

Short Communication

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Nutritional Evaluation of Some of the Traditional Foods of the Rural Areas of Pakistan

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Twelve dishes of traditional foods were analysed. "Lassi", "Suji halwa" and Rao ki kheer" contained maximum amount of protein (29.94%), lipids (25.90%) and carbohydrates (94.15%) respectively. Nishasta contained 516.72 calories/100g sample, the highest in these dishes. "Saag" and "Poki" contained 7.96% and 14.98% of fibre respectively. Mineral content of "Poki" were 22.71%.

Aim of the present study was to evaluate some of the popular foods which are being consumed in the rural areas such as:

1. Lassi - Butter milk.
2. Gahrar - Sweetened butter milk
3. Sattu - Roasted barley flour.
4. Shooshia - Sweetened mango chutney
5. Suji Halwa - Semolina pudding.
6. Rao Ki Kheer - Rice pudding in sugar cane juice.
7. Dabras - Linseed, starch, green gram flour and chick pea flour; after roasting in butter oil, were mixed with sugar and nuts, made into round balls.
8. Poki - Chutney of dried leafy vegetables.
9. Saag - Green leafy vegetable preparation.
10. Basey Roti - A bread/chapatti left over night.
11. Meethee Roti - Sweetened chapatti.
12. Makai Ki Roti - Maize chapatti.

Details of ingredients used for the preparation of these foods are reported in Tables 1 and 2.

Sample collection and proximate analysis. The pre-prepared samples of the above food products were collected from rural areas of the nearby villages brought to the laboratories on the same day and analysed for protein [1], fat [2], moisture, ash and fibre contents [3]. Carbohydrates were calculated by difference and calories were computed by applying the multiplication factors to the estimates protein, carbohydrates and fat values. The results reported in Table 3 are the average of 5 readings.

Twelve dishes of various foods were analysed for their nutritive value. Food dishes were grouped into; (i) Liquid foods (ii) Sweet dishes (iii) Dishes based on green leafy

vegetables and (iv) Unleavened breads depending upon the physico-chemical nature of the foods.

Lassi and Gahrar are nutritious drinks as compared to cold drinks which are commonly consumed in urban areas. These provide high quality protein as these are derived from animal sources. Lassi, Gahrar, Sattu and Shooshia drinks not only provide nutrients like protein and carbohydrates but other nutrients such as lipids and minerals also. Lassi is nutritious as well as suitable for people working under sun to prevent dehydration while Gahrar is an ideal drink for growing children and lactating mothers.

Sweet dishes. The most common dish is Halwa. It is a special diet for ladies in confinement because Suji Halwa is considered to be an energy giving food. Rao Ki Kheer is a favourite dish only during winter because sugar cane juice is available in abundance during this season. Proximate analysis of these foods are reported in Table 3.

Monoglyceryl phosphate, a component of Rao protects the teeth enamel. Thus, consumption of this high sugar food commodity is not as hazardous to dental health as refined sugar.

Dabras. Dabras are very popular in our rural population. These are high lipid, high carbohydrate and high caloric foods. Protein content of these foods is also substantial (Table 3). These are considered to be favourite winter season foods, because it is difficult to preserve these during summer, as high temperature causes oxidative rancidity of the lipids. These foods are of high caloric value and are suitable for the villagers, who undertake more physical exercise and have higher energy requirements. However, due to high lipid content, these dishes are less suitable for people engaged mainly in mental work, because these are slowly digested. These could also produce cardiac ailments if consumed in large quantities over a long period of time.

Dishes based on green leafy vegetables. Poki and Saag the two dishes are based on green leafy vegetables. Saag is available free of cost in villages and once cooked can be served easily for two to three days.

Saag has got toxic substances which are steam volatile and soluble in saline water. These are eliminated in the course of cooking [4].

The vast difference in composition of these two dishes is basically due to difference in their moisture content (Table 3). Poki is produced from dried coriander and fenugreek, while Saag is prepared from fresh leaves. An interesting feature of

TABLE 1. INGREDIENTS USED IN THE PREPARATION OF VARIOUS TRADITIONAL FOODS (g).

S. No.	Food	Shakar	Sattu	Mango	Salt	Chillies	Semolina	Butter	Rao	Rice	Dahi
1.	Lassi	—	—	—	—	—	—	—	—	—	250
2.	Gahrar	25	—	—	—	—	—	—	—	—	250
3.	Sattu	100	100	—	—	—	—	—	—	—	—
4.	Shooshia	75	—	250	2	2	—	—	—	—	—
5.	Suji Halwa	60	—	—	—	—	60	30	—	—	—
6.	Rao Ki Kheer	—	—	—	—	—	—	—	2*	250	—

*Litre

TABLE 2. INGREDIENTS USED IN THE PREPARATION OF VARIOUS TRADITIONAL FOODS (g).

