

Feeding Practices of Preschool Children in Western Orissa

III. Weaning and Supplementary Feeding

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ABSTRACT A detailed study on the feeding practices of infant and preschoolers revealed that the period of exclusive breast-feeding was followed by introduction of liquid supplement except in 17% of industrial, 27% of urban and 80% of rural children where supplementation was done by semisolids directly. A fair number of industrial (67%) and urban (60.5%) mothers introduced artificial milk within first three months. The number of artificial milk-feed was maximum upto 3 within 24 hours during breast-feeding among 47% of urban and industrial children. The most common practice was to dilute the milk with equal volume of water. About 77% of industrial mothers and 60% of urban mothers introduced semisolids within 6 months of age whereas it was 46.5% in rural mothers. The common semisolids in industrial and urban areas were commercial sealed food whereas in rural area cereal preparation, samolina, porridge and sagoo were the preferred semisolids. Majority of the families performed a religious function at the time of introduction of semi-solid/solid food. Chi-square test indicates a significant association of maternal education, income level and caste with the age of introduction of semisolids in industrial and urban communities whereas in rural community the association was significant with caste only. Similar significant association of duration of exclusive and total breast-feeding with the age of introduction of semisolids was obtained in industrial and urban communities whereas the association was not significant in rural communities. Age of introduction of solid food was most common between 6-12 months. However only 14% industrial and 5% urban mothers delayed solid food beyond 12 months of age of the child.

INTRODUCTION

Studies on infant-feeding mostly deals with the relationship between breast-feeding and bottle-feeding, and personality development of the infants. But these studies fail to provide conclusive evidence that the technique used to feed an infant—breast, bottle or to wean an infant *per se*—influences personality. For health education, it is of fundamental importance to understand health related practices. It is equally important to understand the basis of any shift in such practices because in addition to the theoretical value of such knowledge, it may enable modification of the health-related practices as may be necessary (Russel, 1975).

Studies have shown that the majority of urban mothers in most western societies have given up breast-feeding in favour of bottle-feeding (Jelliffe and Jelliffe, 1975; Berg, 1973;

Reis, 1974; Niehoff and Meister, 1972 and Harfouche, 1970). The indication was that this shift in infant-feeding is particularly acute among the mothers of low socio-economic status, breast-feeding being less common among this class compared with the higher social group. This information has been confirmed by studies carried out in Britain, Sweden and the cities of Boston, New York and other parts of United States (Salber and Feinleib, 1966; Klackenberg and Klackenberg-Larsson, 1968; Bernal and Richards, 1970; Rivera, 1971; Fomon and Anderson, 1972). This reported situation is directly opposite to the demographic status of breast-feeding in the 1940's and even later (Fomon, 1974). It has been asserted that this shift in infant-feeding practices has resulted in many maternal and child health problems such as infant malnutrition and gastro-enteritis. Well documented studies show that artificially-fed

documented studies show that artificially-fed infants contract diarrhoeal, respiratory and other infections more commonly compared to breast-fed infants (Mannheimer, 1955; Meyer, 1968; Plank and Malanesi, 1973; Agarwal, 1985). In the Third World countries such trend in the fall of breast-feeding rate could be catastrophic to the infants and preschoolers because of the fact that they live in poor conditions of environment with only limited access to health services.

The present paper deals with weaning, bottle feeding and supplementary feeding practices, and influence of demographic variables on these practices.

STUDY AREA AND METHODOLOGY

The survey was conducted during 1989-90 in some industrial, urban and rural areas of western Orissa by collecting information through a pretested schedule. The details of the study areas, demographic features and breast feeding practices have been dealt in earlier reports (Mishra 1993a,b).

RESULTS AND DISCUSSION

Weaning: The term weaning is used mostly in two ways (Helsing and King, 1984).

(a) to mean the period from when a mother decides to stop breast-feeding, until she achieved this; and

(b) to mean the period from when supplementary food has been introduced until breast-feeding ceased.

However, very often the first definition is used and has been used in the present study.

