The Andhra Agric. J 67 (3): 219-222, 2020

Consumption Pattern of Green Leafy Vegetables among Different Income Groups in Guntur Town of Andhra Pradesh

K Sri Sai Lakshmi, J Lakshmi, K Lakshmi and G Manasa
College of Home Science, APGC, Lam, Guntur, A.P.

ABSTRACT

Green Leafy Vegetables (GLVs) are the most commonly consumed vegetables and are found ubiquitously in Indian cuisine. They are mainly consumed for their nutrients such as high dietary fiber, low lipids and rich folic acid, ascorbic acid, vitamin K, Magnesium and Potassium. The present study was designed to know the consumption pattern of GLVs in Guntur Town, Andhra Pradesh. The study is based on the primary data collected from sample of 150 respondents belonging to the upper, middle and low income group, 50 from each income group. The information on consumption pattern of GLVs was collected with the help of a structured interview schedule. From the data collected the commonly consumed GLVs by respondents were found to be Amaranth, Spinach, Gogu, Fenugreek leaves, Rumex leaves, Basella leaves, Ponnanganni, Tamarind leaves, Drumstick leaves, Mint, Coriander and Curry leaves. Coriander and curry leaves were being used by all the respondents along with seasonings and for making chutney. Out of 150 respondents majority (92%) were consuming GLVs twice in a week followed by Alternate days (42%). GLVs are also consumed in the form of value added powders. 55% of the respondents were consuming GLVs powders. Among all the GLV powders, curry leaf powder was the most commonly used one. GLVs are processed to make dhal by adding red gram dhal to GLVs apart from other ingredients, curry and *pulusu* are prepared by simmering the GLVs. They are also consumed after frying in fat along with seasonings. All the respondents were consuming GLVs dhal. All of the respondents were aware of the benefits of GLVs. Majority of the respondents were aware of the â carotene content in GLVs. 44% of the respondents were storing GLVs prior to consumption. Statistical analysis showed that the educational levels, monthly income and socio economic class has no impact on the frequency of consumption of GLVs.

Keywords: *Consumption pattern, Green Leafy Vegetables and Value added GLV powders.*

India is endowed with a wide range of Green leafy vegetables suited for tropical, sub-tropical and temperate climates. They are grown all round the year. GLVs add variety to the menu, have good appearance and flavor and above all contain several protective nutrients. GLVs are the cheapest sources of several phytochemicals such as Dietary fiber, â carotene, ascorbic Acid, folic acid and minerals like iron, calcium, phosphorus, sodium and potassium (Tiwari *et al*., 2013). These contain a good blend of polyphenols and antioxidants, which render them unique for therapeutic values. â-Carotene which is also known as pro-vitamin A helps and maintain healthy teeth, skeletal, soft tissue, mucus membranes and skin. Vitamin C, phenolics and flavonoids are phytochemical compounds responsible for the antioxidant activity. Calcium and phosphorus are associated with formation and functioning of bones, muscles and tooth. Iron plays important role in prevention of anemia. Phenolics and flavonoids reduce the risk of cardiovascular, chronic and neurodegenerative diseases and certain types of cancer (Das *et al*., 2012; Velderrain-Rodriguez *et al*., 2014; Randhawa *et al*., 2015).

The good nutrition profile of GLVs is beneficial in lowering the risk of cardiovascular diseases and cancer. GLVs are also valued for individuals with type 2 diabetes due to their high Mg content, high fiber content, and low glycemic index. They also possess antimicrobial activity and can be used in different food products to extend storage life. The burden over synthetic chemicals can be reduced by encouraging the use of GLVs in food and food products (Randhawa *et al*., 2015). However, anti-nutritional constituents present in GLVs such as oxalate can reduce the bioavailability of some minerals, especially calcium (Radek and Savage, 2008). There are about ten major GLVs grown in India. The common ones among them are amaranth (*Amaranthus spp*.), agathi (*Sesbania grandifloa*), beet greens (*Beta vulgaris*), mustard greens (*Brassica spp*.), chekkur manis (*Sourophus androgynous*), drumstick leaves (*Moringa Oleifera*), fenugreek leaves (*Trigonella foenum graecum*) and Indian Spinach (*Basella spp*.). Among these GLVs amaranth, spinach, fenugreek leaves and mustard greens are cultivated widely (Lakshmi, 1998).

The present study was planned to know the consumption pattern of Green Leafy vegetables of the people belonging to Upper, Middle and Lower income groups living in Guntur town of Andhra Pradesh.

MATERIALS AND METHODS

Study Area

The study was undertaken in Guntur city, Andhra Pradesh and the data with regard to consumption pattern of green leafy vegetables was collected from households.

Size of the Sample

The total households considered for the study were 150 based on their income level, fifty each from Low income group, Middle income group and High income groups.

Selection of the Respondents

Selection of the respondents was done by Random sampling method. The random sampling method was used for selection of 10 wards out of 52 wards in Guntur city, Andhra Pradesh. Quota sampling procedure was followed to select 5 households each from Low income group (LIG), Middle income group (MIG) and High income group (HIG) from each ward.