S. No.	Foods	linseed flour	Wheat flour	Green gram flour	Maize flour	Sugar	Starch	Raisins	Jaggery	Almond kernels	Nuz	Click pea flour	Pesu-greek	Corriander leaves	Mustard leaves	Spinach	Ginger	Garlic	Green chillies	Butter	Semolina	Chillies	Salt
1.	Alsi Pini dabra	20	40	—	—	—	—	2	30	40	—	—	—	—	—	—	—	—	—	40	—	—	—
2.	Nishasta Dabra	—	—	—	—	60	32	—	—	—	40	—	—	—	—	—	—	—	—	45	32	—	—
3.	Mungi dabra	—	—	64	—	60	—	—	—	—	40	—	—	—	—	—	—	—	—	45	—	—	—
4.	Basin dabra	—	—	—	—	60	—	—	—	—	40	64	—	—	—	—	—	—	—	45	—	—	—
5.	Poki	—	—	—	—	—	—	—	—	—	—	—	100	100	—	—	—	—	—	45	—	5	7
6.	Saag	—	90	—	—	—	—	—	—	—	—	—	—	—	2*	375	3	3	30	—	—	20	30
7.	Basey Roti	—	90	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.5
8.	Meethee Roti	—	90	—	—	—	—	—	40	—	—	—	—	—	—	—	—	—	—	100	—	—	0.5
9.	Makai Ki Roti	—	—	—	100	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.5

* Kilogram.

TABLE 3. PROXIMATE COMPOSITION OF VARIOUS TRADITIONAL FOODS (DRY MATTER BASIS)

S. No	Food	Protein (%)	Lipids (%)	Ash (%)	Fibre (%)	Carbohydrates	Calories per 100 g sample
1.	Lassi	28.94 (±0.18)	6.98 (±0.03)	7.75 (±0.03)	—	54.00 (±1.76)	394.58
2.	Gahrar	12.15 (±0.20)	7.87 (±0.81)	3.46 (±0.62)	—	66.52 (±2.36)	385.15
3.	Sattu	2.25 (±0.03)	—	0.75 (±0.30)	1.03 (±0.02)	95.97 (±0.32)	392.88
4.	Shooshia	2.23 (±0.05)	0.35 (±0.01)	3.56 (±0.03)	4.70 (±0.09)	87.58 (±0.48)	368.71
5.	Suji Halwa	3.81 (±0.10)	25.90 (±0.10)	0.22 (±0.10)	0.20 (±0.03)	69.78 (±0.44)	527.46
6.	Rao Ki Kheer	4.04 (±0.08)	0.41 (±0.02)	0.78 (±0.02)	0.83 (±0.04)	94.15 (±0.46)	392.88
7.	Dabras						
	(a). Alsi plant	4.74 (±0.10)	23.48 (±0.20)	2.80 (±0.04)	3.53 (±0.303)	65.37 (±0.34)	441.76
	(b). Nishasta	3.28 (±0.05)	24.48 (±0.30)	0.54 (±0.01)	6.88 (±0.10)	76.82 (±0.56)	516.72
	(c). Mungi	7.49 (±0.20)	23.33 (±0.30)	1.68 (±0.03)	1.75 (±0.14)	65.75 (±0.83)	502.93
	(d). Basi	9.89 (±0.20)	22.91 (±0.20)	0.38 (±0.03)	0.84 (±0.10)	67.18 (±0.73)	513.67
8.	Poki	7.82 (±0.32)	40.41 (±0.90)	22.71 (±0.20)	14.28 (±0.80)	14.98 (±2.50)	454.09
9.	Saag	1.32 (±0.02)	21.43 (±0.20)	2.51 (±0.08)	7.96 (±0.09)	56.73 (±1.54)	465.27
10.	Basey Roti	13.35 (±0.20)	1.18 (±0.05)	1.93 (±0.02)	5.44 (±0.10)	78.10 (±0.53)	276.52
11.	Meethee Roti	7.18 (±0.20)	3.38 (±0.40)	2.31 (±0.02)	0.80 (±0.03)	80.85 (±0.85)	431.96
12.	Makai Ki Roti	12.26 (±0.30)	14.44 (±0.30)	1.79 (±0.03)	4.63 (±0.05)	66.88 (±1.08)	446.52

- All values of table represent average of 5 readings, - Figures in the paranthesis are S.D. values for each respective mean value

Poki is its ash content (22.71%) which is the highest amongst all the dishes in the present study (Table 3). Saag is eaten in greater quantity. It is also a good source of fibre. These high fibre foods are considered useful for overall better digestion of food and especially for constipated patients.

