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NUTRIENT COMPOSITION OF SOME COMMERCIAL BAKERY PRODUCTS

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Different bakery products including seventeen types of biscuits, eight types of pastries, three types of cakes, two types of crackers and one type each of bread, bund, patty and jalaiby were purchased from open market of Peshawar and analysed for proximate and important mineral composition. Except bread (5.8%), bund (9.8%) and cracker (10.7%), fat content in bakery products ranged from 18-40%. Protein content varied from 5-10% with an average of 6.9%. Other chemical constituents determined were moisture, ash, total carbohydrate, iron, total phosphorus and phytate-phosphorus. Except fat, most of the nutrients studied were low in different bakery products. In general, with the exception of fat, the nutrient contribution of the products tested was small..

Key words: Bakery products, Nutrients, Phytic acid.

Introduction

The nutritional status of people in a locality is dependant to a large extent on their food habits. In rural areas the use of bakery products is limited only to particular occasions. However, in urban areas there is an increasing tendency towards dependence on ready-made or convenience foods like biscuits, cakes, pastries, patties etc. These foods are served at breakfast and as snacks between meals. The bakery products could thus contribute considerably to the nutritional status of people living in cities. There is, therefore, a need to determine type and extent of nutrients provided by these products. Data so generated will not only help nutritional planners but will also be a valuable source of information for a common man to help the diet planning by the general population. Data on the nutrient composition of bakery products commercially produced in Pakistan is scant. In these studies the nutrient composition of biscuits, pastries, cakes, crackers, breads, bunds, patties and jalaibies commercially sold in the Peshawar market was evaluated by chemical analysis.

Materials and Methods

Collection and preparation of samples. Seventeen different types of biscuits, eight types of pastries, three types of cakes, two types of crackers ('rus') and one type each of bread (double roti), bund, patty and jalaiby (chemically bavened 50%) extraction wheat flour is mixed with fat before dough making and then baking is done. Surface is durted with sugar were bought at the open market in Peshawar city. The samples were cut into small pieces and dried in an oven at 70° to constant weight. The loss in weight was reported as moisture. Dried samples were ground with a laboratory grinder to pass through a 30 mesh sieve and were stored in polyethylene bags until analysis.

Chemical analysis of samples. Moisture free samples were used for further analysis. Protein, fat, ash and total carbohydrate content were determined by the Cereal Laboratory Methods [1]. Wet digestion of different samples was carried out according to the method of O' Dell *et. al* [2] for phosphorus and iron determination. Total phosphorus was determined colorimetrically using the vanadate molybdate method of Hanson as described by Egan *et. al* [3]. The iron was determined colorimetrically using the thiocyanate method of wong as described by Ranganna [4] phytate-phosphorus (phytate-P) was determined by Fe (III) substitution method of Haug and Lentzsch [5].The decrease in iron determined colorimetrically was a measure of phytate-P.

Results and Discussion

1. Biscuits. Important nutrient content of different types (17) of biscuit are given in Table 1. Protein contents were low and ranged from 5.7-7.9% in all types of biscuits. Fat contents were generally high (17.9-37.5%) and most of the samples had fat contents of over 25%. Ash contents were less than 1% except in two types where it was above 3%. Highest moisture and carbohydrate content recorded were 7.4 and 68.7%, respectively in different biscuit samples. Iron, phosphorus and phytate-P content ranged from 1.03-10.78, 52.4-103.5 and 19.6-49.1 mg% respectively. In proximate composition maximum variability was recorded in ash content (105.7%) but in minerals maximum variation was found in iron content (65.6%).

2. Pastry. Table 2 shows the nutrient composition of pastries (8 types) used for studies. Moisture content of pastries was higher than that of biscuits (9.3-26.4%). Protein contents (4.9-7.3%) were lower than that of biscuits but fat content were somewhat higher (18.9-39.6%). Ash contents

TABLE 1. PROXIMATE AND IMPORTANT MINERAL COMPOSITION OF DIFFERENT TYPES OF BISCUITS.

Biscuit type	Moisture %	Protein (%)	Fat (%)	Total carbohydrate (%)	Ash (%)	Iron (mg) (%)	Phosphorus (mg) (%)	Phytate-P (mg) (%)
1	3.2	5.8	29.3	61.0	0.71	1.07	52.4	31.2
2	1.0	5.8	31.1	58.9	3.23	4.52	103.5	47.2
3	5.7	6.3	18.2	68.7	1.05	1.14	93.1	49.1
4	7.4	6.5	17.9	67.2	0.94	10.78	56.0	43.8
5	2.8	6.9	30.8	61.9	0.43	2.45	60.5	37.2
6	2.5	7.6	28.4	61.0	0.46	4.17	76.0	33.7
7	4.6	7.9	26.4	60.6	0.47	4.80	71.3	31.7
8	4.5	6.8	31.8	56.5	0.45	4.92	70.8	21.9
9	3.6	7.4	30.8	57.8	0.49	2.37	62.7	26.6
10	3.1	6.9	32.0	57.7	0.34	1.72	67.0	34.1
11	3.2	6.8	31.4	58.2	0.46	4.69	71.9	25.4
12	2.1	7.1	31.3	59.1	0.45	2.54	61.2	19.6
13	2.5	6.4	31.8	58.9	0.45	2.45	64.4	22.7
14	2.8	7.3	26.7	62.9	0.45	1.81	71.0	17.7
15	2.6	5.7	30.6	60.8	0.46	1.03	67.1	35.9
16	2.9	7.7	25.3	63.4	0.67	4.52	72.1	24.2
17	2.3	7.1	37.5	49.5	3.57	4.95	74.9	22.4
Mean	3.3	6.8	28.9	60.2	0.89	3.53	70.4	30.9
CV(%)	43.9	9.6	16.5	6.9	105.7	65.6	17.2	30.0

TABLE 2. PROXIMATE AND IMPORTANT MINERAL COMPOSITION OF DIFFERENT TYPES OF PASTRIES.