Different practices are followed in weaning (Table 1). Majority of the mothers in all the areas preferred gradual weaning whereas 24.5% of the rural mothers and 15.5% urban mothers applied bitter herbs on their breasts to discourage their babies from breastfeeding. Mahadevan et al. (1985) have reported the application of herbs by 14.2% mothers and a few (8.86%) practiced fear techniques.

Table 1 : Method adopted for discontinuing breast-feeding (No. of mothers, % in parentheses)

Methods	Industrial	Urban	Rural
Gradually	73 (53)	135 (65)	72 (62.5)
Abruptly	48 (35)	19 (9)	9 (7)
Diverting attention	8 (5.5)	20 (8.5)	5 (5)
Applying bitter substance on the breast	7 (5)	32 (15.5)	28 (24.5)
Other methods	2 (1.5)	1 (0.5)	1 (1)

A higher percentage of mothers tended to terminate breast-feeding and started supplementary milk-feeding due to lack of secretion (Table 2). The other reasons advanced by mothers were next conception, old age of the child, working mother etc.

Table 2 : Reasons for supplementary milk-feeding (% in parentheses)

Reasons	Industrial	Urban	Rural
Lack of secretion	55 (45.5)	71 (56.5)	10 (25)
Next pregnancy	23 (19)	17 (13.5)	9 (22.5)
Old age of child	14 (11.5)	18 (14.5)	11 (27.5)
Working mother	21 (17.5)	20 (15.5)	10 (25)
Other reasons	8 (6.5)	—	—

Supplementary Milk-feeding

In general, the period of exclusive breast-feeding is followed by the introduction of liquid supplements. The number of children fed with artificial milk were 121, 126 and 40 in industrial, urban and rural areas, respectively. The percentages of mothers who started feeding semi-solid directly without giving any artificial milk-feed were 17%, 27% and 80%, respectively in industrial, urban and rural areas. The figures for supplementary milk-feed are presented in tables 3 to 5. It is evident from table 3 that a fair number of industrial and urban mothers introduced artificial milk-feed within first 3 months (67% and 60.5%, respectively), whereas among rural mothers the figures were 35% within 3 months and another 42.5% between 3-6 months. By and large cow milk was preferred as supplementary milk over goat or buffalo milk. The number of animal milk feed within 24 hours during breast-feeding varied in different areas. While 47% of the industrial and

urban mothers gave a maximum of 3 feeds per day during breast-feeding, the rest preferred more than 3 and 21% of urban mothers introduced more than 6 feeds. The figures in case of rural mothers were 75% and 25% for 3 and 3-6 feeds, respectively (Table 3B).

The extent of dilution of animal milk-feed is presented in table 3C. The common practice was to dilute with equal volume of water. The place of delivery had hardly any association with the extent of dilution.

Table 3(a) : Type of animal milk feed

Type of Animal milk	Industrial		Urban		Rural	
	No. (% in parentheses)					
	Hs	Hm	Hs	Hm	Hs	Hm
Cow Milk	88 (91.5)	24 (96)	95 (84)	9 (69)	12 (75)	18 (78.5)
Goat Milk	7 (7.5)	1 (4)	5 (4.5)	3 (23)	2 (12.5)	3 (13)
Buffalo Milk	1 (1)	—	13 (11.5)	1 (8)	2 (12.5)	2 (8.5)

Note : Hs = Hospital delivery Hm = Home delivery

Table 3 (b) : Number of animal-milk feed in 24 hours during breast feeding

No. of animal milk feed	Industrial	Urban	Rural
	No. (% in parentheses)		
≤ 3	57 (47)	60 (47.5)	30 (75)
> 3 - ≤ 6	64 (53)	40 (31.5)	10 (25)
> 6	—	26 (21)	—

Use of commercial milk was also common in industrial and urban areas (Table 4) and mothers from these areas introduced a particular brand of commercial milk due to self-acquired knowledge whereas the rural mothers mostly depended upon the advice of elderly persons (mother/mother-in law).

Table 5 shows that a higher percentage of mothers used bottle during supplementary milk-feeding and in rural area use of spoon and cup was equally prevalent next to bottle feeding. The use of different utensils in relation to maternal education indicate no positive relation. Similar results have been found by Ghosh et al. (1976), Datta et al. (1981) and Katiyar et al. (1981).

