CONSUMER BEHAVIOUR OF URBAN AND RURAL FAMILIES IN VEGETABLES- A COMPARATIVE ANALYSIS

by

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(2016-11-074)

THESIS

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DECLARATION

I, hereby declare that this thesis entitled **"CONSUMER BEHAVIOUR OF URBAN AND RURAL FAMILIES IN VEGETABLES- A COMPARATIVE ANALYSIS"** is a bonafide record of research work done by me during the course of research and the thesis has not previously formed the basis for the award to me of any degree, diploma, associateship, fellowship or other similar title, of any other University or Society.

Place: Vellayani

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LIST OF ABBREVIATIONS

Abbreviations	Full form
No.	Number
%	Percentage
et al.	And co-workers or co-authers
Fig.	Figure
KAU	Kerala Agricultural University
NSSO	National Sample Survey Organisation
FMCG	Fast Moving Consumer Goods
USDA	United States Department Of Agriculture
PRRAL	Pesticide Residue Research and Analytical Laboratory
Kg	Kilogram
Rs.	Rupees

Introduction

CHAPTER 1
INTRODUCTION

Vegetables are defined as herbaceous plant or plant part which is regularly eaten as, unsweetened or salted food by humans. They are consumed as raw or after cooked. Vegetables are rich and comparatively cheaper source of vitamins and minerals. Vegetables are also good source of water and minerals which can maintain acid–base balance in human body (Beegum, 1991). Vegetables play a vital role in human nutrition and health and hence referred as "protective food".

India is the second largest producer of vegetable with 2.8% of total cropped area and a production of 1.5 million tonnes. But Indian consumers are consuming less than the WHO recommended quantity 300g (3 servings with an average size of 100g) per day (National Horticultural Board, 2015). In Kerala the annual vegetable production was reported as 19 lakh tonnes in 2015 with a cropped area of 9.6% (Sreekumar, 2015). The limiting factors responsible for low vegetable production in Kerala are high and unpredictable rainfall, high cost of cultivation, non-availability of labour, unorganised marketing channels for inputs and produce and lack of need based and timely assistance from government to vegetable growers.

Kerala is still leaning on neighbouring states like Tamil Nadu and Karnataka for meeting the vegetable requirements of its population. The government was spending about Rs. 1500 crores per year for vegetable import even though it had managed to pep its domestic vegetable production by 64% (Nair, 2016).

However it is found that, vegetables brought from neighbouring states have pesticide residue of 5-10 times higher than permissible level (Menon, 2015). The fruits and vegetables were cultivated even with waste and sewer water generated from industries which lead to unwarranted buildup of heavy metals in soils which in turn elevated heavy metal concentration in crops (Karanja *et al.*, 2010). Other production level hazard such as, vehicle exhausts, dusty winds spread over the crops and use of uncured animal manure reduced the quality of

produce (Hide *et al.*, 2001). The state had initiated measures to curb the entry of vegetables that is contaminated while simultaneously promoting organic farming to make state self-reliant in safe vegetables. At the same time there is lack of awareness among public about pesticide contaminated vegetables.

Recently, there is an increase in the share of vegetables in consumer's food expenditure. This trend was recognized partly due to the fact that the consumer had become more sensitive to health related issues and partly due to the influence of factors including rise in income and availability of variety of vegetables (Goksel *et al.*, 2009). The act of consumption is highly influenced by consumers purchasing decisions (Bagozzi and Dholakia, 1999). The five stages of consumer decision making proposed by (Schiffman and Kanuk, 2008) are as follows

1. Problem recognition: It is recognizing that one has a need to fulfil or a problem to solve.
2. Information search: An information search has two aspects i.e internal and external. In internal search, buyers search their memories for information about products that might solve the problem. In external search they seek additional information from outside sources like word of mouth, media, store visit, and trial.
3. Evaluation of alternatives: This involves the comparison of alternatives based on a single or several criteria.
4. Purchase decision: After searching and evaluating, the consumer must decide whether to buy or not.
5. Post purchase behaviour: The consumers compare the product's performance against their expectations.

In developing countries, the consumer's decision to purchase begins when the consumer wants something and price is the most important factor influencing consumer's purchasing decision (Matanda *et al.*, 2000). However, as far as food products are concerned, especially vegetables, non-price factors plays a key role in determining purchase decision. Nowadays, non-price criteria such as nutritional values, product quality and expiry date are becoming important. Hardly any work

has been found dealing with the identification of different factors in the purchase decision of vegetables in India.

As only limited studies have been conducted on consumer behaviour on vegetables as well as awareness of public about decontamination of vegetables, conscientization of public about safe food especially vegetables is a need of the hour. It is in this background, the present study is undertaken with the following objectives

1. To analyse the consumer behaviour of people both in urban and rural areas in vegetable purchase, through a multidimensional analysis.
2. The study will assess their awareness about organic vegetables and its outlets.
3. To determine the knowledge and rate of adoption of Kerala Agricultural University (KAU) recommended measures and adoption of other measures to remove pesticide residue.
4. To provide suggestions to create awareness about safe food habits among rural and urban families.

SCOPE AND IMPORTANCE OF STUDY

According to (Begg *et al.,* 2007) fruits and vegetables consumption is closely associated with increased risk of serious and chronic diseases. It had been reported that inadequate uptake of fruits and vegetables resulted in 31 per cent of heart diseases, 11 per cent of stroke and 5-12 per cent of cancers in human population (Yeates *et al.,* 2015). The people who consumed more fruits and vegetables were found to had low risk of getting heart stroke as compared to others (Manson, 1994). This would suggest the need for an in depth study to determine factors responsible for low fruits and vegetable consumption.

In the past decade, because of the intensification of competition in markets, one of the biggest challenges marketers face is to convince the consumers to buy their products. In the case of fruits and vegetables market with easy perishable products, a marketer should know what type of instruments he should apply in order to convince the consumer to buy the products in the right time, before their natural deterioration. Though the gap between Indian rural and

urban consumer is decreasing, there is considerable difference between them in terms of geographic, demographic and psychographic aspects. These differences are resulting in distinction in rural and urban consumers behaviour, hence requiring different marketing strategies for these regions (Patil, 2017). For these reasons it is important to identify the behaviour of the consumers and their motives in buying these products, which help to identify consumer behaviour.

LIMITATIONS OF THE STUDY

The motives of vegetable purchase and consumption varied in accordance with individual's personality which in turn changed from time to time based on their socio-psycho-economic structure. Thus the study of consumer behaviour was not one shot affair and it required regular updation, which was not practical in context of this study. The sample size was restricted to Kozhikode district such that it had limited generability.

Despite of these limitations, much care had been taken to attain the objectives of the study.

PRESENTATION OF THE THESIS

The entire Master's thesis is presented as five chapters:

The first chapter 'introduction' explains the importance of the topic, objectives, scope and limitation of the study. Second chapter, 'theoretical orientation' deals with review of relevant literature in confirmation and contradiction with the objectives of the study. Third chapter 'research methodology' describes the sampling design, the study area, measurement of dependent, independent and other variables, method of data collection and statistical tools used. Fourth chapter 'results and discussion' describes the findings of the study in order to draw specific and meaningful inferences. The final chapter 'summary' briefly explains the work done, salient findings, explains the implications based on the results of the study and also suggests areas for future research.

Review of Literature

CHAPTER 2
REVIEW OF LITERATURE

Review of literature is a comprehensive way of collecting information pertinent to research studies which enables researcher in identifying the research gaps. The earlier studies help the researcher in stating the concepts and methodology and in choosing appropriate econometric models and analytical tools to address the research questions effectively and to draw meaningful inferences. In this chapter, the different concepts and objectives related to the present study and a review of related past studies are presented under the following heads.

2.1. PROFILE AND PURCHASE RELATED CHARACTERISTICS OF CONSUMERS

Understanding of these behavioural dynamics of the consumers will enable the proper measurement of collected data so as to generate relevant results for the study. The review of literature with regard to the different profile and purchase related characteristics of vegetable consumers are presented under the following heads

2.1.1. Profile characteristics

2.1.1.1. Age

Age is operationally defined as number of calendar years completed by the respondent at the time of interview.

Carlisle (1980) conducted a study on food preferences of teenagers in Albanna and found that the acceptance of vegetables among the teenagers were low when compared to other age groups. They preferred raw vegetables than cooked ones and sweet vegetables over bitter ones.

Farceed and Riggs (1982) in their study regarding the expenditure patterns of old and young consumers, reported that the age of the head of the family reflects their consumption and shopping pattern. Older consumers may shop less

frequently than medium and young because they tend to have smaller families and lower incomes. In contrary by neglecting the impact of family size and income, older consumers may shop more frequently due to less competing demands on their time.

Grigorow *et al.* (1985) concluded from his study on diet of old aged people, that fruits and vegetables should have a major contribution in balanced diet for elderly people due to their increased proneness to diseases.

Catherine and Etienne (2009) in their study on "Age and factors influencing consumer behaviour" found that middle-aged consumers (35–50 years old) put the greatest weight on suitability and elderly consumers (65–90 years old) on durability in purchase of food products.

Rachel *et al.* (2012) conducted a research on "The role of family variables in fruit and vegetable consumption in pre-school children" and determined that availability, accessibility and the perceived effectiveness of parental modelling were the main predictors of children's fruit and vegetable consumption.

