviors. For example, EVER BREASTFED is used to distinguish between children who have and have not been breastfed. Likewise, a set of variables representing breastfeeding duration and introduction of bottle-feeding has been selected. BREASTFED 3 MONTHS distinguishes children, aged three months and older, who have and have not been breastfed for at least the first three months of their lives. As Figure 3-2 indicates, 59% of the sample population breastfed up to eighteen months of age. Since breastfeeding is of such long duration in Semarang, 6, 9, 12 and 18 month durations were included for initial comparisons.

As an indicator of the use of breastmilk substitutes and supplements in Semarang, the variables BOTTLE BY 1 through 4 MONTHS are used. These variables classify children older than the stated number of months according to whether they were introduced to regular bottle-feeding at any time up to the completion of the first, second, third and fourth month of life. As discussed previously, introduction of early bottle-feeding in Semarang is associated with rapid weaning. One-third of the children who received a bottle at the first six weeks of life were weaned within 2 months of that time (Table 3-26). The later a child received a bottle, the longer the interval of weaning. It is therefore important to identify the characteristics of women who introduce bottle-feeding early in their infant's development.

Since most women initiate breastfeeding in Semarang, little variation was anticipated. The data on mother's age, however, suggest a slightly lower likelihood of ever breastfeeding for women over 35. The percentages of children who are breastfed for long durations is, if anything, generally high for the older women. There appears to be no consistent effect of age on introduction of bottle-feeding. This is corroborated by Figure 6-1 which is a life table of duration of breastfeeding according to mother's age. The Figure shows that older women (over 30 years) have a median duration of breastfeeding between 4 and 6 months longer than those 29 and under. These medians substantiate the ethnographic descriptions of some women who appear to breastfeed their child for very long periods of time. Presumably, women over 40 years may well consider the index child to be their last.

As expected, differences in initiation of breastfeeding between rural and city-born women are negligible. Both groups also breastfeed for long durations. Differences in duration are large, however, at 18 months duration, with rural-born women having a higher prevalence than the city-born (70% v.s. 49%). There is a distinctly higher probability of initiating bottle-feeding by city-born women at all intervals, although the use of bottles is relatively uncommon in all groups. Figure 6-2 corroborates the analysis.

Parity, the fourth socioeconomic indicator, appears to have a varied effect on infant feeding practices. Initiation of breastfeeding was well over 90% in all groups. Mothers with first order births seem slightly less likely to breast feed for prolonged durations. Women of parities over 4 seem to breastfeed for slightly longer durations, yet, the very small number of mothers in the highest parity category appear to have a lower likelihood of very long breastfeeding. Data presented in the life table Figure 6-3, for the early months, show that women with the largest number of children breastfeed at consistently higher rates than mothers with fewer children. A similar trend is seen in the pattern of bottle-feeding where there appear to be larger percentages among lowest parity women who introduce early bottles.

Education appears to have little impact on the initiation of breastfeeding. A sharp decline is seen in breastfeeding durations, however, for women with 11 or more years of education. Forty-three percent of these more educated women are still breastfeeding at 18 months as compared with 74.5% of women with no formal education and 61% of those with between 1-10 years of school. Initiation of bottle-feeding is clearly, consistently and inversely correlated with years of education. The less education a woman has, the less likely she is to initiate bottle-feeding by any given month postpartum. Over two-thirds of women with 12 or more years of education have initiated bottle-feeding by 2 months as compared with 8.0% of those with no education. Education, thus, appears to be even more strongly associated with early bottle-feeding than with duration of breastfeeding. The data presented in Lifetable 6-4 are consistent with this analysis where women with 13 or more years of education breastfeed an average of 8 months compared with 24 months for women with no formal education.

There is little variation in initiation of breastfeeding according to household size. In terms of breastfeeding duration, there is also little variation among households, with the exception of the very small number of women in households of more than 13 people, where there is a rapid decline in breastfeeding by 6 months. Early introduction of bottle-feeding is more common among women in households of 10 or more people than in smaller ones. This probably reflects both the availability of numerous

others to care for the child as well as the necessi[illegible] the mother to delegate responsibility for infant feeding, [illegible] her things, in larger households. The propensity to [illegible] les earlier may be related to the shorter duration of br[illegible]ng in the largest households.

Finally, income appears to be negatively rela[illegible]d to breastfeeding duration and positively correlated wi[illegible] introduction of bottles. Higher incomes are associated with slightly less chance of initiating breastfeeding, although the overall initiation rate is almost universal in all groups. This trend is replicated and enhanced for measures of duration. The lower the income, the greater the chance of breastfeeding for longer periods of time (i.e., 71% of the lowest income women breastfeed at 18 months as compared with 45% of highest income women). The life table, Figure 6-5, depicts this trend visually. A similar pattern is reflected in the propensity to introduce bottle-feeding. Only 7.5% of women in the lowest income group bottle-fed by two months of age as compared with 45.4% of those in the highest income category. In fact, as with education, the bottle-feeding variables appear even more strongly and consistently affected than the breastfeeding variables, with a stepwise increase in bottle-feeding by income group for every income interval.

Table 6-2 provides additional data regarding the relationship between income and feeding patterns. Nine percent of the lowest income women were exclusively breastfeeding at the time of the interview as compared with 2% of the higher income. Almost two-thirds of the lowest income women were giving breastmilk and food supplements, a combination used by only 16% of upper income women. On the other hand, half of the higher income women give their children bottle formula and foods, whereas only 13% of lower income women do so. The differences in the feeding patterns of upper and lower income women are highlighted in Table 6-3, which summarizes the patterns in Table 6-2. It is clear that the major difference is use of bottles: 25% of lower income women vs. 81% of higher income women. Breastfeeding is also different in the two groups but differences are not quite as extreme: 81% in lower income women; 46% in the higher income group. There are essentially no differences in use of foods: these are almost universally given to children in both groups.

This underscores the universal belief in supplementation for infants. The fact that higher income women give bottles more often may be a result of the relative cost of food versus bottle-feeding. Whether lower income women would have used formula feeding had cash been available to pay for it is, unfortunately, not verifiable. The emergence of bottle-feeding, however, may be an imitation of Western behavior or the expression of a subtle encouragement to be modern or efficient, among upper and middle class women. In this regard, the discussion above has described

religious and cultural beliefs which either supported or interfered with continuation of breastfeeding. The ethnographer also identified upper and middle class women who were of the opinion that formula and packaged cereals were superior and more efficient patterns of infant eating as compared to breastfeeding and traditional infant feeding habits.

An ethnographic illustration will serve to underscore the significance of income and associated cultural preferences regarding infant feeding habits. Mrs. A, a former mathematics teacher, is a 40 year old Chinese woman of middle class background living in Kranggan Dalam district. After the birth of her child, Mrs. A continued to work, tutoring one student only. She breastfed her child exclusively up to until four months and then supplemented with Morinaga formula and Cerelac. Her friends advised her to introduce Morinaga and her family doctor similarly recommended the Cerelac. Mrs. A's experiences also demonstrate the process of unintentional weaning. At 4 months of age, soon after the introduction of the formula and cereal, Mrs. A's baby began to refuse to breastfeed. Mrs. A's doctor advised giving additional formula as a substitute and the child was precipitously weaned. Most simply, Mrs. A's experience provides a picture of how traditional methods of infant care and feeding can undergo change. In this case, the cumulative pressure or suggestions of a health professional and peers undermined the intention to continue breastfeeding.

Finally, one might expect that mothers who live alone (only 1% of the sample lived in a 2-person household) or without husbands (9%) would have a shorter duration of breastfeeding, especially if they were the main providers of their families' income. For the 41 (3%) female headed households (i.e., females provide most income), 21.6% of the mothers who were not breastfeeding at time of interview had <u>never</u> breastfed their index child as compared with 15% of mothers <u>with</u> husbands. Eighty-two percent of head of household women stopped breastfeeding by 6 months of age. Of women currently breastfeeding and using milk supplements as well, 96% of those <u>without</u> husbands introduced artificial milk by 3 months of life as compared with 65% of women with husbands living at home. Thus, these women living alone are at particular risk of shortened breastfeeding and early use of bottles.

To summarize, initiation of breastfeeding is high for all women in Semarang. Breastfeeding duration and, most especially, initiation of bottle-feeding do vary with a number of socioeconomic parameters, such as age, parity, place of birth, number of persons in household and, most strongly, education and income.

In order to understand fully the individual and cumulative effects of the set of socioeconomic parameters on particular

infant feeding behaviors, they were subjected to logistic regression analysis. The dichotomous dependent variables used in the model reflect whether or not a mother in the study group may be classified into the infant feeding categories chosen. The logistic regression procedure permits evaluation of various models as well as the effects of individual predictor variables in each of the models. The variables for "Ever Breastfed," and "Breastfed 3 Months" do not appear in the regressions because 95.2% of Semarang women do initiate breastfeeding and continue to do so at very high rates for 3 months (92%). The same rationale applies to the choice of Bottle by 4 Months as a dependent variable. Very few Semarang mothers introduce bottles in the first 2 months (the interval used in the 3 comparison studies) but by 4 months 24% are using bottles.

The implications of bottle use may be different depending upon whether their introduction indicates a conscious desire to wean or merely represents the intention to supplement. The potential exists for the introduction of the bottle to shorten the generally lengthy process of weaning even when it is not introduced for that purpose. The issue, is to locate those factors which encourage the unnecessary use of artificial milk, so that appropriate intervention policies be formulated to prevent undesirable early weaning and, for poor families, the introduction of potentially contaminated bottled foods.

Table 6-4 presents the beta coefficients, and chi^2 tests, p values for the associations between the socioeconomic variables and probability of breastfeeding 6, 9, 12 and 18 months, and use of bottles by 4 months. Negative coefficients suggest a reduced probability of the outcome in question; how parity, higher family income and older mothers are significantly less likely to breastfeed for 6 months. Only high income and low parity are significantly associated by 9 months of breastfeeding. The age, education and birthplace of the mother are not significant in this model. For models in which Breastfed 12 and 18 months are the dependent variables, income of family is again a negative predictor. On the other hand, older mothers are more likely to be breastfeeding for 18 months. The fact that the sign of the beta coefficient for maternal age reverses (older mothers are less likely to breastfeed to 6 months, but more likely to breastfeed to 18 months) may indicate that there are two subgroups of older women in our sample: once the group of older mothers who are more likely to stop breastfeeding early is removed from the model, the remainder of older mothers tend to breastfeed for prolonged durations. For the longest duration, urban birth of the mother has a significant negative correlation. The single significant association that affects all durations is family income, and the relationship there is so strong that the p value cannot be given in three decimal places.

The model for the determinants of bottle-feeding by 4 months shows that four of the five predictor variables are significantly related to the outcome, many of them very strongly so. Children of lower parity women, other factors controlled, will be more likely to experience early bottle-feeding. Older age of mother, higher education of mother and higher family income are significantly positively associated with earlier bottle-feeding.

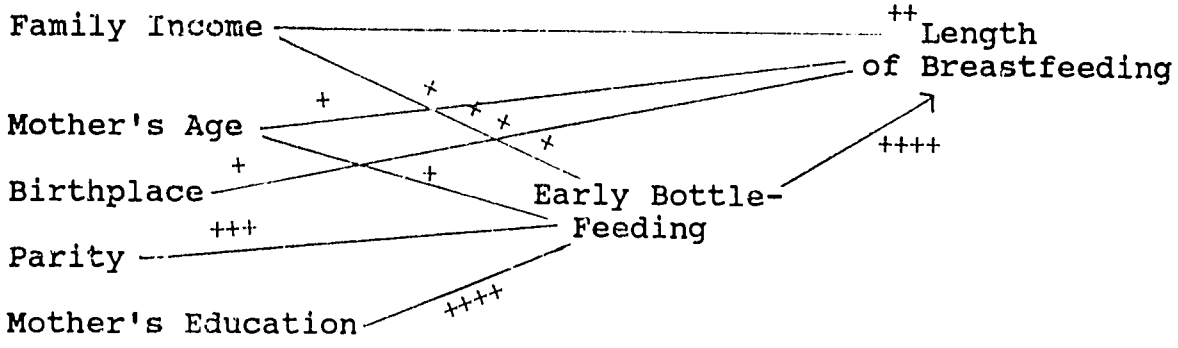
Table 6-5 provides the adjusted odds ratios (ROR) and the 95% confidence intervals for each of the predictor variables that had a significant Beta in the preceding table. The RORs demonstrate the magnitude of the effects of the predictor variables. Although some predictor variables are dichotomous (e.g., urban or rural born), others are arranged on an ordinal scale (e.g. mother's age, family income) and grouped. For the continuous predictor variables, a series of representative odds ratios are presented. In each of these instances, comparisons are made between a reference category and other representative categories for the variable under consideration. The modal category (i.e. the group containing the largest number of mothers) is the reference category for each of the continuous or ordinal variables. Women of parity 8-9 are approximately 2.5 times as likely to breastfeed for 6 or 9 months as women of parity 2-3. They are only one-fourth as likely to introduce bottle-feeding by 4 months.

Again, the odds that women from highest income families would introduce a bottle by four months are 2.5 times greater than for women from the lower modal income class, and breastfeeding to the measured durations is only one-third to one-half as likely. The remaining ROR's for the other predictor variables and models are interpreted in a similar way.

The data indicate that early introduction of bottle-feeding shortens the weaning interval, whether intentionally or not. Thus, bottle-feeding may be a determinant of breastfeeding duration. For this reason, additional logistic models were created adding "bottle by 4 months" to the set of background predictor variables and analyzing the effects on the 6, 9, 12 and 18 months duration of breastfeeding. Table 6-6 presents the results of this further analysis. It is immediately apparent that introduction of a bottle by 4 months has a large negative association with breastfeeding of 6, 9 12, and 18 months duration. Women who do not introduce bottles by 4 months are 30 times as likely to breastfeed for nine months and more than 20 times as likely to breastfeed for 12 months as those who do use early bottles (Table 6-7). The overall model Chi^2 and correlation coefficients have also increased dramatically, compared with the corresponding models in Table 6-4. The introduction of the variable for early bottle-feeding dramatically reduces the independent relationship of family

income to breastfeeding duration although it remains significant for all intervals beyond 6 months.

Bottle by 4 months appears to exert such a large controlling influence on the probability of breastfeeding to six months that it displaces entirely the influence of all other variables at this duration, suggesting perhaps an "overexplanation," i.e., that a certain group of mothers has introduced bottles by four months precisely in order to wean before 6 months. In general, the results of this regression suggest that some portion of the effects seen for the background variables in the prior regression are actually due to the influence of early introduction of bottle-feeding, even where it is not merely evidence of the intention to wean. It should be noted, however, that this does not negate the importance of socioeconomic factors, but merely gives a clearer picture of the way these factors operate. Table 5-4 shows clearly that use of the bottle is itself very strongly associated with the background socioeconomic variables. The picture which emerges suggests the following model:



Socioeconomic factors appear to act more strongly on the decision to introduce bottles then on the duration of breastfeeding itself. In addition to some direct effect on breastfeeding, the background variables tend to operate very strongly, indirectly, through their association with early bottle-feeding, which, in turn, has an independent, extremely strong effect on duration of breastfeeding.

Since the variable bottle by 4 months exerts such a powerful influence on infant feeding outcomes, it will be used again as a predictor variable in the models presented later in this report. The question, however, remains whether early introduction of the bottle does or does not represent a deliberate intention to wean on the part of the mother, in which case it would be, by definition, associated with shorter breastfeeding. If a bottle by 4 months is introduced as part of a weaning strategy, there would, obviously, be a very high probability of weaning by 6 months. One way to test this is to see if a large proportion of the women who do not breastfeed to 9 months are weaning before 6 months. This would mean that most of the effect apparent on weaning by 9 months was, in fact, due to instances of weaning

before 6 months. Cross tabulations of breastfeeding for 6 months with breastfeeding for 12 and 18 months, demonstrate that 2/3rds of the women who did not breastfeed to 12 months also did not breastfeed at 6 months, and 35% of the women not breastfeeding at 18 months did not breastfeed at 6 months. Thus, whatever is determinant of breastfeeding for the 12 and 18 month variable may be acting through its effects on breastfeeding for 6 months.

The logistic regression analysis was therefore repeated using a subset of the sample consisting only of those children who did breastfeed for as long as six months. When this analysis was performed, as Table 6-8 shows, a strong negative correlation of the bottle by four month variable with 9, 12 and 18 months of breastfeeding is still apparent. This suggests that even when controlling for the effects of other socioeconomic variables, the introduction of early bottle-feeding reduces the likelihood that a child will breastfeed for as long as nine, 12 or 18 months, even for those children who do breastfeed for six months. Since it is unlikely that bottles are introduced by four months as part of a plan to wean at 9, 12, or 18 months, the significant association with lower likelihood of breastfeeding to these durations probably does represent an independent association of early bottle-feeding with shortened breastfeeding duration. Supplemental bottle-feeding has been thought to disrupt the biological process of lactation and hasten the complete cessation of breastfeeding. The results of our logistic analysis lends support to this belief. The possibility of decreasing early bottle-feeding may have considerable policy relevance since it is a volitional practice, amenable to change.

Table 6-1 Socioeconomic Indicators by Breastfeeding Experiences and Initiation of Bottle Feeding
(a)

	EVER BREAST-FED	BREAST-FED 3 MONTHS	BREAST-FED 6 MONTHS	BREAST-FED 9 MONTHS	BREAST-FED 12 MONTHS	BREAST-FED 18 MONTHS	BOTTLE BY 1 MONTH	BOTTLE BY 2 MONTHS	BOTTLE BY 3 MONTHS	BOTTLE BY 4 MONTHS
Mother's Age										
14-17	14	8	7	7	6	1	2	0	0	0
	100	100	100	100	85.7	50.0	16.7			
18-19	70	56	43	28	19	6	8	14	13	13
	97.2	93.3	84.3	77.8	67.9	42.9	12.9	25.0	24.5	26.5
20-24	413	342	270	188	145	59	39	54	54	65
	96.7	94.0	87.9	79.0	73.6	50.9	10.8	15.8	16.8	21.4
25-29	342	283	227	178	135	57	51	58	57	64
	96.6	91.3	84.4	76.7	71.4	51.4	17.2	20.5	21.2	25.6
30-34	166	131	108	87	76	40	27	30	38	40
	96.5	85.6	81.2	79.8	80.0	71.4	18.0	20.7	27.1	29.6
35-39	86	68	54	45	40	21	17	23	23	22
	92.5	87.2	80.6	77.6	78.4	67.7	21.0	29.5	31.5	31.9
> 40	42	32	26	21	19	14	4	5	7	9
	87.5	88.9	78.8	75.0	70.4	73.7	10.5	14.3	21.2	28.1

Table 6-1 Socioeconomic Indicators by Breastfeeding Experiences and Initiation of Bottle Feeding (b)

	EVER BREAST-FED	BREAST-FED 3 MONTHS	BREAST-FED 6 MONTHS	BREAST-FED 9 MONTHS	BREAST-FED 12 MONTHS	BREAST-FED 18 MONTHS	BOTTLE BY 1 MONTH	BOTTLE BY 2 MONTHS	BOTTLE BY 3 MONTHS	BOTTLE BY 4 MONTHS
Education										
None	170	140	115	93	76	35	10	12	12	12
	94.4	95.2	91.3	90.3	86.4	74.5	6.3	8.0	8.6	9.0
1-4	230	197	171	123	98	48	12	22	21	24
	96.6	94.7	91.0	86.0	81.7	66.7	5.8	11.2	11.2	13.3
5-7	407	332	268	211	163	81	44	54	56	65
	96.2	91.7	87.3	81.5	76.2	57.0	12.3	15.6	17.3	21.3
8-10	220	187	151	112	90	41	27	32	31	34
	96.1	94.9	88.3	83.6	80.4	58.6	14.1	17.8	17.9	20.9
11-12	174	135	98	65	50	21	40	47	56	62
	96.7	84.9	74.8	59.6	56.2	43.7	26.8	33.1	40.6	48.4
13+	52	32	20	15	13	5	21	27	27	26
	94.2	72.7	54.1	50.0	50.0	41.7	46.7	67.5	71.1	78.8

Table 6-1 Socioeconomic Indicators by Breastfeeding Experiences and Initiation of Bottle Feeding (c)

	EVER BREAST-FED	BREAST-FED 3 MONTHS	BREAST-FED 6 MONTHS	BREAST-FED 9 MONTHS	BREAST-FED 12 MONTHS	BREAST-FED 18 MONTHS	BOTTLE BY 1 MONTH	BOTTLE BY 2 MONTHS	BOTTLE BY 3 MONTHS	BOTTLE BY 4 MONTHS
Mother's Birthplace										
Any City	686	550	390	330	263	105	110	134	140	147
	95.7	89.0	90.1	74.5	70.5	49.3	18.3	23.5	25.6	28.8
Rural	568	474	433	289	227	126	43	59	62	75
	94.9	94.8	82.0	86.0	82.2	70.4	8.4	12.1	13.6	17.2
Parity										
1	313	253	198	146	111	48	58	46	56	57
	96.9	91.0	86.1	78.9	75.0	57.1	23.2	17.0	23.5	25.8
2-3	540	449	353	260	200	91	84	69	89	102
	96.4	93.0	85.3	76.7	71.2	52.0	18.4	14.5	20.6	25.1
4-5	241	193	162	127	106	47	34	22	39	41
	97.2	89.8	84.8	83.0	80.9	64.4	16.4	10.1	9.8	21.6
6-7	103	85	72	55	47	27	10	9	10	13
	93.6	91.4	87.8	85.3	81.0	75.0	11.0	9.7	11.8	15.9
8-9	43	34	30	26	24	17	6	6	5	6
	97.7	91.9	90.9	92.9	92.3	89.5	15.8	15.0	14.3	18.7
10-12	12	11	9	6	6	3	1	1	1	3
	100	100	90.0	85.7	60.0	33.3	8.3	8.3	27.3	27.3

Table 6-1 Socioeconomic Indicators by Breastfeeding Experiences and Initiation
(d) of Bottle Feeding

	Ever BF	BF 3 mos.	BF 6 mos.	BF 9 mos.	BF 12 mos.	BF 18 mos.	Bottle By 1 mo.	By 2 mos.	By 3 mos.	By 4 mos.
No. of Persons in Household										
1-3	229 92.2	190 91.8	145 87.3	110 81.5	81 79.4	39 67.2	32 18.2	35 19.0	35 19.7	35 21.3
4-5	503 95.3	436 94.2	350 88.8	280 79.3	200 73.3	81 59.3	58 12.7	72 16.6	77 18.7	86 22.2
6-7	285 95.6	234 90.7	193 82.5	144 80.0	122 77.7	62 66.0	27 10.5	44 17.8	46 19.7	53 23.3
8-9	145 94.2	106 85.7	89 80.2	73 79.3	61 76.2	35 66.0	20 15.3	24 19.4	25 21.7	26 23.6
10-12	60 96.8	47 88.7	40 83.3	29 76.3	24 72.7	12 60.0	14 24.6	15 27.8	16 31.4	17 34.7
13+	11 100	10 90.9	6 75.0	3 50.0	3 50.0	1 33.3	2 20.0	2 20.0	3 30.0	5 50.0
Family Income										
0-29	214 95.1	180 97.3	144 93.5	106 89.8	88 84.6	47 71.2	10 5.0	14 7.5	15 8.0	19 11.7
30-41	330 96.6	287 95.0	244 92.1	196 88.4	139 83.2	64 66.4	20 6.8	30 10.4	33 12.1	31 12.1
42-60	279 95.2	226 91.6	189 88.3	147 84.5	120 78.9	52 57.8	31 12.7	40 17.4	38 17.4	45 21.2
61-100	252 94.4	204 88.7	152 79.0	114 69.9	91 67.4	44 48.9	49 22.4	54 25.6	58 28.7	67 35.3
101--150	144 93.5	103 78.0	73 63.5	48 52.2	40 51.6	18 45.0	42 34.1	54 45.4	58 50.9	60 56.1