Biscuit type	Moisture (%)	Protein (%)	Fat (%)	Total carbohydrate (%)	Ash (%)	Iron (mg) (%)	Phosphorus (mg %)	Phytate-P (mg %)
1	16.9	5.7	26.6	49.9	0.84	2.29	94.1	44.5
2	9.3	6.9	39.3	48.8	0.68	8.95	150.3	10.4
3	28.0	6.9	39.6	24.4	1.08	8.90	144.0	17.1
4	14.7	7.3	33.6	43.3	1.10	12.50	139.9	16.7
5	19.0	5.1	23.9	51.9	0.96	12.20	216.8	16.7
6	20.8	5.2	24.4	48.7	0.79	4.56	176.0	27.2
7	15.8	4.9	25.1	53.3	0.89	4.08	217.6	15.0
8	26.4	6.8	18.9	47.1	0.78	1.13	127.6	48.5
Mean	18.9	6.1	28.9	45.2	0.89	6.82	158.29	24.5
CV(%)	30.7	14.9	24.7	18.8	15.6	60.5	25.40	54.9

were around 1% and total carbohydrate contents (24.4-53.3%) were less than that of biscuits. Iron (1.13-12.5 mg%) and phytate-P (10.4-48.5 mg%) contents of pastries were comparable whereas phosphorus content (94.1-217.6 mg%) were higher than that of biscuits. In pastries maximum variability was recorded in iron content (60.5%).

3. Miscellaneous. Under this heading three types of cakes, two types crackers and one type each of bread, bund, patty and jalaiby were included (Table 3). Bread had the highest moisture content (28.1%)followed by bund (25.1%). Ash content were highest in patty and jalaiby samples (2.1%).

TABLE 3. PROXIMATE AND IMPORTANT MINERAL COMPOSITION OF DIFFERENT BAKERY PRODUCTS.

Miscelleneous products	Moisture (%)	Protein (%)	Fat (%)	Total carbohydrate	Ash (%)	Iron (mg%)	Phosphorus (mg%)	P-Phytate (mg%)
Cake								
Type 1.	18.8	7.5	23.8	48.8	1.12	1.63	87.2	43.1
Type 2.	10.5	7.2	23.6	51.2	1.73	16.70	149.2	26.5
Type 3.	21.3	7.7	24.2	45.5	1.18	67.32	214.1	45.7
Cracker								
Type 1.	6.9	8.9	10.3	72.7	1.26	5.49	71.1	12.9
Type 2.	12.4	6.9	11.1	67.7	2.01	4.50	66.4	55.5
Bread	28.1	10.2	5.8	54.6	1.31	1.13	204.6	11.6
Bund	25.1	9.0	9.8	54.8	1.31	7.24	88.1	18.8
Patty	9.7	6.1	32.4	49.8	2.05	7.11	52.9	26.5
Jalaiby	12.9	6.9	32.8	45.3	2.05	2.52	47.4	25.9

The same two products had the highest amounts of fat content (32.4 and 32.8% respectively). Protein content ranged from 6.1% in patty to 10.2% in bread whereas carbohydrates were between 45.3 (Jalaiby) and 72.65% (cracker). Lot of variability was observed in minerals studied in these food items. Maximum iron, phosphorus and phytate-P content were observed in bund (7.24 mg%), cake (214.1 mg%) and cracker (85.5 mg%), respectively.

Results reported in Table 1, 2 and 3 clearly indicate intertype and intratype variation in nutrient composition of bakery products. This variation is expected and could be possible due to (i) difference in material used for the preparation of bakery products, (ii) different recipes used in formulating bakery products, and (iii) variation in cooking/ baking procedures. Almost all the bakery products analysed were lower in protein content than ordinary roties which contain about 10% protein [6]. On the basis of 6.9% protein content (average of all the products), a consumer would need more than 700 g bakery products to meet the daily requirement of protein (45-50 g) recommended for an adult [7]. Major source of protein in bakery products is wheat flour of low extraction rate [8], which is deficient in protein quantitatively and qualitatively (due to deficiency of basic amino acids especially lysine). These products should, therefore, be supplemented with lysine rich protein source such as soybean [6], gram [9] etc. The fat content of almost all the bakery products were high. It ranged from 9.8% (Table 3) in bund to 39.6% in pastry (Table 2). However, the quality of fat can be better judged from its essential fatty acid profile. Mean iron content of biscuits (3.53 mg%) were comparable to that of wheat roties (3.4 mg%) [6] but pastries (6.82 mg%) and miscellaneous items (5.89 mg%) had higher amounts of this mineral. Total phosphorus (255.1 mg%) and phytate-P (55.2

mg%) contents of wheat roties as reported [6] are higher than almost all the bakery products analysed. Vitamin assays were not made in present studies. As in case of all grain products, literature reports indicate that vitamin A and vitamin of B group [10] and vitamin C [11] of bakery products like biscuits are usually low.

The results clearly indicate that bakery products available these days in the market are not good source of nutrients and may not contribute much towards the nutritional requirements of consumers. Malnutrition problem in urban areas may be ameliorated to some extent if nutritions bakery products are offered in the market. Nutrient fortification of bakery products should be done in Pakistan as practised in some other countries [12]. Long term planning should also take into consideration modification of the recipe of bakery products in order to improve their nutrient composition. Supplementation of wheat flour with that of grain legumes can improve the quality as well as quantity of protein in bakery products [6,9].

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