2.1.1.2. Gender

Gender refers to a dichotomized variable having only two categories namely 'male' and 'female' who regularly purchase the vegetables for the family.

Sreedaya (2004) in her study related to promotion of terrace cultivation of vegetables by urban housewives revealed that there was increase in vegetable consumption by urban housewives after undertaking terrace cultivation.

Prattala *et al.* (2006) conducted study on gender differences in consumption of vegetables and concluded that women consumed more fruits and vegetables, whereas men consumed more meat, alcohol, and bread.

Morel and Kwakye (2012) in their study on "Green marketing: Consumer's attitudes towards eco-friendly products and purchase in the fast

moving consumer goods (FMCG) sector" reported that there were differences in attitudes and purchase towards green products between the women and men.

Zhen and Mansori (2012) through their study on motivations of young female for purchase of organic food in Malaysia came to a conclusion that out of total respondents women were more focussed on purchasing of fruits and vegetables within diverse religion and ethnicity.

Liu *et al.* (2013) through their study on purchasing behaviour of consumers towards fresh vegetables in Nanjing, China reported that majority (67%) of the respondents were female.

2.1.1.3. Education level

Education level refers to the highest academic qualification possessed by the respondent through formal and informal education at the time of interview.

Stanton *et al.* (1994) in their study on marketing found that with the increasing number of people attaining higher levels of education, marketers should expect to manage changes in their preferences for products and buyers with higher incomes and more discriminating tastes.

Block (2002) observed from his research work on child nutrition that mothers who have greater nutrition knowledge will impart the same to their children and allocate large share of food budget to fruits and vegetables.

Kulviwat *et al.* (2004) conducted study on information search by consumers and revealed that education enhances one's ability to identify, locate, and assimilate relevant information about the product.

Gabe (2009) conducted a study on retailing and concluded that the consumption of food products increased as education level decreased.

Goksel *et al.* (2009) in their study on the effect of demographic variables in purchasing decisions of fresh fruits and vegetables reported that education level of the respondents positively affected the purchase behaviour of food items.

The sample survey report of National Sample Survey organisation (NSSO) revealed that 4.5 per cent of males and 2.2 per cent of females had completed graduation and above level of education in rural areas , while in urban areas 17 per cent of males and 13 per cent of females had completed this level of education (Harish, 2015).

2.1.1.4. Average household monthly income

Average household monthly income is operationalized as average monthly income obtained by respondents and their family through major and subsidiary occupation.

Kenslea *et al.* (1985) in their research work on decision making in purchase of food items reported that the income level of the family influences food purchasing behaviour. There is an inverse relationship between the increase in income and the money allotted for food purchasing.

According to annual report of United States Department of Agriculture (USDA) regarding "India's Poultry Sector: Development and Prospects" an increase in income, particularly of the lower and middle-income households, is having a significant impact on the demand for food items, because these groups tend to spend a relatively larger share of their income on food consumption. Middle income and urban consumers spend a greater part of their income on upgrading and diversifying their diet towards high value products like fruits and vegetables, eating out more often and consumed more processed and convenience food items (USDA, 2004).

Claro and Moteiro (2010) inferred from their study in factors influencing fruits and vegetables purchase that income elasticity computed for food prices and socio demographic variables was 0.27, indicating that a one per cent increase

in per capita monthly income would increase the participation of fruits and vegetables in total food purchases by 0.27 per cent.

Das and Pathak (2012) found from their study on income disparities in urban and rural India that income of low income, medium income and high income household was found as less than Rs. 20000, Rs. 20000-40000 and more than Rs. 40000 respectively.

Andrew *et al.* (2014) found from their study on "Household expenditures on vegetables in Malaysia" that high income households are less likely to purchase fresh vegetables than lower and middle income households.

2.1.1.5. Family size

Family size refers to number of family members dependent on the head of family at the time of interview.

Rajalakshmi (2008) in her study about consumer preferences and attitude for perishables in Chennai stated that 57 per cent of consumers were having a family size less than 4, followed by 38 per cent with 4 to 5 and 5 per cent with greater than 5 respectively. She also concluded that family size had a major influence on purchase decision of vegetables including quantity and place of purchase. The family size is directly related to expenditure of household in purchase of vegetables.

Stewart and Blisard (2008) emphasized from their study entitled "Are Younger Cohorts Demanding Less Fresh Vegetables" that household size is positively related with vegetable demand as households with more family members incurred higher expenses on a varied array of vegetables.

Balaji (2012) studied on buying behaviour, preferences and perception of fruit and vegetable consumers and revealed that family size and periodicity of purchase had significant negative correlation with choice of fruits and vegetable retail outlets.

Kasteridis and Yen (2012) conducted research on demand for organic and conventional vegetables in United States (US) and observed an inverse relation between organic vegetables consumption and family size.

Liu *et al.* (2014) in their study on purchasing behaviour of consumers towards fresh vegetables in Nanjing, China revealed that 36 per cent of the respondents were having a family size of 3 followed by (26%) with 4 members.

2.1.1.6. Health consciousness

Health consciousness is defined as the awareness, knowledge and interest of the respondent regarding the dietary requirements, personal hygiene and environmental sanitation.

Varma (1990) found that education, culture, beliefs and economic motivation were the main factors that influenced health consciousness of unemployed urban women.

Manson (1994) concluded from his study on standardising of recipe for beverage produced from fruits and vegetables that the chances of getting heart stroke was considerably low in people who consume more fruits and vegetables.

Park (1997) in his study regarding preventive and social medicine reported that education status was a factor which determined health concerns of rural women.

Boccaletti and Michele (2000) in their study on "Consumer Willingness to pay for pesticide - free fresh fruit and vegetables in Italy" observed that differences in personal health with respect to fruits and vegetables purchase was due to presence of certain components (artificial additives, genetically modified organisms), the presence of nutritional components (rich in vitamins), and also due to the perceived risk associated with the use of agrochemicals.

Sreedaya (2004) in her research work on "Promotion of terrace cultivation of vegetables by urban housewives" revealed that 70 per cent of respondents

showed high level of health consciousness and preferred to consume safe vegetables.

Dickieson and Arkus (2009) in their study on "Factors that influence the purchase of organic food: A study of consumer behaviour in the UK" reported that health consciousness, concern over food safety, perceived quality, and trust in labelling and marketing play a positive role in influencing consumer behaviour towards organic vegetables.

Botchway *et al.* (2015) in their research work on "Health consciousness and eating habits among non medical students" in Ghana found that there was a positive and significant correlation between education and health consciousness of non medical students of Ghana.

2.1.2. Purchase related characters

2.1.2.1. Periodicity of purchase

Periodicity of purchase refers to the time period between consecutive vegetable purchase by consumer.

Ali *et al.* (2010) in their research work on "Buying behaviour of consumers for food products in an emerging economy" observed that majority of their respondents preferred to purchase fruits and vegetables daily or weekly twice due to its high perishability than other grocery.

Chikkamath *et al.* (2012) in their study about different factors influencing consumer behaviour in vegetable purchase revealed that majority (54%) of low income consumers purchase vegetables daily, whereas majority (55%) of high income consumers purchase twice a week. In medium income category, about 50 per cent of consumers purchase either thrice a week or weekly and 33 per cent of consumers purchase vegetables twice a week.

Pino *et al.* (2012) in their study on "Determinants of Regular and Occasional Consumer's intentions to Buy Organic Food" revealed that ethical

motivations affect the purchase intentions of regular consumers, whereas food safety concerns influence the purchase intentions of occasional consumers.

Kapoor and Kumar (2015) found in their study regarding fruit and vegetable consumers that vegetables were purchased more recurrently than fruits. About 62 per cent of respondents purchased vegetables either daily or twice or thrice a week while 48.5 per cent of respondents purchased fruits on a weekly basis.

Khan and Sharma (2015) reported in their study "A Study of Consumer Behaviour towards Grocery Retailing in Delhi Region of National Capital Region of India" that with regard to frequency of purchase of grocery items, monthly purchase was most preferred by the respondents followed by twice a month with the exceptional daily product bought on daily basis.

2.1.2.2. Source of vegetables

Source of vegetables refers to different sources of obtaining vegetables for consumption of the household.

Padmanabhan and Swadija (2003) in their study on promotion of terrace cultivation in homesteads found that urban consumers can utilize their terrace for cultivation of vegetables which could ensure fresh and organic produce to them.

Berman and Evans (2005) in their study "Retail Management- A Strategic Approach" revealed that the household that focuses more on supermarkets are advanced in their family life, with higher educational levels, and employed in more professional activities.

Chen *et al.* (2005) observed from their study related to changing food retailing in Asia that, most of the household members continued to buy fruits and vegetables from traditional retailers even though they might depend on supermarkets for other products.

Sharkey and Horel (2009) through their study on "Characteristics of Potential Spatial Access to a Variety of Fruits and Vegetables in Large Rural

Area" reported that the fruits and vegetables sector in rural areas is mainly captured by the local vendors, mandis, cart vendors, and kirana stores etc which constitute the unorganized retailers in India due to the proximity.

Mamgain (2011) reported from his findings on food retail chain that Indian-owned retail outlets are dynamic and aggressive in the fruit and vegetable sector.