Table 6-2 Family Income and Feeding Patterns

PATTERN	Lowest (Low-29,000 Rp) TOTAL N	% YES	Highest (110,00 Rp-High) TOTAL	% YES
Exclusive breastfeeding	20	9	3	2
Bottle only	2	1	4	3
Breast and bottle	1	-	5	3
Breast, bottle and foods	24	11	38	25
Breast and foods	136	61	25	16
Foods only	12	5	2	1
Bottle and foods	29	13	76	50
Total	224	100%	153	100%

Table 6-3 Summary - Income and Feeding Patterns

Pattern	Lowest (Low-29,000 Rp)	Highest (110,00 Rp-High)
Any Combination Including Bottle	25%	81%
Any Combination Including Breast	81%	46%
Any Foods	90%	92%

Table 6-4 Logistic Regression Models for Different Infant Feeding Outcomes (Dependent Variables)
Beta Coefficients and P Values for Socioeconomic Predictors

PREDICTORS	BREAST-FED 6 MONTHS	BREAST-FED 9 MONTHS	BREAST-FED 12 MONTHS	BREAST-FED 18 MONTHS	BOTTLE BY 4 MONTHS
Intercept					
Beta	3.781	2.787	1.809	0.364	-3.220
X^2	71.25	42.71	19.27	0.59	70.93
P Value	*(0.000)	*(0.000)	*(0.000)	(0.442)	*(0.000)
Parity					
Beta	0.311	0.305	0.170	0.057	-0.433
X^2	4.80	4.75	1.47	0.12	10.82
P Value	*(0.028)	*(0.029)	(0.224)	(0.725)	*(0.001)
Age of Mother					
Beta	-0.243	-0.043	0.098	0.325	0.242
X^2	3.96	0.12	0.66	4.84	4.74
P Value	*(0.046)	(0.723)	(0.418)	*(0.027)	*(0.029)
Education of Mother					
Beta	-0.003	-0.076	-0.100	0.009	0.316
X^2	0.00	0.60	1.03	0.01	12.53
P Value	(0.974)	(0.440)	(0.309)	(0.938)	*(0.000)
Birthplace of Mother					
Beta	-0.157	-0.184	-0.122	-0.626	0.002
X^2	0.46	0.66	0.29	5.82	0.00
P Value	(0.499)	(0.418)	(0.588)	*(0.015)	(0.989)
Income of Family					
Beta	-0.516	-0.536	-0.393	-0.397	0.442
X^2	22.67	24.88	13.69	11.27	23.70
P Value	*(0.000)	*(0.000)	*(0.000)	*(0.000)	*(0.000)
Model					
X^2	54.41	61.69	32.32	30.38	118.68
P Value	*(0.000)	*(0.0)	*(0.000)	*(0.000)	*(0.0)
Correlation Coefficient r =	0.262	0.285	0.207	0.231	0.362

*Significant

Table 6-5 Logistic Regression Models for Different Infant Feeding Outcomes

	Adjusted Risk Odds Ratios and 95% Confidence Intervals for Socioeconomic Variables with Significant P Values				
	BF6MO	BF9MO	BF12MO	BF18MO	Bottle by 4 Mo
Parity					
2-3 vs 1	1.365 (1.033, 1.803)	1.357 (1.031, 1.785)	NS	NS	0.648 (0.501, 0.839)
8-9 vs 2-3	2.543 (1.925, 3.360)	2.498 (1.898, 3.286)	NS	NS	0.273 (0.211, 0.353)
Age of Mother					
20-24 vs 18-19 years	0.784 (0.617, 0.996)	NS	NS	1.385 (1.036, 1.852)	1.274 (1.025, 1.585)
35-39 vs 20-24	0.482 (0.379, 0.612)	NS	NS	2.658 (1.988, 3.553)	2.070 (1.664, 2.575)
Education of Mother					
5-7 years vs none	NS	NS	NS	NS	1.883 (1.580, 2.243)
Income					
30-41,000 Rp. vs Lo-29,000	0.597 (0.483, 0.738)	0.585 (0.473, 0.722)	0.674 (0.547, 0.831)	0.672 (0.533, 0.847)	1.556 (1.302, 1.859)
60-109,000 vs 30-41,000	0.356 (0.288, 0.441)	0.342 (0.276, 0.422)	0.455 (0.369, 0.560)	0.451 (0.358, 0.569)	2.422 (2.027, 2.894)
Mother's Birthplace	NS	NS	NS	0.534 (0.321, 0.889)	NS

Table 6-6 Logistic Regression Models Using Bottle by 4 Months as a Predictor

	BF 6 Mo.	BF 9 Mo.	BF 12 Mo.	BF 18 Mo.
Intercept				
Beta	6.208	4.1892	3.256	1.1278
χ^2	47.30	42.63	[illegible]	3.28
P Value	(0.000)	*(0.000)	*(0.000)	*(0.069)
Birthorder				
Beta	0.256	0.2028	0.0433	-0.0474
χ^2	1.48	1.00	0.15	0.15
P Value	(0.224)	0.317	0.830	0.225
Age of Mother				
Beta	-0.211	0.1490	0.1881	0.388
χ^2	1.46	0.74	1.21	3.75
P Value	(0.227)	(0.388)	(0.272)	*(0.046)
Education				
Beta	0.092	0.060	0.1177	0.1692
χ^2	0.39	0.18	0.67	1.28
P Value	(0.530)	0.674	0.411	0.258
Birthplace				
Beta	-0.072	-0.3769	-0.3567	-0.724
χ^2	0.05	1.41	1.13	4.63
P Value	(0.830)	(0.234)	(0.287)	*(0.031)
Income				
Beta	-0.214	-0.5193	-0.3981	-0.3822
χ^2	1.61	9.79	5.97	6.17
P Value	(0.205)	*(0.001)	*(0.014)	*(0.012)
Bottle by 4 Mos.				
Beta	-5.021	-3.4037	-3.0545	-2.0976
χ^2	46.54	67.20	84.30	34.63
P Value	*(0.000)	*	*	*(0.000)
Model				
χ^2	233.68	209.79	185.07	97.99
P Value	*0.0	*0.0	*0.0	*0.0
Correlation Coeff. r =	0.657	0.621	.558	0.428

*Significant

Table 6-7 Logistic Regression Models for Different Infant Outcomes:

	Adjusted Risk Odds Ratios and 95% Confidence Intervals for Socioeconomic Variables with Significant P Values			
	Breastfed 6 Months	Breastfed 9 Months	Breastfed 12 Months	Breastfed 18 Months
Parity				
2-3 vs 1	NS	NS	NS	NS
8-9 vs 2-3	NS	NS	NS	NS
Age of Mother				
20-24 vs 18-19 years	NS	NS	NS	1.474 (1.006, 2.16)
35-39 vs 20-24	NS	NS	NS	3.204 (2.187, 4,696)
Education of Mother				
5-7 years vs none	NS	NS	NS	NS
5-7 vs 11-12 years	NS	NS	NS	NS
Mother's Birthplace	NS	NS	NS	0.485 (0.251, 0.938)
Income				
30-41,000 Rp. vs Lo-29,000	NS	0.595 (0.429, 0.824)	0.672 (0.480, 0.924)	0.682 (0.505, 0.922)
61-109,000 vs 30-41,000	NS	0.354 (0.255, 0.490)	0.451 (0.328, 0.621)	0.466 (0.345, 0.629)
Bottle by 4 Months	0.007 (0.002, 0.028)	0.033 (0.016, 0.068)	0.047 (0.024, 0.092)	0.123 (0.062, 0.242)

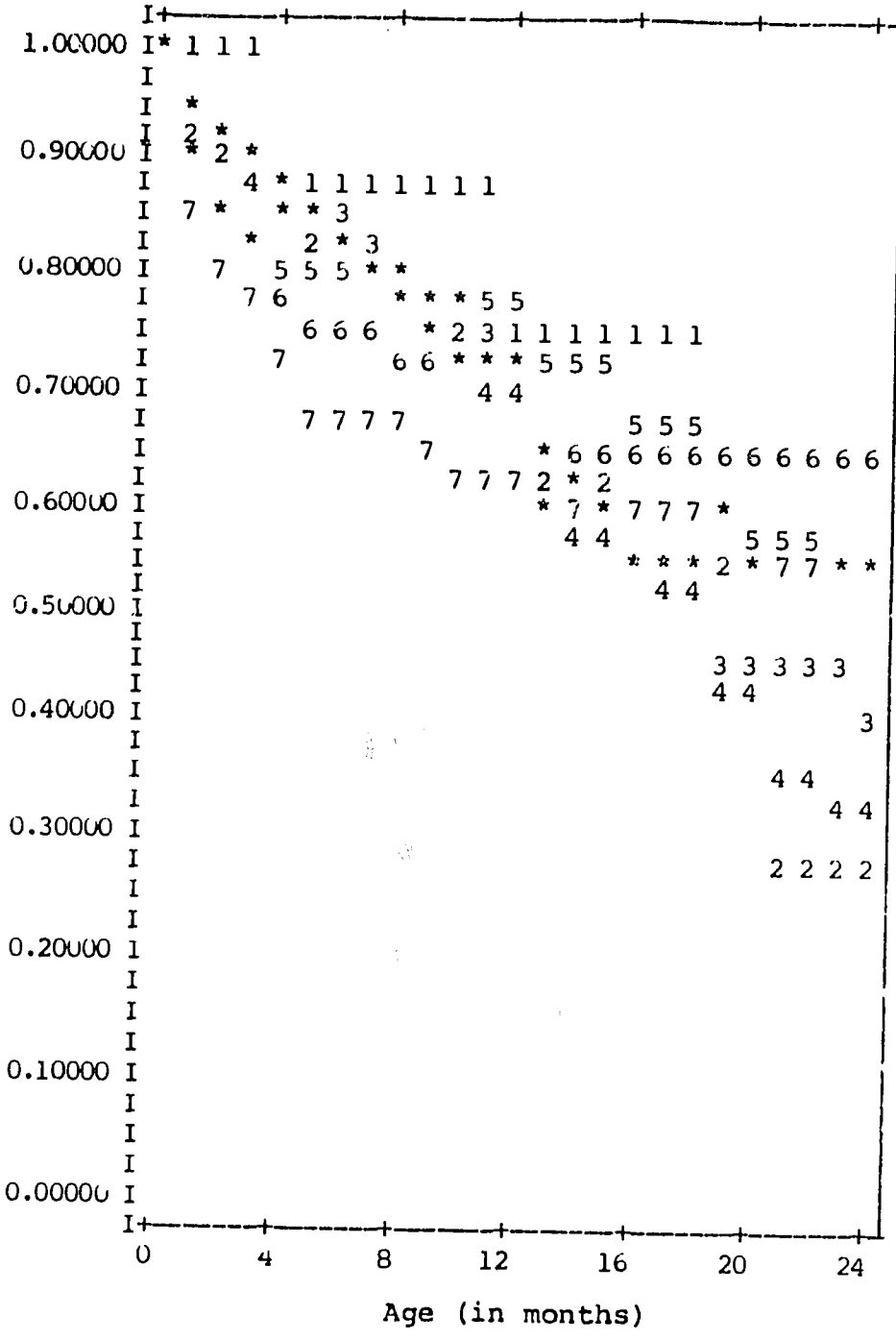
Table 6-8 Logistic Regression Model for Breastfeeding to 9, 12 and 18 Months (excluding children not Breastfed for 6 months) using Background and Bottle by 4 Months as Predictor Variables

	Breastfed 9 Months	Breastfed 12 Months	Breastfed 18 Months
Intercept	5.012 (18.96)***	3.668 (16.70)***	1.287 (3.29)
Parity	-0.044 (0.02)	-0.094 (0.11)	-0.075 (0.10)
Age of Mother	0.723 (4.68)**	0.434 (2.59)	0.432 (3.70)*
Education of Mother	-0.014 (0.0)	0.086 (0.17)	0.150 (0.77)
Mother's Birthplace	-1.208 (3.39)	-0.952 (3.24)	-0.978 (6.38)**
Income	-0.908 (10.37)***	-0.582 (6.59)**	-0.383 (5.16)**
Bottle by 4 months	-1.875 (14.74)***	-1.602 (13.23)***	-1.182 (8.92)***
Model ch^2	56.76***	40.83***	31.58***
r	0.467	0.348	0.290

Significance .05 level *
.01 level **
.001 level ***

Figure 6-1

Duration of Breastfeeding by Mother's Age



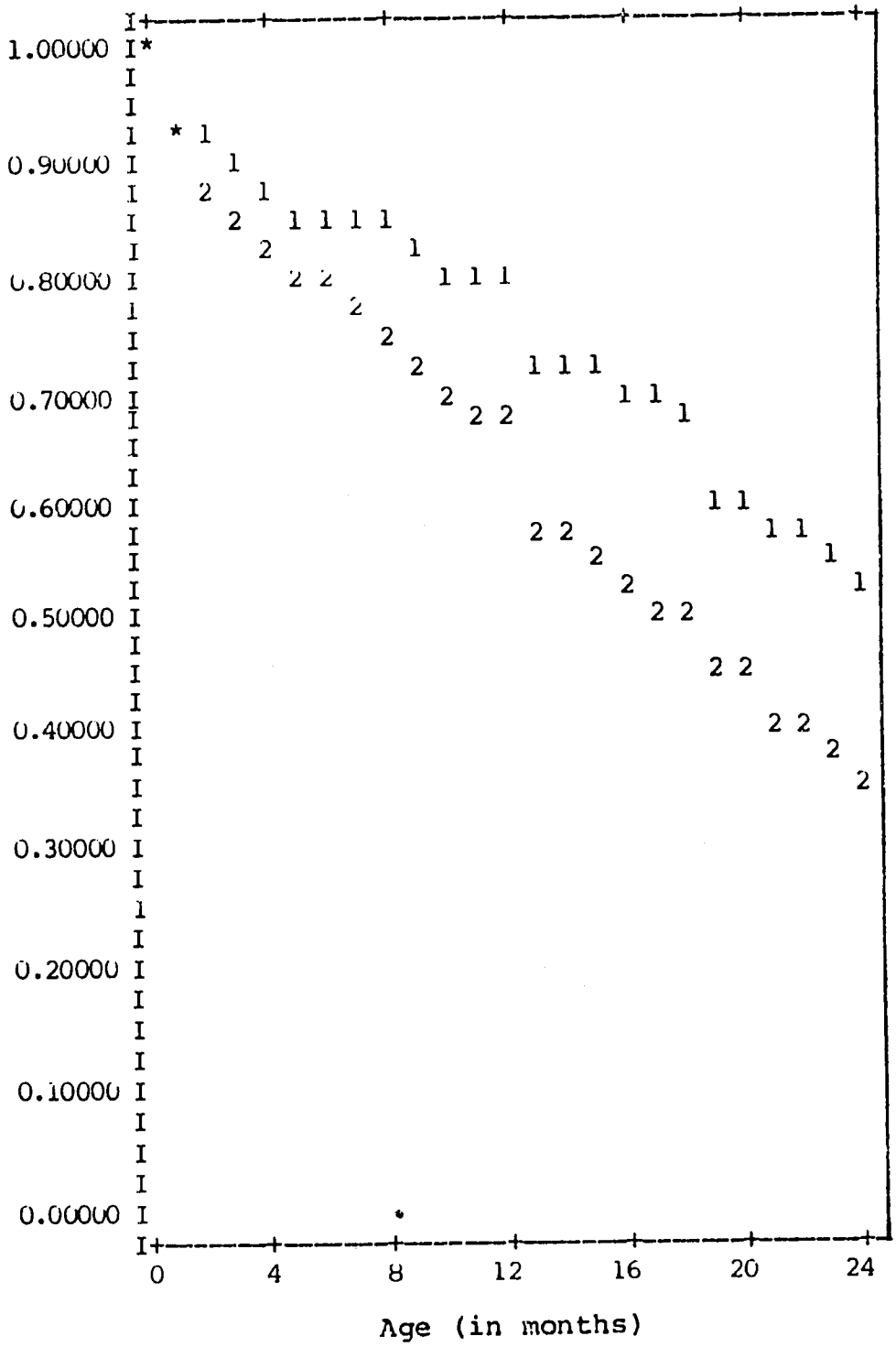
Key:

	N	Median Survival
1 = 14-17	14	18.0
2 = 18-19	73	20.2
3 = 20-24	425	18.51
4 = 25-29	354	18.24
5 = 30-34	172	24.0
6 = 35-39	93	24.0
7 = 40 years or more	47	24.0

* = more than one group

Figure 6-2

Duration of Breastfeeding by Mother's Birthplace



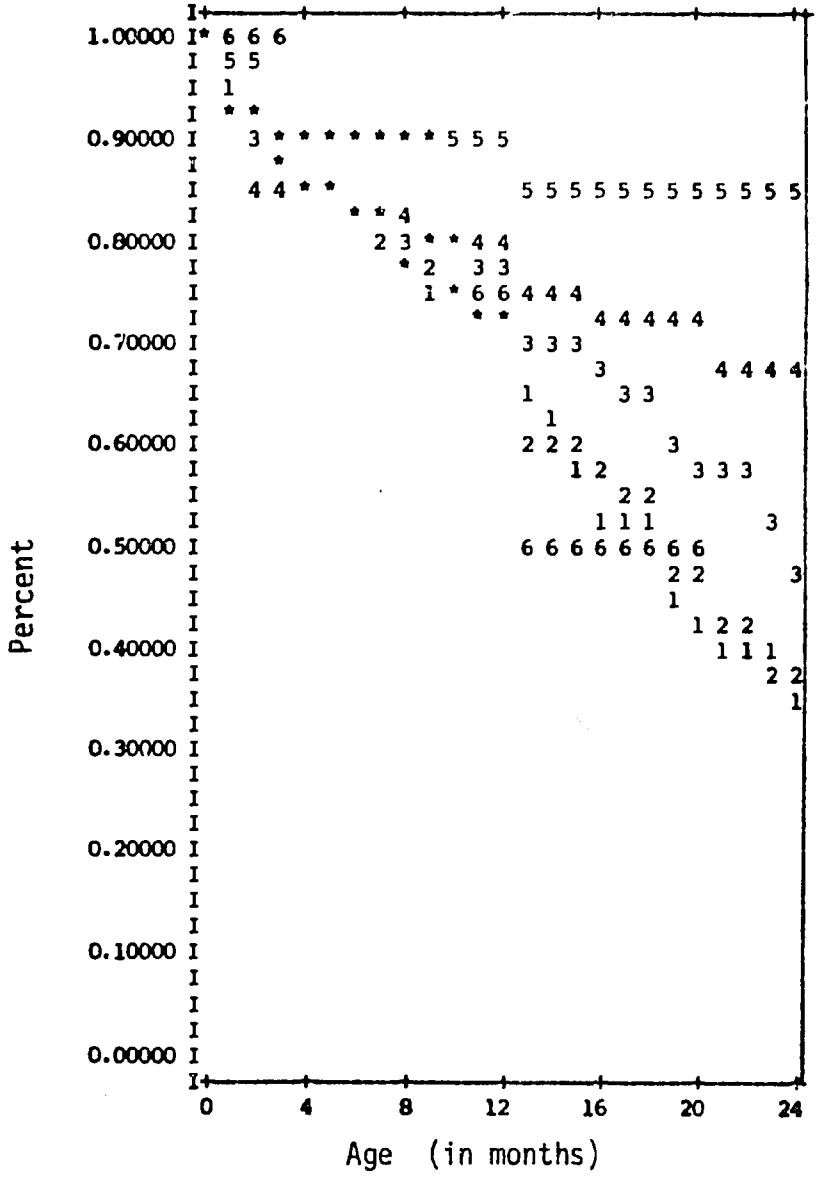
Key:

		N	Median Survival
1	rural	601	24.0
2	urban	713	18.04

* = more than one group

Figure 6-3

Duration of Breastfeeding by Parity

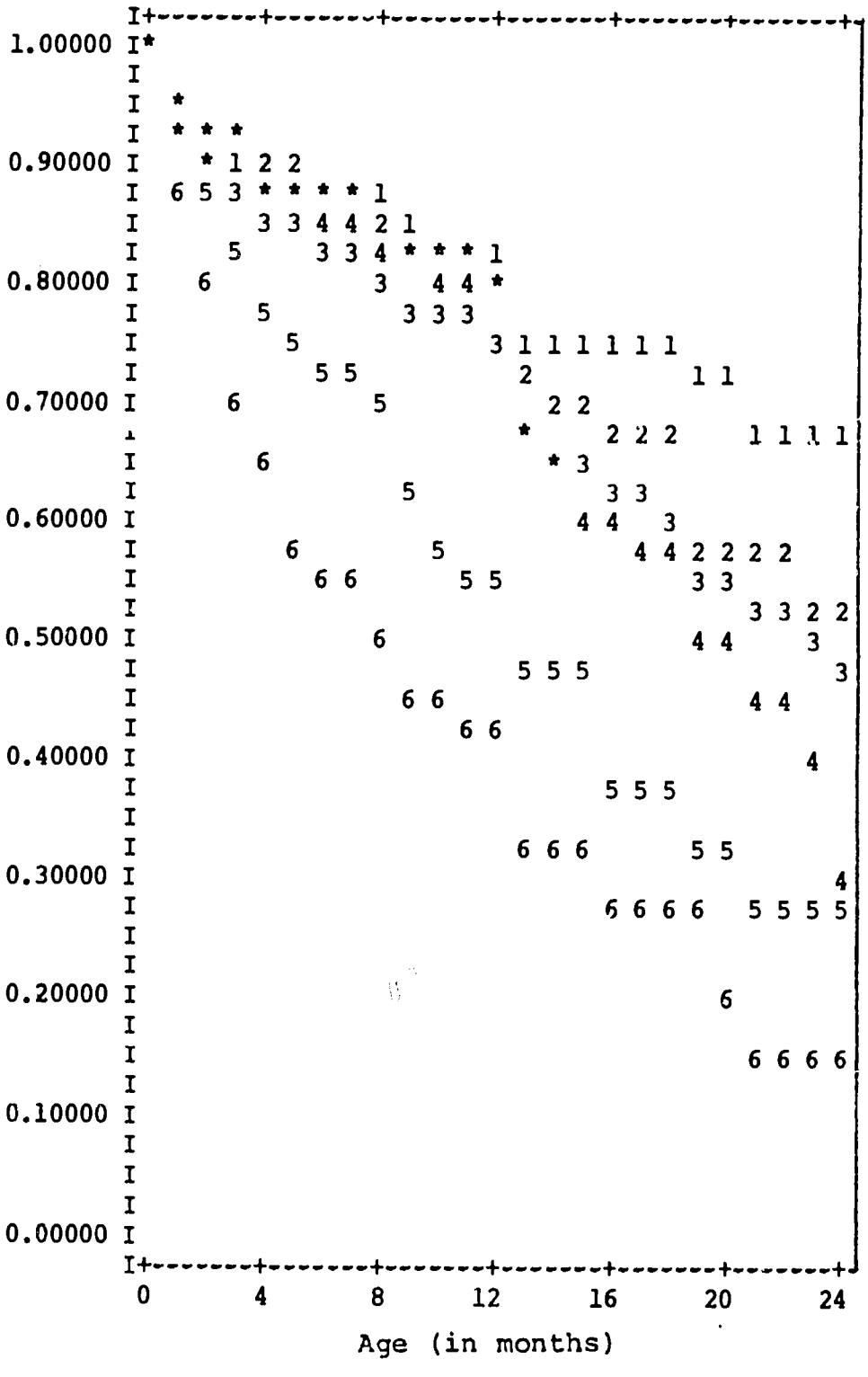


Key:

			N	Median Survival
1	=	1	325	18.44
2	=	2,3	558	18.57
3	=	4-5	247	23.56
4	=	6-7	109	24.00
5	=	8-9	43	24.0
6	=	10+	12	20.0+

Figure 6-4

Duration of Breastfeeding by Mother's Education



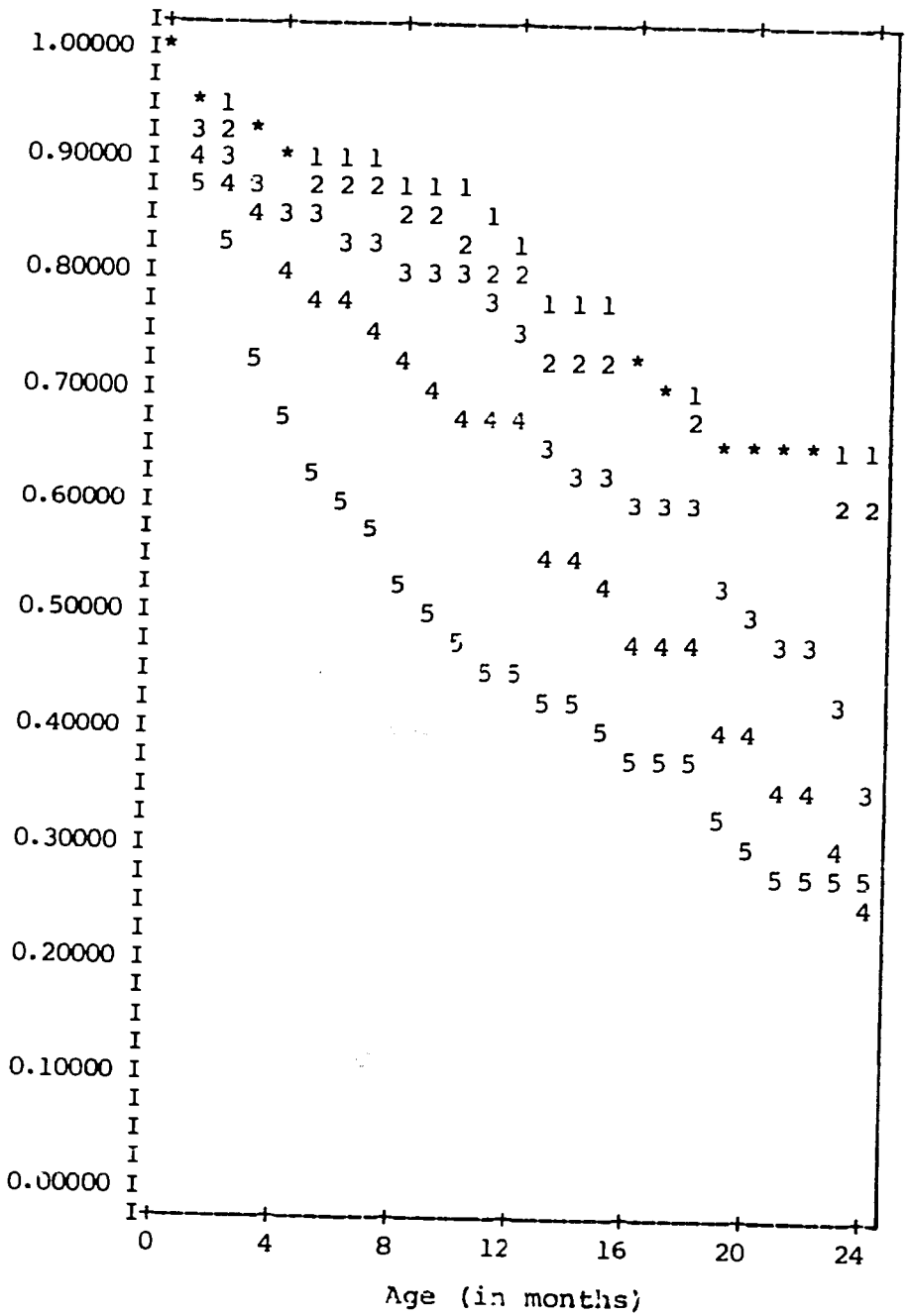
Key:

	N	Median Survival
1 = None	179	24.0
2 = 1-4	240	24.0
3 = 5-7	422	23.09
4 = 8-10	227	18.95
5 = 11-12	180	12.82
6 = 13+	54	7.85

* = more than one group

Figure 6-5

Duration of Breastfeeding by Family Income



Key:

		N	Median Survival
1	low-29,000 Ruphiah	226	24.0
2	30-41,000	347	24.0
3	42-60,000	290	19.69
4	61-109,000	269	15.61
5	110,000-high	153	8.72

* = more than one group

VII DETERMINANTS OF INFANT FEEDING PRACTICES: MARKETING OF COMMERCIAL INFANT FOODS

Methods

The general objective of the marketing studies was to examine the role of infant food marketing and distribution strategies on infant feeding behavior. Because commercial marketing strategies and practices are developed, or refined, on a country by country basis, and because no prior marketing research studies of infant food marketing had been undertaken in the participating countries, much of the marketing research was descriptive and exploratory in nature. Five research questions guided the researchers:

1. What current practices and strategies characterize the infant food marketing in each nation?
2. What factors account, in whole or in part, for the current marketing environment?
3. What is the intensity of current promotional activity by infant food sellers to mothers, health care workers, and others who influence infant feeding choices?
4. What effects, if any, do the marketing practices and policies of infant food sellers have on infant feeding behavior of mothers?
5. What effects, if any, do the marketing practices and strategies of the infant food sellers have on the behavior of health care providers?

Three specific approaches were used to answer these questions: a retail market study; a study of the state of the industry; and a consumer behavior study.

The retail market substudy explored the distribution of breast milk substitutes by examining the number, variety, and prices of products in a sample of sales outlets (food stores, shops, pharmacies). Preliminary market investigations and ethnographic field research on the commercial products actually used to feed infants were employed to develop a list of products in current use in each country.

The state of the industry substudy provided information about the production, distribution, and advertising policies and practices of infant food wholesalers and retailers. Trade policies and regulations of national governments were analyzed to determine their influence on the production, distribution, and advertising practices of producers and sellers. Information was collected through secondary data analysis and interviews with appropriate industry, government, and health personnel. Specific practices such as the distribution of free samples and promotion

to the medical profession were also examined as part of other subsidies.

The consumer behavior substudy, administered as a segment of the cross-sectional survey in infant feeding practices, provided data on the demand for breast milk substitutes. The decisions to buy and use breastmilk are manifested in two distinct types of behavior, namely, purchase of a commercial breastmilk substitute and the actual feeding of such a product to the baby. Purchasing behavior was elicited through survey questions on commercial products fed to infants as well as through observation of retail practices. Feeding behavior was explored in the cross-sectional survey.

Research questions 1, 2, and 3 were studied through the retail audit and state of the industry analysis in each country. This research provided a baseline of information about commercial infant foods marketing which is currently unavailable in each site. The retail audit analysis consisted of collection and analysis of price, product, and promotional data from retail shops and outlets in each field site. These data were collected by local subcontractors on site. All subcontractors were trained or certified as to professional qualifications by Trost Associates Incorporated of Norwalk, Connecticut, the consortium's marketing subcontractor. Retail audit reports were tabulated and analyzed by Trost Associates prior to submission to the consortium. The state of the industry analysis consisted of secondary research about the development and size of the infant foods industry; direct observations of industry activity by consortium staff, consultants, or subcontractors; and interviews of infant food company executives and employees, other businessman directly involved with the industry, and health providers possessing first-hand information about industry actions.

Research question 4 addresses the "consumer behavior" of mothers. To examine maternal decision making, questions of such topics as product awareness, brand awareness, past feeding behavior, and hospital practices (e.g., receipt of samples) were included in the cross-sectional survey instrument.

Research question 5 was addressed through interviews with health care personnel, infant food company representatives, and through direct observation by consortium staff, consultants, or subcontractors.

The consortium conducted the marketing study in Indonesia through two local subcontractors: P.T. In-Search Data, a commercial market research firm located in Jakarta, and University of Diponegoro, which assigned Dr. Sahid of the Faculty of Economics to conduct a market study in Semarang itself. The state of the industry substudy included interviews by In-Search

staff of industry personnel, government officials, and experts; secondary research in Indonesia; gathering of product labels, advertising copy, and other materials. These data were forwarded or reported to Trost Associates, Inc. (the consortium's primary marketing subcontractor) in Connecticut. Information was integrated by Trost Associates with observations made by other consortium staff and consultants into a preliminary report. Dr. Sahid's report from Semarang was forwarded separately to the consortium, and included both retail audit, state of the industry, and health interview data.

The retail market substudy in Semarang was designed by Dr. Sahid with approval by Trost Associates. Because the total number of retail stores in Semarang Municipality is not known (some shops being quite temporary in nature), the official census of shops located in buildings (i.e., permanent structures) in the five old districts of the city was used as a base. According to this census, 321 retail establishments operate in Semarang, distributed in fairly equal numbers throughout the five districts. Thirty retail stores and shops were selected for detailed audits by Dr. Sahid and his team of researchers from Diponegoro University. Interviews were conducted with owners-managers during the course of the audit of products, prices, sizes, and point of sale promotional materials. Four drugstores ("apotek") and four large department stores were included in the sample. All were located in the five old districts of Semarang.

Dr. Sahid's team also made a number of site visits to market areas outside the five districts (e.g., Tugu where a mini-study was conducted of the shops located in a market area near the bus terminal). These audits were often conducted by Dr. Sahid to demonstrate to visiting consortium staff the techniques used by his team to collect information for the marketing substudy.

Four categories of data were collected for the state of the industry substudy: general information about companies; competitive environment (market share, pricing patterns, promotional activities, medical relationships); channels of retail distribution and health care system contact; and government regulatory activities. Data were collected from multiple primary and secondary sources for each category.

Data for the consumer behavior substudy were drawn from the cross sectional survey of mothers in Semarang. Questions were developed in such areas as products used, awareness of past and present promotion/advertising, and advice received from various sources, including health care providers. The consumer behavior analysis has utilized these data, and those from other portions of the survey, to assess the influence of marketing on maternal decisions to use breastmilk substitutes and to purchase specific products.

Overview

Infant formula products are widely available in Semarang. The market is quite competitive at the manufacturer, wholesaler/distributor, and retail levels. There is a high degree of price competition, as well as competition based on perceived differences in product quality. As in all of Indonesia, there is vigorous competition in Semarang between the major Indonesian manufacturer, Sari Husada, which is the largest seller of infant formula in Indonesia, and the multinational companies such as Nestle, Nutricia, Morinaga, and others.

Although Semarang is a city of more than one million residents, it is in many respects unique among the peri-urban locations studied in this project. It is a small city compared to Jakarta, for example, and retains a proximity to rural Java that has tended to limit the complexity of the marketing environment. At the retail level, for example, the only meaningful distinctions are between drugstores, large department stores, and shops. (Some temporary street vendors may occasionally sell infant foods, but they themselves buy at retail prices from the established outlets.) Thus, there are two seemingly contradictory trends in Semarang: a relatively uncomplicated marketing structure, but a high degree of competitiveness. These two findings are strongly suggestive of a "push" strategy by infant formula manufacturers as an effort is made to expand the amount of formula feeding of infants.

Retail Availability

There are many products identified as infant formulas/foods/breastmilk substitutes by retailers in Semarang. As shown in Table 7-1, fifteen products were identified by retailers as appropriate for inclusion in the audit. While different types of retailers tend to limit the variety of brands carried, there was frequent mixing of formulated milks, humanized formulas, and full cream milk products on store shelves. Marketing practices and availability tend to differ by type of retail outlet. To simplify the discussion, therefore, retail data are organized by type of outlet.

Department stores are large retailers of general products, including infant formulas. Infant formulas are displayed alongside other products for the household, and consumers can help themselves to take as much from the shelf as they wish. An important difference between the department stores and the shops is that the department store buys on credit from the distributor and then sells for cash to customers, whereas the shops both buy and sell for cash only. Department stores take products on consignment from the distributor who fills the shelves and keeps the inventory adequate in the store.

Customers who buy infant formula from the department stores tend to be from high income classes, namely the middle class and the wealthy. Unlike the shops, where a consumer usually buys one tin of formula, department store customers are likely to buy five or six tins. According to an employee interviewed at one Semarang department store, the store sells about five cases of infant formula in one month. The department stores do not carry all the brands available, but only those which sell the biggest volume. The popular sellers are: SGM, DAN-Cow, Frisian Flag, S-26 and Enfamil.

Twenty-two small retail shops were studied. The small shops, with only 100 square feet of space, sell to both the consumers and to one another. They are located in all areas of Semarang and are usually located in permanent buildings (in stall spaces), but occasionally a small street vendor will also carry some formula. The shops normally buy the formula from the central market in Semarang where the bigger shops purchase directly from the distributor.

All of the sellers indicated that they had been selling formula for three to eight years, with most saying about five or six years. When asked why they carried infant formula, the answer was "inner motivation." This means that they have been trying to meet the demand of the customers for the product, and in providing that service, they are making a small profit. They claim not to be pushing the product for its own sake. On the question of how much stock was sold each month, there is a wide range of responses, from as little as 24 cans per month to as many as 72 cans (three cases) per month. The tins are the 454 gram tins.

Indonesian drugstores sell medicine and other goods and are increasingly important as people become more aware of health issues. Infant formulas are available in all 20 drugstores in the Semarang area. According to interviews, the drugstores have sold formula products since they were first introduced into Indonesia, at least 20 years ago.

In the drugstores where interviews were conducted, only two had infant formula on the shelf. The others had it stocked below the counter. This contrasts sharply with shops and department stores where all formula is on display. The stores have small amounts of formula in stock because of space requirements and because they can get delivery quickly from the distributor. The store managers said it took about two hours after a telephone call to get delivery. Special formulas (for example, Prosobee) are somewhat difficult to get, primarily because there is a small demand for them. Sellers reported they usually do not sell more than 12 cans per month. These formulas are also expensive (2,600 rupiah per can).

Some employers make arrangements with specific drugstores that allow employees to get prescription items at no cost (i.e., the drugstore bills the employer). Infant formula can be included in this arrangement, and there are reports of women employees of the Bank of Indonesia in Semarang who have requested their physicians to give them prescriptions for infant formula. Drugstores also give a 1,500 rupiah credit on prescription drugs under the public health insurance plan. This does not cover regular infant formula, but may apply to special formulas if prescribed. Not all drugstores participate in the health insurance program. There are extensive contacts between drugstores and distributors but no reports of contacts from manufacturers directly to the druggists.

In the opinion of shopkeepers, price was the most important factor in the choice of a particular brand and quality was secondary. Fourteen of the 22 merchants reported that the best selling products were SGM, Dan-Cow, and Susu Bendera (note: only SGM is an "infant formula"). Based on prices in March and April, 1982, these products were priced between 1200 and 1400 rupiah per tin. Other stores reported Lactogen, Klim, and S-26 were best sellers, brands that are relatively more expensive (Figure 7.1). These interviews also suggest that shopkeepers view full-cream milks, formulas, and humanized formulas as generic "infant foods" and do not distinguish among them.

The shopkeepers report that they are visited by salesmen on a regular basis. The purpose of the visits is to ask about the stock and to keep the name of the product in front of the shopkeeper. One of the 22 shopkeepers interviewed reported a weekly visit by a company salesman. Eight reported one every two weeks, three-reported one per month, and ten were uncertain. There is normally only one salesperson in Semarang per brand, the salesman being employed by the agent or the distributors.

Product position in retail outlets was carefully studied in Semarang. Although any one store may have a unique display pattern, four general placement patterns were identified as follows:

1. near the condensed milk, such as Indo-milk and Susu Bendera
2. with other canned goods, such as canned fruits, biscuits, and crackers
3. near complementary goods, such as bottles, nipples, baby soap and powder
4. near personal care products, such as hair creams, shampoo, talcum powder

Because most of the shops are small, the placement appears to be a function of other products being carried and the demand for infant food products.

Shopkeepers do not promote specific products. Promotion is always of the shop, i.e., the name of the store. There are a number of radio stations in Semarang, and the shopkeepers occasionally place media ads which identify only the name of the shop and its location. Similarly, ads in the newspaper emphasize the name of the shop and never state prices since these can be negotiable. Since the distributor only gives the shopkeeper a five to ten percent discount off the suggested retail price of the formula, there is no real incentive to promote formula milks per se. As one shopkeeper said, at most she makes only 50 rupiah per tin. Usually, after bargaining with the consumer, she nets 25-50 rupiah. The relationship of the shopkeeper to the customer is important and was included in the Phase II ethnographic study. It appears that the shopkeepers try to establish a loyal group of customers, so that it is not necessary to bargain on every item all the time. The buyer knows that she will be treated fairly by the shopkeeper. Thus, efforts are made to promote the shop rather than to promote particular products in the shop.

Most customers buy formula when they visit shops to buy other foods, such as rice, sugar, or syrup. They almost always buy in small amounts, usually one can. This is convenient because most shopping is done near the home. In Tugu, for example, there were ten to twelve shops carrying infant formula in the market near the bus terminal.

An important practice directed at low income groups is the effort of producers to break their products into small packets which are sealed in plastic. Frisian Flag, for example, produces small cellophane packets containing its standard product. A related practice is called breaking bulk and involves purchasing a 450 gram tin and breaking it into 50 gram or 100 gram units.

According to Dr. Sahid, this practice reflects a type of customer segmentation, in which the producer has reached the high and middle income groups with cans and is now reaching the low income groups with these smaller, more affordable packets. Breaking bulk serves to promote product use by reducing the cost of commercial infant foods. This practice also invites abuse by sellers, however, it was noted that some unscrupulous sellers were filling similar sized packets with products of lesser quality (e.g., powdered milk), mislabeling them, and selling these to unwary and unsuspecting customers. Evidence of these practices was seen in many shops, and in all areas of Semarang.

Competitive Structure

The market for infant foods is quite competitive in Semarang. All of the major brands are represented, and manufacturers use agents to distribute their products to major Semarang retailers. There is some reselling from one retailer to another, usually at a small profit. (At the bus station market

in Tugu, for example, consortium staff witnessed a shopkeeper telling a woman customer that he had no Morinaga, but to come back in one hour. He then ran to another shop in the market area, purchased one can of the Morinaga formula and resold it to the original customer when she returned).

There are at least six major infant formula companies operating in Indonesia with imports from still other companies occasionally being found in the marketplace as well. The leading companies are Sari Husada, Nestle, Nutricia, Morinaga, Meiji, and Wyeth Laboratories. During this study, the products of Mead Johnson, Frisian Flag, and Borden were also present in the Semarang market.

In Indonesia, the dominant market position of Sari Husada, an Indonesian-owned company, has been reinforced by various government regulations that affect the ability of foreign companies directly to reach the retail market. Sari Husada has been working with the Indonesian government to encourage the development of a greater domestic market for milk products and an expanded domestic dairy industry. These national economic development goals provide an important context for understanding the continuing expansion and growth of the commercial infant foods market. A policy of "Indonesianization" of industry has also led to significant regulation of the manner in which multinational producers reach the Indonesian consumer market. Under current regulations, only Indonesian distributors or agents can engage in distribution activities, thereby precluding foreign companies from establishing direct marketing channels. One consequence in the infant foods business is the expanded role of independent distributors in promoting the products which they are licensed to sell.

The WHO Code of Marketing has provided an important context in which to analyze the intensity of infant foods promotion. Knowledge of the Code was widespread among government and industry officials. There was almost uniform awareness of the existence of the Code, which was often referred to as "the international marketing standard." This certainty suggests that in Indonesia, government officials and industry executives expect commercial marketing practices to be consistent with the code. In this context, competitors have emphasized: 1. expanded product availability, 2. endorsement from health care workers (including physicians, nurses, midwives and others), and 3. price competition. The purpose of expanding product availability is twofold: obviously, it makes the product more accessible for consumer purchase, and, in addition, assures greater "visual presence," as it is called in the advertising business, which serves as a form of product promotion (In-Search, 1983). Broad product availability was evident in both Semarang and Jakarta. The audit in Jakarta by In-search Data determined that infant

formula products were carried in 97 percent of supermarkets, 28 percent of all shops, and 67 percent of small market outlets.

All companies attempt to reach physicians, nurses, and midwives with product information, samples, and other literature. Among the health providers interviewed in Semarang, it was reported that gifts were frequently provided by the companies. Many gifts were of nominal value and included pens, desk pads, and other professional items. A number of nurses and physicians reported support for travel to meetings, and one nurse reportedly received a television. Free supplies are donated to clinics and hospitals on a frequent and continuing basis by all of the major manufacturers, a practice confirmed by both company and hospital/clinic personnel. Some supplies are subsequently passed on to mothers as samples.

Virtually every source interviewed in the state of the industry substudy stressed the importance of product price as a key variable in consumer choice. Preliminary ethnographic information suggested, as well, that a significant number of mothers would not perceive critical nutritional distinctions between humanized infant formulas, formulated milks ("formulas"), and other milks ("Milk is milk"). Such comments suggest that the demand for products that can be bottlefed to infants is relatively inelastic, but that among all breastmilk substitutes, the demand for any individual product (or brand) is relatively elastic. That is, consumers will choose among products on the basis of price and may not recognize quality distinctions among various product groups.

Interviews with shopkeepers disclosed that they believed two factors determine which products sell best: price and quality. The shopkeepers who were interviewed always tended to rank the variables in that manner i.e., price is most important; quality is second in importance.

Figure 7-1 illustrates the configuration of various products which are used to bottle-feed infants in Indonesia. These products are clustered by market price, and it is clear that a number of key "price points" exist in the Semarang market. If a mother had only 2000 rupiah, for example, she might chose a formula such as SGM or LACTONA or a full cream milk such as Dan-Cow or Frisian Flag. In Semarang, there is a considerable amount of brand-switching dictated by a mothers' disposable income.

In the cross sectional survey, several questions were asked of respondents that focussed on the issue of product use. Table 7-2 summarizes responses from three questions including, "Did you ever use this product to feed your baby?" Note that the products receiving the highest percentage responses are those with the lower prices on Figure 7-1.