Table 3 (c) : Extent of dilution of animal-milk for feeding (in per cent)

Extent of dilution	Industrial		Urban		Rural	
	Hs	Hm	Hs	Hm	Hs	Hm
No dilution	23	20	5.5	7.5	—	4.5
25% dilution	16.5	12	10.5	7.5	25	43.5
50% dilution	6.5	16	21	38.5	25	39
100% dilution	41.5	44	51.5	38.5	44	8.5
200% dilution	10.5	4	9.5	7	6	4.5
> 200% dilution	3	4	2	—	—	—

Note : Hs=Hospital delivery Hm=Home delivery

Table 4 : Distribution of commercial milk feed and source of advice (per cent in parentheses)

Source of advice	Industrial		Urban		Rural	
	Hs	Hm	Hs	Hm	Hs	Hm
Doctor/Nurse	17 (17.5)	4 (16)	13 (11.5)	—	—	—
Mother-in-laws	6 (6)	1 (4)	30 (26.5)	2 (15.5)	10 (66.5)	20 (87)
Self	70 (73)	19 (75)	60 (53)	10 (77)	4 (26.5)	2 (8.5)
Friends and Relatives	3 (3.5)	1 (4)	10 (9)	1 (7.5)	1 (7)	1 (4.5)

Note : Hs = Hospital delivery Hm = Home delivery

A good number of mothers in Delhi started supplementary milk-feeding by the time the infants attained six months of age (Dutta Banik, 1975) but mothers belonging to poor communities started supplementary feeding late, around one year of age. He has also reported a greater dilution of animal milk for a longer period among poor communities. Ghosh et al. (1976) found that in an urban community 16.8% and 47.6% of the infants received top feeds before 1 month and 3 months of age, respectively and 16% received only after their first birth day. Nalwa (1981) recorded 4.8 months as the mean age of introduction of top feed and literacy status of mother and economic condition of the family had an inverse relation with the age of introduction of top feed. The studies conducted by Agarwal et al. (1986) indicate an early introduction of top feed in case of hospital-delivered infants and infants of upper socio-economic, educated and full-time employed mothers. The use of commercial milk was common in urban areas and there was a

tendency for greater use of commercial milk among upper socio-economic groups. Mishra et al. (1985) found 7.13 months as the model age at which top feed is introduced in a backward community of Banda district, Uttar Pradesh.

Table 5 : Per cent distribution of utensils used in supplementary milk-feed and its relation to maternal education

Particulars		Indus- trial	Urban	Rural
<i>Utensils used</i>				
Spoon		31.5	23	22.5
Bottle		61	67.5	57.5
Cup		7.5	10.5	20
	Maternal education	<i>Utensils used</i>		
		Spoon	Bottle	Cup
Industrial	Illiterate	16	73.5	10.5
	Upto High School	38.5	56	5.5
	College and above	29	62	9
Urban	Illiterate	33.5	22	44.5
	Upto High School	20.5	44	35.5
	College and above	15.5	76.5	8
Rural	Illiterate	31	38	31
	Upto High School	33.5	41.5	25
	College and above	—	100	—

The time when weaning should be started and the type of food supplement to be given depend on several factors like availability of food, socio-economic conditions and food habits of the family. In Western countries supplementary milk-feeding are usually started as early as 'second month's but this may be unnecessary as breast-milk satisfies the nutritional needs of the infants during the first few months of life. In developing countries where unhygienic conditions prevail particularly in rural communities, early weaning is undesirable because of high risk of infection. The timing of supplementary feeding is thus critical for the infant's health and nutrition. Although there are different views regarding the time for introduction of supplementary food, the general view is that supplementary food can be given by 4-6 month. The urban elite constitute a tiny fraction of our popula-

tion, but they are trend setters whom the poor envy and wish to emulate. The elites must be made fully aware of the overwhelming new evidence pointing to the clear superiority of breast-milk over all baby foods and a movement for return to traditional breast-feeding must be initiated among the urban elite and maintained with sustained tempo.

