Nutritional Analysis of Fast Food in Streets of Patna Town, Bihar

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Abstract: Mushroom growth of street fast food is a boon for changing lifestyle of urban people. However, its nutritional aspect is also a matter of concern. The objective of the present study was hence to assess the nutrient components of fast food sold in streets of Patna town. A total of 30 fast food samples from streets were collected from different locations of Patna town in aseptic containers and immediately transferred to the laboratory for proximate analysis. Descriptive statistics was used to analyze the collected data. In terms of nutrient contribution, the highest energy content was found in Hot potato chips (536 ± 85.2 kcal /100 g) followed by Chicken chawmin (527 ± 253.08 kcal/plat), Chilli chicken (464 ± 91.8 kcal/plat) and Pav bhaji (425 ± 164 kcal/plat). Highest level of protein was detected in Chilli chicken at 27.3 ± 5.01 g per serving. Protein of Chilli chicken supplied approximately 29% of the total energy content per serving. Maximum amount of fat was also found in Chilli chicken (35.5 ± 31.89 g/plat). Total fat contribution of Chilli chicken to the total energy per serving found to be approximately 67%. Highest level of carbohydrate was detected in Idli at 15.0 ± 9.18 g per serving of sample which contributed approximately 91% of the total energy content per serving. From this study it was concluded that street fast foods provide an appreciable amount of recommended nutrient composition. It could be observed in this study that street fast foods supply appreciable amount of nutrients and calories to the people of Patna.

Key words: Street fast food, proximate analysis, nutritional composition.

1. Introduction

Street fast foods are ready-to-eat foods that can be bought directly from street vendors or hawkers or at local markets and eaten immediately i.e. without necessarily having to cook before consumption as they have been already prepared by the vendors. These are very popular worldwide and provide readily available delicacies at a cheaper rate. Street vended food, even when produced under low level of hygiene, is usually consumed regardless of the source of production or quality of raw materials use [1]. Changing life style and busy schedule of the people, resulted in uncontrolled growth and mushrooming of street food vendors, food joints, fast food corners, public food establishments etc. Familiarity, low cost, tastes and consumer conveniences are some of the other appealing factors that make street fast foods popular

[2]. The street food industry plays an important role in meeting the food requirements of urban dwellers in many cities and towns of developing countries. The industry feeds millions of people daily with a wide variety of foods that are relatively cheap and easily accessible by the people.

In the majority of studies was demonstrated that street fast food provides variable quantities of nutrients and energy to the diet of children and adults in developing countries [3]. The nutritional value of street fast foods depends on the ingredients used and how they are prepared, stored and sold, as occurs with other foods. It is essential to have a good understanding of the type and nutritional value of street fast foods since their consumption in many countries has become entrenched in habitual eating patterns and may influence the development of chronic noncommunicable diseases and other nutrition-related conditions in the population [3-5].

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Street fast food ingredients are country/region specific and rarely they are reported and/or analyzed [6, 7]. Patna being the capital of Bihar is a very popular city and also one of the most populated cities of India. Patna is a major institutional hub and also a tourist spot. Migration of youth and other people from rural areas and other parts of the country to Patna for better education and commercial business and for visiting heritage place of Patna, creates a heavy demand for inexpensive ready-to-eat food. To ensure the nutritional quality of the diet of people who consume street fast foods it is essential that the nutritional composition of street fast food be analyzed and reported. The objective of the present study was hence to analyze the nutritional composition of fast food sold by small vendors in the streets of Patna town.

2. Materials and Methods

2.1 Collection of Samples

A total of 30 street vending fast food samples were collected from different locations of Patna town in an aseptic container and immediately transferred to the laboratory for proximate analysis.