Vijayan (2015) concluded from her study on consumer behaviour towards vegetables that majority (86.67%) of the respondents purchased vegetables from retail outlets because of more convenience and accessibility. It was noticed that 51.67 per cent of respondents depend on own farm production and 58.33 per cent purchased from neighbour farms and only 20 per cent purchased from wholesale market.

Bulsara and Trivedi (2016) in their study "An exploratory study of factors related to consumer behaviour towards purchase of fruits and vegetables" found that with growing and changing urban consumer demand on quantity, quality, choice and convenience the organized retail is about to flourish in India for vegetable marketing.

2.1.2.3. Nature of vegetables consumed

Nature of vegetables consumed refers to whether the consumer prefer organic, inorganic vegetables or both.

Moser *et al.* (2011) conducted a study on "Consumer Preferences for Fruit and Vegetables with Credence-Based Attributes: A Review" and reported that majority of respondents consider organic fruits and vegetables as natural, devoid of pesticides and additives and enriched with high vitamin and nutrient as compared to conventional fruits and vegetables.

Paul and Rana (2012) in their study on "Consumer behaviour and purchase for organic food" revealed that majority of respondents who purchased organic food from selected retail outlets are concerned about their health.

Ward (2013) reported that organic vegetables cultivated in their own houses were the main source for satisfying dietary requirements of slum dwellers in Cuttack city of Odisha.

Chandrasekhar (2014) conducted a study on consumers perception towards organic products in Mysore City and stated that the 64 per cent of respondents daily purchased organic products, because of its high perishability, followed by 34 per cent purchased weekly once and 2 per cent of them purchased once in a month.

Britto and Puhalanthi (2017) in their study on awareness of organic products in Trichy district of Tamilnadu observed that the vegetables and fruits (64.5%) were most preferred organic food product followed by dairy products (45.3%) and meat (23.7%).

2.1.2.4. Consumer preference for vegetable category

Consumer preference for vegetable category refers to different vegetable categories preferred by the consumer.

Rao *et al.* (1980) conducted study on nutrition evaluation of vegetables and found out that adolescence is the nutritionally stress period of life for girls and leads to anaemia. Most of nutritionists have recommended for consumption of green leafy vegetables to tackle this problem.

Swaminathan (1993) in his research work regarding nutritional aspects of various foodstuffs reported that leafy vegetables are the main source of carotene, ascorbic acid, and calcium and peas and beans are good sources of proteins.

Ajitha (2000) studied the dietary habits of old aged citizens in India and revealed that daily consumption of different vegetables by old aged people were more in urban area than rural area but the consumption of roots and tubers were more among rural people.

Charanjit and Kapoor (2002) disproved the general misconception about low nutritional status of processed vegetables and proved that fresh vegetables and processed vegetables were of equal quality and nutrition status.

Mahaliyanaarachchi (2007) reported that about 50 per cent of consumers bought less perishable vegetables (e.g., potatoes) on a weekly basis and more perishable vegetables (e.g., cabbage) twice a week, and perishable vegetables were bought in greater quantity during a given period of time.

Liu *et al.* (2014) in their study on purchasing behaviour of consumers towards fresh vegetables in Nanjing, China revealed that the preference of respondents for different vegetable category as follows tomato (76%), cabbage (70%), cucumber (57%), potato (63%), chilli (55%) and celery (52%), and were more frequently purchased by them.

2.1.2.5. Average household monthly expenditure on vegetables

Average monthly expenditure on vegetables is operationalized as average income spend on purchasing vegetables by family for a month.

Ruel *et al.* (2005) found through their study on determinants and patterns of consumer behaviour in Cambodia that vegetable cost was ten to forty times more than per kilo calorie of rice.

An urban household in Uttar Pradesh spent about 47 per cent of their consumption expenditure on food items, out of which, about 30 per cent was spent on grocery items and about 16 per cent on fruits and vegetables (NSSO, 2006).

According to study conducted on cost of vegetables by (Ard *et al.*, 2007) in Albana, the average cost per serving not only represents the cost of various forms of the fruit and vegetable but it also intends type of food outlets from which these items may have been purchased.

Rajalakshmi (2008) studied on consumer preferences and attitude for perishables in Chennai and came to a conclusion that 59 per cent of respondents

spend Rs. 2000 per month for purchase of vegetables, followed by 30 per cent who spend Rs. 1200-2000 and 11 per cent who spend less than Rs. 1200.

Patibandla (2012) in her study on direct investment of foreign countries in India's retail sector reported that an Indian consumer spends more than 50 per cent of total retail expenditure on food, which was found to be lot higher for low income category.

2.1.2.6. Proximity to outlet

Proximity to outlet is operationally defined as nearness of outlets of vegetables from the house of consumers.

Bodor *et al.* (2007) reported from their study on vegetable consumption in urban zone that greater fresh vegetable availability within 100 metre of a residence was a positive predictor of vegetable intake.

Mittal and Prashar (2010) through their study "Retail purchase behaviour in food and grocery in Punjab: A study of retail strategy" which was confined to four cities of Punjab revealed that the purchase patterns of grocery remains more or less same across geographies and people prefer grocery stores to be nearby their residences.

Chikkamath, *et al.* (2012) in their study on "Factors influencing consumers behaviour for vegetable purchase" revealed that about 9 per cent, 13 per cent and 26 per cent of low, medium and high income groups of consumers were having the opinion that they consider distance of markets from their houses while going out for vegetable purchases.

According to (Drewnowski *et al.*, 2012) study on obesity and supermarket access, the physical distance to a supermarket is not related with fruit and vegetable intake. The determinants of dietary intake are personal choices, psychosocial factors and socioeconomic status.

Khan and Sharma (2015) reported in their study " A Study of Consumer Behaviour towards Grocery Retailing in Delhi Region of National Capital Region of India" that more than half of respondents had agreed that location and offers

were the most important criteria taken in consideration by them to choose an outlet irrespective of its retail format.

2.1.2.7. Quantity of vegetables purchased per month

Quantity of vegetables purchased per month is operationally defined as quantity of vegetables purchased by consumer for entire family in a month.

Srinivasan (2006) in his study on consumer buying behaviour for fruits and vegetables in Puducherry found that 55 per cent of respondents purchase 1-2 Kg of vegetables per purchase followed by 31.67 per cent purchased less than 1 Kg and 13.33 per cent purchased more than 2 Kg.

Balaji (2012) in his research wok on consumer behaviour of fruits and vegetables reported that 58.75 per cent of respondents purchased less than 2 Kg of vegetables for a week, 36.25 per cent purchased 3Kg-5 Kg and 5 per cent of respondents purchased more than 5 Kg.

2.2.1. Consumer

Any individual who purchases goods and services from the market for his/her end-use is called a consumer.

Nagendra (1994) defined consumer as a person who bought goods or services for own use and needs and not for resale.

Kotler (2000) referred consumer as all individuals or households who bought or acquired goods and services for personal consumption.

2.2.2. Consumer attitude

Consumer attitude is the positive and negative feelings, beliefs towards purchase of vegetables.

Solomon (2004) stated that consumer attitude can be divided into 3 stages i.e affect (consumer feel about the product), behaviour (consumer experimenting with product) and cognition (consumer belief in product).

Blackwell *et al.* (2006) in their study on consumer behaviour observed that a positive attitude towards the product had reduced the length of decision making process in purchase of the product.

Amarnath and Vijayudu (2011) conducted a study on "Rural Consumers Attitude towards Branded Packaged Food Products" to identify the factors behind the change of attitude and perceptions of a rural consumer towards branded packaged food. They have developed a model "ABCDE" – Affect (A), Behavior (B), Cognition (C), Desire (D), and Environment (E). The first three components were used to investigate attitude and the different impact of these revealed about consumer's motivation and involvement in consumption. A closed end questionnaire was developed considering the factors such as health, mood, convenience, sensory appeal, natural content, price, brand image, familiarity, culture, weigh control and safety. The total response was expressed in weighted average mean and it was found that three attributes like smell good, looks good and tastes good had shown 80 percentage of positive results. The drawback was that rural consumers had no trust in branded packaged food products and believed that they are not natural and are not good for health.

Shafiwu *et al.* (2018) in their study on "Consumers' preferred purchasing outlet of safer vegetables in Ouagadougou, Burkina Faso" found that consumer's willingness to pay for a product was associated with their pre conceived ideas about the product.

2.2.3. Consumer preference

It refers to different attributes like price, availability, quality etc preferred by consumers during purchase of vegetables.

Boccaletti *et al.* (2000) in their study on "Consumer Willingness to pay for pesticide - free fresh fruit and vegetables in Italy" revealed that "pesticide free" is perceived an important attribute in purchase of vegetables because respondents were ready to pay a premium of average 15% above the regular price to purchase pesticide-free fruits and vegetables.

Ragaert *et al.* (2004) in their study "Consumer Perception and Choice of Minimally Processed Vegetables and Packaged Fruits" have developed a classic attitude behaviour model and found out that the consumers rely on different attributes such as search attributes (price, color and appearance), experience attributes (taste and flavor) and credence attributes (health and microbiological) before deciding whether or not to buy and which product to choose.

Srinivasa and Tharananthan (2006) observed from their study that despite of the decreasing taste differences between urban and rural customers, they differed in consumption as well as shopping pattern in many ways.