INTRODUCTION OF SEMISOLIDS

In industrial and urban areas respectively, about 77% and 60% of the mothers introduced semisolids within six months of age whereas in rural area it was 46.5% (Table 6). The common semisolids in industrial and urban areas were commercial sealed food available in the market irrespective of socio-economic and educational status and in rural area cereal preparations, somalina, porridge and Sagoo were the preferred semisolids (Table 7). Educated employed and high income level mothers of rural area preferred commercial food.

Table 6 : Age of introduction of semi solid food (% in parentheses)

Age of introduction (months)	Industrial	Urban	Rural
	n = 121	n = 168	n = 187
≤ 3	45 (37)	27 (16)	40 (21.5)
>3 - ≤ 6	49 (40.5)	76 (45.5)	49 (26)
>6 - ≤ 12	27 (22.5)	65 (28.5)	98 (52.5)

The most common age of introduction of semisolid in an Indian urban community was 10-12 months (Ghosh et al., 1976) and only 10.9% of illiterate mothers introduced semisolids at 4-6 months of age compared to 33% of graduate mothers. Thus in majority of cases, there was late introduction. The model age of introduction of semisolids in a backward community of Uttar Pradesh (Mishra et al., 1985) was 9 months. Data of Dattal et al. (1984) reveal that against a negligible number of rural mothers, 25.6% of urban mothers were giving semisolids to their babies by the end of first six months. Similarly, by the end of first year, 40.7% of rural children and 73.3% of urban children were receiving semisolids. Thus,

more than half of rural children received semi-solids during 12-24 months of age against 15% only from urban areas. Early introduction of semisolids by more industrial and urban mothers and late introduction by majority of rural mothers in the present study confirm the findings of Bhandari and Patel (1977), Gupta et al. (1980) and Dattal et al. (1984).

There are some cultural beliefs in different parts of India regarding the suitable time for starting semisolid food. Most communities perform a religious function between 6th and 9th month of age. Table 8 shows that this is more prevalent in urban community (70%) followed by industrial (57.5%) and rural community (40%).

Chi-square on the association between social variables like maternal education, income level and caste and age of introduction of semisolids revealed a significant association with maternal education, income level and caste in industrial and urban areas (Table 9) i.e. the mothers drawn from educated, and upper socio-economic strata introduced semi-solids earlier than their counter parts in the other group. But in rural area only upper-caste mothers introduced semisolids earlier and other factors were not significant (Table 9). Analysis of the relation between length of breast-feeding and age of introduction of semi-solids (Tables 9 and 10) shows that the length (duration) of time the infant was exclusively breast fed is associated with the age of introduction of semisolids significantly in industrial and urban areas i.e. the longer the infant was exclusively breast-fed, the later semi-solids were likely to be introduced. But in rural area there was no such significant association (Table 9). A similar semi-solids in industrial and urban areas (Table 11) and in rural area the association is significant at 0.1 level only.

Table 12 shows the mean age of introduction of semisolids in relation to maternal education, income level and caste in industrial, urban and rural areas. The mean age of introduction by educated, high income group and caste mothers was earlier than their counterparts in the other groups.

Table 7: Percent distribution of type of first semisolid introduced in relation to maternal education, occupation of mother, income and caste