2.2 Determination of Proximate Composition

The proximate composition of the street fast food made in practise was analysed by approved AOAC (Association of Analytical Chemists) methods [8]. The moisture, ash, crude fat, crude fibre, and crude protein and carbohydrate contents of each food sample were analyzed. Moisture content was determined by heating 2.0 g of each fresh sample to a constant weight in a crucible placed in an oven maintained at 105 °C. The ash content was determined by the incineration of 5 g samples placed in a muffle furnace maintained at 550 °C for 5-8 hrs. The crude fibre was obtained by digesting 5 g of the samples with H₂SO₄ and NaOH and incinerating the residue in a muffle furnace maintained at 550 °C for 5-8 hrs. The crude protein (% total nitrogen X 6.25) was determined by

Kjeldahl method, using 2 g of the samples. The crude lipid content was obtained by extracting 5 g of each sample in a Soxhlet apparatus using Petroleum ether boiling point 60-80 °C as the extractant. Each analysis was carried out in triplicates. The carbohydrate content was determined by the difference i.e. deducing the sum of the percentage (moisture, ash, fibre, fat, and protein) from 100.

2.3 Statistical Analysis

Data were analyzed using the Statistical Package for Social Sciences (SPSS) program version 11. Descriptive statistics such as percentage means and standard deviation were used to present the findings.

3. Results and Discussion

The results of proximate analysis of 30 street fast food samples are provided in Table 1.

3.1 Assessment of Nutritional Composition

3.1.1 Moisture

It could be observed in this study that the moisture content of street fast foods varied greatly depending upon the types of food, their cooking methods and consumers' choice.

3.1.2 Ash

Ash is the residue of mineral. Results of study indicated that among sampled foods Pav bhaji, Burger, Chhole bhature, Gulab jamun, Chilli chicken and Chana bhaji had considerable amount of ash. Their ash content per serving was 6.7 ± 4 g, 5.0 ± 3 g, 4.5 ± 3 g, 4.0 ± 1 g, 2.5 ± 2 g and 2.3 ± 0.3 g respectively.

3.1.3 Energy

The National Institute of Nutrition (NIN) 2010 dietary guidelines recommend that the RDA for energy is about 2,320 kcal per day for a sedentary man and 2,100 kcal per day for a sedentary women and 1,900 kcal for children age groups 10-12 yrs. The data obtained showed that energy content in the 30 street fast food samples in kcal per serving of sample was in

Table 1 Proximate composition of the street fast foods.