Marketing Through The Health Care System

What is quite evident in Semarang, as elsewhere, is that industry promotion is directed at health care professionals at every level, and that product samples, educational materials, and advertising are being channeled through those facilities to reach mothers. The situation in Semarang and Central Java is reportedly less turbulent than in Jakarta, in part because the Indonesian government has been aggressive in promoting breastfeeding and in part because the sellers in Central Java are operating in a somewhat more stable environment. According to interviewees, more "promotional adventurism" occurs in the Jakarta market than in any other Indonesian city.

The role of midwives is prominent in the health care system of Central Java. At the suggestion of the research team, special attention was given to the attitudes of midwives about infant feeding and to the effect of marketing practices on their attitudes and behavior. These interviews complemented other interviews with pediatricians and obstetricians practicing in Semarang. Together, they form an important profile of how health professionals in Central Java think about infant feeding.

According to the physicians interviewed, hospitals in the Semarang area are quite careful in their handling of infant formula products. While pediatricians generally have the authority to prescribe formulas for their private patients, decisions about formula use in the children's wards is left to senior hospital staff. For private patients, physicians may specify particular brands of formula to be given while the child is in the hospital.

According to the physicians interviewed, mothers who deliver in hospitals receive some educational information about infant feeding. The physicians indicated that they give advice if asked and occasionally provide some instruction. Usually, however, such education and information is provided through meetings arranged by the ward nursing supervisor or social service unit of the pediatric division. Midwives frequently play an important role in providing these educational services.

All of the physicians interviewed expressed the opinion that breastfeeding is best for infants. The pediatricians all responded that at least some mothers inquire about how to feed their babies. It was the opinion of these physicians that mothers who were from the "well off" or "more educated" groups tended to ask questions more frequently.

All of the pediatricians interviewed said that mothers are the key decision makers on matters of infant feeding. A substantial number of those interviewed, however, also said that mothers did not know how to do this very well. These physicians

felt that mothers needed assistance in feeding their babies and noted that nurses and/or midwives are the appropriate sources of this assistance. The pediatricians all said that breastfeeding is best for as long as the mother can do it. It was their opinion that at least 50% and probably 70-80% of mothers were breastfeeding.

These same physicians agreed that infant formula is needed as a supplement even though mothers are breastfeeding. When asked about the type of infant formula to be recommended to patients, all answered that the age of the child and the price of the formula should be taken into consideration. Some answered that the milk should be one which was "humanized", not full cream. Others did not distinguish between formula and full-cream milks and simply specified brand names such as SGM, S-26, and Enfamil (formulas), and Klim, Dan-Cow, and Frisian Flag (full cream milks) as acceptable. They did not specify a general age at which certain milks should be introduced.

The pediatricians' product knowledge derives both from visits of company detailmen, which occur once or twice a month, and from the materials (booklets, brochures, posters, pamphlets) these representatives leave. All of the physicians said they knew infant formula was widely available in the community, and more than half of those interviewed said that detailmen had left infant formula samples in special small packages for them. These samples are, in turn, given to mothers.

Interviews were conducted by Dr. Sahid with forty midwives who practice in the Semarang area, and the following summary is derived from his report. Forty of the 200 practicing government trained midwives (Bidans) in the Semarang area were interviewed. Thirty-nine received formal training as midwives; one was a specialist in teaching who has returned from the public health service. Most received their formal training in Semarang where there is a three year program based at hospitals. The sample of 40 was a focused sample drawn by the interviewer who went to the places where the midwives worked and looked for places where things are done "particularly well," such as Dr. Kariadi Hospital.

The midwives' experience ranges from three years to more than 32 years, the average being 15.7 years. They range in age from 26 to 60 years. Midwives can work in more than one workplace, including public hospitals, "puskesmas" (health centers), birth clinics or private hospitals, the army hospital, or the police hospital. In addition, some said they did freelance or private practice work. Of the 40 interviewed, 24 directly helped mothers during the labor and delivery process, 11 are involved in administration, 4 do family planning work, and one person is a teacher doing training. All of the midwives are members of the IBI (Iratan Bidan Indonesia), the leading

professional organization for midwives. They also indicated that their professional development is shaped by the journals on family planning, nutrition and health, and there is an association called PTNI for improving nutrition in Indonesia.

The midwives said most mothers have contact with health facilities in the Semarang area, and mothers usually ask for advice about infant feeding. The midwives said that 70-100% of the mothers follow their advice to breastfeed. They attribute this almost universal practice to custom, the mother's knowledge that breastfeeding is healthier, psychological contact, cost saving, and "mother's wisdom."

Of these midwives, 45% said they had direct contact with companies, 17% had no direct contact, and the rest gave no answer. This contact occurs in the hospitals where the administrators approve. Only rarely (13%) are midwives contacted at home. The contact is usually once per month, although some reported only one contact in three months. There is a long list of items that the midwives received from the company representatives including calendars, posters, charts, pamphlets, and pictures. The most popular item is the calendar. The midwives report that formula samples are frequently given to the clinics and are placed in the storage room there. The head of the department then decides which mothers should get formula. The most popular selling brands are well represented in the recall of the midwives: SGM, Lactona, and the Nestle products. According to 90% of the midwives, receiving a sample has a positive effect on the likelihood of the mother's use of that product.

According to the midwives, the size of the sample package, determines the quantity of samples received. For example, representatives of Sari Husada give 6 - 200 gram containers of Vitalac, 10 - 200 gram containers of SGM, and 50 - 50 gram containers of SGM as free samples.

Commercial Influences and Consumer Behavior

A marketing analysis of infant feeding patterns should focus on factors that affect the supply and demand for commercial infant foods, here, specifically, formula and non-formula milks. Factors that affect the supply have already been discussed, i.e., the availability of formula and non-formula milks in retail outlets, the number and diversity of products, and the relationship between producers and the State. Factors relevant to the demand for commercial infant foods include those experiences and circumstances that have direct bearing on the mother and her child, i.e., the receipt of a promotional sample of infant formula, problems with breastfeeding, and in some cultures, labor force participation. Less direct influences are those that result from previous experience, or encounters, such as recommendations about infant feeding from relatives,

neighbors, or health care workers. As regards the latter, Semarang presents a unique situation because of the availability of both traditional and modern health services. Forty-seven percent of the sample delivered their babies in their own homes, and 57 percent of all home births were attended by traditional birth attendants (Dukuns). The remaining home births were attended by government trained midwives (Bidans). Bidans attended the majority of births in other settings, including the Bidan's home (a small home business different from a maternity home), private maternity homes, community health centers, and general hospitals. Physician-attended births account for only 14 percent of the sample, and the majority of these were in private maternity homes. On appearance, then, the combination of birth setting and birth attendant represents a continuum of available health services from traditional to modern.

In this discussion, the focus is on the following consumer variables: receipt of an infant formula sample, recall of mass market advertising, brand awareness, and attitudes towards commercial infant foods.

Samples

Overall, the provision of samples of infant formula to new mothers does not appear to be particularly widespread in Semarang. Among those surveyed, only five percent reported receiving a free sample of infant formula. Even though overall sample distribution does not appear to be extensive, there were some differences in the likelihood of receiving a sample. Women who reported monthly family income above 61,000 rupiah (approximately U.S. $98.00) were significantly ($p<.03$) more likely to report receiving a free sample than women who reported monthly family income below that figure (Table 7-3). Approximately eight percent of the women in this income group reported receiving a free sample, and this group accounts for nearly one-half (48%) of all women who reported receiving samples.

In terms of other respondent characteristics, years of schooling, age, parity, and labor force participation were not significantly associated with the report of receiving a free sample of infant formula. What does appear to be noteworthy, in addition to family income, is the evidence of some sample distribution regardless of the mother's birth attendant or place of delivery. While there is an expectation that free sample distribution will be associated with modern health facilities, in this case women who had their babies outside that setting, either in their own home, or in a Bidan's home, also reported receiving a free sample of infant formula. Compared to other settings, the community health center appears to distribute samples to a greater proportion of its clients (14%). While only a small percentage of those women who were attended by a Dukun report

receiving a free sample (3.2%), it is still interesting that these traditional birth attendants, operating entirely outside the modern maternity setting, are distributing free samples of infant formula. Further, women who reported delivery in their own home, attended by Bidans, also reported receiving free samples, as did those who had their babies in the Bidan's home. In short, regardless of the birth attendant, or the place of delivery, some percentage of women report the receipt of a free sample of infant formula.

Although the number of women who report receipt of a free sample is small, we examined the effect of receiving a free sample on some infant feeding outcomes (Table 7.4). Women who received a free sample were less likely, but not significantly less likely, to be breastfeeding at 3, 6, 9, and 12 months than women who did not receive a sample. There are clear differences in bottle introduction by the first and second month, and by the third and fourth month these differences achieve statistical significance. The proportion bottle-feeding by the end of the third and fourth months is twice as great among those that received a sample than among those who did not receive a sample.

To examine the independent effects of receiving a free sample on infant feeding outcomes, a stepwise logistic regression model was fit for bottle introduction at the end of the first, second, third, and fourth month. Receipt of a sample was not significantly associated with infant feeding outcomes. After controlling for income, schooling, labor force participation, and health services variables, the effect of receiving a sample disappears. In this model, delivery in a private maternity home and a physician attendant are both significantly associated with early bottle introduction (see Health Services Chapter, below). The bivariate association between receiving a sample and infant feeding outcomes is best explained by the association between receiving a free sample and both the birth setting and maternal characteristics.

The effects of free sample distribution have been of concern to research and policy in recent years. In the case of Semarang, the distribution of free samples is not widespread, but does occur more often in modern health settings. Our analysis suggests that the receipt of a free sample does not have an independent effect on early bottle-feeding. As discussed earlier, however, midwives distribute samples with the full knowledge that one effect is a high probability that the brand eventually used will be the brand received as a sample.

Advertising Recall

More than one-half of the women surveyed report recollections of infant formula advertising. Since mass media advertising of commercial infant foods has been suspended,

beginning with earlier voluntary withdrawals and later reinforced by the WHO Code, the patterns of recall in Semarang are in the expected directions. Women from higher income families are significantly more likely to report recall of advertising than women with less income (Table 7-5). In fact, for both income and years of schooling, the association is clearly linear.

Women 19 years of age or younger and women 35 years of age or older, are less likely to recall advertising than women between 20 and 34. The differences we observe when women are grouped by birth attendant are primarily a reflection of income. (Sixty-three percent of women attended by physicians had monthly family income greater than 61,000 rupiah).

Brand Awareness

Respondents were read a list of local products and, after each one, asked if they were familiar with that particular brand. Brand awareness is measured by the number of brands acknowledged by the respondent. This is also reported as a proportion of all brands. The pattern of brand awareness is similar to that observed for recall of advertising (Table 7-5). There is a significant linear relationship between the mean number of brands recalled and both monthly family income and years of schooling. Age shows a pattern similar to that observed with advertising recall, although the oldest women here have more in common with the 20-24 age group than with those under 20 years of age. Generally, awareness is lower for the youngest age group, increases steadily, and then falls off for older women. There is no difference by parity, and the differences noted by birth attendant are, for the most part, explained by differences in income.

In contrast to the differences between groups of respondents is the overall low proportion of available milk products recognized by women in this sample. Since this portion of the interview involved simply brand recognition (as opposed to requesting mothers to recall brand names without prompting), it is interesting that the highest proportion recognized was only 40 percent of the 19 products listed. Several products are not widely available in Semarang, however, so the overall awareness of readily available products can be reasonably thought of as somewhat higher.

Consumer Attitudes

The Semarang survey contained only a few items with which to gauge consumer attitudes towards commercial infant foods. Respondents overwhelmingly agree that breastmilk is better than bottle milk (97%). There are two additional items that, on the basis of the respondent's agreement or disagreement, can serve as a measure of orientation to bottle feeding. Respondents were

asked if they agreed with the statement, "Bottle-feeding is an upper-class symbol." Twenty-seven percent of the sample agreed (Table 7-7). There is a significant inverse relationship between both years of schooling and family income, and agreement with that statement ($p<.001$). Women currently working also were significantly less likely to agree, although the magnitude of the difference is not particularly great (29% vs. 21%).

A more straightforward indication of orientation, however, can probably be derived from a woman's agreement or disagreement with the statement that "Bottle-feeding is not such a mess." Approximately 88% of those surveyed disagree, suggesting that the majority of women in Semarang do think of bottle-feeding as rather messy (Table 7-8). It is also interesting that the only respondent characteristic that reveals any significant variation is labor force participation. Working women are significantly more likely than non-working women to agree that bottle-feeding is not such a mess (21% vs. 9%). One factor that might have some bearing on this attitude is experience: among those currently working and bottle-feeding, 21 percent agree that bottle-feeding is not too messy compared to 16 percent of working women not currently bottle-feeding.

Present labor force participation is significantly positively associated with bottle-feeding before four months of age. Yet, even among this group, the proportion expressing a favorable attitude on any given item is never more than 25 percent. All together, it is clear that women in Semarang are not predominately oriented towards bottle-feeding. Further evidence for this conclusion comes from responses to a question about the feeding advice the respondent would give her daughter or neighbor about infant feeding. Only 8.5% percent said they would recommend supplementary bottle-feeding, and, then, "only if necessary."

Summary

It would appear that the single most impressive factor influencing overall consumer orientation in Semarang is the degree to which traditional values and rituals are predominant. Semarang remains largely a society with a population that is still oriented toward traditional infant feeding practices.

Marketing of infant formula and related milk products involves a three-pronged strategy: price competition among brands; widespread product availability in retail outlets; use by hospitals, clinics and health care workers to create a positive, modern image of breastmilk substitutes.

The people of Semarang seem to be very sensitive to price fluctuations, with disposable income determining which product a mother will purchase at any given time. Because there seems to

be a weak understanding of distinct product groups within the broad "infant foods" category, reduced income may lead a mother to search for the lowest priced item. This can lead to the use of a humanized formula one week, a full cream milk the next, and a formulated milk the third.

The majority of the women interviewed do not reveal any predisposition to bottle-feed, nor do they have positive attitudes toward bottle-feeding. Recall of advertising and awareness of available products is associated with socioeconomic variables, as would be expected, but the overall interest in commercial infant foods is not particularly high. On the other hand, there is a variety of different formula milks available, and promotional samples of formula are being distributed to mothers in every birth setting and by both traditional and modern birth attendants. Thus, producers and distributors of commercial infant foods have not overlooked any potential point of contact in either the retail or health care settings.

The health care system is the most apparent point of intervention for curbing the aggressive marketing of breastmilk substitutes. There is also an opportunity for the Ministry of Health to utilize shops as a means to convey public health information for there is a well established relationship between customers and shopkeepers. The marketing climate in Semarang is still amenable to such countervailing measures.

Table 7-1 Brand Availability, Semarang 1982: Number of Stores Carrying Each Brand

Brand	Department Stores (n=4)	Retail Stores/Shops (n=22)	Drug Stores (n=4)
SGM	4	22	4*
S-26	4	11	2*
Enfamil	4	6	2*
Nutricia	--	--	2*
Morinaga	--	12	1
Klim	--	7	4*
Dan Cow	4	22	1*
Frisian Flag	4	22	1*
Prosobee	--	2	1*
Lactogen	--	13	--
Vitalac	--	5	--
Almarin	--	1	--
LLM	--	14	--
Sustagen	--	2	--
Lactona	--	9	

*Includes the government-owned pharmacy which sells to other 20 drugstores in Semarang.

Table 7-2 Consumer's Product Experience in Indonesia Semarang, 1982

Brand	Ever Used* (Percentage Responding "Yes")	Current Use
SGM	34%	7%
Lactona	14	4
Klim	7	4
Dan Cow	14	6
Lactogen	11	4
Campelo 2	2	0
Morinaga	2	0
S-26	5	1
Enfamil	1	1
Frisian Flag	21	10
Indomilk**	24	8
Susu Bendera**	22	9

*Respondents may have used these products with children prior to the index child.

**(Note: Indomilk and Susu Bendera are sweetened condensed milks.)

Table 7-3 Select Respondent Characteristics by Receipt of Infant Formula sample (n=1358)

	%		%
Total	5.2		
Income (x1000)		Education	
0-29	5.4	0-4	4.0
30-41	2.9	5-7	4.8
42-60	4.4	8-10	6.5
61-109	8.1	11-12	7.7
110 +	7.8	13 +	9.1
Age		Currently Working	
<-19	5.7	No	4.8
20-24	4.3	Yes	6.8
25-27	5.0		
30-34	8.7		
35 +	6.3		
Place of Delivery		Birth Attendant	
Mother's Home	4.2	Dukon	3.2
Bidan's Home	8.0	Bidan	7.0
Private Maternity Home	5.2	MD	3.3
Community Health Ctr.	14.0		
General Hospital	4.7		
Parity			
Primiparous	3.4		
Multiparous	5.8		

Table 7-4 Infant Feeding characteristics by Receipt of Infant Formula Sample (n's in parentheses)

Infant Feeding Characteristic	Did not Receive Sample	Received Sample
Breastfeeding at:		
3 months (1119)	92.0	85.0
6 months (962)	86.0	81.0
9 months (781)	80.0	76.0
12 Months (652)	76.0	73.0
Bottle-feeding at:		
1 month (1113)	13.0	18.0
2 months (1055)	18.0	35.0
3 months (1000)	19.0	36.0
4 months (944)	23.0	42.0

Table 7-5 Select Respondent Characteristics and Recall of Advertising of Commercial Infant Foods (n=1358)

	%	Significance
Total	56.5	
Income (x1000)*		
0-29	38.5	p< .002
30-41	49.6	
42-60	56.8	
61-109	70.4	
110 +	83.8	
Education		
0-4	31.0	p< .01
5-7	60.1	
8-10	76.8	
11-12	77.6	
13 +	80.0	
Age		
<-19	50.0	p< .01
20-24	61.3	
25-27	63.0	
30-34	62.2	
35 +	50.3	
Parity		
primiparous	57.6	ns
Multiparous	56.5	
Birth Attendant		
Dukun	36.2	p< .001
Bidan	61.1	
MD	80.1	

*in Rupiah/month (U.S. $1 = 625 Rp)

Table 7-6 Awareness of Commercial Infant Formula Brands (n=1358)

	x Brands Recalled	Proportion of all Brands	Sig.
Total	4.33	22.82	
Income (x1000)*			
0-29	2.68	14.15	p< .001
30-41	3.45	18.23	
42-60	4.72	24.85	
61-109	5.51	29.01	
110 +	6.67	35.12	
Education			
0-4	2.43	12.81	p< .001
5-7	3.98	21.01	
8-10	5.90	31.09	
11-12	6.80	35.83	
13 +	7.71	40.55	
Age			
<-19	3.22	16.93	p< .001
20-24	4.32	22.79	
25-27	5.19	27.36	
30-34	5.41	28.49	
35 +	4.41	23.24	
Parity			
primiparous	4.33	22.81	ns
Multiparous	4.34	22.89	
Birth Attendant			
Dukun	2.53	13.35	p< .001
Bidan	4.72	24.91	
MD	6.59	34.67	
Receive Sample			
No	4.28	22.56	p< .02
Yes	5.32	28.04	

*in Rupiah/month (U.S. $1 = 625 Rp)

Table 7-7 Select Respondent Characteristics and Response to "Bottle-feeding is an upper class symbol" (n=1358)*

	% Agree	% Disagree
Total	27	73
Income (x1000)**		
0-29	36.5	63.5
30-41	36.2	63.8
42-60	27.4	72.6
61-109	14.5	85.5
110 +	14.8	85.2
Education		
0-4	41.2	58.8
5-7	25.9	74.1
8-10	19.1	80.9
11-12	13.7	86.3
13 +	12.7	87.3
Age		
<-19	28.4	71.6
20-24	22.5	77.5
25-27	24.0	76.0
30-34	27.7	72.3
35 +	26.2	73.8
Currently Working		
No	28.7	71.3
Yes	21.3	78.7

*Those with either no opinion, or no response (approx. 10%) were excluded from this analysis

**in Rupiah/month (U.S. $1 = 625 Rp)

Table 7-8 Select Respondent Characteristics and Response to the statement "Bottle-feeding is not such a mess" (n=1358)*

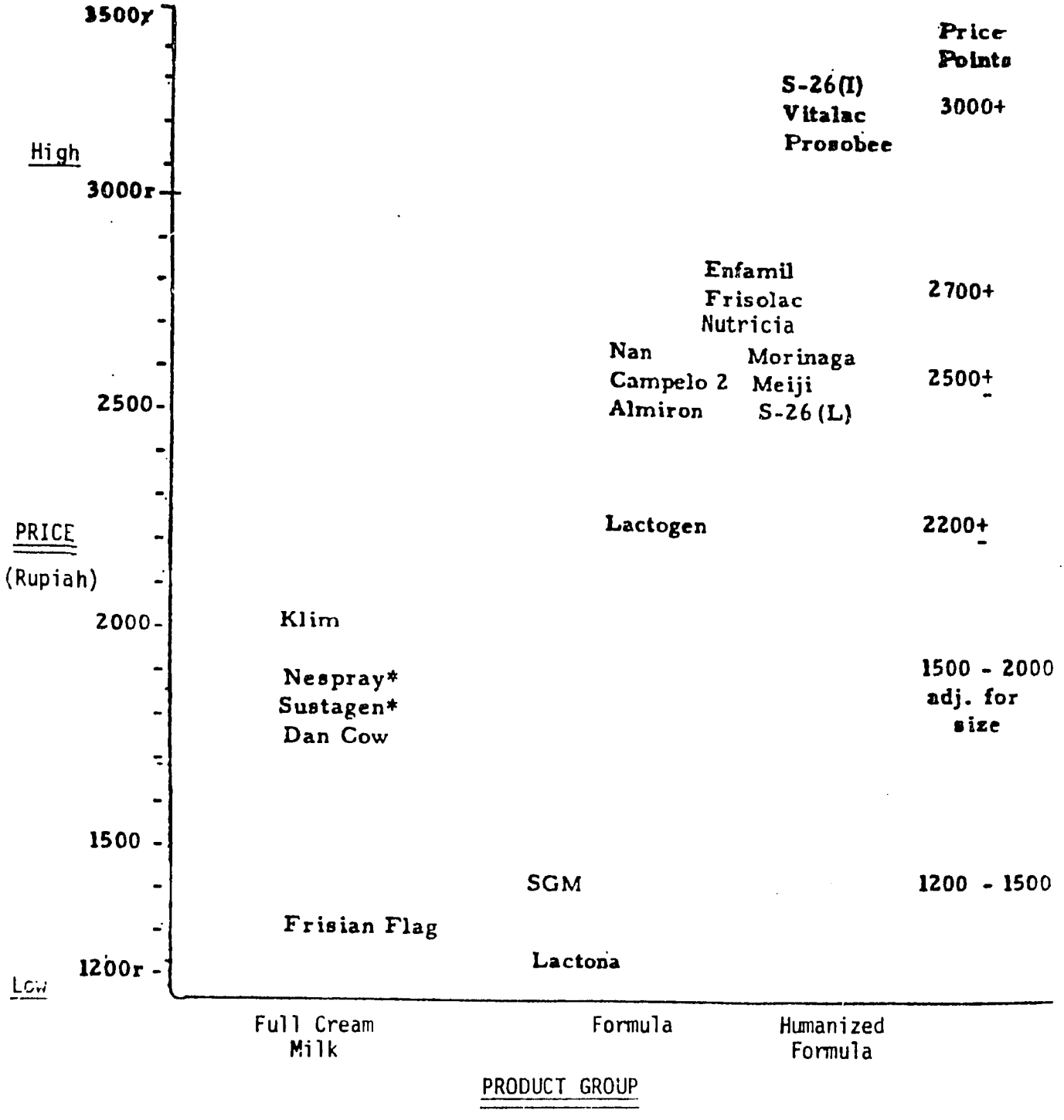
	% Agree	% Disagree
Total	12.3	87.7
Income (x1000)**		
0-29	10.2	89.9
30-41	9.5	90.5
42-60	12.1	87.9
61-109	15.8	84.2
110 +	16.2	83.8
Education		
0-4	12.4	87.6
5-7	11.8	88.2
8-10	9.8	90.2
11-12	14.6	85.4
13 +	16.4	83.6
Age		
<-19	7.3	92.7
20-24	13.9	86.1
25-27	14.8	85.2
30-34	10.4	89.6
35 +	12.9	87.1
Currently Working		
No	9.3	90.7
Yes	20.9	79.1

*Those with either no opinion, or no response (approx. 7%) were excluded from this analysis

**in Rupiah/month (U.S. $1 = 625 Rp)

Figure 7-1

Product Clusters in the Indonesian Infant Foods Market (Semarang, 1982)



*Nespray and Sustagen have been adjusted to common size with Klim and DanCow. Actual price for 1k can of Nespray was 3950r and Sustagen at 3650r.