Goyal and Singh (2007) reported that Indian consumers had preferred raw and fresh foods over processed and packaged food items.

Hadi *et al.* (2010) reported that, with the rising per-capita income in developing countries, there had been changes in the consumer demand for food attributes such as safety, freshness, appearance, and texture.

Chandrashekhar (2014) in his study on 'Consumers Perception towards Organic Products in Mysore city' observed that the consumer preferences for organic vegetables widely varied i.e 58 per cent of respondents preferred organic vegetables in order to maintain good health, 14 per cent of respondents preferred because of its taste and other feelings, 26 per cent of respondents preferred due to its high quality and remaining 2 per cent of the respondents preferred due to its low price.

2.2.4. Consumer decision making

Consumer decision making is operationally defined as a choice between two or more alternative actions involved in purchase of vegetables.

Sinha *et al.* (2002) studied the store choice behaviour of Indian consumers and observed that there was a growing need to understand the real drivers of the shopping behavior of Indian customers as they were fairly involved in store choice decision making.

Nagaraja (2004) in his study "Consumer behaviour in rural areas: A microlevel study on buying behaviour of rural consumers in Kavali Mandal"

stated that consumer decision making is a collective process, where woman is initiator, man is financer and child is influencer.

Jayatillake and Mahaliyanaarachchi (2007) in their study on "Behavioural pattern of fruit and vegetable consumers in the 'pola' system in Monaragalla district in Sri Lanka" revealed that the factors most often considered by consumers during the decision making in purchase of vegetables were: price (57%), followed by appearance (52%), freshness (40%) and nutritional value (42%).

Qu (2007) in his study "A survey on vegetable consumer purchasing behaviour" conducted in China found out that as purchase of vegetables is very much a routine activity, consumers used limited number of criteria for purchase.

Kuhar and Juvancic (2010) in their research on "Determinants of purchasing behavior for organic and integrated fruits and vegetables in Slovenia" had demonstrated how the decision to purchase vegetables was influenced by the factors like the consumer's income, availability of retail outlets, ,health, the visual attractiveness of the products and environmental considerations.

Nicolae and Corina (2015) in their study "Consumer behaviour on fruits and vegetables market" revealed that decisions of the consumer pertaining to purchase of fruits and vegetables is taken in the store and no prior decision making. Some of the decisions were based on cognitive aspects including the best price or the best alternative, while others were based on their emotional elements such as the product which is liked best.

2.2.5. Intentions to buy from an outlet

It is operationally defined as store choice behaviour of consumers i.e intentions of a consumer to purchase vegetable from an outlet.

Lumpkin and Hite (1988) found that elderly customers behave differently from younger ones in terms of the type of store patronized. The former group is less price conscious and proximity of residence to store is not an important factor. They consider shopping as a recreational activity and choose a store that is perceived to be high on 'entertainment' values.

Sinha *et al.* (2002) in their study tried to understand store choice behaviour of shoppers in the context of the changing retailing environment. They have tried to identify major drivers behind choice of stores for various shopping needs as exhibited by a typical Indian consumer. Their study revealed that convenience and merchandise are the primary reasons behind choosing a store. Proximity of the store, store ambience and service being other reasons. Grocery stores are chosen more on the basis of their proximity and long term association with merchandise.

Ganesan (2003) studied rural consumer's behaviour and observed that marketing strategies such as advertisements and discounts were not significant for rural communities due to lack of reach of media and dissemination of information to them.

Maruyama & Trung (2007) revealed from their study related to traditional bazars that freshness, price, and convenience were important attributes that attracted consumers towards traditional outlets.

Chikkamath, *et al.* (2012) in their study on "Factors influencing consumers behaviour for vegetable purchase" reported that about 94 per cent all of the high income category of consumers prefer to purchase vegetables from stores with good hygienic conditions but for low and medium income category of consumers does not consider hygienic condition as a major factor for determining the purchase behaviour of vegetables.

2.2.6. Consumer behaviour

Consumer behaviour is operationalized as the sum total of consumer's attitude, preferences, intensions, and decisions in market place when purchasing vegetables.

Elling (1984) identified four factors that determined the buying behaviour irrespective of whether the buyer is a consumer or an individual user. They are rational forces, emotional forces, life cycle of the consumer, and life cycle of the product.

Sabeson (1991) in his study regarding consumption of processed fruits and vegetables revealed that an increased consumption of processed food items were observed with respect to an increase in education level of household head and wife. A similar increase of consumption was also observed in case of employed housewife and high income families.

Ganesan (1994) studied about consumers of agricultural products and observed that they exhibited very good response towards 'AGMARK' labelled food products because of its promising quality.

Hogg (2000) reported that shopping behaviour of urban consumers can be determined as a subjective action motivated largely by individual and group behaviour of fellow consumers.

Sinha (2003) revealed from his study on Indian market that it was significant for store managers to understand consumer's behaviour in order to develop marketing strategies.

Wu (2003) revealed that there was a significant relationship between consumer lifestyle and online shopping behaviour for the purchase of vegetables.

Sherief (2006) stated that cultivation of vegetables in terrace would change the consumer behaviour of urban families pertaining to vegetables.

Al Gahaifi and Svetlik (2011) indicated from their study factors influencing consumer behaviour that Consumers buying behaviour has been influenced by social, economic, cultural, and psychological factors.

Acheampong *et al.* (2012) conducted a study on 'Consumers Behaviours and Attitudes towards Safe Vegetables Production in Ghana: A Case Study of the Cities of Kumasi and Cape Coast'. It was aimed at ascertaining farmers and consumers awareness and perceptions on production and consumption of organic vegetables. It was also aimed at coaching them on how to produce and or obtain and consume safe vegetables. Much attention was paid to the use of chemical pesticides in vegetable production and the presence of chemical residues on

vegetables and vegetable products. The model showed that labelling, visual appearance, freshness and availability had significant influences on consumers' willingness to pay higher prices for safe vegetables.

Balaji (2012) who studied on the consumers of fruits and vegetables observed that their demographic profile is changing and the evolving consumer profile needs should be taken in to account in formulating policies related to retailing fruits and vegetables.

2.3. Awareness of rural and urban families about organic vegetables and their outlet

It refers to the state of having knowledge and understanding of organic vegetables and their outlet among rural and urban families.

Ngigi *et al.* (2011) reported that the awareness should be increased among developing country urban consumers, of the medical health dangers of consuming foods grown using unsafe practices and the general belief among consumers that, vegetables sold through certain outlets (e.g. supermarkets and specialty stores) are produced using safer production practices.

Britto and Puhalenthi (2017) in their study on awareness of organic products in Trichy district of Tamilnadu reported that 76% of the total respondents were aware about organic food products in which 62% of the respondent purchased and consumed organic foods especially fruits and vegetables. This study revealed that there is only a little difference between awareness level and consumption level so by increasing the awareness level shall, increase consumption. The increased awareness can also encourage respondents to grow their own organic home garden or kitchen garden which in turn can increase consumption of organic food products.

Chandrashekhar (2014) in his study on "Consumers Perception towards Organic Products" in Mysore revealed that 59 per cent of the respondents were not able to purchase organic products due to its irregularity in supply, 28 per cent of respondents were not preferring because of its limited choices, and remaining

12 per cent of respondents were not willing to purchase because of its highly expensive price. Most of respondents (73%) purchased organic vegetables through organic outlets,10 per cent of the respondents purchased directly from producer's farm and 7 per cent of them purchased from super markets.

Muhammad *et al.* (2016) in their study on "The Significance of Consumer's Awareness about Organic Food Products in the United Arab Emirates" found that awareness about organic food was highly influenced by age, gender, education, income and occupation status of the respondents.

2.4. Source of awareness of organic vegetables and their outlets

It refers to the different sources from which the respondent receives relevant information about organic vegetables and their outlets.

Atmadi (2013) reported from his study that community market had created a website to create awareness and perception of organic products among consumers of organic fruits and vegetables to lead a healthier life.

Vijayan (2015) observed from her research work on consumer behaviour towards vegetables that the magazines (85%) and television (81.67 %) were the most main source for providing information to consumers regarding organic vegetables and their outlets, followed by newspaper (56.67%). The role of radio and agricultural institutions like Krishibhavan were negligible.

Ismoyowati (2015) conducted a study to compare the consumer behaviour towards organic vegetables in community market and modern market in Jakarta and reported that the consumers of modern market and community market got the information regarding organic vegetables mainly from peers and nears in purchase of organic vegetables. It was also found that online social media had only influenced consumers of community market.

Russo and Simeon (2017) conducted a study on growing influence of digital and social media in consumer choice and observed that social media had made consumers more informed about the products as a result their concern about food quality attributes also increased. In contrary, majority of

consumers received partial information and they prefer to purchase cheaper products with high value. The social media favoured emergence of market segmentation. The consumers exposed to social media were more informative and concerned about environmental issues when compared to consumer exposed to mass media.

2.5. Knowledge of KAU recommended practices to remove pesticide residue

The "Safe to Eat package" was formulated by Pesticide Residue Research and Analytical Laboratory (PRRAL) of KAU, which contained a list of practices to make 31 types of insecticide-laced vegetables, safe to eat. The package included age-old cleansing operations such as washing or soaking in water with vinegar, turmeric, tamarind paste, veggie wash. It was found that by dipping in 2% solution of vinegar or tamarind pulp in water for 10 minutes helps removed 40% to 60% of external residues, which was further improvised by using Veggie Wash. A reduction of 50% to 89% in pesticide residues was observed when vegetables were soaked in veggie wash (10-12ml) solution for 10-15 minutes. Apart from this cooking was found to removes 20% to 45% of residue (Muringatheri, 2017).

2.6. Adoption of KAU recommended practices to remove pesticide residue

It is operationally defined as the extent to which KAU recommended practices were put into practice by the respondents in removal of pesticide residues in vegetables.

The KAU veggie wash formula had attracted 20 companies and half of them were given the formula. The product was expected to hit the market by january 2015 (Chandran, 2014).

The veggie wash project had been taken up as a scheme titled "Production and Marketing of Safe to Eat vegetables for sale through Government Outlets" by KAU for promoting commercial manufacturing of veggie wash such that it could be accessible wide range of consumers. As a result, the formula for 'Veggie Wash' was sold to seven firms in Kerala (Nandakumar, 2014).

2.7. Adoption of other practices by respondents to remove pesticide residue

It is operationally defined as the extent to which other practices were put into practice by the respondents in removal of pesticide residues in vegetables.

Knight *et al.* (2003) conducted a study in which three distinct socio-economic groups of housewives were interviewed about their awareness of safe food handling and practices, risk perception, and their attitude to food safety issues. The majority of respondents reported a fairly high knowledge of safe food handling practices. However, more than half were unfamiliar with the correct procedure for freezing and thawing of foods. These findings raise concerns about consumer food safety knowledge and practices.

Roseman and Kurzynske (2006) have found an important relationship between the gender of the consumers, per capita income, household population, race and education, food safety and behaviour. They have emphasized the importance of providing efficient food safety education materials and messages to the consumers, to comprehend food safety risks and to understand the consequences of their own action.

Liu *et al.* (2014) in their study on "Consumer Purchasing Behaviour for Fresh Vegetables in Nanjing, China" reported that, most of the respondents washed or soaked the fresh vegetables they intended to eat and also to buy from trusted suppliers in order to reduce the possibilities of pesticide residue contamination.

Wanwimolruk *et al.* (2015) studied about different pesticide residues found in Chinese kale which was a commonly consumed vegetable in Asian countries. It was observed that profenofos residues reduced by 55 per cent after running water washing. But this method of removing pesticide did not significantly reduced cypermethrin residues but a significant reduction was observed when washed with vinegar. They also reported that routine monitoring of pesticide residues in vegetables are required to reduce the public health risks with regard to consumption of vegetables contaminated with pesticide residue.

Methodology

CHAPTER 3
METHODOLOGY

This chapter deals with the brief description of methods and procedures that were used for meeting the objectives set forth in this study. The methodology followed in the study is presented under the following sub-headings:

3.1. Research design

3.2. Locale of study

3.3. Selection of the respondents

3.4. Operationalization and measurement of the variables

3.4.1. Distribution of the respondents based on their profile and purchase related characteristics

3.4.2. Consumer behaviour of rural and urban families on vegetables

3.4.3. Awareness of rural and urban families about organic vegetables and their outlets

3.4.4. Knowledge of KAU recommended practices to remove pesticide residue

3.4.5. Adoption of KAU recommended practices to remove pesticide residue

3.4.6. Adoption of other practices by respondents to remove pesticide residue

3.5. Data collection procedure

3.6. Statistical tools

3.7. Conceptual framework for the study

3.1. RESEARCH DESIGN

'Ex-post-facto' and 'explorative' research designs were used for conducting this study. Kerlinger (1964) defined ex post facto research as that research in which independent variables have already occurred when the researcher starts with the observation of a dependent variable or variables. The independent variables were studied in retrospect for their possible relations to, and effects on, the dependent variable or variables. This research design was resorted to this study, as there was no scope for manipulation of any variables under study.

3.2. LOCALE OF THE STUDY

The study was conducted in the Kozhikode district comprising eleven blocks, seven municipalities and one corporation. From the 11 blocks, one block and from that block two panchayats were selected randomly. Thirty families were selected randomly from each panchayat which represent the rural respondents. One ward each from municipality and corporation were selected randomly. Thirty families were selected randomly from each ward. Thus a total of 60 urban and 60 rural respondents were selected for the study. From among these it was ensured that there were 24 vegetarian respondents, 12 each from urban and rural area thus making the total sample size 120.

3.3. SELECTION OF THE RESPONDENTS

The respondent groups of the study comprised of 60 respondents each from rural and urban areas of Kozhikode district. The 48 respondents out of 60 were of mixed category and 12 were of vegetarian category. The respondents were selected randomly from voters list of selected panchayats and wards. The criteria for selection of respondents were that their main occupation was not farming and ninety per cent of their requirement of vegetables were met from the markets. The diagrammatic representation showing the selection of respondents for the study is given below in Fig-2.

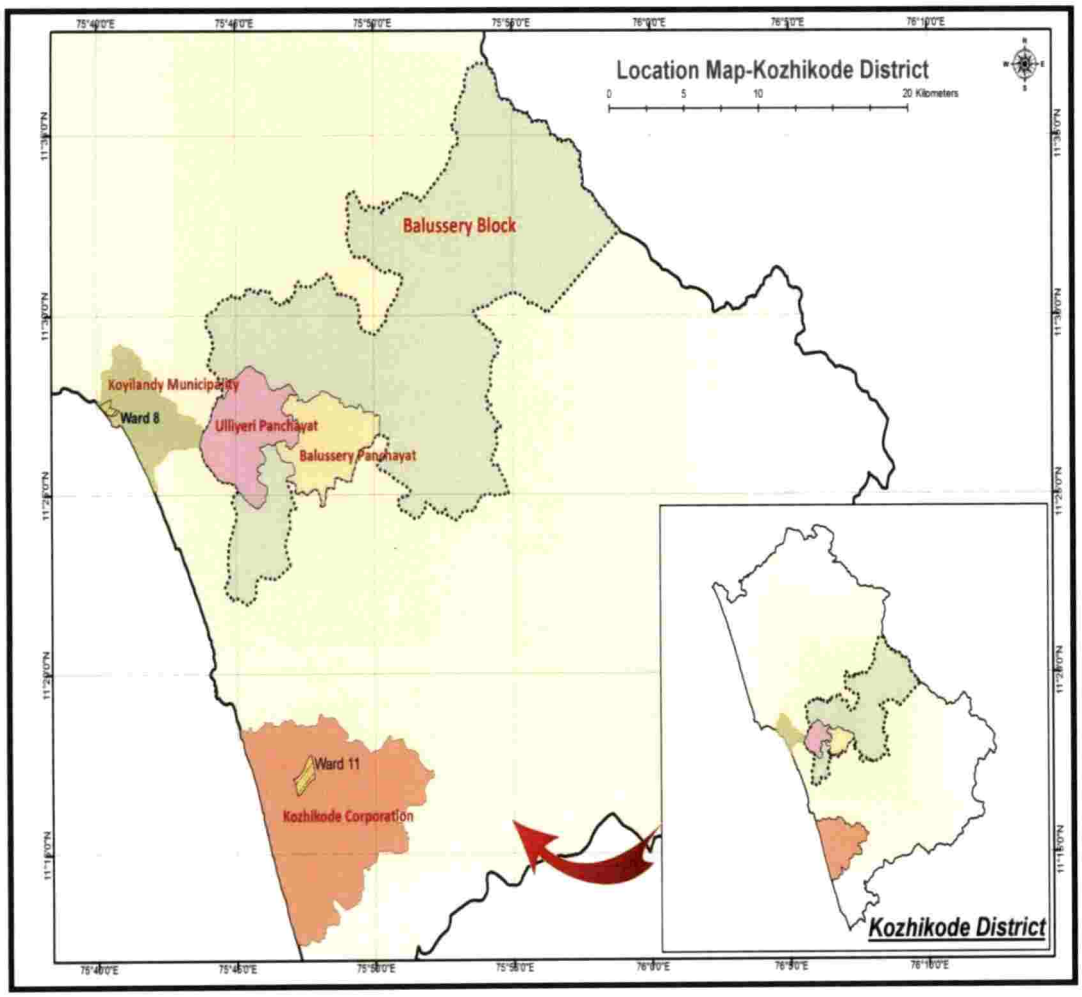

Fig 1. Location map of the study

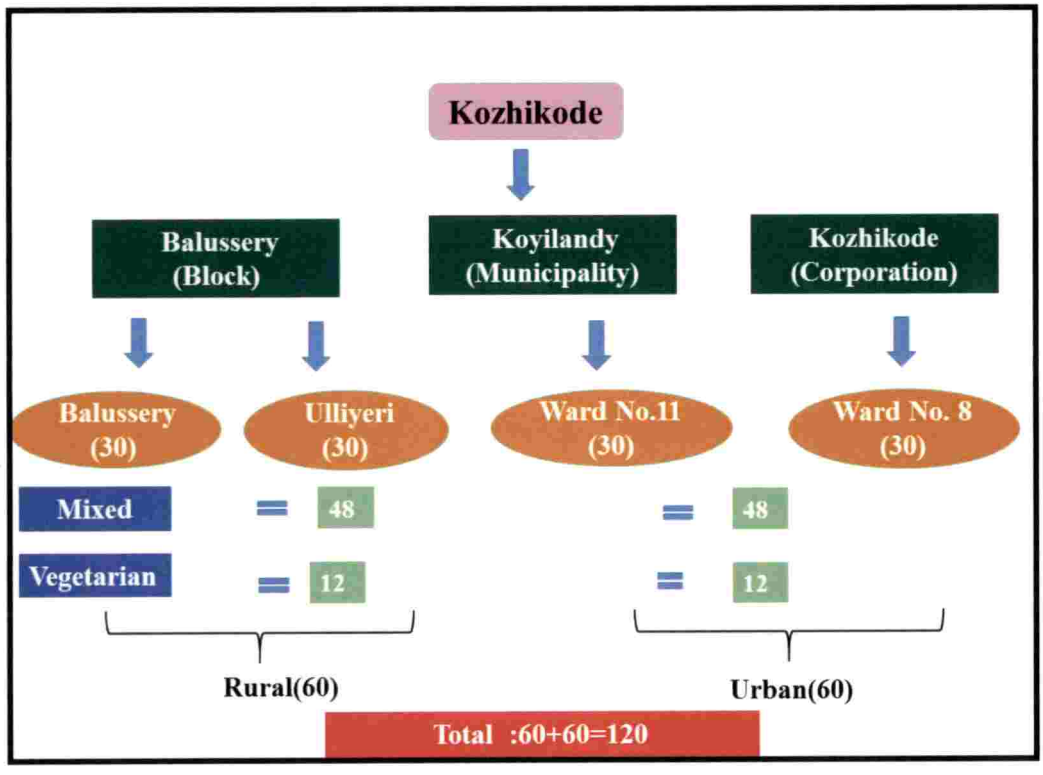

Fig 2. Sampling design of the study

3.4. OPERATIONALIZATION AND MEASUREMENT OF VARIABLES

3.4.1. Distribution of the respondents based on their profile and purchase related characteristics

In order to study the influence of the profile and purchase related characteristics of the consumers of vegetables in urban and rural area for meeting the objectives of the study, the characteristics of the vegetable consumers were identified as given below:

A list of 40 independent variables related to the profile and purchase related characteristics of the consumer respondents for meeting the objectives of the study were selected after detailed review of literature and discussion with subject matter specialists. These variables were sent to 40 judges including extension scientists and faculty members of extension department in various SAU's (State Agricultural Universities) in south India (Appendix-I).

They were asked to examine the variables critically and to rate the relevancy of each variable on a five-point continuum ranging from most relevant, more relevant, relevant, less relevant and least relevant with weightages of five, four, three, two and one, respectively. Out of 40 judges only 25 responded.

The final variables were selected based on the criterion of mean relevancy score, which was obtained by summation of the weightages obtained by variable and dividing it by the number of judges responded. Those variables getting a score more than the mean score were selected for the study.

The variables with the mean relevancy scores are presented in Appendix-II . The profile and purchase related characteristics of the respondents which constituted the independent variables finally selected for the study were age, gender, education level, average household monthly income, family size, health consciousness, periodicity of purchase, source of vegetables, nature of vegetables consumed, preferred vegetable category, average monthly household expenditure on vegetables, proximity to outlet, and quantity of vegetables purchased per month.

Table 1. The independent variables and their measurement devices or procedures

Sl. No	INDEPENDENT VARIABLES	MEASUREMENT DEVICES
Profile characters		
1	Age	Census report, 2011 was used
2	Gender	Standard scoring procedure was used
3	Education level	Scale developed by Singh (1993) followed by Hanjabum (2013)
4	Average monthly household income	Measured by directly asking the respondents
5	Family size	Measured by directly asking the respondents
6	Health consciousness	Scale developed by Sreedaya (2004)
Purchase related characters		
1	Periodicity of purchase	Scale developed by Balaji (2012)
2	Source of vegetables	Scale developed by Nimita (2013) with slight modification
3	Nature of vegetables consumed	Scoring procedure developed for the study
4	Preferred vegetable category	Scoring procedure developed by Rajalakshmi (2008) with slight modification
5	Average monthly household expenditure on vegetables	Measured by directly asking the respondents
6	Proximity to outlet	Measured by directly asking the respondents
7	Quantity of vegetables purchased per month	Measured by directly asking the respondents

The selected 13 independent variables are the following :

Profile characters

3.4.1.1. Age

Age was defined as the number of calendar years completed by the respondent at the time of interview and classified was done based on census report, 2011 classification method. Those who belonged to age group below 35 were categorised into young category, 35-55 into middle aged and above 35 as old aged category.

3.4.1.2. Gender

Gender was operationalized as a dichotomized variable having only two categories namely 'male' and 'female who regularly purchases the vegetables for the family and classification was based on a standard procedure. A score of '1' was assigned to male and '0' for female.

3.4.1.3. Education level

It refers to the highest academic qualification possessed by the respondent through formal and informal education at the time of interview. The scale developed by Singh (1993) followed by Hanjabum (2013) was used for this study.One score was added to every successful completion of formal schooling and the respondent were categorized based on their level of education.

Category	Score
Illiterate	1
Write and read	2
Primary	3
High school	4
Higher secondary	5
College	6

3.4.1.4. Average household monthly income

It was operationalized as average monthly income obtained by respondents and their family through major and subsidiary occupation. It is measured by directly asking the respondents and is expressed in terms of rupees per month. It was categorized into 3 categories *viz.*, low, medium and high by computing mean and standard deviation.

3.4.1.5. Family size

Family size refers to number of family members dependent on the head of family at the time of interview. It was measured by directly asking the respondents and further classified into small, medium and large families by calculating mean and standard deviation of collected data.

3.4.1.6. Health consciousness

Health consciousness was operationalized as the awareness, knowledge and interest of the respondent regarding the dietary requirements, personal hygiene and environmental sanitation. It was measured by a scale developed by Sreedaya (2004). The scale of consisted of six statements and response was measured on a five point continuum ranging from strongly agree to strongly disagree with scores ranging from 5 to 1 as given below. The responses for health consciousness as perceived by respondents were collected as given in interview schedule (Appendix-III).

The maximum and minimum score that could be obtained were "30" and "6" respectively. The responses were categorized as low, medium, and high by computing mean and standard deviation of the total scores obtained by respondents.

Purchase related characters

3.4.1.7. Periodicity of purchase

Periodicity of purchase refers to the time period between consecutive vegetable purchase by consumer. The scale developed by Balaji (2012) was used in this study for categorization of the respondents. The scoring procedure was as given below

Category	Score
Fortnightly once	1
Weekly once	2
Weekly twice	3
Alternate days	4
Daily	5

3.4.1.8. Source of vegetables

It was defined as different sources of obtaining vegetables for consumption of the household. It was determined by a method developed by Nimita (2013) with slight modification. A list of possible sources were given in the interview schedule and respondents were asked to mark their responses. The frequency and percentage analysis was done for the interpretation of data.

Category	Frequency		
	Regular (2)	Occasional (1)	Never (0)
Own farm			
Neighbourhood farm			
Wholesale outlet			
Retail outlet			

3.4.1.9. Nature of vegetables consumed

It refers to the nature of vegetables consumed by respondents i.e organic, inorganic or both. A scoring procedure was developed for the study such that a score of 2 was given for those who consumed only organic vegetables, 1 for those who consumed both and 0 for those who consumed only inorganic vegetables.

3.4.1.10. Preferred vegetable category

It refers to the consumer preference for different vegetable categories. The schedule developed by Rajalakshmi (2008) with slight modification was used for this study. A list of families of commonly consumed vegetables were presented in the interview schedule and appropriate responses of respondents were marked based on their preferences expressed in a three point continuum viz., less preferred(LP), preferred(P) and more preferred(MP) with scores 0, 1 and 2 respectively. The scores ranged from 0 to 20. The percentage analysis was performed for interpretation of data collected.

Category	LP(0)	P(1)	MP(2)
Leafy vegetables			
Solanaceae			
Cucurbitaceae			
Brassicaceae			
Umbeliferae and Chenopodiaceae			
Malvaceae			
Moringaceae			
Leguminaceae			
Euphorbiaceae and araceae			
Alliaceae			

3.4.1.11. Average household monthly expenditure on vegetables

Average monthly household expenditure was operationalized as average income spend on purchasing vegetables by family for a month and expressed in rupees per month. It was determined by directly asking the respondents and categorization was done as low, medium and high based on mean and standard deviation.

3.4.1.12. Proximity to outlet

It was referred as nearness of outlets of vegetables from the house of consumers expressed in kilometre. It was measured by directly asking the respondents and distance as perceived by respondents were categorised as less, moderate and more based on mean and standard deviation.

3.4.1.13. Quantity of vegetables purchased per month

It refers to quantity of vegetables purchased by consumer for entire family for a month expressed in kilogram. It was determined by directly asking the respondents and further classification as low, medium and high was done using mean and standard deviation.

3.4.2. Consumer behaviour of rural and urban families on vegetables

It was operationally defined as the sum total of consumer's attitude, preferences, intentions, and decisions in market place when purchasing vegetables. It consist of four components. Each component was measured using scales having eight statements expressed on a five point continuum *viz.*, strongly agree, agree, undecided, disagree and strongly disagree having scores 0,1,2,3 and 4 respectively.

