Tropical Agricultural Research Vol. 2 1990

Consumption Pattern and Methods of Preparation of Green Leafy Vegetables

G.G.S. Gunasekera, M.W.A.P. Jayatilaka & G. Ravindran

Postgraduate Institute of Agriculture, University of Peradeniya
Peradeniya.

ABSTRACT: This study was undertaken to assess the relationship between consumption and methods of preparation of green leafy vegetables with socioeconomic factors, seasonality and substitution effect among urban people.

The study showed no clear seasonal differences in consumption and preparation methods since most of the vegetables are available throughout the year. The data neither revealed any substitution effects, though it was expected due to price increase of other vegetables. There was no change in the consumption pattern, during the period of study. There is a clear preferential pattern to some leafy vegetables which is not related to any of the independent variables. Storage methods were related to income. The occupation had a strong relationship with consumption patterns. Some with home gardens tend to produce their own leafy vegetable needs. This was more due to tradition/habit than due to any other factor. There was widespread awareness of basic nutrition principles associated with preparation across the different categories of people sampled. Although awareness of these principles are high the actual practices deviated from theory. Hence improving their ability to cope with situations that prevent them from practicing basic nutrition principles in storage and preparation must be undertaken.

INTRODUCTION

Food consumption surveys are the only source of measurement of variations in the consumption of foods by season, with consumer characteristic and geographic areas. Furthermore they provide the only basis for measuring the relationship among the variations in food consumption and patterns of nutrient supplies on the one hand and, among variations in food consumption and demographic, socioeconomic cultural, environmental and institutional factors on the other (FAO Nutritional paper, 1980).

The food habit and dietary patterns of a society are never static. A great variety of socioeconomic, cultural and environmental variables influence food intake and nutritional status of any group of people. Income is a major factor in food habits and nutrition. With a significant increase of income more expensive foods are consumed and the proportion of income spent on food diminishes. Food avoidance or taboos as part of the culture of a people may also influence food habits and household size. With increasing size of the household, consumption of animal foods decreases and staple foods are replaced by cheaper ones (Adel *et al.*, 1985).

Dark green leafy vegetables have formed the mineral and vitamin supplement for village communities for thousands of years. Leaves are good sources of carotein, folic acid, iron, vitamin C and calcium (Wickramanayaka, 1979). However, after introduction of vegetables such as cabbage, leeks, cauliflower & lettuce from the west, the dark green vegetables have been low status vegetable and their consumption has diminished.

The fact that a food contain a particular level of nutrient when analyzed in a laboratory does not mean that all the nutrients will be available to one who eats it. The bioavailability of nutrients in food vary greatly with the form in which they are found, consumption pattern storage conditions and methods of preparation. In the context of the presence of a large number of inexpensive edible green leafy vegetables, their abundance and their attribute qualities, it is of practical importance to identify the consumption patterns and the contribution of green leaves to the nutrition of an average Sri Lankan.

This study was carried out to achieve the following objectives: –

1. To assess the availability and consumption habits of leafy vegetables.

2. To identify if socio – economic status is related to consumption of leafy vegetables.

3. To identify if consumption of leafy vegetable is related to availability of land for use as home garden.

METHODOLOGY

A survey was conducted among a sample of 100 households in 4 wards of the Kandy municipality area. A questionnaire was prepared to collect data on types, amount of leafy vegetables consumed, seasonality, preferences and reasons, storage methods and methods of preparation. These parameters were analyzed in relation to socio-economic indicators such as income, education and occupation. Frequency tables were prepared and the data was analyzed statistically using the Chi-square test.

RESULTS AND DISCUSSION

Seasonality

This study shows no clear seasonal difference in consumptions and preparation methods. It is observed that only 18% of people noted the scarcity of green leafy vegetables during December to February, while 78% reported that most of the green leafy vegetables are purchased and available throughout the year.

This situation may be attributed to the high growth rate, short life and the relatively easy propagation methods using vegetative parts of leafy vegetables.

Price substitution

The different types of vegetables consumed by the households surveyed are presented in Table 1. 99% of households consume green leafy vegetables along with other vegetables. There was no substitution effect observed in this study. Consumption of green leafy vegetables has increased only by 2% when the prices of other vegetables increased. The people make adjustments and continue their consumption pattern unchanged. This may be due to the ready availability and preferences.

Table 1. Type of vegetables consumed.

Type of vegetables	No. of house hold	Percentage	*No. of house hold	Percentage
Fruit vegetables	96	25	72	23
Root vegetables	95	26	80	25
Pumpkin & Gaurds	82	22	72	23
Leafy vegetables	99	27	90	29
Total	372	100	314	100

* When prices of vegetables are high.

Preference

Table 2 shows the data on consumption of different types of green leafy vegetables. There is a clear preferential pattern to some leafy vegetables which is not related to any of the independent variables. *Mukunuwenna* (21%), *Gotukola* (21%) and *Kathurumurunga* (16%) are consumed more than the other types. From the data on preference of green leaves (Table 3), it is clear that *Gotukola* has been the most popular while *Mukunuwenna* was next. This could be attributed to its good flavour and wide use in herbal medicine as a cure for catarrh. There was no appreciable avoidance or taboos towards consumption of green leafy vegetables. *Kankun* is slightly less popular when compared to the other types due to its slimy texture and digestive problems.

Knowledge and awareness

The knowledge of different people on consumption of green leafy vegetables (Table 4) are almost similar. About 60% of the housewives have an idea of its nutritional value. It is not related to any of the socio-economic factors.

Source

The source of green leafy vegetables (Table 5) are different for households. Of the households surveyed 22% produce all their leafy vegetable needs in their home gardens. About 75% the sampled group has only less than 25 perches for their home garden and as a result, purchase most of their green leafy vegetable requirement from the market (49%) or *pola* (12%).

Storage methods and durations

In general, some storage methods are practiced for green leafy vegetables which is related to income (Table 5). Most of the respondents (49%) are used to storing green leaves by dipping in water, while the higher income groups use refrigeration storage. The normal storage duration observed in this study was about 1-2 days. In few

Table 2. Type of green leafy vegetables consumed by house holds (N = 100)

Type of leafy vegetables	No. of house holds	Percentage
Mikanuwenna	92	21
Kankun	31	7
Gotukola	90	20
Kathurumurunga	70	16
Thampala	26	6
Nivithi	11	3
Kohila	11	3
Anguna	7	2
Sarana	4	1
Cabbage	37	9
Penela	6	1
Japan batu	33	8
Wattaka	6	1
Polpala	5	1
Salad leaves	4	1
Manioc	2	
Total	435	100

Table 3. Preference on green leafy vegetables.

Type of leafy vegetables	Like very much	Like	Dislike
	*		
Mikunuwenna	73	84	1
Kankun	2	0	10
Gotukola	99	4	0
Kathurumuringa	17	8	0
Thampala	5	1	0
Nivithi	0	0	0
Kohila	0	1	8
Anguna	0	0	0
Sarana	0	0	5
Cabbage	2	1	2
Penela	0	0	0
Japan batu	2	1	1
Polpala	0	0	0
Manioc	0	0	4
Salad leaves	0	0	0
Total	200	100	31

Table 4. Reasons for consuming leafy vegetables.

Source	No. of house holds	Percentage
Home garden	35	23
Market	75	49
Pola	19	12
Paddy field	7	5
Vegetable gardens	17	11
Total	153	100

Table 5. Source from green leafy vegetables purchase

Source	Number of house holds	Percentage
Homegarden	35	23
Market	75	49
Pola	19	12
Paddy field	7	5
Vegetable gardens	17	11
Total	153	100

cases, the leaves are kept in the refrigerator even up to 7 days. Vitamin C is required in the diet in greater amounts than all the other vitamins combined and also it is notably liable and is more readily lost than most other food constituents. Cardwell M., 1973 reported that loss of ascorbic acid when leaves were held at room temperature, was 85%. Therefore most of the vitamin C present in the leafy vegetables does not get added to their diet, under such conditions of storage.

Effect of income, education and occupation on consumption of green leafy vegetables are given in Table 7. About 75% of the sampled population were within the middle income range and there was no clear difference on the amount of green leaves consumed. It is also revealed that the education levels of the people have no significant effect on consumption. Most of them consume green leaves in a similar manner. This may be due to the low price and the abundance of green leafy vegetables. Most of the housewives in this area are unemployed (63%). Because of this situation they may have more time to obtain and prepare green leafy vegetables than those who are employed. In most households, the inclusion of leafy vegetable preparation in the daily diet is an accepted practice.