Roti. Roti is the major component of food of several countries of the world and is staple Pakistani food (commonly used both in rural and urban areas). Proximate composition of various types of Rotis are reported in Table 3.

Lipids content of Basey Roti is only 1.18% i.e. lower than other Rotis. This is due to the difference in ingredients used for its preparation. Meethee and Makai Ki Rotis have a lot of

butter or ghee in the basic formulae of their preparation, therefore, fat content of these Rotis are considerably higher than the Basey Roti.

It is quite obvious from the analytical results of various traditional food that people living in the rural areas are getting substantial amounts of protein, carbohydrates, fat, fibre, minerals, etc. by including these foods in their daily meals.

Key words : Foods, Traditional, Nutritive value.

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The mixture was shaken vigorously and kept for 2 hours at 4° and finally centrifuged at 1000 g. The clear supernatant (S₁) was subjected to analysis using automatic amino acid analyzer (L.C. 6001 Biomicro, GmbH) for determination. Amino acids were estimated after hydrolyzing the pulp and seed proteins separately with 6N HCl in sealed glass tubes incubated at 110° for 20 hrs. Finally HCl was removed in vacuum and amino acids were analyzed by the automatic amino acid analyzer.

The amino acids found in the hydrolyzed seed and pulp (free amino acid) juice of Falas pulp and seed presented in Table I revealed some interesting and significant observations. While evaluating the essential amino acids it was found that lysine is found in pulp while it is missing in seed extract, on the other hand methionine is present in seed indicating that substitution of seed's solution in Falas juice may be detected by presence of methionine. The presence of valine as free amino acid in juices only in the pulp may be

TABLE I. AMINO ACID COMPOSITION OF FALAS JUICE

Amino acids	Pulp (μmole/100g)		Seeds (μmole/100g)	
	FAA	Hydrolysate	FAA	Hydrolysate
Serine	1.33	4.12	28.68	—
Proline	3.08	—	19.92	—
Amino butyric acid	—	—	11.62	—
Methionine	—	—	7.2	14.28
Lithidine	—	2.43	3.06	0.38
Valine	1.62	—	—	4.02
Isoleucine	1.32	—	3.24	—
Leucine	1.24	—	8.42	—
Tyrosine	1.12	—	2.2	4.22
Phenylalanine	2.82	—	—	4.22
Glutamic acid	—	40.31	—	—
Threonine	2.76	0.69	—	—
Glycine	2.19	—	14.82	0.21
Alanine	1.40	—	27.88	—
Alanine	0.86	—	—	—
I-yane	—	28.29	8.24	0.28
Aspartic acid	—	60.31	—	—
Propanoic acid	8.22	—	22.82	—
Taurine	2.41	—	12.22	—
Cysteine	1.79	—	—	—

FAA = Free amino acid, — Not detected

Amino Acid Composition of Falas Juice (Fals) as Index of Juice Quality

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(Fals) juice, commonly known as 'Falas' was analyzed for the amino acid composition. Amino acids of pulp and seeds were found to exhibit very specific ratio. Glutamic acid and lysine were absent in extracts of seeds while the hydrolyzed seeds contained large amount of glycine and proline, however their absence in pulp hydrolysate was especially significant.

The fruit juices are generally highly priced, so it is tempting to substitute them with cheaper ingredients or more sophisticated methods like mixing of protein hydrolysate, low cost amino acids, or other fruit juices of inferior quality (1).

Green (2) suggested that amino acid analysis may be a useful tool for determining the identity and quality of fruit drinks. The concentration profile of free amino acids has been found significant to detect the adulteration of citrus juices. The sophisticated techniques involved in estimation of amino acids (3) including amino acid analyzer (4) have further encouraged the application of methodology in assessing the quality of fruit juices.

Importance of free amino acid in fruit juices has been recognized only decade and half ago (5,6), they were regarded as useful indicators for authenticity of juice. Amino acids profile can also be used to substantiate or verify the same fruit, e.g. amino butyric acid is present only in Valerian orange while New Zealand orange do not have it. Wallrauch (7) reported that genuine fruit juices are rich in serine and alanine while genuine level is high in pear juices (8). The specificity in ratio of amino acid is thus another way of determining the degree of adulteration (9).

The present paper deals with the analysis of amino acids of pulp and seeds of Falas and its significance in determining the degree of adulteration in Falas fruit juice.

Analytical reagent grade chemicals and double distilled water were used throughout the experimentation. Protein content was estimated by micro Kjeldahl method.

Free amino acids in extracts of pulp and seed were analyzed after precipitation of proteins by adding 10% trichloroacetic acid to the known quantity of juice (a ratio of 1: