

Exploration of Consumer Perception of Vegetables in Gampaha District

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ABSTRACT

Vegetables play an important role in the maintenance of human health. It makes diet nutritive and balanced. A balanced diet is important to sustain good health. A survey was conducted using a pretested questionnaire *via face to face* interviews, within Gampaha district from February to April 2016. The aim of this study was to find out the vegetable consumption rate and its association with socio economic characteristics of consumers in Gampaha district, Sri Lanka. Specific objectives were to find out the vegetable purchasing locations and factors of vegetable concerning for purchasing of vegetables by consumers. The results of the descriptive analysis showed that, in all areas, females made the decision of vegetable purchasing. Mainly, in rural areas, respondents purchased vegetables from groceries. In urban and semi-urban areas, the majority of respondents purchased vegetables from fairs while 7% of respondents purchased vegetables from only supermarkets in urban area. In rural areas, the daily intake of vegetable was above the World Health Organization (WHO) recommendation (260 g of vegetables/day). In contrast, vegetable consumption rate was below the recommended rate both in urban and semi urban areas. There was no relationship between vegetable consumption rate and socio economic characteristics except the ethnicity of the respondents. According to the index (Ys) value, freshness (0.8565) of the vegetable was the most reflected factor when the respondents purchased vegetable. According to the scored percentage of considerable factors, 89% of the respondents have given good responses for cleanliness of vegetable. Furthermore, consumers paid more attention to freshness and nutritional value of vegetable when they purchased vegetables.

KEYWORDS: Association, Consumption rate, Socio economic characteristics, Vegetable

INTRODUCTION

Vegetables play a vital role in balancing human diet, being nutritious and protective. It is highly essential to take vitamins and minerals in required quantities for sound health of human body and to create resistance against diseases. Thus, vegetables have become an integral part of all classes of society (Arya, 2002).

Annual vegetable production in the world is 1.1 billion metric tons. Over three quarters of this production volume is generated in Asia. Out of that 500,000 mt is produced in Sri Lanka (Census and Statistics, 2014). Worldwide production of vegetable has risen at an impressive rate of 4.97% per year (FAO, 2004). The top five vegetable producers are China, India, Vietnam, Nigeria and Philippines while Sri Lanka is the 38th in the vegetable production worldwide (FAO, 2012).

Vegetables are consumed in fresh, cooked, tempered and snack forms (Swiader. *et al.*, 1992). The availability of nutrients in vegetable varies considerably, though generally vegetables contain little protein or fat. Vegetables are sources of many essential micronutrients including vitamin C and K, folate, thiamine, carotenes, several minerals and dietary fiber. Vegetables are rich in vitamins A, C, B and E and comparatively cheaper source of these vitamins. Also, vegetable consumption

improves taste, palatability and appetite (Chadha and Oluoch, 2003).

Vegetables are the most sustainable and affordable dietary source of micronutrients (AVRDC, 2004). The fiber content of the vegetable has been reported to have numerous beneficial effects on human health. For example, it reduces the level of blood cholesterol, aids in the prevention of bowel diseases and improves glucose tolerance in diabetic subjects (Institute of Food Technology, 1990). Furthermore, bio actives of fruits and vegetables that help in protecting the humans against a number of diseases such as coronary heart diseases, hypertension and cancer (British Dietetic Association, 2011).

Vegetables play key roles in neutralizing the acids produced during food digestion because of their fiber content and roughages which promote bowel attention reducing or preventing constipation (Rai and Yadev, 2005). Vegetables are an important component of a healthy diet. Reduced vegetable consumption is linked to poor health and increased risk of non-communicable diseases (NCDs). An estimated 5.2 million deaths worldwide were attributable to inadequate consumption of vegetable (WHO, 2013). Sufficient daily consumption of vegetable could help to prevent major diseases such as cardiovascular diseases and certain types of cancer. In 1995, more than 20% of the

cancer incidents in Sri Lanka was attributable to inadequate fruit and vegetable intake, and it has been predicted that this value will further go up in the future (FAO, 2005). Currently, NCDs have overtaken communicable diseases and are now the leading causes of mortality, morbidity, and disability. In 2001, NCDs accounted for 71 % of all deaths in Sri Lanka (WHO, 2011).

Although vegetables are essential for human health, most people in developing countries cannot afford or do not have access to this food. In Asia, although vegetable production is increasing at a higher rate compared to other major food crops, postharvest losses and inadequate income contribute to wide spread malnutrition. Per capita vegetable consumption was 70 g in South Asia which is much lower than the recommended quantities by WHO (FAO, 2005). Generally, adults earning low income express less desire to increase their fruit and vegetable consumption due to price and storage barriers (Neumark-Sztainer *et al.*, 2006).

Therefore, this study was conducted with the objective of exploring the vegetable consumption behavior of consumers in Gampaha district.