Sl. No.	Name of street fast food	Serving size	Moisture (%) (mean $\pm$ SD)	Ash (g) (mean $\pm$ SD)	Protein (g) (mean $\pm$ SD)	Fat (g) (mean $\pm$ SD)	Fibre (g) (mean $\pm$ SD)	CHO (g) (mean $\pm$ SD)	Energy (Kcal) (mean $\pm$ SD)
1	Idli	1 pc	44 $\pm$ 20.04	0.9 $\pm$ 0.8	1.2 $\pm$ 2	0.2 $\pm$ 0.4	0.1 $\pm$ 0.2	15.0 $\pm$ 9.18	66.6 $\pm$ 34.9
2	Plain Dosa	1 pc	59 $\pm$ 12.12	2.3 $\pm$ 0.3	2.8 $\pm$ 2.1	5.2 $\pm$ 0.5	0.8 $\pm$ 0.9	21.5 $\pm$ 8.09	144 $\pm$ 47.23
3	Sambher	1 bowl	80 $\pm$ 10.6	0.6 $\pm$ 2	5.6 $\pm$ 1.9	2.5 $\pm$ 3.12	0.3 $\pm$ 1.0	18.4 $\pm$ 14.98	119 $\pm$ 81.9
4	Chhole bhature	1 plate	60 $\pm$ 20.12	4.5 $\pm$ 3	10.7 $\pm$ 2.18	12.6 $\pm$ 16.0	4 $\pm$ 3.09	41.4 $\pm$ 23.12	321.8 $\pm$ 74.6
5	Bread pokora	1 pc	61 $\pm$ 5.6	0.7 $\pm$ 0.1	2.2 $\pm$ 4.01	9.4 $\pm$ 10.2	0.9 $\pm$ 0.5	12.0 $\pm$ 6.67	141.8 $\pm$ 42.90
6	Onion pokora	3 pcs	52 $\pm$ 9.02	0.9 $\pm$ 0.5	3.7 $\pm$ 2.1	11 $\pm$ 11.22	0.3 $\pm$ 0.2	14.9 $\pm$ 8.09	171.5 $\pm$ 48.64
7	Gulab jamun	2 pcs	52.8 $\pm$ 13.68	4.0 $\pm$ 1	6.7 $\pm$ 4.12	12.9 $\pm$ 5.78	0.55 $\pm$ 2.01	46.6 $\pm$ 32.4	329.3 $\pm$ 142.12
8	Jalebi	2 pcs	30 $\pm$ 18.18	1.2 $\pm$ 0.9	5.0 $\pm$ 2.22	14.1 $\pm$ 6.9	0.01 $\pm$ 1.09	28.0 $\pm$ 21.9	259 $\pm$ 121.89
9	Litti	1 pc	38.3 $\pm$ 12.0	1.2 $\pm$ 0.1	5.0 $\pm$ 2.6	0.5 $\pm$ 0.9	0.15 $\pm$ 0.05	24.0 $\pm$ 8.09	120.5 $\pm$ 52.10
10	Bagan ka bharta	100 g	85.4 $\pm$ 8.9	0.9 $\pm$ 0.8	1.2 $\pm$ 0.6	5.7 $\pm$ 4.12	2.5 $\pm$ 2	5.70 $\pm$ 5.9	72.6 $\pm$ 34.61
11	Pav bhaji	1 plate	44 $\pm$ 21.0	6.7 $\pm$ 4	16 $\pm$ 4.4	21 $\pm$ 16.0	3 $\pm$ 2.09	43.0 $\pm$ 34.12	425 $\pm$ 164.0
12	Burger	1 pc	26.0 $\pm$ 29	5.0 $\pm$ 3	8.8 $\pm$ 3.1	10.5 $\pm$ 12.98	1.4 $\pm$ 2.1	36.0 $\pm$ 27.12	273 $\pm$ 119.2
13	Chilli chicken	1 plate	62.0 $\pm$ 32.1	2.5 $\pm$ 2	27.3 $\pm$ 5.01	35.5 $\pm$ 31.89	0.3 $\pm$ 1.09	8.80 $\pm$ 8.98	464 $\pm$ 91.8
14	Chawmein	1 plate	54.0 $\pm$ 14.8	1.2 $\pm$ 1.5	4.0 $\pm$ 4.01	24.2 $\pm$ 22.8	-	49.6 $\pm$ 33.09	432 $\pm$ 161
