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## Nutritional evaluation and cost efficacy of Punjabi breakfast preparations

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### ABSTRACT

Information regarding breakfast preparations was collected from eighty Punjabi families from the urban localities near the Punjab Agricultural University Ludhiana. Maximum families preferred parathas stuffed or plain with vegetable preparation for breakfast. Potato stuffed paratha, of course was the favorite breakfast. The protein content of breakfast preparations varied from  $6.95 \pm 0.38$  g to  $12.62 \pm 0.29$  g per 100 g on dry weight basis, minimum for vegetable sandwich and maximum for missa paratha. Energy value of breakfast preparations ranged from 291 to 418 Kcal/100 g, minimum for plain bread and maximum for Ajwain paratha. Children did consume chocolates and cornflakes with milk usually in the evening. Ready-to-eat preparations though costly give more calcium and vitamins A and C.

**Key words :** Paratha, Bread, Chapati, Ready-to-eat breakfast

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### INTRODUCTION

Breakfast is like a king, lunch like a prince, dine like a pauper.' True to this old adage, breakfast is the most important meal of the day. Consumption of a nutritious breakfast is associated with better physical and mental performance. Ideally a good breakfast should provide one-fourth to one-third of the day's energy and nutrient needs. So, people who skip breakfast usually fall short of their daily dietary needs. Furthermore, the skipping of breakfast sometimes results in adverse effects such as muscle tremors, fatigue, dizziness, nausea and vomiting when strenuous physical activity is undertaken (Tuttle *et al.*, 1983). Benefits of good breakfast are mainly due to the protein, irrespective to its source whether animal or plant food as it helps maintain blood sugar at normal levels. Holt *et al.*, 1999 observed that the high fibre, carbohydrate rich breakfast was less palatable but more filling than fat rich breakfasts. A cereal based breakfast also supplies more of B-complex vitamins (Ruxton *et al.*, 1993). With a rise in availability of 'Ready-to-eat' foods, breakfast cereals and a large variety of baked products end up on the breakfast table.

A spurt in the growth of convenience foods has been

witnessed in the recent years triggered by increasing urbanization and industrialization. More and more people are going for instant and ready-to-eat foods.

### MATERIALS AND METHODS

Eighty families of Ludhiana City were selected purposively to collect information related to their breakfast consumption pattern and preparations. A questionnaire was developed to collect the information on the food preferences of family members regarding breakfast.

#### Analysis of common breakfast preparations:

The frequently consumed breakfast preparations like stuffed *paratha*, plain *paratha*, *chapati* with seasonal vegetable and sandwiches were analyzed for proximate composition by the method of AOAC (2000).

#### Market survey:

A market survey was carried out to find out the most commonly purchased breakfast cereals by the people, their nutritional content, net weight of the product and their price.

## RESULTS AND DISCUSSION

The results obtained from the present investigation have been discussed in the following sub heads :

### General information:

The respondents were the female members of the family who were involved in preparation of breakfast. Their age ranged between 25-45 years. Maximum of them were graduates (38.7%) and postgraduates (32.5%). The family size varied from 3(36%) to 4 (58%) members. The monthly income of the family ranged between Rs. 10,000 to 30,000 in majority of the cases (95%). Forty nine per cent of the respondents were vegetarian and forty one per cent were non-vegetarian and rest were ovatarian.

### Information regarding breakfast practices:

The food preference data in Table 1 showed that *paratha* was the most popular breakfast preparation and was consumed by majority of the respondents (86.2%), their husbands (91.9%) and children (95%). This was followed by preference for bread by 77.5 per cent

respondents, 75.7 per cent their husbands and 83.6 per cent children whereas 53.8 per cent of the respondents, 47.3 per cent husbands and only 31.4 per cent children were reported to accept *chapati* also for breakfast. The consumption of breakfast cereals was low with only 30 per cent children consuming them. The consumption of butter and curd was very high as the Punjabis normally prefer these with *parathas*.

It was seen that potato stuffed *paratha* was most popularly consumed followed by cauliflower and radish stuffed *parathas* with 68.8, 56.3 and 57.5 per cent of the families having them at least once a week (Table 2). *Missa* and fenugreek *paratha* were consumed once a week by only 27.5 per cent and 28.8 per cent of the families, respectively.

Among ready-to-eat breakfast products Kellog's Chocos were the most popularly consumed product by majority (69.2%) of the families along with 200 ml of milk per serving.