. The consumer behaviour of respondents was computed by summing up the total scores of four components and categorization was done as less favourable, moderately favourable and highly favourable using mean and standard deviation. The score range that could be obtained for consumer behaviour was 0 to 128. A student t- test had been performed for different combinations of consumers to

analyze whether there is any significant difference between their consumer behaviour towards vegetable purchase. The four components and their respective measurements are given under following heads

3.4.2.1. Consumer attitude

Consumer attitude was defined as the positive and negative feelings , beliefs towards vegetables. An arbitrary scale consisting of 8 statements, 4 each positive and negative, was developed to measure consumer attitude. . It was measured on a five point continuum *viz.*, strongly agree, agree, undecided, disagree, and strongly disagree. A score of 4,3,2,1,0 was given for positive statements, and score was reversed for negative statements. The maximum and minimum scores could be obtained was '32' and '0'.The respondents were further classified into 3 groups as less favourable, moderately favourable and highly favourable using mean and standard deviation of the scores obtained.

3.4.2.2. Consumer preference

Consumer preference refers to the different attributes like quality, better taste, lower residue, nutrient value, shelf life, accessibility, better value for money, and eco friendliness preferred by consumers during purchase of vegetables. The method developed by Vijayan (2016) with slight modification consisting of 8 characteristics assessed on five point *viz.*, strongly agree, agree, undecided, disagree, and strongly disagree with scores 0,1,2,3 and 4 respectively was used for the study. The score range could be 0-32. The responses of consumer were categorized as 3 groups viz., low, medium and high. The chi-square test was carried out to check the dependence between consumer preference for various attributes of vegetable and the locality of consumers.

3.4.2.3. Consumer decision making

Consumer decision making was operationally defined as a choice between two or more alternative actions involved in purchase of vegetables. The scale developed by Devi (2005) with slight modification was taken for the study. The

responses were expressed on a five point continuum *viz.*, strongly agree, agree, undecided, disagree, and strongly disagree with score of 4,3,2,1 and 0 respectively. The responses were further classified as less favourable, moderately favourable and highly favourable by computing mean and standard deviation. The possible score range was 0-32. The chi square test was performed to determine the dependence between consumer decision making in purchase of vegetables and the locality of consumers.

3.4.2.4. Intentions to buy from an outlet

Intentions to buy from an outlet was operationalized as store choice behaviour of consumers i.e intentions of them to purchase vegetable from an outlet. It was measured by a procedure developed by Rajalakshmi (2008). The method consisted of 8 statements measured on a five point continuum *viz.*, strongly agree, agree, undecided, disagree, and strongly disagree with score of 4,3,2,1 and 0 respectively. The responses were further categorized as low, medium and high by computing mean and standard deviation. The possible maximum and minimum scores were 0 and 32. The chi square test was conducted to analyze the dependence between consumer intentions to buy vegetables from an outlet and the locality of consumers.

3.4.3. Awareness of rural and urban families about organic vegetables and their outlets

Awareness was determined based on a method developed by Vijayan (2016) with slight modification. It consist of 9 statements measured on a 3 point continuum as not aware, partially aware and fully aware with score of 0,1 and 2 respectively. The possible maximum and minimum scores for respondents were 18 and 0.

3.4.4. Source of awareness of organic vegetables and their outlets

Source of awareness of organic vegetables and their outlets refers to the different sources from which the respondent receives relevant information about

organic vegetables and their outlets. It was measured by using the procedure followed developed for the study. A list of various sources including television, radio, magazine, newspaper, internet and agricultural institutions were given to respondents to express their responses based on a three point continuum as never, occasional and regular with scores 0,1 and 2 respectively. The range of scores obtained could be zero to fourteen.

3.4.5. Knowledge of KAU recommended practices to remove pesticide residue

A set of four KAU recommended practices to remove pesticide residues in vegetables such as veggie wash, tamarind paste, turmeric solution and vinegar solution were identified after consultation and discussion with research scientists in Pesticide Residue Research and Analytical Laboratory (PRRAL). The perceived responses were taken from consumers. The score of one was given for positive response and zero was given for negative response. The cumulative score was computed by adding scores obtained by respondents which formed the knowledge score. The possible range of knowledge score was zero to four.

3.4.6. Adoption of KAU recommended practices to remove pesticide residue

Adoption of KAU recommended practices to remove pesticide residue was operationally defined as the extent to which KAU recommended practices were put into practice by the respondents in removal of pesticide residues in vegetables. A scoring procedure was developed for this study. The practices were measured on three point continuum, non adoption, partial adoption, and full adoption with score 1,2,3 respectively. The cumulative score obtained for four practices represented the adoption score of respondent. Later adoption index was calculated for all the respondents and further classification was done based on mean and standard deviation. The possible range of adoption score was 4 to 12.

The adoption index was worked out using the formula

$$A_{d.}I = \frac{\text{Respondents total score}}{\text{Total possible score}} \times 100$$

3.4.7. Adoption of other practices by respondents to remove pesticide residue

It was operationalized as the extent to which other practices were put into practice by the respondents in removal of pesticide residues in vegetables. A list of household practices for removal of pesticide residues were identified through review of literature and five out of them were finalized after discussion with subject matter specialist. The respondents were asked to tick the practices they were following and to specify if any additional practices were followed by them. A percentage analysis was conducted to determine the mostly followed and least followed practices by consumers.

3.5. DATA COLLECTION PROCEDURE

A structured interview schedule (Appendix-III), focus group interviews and observation method were used for collecting primary data. A draft interview schedule covering all aspects mentioned above was prepared and was pretested by conducting a pilot study in a non sample area to check the validity of population sample. The modifications identified were incorporated to the final interview schedule which was distributed to respondents.

3.6. STATISTICAL TOOLS USED IN THE STUDY

The collected data were scored, tabulated and analyzed using statistical tools and methods as described below.

3.6.1. Mean

The mean or average is a central value of discrete set of numbers. The dependent variable and independent variables including average household monthly income, health consciousness, family size, average monthly household expenditure on vegetables, proximity to outlet and quantity of vegetables purchased per month were categorized based on mean and standard deviation of collected data set.

3.6.2. Percentage Analysis

The percentage analysis was performed to represent collected data on percentage basis for better understanding and simple interpretations. It can be developed from the frequency distribution of the collected data. It is calculated by multiplying frequency with hundred and then dividing the product with total number of respondents.

3.6.3. Standard deviation

The standard deviation is a commonly used measure of dispersion used to quantify the amount of variation or dispersion of a set of values. A low standard deviation indicates that the values tend to be close to the mean (also called the expected value) of the data set, while a high standard deviation indicates that the values are dispersed in wider range.

3.6.4. Quartile deviation

The categorization of respondents based on knowledge of KAU recommended practices to remove pesticide residue was done by quartile deviation analysis. The first quartile (Q_1) and third quartile (Q_3) was computed for the data and respondents were classified as low, medium, high as per their respective knowledge score. For a normal data set, the first quartile (Q_1) is the middle value between smallest number and median of data. The second quartile (Q_2) represents the median of the data. The third quartile (Q_3) is the middle value between the median and the highest value of the data set.

3.6.5. Chi-square test

The chi-square is a statistical hypothesis test which is used to determine whether there is any dependence or association between expected frequencies and observed frequencies in one or more categories. In this study, chi-square test was performed to analyze whether there was any dependence between consumer attitude, consumer preference, consumer intensions and consumer decision making in purchase of vegetables with their residing locality.

3.6.6. F- test

F-test is a statistical test which is used to analyze the variances of two sets of population. The $F_{calulated}$ value is denoting variance ratio of the two population.

3.6.7. Student's t- test

The student's t-test is commonly applied when the test statistic follow a normal distribution. It is performed to determine if two sets of data are significantly different from each other. An F-test will be conducted prior to t-test. If F-test is significant, then t-test with unequal variance is performed and if not significant t-test with equal variance is performed. This is used in the study for comparative analysis of consumer behaviour of different combinations of consumers *viz*., urban and rural consumers, rural mixed and rural vegetarian, urban mixed and urban vegetarian, urban vegetarian and rural vegetarian, mixed consumer of 2 rural panchayats, urban mixed and rural mixed, and mixed consumers of 2 urban wards, male and female.

3.6.8. Simple correlation analysis

It is a statistical technique used to study the relationship between two variables. It is used in this study to determine the relationship between dependent and ten independent variables such as age, education level, average household monthly income, family size, health consciousness, periodicity of purchase, source, nature of vegetables consumed, average monthly expenditure on vegetables, proximity to outlet, and quantity of vegetables purchased per month.

3.7. CONCEPTUAL FRAMEWORK FOR THE STUDY

The conceptual framework had been developed for the study with an objective to provide an abstract view of the relationship between the selected independent variables and dependent variable in the study. The relationship between the consumer behaviour and ten independent variables including age, education level, average household monthly income, family size, health consciousness, periodicity of purchase, nature of vegetables consumed, average

household expenditure on vegetables, proximity to outlet and quantity of vegetables purchased per month is conceptually illustrated in Fig 3.