METHODOLOGY

Study Area

A survey was conducted in Gampaha district during the period from February to April 2016. Gampaha district consists of 1177 Grama Niladhari divisions. The 12 Divisional secretarial (DS) divisions included in this study are Attanagalla, Divulapitiya, Gampaha, Dompe, Ja-ela, Katana, Kelaniya, Mahara, Minuwangoda, Mirigama, Negambo and Wattala. Main Agro Ecological Zones of the area are Low country Wet Zone (WL) and Low country Intermediate Zone (IL).

Data Collection

Data were collected from 100 individuals who purchase vegetable in Gampaha district. Gampaha municipal areas were considered as urban areas. Suburbs of urban areas up to 5 km were considered as semi-urban areas and remote areas were considered as rural areas.

A pretested questionnaire was used to gather data from respondents *via face to face* interviews. The questionnaire consisted of five main question categories including general information of consumers, vegetable purchasing locations, factors of vegetable considered by consumers when purchasing vegetable, amount of vegetable consumption per week and attitudes on vegetable consumption including freshness, cleanliness,

nutrition, taste and preference, attractiveness, price and storage period of different vegetables.

Data Analysis

Data were analyzed using descriptive statistics and inferential statistics with statistical package Minitab 15. Descriptive statistics was used to describe the gender percentage of the respondents, vegetable consumption rate of consumers and vegetable purchasing locations. Consumption rate was calculated dividing total grams of purchased vegetable per day by number of family members of more than five years old. World Health Organization recommended vegetable consumption rate for an individual is 260 grams per day.

Chi-square independent test (cross tabulation) was used to investigate the association between socio-economic characteristics and vegetable consumption rate of respondents. Gender, ethnicity, age, area (urban, semi-urban and rural), marital status, educational level and monthly income of the respondents were considered as socio-economic characteristics of consumers.

Five point Likert scales were used to score for each statement ranging from strongly disagree to strongly agree.

An index for attitudes was derived as,

$$Y_p = \frac{X_i}{\text{Max } X}$$

where,

Y_p - Index value for attitudinal statement category of each respondents

X_i - Score given to the i^{th} statement

MaxX - Maximum score that could be given by a respondent

Index is a measurement that varies from 0.2 to 1.0. The level of factors, which for purchasing vegetable, were categorized as disagree, neutral and agree if the y_p varies from 0.2 - 0.49; 0.5 - 0.7 and 0.7 - 1.0 respectively. The formula used to measure the most important factor of vegetable followed by consumers for purchasing vegetables is given below. The factor that obtained the highest value was concerned the most influential factor.

$$Y_s = \frac{\sum_{i=1}^n X_i}{n * \text{Max } X}$$

where,

Y_s - Index for considerable factors for purchasing vegetable

X_i - Score given to the i^{th} statement

n - Sample size

MaxX - Maximum score that could be given by a respondent

RESULTS AND DISCUSSION

Descriptive Statistics

Vegetable purchasing decisions of respondents were shown in Figure 1. Both males and females purchased vegetables in Gampaha district. Further, the majority of vegetable purchasers were females of rural (79%), semi-urban (69%) and urban (52%) areas in Gampaha district.

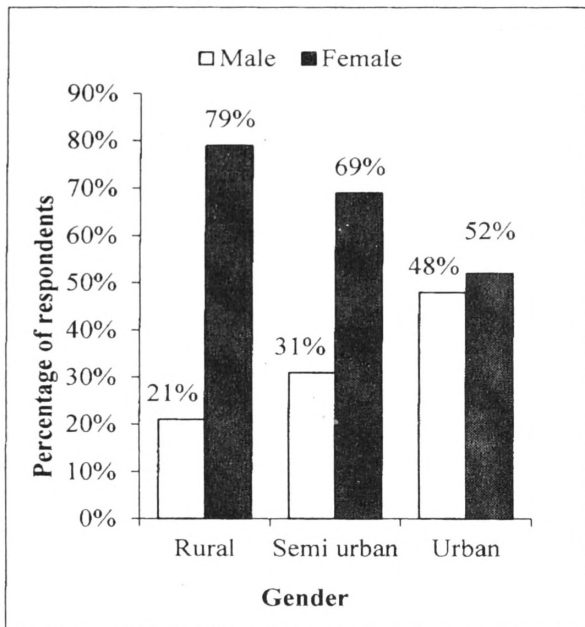


Figure 1. Gender of purchasing vegetable

Vegetable Consumption Rate

According to the WHO recommendation, it is important for an individual to consume 260 grams of vegetable per day. According to the survey, 54% of respondents of rural areas consumed more than 260 g per day (Figure 2).

According to the respondents of urban areas, only 33% consumed more than 260 g of vegetable per day while in semi-urban areas, 37% of respondents consumed more than the standard amount. Only in rural areas, the majority of respondents consume more than the standard rate (Figure 2).

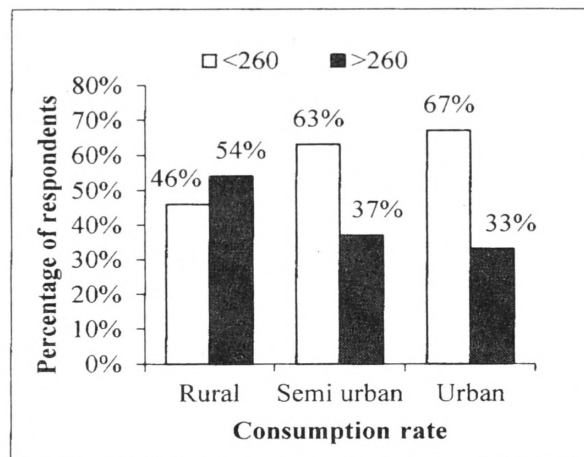


Figure 2. Vegetable consumption rate

Consumer Purchasing Habit

Vegetable purchasing locations of respondents are shown in Figure 3. The majority (32%) of the respondents of rural area purchased vegetable from groceries, 26% from both groceries and fairs, and only 16% of respondents purchased vegetable from fairs. A higher percentage (52%) of the respondents used more than one market in rural area for purchasing vegetable. The majority of rural people tend to purchase vegetable from groceries because of close proximity and often availability.

The respondents from both urban (30%) and semi-urban (26%) areas purchased vegetable mainly from fairs, while 22% of urban and 20% of semi-urban respondents purchased vegetable from groceries. A lower percentage (7.8%) of respondents in urban areas purchased vegetable from only super markets, while others considered that the prices of vegetable were high in supermarkets. The majority of semi urban (51%) and urban (41%) respondents used more than one place for purchasing vegetable. The majority of consumers tended to purchase vegetable from fairs because of cheapness, close proximity and high availability of vegetables in the fair.

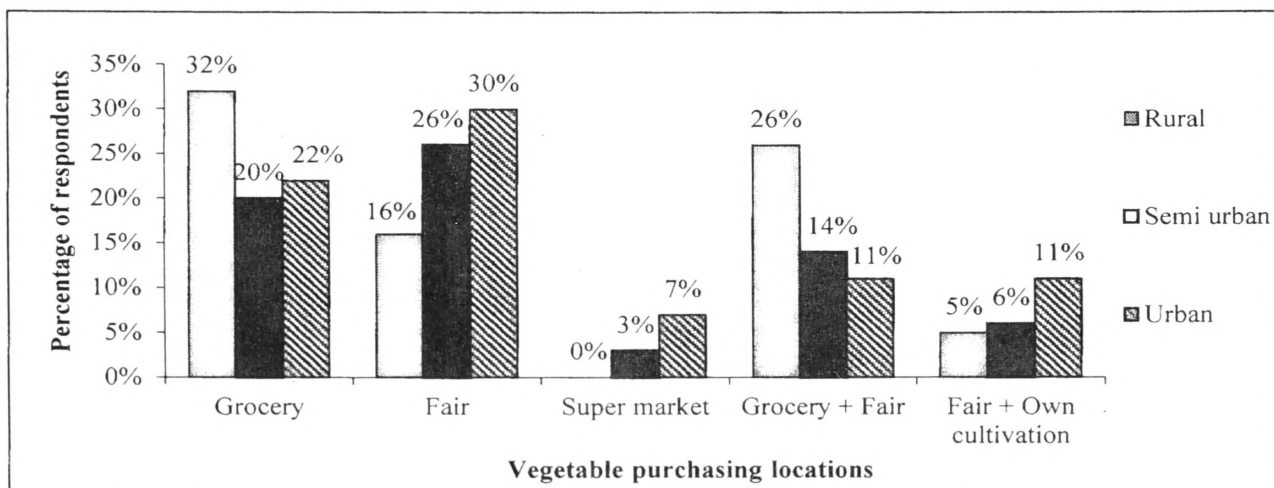


Figure 3. Vegetable purchasing locations

Inferential Statistics

Socio Economic Characteristics of Consumers

The association between socio-economic characteristics with vegetable consumption rate are shown in Table 1. According to that, there is no relationship between WHO recommendation with the socio economic characters (gender, area, age, marital status, educational level and income level). Further, as the P value of ethnicity is less than 0.05, there is an association between the vegetable consumption rate and ethnicity.