15	Pani puri	1 pc	84.0 $\pm$ 10.3	-	0.5 $\pm$ 0.6	2.5 $\pm$ 0.04	-	8.00 $\pm$ 2.2	54 $\pm$ 11.98
16	Bhel puri	25 g	11.0 $\pm$ 8.0	0.1 $\pm$ 0.5	2.0 $\pm$ 3.8	0.5 $\pm$ 0.1	-	23.0 $\pm$ 8.18	104 $\pm$ 55.8
17	Samosa	1 pc	54.0 $\pm$ 10.4	1.0 $\pm$ 0.9	4.0 $\pm$ 5.7	12.6 $\pm$ 14.19	1.7 $\pm$ 2.0	41.0 $\pm$ 32.12	293 $\pm$ 199
18	Tikki chat	1 plate	69 $\pm$ 23.12	1.1 $\pm$ 0.9	4.7 $\pm$ 7.89	9.1 $\pm$ 9.9	0.2 $\pm$ 1.9	38.0 $\pm$ 36.9	252 $\pm$ 187.8
19	Samosa chat	1 plate	64 $\pm$ 26.2	1.2 $\pm$ 0.8	7.4 $\pm$ 6.19	14.1 $\pm$ 9.86	1.2 $\pm$ 1.67	56.0 $\pm$ 45.7	380 $\pm$ 201
20	Egg roll	1 pc	63 $\pm$ 5.01	1.6 $\pm$ 0.5	9.0 $\pm$ 2.12	11 $\pm$ 0.6	1.0 $\pm$ 0.5	18.0 $\pm$ 9.98	207 $\pm$ 53.4
21	Veg roll	1 pc	44 $\pm$ 10.6	0.6 $\pm$ 0.56	0.6 $\pm$ 3.12	5.0 $\pm$ 0.4	0.3 $\pm$ 0.5	18.0 $\pm$ 8.89	127 $\pm$ 57.1
22	Jeera rice	1 plate	68.0 $\pm$ 6.1	0.4 $\pm$ 0.1	5.5 $\pm$ 0.9	4.4 $\pm$ 4.32	-	50.0 $\pm$ 22.31	222 $\pm$ 91.2
23	Chhole	1 bowl	65 $\pm$ 32.12	2.2 $\pm$ 1.9	7.7 $\pm$ 8.9	7.6 $\pm$ 8.90	0.22 $\pm$ 1.12	25.4 $\pm$ 21.13	202 $\pm$ 127.6
24	Dal vada	2 pcs	58 $\pm$ 6.23	1.2 $\pm$ 0.9	7.2 $\pm$ 0.4	7.9 $\pm$ 4.08	0.6 $\pm$ 1.31	17.8 $\pm$ 10.9	171 $\pm$ 51.11
25	Chicken chowmein	1 plate	52 $\pm$ 8.65	1.4 $\pm$ 1.1	17.0 $\pm$ 9.1	29 $\pm$ 25.91	0.3 $\pm$ 2.12	49.6 $\pm$ 48.44	527 $\pm$ 253.08
26	Momo	1 plate	55 $\pm$ 5.01	0.5 $\pm$ 0.12	15.3 $\pm$ 1.12	1.3 $\pm$ 0.09	-	73.9 $\pm$ 9.9	376 $\pm$ 46.7
27	Hot potato chips	100g	0.00	1.5 $\pm$ 0.04	7.0 $\pm$ 4.12	34.8 $\pm$ 37.91	3.0 $\pm$ 2.19	52.8 $\pm$ 12.1	536 $\pm$ 85.2
28	Dahi vada	2 pc	76 $\pm$ 20.04	1.6 $\pm$ 0.8	12.1 $\pm$ 9	11.2 $\pm$ 4	0.4 $\pm$ 2	35.0 $\pm$ 18	301 $\pm$ 117
29	Chana bhaji	1 plate	69 $\pm$ 12.12	2.3 $\pm$ 0.3	6.07 $\pm$ 2.1	0.7 $\pm$ 0.3	1.2 $\pm$ 5 $\pm$ 0.9	21.5 $\pm$ 8.09	122 $\pm$ 42.23
30	Roasted mixed bhuja	100 g	22 $\pm$ 10.6	1.6 $\pm$ 2	15.6 $\pm$ 11	6.5 $\pm$ 3.12	2.6 $\pm$ 2.1	57.4 $\pm$ 44.98	365 $\pm$ 235.9