Particulars	Type of first semisolid			
	1	2	3	4
I. Industrial				
<i>Maternal Education</i>				
Illiterate	78.0	—	22.0	—
Upto High School	84.0	2.5	11.0	2.5
College and above	89.5	6	—	4.5
<i>Occupation of Mother</i>				
House-wife	87.5	3.0	6.5	3.0
Full-time	80.0	13.5	—	6.5
Part-time	100.0	—	—	—
<i>Per capita Income (Rs)</i>				
≤ 200	82.0	—	13.5	4.5
> 200 - ≤500	93.0	3.5	1.5	1.5
>500	80.5	7.5	7.5	4.5
<i>Caste</i>				
Upper	89.5	5.5	1.0	4.0
Lower	82.0	2.0	14.0	2.0
SC/ST	100.0	—	—	—
II. Urban				
<i>Maternal Education</i>				
Illiterate	33.5	33.5	24.0	9.0
Upto High School	60.5	12.5	8.5	18.5
College and above	79.0	12.0	4.0	5.0
<i>Occupation of Mother</i>				
House-wife	67.0	13.5	9.5	10.0
Full-time	63.5	17.0	7.0	12.5
Part-time	—	—	—	—
<i>Per capita Income (Rs)</i>				
≤ 200	27.0	21.5	21.5	30.0
>200 - ≤500	54.5	22.0	11.0	12.0
>500	92.0	6.5	—	1.5
<i>Caste</i>				
Upper	69.00	13.0	7.5	10.5
Lower	64.0	13.0	10.0	13.0
SC/ST	37.5	50.0	—	12.5
III. Rural				
<i>Maternal Education</i>				
Illiterate	2.0	41.0	51.5	5.5
Upto High School	26.5	25.5	27.5	10.5
College and above	—	—	—	—
<i>Occupation of Mother</i>				
House-wife	4.5	33.5	56.0	6.0
Full-time	50.0	12.5	37.5	—
Part-time	18.5	42.5	29.5	9.5
<i>Per capita Income (Rs)</i>				
≤ 200	4.5	46.0	42.5	7.0
> 200 - ≤500	100.0	—	—	—
<i>Caste</i>				
Upper	47.0	29.5	17.5	6.0
Lower	8.0	37.0	47.0	7.0
SC/ST	9.5	36.0	46.0	8.5

Note : 1. Market sealed food (Farex, Nestum, Cerelac etc.)
2. Semolina, Porridge, Sago etc. 3. Cereal preparations like rice, dal etc. 4. Green vegetables, fruit juice etc.

Table 8 : Practice of performing any ceremony at the time of introducing semisolid/solid food (in per cent)

Particulars	Performance of ceremony	
	Yes	No
Industrial	75.5	42.5
Urban	70.0	30.0
Rural	40.0	60.0

Table 9 : Chi-square analysis of age of introduction of semisolid in relation to maternal education, income and caste

Particulars	Age of introduction (months)	Maternal Education		
		Illiterate	Upto High School	College and above
Industrial	≤6	4	41	49
	>6 - ≤12	5	3	19
		$\chi^2=9.99$ p<0.01		
Urban	≤6	14	25	54
	>6 - ≤12	7	46	12
		$\chi^2=22.1$ p<0.01		
Rural	≤6	75	14	—
	>6 - ≤12	57	41	—
		$\chi^2=5.16$ p<0.01		

		Per capita Income (Rs.)		
		≤200	>200-500	>500
Industrial	≤6	17	0	37
	>6 - ≤12	5	18	4
		$\chi^2=6.25$ p<0.05		
Urban	≤6	27	41	35
	>6 - ≤12	10	14	41
		$\chi^2=13.43$ p<0.01		
Rural	≤6	63	26	0
	>6 - ≤12	22	75	1
		$\chi^2=44.16$ p<0.001		

		Caste		
		Upper	Lower	SC/ST
Industrial	≤6	59	33	2
	>6 - ≤12	26	11	0
		$\chi^2=4.19$ (not significant)		
Urban	≤6	57	40	6
	>6 - ≤12	34	29	2
		$\chi^2=1.01$ (not significant)		
Rural	≤6	8	40	41
	>6 - ≤12	9	65	24
		$\chi^2=10.01$ p<0.01		

Table 10 : Relationship between length of exclusive breast-feeding and age of introduction of semi-solid

Particulars	Length of exclusive breast-feeding (in months)	Age of introduction of semi solid (months)	
		≤6	>6
Industrial	≤3	79	11
	>3	15	16
		$\chi^2=20.15$ p<0.01	
Urban	≤3	75	28
	>3	28	37
		$\chi^2=15.66$ p<0.01	
Rural	≤3	13	12
	>3	76	86
		$\chi^2=0.01$ (not significant)	

Table 11 : Relationship between length of total breast-feeding and age of introduction of semisolid

Particulars	Length of total breast-feeding (months)	Age of introduction of semisolid (months)	
		≤ 6	>6
Industrial	≤ 6	36	21
	>6	58	6
		$\chi^2=13.1$ p<0.01	
Urban	≤ 6	43	17
	>6	60	48
		$\chi^2=4.21$ p<0.05	
Rural	≤ 6	1	6
	>6	88	92
		$\chi^2=3.64$ p<0.05	