Table 1. Association between socio economic characteristics and vegetable consumption rate of consumers

Parameter	Consumption rate (g /Person/Day)		P value
	<260	>260	
Gender			
Male	16	16	0.332
Female	41	27	
Ethnicity			
Sinhala	51	36	0.030*
Tamil	00	04	
Muslim	07	01	
Age			
18-27	05	03	0.231
28-37	10	09	
38-47	22	08	
48-57	11	14	
>57	09	09	
Area			
Rural	13	25	0.146
Semi urban	13	22	
Urban	13	14	
Marital state			
Married	52	40	0.743
Unmarried	05	03	
Level of Education			
O/L	27	21	0.515
A/L	17	13	
Diploma	11	05	
Degree	02	04	
Income Level			
<20000	01	03	0.440
20000-30000	11	12	
30000-40000	24	16	
40000-50000	15	07	
>50000	06	05	

*Significant at 5% confidence level ($p < 0.05$)

Factors Affecting Vegetable Consumption

According to the index (Y_s) value, Freshness (0.8565) of the vegetable was the most reflected factor when purchasing vegetable (Table 2). Cleanliness, nutrition and safety are other important factors.

The majority of the respondents considered the cleanliness (89%), freshness (84%) and nutritional value (84%) of vegetable when purchasing vegetable (Table 3). Interestingly, 70% of the respondents did not consider about the price when they purchased vegetables.

Table 2. Mean value of factors of vegetable

Factor	$\frac{\sum_{i=1}^n X_i}{n * Max X}$	Place
Freshness	0.8565	1
Cleanliness	0.8067	3
Taste and Preference	0.8370	2
Price	0.3334	7
Safety	0.7713	5
Nutritional value	0.7849	4
Attractiveness	0.3032	8
Storage period	0.7440	6

Table 3. Attitudinal agreement for purchasing vegetable

Factor	Agree (%)	Neutral (%)	Disagree (%)
Freshness	84	16	0
Cleanliness	89	11	0
Taste and Preference	65	34	1
Price	8	22	70
Safety	66	33	1
Nutritional value	84	16	0
Attractiveness	51	33	16
Storage period	65	0	35

CONCLUSIONS

This study explored the behavior of the vegetable consumers in Gampaha district. According to this study, vegetable purchasing decisions were taken by both females and males while, the majority was female respondents. Majority of the respondents consumed vegetables less than standard rate in both urban and semi urban areas whereas the majority of respondents consumed more than the standard rate in rural areas. In rural areas, majority of the respondents purchased vegetable from groceries. However, in urban and semi urban areas, the majority of the respondents purchased vegetable from fairs. There is no association between gender, area, and marital status, level of education and income level with vegetable consumption rate of consumers except ethnicity. The most considerable factor for purchasing vegetable was the freshness of vegetable. Further, consumers paid more attention about the cleanliness and nutritional value of vegetable when they were purchasing vegetables.

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REFERENCES

- Arya, P.S. (2002). *Vegetable Culture*. Kalyani publishers, Administration office, 4779, Ansari road, Daryagani, New delhi-110002. 1.
- AVRDC. (2004). *AVRDC Medium-Term Plan: 2004-2006*. Shanhua, Taiwan: AVRDC publication, 4 (566), 46.
- British Dietetic Association. (2011). *Food Facts*. Available from https://www.bda.uk.Com/food_facts/home (Accessed 16 May 2014).
- Census and Statistics. (2014). Available from http://en.m.wikipedia.org/wiki/Agriculture_in_Sri_Lanka (Accessed on 3 May 2016).
- Chadha, M.L. and Oluoch, M.O. (2003). Home-based vegetable gardens and others strategies to overcome micronutrients malnutrition in developing countries, *Food Nutrition and Agriculture*, 17-23.
- FAO. (2004). *Food and Agriculture Organization of the United Nations. FAOSTAT Data*.
- FAO. (2005). *Food Security Statistics, Food and Agriculture Organization*, viewed on 12th January 2011
- <https://www.fao.org/economic/ess/food-security-statistics/en/>.
- FAO. (2012). *Food and Agriculture of the United Nations. FAOSTAT Data*.
- Institute of Food Technology. (1990). *Quality of Fruits and Vegetables: A Scientific Status Summary by the Institute of Food Technology Expert Panel on Food Safety and Nutrition*.
- Neumark-Sztanier, D., Story, M., Resnick, M.D. and Blum, R.W. (2005). Correlation of Inadequate Fruit and Vegetable Consumption among Adults. *Journal of Preventive medicine*, 25.
- Rai, N. and Yadev, D.S. (2005). In *Advances in Vegetable Production*, 5-6.
- Swiader, J.M., Ware, G.W. and Mc Collum, J.P. (1992). *Producing vegetable crops*, International book distribution company limited, 7.
- Weinberger, K. (2002). *Survey of Vegetable and Non-vegetable Farmers*. AVRDC unpublished report.
- WHO. (2011). *World Health Organization*. <http://www.who.int/childgrowth/en/>. (Accessed on 16 May 2014).