(Rp 640 = $1 (US))

VIII DETERMINANTS OF INFANT FEEDING PRACTICES: MATERNAL EMPLOYMENT

A fundamental task of this research is to identify the factors which shape specific infant feeding choices. The following section evaluates employment status of Semarang women as a possible determinant of infant feeding practices, emphasizing work in or outside the home, number of hours worked per day, and location of child while mother is at work.

Some women may fail to report income generating work in Semarang in deference to their husbands' public image. That is, they do not want to contribute to the idea that their husbands are not fully capable of supporting the family. In addition, many women work as sharecroppers, and although they are not paid in cash, they do take home a share of the crop as "income" earned. According to census enumeration,[1] one-fourth of the Indonesian labor force are unpaid family workers consisting mostly of women and children. Thus, underreporting in all categories should be considered as likely and must be kept in mind when evaluating the influence of employment status on infant feeding practices in Semarang. At the time of the interview, 75% (1,019) of the respondents were exclusively housewives. Twenty-five percent (339) of the sample reported employment in income-generating activities (Table 8-1). Seventy-one percent of these women (18% of the total sample) were employed outside of the home. Twenty-nine percent (6% of the total) worked at home to earn income (Table 8-2). The occupational distribution of employed women is presented in Chapter II, as follows: 47% merchants or businesswomen, 27% laborers or peasant workers, 15% government employees, 14% office workers and 1% farmers or fishermen.

Tables 8-3 and 8-4 present information on the number of hours the women work per day. Most women work between 4 and 9 hours per day. Forty percent of women who work at home, however, work for more than ten hours a day as compared with 14% of women with outside employment.

Table 8-5 presents data regarding employment history. Of the women who were employed before the child was born, 87% stopped working at the birth as compared with 12% who continued to work. Tables 8-6 and 8-7 provide information on percentages of employed and non-working women using bottles according to their child's age. Table 8-7 shows that 64% of the working women with children aged 0-6 months have introduced bottle-feeding

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[1] Demographic Profile of the Indonesian Population by N. Iskandar, Institute of Demography, University of Indonesia, Jakarta, 1976, p. 23.

compared with 22% of unemployed women using bottle milks. Sixty percent of employed women with children over 7 months of age use bottle milk compared with 38% of non-working women with similar-aged children (Table 8-7). It should be remembered, when making such comparisons, however, that in any group, the children of working mothers tend to be slightly older than those of the non-working women.

An important question regarding the relationship between optimal infant feeding practices and maternal employment is the location of the child when the mother is at work. Tables 8-8 to 8-10, present information about childcare. Although 75% of the women never take their children to work with them, one-quarter of working mothers do. Of the children who accompany their mothers to work, almost 80% of them are cared for by their mothers, i.e., the child plays near the mother while she is working. It is assumed that having a child near his or her mother at work would increase the likelihood of breastfeeding as would a day nursery located on the job site. Five percent of the women have the latter arrangement.

Three-fourths of the sample leave their children at home or make other arrangements for childcare. Table 8-10 identifies other "adult, female relatives" as the predominant persons responsible for childcare when the mother is away. The information indicates, that most children are being cared for by relatives--and presumably remain in their own homes. The distinctive feature about childcare practices of working Semarang mothers is that most working women are separated from their children during working hours.

It is obvious that if a working mother must leave a young infant with other caretakers for long periods of time, the use of substitute milk becomes almost a necessity. This is especially so if a child is younger than six months of age where the major portion of a child's intake should not be solid food. Introduction of the bottle, however, does not automatically signal cessation of breastfeeding in this sample, as the following ethnographic case indicates:

> Mrs. K. is a 31-year old, middle class Chinese woman from the Kranggan Dalam District, who worked outside of her home, selling cooked dishes or cakes to small restaurants or shops nearby. When she was shopping for ingredients or selling her wares, Mrs. K. left her first child with her unemployed husband who fed him S26 formula. Even though she did not continue to work after the birth of her second (index) child, Mrs. K. followed a similar feeding regime. Although her baby was breastfed soon after birth, she was also given S26. Throughout the first year of the baby's life she was introduced to a variety of foods. Concurrently,

Mrs. K. continued to breastfeed and supplement the child's diet with S26. At 18 months, Mrs. K. substituted "Shinta" canned milk for S.26 because it could be purchased at a low price from the Army's distribution center.

Mrs. K.'s experience with formula milk as a working mother was precedent-setting for her. The initial introduction of the milk was a necessity for her first child, while the subsequent use, in a different set of circumstances, demonstrates habituation to the product. This case illustrates the permeation of a new pattern which has supplanted a traditional practice.

The earlier description contrasts the feeding practices of women who reported working at the time of the interview and those who reported no work. Table 8-11 also shows the differences in patterns of women who work at home and those who have jobs outside of the home. Breastfeeding initiation is high whether or not the mother is working. Among working women, those employed outside of the home have a lower rate of breastfeeding initiation (93%) than those working at home (98%).

There are substantial differences between employed women and those who are exclusively housewives in regard to various breast-feeding durations. For example, 93.4% of unemployed mothers as compared with 86% of working mothers breastfeed up to 3 months of age. Little difference is discerned among women working at home or outside for breastfeeding up to 3 months of age. For women working at home, breastfeeding lasts more often to 6, 9 and 12 months than for those working away from the home. In fact, at longer durations, woman who work at home appear to behave more like non-working women than like women who work away from the home. At 18 months, there is a difference of fifteen percent between women working outside and inside the home. It is possible that women who choose to breastfeed their children for one and a half years do so for reasons unrelated to convenience, location of the child, or work status. Perhaps this is an expression of religious or cultural values, not yet affected by "modern" expectations.

Many more working women introduce a bottle between 1 and 4 months of age than do non-working women, (10.3% of non-working women and 24.3% of working women by the end of one month.) Except for the first month of life, there are fairly large differences in early bottle use for women working at home and those with jobs elsewhere: women working at home are much less likely to use a bottle. By 4 months of age 27% of women working at home have introduced a bottle compared to 58% of those working away from home. Women who do not work use the bottle still less-rising from 10% at one month only to 15% by 4 months. It appears that working outside the home exerts a powerful influence on

Semarang women to utilize breastmilk substitutes in feeding their children.

There is a generally clear decline in breastfeeding at all periods (3 through 18 months) according to number of hours worked per day (Table 8-12). In general, women working more than 10 hours a day are less likely to maintain breastfeeding. The relationship is not clear for early introduction of bottles.

To summarize, most employed women in Semarang hold jobs away from home. From the above data, it appears that employment away from the home may interfere with breastfeeding beyond 3 months and strongly encourages women to introduce bottle-feeding early in the infant's life. On the other hand, all employment, regardless of location, appears to contribute to the early introduction of bottle-feeding. The experiences of the variously employed women are graphically depicted in lifetables, Figures 8-1 and 8-2. The data presented in these lifetables are consistent with the results of the cross-sectional analysis. Figure 8-1 indicates that working women have lower percentages of breastfeeding at all durations than unemployed mothers, but the differential is not nearly as much as in two of the other sites of this study (Bangkok and Bogota). The median duration of breastfeeding for working women is 19 months compared with 23 months for non working women. Figure 8-2 compares women working at home and those working away from home. Women who work in their own home breastfeed on the average three months longer than those working outside and clearly at higher percentages at all durations.

The relationship between certain employment characteristics and infant feeding outcomes was further tested by logistic regression. The logistic regression models utilize the same set of socioeconomic predictor variables discussed in the previous section of this report plus a variable (WORKOUT), representing work outside the home. The results of the new analysis are presented in Tables 8-13 and 8-14. The predictor variable WORKOUT is, statistically, significantly associated with lower probability of breastfeeding to 6 months, but for longer durations the significance of the association disappears. Income is highly significantly correlated with this duration for all intervals measured and is the clearest, most significant association in all the models. Table 8-13 also shows that the variables which significantly influence the introduction of a bottle by 4 months are: lower parity, higher education, higher income and, most especially, maternal employment outside the home. The relatively high correlation coefficient for this model also underscores the power of maternal employment as a predictor of bottle use. The adjusted risk odds ratios in Table 8-14 suggest that a woman employed outside the home is over ten times as likely to introduce a bottle to her child's diet by 4 months of age as other women.

Table 8-1 Mothers' Current Work Status

	Total N	%
Not Working	995	75
Working Now	339	25
Total	1334	100%

Table 8-2 Place of Mother's Work

	TOTAL N	%
Works outside home	239	71
Works at home to earn income	96	29
Total	335	100%

Table 8-3 Hours Worked Per Day

Hours	Total N	%
2-3	34	12
4-5	59	21
6-7	66	23
8-9	72	26
10-12	38	14
13+	12	4
Total	281	100%

Table 8-4 Hours of Work by Working at Home or Outside Employment

Work Hours	Home Work Total		Work Outside Total	
N		%	N	%
2-3	10	21.7	24	10.3
4-5	4	8.7	55	23.5
6-7	10	21.7	56	23.9
8-9	4	8.7	67	28.6
10-12	13	28.3	25	10.7
13+	5	10.9	7	3.0
Total	46	100.0	234	100%

Table 8-5 Did Mother Stop Work After Having Given Birth to This Child

	Total	
	N	%
Yes	298	88
No	41	12
Total	339	100%

Table 8-6 Percentages of Women Employed and Not Working by Age of Child and Current Use of Bottle

Children 6 Months and Younger

	Employed Mothers		Non-Working Mothers	
Bottle Use:	Yes	No	Yes	No
Age 0-6 Months	97 (64.0)	35 (36.0)	59 (22.4)	204 (77.6)

Table 8-7 Percentages of Women Employed and Not Working by Age of Child and Current Use of Bottle

Children 7 Months and Older

	Employed Mothers		Non-Working Mothers	
Bottle Use:	Yes	No	Yes	No
Age 7-24 Months	148 (59.2)	102 (40.8)	281 (37.6)	467 (62.4)

Table 8-8 Do You Take Your Child to Work With You

	Total N	%
Always	55	20
Never	208	75
Sometimes	15	5
Total	278	100%

Table 8-9 Who Cares for Your Child at Work?

	Total N	%
Day care	4	5
Mother	64	79
Other	13	16
Total	81	100%

Table 8-10 Childcare for Working Women

	N	%
Mother herself or Older Woman in household	49	88%
Other Sibling	4	7.0%
Husband	3	5.0%

Table 8 -11 Maternal Employment Variables and Infant Feeding Patterns

	EVER BREAST-FED	BREAST-FED 3 MONTHS	BREAST-FED 6 MONTHS	BREAST-FED 9 MONTHS	BREAST-FED 12 MONTHS	BREAST-FED 18 MONTHS	BOTTLE BY 1 MONTH	BOTTLE BY 2 MONTHS	BOTTLE BY 3 MONTHS	BOTTLE BY 4 MONTHS
Not working	939 96.9	782 93.4	638 88.5	473 81.7	368 77.5	169 59.3	86 10.3	93 11.9	93 12.5	106 15.0
Any current paid work	313 94.6	240 86.0	184 77.3	145 73.2	122 70.1	62 59.0	68 24.3	101 37.4	110 43.3	117 49.6
Paid work outside home only	215 93.1	165 85.1	121 74.7	94 69.1	80 66.7	40 54.8	49 25.0	77 40.7	87 48.6	98 58.3
Paid work in home only	93 97.9	70 87.5	57 81.4	46 80.7	37 75.5	20 69.0	17 21.5	22 28.9	21 30.0	17 27.4

Table 8-12 Work Hours According to Breast and Bottle Feeding Experience

WORK HOURS	EVER BREAST-FED	BREAST-FED 3 MONTHS	BREAST-FED 6 MONTHS	BREAST-FED 9 MONTHS	BREAST-FED 12 MONTHS	BREAST-FED 18 MONTHS	BOTTLE BY 1 MONTH	BOTTLE BY 2 MONTHS	BOTTLE BY 3 MONTHS	BOTTLE BY 4 MONTHS
2-3	29 93.5	25 96.2	20 87.0	16 80.0	15 78.9	3 37.5	3 10.3	3 11.1	4 14.8	4 14.8
4-5	56 98.2	44 88.0	35 79.5	21 70.0	18 66.7	6 60.0	15 28.8	22 44.0	27 56.2	27 58.7
6-7	60 92.3	50 90.9	36 80.0	30 76.9	26 78.8	15 75.0	11 20.8	20 39.2	21 43.7	26 61.9
8-9	66 91.7	50 83.3	34 70.8	28 66.7	22 61.1	11 44.0	16 27.1	26 44.8	28 50.9	33 66.0
10-12	36 97.3	22 71.0	17 65.4	15 62.5	13 59.1	10 50.0	7 23.3	10 37.0	10 38.5	9 36.0
13+	11 91.7	7 70.0	5 62.5	3 50.0	2 50.0	- -	3 33.3	5 55.6	5 62.5	4 66.7

Table 8-13 Logistic Regression Models for Different Infant Feeding Outcomes
Beta Coefficients and P Values for Socio-economic and Workout Predictors

Predictors		Models: Breastfed 6 Months	Breastfed 9 Months	Breastfed 12 Months	Breastfed 18 Months	Bottle by 4 Months
Intercept						
	Beta	3.6852	2.7357	1.7759	0.3731	-3.398
	X^2	68.22	41.41	18.61	0.62	65.99
	P Value	*(0.000)	(0.000)	*(0.000)	(0.431)	*(0.000)
Parity						
	Beta	0.263	0.273	0.148	0.045	-0.374
	X^2	3.41	3.73	1.09	0.07	6.87
	P Value	(0.649)	*(0.053)	(0.295)	(0.787)	*(0.008)
Age of Mother						
	Beta	-0.177	-0.000	0.126	0.331	0.090
	X^2	2.05	0.00	1.03	4.85	0.55
	P Value	(0.152)	(0.999)	(0.310)	*(0.027)	(0.459)
Mother's Education						
	Beta	-0.009	-0.076	-0.095	0.012	0.291
	X^2	0.01	0.59	0.93	0.01	8.73
	P Value	(0.927)	(0.443)	(0.335)	(0.920)	*(0.003)
Birthplace						
	Beta	-0.222	-0.221	-0.150	-0.621	0.211
	X^2	0.90	0.93	0.44	5.68	0.90
	P Valu e	(0.343)	(0.334)	(0.508)	*(0.017)	(0.343)
Income						
	Beta	-0.488	-0.517	-0.380	-0.394	0.462
	X^2	20.05	22.94	12.67	10.93	21.66
	P Value	*(0.000)	*(0.000)	*(0.000)	*(0.000)	*(0.000)
Workout						
	Beta	-0.692	-0.448	-0.307	-0.079	2.358
	X^2	7.63	3.15	1.39	0.06	92.46
	P Value	*(0.005)	(0.076)	(0.238)	(0.805)	*
Model						
	X^2	3.77	64.87	35.98	29.88	221.91
	P Value	*(0.000)	*(0.000)	*(0.000)	*(0.000)	*(0.000)
Correlation Coefficient "R "		0.277	0.287	0.206	0.218	0.499

*Statistically Significant

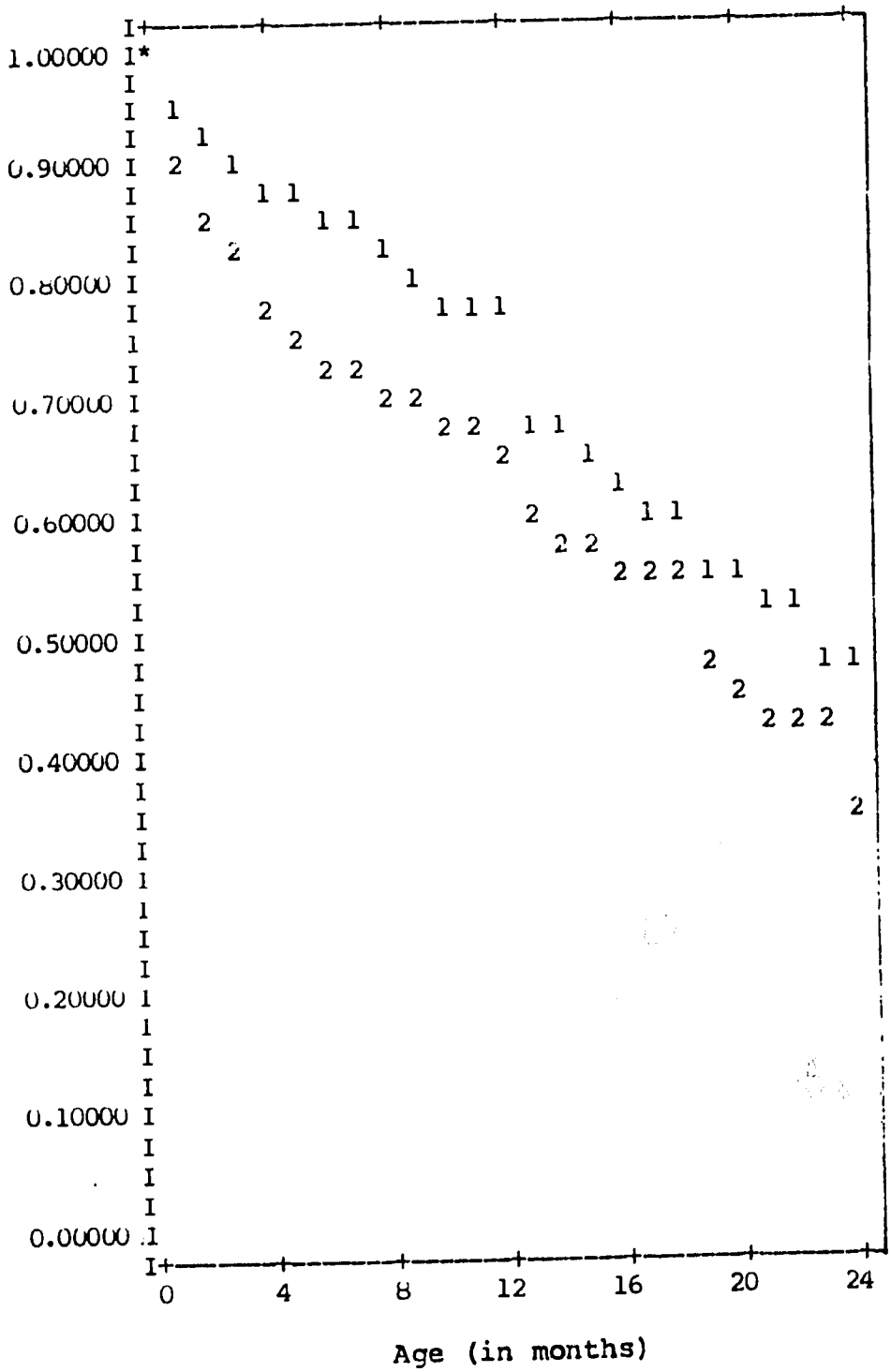
Table 8-14 Logistic Regression Models for Different Infant Feeding Outcomes

Adjusted Risk Odds Ratios and 95% Confidence Intervals for Socioeconomic and Maternal Employment Variables with Significant P Values

	BF6MO	BF9MO	BF12MO	BF18MO	Bottle by 4 Mo
Parity					
2-3 vs 1	NS	1.313 (0.996, 1.732)	NS	NS	0.688 (0.520, 0.910)
8-9 vs 2-3	NS	2.265 (1.718, 2.987)			0.325 (0.246, 0.430)
Age of Mother					
20-24 vs 18-19	NS	NS	NS	1.392 (1.037, 1.868)	NS
35-39 vs 20-24	NS	NS	NS	2.698 (2.010, 3.621)	NS
Mother's Education					
5-7 vs none	NS	NS	NS	NS	1.338 (1.103, 1.623)
11-12 vs 5-7	NS	NS	NS	NS	1.338 (1.103, 1.623)
Family Income					
30-41000 RP vs LO-29000	0.614 (0.496, 0.760)	0.596 (0.482, 0.737)	0.684 (0.614, 0.761)	0.674 (0.534, 0.852)	1.587 (1.307, 1.929)
61-109 vs 30-42	0.377 (0.304, 0.466)	0.355 (0.288, 0.439)	0.467 (0.420, 0.520)	0.454 (0.360, 0.574)	2.521 (2.075, 3.063)
Workout	0.500 (0.306, 0.818)	NS	NS	NS	10.579 (6.541, 17.109)
Mother's Birthplace	NS	NS	NS	0.538 (0.323, 0.896)	NS

Figure 8-1

Duration of Breastfeeding by Current Work



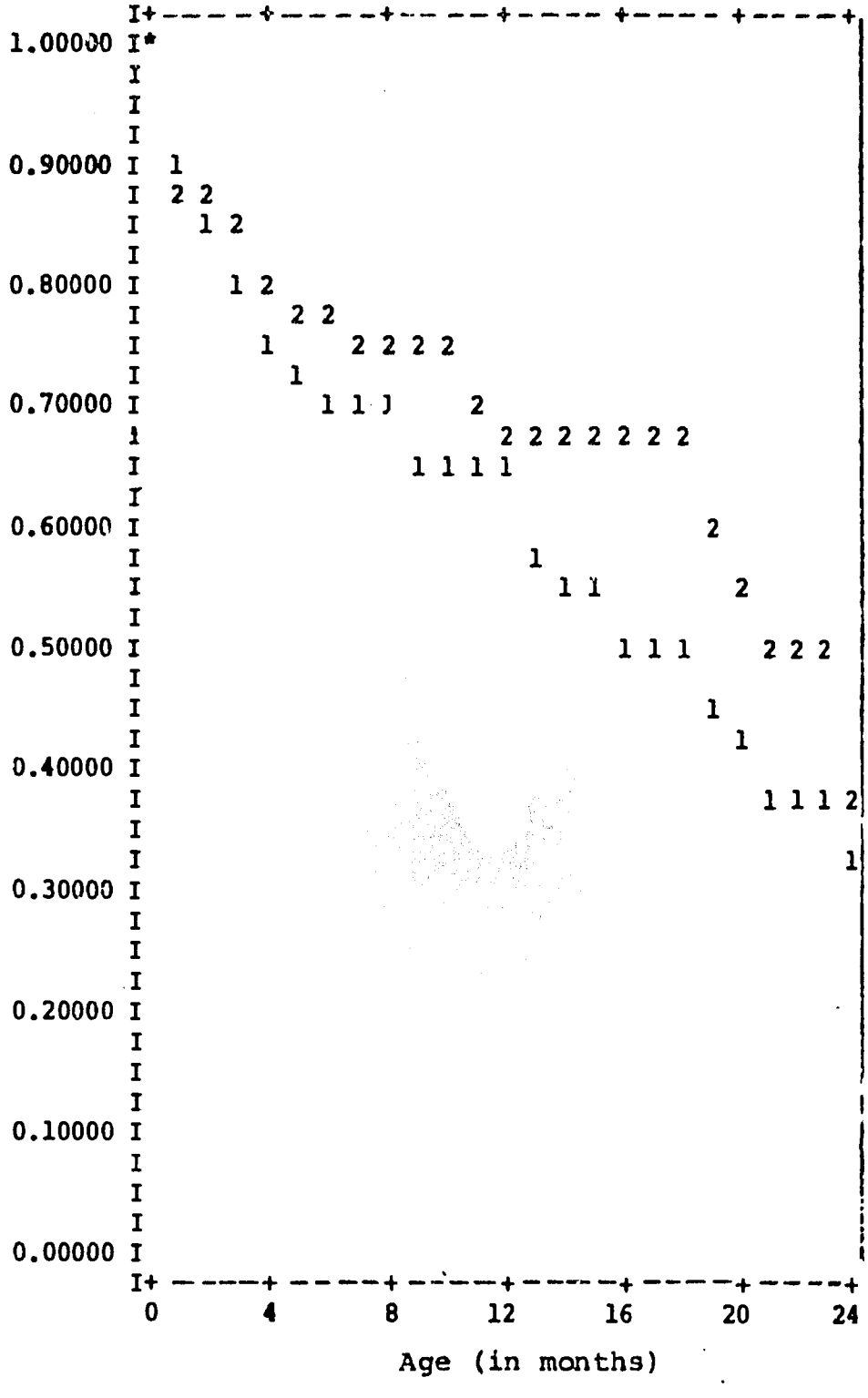
Key:

		N	Median Survival
1	No	971	22.52
2	Yes	329	18.72

* = more than one group

Figure 8-2

Duration of Breastfeeding by Current Work at Home Compared with Women Working Outside



Key:

		N	Median Survival
1	No	231	17.95
2	Yes	94	20.83

* = more than one group

IX DETERMINANTS OF INFANT FEEDING PATTERNS: THE EFFECT OF HEALTH SERVICES

A major hypothesis of this study has been that the health care sector influences women's decisions regarding infant feeding either (1) directly through available services and advice or (2) through implicit values communicated by health professionals. Consequently, this section will explore the effects of health services and professionals on the initiation and duration of breastfeeding and decisions regarding the introduction of bottle milks.