the range 54 to 536. The highest energy content was found in Hot potato chips (536 $\pm$ 85.2 kcal /100 g) followed by Chicken chawmin (527 $\pm$ 253.08 kcal/plat), Chilli chicken (464 $\pm$ 91.8 kcal/plat) and Pav bhaji (425 $\pm$ 164 kcal/plat).

Average energy content in Pani puri was 54 $\pm$ 11.98 kcal, in Idli 66.6 $\pm$ 34.9 kcal in Plain dosa was 144 $\pm$ 47.23 kcal in Veg roll 127 $\pm$ 57.1 kcal, in Egg roll 207 $\pm$ 53.4 kcal and in Littti was 120.5 $\pm$ 52.10 kcal per pc.

Average energy content in Bhel puri was 104 $\pm$ 55.8 kcal per 25 g. Average energy content in Bagan ka

bharta was 72.6 $\pm$ 34.61 kcal, in Sambher 119 $\pm$ 81.9 kcal and In Chana bhaji was 122 $\pm$ 42.23 kcal per serving.

3.1.4 Protein

The Indian dietary guidelines (NIN, 2011) recommends that 10%-15% calorie should be from protein. Among 30 sample highest level of protein was detected in Chilli chicken at 27.3 $\pm$ 5.01 g per serving. Protein of Chilli chicken supplied approximately 29% of the total energy content per serving. Egg Roll, Roasted mixed bhuja, Dal vada and

Momo also had significant amount of protein. Per serving approximately 20% of energy was provided by protein of these fast food.

3.1.5 Fats

The Indian dietary guidelines (NIN, 2011) recommends that 20-30 percent of calories should be from total fat. Per serving maximum amount of fats was found in Chilli chicken (35.5 ± 31.89 g). Total fat contribution of Chilli chicken to the total energy per serving found to be approximately 67% followed by Hot potato chips (34.8 ± 37.91 g, 58% of total energy), Chawmin (24.2 ± 22.8 g, 50% of total energy), Chicken chawmin (29 ± 25.91 g, 49% of total energy) and Pav bhaji (21 ± 16.0 g, 44% of total energy). Level of fat was found to be very high in these street fast food.

Idli, Momo, Litti, Bhel Puri, Chana bhaji, were very low fat containing street fast food. These fast food would contributed fat 0.2 ± 0.4 g (2.7% of total energy), 1.3 ± 0.09 g (3.1% of total energy), 0.5 ± 0.9 g (3.7% of total energy), 0.5 ± 0.1 g (4.3% of total energy), 0.7 ± 0.3 g (5.1% of total energy) per serving respectively.

3.1.6 Fibre

Results of proximate analysis showed that street fast foods had little fibre or roughage. Sampled foods were generally made from processed food grain. Processing resulted in loss of fibre content as they are present in outer parts of food grains which are removed by processing. However some street fast food such as Chhole bhature, Pav bhaji, Bagan ka bharta, Roasted mixed bhuja, Burger, Samosa, Chana bhaji had appreciable amount of fibre as they made from either whole grains or vegetables which are rich source of fibre.

3.1.7 Carbohydrate

NIN recommends 50%-60% of the total energy intake from carbohydrates. Among selected food sample Idli, Jeera rice, Bhel puri, Litti, and Momo were rich in carbohydrate content.

Highest level of carbohydrate was detected in Idli at

15.0 ± 9.18 g per serving of sample which contributed approximately 91% of the total energy content per serving followed by Jeera rice (50.0 ± 22.31 g, 90% of total energy), Bhel puri (23.0 ± 8.18 g, 88% of total energy), Litti (24.0 ± 8.09 g, 80% of total energy), Momo (73.9 ± 9.9 g, 76% of total energy per serving of sample).

Chilli chicken, Bagan ka bharta, Bread pokora, Egg roll, Onion pokora, Chicken chowmein were food with a low carbohydrate. Their carbohydrate content was found to be 8.80 ± 8.98 g, 5.70 ± 5.9 g, 12.0 ± 6.67 g, 18.0 ± 9.98 g, 14.9 ± 8.09 g and 49.6 ± 48.44 g respectively which was approximately 8%, 33%, 34%, 34%, 35%, 38% of total energy per serving of sample respectively.

4. Conclusions

From this study it was concluded that, street fast foods provide an appreciable amount of recommended nutrient composition. Consumption of a substantial quantity of the street fast foods as well as right combination of the quality and quantity of foods would serve as a means of obtaining a good nutritionally balanced meal outside the home and subsequently meeting the required ration for body development.

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