RESULTS AND DISCUSSION

I. Background information :

Table 52 presents the profile of the sample, in the 10 centres. A total of 334 subjects were enrolled out of which 202 (60%) were pregnant and 138 (40%) were lactating The enrolment at each of the different centres ranged from 27 to 45. Majority of the pregnant women were in the second and the third trimester and very few (6%) in the I trimester. Only those lactating women whose infants were upto 6 months of age were enrolled The average parity was 2.89. Majority (65%) of the subjects were Gujaratis and 20% were Muslims. The other ethnic groups were Maharashtrian, Rajasthanis, and North Indians. In one of the centres the number of Muslim women was particularly high (56%). About 63% of the subjects came from nuclear families and the rest (37%) were living in a joint family. The average size of the family was 5.5 . Illiteracy was common, 45% subjects being illiterte. Thirteen percent women had undergone primary education; 20% secondary education and 22% higher secondary. None of the subjects was a graduate. The illiteracy rate was quite high (25%) even among the husbands of these women. Majority (65%) of the husbands of the subject had a salaried occupation. Thirty percent of them were daily wage earners. The per capita income on an average was Rs. 127/- per month, ranging from as low as Rs. 50/- to Rs. 350/- or more. The average age of the pregnant and lactating women was 25 years and most of them were in the age group of 18 to 32 years.

Acceptability of methi biscuits among the pregnant and lactating subjects

Most of the subjects enrolled were very shy and inhibited in consuming the biscuits at the centre even for the purpose of determining the acceptability. Therefore, it was difficult to asess the number of biscuits each subject could consume which would indicate the acceptability. However the subjects were requested to taste the biscuits and give their responses regarding the bitterness of the biscuits. These responses are tabulated in Table 53. Out of 209 subjects who tasted these biscuits, 49% did not find them very bitter; 33% said that the biscuits were bitter and 8% said that they were very bitter. All these subjects were willing to consume the biscuits inspite of the bitter taste and hence it was considered as accepted. About 10 % of the subjects found the bitterness of the biscuits intolerable and they refused to consume them. Thus the majority of the subjects accepted the biscuits. For further analysis of the data only two categories, i.e. accept or reject were made.

As shown in Table 54, methi biscuits were significantly more acceptable by the lactating subjects as compared to the pregnant subjects. However the rate of

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Table 52 : Background information on the pregnant and lactating subjects enroled for the study

S.No.	Particulars	n	%
1.	Total subjects enroled	334	-
2.	Number of pregnant women	202	60
	I trimester	12	6
	II trimester	115	57
	III trimester	75	37
3.	Number of lactating women	132	40
	at 1 m of lactation	37	28
	at 2 m of "	12	9
	at 3 m of "	14	11
	at 4 m of "	17	13
	at 5 m of "	43	32
	at 6 m of "	9	7
4.	Parity		
	1	68	22
	2	86	28
	3	68	22
	4	43	14
	5	23	8
	6	20	6
	Mean ± SE	2.87 ±	0.15
5.	Ethnic group		
	Gujaratis	206	65
	Muslims	63	20
	Others (Maharashtrian, Rajesthanis, Punjabis)	50	15
6.	Type of family		
	Joint	113	37
	Nuclear	196	63
7.	Family size (Mean ± SE)	5.51 ±	0.24

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S.No.	Particulars	n	%
8.	Education of the subject		
	Nil	117	45
	Primary	33	13
	Secondary	51	20
	Higher secondary	58	22
9.	Education of the husband		
	Nil	64	25
	Primary	33	13
	Secondary	52	20
	Higher Secondary	85	33
	Graduation	23	9
10.	Occupation of the husband		
	Daily wage earner	91	30
	Service	201	65
	Business	15	6
11.	Per capita income (Rs.)		
	< 50	18	6
	51 - 150	205	68
	151 - 250	65	21
	251 - 350	10	3
	351 - 450	6	2
	Mean ± SE	126.8 ±	6.98
12.	Age of the subjects (years)		
	< 17	4	1
	18 - 20	63	21
	21 - 23	62	21
	24 - 26	88	29
	27 - 29	16	5
	30 - 32	46	15
	33 - 36	22	8
	Mean ± SE	24.88 ±	7.86

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Table 53 : Acceptability of methi biscuits among the pregnant and lactating subjects

Rsponse to the biscuits	n	%
Not Very Bitter*	102	49
Bitter*	69	33
Very Bitter*	17	8
Intolerable+	21	10

*Accepted; + - rejected.

Table 54 : Acceptability of methi biscuits by pregnant versus lactating subjects

	Pregnant		Lactating		Total	
	n	%	n	%	n	%
Accept	99	85	89	96	188	90
Reject	17	15	4	4	21	10
Chisquare	5.211*					
df 1						

* $P < .05$

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acceptance in both the groups was high (>85%). There was no significant difference in the acceptability by pregnant women in different trimesters (Table 55) or by lactating women at different months of lactation as shown in Table 56.

Acceptability of methi biscuits in relation to the parity, ethnic group, type of the family, education of the subject and per capita income.

Since the acceptability of the methi biscuits by both the pregnant and lactating women was high (>85%), the data for these two groups was pooled to determine if other factors such as parity, ethnic group, type of the family, education and per capita income influenced the acceptability.

As revealed by Table 57, parity (from 1 to 6 or more) was not correlated with the acceptability. Among the ethnic groups, the acceptability was slightly higher by the Gujarati subjects as compared to Muslims and other ethnic groups. However, the difference was not significant. The type of family (joint vs nuclear), education of the subject (illiterate vs literate) and the per capita income (>150 Rs./month or > 175 Rs./month) did not influence the acceptability as shown in Tables 58 to 61 respectively.

In the study conducted by the PFNDAI (1977) in which methi biscuits were given to pregnant and lactating women, 23% women expressed a negative reaction (bitter, hot, hard in texture) towards the biscuits. The response of the remaining 67% was positive i.e. they believed that the biscuits were good for their and the child's health, had good appearance and good taste. Compared to the PFNDAI study, the acceptability of the methi biscuits in the present study, was found to be higher as only 10% of the subjects rejected the taste.

Acceptability of methi biscuits among preschool children attending the ICDS centres

A total of 301 preschool children attending the 10 ICDS study centres were given biscuits to taste. The criteria for acceptability were :

(1) demand for more biscuits and

(2) the number of biscuits consumed by each child.

Table 62 summarizes the responses obtained from this trial. As shown in the Table, more than half of the children i.e. 54% were unable to consume even one biscuit. Only 25% children asked for more than one biscuit and very few (about 2%) could consume more than four biscuits. Thus the findings of the product development (Chapter) were essentially confirmed in this study.

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Table 55 : Acceptability of methi biscuits by pregnant subjects in different trimesters

	I Trimester		II Trimester		III Trimester		Total	
	Accept	Reject	Accept	Reject	Accept	Reject	Accept	Reject
n	10	1	59	9	30	7	99	17
%	91	9	87	13	81	19	85	15

Chisquare 0.91^{NS}

df 2

NS : Not significantly different.