Ninety percent of the Semarang index women received some form of prenatal care (Table 9-1). Table 9-2 gives the distribution of various locations where they received this care. Forty percent visited a government health center, another 25% used private hospitals or health centers, 13% used licensed midwives, 12% used government hospitals and 9% went to a private physician.

Table 9-3 indicates that two thirds of the women had less than 10 prenatal examinations and 12% had less than four visits. Seventy-seven percent of the women were examined by a midwife and 20% by a doctor (Table 9-4). The remainder visited a traditional birth attendant or another person. One-quarter of the women recalled receiving infant feeding advice during the visit (Table 9-5). Only 3% were advised to use formula <u>exclusively</u> to feed their children (Table 9-6), however, it should be noted that 20% were told to supplement breastfeeding with other milk "if absolutely necessary," and, in some context, formula feeding was discussed with over 40% (Table 9-6). Table 9-7 presents data on advice given by particular health workers. Physicians more often gave bottlefeeding advice alone (6%) or in combination with other foods (39%) than with midwives, who discussed exclusive bottle use only 2% and bottle supplementation 21% of the time.

Fifty-three percent of the children were born at home, 32% were delivered at a maternity clinic and 15% at a community health center or a public hospital (Table 9-8). Only <u>6</u> (1%) women reported having caesarean sections. With respect to choice of birth attendants (Figure 9-1), 19% of the Semarang women used a traditional birth attendant, 16% a doctor, 63% a licensed nurse midwife and 2% relied on family or friends. Table 9-9 indicates that 73% of all healthy babies were taken to a hospital nursery after they were born; the remainder roomed in with their mothers. Seven percent (53 of 714) of all index children born in a hospital were placed in a special room for ill babies called a <u>covens</u>. Most women were thus separated from their infants after birth. Only 2% (36) of the children remained in the hospital after their mothers were discharged. Fifty percent of them were

discharged in less than one week (Table 9-10). Prematurity (38%) and low birth weight (28%) were the major reasons for remaining in the hospital. Table 9-11 indicates that 8% of the index babies were re-hospitalized after their births; most of these (82%) reported only a single admission. Tables 9-12 and 9-13 describe the infant feeding outcomes of Semarang babies in terms of various birth services and experiences, i.e. place of birth, rooming-in or not, caesarean section, type of birth attendant and distribution of formula samples.

There is only a small difference in initiation of breastfeeding among women whose births were in a public hospital, private maternity clinic or at home, 96.9%, 93.9%, and 96.0% respectively. In terms of duration of breastfeeding, there is a clear relationship between home births and longer durations. Women giving birth at maternity clinics consistently have the lowest percentages of breastfeeding at all durations up to 18 months of life. At this duration, almost 70% of women with home births are still breastfeeding as compared with just under half of the women who gave birth at the other facilities. The lifetable (Figure 9-2) corroborates this: median duration of breastfeeding was 15 months for women using a maternity clinic, 20 months for hospital births and 24 months for home deliveries. Women whose infants were born at maternity clinics have a much higher rate of bottle use at each of the monthly intervals, with more than four times the number giving a bottle at one month as compared with mothers who gave birth at home. Use of bottles by women having either home or public hospital births is lower, with the least prevalence at each duration for women with home births.

Rooming-in appears to exert a strong influence on infant feeding practices. The lifetable demonstrates this graphically (Figure 9-3). The data add credence to the hypothesis that separation of a mother and infant at birth places them at greater risk for earlier cessation of breastfeeding and introduction of bottle-feeding.

There seems to be an important association between particular attendants and various infant feeding outcomes. Table 9-12 shows for each feeding outcome that women using the traditional birth attendant have the highest prevalence of initiation and duration of breastfeeding and are at lowest risk of early introduction of bottles. Women relying on doctors display the reverse trend. People who utilized licensed midwives fall between the two extremes. The lifetable (Figure 9-4) corroborates this pattern: women who used traditional birth attendants and licensed midwives breastfed at consistently higher rates than those who had physicians in attendance at their births. At 12 months, the percent of physician-assisted women breastfeeding declined 50% where a similar decline for women using traditional <u>dukun</u> midwives is not seen until the 20th

month. This appears to be an important insight about the delivery of health services and infant feeding choices. Because of the enormous potential for confounding with socioeconomic background variables, however, differences ascribed to contact with health care providers must be examined carefully with control for social and economic status.

The small number of women who delivered by caesarean section makes it difficult to discern trends. It is clear however that the few women who had caesarean sections were at greater risk for not initiating breastfeeding than women in the study who had normal births (Table 9-13).

There is a difference in probability of breastfeeding at all durations between women who did and did not receive a sample of formula. For example, at 3 months 92% of those not receiving a sample were still breastfeeding as compared with 85.2% of those who got the sample. Use of the sample provided is even more strongly associated with curtailed breastfeeding: only 90% initiate breastfeeding and only 80% breastfeed three months. The introduction of bottle-feeding is startlingly different among women who received and did not receive a sample: 23% of those who did not receive a sample of formula introduced a bottle by 4 months of age compared with 42% of those who did receive a sample. It is obvious that issuance of a free sample of formula creates an incentive for its use.

There is a negative association between giving children milk after birth in the hospital and breastfeeding through 12 months of life as well as a greater likelihood of early introduction of bottles. One interesting fact displayed in Table 9-14 is that babies who were given sugar water in the first three days of life had patterns similar to the babies who received milk: higher prevalence of bottle-feeding and shorter breastfeeding than infants given no supplements.

The choice of the traditional birth attendant, rooming in, and not using early supplementary milk appear to be important determinants of infant feeding patterns and deterrents to inappropriate or unnecessary formula supplementation. It is worthwhile to examine more carefully the role of the traditional birth attendant, or dukun, in an effort to identify the characteristics of women who use them. A pattern emerges linking lower family income with use of traditional birth attendants and higher income with greater likelihood of using doctors (Table 9-15). Almost 30% of the mothers in the highest income groups had doctors in attendance at their children's births. As expected, the average cost of delivery by a dukun is considerably lower than that by a doctor. Similarly, of those women who recalled type of payment given to the dukun for birth services, 60% of them paid in cash, 20% in installments and 20% in kind.

Rural birthplace is also associated with selection of a traditional birth attendant: 41% of the rural-born vs. 15% of urban born (Table 9-16). Culturally, the dukun's role is not comparable to that of the midwife or doctor because of the additional perinatal service and Javanese rituals she provides. The dukun is a source of personal and traditional knowledge. Thirty-eight percent of the mothers stated they used a dukun because of religious belief or custom. The role of dukuns may be especially significant with a first baby for physical help and psychological support.

The use of birth attendant in the Mangkong Kulon district indicates a hierarchy of choice, so to speak, depending upon whether there were prenatal problems or perceived high-risk deliveries. Most women of all classes used a traditional birth attendant for normal pregnancies and deliveries. For all income groups in the Mangkong Kulon district, the baby remained in the care of the traditional birth attendant until the child lost the umbilical cord, usually no longer than one week. With prenatal difficulties or expected birth complications, however, poorer women used a midwife or doctor, and wealthier ones went to a hospital. This parallels a hierarchy of response to childhood illnesses. For example, in Krobokan district some mothers utilized a dual medical system: sending for a traditional midwife or healer for a mild illness and taking the child to a clinic or doctor if there had been a more severe sickness in the past.

The dukun's paramount value lies in the cultural and religious services she provides for the mother and infant that are not available from Western-trained attendants. The dukun visits the mother and neonate every day after birth to massage them both. She prepares the jamu that is considered essential for good quality and large quantity of breastmilk and arranges slametan feasts and helps with weaning rituals, if the baby is sickly. Slametan feasts are religious rituals related to a newborn's welfare. A few examples follow:

> The Brokohan ceremony which is held after the child's birth for the mothers to thank god for a healthy child and to name the baby.
>
> The Puputan ceremony is held with neighborhood fathers in attendance. Its purpose is to pray for a happy and useful future for the child.
>
> The Selapanan party when the baby is 36 days old where neighbors are invited to eat dinner after offering prayers for the baby's welfare.
>
> Wetonan is a monthly ceremony to show gratitude to danyang-danyang spirits who have kept the child from danger.

The ethnographer pointed out that the dukun usually encourages breastfeeding. In many cases, however, health professionals' advice can lead to a less than optimal infant feeding regime for the baby:

> Mrs. A. is a Javanese woman from a poor family, living in Kranggan Dalam District, who had been intermittently employed throughout her married life. Her working hours differed according to her jobs--one involved her being away from home from early morning to 9:00 at night. Her index child was breastfed at birth. Since she was a month old, Mrs. A. had given her daughter "TBM" formula as a food supplement. At three months she experienced "insufficient milk," and the Maternal and Child Health Clinic advised her to feed her baby "SGM" formula. Mrs. A. was also given "KMS" from this clinic and from the Karyadi Hospital where her daughter had been born. Mrs. A. followed a mixed feeding pattern, introducing a variety of foods at different periods in the first year of her child's life, along with early use of breastmilk and breastmilk substitutes. The child however, was unintentionally weaned at 3 months of age--the combined result of the mother's "insufficient milk" problem and the introduction of formulas early on. The family is poor and buys water for cooking and drinking at Rp 100 a tin every few days. They use a public toilet facility and water drawn from a public well for bathing and washing. The ethnographers were present when Mrs. A. fed her 21 month old index child with "lontong" and sauce, followed by a bottle of "Bendara" milk. After the milk was finished, the unwashed bottle was refilled with tea. Bottles were consistently reused without being washed out. Mrs. A. was concerned about her child's health and hoped her food regime, with milk substitutes, would provide the necessary nutrients to improve her condition.

The above case is illustrative of what one might call a "self-fulfilling prophecy." Concern over the health status of a child contributed to a decision to supplement breastmilk with artificial formula, resulting in the unforeseen consequence of a drastically decreased milk supply. The feeding problem was then "resolved" by the Maternal and Child Health Clinic, who advised the mother to use additional breastmilk substitutes, in turn resulting in the cessation of breastfeeding at 3 months of age. This poor family was placed at greater risk of introducing infectious disease to the baby through the use of unclean bottles and the loss of vital nutrients and antibodies in breastmilk. This appears not to be not an isolated case, but a general phenomenon.

Extended interviewing and participant observation was conducted at Puskesmas Karangbalong (the Karangbalong Health Center.) It is useful to detail some of the health center's practices regarding infant care and nutrition in view of the varied infant feeding outcomes of women with different birth experiences noted above. There seems to be contradictory information communicated to women utilizing the health center. There were specific nutritional programs directed towards pregnant women and those with small children, and there was an educational training course for a group of traditional birth attendants, with a large clientele in the district serviced by the health center. The value of breastmilk, ways to create optimal infant feeding habits and to prevent and treat problems associated with breast feeding were topics of discussion for both the clients and the traditional birth attendant students. For example, women who worked were advised to pump breastmilk and bottle-feed it to children rather than supplement with artificial milk. Likewise, women who complained of decreased breastmilk were told to increase maternal nutrition and massage their breasts. The health clinic staff viewed the introduction of breastmilk substitutes as a last resort.

Although women were encouraged to overcome breastfeeding problems and not to resort to artificial bottle-feeding, samples of milk powders, Lactona or SGM and powdered porridge were distributed to mothers whose babies and children were clearly undernourished. Instructions on how to prepare bottles and powdered foods were provided. Yet, the cross sectional data indicate that only 49% of 158 women respondents boil their babies' bottles before using them (Table 9-17).

Dietary practices among these poor clients appear not to be acknowledged by the health staff, who provided sporadic and limited free formula to malnourished babies. The families of the children in greatest need of food were among the poorest in the district with the problems of sewage disposal, absence of sanitary, piped water, inadequate heating facilities for sterilization of feeding apparatus and lack of storage for the prepared milk. Indeed, use of formula may place already malnourished babies at great risk if families cannot afford adequate supplies.[1] On another level, such practices subtly encourage the

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[1]There are about 25 infant formulas available in Semarang Municipality. The price varies from Rp 1, 850 (US $2.96) to Rp 4,500 (US $7.20) per pound. If a three-month old child used one tin of the cheapest brand, it would cost the family about Rp 250 (US $.40) per day. Since the minimum wage is 16,000 Rp (US $26.00) per month, one-half of this monthly income would be needed to supply one child with infant formula. (Statistics taken from: Draft Report of Infant Feeding Practice Study, 1983 Diponegoro University, Semarang.)

unsound notion that formulas are more nutritious than breastmilk and undermine, rather than reinforce, the traditional values of breastfeeding.

In addition, it appears to be clinic policy to advise women to stop breastfeeding children with diarrhea until after electrolyte solution treatment is completed. Interruptions in breastfeeding because of this policy may give some women the idea that the cause of the diarrhea is somehow associated with breastmilk. Temporary cessation of breastfeeding in the first few months of life, when anti-viral agents in breastmilk provide some protection, has been shown to be counterproductive. It also decreases material milk supplies dramatically, resulting in a higher probability of "insufficient milk" and unnecessary supplementation. Another of the major functions of the clinic was to supply contraceptives to women. In this regard, the ethnographer noted several women who used the pill but who had not been told about any possible decrease in milk volume.

In an effort to determine the significance of health service practices for various infant feeding outcomes, logistic regression analysis was performed. The original model is expanded to include a health services variable as an additional predictor. Since several health service components appeared to influence outcomes, (e.g., location of birth, receipt of a free formula sample, birth attendant), each of several possibilities was explored. In an experimental attempt, a variable representing whether or not a mother received a sample of infant food or formula was added to the logistic analysis. It was associated with increased likelihood of introducing a bottle by 4 months of age, but was not statistically significant (p=.07). "Rooming-in" was used in an experimental logistic procedure and was not found significant in any of the models.

A variable representing birth attendant (i.e., use of a dukun or midwife vs. a Western-trained physician) did, in fact, demonstrate a consistently significant association with the feeding outcomes. Tables 9-18 and 9-19 present the results of logistic regression analyses and corresponding adjusted risk odds ratios for all models using socioeconomic and health service variables as the predictor set.

The significant determinants of breastfeeding duration through the first year of life appear to be family income and birth attendant. In addition to these two variables, mothers' birthplace and mothers' age affect the chances of breastfeeding at the longest durations. Higher income has a negative relationship with breastfeeding at all durations. For example, a woman with an income of 61,000 to 109,000 Rp is about half as likely to breastfeed to 18 months as a woman from a family with an income of 30-41,000 Rp. Again, a woman with a physician in attendance at the birth of her child is less than half as likely

to breastfeed to 6 months as a woman using any other birth attendant.

The introduction of a bottle appears to be related to higher education, higher family income, physician attendant and lower parity. A woman with 2-3 children is more than three times as likely to introduce early bottles as a woman with 8-9 children. A woman with a physician in attendance at the birth of her child is one and one half times as likely to introduce a bottle by four months as a mother with another type of birth attendant.

Table 9-1 Prenatal Care

Response	Total N	%
Yes	1199	90
NO	130	10
Total	1329	100%

Table 9-2 Place of Prenatal Care

	TOTAL	%
Health/MCH Centers	486	40
Private or General Hospital with Maternity Center	249	21
Licensed Midwife	147	13
Government General Hospital	114	10
Private Doctor	102	9
Private MCH Centers	51	4
Army Hospital	29	2
Traditional Birth Attendant	9	-
Other	16	1
Total	1203	100%

Table 9-3 Number of Prenatal Visits

	(N)	%
1-3	156	12
4-6	321	25
7-9	322	25
10-12	255	20
13-15	95	7
16+	140	11
Total	1289	100%

Table 9-4 Who Examined the Pregnant Woman?

	(N)	%
Midwife	910	77
Doctor	237	20
Traditional Birth Attendant	18	2
Others	12	1
Total	1177	100%

Table 9-5 Were You Given Advice on Feeding Your Infant During the Examination?

	Total N	%
Yes	304	25
No	889	75
Total	1193	100%

Table 9-6 What Was the Advice Health Personnel Gave You?

	(N)	%
Breastfeeding Exclusively	180	53
Breastfeeding and Bottle, if absolutely necessary	74	22
Breastfeeding and Foods	58	17
Formula-Bottle only	7	2
Other	19	6
Total	338	100%

Table 9-7 Advice According to Health Worker

	Any Bottle %	Bottle Only	BF Only	BF & Bottle	BF & Foods	Other
Physician	39.0	6.0	44.0	33.0	8.0	8.0
Midwife	21.0	2.0	55.0	19.0	21.0	3.4
Medical Student	50.0	-	50.0	-	-	-
Other	20.0	20.0	20.0	-	20.0	20.0

Table 9-8 Place of Birth

	(N)	%
Public Hospital	193	15
Maternity Clinic	408	32
Home	684	53
Total	1285	100%

Table 9-9 Rooming in Hospital

	(N)	%
Hospital Nursery	474	73.0
Same Room*	106	16.5
Same Bed*	68	10.5
Total	648	100%

*Referred to as "Rooming-In" in this report

Table 9-10 Duration of Infants Initial Hospital Stay Beyond Discharge of Mother

Duration	(N)	%
Less than 1 week	17	47
2 weeks	11	31
Greater than 2 weeks	8	22
Total	36	100%

Table 9-11 Frequency of Re-hospitalizations

Number of Hospitalizations	No. of Children	%
1	88	82
2	10	9
3	5	5
4-8	4	4
Total	107	100%

Table 9-12 Birth Attendants and Breast and Bottle Feeding Experiences

Attendant Mo.	Ever Breastfed	3 Mos	6 Mos	9 Mos	12 Mos	18 Mos	Bottle 1 Mos	2 Mos.	3 Mos	4 Mos
Traditional Birth Attendant	334*	279	237	187	151	81	10	21	24	25
	96.3	95.2	93.7	91.7	88.8	75.0	3.2	7.3	8.9	9.8
Licensed Midwife	723	600	484	361	284	130	88	113	118	134
	95.4	92.7	86.7	79.5	74.0	56.8	13.8	18.6	20.5	24.5
Doctor	174	124	85	58	45	16	54	57	57	60
	93.5	79.0	64.9	54.2	53.6	32.7	32.5	41.0	43.5	49.6
Other	22	21	17	14	11	4	2	3	4	4
	100.0	100.0	89.5	93.3	91.7	57.1	10.0	15.0	20.0	22.2

* n = positive responses

Table 9-13 Infant Feeding Outcomes According to Birth Experiences

	Ever BF	3 Mo.	6 Mo.	9 Mo.	12 Mo.	18 Mo.	Bottle 1 Mo.	2 Mo.	3 Mo.	4 Mo.
Publ.Hospital or Com. Ctr.	187 *	163	133	93	78	25	19	26	31	[illegible]
	96.9	95.3	89.9	79.5	75.0	46.3	11.3	15.9	20.0	23.6
Priv. Maternity Home	383	300	217	165	131	59	91	101	100	108
	93.9	87.0	75.9	68.2	66.2	48.8	28.0	32.5	33.8	39.4
Home	655	545	459	352	275	144	39	62	66	75
	95.0	94.3	90.7	87.6	82.3	69.2	6.5	11.1	12.4	14.7
Rooming-in No	426	332	254	185	154	58	92	105	109	111
	95.7	86.5	78.2	69.0	67.5	43.9	24.9	29.5	32.3	35.7
Yes	118	102	78	59	46	22	13	17	17	26
	94.4	96.2	89.7	79.7	76.7	57.9	12.9	17.3	18.5	30.2
Got sample No	1190	979	781	585	462	215	143	181	186	203
	95.4	91.9	85.8	79.6	75.6	59.1	13.5	18.0	19.5	22.6
Yes	65	46	42	35	30	16	10	12	16	19
	92.9	85.2	80.8	76.1	73.2	55.2	18.2	25.0	35.6	42.2
Use sample No	833	723	611	474	380	187	30	43	47	53
	98.3	97.4	94.7	92.4	87.6	69.3	3.8	5.8	6.6	7.9
Yes	424	304	214	147	112	44	124	151	156	170
	89.5	80.2	67.1	54.6	51.4	35.8	37.9	48.4	53.1	61.8
C section No	1247	1021	821	617	488	230	152	193	202	222
	96.1	91.7	85.7	79.5	75.4	58.8	13.7	18.4	20.3	23.6
Yes	5	3	3	3	3	1	2	1	1	1
	83.3	75.0	75.0	75.0	100.0	50.0	40.0	25.0	25.0	25.0

* n = Positive responses

Table 9-14 Foods Given in First 3 Days of Life by Breast and Bottle Feeding Experiences

FOODS	EVER BREAST-FED	BREAST-FED 3 MONTHS	BREAST-FED 6 MONTHS	BREAST-FED 9 MONTHS	BREAST-FED 12 MONTHS	BREAST-FED 18 MONTHS	BOTTLE BY 1 MONTH	BOTTLE BY 2 MONTHS	BOTTLE BY 3 MONTHS	BOTTLE BY 4 MONTHS
None	419 *	359	292	226	176	29	18	37	35	44
	98.1	95.7	91.3	88.6	84.2	50.9	4.7	9.1	10.3	13.6
Honey	159	127	107	80	65	4	7	14	15	14
	95.2	90.1	85.6	79.2	72.2	80.0	5.0	10.8	12.1	11.9
Sugar and water	28	22	18	9	6	67	4	2	6	7
	100.0	91.7	81.8	69.2	66.7	49.6	16.0	30.4	28.6	36.8
Milk in hospital	447	356	272	198	162	28	100	112	11	126
	94.1	87.7	79.5	69.2	67.5	68.3	25.4	29.5	32.8	37.1
Other	133	108	92	70	53	13	14	17	19	20
	95.0	93.9	91.1	89.7	85.5	50.0	11.7	15.5	18.1	20.2

* n = Number responding

Table 9-15 Family Income and Birth Attendant

Attendant	Low 29-41,000 (N)	%	Middle 42-60,000 (N)	%	High 61-110,000 (N)	%
TBA (340)	243	42.6	60	20.5	37	10.9
Midwife (740)	289	50.6	187	64.0	264	62.9
M.D. (183)	29	5.1	37	12.7	117	27.9
Other (20)	10	1.8	8	2.7	2	0.5
Total (1283)	571	44.5	212	22.8	420	32.7

Table 9-16 Mother's Birthplace and Birth Attendant

Birth Attendant	Rural (N)	%	City (N)	%
TBA	242	40.6	106	14.8
M.D.	39	6.5	147	20.5
Midwife	308	51.7	448	62.6
Other	7	1.2	15	2.1
Total (1312)	596	100%	715	100%

Table 9-17 How Are Bottles Used for Formula Feeding Washed?