### Proximate composition of selected breakfast preparations:

Table 3 represents the proximate composition on the

**Table 1: Food preference of the family members**

	Respondents (N=80)		Husband (N=74)		Children (N=140)	
	Yes	No	Yes	No	Yes	No
Bread	62 (77.5)	18 (22.5)	56 (75.7)	18 (24.3)	117 (83.6)	23 (16.4)
Eggs	27 (33.8)	53 (66.2)	32 (43.2)	42 (56.8)	61 (43.6)	79 (56.4)
<i>Parathas</i>	69 (86.2)	11 (13.8)	68 (91.9)	6 (8.1)	133 (95.0)	7 (5.0)
<i>Chapati</i>	43 (53.8)	37 (46.2)	35 (47.3)	39 (52.7)	44 (31.4)	96 (68.6)
Porridge	41 (51.2)	39 (48.8)	30 (40.5)	44 (59.5)	61 (43.6)	79 (56.4)
Fruits	21 (26.2)	59 (73.8)	19 (25.7)	55 (74.3)	27 (19.3)	113 (80.7)
Butter	60 (75.0)	20 (25.0)	55 (74.3)	19 (25.7)	102 (80.0)	28 (20.0)
Curd	65 (81.2)	15 (18.8)	56 (75.7)	18 (24.3)	103 (73.6)	37 (26.4)
Milk	37 (46.3)	43 (53.7)	41 (54.4)	33 (44.6)	107 (76.4)	33 (23.6)
Tea	68 (85.0)	12 (15.0)	55 (74.3)	19 (25.7)	37 (26.4)	103 (73.6)
Coffee	13 (16.3)	67 (83.7)	11 (14.9)	63 (85.1)	9 (6.4)	113 (83.6)
Ready-to-eat breakfasts	11 (13.8)	69 (86.2)	12 (16.2)	62 (83.8)	42 (30.0)	98 (70.0)

Figures in parentheses show percentages

**Table 2 : Frequency of consumption of various *parathas* in a week**

Type of <i>paratha</i>	N = 80						
	All seven days	Six days	Five days	Four days	Thrice	Twice	Once
Plain	1 (1.3)	5 (6.3)	-	4 (5.0)	9 (11.3)	10 (12.5)	28 (35.0)
Potato stuffed	-	-	1 (1.3)	-	3 (3.8)	9 (11.3)	55 (68.8)
Cauliflower stuffed	-	-	-	-	-	9 (11.3)	45 (56.3)
Radish stuffed	-	-	-	-	-	3 (3.8)	46 (57.5)
Fenugreek	-	-	-	-	-	2 (2.5)	23 (28.8)
<i>Missa</i>	-	-	-	1 (1.3)	1 (1.3)	1 (1.3)	22 (27.5)
<i>Chapati</i>	6 (7.5)	2 (2.5)	2 (2.5)	-	3 (3.8)	2 (2.5)	9 (11.3)

Figures in parentheses show percentages

**Table 3 : Proximate composition of cooked breakfast preparation on dry weight basis (per 100 g)**

Preparation	Moisture (g)	Protein (g)	Fat (g)	Fibre (g)	Ash (g)	Carbohydrates (g)	Energy (kcal)
Potato <i>paratha</i>	3.73 ± 0.14	9.22 ± 0.32	9.23 ± 0.23	1.54 ± 0.21	1.84 ± 0.22	74.45 ± 0.27	418
Radish <i>paratha</i>	5.87 ± 0.19	9.03 ± 0.46	7.83 ± 0.28	1.57 ± 0.26	2.38 ± 0.18	73.32 ± 1.37	400
Cauliflower <i>paratha</i>	4.89 ± 0.11	9.24 ± 0.30	8.11 ± 0.29	1.62 ± 0.29	2.78 ± 0.13	73.36 ± 1.12	403
<i>Missa paratha</i>	3.94 ± 0.16	12.62 ± 0.29	8.83 ± 0.31	1.32 ± 0.29	1.61 ± 0.24	71.68 ± 1.29	417
Plain <i>paratha</i> with vegetable	4.25 ± 0.18	10.12 ± 0.25	9.85 ± 0.15	1.59 ± 0.27	2.45 ± 0.20	71.74 ± 1.05	416
Fenugreek <i>paratha</i>	3.69 ± 0.21	10.50 ± 0.34	8.29 ± 0.27	1.60 ± 0.28	2.46 ± 0.13	73.46 ± 0.55	410
<i>Ajwain paratha</i>	3.58 ± 0.24	10.34 ± 0.33	8.65 ± 0.28	1.35 ± 0.25	1.36 ± 0.12	74.72 ± 1.22	418
<i>Chapati</i> with vegetable	6.67 ± 0.21	10.20 ± 0.27	6.71 ± 0.25	1.65 ± 0.27	2.47 ± 0.21	72.30 ± 1.21	390
Potato sandwich	27.35 ± 0.15	7.02 ± 0.31	7.48 ± 0.21	0.64 ± 0.34	1.18 ± 0.19	56.33 ± 1.20	317
Vegetable sandwich	30.38 ± 0.19	6.95 ± 0.38	7.24 ± 0.19	1.62 ± 0.23	1.24 ± 0.25	52.57 ± 1.24	303
Plain bread	26.95 ± 0.25	7.5 ± 0.24	0.68 ± 0.21	0.06 ± 0.02	1.21 ± 0.17	63.60 ± 0.89	291