Table 56 : Acceptability of methi biscuits by lactating subjects at different months of lactation

	0 - 2 m		2 - 4 m		4 - 6 m		Total	
	n	%	n	%	n	%	n	%
Accept	38	97	21	91	30	97	89	96
Reject	1	3	2	2	1	3	4	4

Chisquare 1.47^{NS}

df 2

NS - Not significantly different

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Table 57 : Acceptability of methi biscuits by pregnant and lactating subjects in relation to the parity

Parity	Accept		Reject	
	n	%	n	%
1	35	81	8	19
2	56	92	5	8
3	40	87	6	13
4	26	93	2	7
5	16	89	2	11
6	16	94	1	6
Total	**189**	**90**	**24**	**10**
Chisquare	4.00^{NS} (df 2)			

Table 58 : Acceptability of methi biscuits by pregnant and lactating subjects belonging to different ethnic groups

Ethnic group	Accept		Reject	
	n	%	n	%
Gujarathi	133	92	12	8
Muslims	35	83	7	17
Others*	21	88	3	12
Total	**189**	**90**	**22**	**10**

Chisquare : 2.59^{NS} (df 2)

*Punjabis, Rajasthanis & other North Indians.

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Table 59 : Acceptability of methi biscuits among pregnant and lactating subjects belonging to joint and nuclear families

Type of family	Accept		Reject	
	n	%	n	%
Joint	79	92	7	8
Nuclear	110	88	15	12
Chisquare	0.452^{NS}	(df - 1)		

Table 60 : Acceptability of methi biscuits by literate vs illiterate pregnant and lactating subjects

Education		Accept		Reject	
		n	%	n	%
Literate		83	87	12	13
Illiterate	Chisquare 0	63	87	9	13

Table 61 : Acceptability of methi biscuits by pregnant and lactating subjects in relation to the per capita income

Per Capita Income (Rs.)	Accept		Reject	
	n	%	n	%
< 150	150	91	15	9
151 - 174	9	82	2	18
> 175	30	86	5	14
Chisquare :	0.38^{NS}	(df - 2)		

From this trial it can be predicted that the sharing of the methi biscuits among children of the preschool age group would be minimum. Even if sharing was to occur, the number of biscuits consumed by the children would be much less than if sweet biscuits were to be offered.

Regularity of collection of sweet and methi biscuits

The regularity of collection was defined as the number of days on which the subjects collected the biscuits from the centre divided by the number of days on which the biscuits were distributed in the centre. This was expressed as a percentage, since the number of distribution days differed from centre to centre and ranged from 10 to 15 for each type of biscuit. The distribution was done on every alternate day or once in three days if due to some reason such as holidays, it could not be done every alternate day.

The regularity of collection was considered as low when the subjects collected the biscuits for less than or equal to 50% of the distribution days ; average if it was 51 to 74% and high if it was more than or equal to 75%.

As shown in Table 63, there was a considerable difference in the collection of sweet and methi biscuits, collection being more regular for sweet biscuits. However, the majority of subjects i.e. 70% collected even the methi biscuits quite regularily i.e. more than 75% of the distribution days. Seventeen percent of subjects were poor collectors of methi biscuits. This low rate could be due to a dislike for the biscuits. Similar results were obtained in the pilot trial in product development (chapter 4 page 130), wherein 18% of the subjects did not come to collect the biscuits indicating rejection.

Thus more than 80% pregnant and subjects collected the methi biscuits for about a month which was a fairly long time for product testing. The regularity of collection can also be considered as an important indicator of acceptability.

The regularity of collection was not studied by PFNDAI (1977) in a similar study on the acceptability of methi biscuits.

Table 62 : Acceptability of methi biscuits among preschool children beneficiaries of the ICDS

Observation	n	%
Number of children for the trial	*301*	-
Number of children who did not eat any biscuit	*162*	*54*
Number of children who ate only one biscuit	*65*	*21*
Number of children asking for more than one biscuit	*74*	*25*
Number of biscuits consumed		
Nil	*162*	*54*
1 - 2	*110*	*37*
3 - 4	*25*	*8*
> 4	*2*	*0.6*

Table 63 : Regularity of collection of sweet vs methi biscuits by the study subjects

*Regularity of collection**	*Sweet biscuits*		*Methi biscuits*	
	n	%	n	%
< 50%	*3*	*2*	*24*	*17*
50 - 74%	*11*	*8*	*18*	*12*
> 75%	*129*	*90*	*101*	*71*
Chisquare	*21.43****			
df 2				

* *Regularity of collection* $= \frac{\text{Number of days on which collected}}{\text{Number of days on which distributed in the centre.}} \times 100$

*** $p < .001$

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Regularity of collection of sweet and methi biscuits by pregnant vs lactating subjects.

As shown in Table 64, there was no difference in the collection of sweet biscuits by pregnant and lactating subjects. About 90% of the subjects in both the groups were good collectors or collected the biscuits for more than 75% of the distribution days. The lactating subjects were better collectors of methi biscuits as compared to the pregnant women. However, the difference was not found to be significant. Thus majority of the pregnant women collected the methi biscuits regularly inspite of the belief that methi should not be consumed during pregnancy (as reported earlier in study I on Habit survey). There was no difference in the collection rate of sweet or methi biscuits between the first, second or third trimester of pregnancy (Table 65). During lactation, the subjects in the first two months of lactation were better collectors of sweet biscuits as compared to the subjects in second to sixth month of lactation (Table 66). However all the subjects were equally regular in collecting the methi biscuits.

Thus, the trimester of pregnancy or the month of lactation did not affect the acceptability of methi biscuits as indicated by the regularity of collection.

Regularity of collection by pregnant and lactating subjects in relation to parity, ethnic group, type of the family, education and the per capita income.

Since both the pregnant and lactating subjects were good collectors of the sweet and methi biscuits, for further analysis the data for pregnant and lactating subjects were pooled.

As shown in Table 67, the subjects who had 5 or more children were the best collectors of sweet biscuits as compared to those who had 4 or less than 4 children. This could be due to the increased sharing of the sweet biscuits. In contrast there was no definite trend in the relation of regularity of collection of methi biscuits and parity. It could be inferred from this observation that the sharing of methi biscuits was minimal.

Table 68 Shows the regularity of collection in different ethnic groups. Gujrati subjects were better collectors than Muslim subjects for both sweet and methi biscuits. However, the difference was more pronounced for methi biscuits which could be due to the fact that methipak is generally a food consumed by Gujaratis and Maharashtrians.

There was no difference in the collection of sweet biscuits by subjects

Table 64 : Regularity of collection of sweet and methi biscuits by pregnantvs lactating subjects

	Sweet Biscuits						Methi Biscuits					
	< 50%		51 - 74 %		> 75%		< 50%		51 - 74%		> 75%	
	n	%	n	%	n	%	n	%	n	%	n	%
Pregnant	3	2	11	8	129	90	24	17	18	12	101	71
Lactating	1	1	9	8	106	91	12	11	9	8	91	81
Total	4	2	20	8	235	90	36	14	27	11	192	75
Chisquare			0						3.80^{NS}			
df 2												

NS - Not significantly different.