	(N)	%
Plain unboiled water	12	8
Plain unboiled water and soap	20	13
Plain unboiled water, then boil bottle	33	21
Plain unboiled water and soap, then boil bottle	45	28
Plain unboiled water, then run bottle through hot water	27	17
Plain unboiled water and soap, then run bottle through hot water	18	11
Other	3	2
Total	158	100%

Table 9-18 Logistic Regression Models for Infant Feeding Outcomes: Health Services and Socioeconomic Predictors

PREDICTORS	BREASTFED 6 MONTHS	BREASTFED 9 MONTHS	BREASTFED 12 MONTHS	BREASTFED 18 MONTHS	BOTTLE BY 4 MONTHS
Intercept					
Beta	3.494	2.606	1.689	0.193	-3.086
X2	59.67	36.85	16.67	0.16	63.20
P Value	*(0.000)	*(0.000)	*(0.000)	(0.688)	*(0.000)
Parity					
Beta	0.247	0.240	0.119	-0.011	-0.409
X2	2.93	2.86	0.71	0.00	9.42
P Value	(0.086)	(0.091)	(0.399)	(0.946)	*(0.002)
Mother's Age					
Beta	-0.172	0.012	0.145	0.388	0.213
X2	1.86	0.01	1.35	6.54	3.53
P Value	(0.172)	(0.920)	(0.245)	*(0.010)	(0.060)
Mother's Education					
Beta	0.040	-0.059	-0.081	0.039	0.293
X2	0.18	0.35	0.67	0.10	10.67
P Value	(0.691	(0.552)	(0.413)	(0.749)	*(0.001)
Birthplace					
Beta	-0.99	-0.142	-0.851	-0.630	-0.038
X2	0.18	0.38	0.14	5.74	0.04
P Value	(0.673)	(0.536)	(0.709)	*(0.017)	(0.851)
Income					
Beta	-0.459	-0.485	-0.364	-0.348	0.421
X2	17.24	19.69	11.65	8.27	20.68
P Value	*(0.000)	*(0.000)	*(0.006)	*(0.004)	*(0.000)
Birth Attendant					
Beta	-0.879	-0.689	-0.613	-0.955	0.498
X2	11.73	6.91	4.68	6.34	4.06
P Value	*(0.001)	*(0.009)	*(0.030)	*(0.012)	*(0.044)
Model					
X2	72.05	71.2	39.78	36.57	125.71
P Value	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Correlation Coefficient r =	0.289	0.297	0.217	0.254	0.367

Table 9-19 Logistic Regression Models for Different Infant Feeding Outcomes Adjust Risk Odds Ratios and 95% Confidence Intervals for Socioeconomic and Health Services Variables with Significant P Values

	BF6MO	BF9MO	BF12MO	BF18MO	Bottle by 4 Mo
Parity					
2-3 vs 1	NS	NS	NS	NS	0.664 (0.082, 5.388)
8-9 vs 2-3	NS	NS	NS	NS	0.293 (0.036, 2.378)
Age of Mother					
20-24 vs 18-19	NS	NS	NS	1.474 (1.095, 1.984)	NS
20-24 vs 35-39	NS	NS	NS	3.200 (2.377, 4.308)	NS
Mother's Birthplace	NS	NS	NS	0.532 (0.318, 0.892)	NS
Mother's Education					
5-7 vs none	NS	NS	NS	NS	1.339 (1.124, 1.597)
11-12 vs 5-7	NS	NS	NS	NS	1.795 (1.506, 2.14)
Family Income					
30-41,000 Rp vs Lo-29,000	0.632 (0.509, 0.785)	0.616 (0.497, 0.763)	0.693 (0.561, 0.855)	0.706 (0.557, 0.895)	1.524 (1.271, 1.827)
61-109 Rp vs 30,000-41,000	0.399 (0.322, 0.496)	0.379 (0.306, 0.470)	0.480 (0.389, 0.593)	0.498 (0.393, 0.632)	2.32 (1.936, 2.781)
Birth Attendant MD vs others	0.415 (0.251, 0.687)	0.502 (0.300, 0.839)	0.542 (0.311, 0.944)	0.385 (0.183, 0.809)	1.644 (1.013, 2.669)

Figure 9-1
Distribution of Birth Attendants

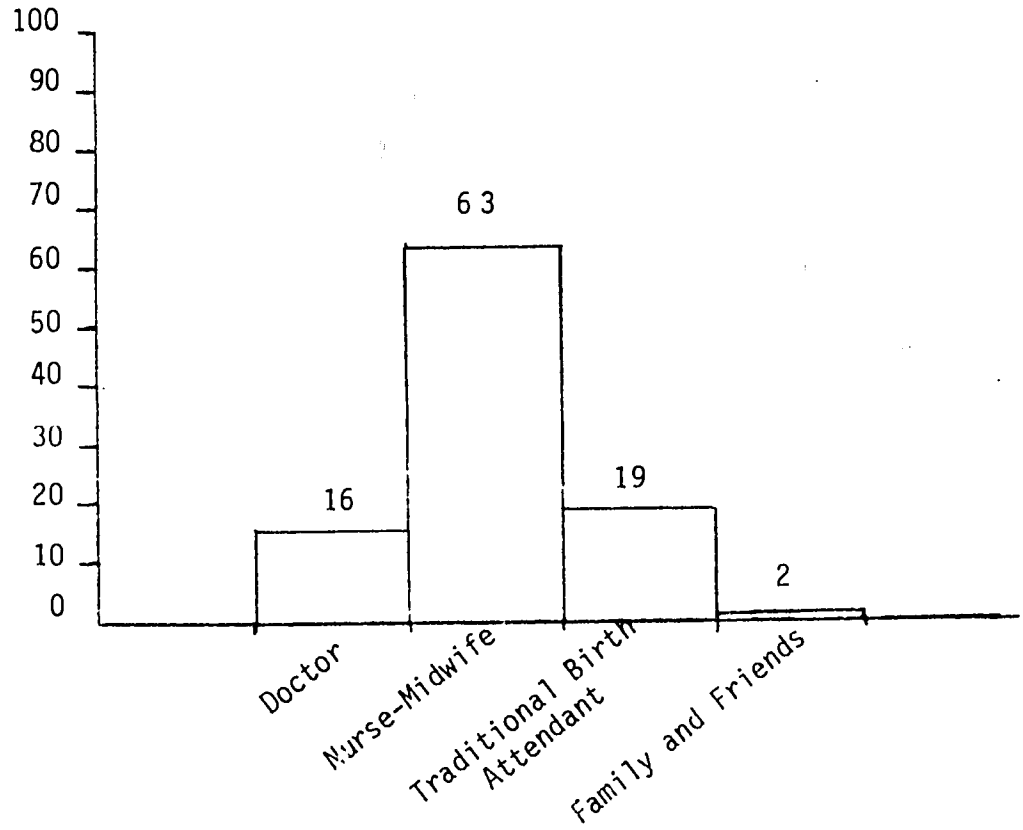
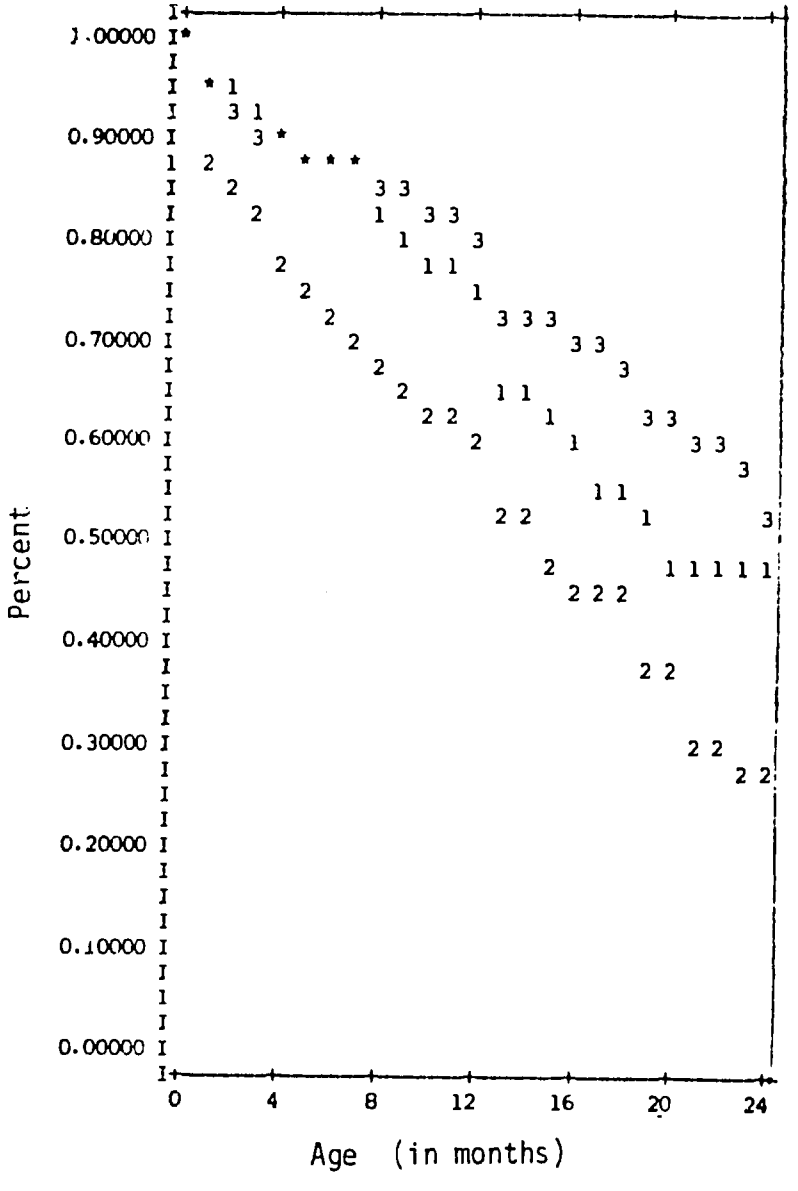


Figure 9-2

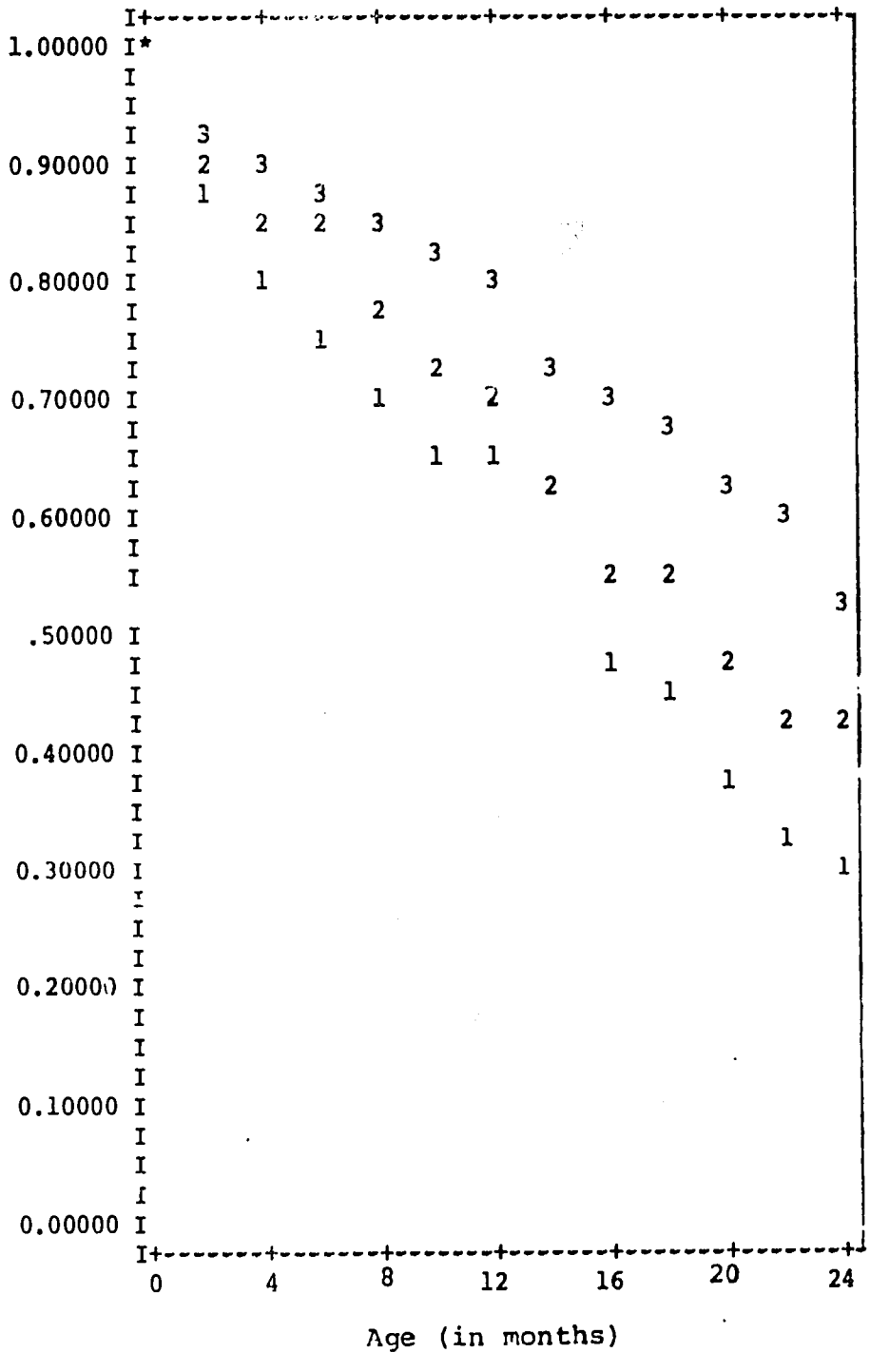
Duration of Breastfeeding by Location of Birth



Key:	n	Median Survival
1 = Public Hospital	193	19.65
2 = Maternity Hospital	406	14.58
3 = Home	681	24

Figure 9-3

Duration of Breastfeeding by Hospital Rooming-In



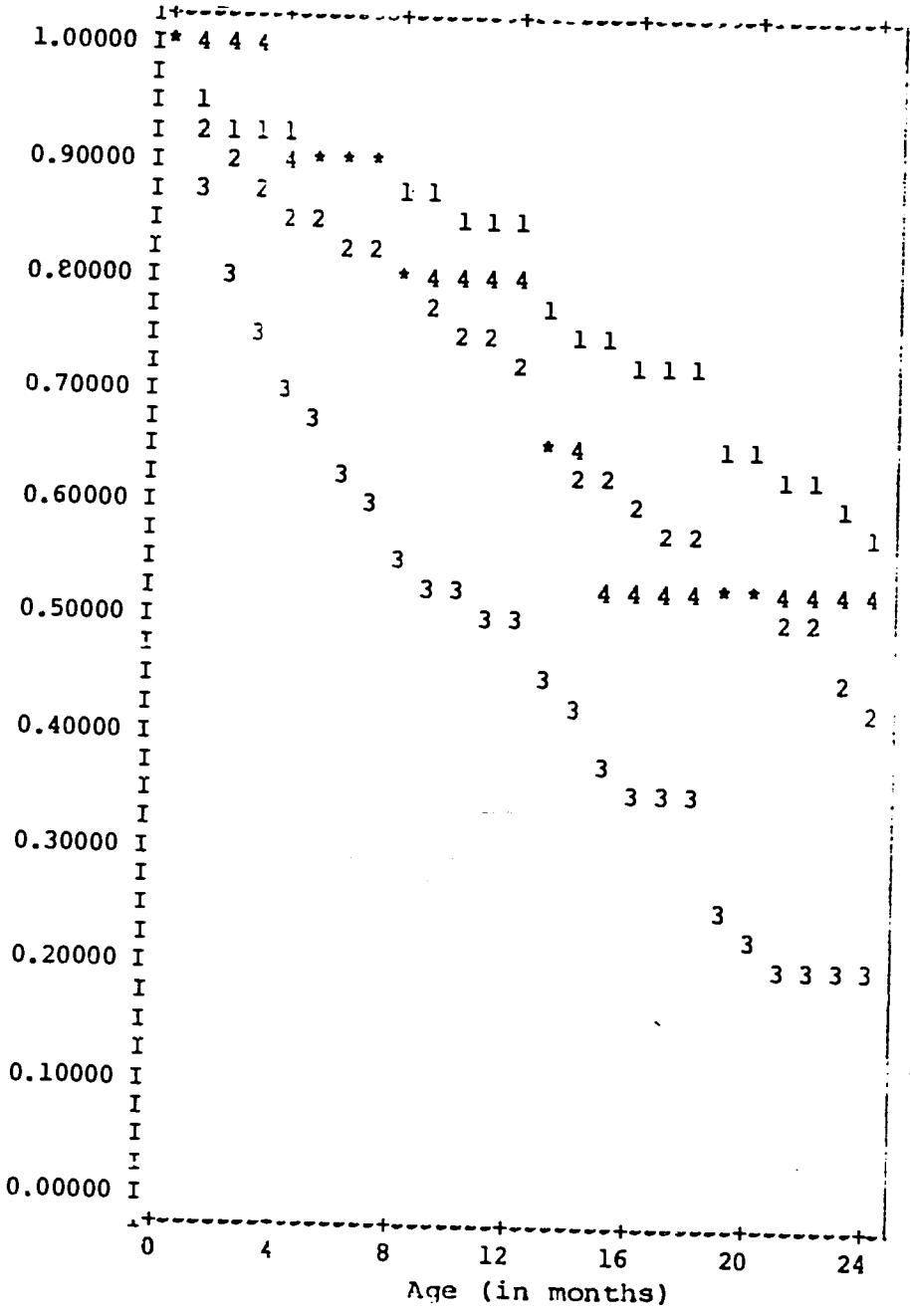
Key:

		N	Median Survival
1	Nursery	443	15.33
2	Rooming-In	125	19.4
3	Home Birth	681	24.0

* = more than one group

Figure 9-4

Duration of Breastfeeding by Birth Attendant



Key:

		N	Median Survival
1	Traditional Birth Attendant	348	24.00
2	Licensed Midwife	755	20.61
3	Physician (M.D.)	185	12.13
4	Other	22	24.00

* = more than one group

Chapter X DETERMINANTS OF INFANT FEEDING PRACTICES: THE OVERALL MODEL

In an effort to assess the relative impact of socioeconomic, health service and maternal employment variables on the infant feeding outcomes in Semarang, a final logistic regression was fit with a full set of predictors. Tables 10-1 through 10-4 present the results. The dominating variables for the various outcomes are: family income, birth attendant and working outside the home. Higher income, physician attendant and working away from home lower the probability of longer breastfeeding and increase the odds of early introduction of bottles. Working outside the home appears associated with duration of on breastfeeding only at the earliest durations.

Indeed, these conclusions are internally consistent with a constellation of factors discussed throughout this report. In a real way, the character of societies or classes is recast in behavior and attitudes towards children. The factors identified that shape infant feeding decisions reflect variability among classes of women and are also consequences of the differential impact of external forces. Semarang is experiencing urbanization, an increase in its health and education services, and a diffusion of Western values and attitudes. These conclusions, therefore, are important for predicting the range of possible infant feeding choices which accompany social change. For example, older women of rural origin, with less education, who do not work outside the home may, at the moment, be a bastion of traditional values regarding infant care and feeding. On the other hand, if maternal employment outside the home increases, its negative effects on infant feeding could become extremely significant.

In general, it is likely that a Semarang woman who has more education, is a member of a high income family, utilizes a physician to assist in the birth of her child and who is employed away from home will be likely to introduce a bottle by four months of age. Most of these factors, i.e., expanded utilization of Western medicine, increased family income, and higher education are major goals of developing nations such as Indonesia. Government policies are, in fact, directed to attaining such goals. Thus, increasing numbers of women in Semarang may experience one or more of these changes in the near future. Because development often proceeds unevenly, use of a doctor and employment outside the home may not be accompanied by expanded incomes and a general upgrading in the quality of life which might render bottle-feeding less dangerous. As Tables 10-1 and 10-2 show, maternal employment exerts a strong influence on breastfeeding to 6 months and 9 months. Women who work out or come from higher income families and utilize Western medical professionals are at risk for curtailed breastfeeding durations.

Thus, the combined pressure on some women to supplement with early bottle-feeding may be so great it also places them at high risk for early cessation of breastfeeding and its sequelae.

The relationship between introduction of early bottle-feeding and early weaning in Semarang for all women is strikingly apparent in Tables 10-3 and 10-4. Introduction of a bottle by 4 months as a predictor is overwhelming in its association with the probability of shorter breastfeeding durations. It is such a strong influence that the otherwise dominating factors of FAMILY INCOME and WORKOUT are displaced, for example, in the model for breastfeeding 6 months. A woman who introduces a bottle by four months is 25 times less likely to be breastfeeding to 18 months as one who does not. Interestingly, the effect of birth attendant on breastfeeding for 6 and 12 months does not disappear, suggesting that while higher income and working outside the home primarily shorten breastfeeding because of their effect on early introduction of the bottle, contact with doctors operates in perhaps other more subtle ways as well. The result is shortened breastfeeding. In later infancy (older than 6 months of age) high income is associated with shorter breastfeeding, as is use of a physician, even after controlling for the effects of early bottle-feeding.

Table 10.1 Overall Logisitic Regression Model Utilizing Socioeconomic, Maternal Employment and Health Services Predictors

PREDICTORS	BREASTFED 6 MONTHS	BREASTFED 9 MONTHS	BREASTFED 12 MONTHS	BREASTFED 18 MONTHS	BOTTLE BY 4 MONTHS
Intercept					
Beta	3.3627	2.5276	1.6369	0.1930	-3.1880
X2	56.02	34.99	15.72	0.16	56.81
P Value	*(0.000)	(*0.000)	*(0.000)	(0.688)	*(0.000)
Parity					
Beta	0.191	0.198	0.089	-0.272	-0.330
X^2	1.73	1.91	0.38	0.03	5.20
P Value	(0.189)	(0.167)	(0.151)	(0.872)	*(0.023)
Mother's Age					
Beta	-0.092	0.067	0.181	0.398	0.039
X^2	0.52	0.29	3.06	6.67	0.10
P Value	(0.468)	(0.592)	(0.466)	*(0.009)	(0.749)
Education					
Beta	0.054	-0.057	-0.073	-0.042	0.260
X^2	0.29	0.33	0.53	0.12	6.85
P Value	(0.592)	(0.566)	(0.616)	(0.722)	*(0.009)
Birthplace					
Beta	-0.167	-0.180	-0.115	-0.630	0.152
X^2	0.49	0.61	0.25	5.71	0.46
P Value	(0.483)	(0.436)	(0.616)	*(0.017)	(0.496)
Income					
Beta	-0.415	-0.455	-0.347	-0.342	0.421
X^2	13.77	17.08	10.33	7.88	17.03
P Value	*(0.000)	*(0.000)	*(0.001)	*(0.005)	*(0.000)
Workout					
Beta	-0.809	-0.532	-0.374	-0.155	2.391
X^2	10.00	4.36	2.02	0.22	94.12
P Value	*(0.001)	*(0.037)	(0.155)	(0.637)	*
Birth Attendant					
Beta	-0.997	-0.774	-0.686	-0.944	0.709
X^2	14.42	8.45	5.20	6.03	6.72
P Value	*(0.000)	*(0.004)	*(0.017)	*(0.014)	*(0.009)
Model					
X^2	83.70	75.88	42.49	35.75	229.48
P Value	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
Correlation Coefficient R =	0.309	0.303	0.220	0.240	0.505

*Significant statistic

Table 10-2 Logistic Regression Models for Different Infant Feeding Outcomes Adjusted Risk Odds Ratios and 95% Confidence Intervals for Socioeconomic, Maternal Employment, Health Services Predictor Variables with Significant P Values

	BF6MO	BF9MO	BF12MO	BF18MO	Bottle by 4 Mo
Parity					
2-3 vs 1	NS	NS	NS	NS	0.719 (0.541, 0.955)
8-9 vs 2-3	NS	NS	NS	NS	0.372 (0.280, 0.494)
Age of Mother					
20-24 vs 18-19	NS	NS	NS	1.488 (1.101, 2.013)	NS
20-24 vs 35-39	NS	NS	NS	3.298 (2.438, 4.459)	NS
Mother's Education					
5-7 vs none	NS	NS	NS	NS	1.298 (1.068, 1.578)
11-12 vs 5-7	NS	NS	NS	NS	1.298 (1.068, 1.578)
Mother's Birthplace	NS	NS	NS	0.533 (0.317, 0.896)	NS
Family Income					
30-41000 Rp vs LU-29000	0.660 (0.530, 0.822)	0.634 (0.511, 0.787)	0.706 (0.572, 0.873)	0.710 (0.559, 0.902)	1.523 (1.247, 1.860)
30-41 vs 61-109 Rp	0.436 (0.350, 0.543)	0.402 (0.324, 0.499)	0.499 (0.404, 0.617)	0.504 (0.397, 0.641)	2.321 (1.900, 2.834)
Workout	0.445 (0.270, 0.735)	0.587 (0.356, 0.968)	NS	NS	10.922 (6.738, 17.705)
Birth Attendant	0.369 (0.221, 0.617)	0.461 (0.274, 0.777)	0.504 (0.287, 0.885)	0.392 (0.184, 0.832)	2.031 (1.189, 3.471)

Table 10-3 Overall Model: Logistic Regression Using Background, Employment, Health Services and Introduction of a Bottle by 4 Months as a Predictor

	BREASTFED 6 MONTHS	BREASTFED 9 MONTHS	BREASTFED 12 MONTHS	BREASTFED 18 MONTHS
Intercept				
Beta	5.909	4.0724	3.1371	0.9953
X^2	42.25	38.67	24.33	2.49
P Value	*(0.000)	*(0.000)	*(0.000)	(0.114)
Parity				
Beta	0.245	0.207	0.038	-0.054
X^2	1.26	0.97	0.03	0.06
P Value	(0.262)	(0.323)	(0.854)	(0.808)
Mother's Age				
Beta	-0.205	0.144	0.195	0.405
X^2	1.21	0.64	1.21	4.11
P Value	(0.272)	(0.423)	(0.272)	*(0.042)
Education				
Beta	0.097	0.068	0.139	0.183
X^2	0.41	0.21	0.89	1.49
P Value	(0.520)	(0.643)	(0.345)	(0.221)
Birthplace				
Beta	0.098	-0.304	-0.248	-0.721
X^2	0.08	0.79	0.53	4.54
P Value	(0.728)	(0.374)	(0.467)	*(0.033)
Income				
Beta	-0.119	-0.484	-0.378	-0.355
X^2	0.46	7.99	5.10	5.01
P Value	(0.499)	*(0.004)	*(0.023)	*(0.025)
Workout				
Beta	0.481	0.522	0.505	0.385
X^2	1.98	2.20	1.80	0.77
P Value	(0.159)	(0.138)	(0.179)	(0.381)
Birth Attendant				
Beta	-1.066	-0.637	-0.795	-0.688
X^2	8.20	2.89	3.71	1.96
P Value	*(0.004)	(0.088)	*(0.054)	(0.161)
Bottle by 4 Months				
Beta	-5.167	-3.550	-3.234	-2.176
X^2	47.80	85.12	76.39	32.83
P Value	(0.0)	(0.0)	(0.0)	(0.0)
Correlation Coefficient R =	0.670	0.624	0.563	0.424

*Significant Statistic

Table 10-4: Logistic Regression Models for Different Infant Feeding Outcomes: Adjusted Risk Odds Ratios and 95% Confidence Intervals for Introduction of a Bottle by 4 Months as Predictor Variables with Significant P Values

	BF6MO	BF9MO	BF12MO	BF18MO
Parity				
2-3 vs 1	NS	NS	NS	NS
8-9 vs 2-3	NS	NS	NS	NS
Age of Mother				
20-24 vs 18-19	NS	NS	NS	1.450 (1.013, 2.219)
20-24 vs 35-39	NS	NS	NS	3.373 (2.279, 4.992)
Mother's Education				
5-7 vs none	NS	NS	NS	NS
11-12 vs 5-7	NS	NS	NS	NS
Mother's Birthplace	NS	NS	NS	0.486 (0.250, 0.944)
Family Income				
30-41000 Rp vs Lo-29000	NS	0.616 (0.441, 0.862)	0.685 (0.493, 0.951)	0.701 (0.513, 0.957)
30-42 vs 61-109 Rp	NS	0.380 (0.272, 0.531)	0.469 (0.338, 0.651)	0.491 (0.360, 0.671)
Workout	NS	NS	NS	NS
Birth Attendant	0.344 (0.166, 0.714)	NS	0.451 (0.201, 1.014)	NS
Bottle by 4 Months	0.006 (0.001, 0.025)	0.029 (0.014, 0.061)	0.039 (0.019, 0.081)	0.113 (0.539, 0.239)

XI SUMMARY OF FINDINGS AND RECOMMENDATION

Alfred Sauvy, the great French demographer, concerned himself with the human qualitative factor in economic development and asked whether "growth goes with quality or against it."[1] In a sense, that is a fundamental motivating question in this study of infant feeding practices in Semarang, Indonesia. The findings raise the question whether the people of Semarang have experienced improvements in their lives as a result of increased access to Western-trained medical professionals, hospitals and health care centers with modern medical technologies, and convenient, manufactured products. The case would be clearer if one were evaluating the effects of a specific public health campaign, which sought to reduce mortality by vaccination of the populace; in this instance quality would accompany quantity. The position is not so clear, in this case, where Western medical attitudes and behaviors may be undermining the habits which would provide the optimum nutrition possible for all infants.

Such conclusions are not a cause for optimism. On the other hand, there may be ways to reverse some of the problems of lopsided development. Accordingly, this section will set out the major conclusions of our research and make recommendations for logical public health policies, which, when implemented, can contribute to infant and child survival in Indonesia by improving nutrition and health.

Demographic Characteristics

The typical household from our sample consists of five people living in three rooms or less. The median aggregate family monthly income is 42,000 Rp, the equivalent of US $67. Slightly more than one-half of the families have electricity. Forty-four percent have a closed toilet. Only 18% have running water and 6% own a refrigerator. The largest proportion of families purchase the supply of water on a daily basis.

Most of the people in the study are ethnically Javanese. The next largest group is Chinese. Mothers are in their mid-twenties (median age of 26) with 2-3 children each. Fifty-four percent were born in a city; the remainder had rural origins. The mothers in Semarang had little education, with a median of five years of schooling. One-quarter of them participated in the paid labor force.

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[1]A. Sauvy, Fertility and Survival, Collier Books, New York NY, 1963, p. 110.

The median age of the index child is twelve months. Fifty-one percent are females, 49% are males. Forty-four percent of these children were born at home and 30% at a maternity clinic. The remainder were born at a midwife's home or in public hospitals. Twenty-six percent of the births were attended by a traditional dukun, 58% by a licensed midwife (bidan) and 14% by a doctor. Only 8% of the index children had been rehospitalized since birth. Most (95%) children had been breastfed at some time during their life.

Infant Feeding Practices and Recommendations

Extended breastfeeding (up to 30 months), of high daily frequency (median of 11 feedings per day) is the norm in Semarang. The predominant patterns of infant feeding are: (1) breastmilk and food supplements; and (2) some combination of breast, bottle and foods. Unsupplemented bottle-feeding or breast and bottle-feeding as the sole source of nutrients is rare. On the other hand, infant formula use was reported for 50% of the sample at some time, from a low of 10% at ages 0-2 months to 50% at 12-14 months of age. The introduction of solid foods is widespread among Semarang children. By 2 months of age 56% of the children received various types of foods.

Although breastfeeding is valued, the use of colostrum is not. In fact, prelacteal feeds are not uncommon in Semarang. The almost universal use of formula milk in hospitals for neonates gives new mothers the impression that colostrum is not good for infants and that artificial milk is better than breastmilk. Although 72% of our sample discarded colostrum, the fact that almost 30% used it is a source of optimism. Although Semarang women are aware of the multiplicity of benefits of breastfeeding, the yellow appearance of colostrum is sometimes considered unclean. Islamic tradition considers honey to be a purifying agent, and some women use it as a prelacteal feed. Since colostrum has a laxative effect, information emphasizing the similar functions of colostrum and honey, as well as clear explanations regarding the antibodies in colostrum should be provided by health personnel to pregnant women and again immediately after childbirth. The recognition of colostrum as a "purifier" may induce some women to use it.

Overall, this culturally specific approach should be taken in response to what may be an "insufficient milk syndrome" among Semarang mothers. At least one-quarter of the sample reported experiencing decreased breastmilk. Forty percent of them stated that they knew their milk was insufficient because the milk was diluted. This may be based on an inaccurate expectation as to the color and consistency of breastmilk. The problem of insufficient milk warrants additional study.

On one level, considering the high infant morbidity and mortality in Indonesia, it is not surprising that women are anxious about their ability to nourish their children. The most frequent responses to insufficient milk were to drink jamu, an herbal tea treatment consistent with humoral therapeutics, and to eat more fruits and vegetables. In view of this, health professionals should encourage the greater use of jamu, consumption of fruits and vegetables, along with an explanation of how an increase in the frequency of breastfeeding will stimulate lactation. These recommendations are vital for those women who tend to respond to perceived decreases in milk supply by using artificial formulas, since the introduction of formula may have the unfortunate result of unintended, premature weaning. As was noted in the data, women who introduced bottles early in the lives of their infants had a much shorter weaning interval. Introduction of artificial milk in bottles too early can interfere with the infant's sucking response, leading to inadequate milk production and unwanted weaning: the "cure" deepens the problem.

At least half of the women who introduced artificial milk did so in order to decrease their breastmilk. This may mean artificial milk was used as a weaning method. Since current pediatric recommendations are that weaning not take place before 4-6 months, the traditional and still widespread method of lengthy breastfeeding and gradual weaning with a variety of locally produced foods, served with utensils other than bottles, should be encouraged. As mentioned elsewhere, ammenorhea due to lactation assures reasonable spacing between births--an advantage to individual families as well as to a nation struggling with problems of an already large population.

Use of food supplements is universal among Semarang mothers. Foods appear to be both ritually and ceremonially significant as well as nutritionally valued. All children consumed foods by four months of age. For those who were never breastfed, 50% received foods in the first month of life vs. 39% of those who were breastfed. For women who are exclusively breastfeeding, the addition of foods is, at best, an unnecessary expense. At worst, it offers an additional medium for bacteriological contamination. Large quantities of foods can also cause disinterest in breastfeeding in infants whose hunger is satisfied.

The inaccurate notion that manufactured solids are better or cleaner than traditional food items should be corrected. Indeed, there appears to be a great deal of misinformation regarding nutritional and disease-preventive attributes of modern methods of infant feeding among Semarang mothers in our sample. Not only do some mothers believe that canned milk "somehow" provides disease immunity, but they reject the traditional habit of prechewing certain foods for infants on the grounds that this

practice promotes disease. Premastication may be a necessity to begin enzymatic breakdown and hasten digestion for certain foods given to young babies. Persistence in providing infants these foods without prechewing may result in serious digestive disturbances, aside from an inability to absorb nutrients.

Socioeconomic Indicators

Family income, mother's age, education and birthplace all influence breast and bottle-feeding practices in Semarang. Higher income and education and city born mothers follow this same trend. Although all women provide supplements, high income women introduce bottles and breastfeed whereas lower income women supplement with foods. The cumulative pressure of physicians, bidans, and peers encourages the use of packaged cereals and formulas among wealthier women.

Accordingly, the major target groups in need of public health education and support, on the one hand, are women without husbands or living in households of more than ten people, and on the other hand, are women from wealthier families who have greater access to Western values, physicians and advertisements promoting manufactured infant foods and formulas.

Women from upper income families who gave birth to ill children in a hospital were more likely not to breastfeed than those from lower income families. Hospital policies should encourage mothers whose babies are ill to express and save their milk and also permit mothers to remain with infants when rehospitalization is necessary, in order to breastfeed their babies.

Poor women over the age of 35 and higher income women appear to be at greatest risk of never breastfeeding. The use of formula is a greater detriment to poor children because it increases the possibility of unnecessary exposure to infectious agents in poorly cleaned bottles and in diluted formula. The cost of sterilizing bottles is significant for women who must purchase water daily, use unsterilized containers for storage and boil bottles on kerosene or wood braziers. The high cost of formula milk places an additional constraint on meager daily wages.

Marketing Characteristics

There are a variety of different commercial infant foods in Semarang. Product availability is widespread. There is price competition between brands. Although the distribution of free samples is not widespread, one of the more interesting features of product promotion in the Semarang community is the degree to

which some mothers in every birth setting and with each type of birth attendent reported receiving a free sample. It would appear that producers have not overlooked any point of contact with new mothers. Overall, there did not seem to be a strong orientation to using commercial infant foods at the time of the survey. There is, however, evidence that promotional marketing efforts exist nonetheless, and that those efforts appear to be excessive for the apparent demand. If traditional infant feeding values are to be protected and encouraged, it would appear that the health care system is the most important point of intervention.

Maternal Employment

Only 25% of the sample was employed in income generating activities. Nonetheless, for these women, a number of factors related to paid labor force participation are closely linked to less than optimal infant feeding regimes. Working outside the home increases the likelihood of early bottle-feeding, although by itself work does not appear associated with shortened duration of breastfeeding. Women working in circumstances without day care facilities or who are not allowed to keep their children with them show this pattern. Maternity leaves appear to be rare in Semarang. Many working women returned to work within two months with the consequent introduction of breastmilk substitutes.

Longer paid maternity leaves, on-site child care facilities with frequent feeding breaks and the encouragement, only if absolutely necessary, of mixed feeding for mothers employed outside the home would help to improve life conditions of working mothers and infants in Semarang. A higher minimum wage might reduce the necessity for some women to work more than seven hours a day and might allow other women to work part time, thereby encouraging exclusive breastfeeding or breastfeeding and appropriate supplementary food.

Health Services

Location of birth, birth attendant, rooming-in or not and receipt of free formula all have an influence on infant feeding outcomes. Home births, use of the dukun and rooming-in all predisposed index mothers to high initiation and lengthy durations of breastfeeding. In comparison, women with hospital births, doctors and bidans, who were separated from their children at birth all had an increased chance of introduction of formula feedings early and shorter durations of breastfeeding.

It is evident that there is a basic need for additional education or re-education of bidans, physicians and dukuns

regarding optimal infant feeding habits. For example, although 50% of the women who introduced artificial milk did so on their own or their husbands' initiative, bidans were the next most influential group with doctors and dukuns following.

Cross sectional data indicate that bidans are a key element in the introduction of bottle formulas for weaning purposes and as a response to problems of insufficient milk and breast morbidity. Both doctors and bidans who visited mothers immediately after birth influenced their decisions to use formula EXCLUSIVELY or breastmilk and formula SUPPLEMENTS. The dukun, on the other hand, is positively associated with optimal breastfeeding habits. She also organizes rituals and ceremonies which provide social and psychological validation and communal recognition of the life cycle event of childbirth. On the other hand, an ethnographer has indicated that bidans are particularly vulnerable to advertisements and readily distribute formula samples provided by manufacturers.

The life table analyses demonstrate that women using bidans breastfed their children for nine months less than women using traditional dukuns. Physicians are equally, if not more seriously, implicated in practices which tend to shorten the duration of breastfeeding. Almost 60% of the Semarang sample used bidans as birth attendants and 16% used physicians. It follows, then, that changes in some of their less helpful practices would have a great effect on local community health.

One is struck by the degree of contradictory information and lack of knowledge on several important health issues among medical personnel. Information is seriously lacking on topics such as the effects of hormonal contraceptives on breastmilk production, the relative nutritional value of breastmilk versus artificial milks, the disease-protective properties of the breastmilk, the benefit of some traditional feeding habits. Women were simply not informed in health clinics that hormonal contraceptives may interfere with milk production. Again, health centers were not consistent in advising women to continue breastfeeding while they or their children were ill. Some centers distributed free samples of formula and cereals to all, but most often to under-nourished babies, inadvertently fostering the idea that formula bottles were superior methods of infant foods.

These observations logically lead to the following recommendations. Rooming-in should be the norm in hospitals. The professional health staff of medical clinics, hospitals and health centers should be educated in the virtual impossibility of disease-free bottle-feeding by poor clients, such as 35% of this sample with access only to easily contaminated water. Prelacteal feeds in hospitals should not be offered. Immediate breastfeeding after birth and the use of colostrum should be

promoted for well and ill babies. No free formula samples should be given, in particular, to poor families, because of the additional financial burden which would be placed on them if they tried to continue artificial feeding. Bidans and physicians, in particular, must receive upgraded education on the unintended consequences of early bottle-feeding.

Health professionals should provide basic information to pregnant and lactating women emphasizing that bottle-fed infants are more susceptible to infections because they lack the protective mechanisms derived only from breastmilk. Women should be advised to continue breastfeeding if they or their children are ill. Since almost 90% of the Semarang sample did receive prenatal care, information and advice should be begun during the prenatal period. All identified beneficial traditional practices, including exclusive breastfeeding on demand, and prolonged weaning should be promoted along with dissemination of information that exclusive breastfeeding can provide enough nutrients for the growth of infants up to five or six months of age. Fathers should be incorporated into any health education programs, since they appear to have considerable influence in advising their wives to use formulas and/or packaged cereals.

The formation of breastfeeding support groups similar to La Leche League of America is suggested. These could, perhaps, work through local women's organizations, which would provide needed encouragement and education to women who are breastfeeding. It is possible that the dukuns could play some role here, since many women, regardless of class, appear to respect their child rearing advice. Utilization of the dukun to disseminate advice to counter low milk supply by increasing the frequency of breastfeeding (encouraging women to drink more jamu and to use traditional massages etc.) illustrates how to integrate both scientific knowledge of Western medicine and historically-recognized practices for medically efficacious outcomes. Health care in a society with dual medical traditions must provide treatments in ways which maintain respect for the cultural context of illness.

Ethnographic information also revealed the fact that bidans are concerned about differentiating themselves from the dukuns, since they have received training in the biomedical model of disease similar to physicians. This implies a concern with status and respect, which partially explains the intensity of their emulation of Western medical opinions regarding infant feeding. Educational seminars in already-existing government health centers should emphasize a "promoter" role for the bidan. Their basic understanding of traditional Indonesian values and beliefs should be reinforced, and they should be helped to integrate that perspective into their advanced clinical knowledge of preventive and curative medicine. A pilot project to re-train bidans could be initiated along the lines of the cross-cultural

nursing programs instituted in the 1970's for American health workers whose clients were ethnically diverse. This would be a first step in upgrading the bidans' education regarding maternal-infant care, and at the same time, validating their singular importance in community health.

There appears to be a fundamental need for further research examining points of agreement between Western and humoral theories of disease, the relationship between meaning and efficacy, as well as an assessment of specific treatments which are best able to deal with the social context of disease.

Information documenting reasons why fathers advise women to use artificial formula would be extremely helpful in policy and health education planning. One wonders whether the popular belief in other countries is also held by Indonesian males, that lactating women are less sexually available. This aspect, obviously, is related to questions about contraceptive use immediately post partur

The recommendations set forth throughout this last section can help to prevent continued erosion of traditional feeding practices. There is, however, another difficulty: the influence of world-wide communication which broadcasts the prosperity of the West in all of its aspects. The idea that parents everywhere could reproduce a portion of this prosperity in their own families through use of formulas, for example, is seductive. The tendency to use formulas and packaged cereals instead of breastfeeding and locally produced weaning foods may reflect a rejection of cultural history.

It has been the primary interest of this research to increase the comprehension of individual and collective decisions regarding childhood nutrition and health and to assess habits which increase survival. The findings have documented the effect of Western medical and industrial technology on Semarang families, through the use of free samples, poor medical advice, and subtle, but nonetheless, negative valuations by Western-trained health personnel of Semarang mothers.

Policy changes suggested include rooming-in, paid maternity leaves, increased minimum wages, support groups as well as programs to re-educate health workers and families. It is hoped that such recommendations will lend themselves to:

(1) a re-evaluation of what is superior in Indonesian patterns of infant feeding and nutrition and;

(2) a way to integrate these with the real advances of Western medicine and technology.