Tools for the Collection of Data

The data was collected with the help of a structured interview schedule developed based on the objectives of the study comprising information regarding the type of the family, family size, occupation of head of the family, education of head of the family, monthly income of the family and socioeconomic status of the family which effects the consumption pattern of the family. The schedule was pretested by administering on a sample of 30 households, necessary modifications were done in this schedule and was used for further collection of the data.

Statistical Analysis

The data collected was subjected to statistical tests such as Percentages, Inferential statistics and chi square test for making valid interpretation of the data.

RESULTS AND DISCUSSION

In the study area out of 150 respondents 85% of the respondents belonged to nuclear family and 15% belonged to joint family. The average size of the family was found to be 4-6 members comprising of parents and children. The consumption pattern of food is always influenced by family members, the consumption of food in children is always influenced by parents (Scaglioni *et al*., 2008). As far as Education of head of family is concerned 15% of the subjects were possessing professional or honours degree, 23% were graduates or post graduates, 9% were educated up to Intermediate or post high school diploma, 8% were high school certificate holders, 19% were Middle school certificate holders, 12% were primary school certificate holders and 13% were illiterates. Regarding the occupation of head of the family 15% were Legislators, Senior Officials and Managers, 14% were professionals, 11% were Technicians and Associate Professionals, 5% were Clerks, 22% were Skilled workers and shop and Market sales Workers, 1% were Skilled Agricultural and Fishery workers, 1% were Craft and Related Trade workers, 4% were Plant and Machine Operators and Assemblers, 27% belongs to Elementary Occupation and 0% were Unemployed. Regarding the monthly income of the subjects 11% of the subjects with income > 1,26,360, 21% with 63,182 -1,26,360, 16% with 47,266 – 63,178, 19% with 31,591 – 47, 262, 10% with 18,953 – 31,589, 16 % with 6,327 – 18,949 and 7% with d" 6,323 of income. Regarding the socio economic status of the subjects 20% of the respondents belongs to Upper class, 33% of the respondents belongs to Upper middle, 15% belongs to Lower middle, 27% belongs to Upper lower and 5% of the respondents belongs to Lower. Socioeconomic factor plays a key role in achieving food security anywhere in the world, especially among the poor people (Saleh *et al.,* 2013).

The data on consumption pattern of GLVs showed that most commonly consumed GLVs were Amaranth, Spinach, Gogu, Fenugreek leaves, Rumex leaves (*Chukka kura*), Basella leaves (*Bacchala kura*), Ponnanganni (*Ponnaganti kura*), Tamarind leaves, Drumstick leaves, Mint, Coriander and Curry leaves. The data on consumption of type of GLVs showed that 100% of the respondents were consuming coriander and curry leaves which are widely used as spices and condiments, 99% were consuming Amaranth, Spinach, Gogu and Mint. 95% were consuming Fenugreek leaves, 90% were consuming Rumex leaves, 73% were consuming Tamarind leaves seasonally, 61% were consuming Basella leaves, 46% were consuming Ponnanganni, 32% were consuming Drumstick leaves and consumption of Agathi leaves was not seen due to their unavailability in the study area. Coriander and curry leaves are consumed by all the respondents as seasonings, garnishing and for making Chutney (*Roti pacchadi*). Monthly income of the respondents does not effect the varieties of GLVs consumed which was in accordance with (Prabha *et al*. 2008). Out of 150 respondents majority (92%) were consuming GLVs twice in a week followed by Alternate days (42%). According to Prabha *et al.* (2008) majority of women (50%) of all the age groups,

Table 1. Impact of educational levels on the frequency of consumption of GLVs

Educational Level	Daily	Alternate Days	Twice in a Week	Once in a Week	Total	χ^2 Value
Graduate and Above	1 (1.7)	13 (22.4)	38 (65.5)	6 (10.3)	58 (100)	4.311^{NS}
Intermediate and SSC	0	11 (42.3)	13 (50)	2 (19.2)	26 (100)	
Below SSC	0	19 (28.7)	41 (62)	6 (9)	66 (100)	

Table 2. Impact of monthly income on the frequency of consumption of GLVs

Monthly family income (Rs)	Daily	Alternate Days	Twice in a Week	Once in a Week	Total	χ^2 Value
> 1,26,360 – 63,182 (High income)	1 (2)	18 (36)	26 (52)	5 (10)	50 (100)	5.081^{NS}
31,591 -63178 (Middle income)	0	10 (20)	35 (70)	5 (10)	50 (100)	
≤6323- 31589 (Low income)	0	15 (30)	31 (62)	4 (8)	50 (100)	

Table 3. Impact of socio economic class on the frequency of consumption of GLVs

Socio economic class	Daily	Alternate Days	Twice in a Week	Once in a Week	Total	χ^2 Value
Upper	1	11	15	3	29	7.012^{NS}
Upper middle	0	12	30	7	49	
Lower middle	0	6	17	0	23	
Upper lower	0	11	25	4	40	
Lower	0	3	5	0	8	

all the monthly income groups and educational level consumed vegetables twice a week. Table 1 and 2 showed Education of the family and monthly income had no impact on the frequency of consumption of GLVs. Hence socio-economic status also had no influence in the frequency of consumption of GLVs as mentioned in Table 3. Statistical analysis showed that educational levels, monthly income and socio economic class has influence on frequency of consumption of GLVs which was in par with (Prabha *et al*. 2008).