Table 65 : Regularity of collection of sweet and methi biscuits by pregnant subjects in different trimesters

Trimester	Sweet Biscuits						Methi Biscuits					
	< 50%		50 - 74%		> 75%		< 50%		50 - 74%		> 75%	
	n	%	n	%	n	%	n	%	n	%	n	%
I	-	-	1	8	12	92	1	8	1	8	11	84
II	2	3	9	11	69	86	14	18	12	16	50	66
III	1	2	1	2	48	96	9	17	5	9	40	74
Total	3	2	11	8	129	90	24	17	18	12	101	71
Chisquare. df 4	4.09^{NS}								2.80^{NS}			

NS - Not significantly different.

Table 66 : Regularity of collection of sweet and methi biscuits by lactating subjects at different months of lactation

Months of Lactation	Sweet Biscuits						Methi Biscuits					
	< 50%		51 - 74%		> 75%		< 50%		51 - 74%		> 75%	
	n	%	n	%	n	%	n	%	n	%	n	%
0 - 2	-	-	1	2	41	98	4	10	4	10	34	80
2 - 4	1	3	3	9	29	88	3	10	2	7	24	83
4 - 6	-	-	5	12	36	88	5	12	3	8	33	80
Total	1	1	9	8	106	91	12	11	9	8	91	81
Chisquare (df 4)			7.50^{NS}						0.34^{NS}			

NS - Not significantly different.

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Table 67 : Regularity of collection of sweet and methi biscuits by pregnant and lactating subjects in relation to parity

Parity	Sweet Biscuits						Methi Biscuits					
	< 50%		51 - 74%		> 75%		50%		51 - 74%		> 75%	
—	n	%	n	%	n	%	n	%	n	%	n	%
1	1	2	7	14	43	84	7	14	8	16	36	70
2	1	1	6	8	72	91	7	9	6	8	61	83
3	2	4	3	5	52	91	13	24	7	13	35	63
4	-	-	5	17	25	83	5	14	4	11	27	75
5	-	-	-	-	18	100	3	15	-	-	17	85
6	-	-	-	-	22	100	2	9	2	9	19	82
Total	4	2	21	8	232	90	37	14	27	11	195	75
Chisquare - (df - 10)			5.55^{NS}						11.27^{NS}			

NS - Not significantly different.

Table 68 : Regularity of collection of sweet and methi biscuits by pregnant and lactating subjects belonging to different ethnic groups

Ethnic Group	Sweet Biscuits						Methi Biscuits					
	< 50%		51 - 74%		> 75%		< 50%		51 - 74%		> 75%	
	n	%	n	%	n	%	n	%	n	%	n	%
Gujaratis	3	2	9	6	146	92	14	9	16	10	133	81
Muslims	-	0	9	17	45	83	13	24	7	13	34	63
Others	1	2	3	7	38	91	9	23	4	10	27	67
Total	4	2	21	8	229	90	36	14	27	11	194	75
Chisquare (Guj vs Mus)			7.40*						Guj vs Mus 12.05*			
df 2												

*p < 0.05

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from joint or nuclear families as revealed by Table 69. For methi biscuits, the collection was slightly better although not significantly different by the subjects belonging to joint families as compared to those from nuclear families. A possible explanation for this could be that, methi biscuits might be consumed to a certain extent by the elderly family members since methi is supposed to be good for rheumatic pain which is common in this age group.

Education made no significant difference in the collection rate of sweet and methi biscuits as seen in Table 70.

In Table 71, the data on the collection rate in relation to the per capita income per month are presented. The collection of sweet biscuits was significantly higher when the per capita income was less than or equal to Rs. 150/- as against the collection when the per capita income was more than or equal to Rs. 175/- per month. However the per capita income did not influence the collection of methi biscuits. This might be due to the possibility that the women associated these biscuits with therapeutic properties, Another reason could be the non availability of methi biscuits in the market.

Sharing of sweet and methi biscuits by pregnant and lactating subjects.

Table 72 compares the sharing of methi biscuits with sweet biscuits. Out of all the women interviewed, 25% reported that they shared methi biscuits as against 63% who shared sweet biscuits. This difference was highly significant.

As shown in Table 73, there was no difference in the number of pregnant or lactating women who shared either the sweet or methi biscuits. The trimester of pregnancy or the month of lactation also had no effect on the sharing of the biscuits as revealed by Tables 74 and 75 respectively.

Sharing of sweet and methi biscuits in relation to parity, ethnic group, type of family, education and per capita income.

Since there was no difference in the sharing characteristics of the sweet or methi biscuits by pregnant and lactating subjects, the data were pooled for the pregnant and lactating subjects for further analysis. Parity or number of children affected the sharing of sweet biscuits (Table 76). Sharing was significantly less by the first para as compared to the women who were multiple para. There was no difference in the sharing by women in second to sixth parity. Thus, it is clear that children are the major sharers of the maternal food supplement. There was no definite trend in the sharing of methi biscuits in relation to the parity.

The ethnic group, type of family (nuclear or joint), education of the subject

Table 69 : Regularity of collection of sweet and methi biscuits by pregnant and lactating subjects belonging to joint and nuclear families

Type of family	Sweet Biscuits						Methi Biscuits					
	< 50%		51 - 74%		> 75%		< 50%		51 - 74%		> 75%	
	n	%	n	%	n	%	n	%	n	%	n	%
Joint	2	2	11	9	112	89	9	9	12	12	82	79
Nuclear	4	3	13	8	136	89	27	18	15	10	108	72
Total	6	2	24	9	248	89	36	14	27	11	190	75
Chisquare			0.339^{NS}						4.31^{NS}			
df 2												

NS Not significantly different.

Table 70 : Regularity of collection of sweet and methi biscuits by literate vs illiterate pregnant and lactating subjects

	Sweet Biscuits						Methi Biscuits					
	< 50%		51 - 74%		> 75%		< 50%		51 - 74%		> 75%	
	n	%	n	%	n	%	n	%	n	%	n	%
Literate	3	3	13	12	96	85	11	11	3	13	78	76
Illiterate	1	1	8	8	93	91	23	21	14	13	70	66
Total	4	2	21	10	189	88	34	16	27	13	148	71
Chisquare			1.77^{NS}						4.58^{NS}			
df - 2												

NS - Not significantly different.

Table 71 : Regularity of collection of sweet and methi biscuits by pregnant and lactating subjects in relation to the per capita income

Per capita Income Rs.	Sweet Biscuits						Methi Biscuits					
	< 50%		51 - 74%		> 75%		< 50%		51 - 74%		> 75%	
	n	%	n	%	n	%	n	%	n	%	n	%
< 150	1	0	19	10	181	90	25	12	20	10	155	78
> 175	7	16	2	5	35	79	6	13	5	11	36	76
Total	8	3	21	9	216	88	31	13	25	10	191	77
Chisquare	27.82***						0.02^{NS}					
df 2												

NS - Not significantly different.

*** - P < .001

Table 72 : Sharing of sweet and methi biscuits by the subjects

	Sweet Biscuits		Methi Biscuits	
	n	%	n	%
Shared	84	63	25	25
Not shared	50	37	74	75
Chisquare	37.42***			
df 1.				

*** P < .001

Table 73 : Sharing of sweet biscuits and methi biscuits by pregnant vs lactating subjects

	Sweet Biscuits				Methi Biscuits			
	Shared		Not shared		Shared		Not shared	
	n	%	n	%	n	%	n	%
Pregnant	84	63	50	37	25	23	85	77
Lactating	64	64	36	36	26	25	76	75
Total	148	63	86	37	51	24	161	76
Chisquare		0				0.09^{NS}		

NS - Not significantly different.

Table 74 : Sharing of sweet and methi biscuits by pregnant subjects in different trimesters

Trimester	Sweet Biscuits				Methi Biscuits			
	Shared		Not shared		Shared		Not shared	
	n	%	n	%	n	%	n	%
I	4	36	7	64	-	-	11	100
II	48	63	28	37	17	26	48	74
III	32	68	15	32	8	24	26	76
Total	84	63	50	37	25	25	74	75
Chisquare		3.85^{NS}				0.08^{NS}		

NS - Not significantly different.

Table 75 : Sharing of sweet biscuits and methi biscuits by lactating subjects at different months of lactation

Month of Lactation	Sweet Biscuits				Methi Biscuits			
	Shared		Not shared		Shared		Not shared	
	n	%	n	%	n	%	n	%
0 - 2	22	58	16	42	9	21	34	79
2 - 4	17	61	11	39	10	38	16	62
4 - 6	25	74	9	26	7	21	26	79
Total	64	64	36	36	26	25	76	75
Chisquare		2.08^{NS}				3.10^{NS}		
df 2								

NS - Not significantly different.

Table 76 : Sharing of sweet biscuits and methi biscuits by pregnant and lactating subjects in relation to the parity

Parity	Sweet Biscuits				Methi Biscuits			
	Shared		Not shared		Shared		Not shared	
	n	%	n	%	n	%	n	%
1	15	36	27	64	2	6	30	94
2	41	61	26	39	12	18	55	82
3	35	67	17	33	17	39	27	61
4	27	79	7	21	14	47	16	53
5	15	71	6	29	-	-	17	100
6	13	76	4	24	5	28	13	72
Total	146	63	87	37	50	24	158	76
Chisquare		20.13***				25.95***		

*** P < .001

and the per capita income did not affect the sharing of either sweet or methi biscuits as shown in Tables 77 to 80 respectively.

Sharing of sweet and methi biscuits in the first half and the second half of the testing period.

In order to determine if the change over of treatment from sweet biscuits to mehti biscuits or vice versa, had any effect on the sharing of the biscuits, the responses in the first half of the experiment were compared with those of the second half. In the first half of the experiment (one month) 5 centres were given methi biscuits and 5 centres were given sweet biscuits. In the second half, the order was reversed, that is, those centres where methi biscuits were given in the first half were now given sweet biscuits. Thus each half could be considered as a complete experiment.

As represented in Tables 81 and 82, the sharing of methi biscuits was much less than that of sweet biscuits in both experimental periods.

Sharing of methi biscuits in the first half was also compared with sharing in the second half. As shown in Table 83, 36% women reported that they shared methi biscuits in the first half of the experiment as against 15% women who shared it in the second half of the experiment. This could be because the women who were given methi biscuits in the second half were given sweet biscuits in the first half. It is possible that the children got used to consuming sweet biscuits and therefore found the methi biscuits too bitter and therefore did not demand them.

Likewise, the sharing of sweet biscuits increased from the first half & the second half as shown in Table 84. The possible explanation could be again because the children who were eating methi biscuits when given sweet biscuits found them much more acceptable.

Thus sharing of methi biscuits although not completely curtailed, was minimised to a great extent. Approximately 26% pregnant and lactating women (of the total sample), mentioned that they shared the methi biscuits. This is in agreement with the results of the acceptability trials on preschool children wherein 25% of the children could tolerate the bitter taste of the biscuits.

These children could have asked their mothers for the biscuits. However, it is to be noted that although 25% children asked for methi biscuits only 2% could eat more than 2 biscuits. Thus extent of sharing would have been minimal.

Table 77 : Sharing of sweet biscuits and methi biscuits by pregnant and lactating subjects belonging to different ethnic groups

Ethnic Group	Sweet Biscuits				Methi Biscuits			
	Shared		Not shared		Shared		Not shared	
	n	%	n	%	n	%	n	%
Gujaratis	93	63	54	37	35	25	107	75
Muslim	22	52	20	48	7	18	32	82
Others	25	64	14	36	10	34	19	66
Total	140	61	88	39	52	25	158	75
Chisquare	1.77^{NS}				2.44^{NS}			
df 2								

NS - Not significantly different.

Table 78 : Sharing of sweet biscuits and methi biscuits by pregnant and lactating women belonging to joint vs nuclear families

	Sweet Biscuits				Methi Biscuits			
	Shared		Not shared		Shared		Not shared	
	n	%	n	%	n	%	n	%
Joint	54	59	37	41	17	21	65	79
Nuclear	93	64	52	36	35	28	90	72
Total	147	62	89	38	52	25	155	75
Chisquare	0.36^{NS}				1.03^{NS}			

NS - Not significantly different.

Table 79 : Sharing of sweet biscuits and methi biscuits by literate vs illiterate pregnant and lactating subjects

	Sweet Biscuits				Methi Biscuits			
	Shared		Not shared		Shared		Not shared	
	n	%	n	%	n	%	n	%
Literate	77	72	30	28	30	32	63	68
Illiterate	64	63	37	37	18	23	61	77
Total	141	68	67	32	48	28	124	72
Chisquare		1.38^{NS}				1.46^{NS}		

NS - Not signicantly different.

Table 80 : Sharing of sweet biscuits and methi biscuits by pregnant and lactating subjects in relation to per capita income

Per capita Income Range (Rs.)	Sweet Biscuits				Methi Biscuits			
	Shared		Not shared		Shared		Not shared	
	n	%	n	%	n	%	n	%
< 150	113	63	65	37	40	24	127	76
> 175	25	63	15	37	9	28	23	72
Total	138	63	80	37	49	25	150	75
Chisquare		0				0.07^{NS}		

NS - Not significantly different.

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Table 81 : Sharing of sweet biscuits and methi biscuits in the first half of the experiment

	Sweet Biscuits		*Methi Biscuits*	
	n	**%**	**n**	**%**
Shared	*49*	*49*	*40*	*36*
Not shared	*52*	*51*	*72*	*64*
Chisquare	*66.45****			
(df 1)				

*** p < 0.001

Table 82 : Sharing of sweet biscuits vs methi biscuits in the second half of the experiment

	Sweet Biscuits		*Methi Biscuits*	
	n	**%**	**n**	**%**
Shared	*101*	*74*	*15*	*15*
Not shared	*35*	*26*	*82*	*85*
Chisquare	*75.97****			
(df 1)				

*** p < .001

Table 83 : Sharing of methi biscuits in the I half of the experiment versus sharing of methi biscuits in the II half of the experiment

	I half		*II half*	
	n	**%**	**n**	**%**
Shared	*40*	*36*	*15*	*15*
Not shared	*72*	*64*	*82*	*85*
Chisquare	*1.97**			
df 1				

* p < 0.05

In the PFNDAI (1977) study sharing of methi biscuits was reported to by 10% of the subjects, and the extent of sharing was low i.e. children ate very few biscuits.

