

Short Communication

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PREPARATION AND NUTRITIONAL EVALUATION OF DISHES CONTAINING SOYBEAN FLOUR

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The average Pakistani diet is deficient in protein. This difference can be removed by increasing the protein supply from other sources such as oil seeds and legumes. Among oil seeds soybean is the cheapest source but due to inagurable odour and presence of trypsin inhibitor, is not used in the dishes. The present study deals with preparation of dishes, having soyflour free from trypsin inhibitor. The soyflour used was analysed for moisture, fat, protein, crude fibre and ash according to A.O.A.C. methods. The results of analysis are shown in Table 1.

Table 1.

Product	Protein (%)	Fat (%)	Fibre (%)	Ash (%)	Carbo- hydrates (%)
Raw soybean	39.0	23.0	5.6	6.0	26.2
Soy flour	46.4	7.9	1.2	2.5	65.0

Various food dishes were prepared according to the following recipes both with and without soyflour addition.

1. Pakora

Ingredients	Control sample	Sample containing soyflour
Gram flour	100 g	70 g
Soyflour	—	30 g
Onion	35 g	35 g
Pomegranate seeds	3 g	3 g
Black cusin seeds	4 g	4 g
Salt	4 g	4 g
Red chillies	2 g	2 g
Coriender seeds	3 g	3 g
Baking soda	0.5 g	0.5 g
Fat	for frying	for frying

Both lots of ingredients were mixed, with water to make a paste. The spoonful of this paste dropped in a

heated saucepan containing fat pakoras, which get enough brown, were taken out of saucepan.

2. Cake.

Ingredients	Control sample	Sample containing soyflour
Wheat fine flour	100 g	90 g
Soyflour	—	10 g
Sugar	100 g	100 g
Fat	80 g	80 g
Eggs	2 only	2 only
Baking powder	1 teaspoon	1 teaspoon

Fat, sugar and eggs were beaten together till the mixture became fluffy. Dry ingredients i.e. wheat flour, soyflour and baking powder were mixed together and then added into the above mixture gradually and mixed to a smooth consistency. The desired amount of the dough was baked at 160-170° for 40 minutes. Control cake was also prepared in the above manner except that soyflour was not incorporated.

3. Soy roti.

Ingredients	Control sample	Sample containing soyflour
Wheat flour	100 g	80 g
Soyflour	—	20 g
Onion	10 g	10 g
Green chillies	2 g	2 g
Corriender seeds	1 g	1 g
Corriender leaves	1 g	1 g
P megranate seeds	2 g	2 g
Red chillies	1 g	1 g
Salt	1 g	1 g
Fat	for frying	for frying

All the above ingredients were mixed together, water was added gradually to dry mixture and mixed to make a smooth dough. "Chappaties" were made and baked with a small amount of fat on a hot plate.

4. Dough nuts.

Ingredients	Control sample	Sample containing soyflour
White flour	100 g	90 g
Soyflour	—	10 g
Sugar powdered	40 g	40 g
Fat	20 g	20 g
Eggs	40 g	40 g
Baking powder	2 g	2 g
Salt	2 g	2 g
Milk	5 ml	5 ml

Eggs and sugar were beaten together till the mixture became fluffy, then added milk and melted fat to it. Mixture of white flour, soyflour, salt and baking powder was added gradually to the egg sugar mixture and mixed to mouth consistency. It was spread 3/8 of an inch on a board and was cut with a doughnut cutter. Then these were fried in fat till golden brown. Finally doughnuts were rolled in powdered sugar. Control doughnuts were also prepared in above manner except that soyflour was not incorporated.

5. Kabab.

Ingredients	Control sample	Sample containing soyflour
Minced meat	500 g	500 g
Chick peas	150 g	—
Soyflour	—	100 g
Onion	100 g	100 g
Garlic	20 g	20 g
Ginger	30 g	30 g
Salt	6 g	6 g
Red chillies	8 g	8 g
Pepper	4 g	4 g
Cumin seeds	5 g	5 g
Cinnsmon sticks	3 g	3 g
Cardimum	3 g	3 g
Clove	2 g	2 g
Eggs	40 g	40 g

All the ingredients except eggs were cooked along with a small quantity of water in a saucepan till it was tender (added soyflour to it and cooked till the free water was evaporated from soy kaban). Whole material was cooked till the free water evaporated and ground to fine mesh. Kabab was shaped with hands. Eggs were beaten in a separate bowl. Each kabab was coated with egg by dipping it into beaten eggs, then fried in fat on hot plate. Control kabab was also prepared in the above manner except that soyflour was not incorporated.

Net Protein Utilization (NPU) was determined according to the method of Miller and Bender [1] using eight male albino rats weighing 30–35 gm in a group for each recipe. Efficiency ratio (PER) of various products were determined according to the method described earlier [2] using male albino rats weighing 30–35 grams protein content of dishes and PER were shown in Table 2.

RESULTS AND DISCUSSION

It was observed from Table 2 that enriched dishes had high content of protein as compared to control dishes which were prepared without the addition of soyflour. It was observed from Table 2 that NPU of control products were less than that of the products containing soyflour. NPU of control pakora and soyflour containing pakora were 51.9 and 60.1 respectively and their PER values were

Table 2.

S.	Name of dish	Protein dry wt. basis (%)	N.P.U.	P.E.R.
1.	Pakora (control)	19.1	51.9	2.1
	Pakora containing soyflour	30.6	60.1	2.47
2.	Cake (control)	8.7	38.3	1.1
	Cake containing soyflour	11.2	45.5	1.4
3.	Roti (control)	10.0	40.0	1.1
	Roti containing soyflour	13.6	56.1	1.8
4.	Doughnut containing soyflour	6.2	38.0	1.0
		8.1	52.3	1.6
5.	Kabab	35.5	76.0	2.6
	Kabab containing soyflour	40.0	80.5	3.0

also raised from 2.1 to 2.47. Other products such as soy roti, doughnut and cake gave the similar results.

The protein efficiency ratio of soy containing products have high value than that of control, which conformed to the results of NPU determination.

On the basis of above results, it was concluded that dishes containing soyflour such as pakora, kabab and soy roti were suitable for diabetic patients, as these products have high percentage of protein. Incorporation of small quantity of soyflour (10 %) in preparation of dishes enhanced the nutritional values of the products.

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Key words: Nutritional evaluation, Soybean products, Soybean flour.

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Table 1. Effect of naphthalene acetic acid on the fruit yield of tomato (cv. Marmande)

NAA (ppm)	Number of fruit/plant	Wt. fruit (g)	Fruit yield/plant (g)	Percent increase over control
0	30 a	21.72 b	1257 a	100
2	43 b	63.72 c	2681 b	172
10	56 c	24.57 d	3056 c	196
15	63 d	48.86 e	3078 c	198
20	68 d	49.60 f	3377 d	217
25	88 e	42.83 a	3769 e	242
L.S.D. 1% 7.96				
181.45				

It is therefore concluded that foliar spraying of naphthalene acetic acid at the time of flowering prevent pre-harvest flower abortion by increasing the available auxin concentration at this critical phase of reproductive development.

Key words: Growth regulator, Tomato, Nutrient contents.

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After 15 days seedlings were transferred to perforated plastic bags (50 x 40 cm) and irrigated with nutrient solution. One month old seedlings transplanted in the soil (superphosphate) in AERC export farm in twelve rows (4 plants in each row) at a distance of 60 cm from plant to plant and 90 cm from row to row. Two rows assigned for each treatment. The mean average temperature was 20° during growing season (November-March). The only source of water was irrigation during the season. The plant were sprayed with a aqueous solution of (water) 2, 10, 15, 20 and 25 ppm NAA at flowering time. In addition wetting agent Tween 0.07% and insecticide sulpho 0.1% were also used.

RESULT AND DISCUSSION

Foliar spray of naphthaleneacetic acid had pronounced effect on increasing the yield of tomato fruit. Increasing concentrations of NAA significantly increased the yield by increasing number of fruits retained in the tomato cultivar tested (Table 1). Compared with control the percent increase was 172 at 2 to 242 at 25 ppm NAA. It was further observed that the increase in yield was not due to increase in the size of the fruit but due to increased retention of fruits per plant.

Results obtained indicating the increase in yield of fruits with NAA treatments are similar to those already reported for tomato [1, 2], chilli [4], mango [2] and citrus