Methods and duration of cooking

In Sri Lanka, leaves are prepared in three different ways. The soft mucilaginous leaves such as *Kankun, Kohila* leaves of gourds *etc.* are cooked in coconut milk or tempered in oil. Some are mixed with grated coconut and cooked over direct flame. In this study (Table 8), it is also noted that almost all the people preferred the preparation of "*mallun*" with *Mukunuwenna* and *Kathurumurunga* and raw salad with *Gotukola*. Other methods of preparation are practiced to a lesser extent. They also have knowledge on destruction of certain nutritional components during heat preparations. Therefore they try to minimized the duration of cooking. About 85% of them cooked green leaves only up to 5 minutes. According to Gunasekera and Ravindran (1989) the average loss of ascorbic acid observed during boiling steaming and "*mallum*" preparation was 54%, 39% and 35% respectively. Therefore "*mallum*" preparation, is the best method of preparation to maximize vitamin C retention is practiced in most of the households. There was no clear difference among the different education levels on these nutritional principles.

Table 6. Storge methods and durations

Storage method	No. of house holds	Income					Storage duration					
		1	2	3	4	5	0	1	2	3	4	5
Just kept in air	10	4	3	3	0	0	4	5	0	0	0	0
Dipped in water	49	4	19	18	4	4	0	27	21	1	0	0
Kept in regrigerator	34	2	6	18	8	-	4	4	12	9	2	7
Covered with polythene	7	1	3	3	-	-	0	4	3	0	0	0
Total	100	11	31	42	12	4	4	40	36	10	2	7

* Number of house holds

Table 7. Effect of income, education, occupation on consumption

Amount Bundles/ week	Income					Education				Occupation					
	1	2	3	4	.5	1	2	3	4	1	2	3	4	5	6
2 - 4	3	9	14	2	0	8	12	7	1	19	4	1	3	1	0
5 - 7	3	15	17	7	3	10	23	9	3	25	5	5	7	1	2
8 - 10	1	5	8	3	1	2	11	5	0	14	1	3	0	0	0
11 - 15	0	1	5	2	0	1	4	3	0	4	2	1	0	1	0
Over 15	0	1	0	0	0	0	1	0	0	1	0	0	0	0	0
Total	7	31	44	14	4	21	51	24	4	63	12	10	10	3	2

* Number of house holds

Income levels (Rs)	Education levels	Occupation
1 0 - 1500	1 Primary	1 No employment
2 1500 - 3000	2 G.C.E. (O/L)	2 Teacher
3 3000 - 5000	3 G.C.E. (A/L)	3 Clerk
4 5000 - 10,000	4 Graduate	4 Self employed
5 more than 10,000		5 Typist
		6 Administrative

Table 8. Cooking methods

Type of leaves	*"Mallum"*	"Curry"	*"Kola – kenda"*	"Temper"	"Salad"
Mikunuwenna	208	12	3	3	0
Kankun	0	1	0	19	0
Gotukola	7	3	11	3	88
Kathurumurunga	58	11	0	3	10
Thampala	3	17	0	3	0
Nivithi	0	6	0	0	0
Kohila	0	9	0	0	0
Anguna	2	0	0	0	0
Sarana	0	5	0	0	0
Cabbage	15	0	0	10	0
Penela	0	0	10	0	0
Japan batu	0	0	0	0	0
Polpala	0	0	1	0	0
Manioc	0	0	0	0	0
Salad leaves	0	0	0	0	4
Total	293	64	25	41	102

* Number of households

CONCLUSION

This study shows that green leafy vegetables are abundant and extensively used in the daily diets of people in Kandy Municipality area. There was no substitution, seasonal or socioeconomic factor effect on consumption. The cooking methods they practice show less nutrient destruction compared to other methods. To improve the vitamin C contribution from green leafy vegetables, it is suggested that attention should be given to educate people on minimizing the storage durations and consuming greens as much in fresh and in raw forms.

REFERENCES

Adel, P., Den Hartog and Wija, A. (1985). Manual for social surveys on food habits and consumption in developing countries. Wegeningen, Netherlands.

Cardwell, M. and Gim – Sayi, Y. (1973). The effect of cooking method and storage on the ascorbic acid content of leafy vegetables. J. Ecol. Food & Nutrition, 2: 35 – 38.

FAO Nutrition paper, 1980, Rome.

Gunasekera, G.G.S. and Ravindran G. (1989). Vitamin C content and some antrinutritional properties of green leafy vegetables and their losses during home level preparations. (in press).

Wickramanayake, T.W. (1979). Food and Diets, K. Double I press, Kandy, Sri Lanka.