As compared to the sharing of methi biscuits, the sharing of sweet biscuits was very high. More than 60% of the subjects reported of sharing the sweet biscuits with their children.

The data on the consumption of biscuits by pregnant and lactating women might give an indication of the amount shared.

Who shared the biscuits ?

Table 85 gives data on the family members with whom the sweet and methi biscuits were shared. Seventy five percent subjects (who shared at all) shared the methi biscuits with children as against 95% for sweet biscuits. In case of methi biscuits 20% of the subjects shared them with elderly family members like the mother-in-law or the father-in-law. This could be because of the prevalent belief that fenugreek seeds reduce the rheumatic or arthritic pains which are common in old age. Sweet biscuits were not shared by old people. Women seldom shared the biscuits whether sweet or methi, with their husbands.

An attempt was made to determine which group of children (preschooler or schooler) shared the biscuits most. In Table 86, a comparison is made between sharing in families without any children, families with both preschool and school children, families with only only preschooler and families with only schoolers. There were very few families with only schoolers and majority of the families had only preschool children. There was a significant difference in the sharing in the families with preschoolers vs that with schoolers - for sweet biscuits. There was not much difference in the sharing of methi biscuits by preschooler vs schoolers. Thus although this observation is subjective to some extent, it can be inferred that the major sharers of the maternal supplement were preschool children. This could be becuse, they are the ones who remain with the mothers most of the time, whereas children of school age either remain in school or are playing outside their homes.

Similar findings have been reported by Gopaldas et al (1975) and ICMR (1981) where the 'take home' supplement given to the mothers was usually shared by preschool children and barely by other members of the family.

Consumption of sweet and methi biscuits by pregnant and lactating subjects.

The actual consumption of the biscuits by the subjects was one of the most important aspects of the study. Eventhough it was shown that the sharing of methi biscuits

Table 84 : Sharing of sweet biscuits in the I half of the experiment versus sharing of sweet biscuits in the II half of the experiment

	I half		II half	
	n	%	n	%
Shared	49	49	101	74
Not shared	52		35	26
Chisquare (df 1)		15.45**		

** $p < .01$

Table 85 : Family members with whom sweet biscuits and methi biscuits were shared

Family Members	Sweet Biscuits		Methi Biscuits	
	n	%	n	%
Children	137	95	44	75
Elders	1	1	12	20
Others	6	4	3	5

Table 86 : Sharing of sweet and methi biscuits in families with preschoolers versus families with schoolers

	Sweet Biscuits				Methi Biscuits			
	Shared		Not shared		Shared		Not shared	
	n	%	n	%	n	%	n	%
Families without preschoolers & schoolers	10	26	28	74	-	0	25	100
Families with preschoolers & schoolers	58	76	18	24	20	30	47	70
Families with only preschoolers	68	70	29	30	29	34	57	66
Families with only schoolers	3	38	5	62	2	22	7	78

was minimal, it was essential to determine if the women were consuming the biscuits themselves or not. Again, since it was not possible to objectively assess the actual amount consumed by each subject, this information was collected by interviewing the subjects.

In Table 87, the consumption of sweet biscuits is compared with that of methi biscuits. The consumption was considered as low when it was less than or equal to half a packet (50 g or 8 biscuits) and high when the women consumed more than or equal to half a packet each per day. As shown in the table, when the biscuits were sweet, 36% of the subjects reported that they consumed one packet per day, whereas in case of methi biscuits 57% women reportedly consumed one packet per day without sharing. The difference was found to be statistically significant.

There was no significant difference in the consumption of both the types of biscuits by pregnant or lactating subjects as shown in Table 88. As revealed by Table 89, pregnant women in the first trimester reportedly consumed higher amount of biscuits as compared to those in the second or third trimester. However, since the number of subjects in the first trimester was small, no definite conclusion can be drawn from this finding. The consumption of both the sweet and methi biscuits was essentially the same by lactating subjects at different months of lactation as shown in Table 90.

Consumption of sweet and methi biscuits in relation to parity, ethnic group, type of family, education and per capita income.

Since there was no difference in the consumption pattems of sweet and methi biscuits by pregnant and lactating subjects, the data of both the groups i.e. pregnant and lacating subjects were pooled for further analysis.

As shown in Table 91 , parity made no significant difference in the consumption of methi biscuits. For sweet biscuits, the consumption was higher by first or second para as compared to women who had more than 2 children. Ethnic group, education, type of family and per capita income did not significantly affect the consumption of both sweet and methi biscuits (Tables 92 to 95).

It can be inferred from the data on consumption that the sharing of mehti biscuits was much less than that of sweet biscuits. The consumption of methi biscuits was higher possibly because they were available to the mothers to eat as children did not demand them.

One of the major shortcomings of providing special supplement to pregnant and lactating women, which was also pointed out by the PFNDAI (1977), is that,

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Table 87 : Claimed amount of sweet and methi biscuits consumed by the pregnant and lactating subjects

Consumption	Sweet Biscuits		Methi Biscuits	
	n	%	n	%
Low				
< 1/2 Packet	30	14	8	4
1/2 Packet	54	25	34	17
High				
> 1/2 Packet	56	26	44	22
1 Packet	79	36	116	57
Chisquare between high & low df 1	13.13***			

*** p < 0.001

Table 88 : Claimed consumption of sweet and methi biscuits by pregnant vs lactating subjects

	Sweet Biscuits				Methi Biscuits			
	Low *		High		Low		High	
	n	%	n	%	n	%	n	%
Pregnant	57	43	76	57	28	26	79	74
Lactating	37	37	63	63	21	21	79	79
Total	94	40	139	60	9	24	158	76
Chisquare	0.58^{NS}				0.50^{NS}			

* Low : < 1/2 packet
High : > 1/2 Packet

NS - Not significantly different.

Table 89 : Claimed consumption of sweet and methi biscuits by pregnant subjects in different trimesters

Trimester	Sweet Biscuits				Methi Biscuits			
	Low		High		Low		High	
	n	%	n	%	n	%	n	%
I	2	18	9	82	2	18	9	82
II	34	45	42	55	17	27	46	73
III	21	46	25	54	9	27	24	73
Total	27	43	76	57	28	26	79	74
Chisquare	3.583^{NS}				3.00^{NS}			
df 2								

Low < packet : High > 1/2 packet

NS - Not significantly different.

Table 90 : Claimed consumption of sweet biscuits and methi biscuits by lactating subjects at different months of lactation.

Month of Lactation	Sweet Biscuits				Methi Biscuits			
	Low		High		Low		High	
	n	%	n	%	n	%	n	%
0 - 2	11	31	25	69	8	19	35	81
2 - 4	10	34	19	66	7	29	17	71
4 - 6	16	46	19	54	6	18	27	82
Total	37	37	63	63	21	21	79	79
Chisquare (df 2)	1.86^{NS}				1.27^{NS}			

NS : Not significantly different

Low < 1/2 packet : High > 1/2 packet

Table 91 : Claimed consumption of sweet and methi biscuits by pregnant and lactating subjects in relation to parity

Parity	Sweet Biscuits				Methi Biscuits			
	Low		High		Low		High	
	n	%	n	%	n	%	n	%
1	5	15	28	85	8	20	32	80
2	12	18	54	82	20	30	46	70
3	17	39	26	61	32	56	25	44
4	6	21	23	79	17	50	17	50
5	4	22	14	78	12	57	9	43
6	5	29	12	71	12	71	5	29
Total	49	24	157	76	101	43	134	57
Chisquare (df 5)	8.86^{NS}				25.21^{***}			

*** $p < 0.001$ NS - Not significantly different

Low - < 1/2 packet : High > 1/2 packet.

Table 92 : Claimed consumption of sweet and methi biscuits by pregnant and lactating subjects belonging to different ethnic groups

Ethnic group	Sweet Biscuits				Methi Biscuits			
	Low		High		Low		High	
	n	%	n	%	n	%	n	%
Gujaratis	58	39	90	61	30	21	112	79
Muslims	16	36	28	64	11	30	26	70
Others	19	49	20	51	9	30	21	70
Total	93	40	138	60	50	24	159	76
Chisquare (df 2)		1.50^{NS}				1.90^{NS}		

NS : Not significantly different

Low < 1/2 packet : High > 1/2 packet.

Table 93 : Claimed consumption of sweet and methi biscuits by pregnant and lactating subjects belonging to joint and nuclear families

Type of Family	Sweet Biscuits				Methi Biscuits			
	Low		High		Low		High	
	n	%	n	%	n	%	n	%
Joint	34	37	58	63	17	21	65	79
Nuclear	60	42	82	58	31	25	91	75
Total	94	40	140	60	48	24	156	76
Chisquare (df 1)		0.45^{NS}				0.364^{NS}		

NS : Not significantly different

Low < 1/2 packet : High > 1/2 packet

Table 94 : Claimed consumption of sweet and methi biscuits by literate vs illiterate pregnant and lactating subjects

	Sweet Biscuits				Methi Biscuits			
	Low		High		Low		High	
	n	%	n	%	n	%	n	%
Literate	46	43	62	57	30	32	64	68
Illiterate	42	42	57	58	15	19	62	81
Total	88	43	119	57	45	26	126	74
Chisquare (df 1)		0					2.76^{NS}	

NS : Not significantly different

Low : < 1/2 packet ; High > 1/2 packet

Table 95 : Claimed consumption of sweet and methi biscuits by pregnant and lactating subjects in relation to per capita income

Per Capita Income Rs.	Sweet Biscuits				Methi Biscuits			
	Low		High		Low		High	
	n	%	n	%	n	%	n	%
<150	75	43	101	57	39	24	123	76
>175	15	38	24	62	8	24	25	76
Total	90	42	125	58	47	24	148	76
Chisquare		$.08^{NS}$				0		

NS : Not significantly different

Low: < 1/2 packet ; High > 1/2 packet

a food which tastes good is shared and does not reach the beneficiary, whereas a food which is strongly flavored may be shared to a lesser degree but may also not be universally accepted. In the present study also, the acceptability of methi biscuits was not universal which also reflected in the consumption. Many subjects did not consume the full ration of biscuits i.e. 100 g or one packet. However, in the final analysis, it would be more cost effective if the food is not shared rather than if it is less acceptable by a few target beneficiaries.

Nutrient intake (calories and protein) with and without the supplementation with biscuits.

Diet surveys conducted among the underprivileged pregnant and lactating women in Baroda have shown that the diets of these women provided about 1400-1500 Kcal and 40 g protein (John 1983, Rajalakshmi 1983). The RDA proposed by ICMR (1981) are 2500 Kcal and 55 g of protein. Thus there is a deficit of about 1000 Kcal and 15 g protein.

Although the complete gap of calories and protein deficit could not be bridged by providing the biscuit supplement, the % RDA met for calories was raised from 60 to 79 and that for protein was raised from 68 to 88 for more than half (57) of the subjects as shown in Table 96. These women consumed the complete ration i.e.100 g given to them which provided 470 Kcal and 12 g protein. The % RDA met for calories and protein was raised even for other subjects upto 75% and 83% respectively. It has been shown in food intervention studies on pregnant women that even if they consume about 350 Kcal extra every day in the last trimester it reflects in the birth weight of the infants (Tontisirin 1983, Lechtig et al 1979).

In the present study only 100 g of he biscuits were provided because in the ICDS program, that is the amount of ration given to the pregnant and lactating women beneficiaries.

In the PFNDAI study (1977), the pregnant and lactating women were given 100 g of similar methi biscuits. Some of the subjects reported that this amount was too much for them to consume in one day. However the sample size was small in the PFNDAI study and there is a need to study the consumption patterns if more than 100 g biscuits were to be provided.

Time at which the biscuits were consumed

The traditional methipak was consumed in the mornings on an empty stomach. in order to determine if the methi biscuits too were consumed at a particular time, the women were asked about the time when they generally ate the biscuits.

Table 96 : ***Calculated calories and protein intake of pregnant & lactating subjects with and without supplementation with biscuits***

		Biscuits consumed	Calories		Protein	
			Intake	% RDA	Intake	% RDA
Before supplementation	*Mean*[1]		*1400 -1500*	*60*	*40 g*	*68*
After supplementation	*8* (4%)*	*1/4 pkt*	*1500 + 118*	*65*	*40 + 3*	*73*
	34 (17%)	*1/2 pkt*	*1500 + 235*	*70*	*40 + 6*	*78*
	44 (22%)	*3/4 pkt*	*1500 + 353*	*75*	*40 + 9*	*83*
	116 (57%)	*1 pkt*	*1500 + 470*	*79*	*40 + 12*	*88*

** Number of women - percentages in parentheses*

[1] *Figures obtained from John (1983) and Rajalakshmi (1983)*

RDA for calories 2500; protein - 59 g/day (ICMR - 1981)

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Table 97 reveals data on the time of the day when the biscuits were consumed. No particular time emerged when the women consumed the biscuits. Majority of the subjects stated that they consumed the biscuits whenever they felt like and generally in the mornings, afternoons and evenings. It is to be noted that the biscuits were not consumed with meals and therefore substitution which is another problem of the supplementary nutrition programs would have been minimum. Consumption of biscuits any time of the day was a positive point. Had the women consumed the biscuits only in the morning like the traditional methipak they might not have been able to consume all the biscuits. This is an advantage of the "take home" supplement The beneficiaries have the freedom to eat when they like and not force themselves to eat which may be the case in 'on-the-spot' feeding.