GLVs are also preferred in the form of powders. Out of 150 respondents, 40% were consuming Curry leaf powder, 3% were using mint leaf powder and 1% of the respondents were using Tamarind and Drumstick leaf powder each. Among all the GLV powders, curry leaf powder was commonly used by majority of the people. Pre processing operations commonly carried out for GLVs such as washing, cutting and storing etc. Fifty six per cent of the respondents were always cutting and washing the GLVs before processing. Majority of the people were cutting the GLVs prior to washing which may result in the loss of water soluble vitamins. GLVs are processed prior to consumption. 79% of the respondents were processing the GLVs by pressure cooking, 25% by boiling, 70% by frying, 13% by deep fat frying and 100% of the respondents were practising sauteing and simmering.

GLVs are processed to make dhal by adding red gram dhal to GLVs apart from other ingredients, curry and *pulusu* are prepared by simmering the GLVs along with other ingredients. They are also consumed after frying in fat along with seasonings. 100% of the respondents were consuming GLVs in the form of *Dhal*, 91% in *Curry* form, 85% in *pulusu,* 70% in shallow fried form, 15% in deep fat fried form, 84% in *rotipacchadi*, 65% in pickles and 28% in other forms such as GLVs chapathi, Gogu chicken, Gogu mutton, Methi chicken, Methi potato curry, Palak paneer, Pudina rice, Spinach rice and Tamarind leaves chicken etc. All the respondents were consuming GLVs dhal.

Most of the respondents were aware of the benefits of GLVs. Ninety three per cent of the respondents were aware that GLVs contains carotene which is good for vision, 57% of the people were aware that they are rich in fiber, 77% of the people are with

the knowledge that GLVs are rich in vitamins and minerals, 52% of the people knew that they are good for anaemic patients, 26% of them were aware of GLVs containing low sugars, 25% of them were with the knowledge that the GLVs are good for bone health and 22% of the people were habituated to consuming GLVs in their daily diet.

Regarding the storage of GLVs 56% of the respondents were not storing GLVs. 13% were storing it for half a day, 13% were storing them for one day, 9% were storing them for two days and 9% were storing for three days. The GLVs were stored in refrigerated temperature by placing in poly ethylene covers by majority of the people.

CONCLUSION

It can be concluded from the present study that the educational levels, monthly income and socio economic class has no impact on the consumption pattern of GLVs.

LITERATURE CITED

Das L, Bhaumik E, Raychaudhuri U and Chakraborty R 2012 Role of nutraceuticals in human health. *Journal of Food Science and Technology*. 49 : 173-183.

Jenkins D J, Kendall C W, Popovich D G 2001 Effect of a very high fiber vegetable, fruit, and nut diet on serum lipids and Colonic function. *Metabolism*. 50 (4):494-503.

Lakshmi K 1998 Development of nutritious dehydrated green leafy vegetable blends. Ph. D Thesis submitted to Acharya N.G Ranga Agricultural University, Hyderabad.

Radek M and Savage G 2008 Oxalates in some Indian green leafy vegetables. *International Journal of Food Science and Nutrition*. 59 (3): 246–260.

Prabha P, Nath K G and Ramya B S 2008 Consumption pattern of green leafy vegetables among selected urban households in bangalore, India. *Asian Journal of Home Science*. 3 (2): 180-185.

Randhawa M A, Khan A A, Javed M S and Sajid M W 2015 Chapter 18 - Green leafy vegetables: a health promoting source. In Watson, R.R (Eds.), Handbook of Fertility (pp. 205-220). San Diego, CA, USA: Academic Press.

Saleh A S M, Zhang Q, Chen J and Shen Q 2013 Millet grains: nutritional quality, processing, and potential health benefits. *Comprehensive Reviews in Food Science and Food Safety*. 12: 281-295.

Scaglioni S, Salvioni M and Galimberti C 2008 Influence of parental attitudes in the development of children's eating behavior. *British Journal of Nutrition*. 99 (1): S22–S25.

Tiwari A K, Jyothi A L, Tejeswini V B, Madhusudana K, Kumar D A, Zehra A and Agawane S B 2013 Mitigation of starch and glucose-induced postprandial glycemic excursion in rats by antioxidant-rich green-leafy vegetables juice. *Pharmacognosy Magazine* 9(1): S66–S73.

Velderrain-Rodriguez G R, Palafox-Carlos H, Wall-Medrano A, Ayala-Zavala J F, Chen C Y, Robles-Sanchez M, Astiazaran-Garcia H, Alvarez-Parrilla E and Gonzalez-Aguilar G A 2014 Phenolic compounds: their journey after intake. *Food and Function*. 5 (2): 189-197.

Received on 25.07.2019 and revised on 10.01.2020