(Values are Mean ± S.D.)

**Table 4 : Nutrient content of ready-to-eat breakfast preparation**

	Chocos		Cornflakes	
	Nutrient content per 30 g of chocos	Nutrient content* per serving (230g)	Nutrient content per 30 g of cornflakes	Nutrient content* per serving (230g)
Energy (kcal)	114	345	114	340
Protein (g)	2.25	10.85	240	11.00
Carbohydrates (g)	25.50	45.50	24.60	44.60
Fat (g)	0.30	13.30	0.09	13.09
Fibre (g)	0.36	0.36	0.75	0.75
Calcium (g)	159.90	579.90	-	420.0
Iron (mg)	6.99	7.39	6.99	7.39
Zinc (mg)	1.50	1.50	-	-
Vitamin A (µg)	150.0	246.0	150.0	246.0
Vitamin C (mg)	20.10	22.10	20.01	22.01

\* The value is calculated after addition of 200 ml of buffalo milk.

dry weight basis. The moisture content of the preparations ranged between 3.58-30.38 per cent the lowest being in *ajwain paratha* and the highest in vegetable sandwich. The maximum protein content of  $12.62 \pm 0.24$  per cent was observed in *missa paratha* followed by fenugreek *paratha* and *ajwain paratha*. Grewal (1991) had observed a value of 8.50 and 8.48 per cent of crude protein in potato and cauliflower stuffed *paratha*, respectively. Plain bread had protein content of only 7.5 per cent whereas vegetable sandwich had 6.95 per cent. Farzana *et al.* (2003) reported similar protein content of 7.4 per cent in plain bread. Plain *paratha* and vegetable combination had the highest crude fat content (9.85%) whereas plain bread had the lowest content of 0.68 per cent.

The highest crude fibre content (1.65%) was observed in combination of *chapati* and vegetable preparation. The crude fibre among stuffed *parathas* was

highest in cauliflower *paratha* (1.62%) followed by fenugreek *paratha* (1.60%). Kavitha *et al.* (1999) reported lower value of 0.84 g crude fibre/100g in fenugreek *paratha*. Sawhney and Kawatra (1986) reported 1.20 per cent crude fibre in plain wheat *chapati*.

The ash content was lowest in potato sandwich (1.18%) and highest in cauliflower *paratha* (2.78%). The carbohydrate content of the breakfast preparations ranged from 52.57 per cent in vegetable sandwich to 74.72 per cent in *ajwain paratha*. Energy value of all the *parathas* varied from 400 to 418 Kcal per 100g whereas plain bread and sandwiches had energy value ranging from 291 to 317 Kcal.

#### Nutritional facts of ready-to-eat breakfast cereals:

The nutritional facts mentioned on the packaging of breakfast cereals are given in Table 4. It was observed that 30g of both chocos and cornflakes provided 114 kcal

each, 2.25 and 2.40g protein, 0.30 and 0.09g fat, 0.36 and 0.75g fibre, respectively. But as these are usually consumed with milk, the calculations have been made on the basis of per serving *i.e.* 30g of chocos or cornflakes with 200 ml. of milk. Swaroop *et al.* (1998) have also reported 8.9g protein, 2.6g fat, 0.05g fibre and 376 kcal/100g in cornflakes. Chocos and cornflakes both are enriched with calcium, iron, zinc, vitamin A and vitamin C.

### Conclusion:

It can be concluded that *paratha* was the most popular breakfast followed by bread. Though a number of ready-to-eat breakfast cereals are available but these two were preferred mainly by children. *Parathas* had higher crude fat, crude protein, crude fibre and ash and contributed to higher amount of energy. Hence, the traditional breakfast preparations are much cheaper as compared to ready-to-eat breakfast cereals and are more nutritious.

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