As shown in Table 98 majority of the subjects ate the biscuits without any tea or milk. About 29% ate them with tea and about 4% even added jaggery and ghee to the biscuit crumbs. Biscuits being ready-to-eat are very convenient and do not need any further preparation. The food supplement which was usually distributed in the centres was Baroda mix (a cereal pulse mix) which could not be eaten without cooking it further. Many women reported that they made **chappatis** or some kind of **sheera** with the Baroda mix. For preparing these foods they used additional oil or sugar which incurred extra expenditure. Such foods were also eaten by all the members of the family. Thus ready-to-eat foods were definitely preferred by the women as it saved their time and money and could be consumed without sharing with the family members.

Perceived beneficial effects of methi biscuits and sweet biscuits on self and the child

In order to know whether the women associated the methi biscuits with methipak as regards its medicinal property, they were asked about the beneficial effects of consuming the biscuits, as perceived by them, both on themselves and the infants if the subjects were lactating. Table 99 and 100 list some of the beneficial effects ascribed to methi biscuits and sweet biscuits on self and the infant respectively. Thirty one percent of the subjects stated that methi biscuits reduced the body aches; 34% said that their health was better as a result of consuming these biscuits and 13% mentioned that the biscuits provided them with energy and stamina. Other beneficial effects reported by a few women were increased appetite; help in digestion and reduced stomachache. Seven percent women did not feel any improvement in their health. However it is possible that these women did not suffer from any health problems because of pregnancy or lactation. Thirteen

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Table 97 : Time at which the biscuits were generally consumed by the subjects

Time	Sweet biscuits		Methi biscuits	
	n	%	n	%
Morning	8	4	9	4
Morning & Evening	40	18	48	23
Morning/Afternoon/Evening	5	2	22	11
Afternoon/Evening	4	2	2	1
Morning/Afternoon	9	4	6	3
Anytime	151	70	117	57

Table 98 : The way in which the biscuits were consumed (with tea/without tea/ etc) by the subjects

	Sweet biscuits		Methi biscuits	
	n	%	n	%
With tea	37	17	59	29
Without tea	151	68	106	52
With/without tea	29	13	29	14
With milk	4	2	5	2
With jaggery & ghee	-	-	4	2

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Table 99 : Perceived beneficial effects of sweet biscuits and methi biscuits on self by pregnant and lactating subjects

Perceived Beneficial effect	Sweet biscuits		Methi biscuits	
	n	%	n	%
Gives energy	33	15	27	13
Better health	98	46	69	34
Reduced body ache	15	7	61	31
Others*	6	3	6	3
No difference	21	10	15	7
Don't know	36	17	26	13

* Increased appetite, helps in digestion, reduced stomachache.

Table 100 : Perceived beneficial effects of sweet and methi biscuits on the infants

Perceived Beneficial effect	Sweet biscuits		Methi biscuits	
	n	%	n	%
Increased breast milk of the infant	26	25	19	17
Increased weight	15	14	17	15
Better health	48	46	46	42
No difference	8	8	14	13
Don't know	10	10	9	8

percent subjects said that they did not know if methi biscuits brought about any change in their physical condition. Four women (2%) even mentioned that methi biscuits caused diarrhea and vomiting. Majority of the women stated that the sweet biscuits provided them energy and were good for their health. Seven percent even mentioned that they reduced the body aches; 27% either did not know the difference of felt no better after consuming sweet biscuits.

The perceived beneficial effects of methi biscuits related to the health of the infant (Table 100) were: better health (42%); increased breast milk for the infant (17%) and increased weight of the child (15%). Thirteen percent subjects said that they did not notice any improvement in the health of their infants and 8% did not know. Three women complained that their infants had diarrhea if they consumed methi biscuits. The responses were similar for sweet biscuits.

In the PFNDAI study (1977) similar positive responses to methi biscuits were recorded. Thus several women who received methi biscuits said that they were good for health, reduced pain, increased breast milk and increased the weight of the baby. Thus methi biscuits were closely associated with methipak as regards the positive attributes.

In contrast to this, unlike methipak very few adverse effects were attributed to methi biscuits, specially during pregnancy. Almost all the pregnant women enrolled in the study consumed the methi biscuits.

Such positive effects, although largely psychological, helped in the promotion of the biscuits as a health food and inspite of the bitter taste the pregnant and lactating women wanted to consume them.

Weight changes in pregnancy, lactation and infancy

Although there are several confounding factors which affect the weight, an attempt was made to determine if there was any difference in the weight of pregnant and lacating subjects and the infants as a results of supplementation with the biscuits. The weights were taken before the trial began and after the first and second intervention (with sweet and methi biscuits). Based on the pre-intervention weights of pregnant subjects, 33% women were at risk of delivering a low birth weight baby as their weight was less than 42 kg.at 24 weeks of pregnancy, a cut off point suggested by Shah and Shah (1981).

In Table 101, the average weights of pregnant subjects at baseline and after the first intervention (with sweet biscuits in group-I and methi biscuits in group-II) and secood intervention (with methi biscuits in group I and sweet biscuits in Group II)

Table 101 : Weight changes in pregnancy after supplementation with methi and sweet biscuits

	Group I *(Treatment : sweet) biscdits-methi biscuits)*	**Group II** *(Treatment : Methi) biscuits-Sweet biscuits)*
Baseline weight (I)	*43.10 ± 0.75 (33)*	*43.86 ± 0.77*
Weight after first intervention (II)	*45.21 ± 0.71*[a] *(37)*	*45.86 ± 0.81*[b] *(38)*
Weight after second intervention (III)	*46.01 ± 0.87*[b] *(26)*	*46.12 ± 1.08*[a] *(25)*
Difference (II-I)	*2.36*	*2.22*
Diference (III-II)	*0.86*	*1.17*
't' between (II-I)	*0.419*[NS]	
't' between (III-II)	*0.944*[NS]	

Number in parentheses indicate the sample size.

a - weights after intervention with sweet biscuits.

b - weights after intervention with methi biscuits.

are presented. There was no difference in the weights of the women who were given methi biscuits as compared to those who were given sweet biscuits in both the intervention periods. The increment in the second intervention is not as high as the first because the first period was longer than the second period owing to a break in the supply of the biscuits for some unavoidable reason.

As mentioned earlier, a change in the weight was not anticipated due to the confounding factors. The mean weights of nursing mothers remained more or less stationary. In lactating women, there is usually a loss of weight of about 2 kg. in a year (Prema et al 1981). In the present study, some subjects did lose weight but the mean weights were not different from the baseline values.

The mean weight of infants before the invervention was 4.8 kg. After giving sweet and methi biscuits the mean weight in both the groups was 5.8 kg. There was no difference in the weight increments in both the groups. The weights of infants were analysed only in the 1st intervention period as the second period was much shorter than the first and no differences were observed in the first intervention period.