Table 12 : Mean age of introduction of semisolids (in months)

Particulars	Industrial	Urban	Rural
Maternal Education			
Illiterate	8.5	9.58	15.19
Upto High School	6.5	6.08	11.27
College and above	4.6	4.10	—
Per capita Income(Rs)			
≤200	8.9	8.48	14.98
>200 - ≤500	5.6	7.87	8.11
>500	3.8	4.31	9.50
Caste			
Upper	4.3	5.69	10.35
Lower	6.5	7.31	10.95
SC/ST	8.5	9.00	12.10

Introduction of Solid Foods

The age of introduction of solid food was most common between 6-12 months (Table 13). Only 14% of the industrial mothers and 5% of urban mothers delayed the introduction of solid food beyond 12 months of age. There was no impact of parental education, per capita income, caste on age of introduction of solid food (Table 14). As the number of SC/ST in industrial and urban areas was very small, any interpretation of results in their case may have significant error.

Table 13 : Distribution of age of introduction of solid food (% in parentheses)

Age of introduction of solid food (months)	Industrial n = 107	Urban n = 143	Rural n = 137
≤ 6	5 (4.5)	15 (10.5)	38 (28)
>6 - ≤12	87 (81.5)	121 (84.5)	99 (72)
>12	15 (14)	7 (5)	—

The immediate aim of infant-feeding is to ensure a happy growing child, and if the child is happy and growing, the mother's method is probably a good one, even if it is unusual. But the success of the manner the infant is fed is also to be judged by his acquisition in later childhood of a reasonable interest in food and on unobtrusively efficient digestive system. The additional prospect and additional responsibility for the mother's advisors is that the child is laying the foundation of the bodily and mental health of his adult life. This will thus be influenced by the feeding he has in his first year. Most of our young mothers in rural areas are ignorant of wholesome infant-and-child rearing practices. The real key to successful child feeding lies with the improvement of the knowledge and competence of mothers. The health personnel, particularly employed in rural areas require better practical training in the promotion of wholesome and feasible feeding practices.

Table 14: Per cent distribution of age of introduction of solid food in relation to parental education, income and caste

Particulars	Age of Introduction of solid food (months)		
	≤6	>6-≤12	>12
I. Industrial			
<i>Maternal Education</i>			
Illiterate	14.5	64.5	21.0
Upto High School	4.0	77.0	19.0
College and above	2.0	90.0	8.0
<i>Paternal Education</i>			
Illiterate	50.0	33.5	16.5
Upto High School	2.5	84.0	13.5
College and above	2.0	84.0	14.0
<i>Per Capita Income (Rs)</i>			
≤ 200	6.5	71.0	22.5
>200 - ≤500	4.0	82.5	13.5
>500	4.0	92.0	4.0
<i>Caste</i>			
Upper	2.0	85.0	13.0
Lower	2.0	83.0	15.0
SC/ST	43.0	43.0	14.0
II. Urban			
<i>Maternal Education</i>			
Illiterate	23.5	47.0	29.5
Upto High school	10.5	86.5	3.0
College and above	8.5	91.5	—
<i>Paternal Education</i>			
Illiterate	50.0	—	50.0
Upto High School	82.5	7.0	10.5
College and above	8.5	91.5	—
<i>Per Capita Income (Rs)</i>			
200	40.0	48.0	12.0
>200 - 500	5.5	89.0	5.5
>500	3.0	95.0	2.0
<i>Caste</i>			
Upper	7.0	90.5	2.5
Lower	10.0	86.5	3.5
SC/ST	44.5	22.0	33.5
III. Rural			
<i>Maternal Education</i>			
Illiterate	38.5	61.5	—
Upto High School	11.0	89.0	—
College and above	—	—	—
<i>Paternal Education</i>			
Illiterate	31.5	68.5	—
Upto High School	25.0	75.0	—
College and above	—	—	—
<i>Per Capita Income (Rs)</i>			
≤200	35.0	65.0	—
>200 - ≤500	12.0	88.0	—
>500	—	100.0	—
<i>Caste</i>			
Upper	33.5	66.5	—
Lower	18.5	81.5	—
SC/ST	38.5	61.5	—

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