Efficiency of distribution of biscuits by the Anganwadi Workers

The biscuits were distributed at the ICDS centres every alternate day by the Anganwadi workers. The total distribution days ranged from 26 to 38 in different centres. In Table 102, the scheduled distribution days are compared with the actual distribution days i.e. the days on which the Anganwadi Workers distributed the biscuits. The efficiency of distribution with respect to this ranged from 80 to 100%, average being 91%. Most of the Anganwadi workers willingly distributed the biscuits and some even called the subjects to collect the biscuits if they failed to come. The records of collection was kept up-to-date by all (nine) but one Anganwadi worker who could not maintain the records properly perhaps due to the fact that she was recently appointed and was not familiar with the work.

It was the general impression of the investigator that the collection of the biscuits by the subjects depended to a great extent on the efficiency of the Anganwadi worker and her rapport with the women of the community.

Willingness to purchase the biscuits

At the end of the product testing, the subjects were asked about their willingness to buy the methi bisciuts if available at the centre. Of the 189 women 58% expressed their willingness to purchase the biscuits and the rest mentioned that they would not buy them either because they could not afford to buy, or perhaps

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Table 102 : Efficiency of distribution of biscuits by the Anganwadi Workers

ICDS Centre Codes	Days of distribution		Efficiency of distribution (%)
	Scheduled	Actual	
PB	38	38	100
CP2	36	35	97
CP1	36	29	80
EK1	34	30	88
EK2	34	30	88
PP	29	29	100
FW	36	36	100
NY1	30	25	83
NY2	26	25	96
Mean ± SE	33.2 ± 1.25	30.7 ± 1.45	91.0 ± 2.56

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a dislike for the bitter taste. If given a choice and the purchasing power, the investigator feels that they would prefer to buy sweet biscuits rather than methi biscuits. It may again be due to the fact that these women were psychologically inhibited to spend any money for food exclusively for themselves and would prefer to buy something which the whole family could consume. To determine if the women who expressed their willingness to buy the biscuits, would really do so, a few packets of methi biscuits were given to the Anganwadi Workers and she was asked to announce among the beneficiaries that they were for sale at a cost of Re. 1/- per packet of 100 g biscuits. Out of the 10 centres only in 2 centres a few women came to buy the biscuits. These too were not regular and bought one or two packets in a few days. Thus, even if the women bought the biscuits it was not everyday.

In a pricing study of Project Poshak, Gopaldas et al (1975) evaluated the effect of pricing a 700 g weekly 'take home' ration of sweetened ICSM (Instant Corn Soya Milk) at a nominal token price of either 10 p, 50 p or Re. 1.00, ;on the participation, utilisation and nutritional impact with respect to the child population. The food was sold through either a 'fair price' shop or through the PHC. It was observed that the offtake was only 11 percent when the food was priced at Re.1.00 per 700 g of ICSM. There was a consumer resistance to purchase even though the price was equivalent to that of the same amount of their staple wheat. The collection rates for food priced at either 10 p or 50 p were not different and indicated that about 20% of the rural poor may be prepared to pay a subsidized price upto 50 p per kg of the weaning food. The data also revealed that all the enrolled beneficiary families bought the food atleast once. Curiosity purchases were very high. The price did not influence the purchasing trend upto 5-7 purchases. There was a sharp tailing off after 8 to 10 purchases.

In the present study, very few subjects came forward to buy the biscuits. Perhaps the price (Re 1/packet) was too high for them. In the PFNDAI (1977) project, only 27% of the beneficiaries expressed willingness to buy the food. In the PFNDAI project the test marketing was not attempted and it was concluded by the authors that commercialization of special pregnancy and lactation foods among the low income groups would not succeed and such foods would need total or near-total subsidy if instituted as a measure of social concern.

More in-depth studies are required on the social marketing aspect of the biscuits.

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Attitudes of Anganwadi Workers towards supplementation with methi and sweet biscuits.

Nine Anganwadi workers were interviewed in order to obtain their opinions about supplementation with methi biscuits and sweet biscuits. One Anganwadi worker could not be interviewed because she was out of station when the interviews were conducted. The questionnanre is given in Appendix 3. In only seven centres the pregnant and lactating women were receiving the food supplement. In 2 centres, no food supplement was given to pregnant and lactating women because there were SNP centres in these areas through which the maternal supplement was distributed. All the Anganwadi workers preferred the biscuits to the Baroda mix which was usually given in the ICDS centres to the pregnant and lactating women. The reasons for their preference for biscuits were :

i) Biscuits were convenient since the women did not have the time to cook and also the cooking of Baroda mix required addition of oil or sugar which meant extra expenditure for the women.

ii) Baroda mix was being eaten by all the family members.

iii) Many women did not like the taste of Baroda mix and did non collect it regularly from the centre.

The Anganwadi Workers were asked whether Methi biscuits or the sweet biscuits were preferred as a supplement for the pregnant and lactating women. Seven Anganwadi Workers said Methi biscuits were preferred to sweet biscuits. However they said that since these biscuits were bitter, some women did not come to collect them and therefore methi biscuits with less methi would be better. Two Anganwadi Workers said that one packet of methi biscuits and one packet of sweet biscuits should be given so that there is no monotony in eating. The reasons given for preferring methi biscuits were that they were good for the health of the women and reduced the body aches. All the Anganwadi Workers reported that the collection of sweet biscuits was very regular. Four Anganwadi Workers said that the collection of methi biscuits was regular and the others said that some women did not come to collect regularly and they had to be called to the centre. They said that the collection of methi biscuits was irregular by a few women because they did not like the bitter taste of the biscuits.

When asked if the women shared the biscuits with family members, all the Anganwadi Workers unanimously agreed that the sweet biscuits were consumed by family members specially the children. As compared to this, very few women shared the methi biscuits with other family members mainly children and elderly people.

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The Anganwadi workers felt that the methi biscuits were available for consumption for the women because sharing was less as compared to the sweet biscuits.

All the Anganwadi workers claimed that as a result of supplementation with methi biscuits, the health of the women and infants both had improved. They said that the women reported of having less body aches, and increased stamina. The weight of these women also increased according to them. The health of these women improved even when sweet biscuits were given but to a lesser degree. In infants, the positive attributes perceived by the Anganwadi Workers were increased weight because of the increased secretion of milk. These perceived effects by the Anganwadi Worker indicate a positive attitude towards the biscuits.

None of the Anganwadi workers faced any problem in maintaining the records of collection of the biscuits. Two Anganwadi Workers felt that instead of every alternate day, the biscuits should be distributed twice a week. According to all the AWs, a quantity of 100 g of biscuits per day was adequate and there was no need to either reduce it or increase it.

Some of the comments recorded were as follows :

1. *The biscuits are good and the distribution should be continued as these women are poor and cannot afford to buy food for themselves.*
2. *The biscuits attracted the pregnant and lactating women to the centre and their task of enrolment was made easier as they did not have to go h o u s e to house to enrol cases of new pregnancy. Thus, when the women came to the centre for collection of biscuits, they were given other services also such as immunization and other antenatal services.*
3. *Methi biscuits are good but the amount of methi should be decreased so that the consumptoion by the women increases.*