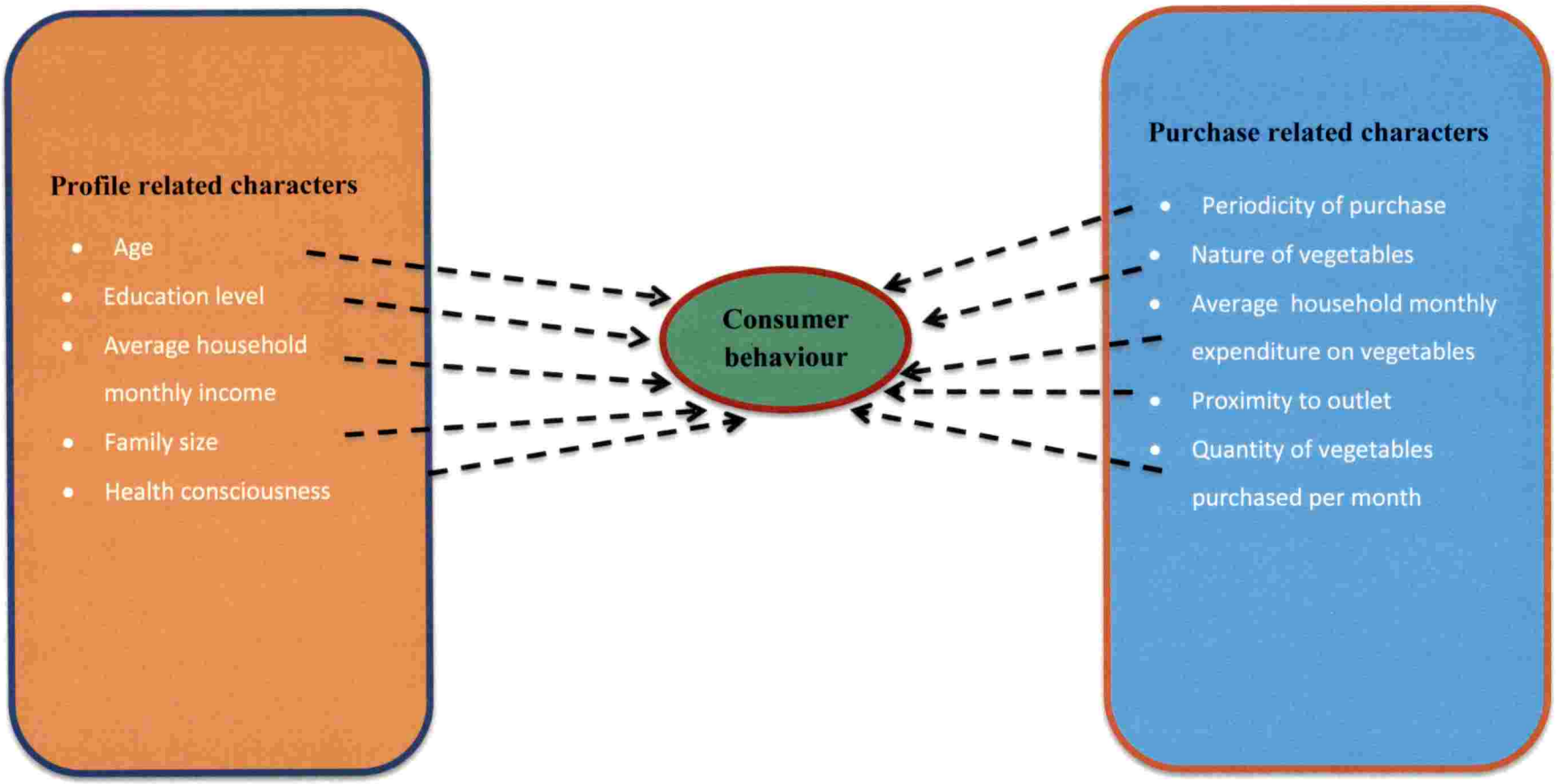

Fig 3. Conceptual framework for the study

Results & Discussion

CHAPTER 4

RESULTS AND DISCUSSION

This chapter deals with the results and discussion based on the analysis of data obtained from the study. The findings of the present study are presented in this chapter under the following heads.

4.1. Distribution of the respondents based on their profile and purchase characteristics related to consumer behaviour in vegetable purchase

4.2. Consumer behaviour of rural and urban families on vegetables

4.3. Awareness of rural and urban families about organic vegetables and their outlets

4.4. Source of awareness of organic vegetables and their outlets

4.5. Knowledge of KAU recommended practices to remove pesticide residue

4.6. Adoption of KAU recommended practices to remove pesticide residue

4.7. Adoption of other practices by respondents to remove pesticide residue

4.8. Suggestions for creating awareness about safe food habits

4.9. Empirical model for the study

4.1. DISTRIBUTION OF RESPONDENTS BASED ON THEIR PROFILE AND PURCHASE CHARACTERISTICS RELATED TO CONSUMER BEHAVIOUR IN VEGETABLE PURCHASE

PROFILE RELATED CHARACTERISTICS

4.1.1. Age

The distribution of respondents based on age for all selected panchayats and wards in Kozhikode district is presented below in Table-2.

Table 2. Distribution of respondents based on their age

Category	Urban n=60		Rural n=60		Total N=120	
	No.	%	No.	%	No.	%
Young (<35)	9	15.00	1	1.67	10	8.84
Middle aged (35-55)	37	61.67	30	50.00	67	55.83
Old aged (>55)	14	23.33	29	48.33	43	35.83

The total distribution of respondents based on their age as shown in Table-2 showed that the more than half (55.83%) of consumer respondents who regularly purchased vegetables for entire family of selected rural and urban areas belonged to middle aged category followed by old age (35.83%) and young age (8.84%). Older consumers would shop less frequently than medium and young because they tend to have smaller families and lower incomes. These results are in conformity to the findings of Farceed and Riggs (1982).

The frequency of young people (<35) was found relatively low among urban and rural samples when compared to other two age groups. The possible reason could be that it is usually the head of family or mother who purchases vegetables for the family and most of respondents interviewed were belonging to middle aged category.

4.1.2. Gender

The Table-3 showed the distribution of male and female respondents in selected rural and urban area who regularly purchased vegetables for the whole family.

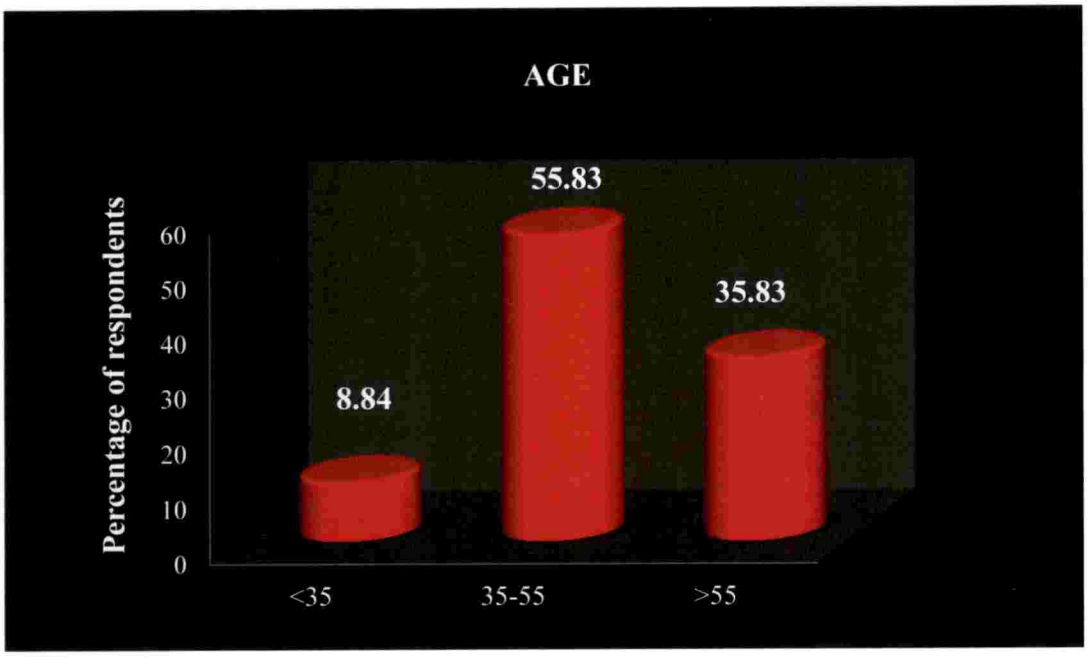

Fig 4. Distribution of respondents based on their age

Table 3. Distribution of respondents based on their gender

Category	Urban n=60		Rural n=60		Total N=120	
	No.	%	No.	%	No.	%
Male	38	63.33	36	60.00	74	61.67
Female	22	36.67	24	40.00	46	38.33

It was observed from the Table-3 that 61.67 per cent of total consumer respondents were male and 38.33 per cent were female. The results were almost same in rural and urban population. In urban area, 63.33 per cent were male and 36.67 per cent were female. In rural area 60 per cent were male and 40 per cent were female. These results were in contradiction with the findings of Liu *et al.* (2013).

The higher proportion of male in purchase of vegetables could be because most of the head of family are male. They are engaged in some occupation or other and vegetables are mainly purchased by them on the way back home from workplace. However the involvement of female respondents were more than half of male respondents which was not negligible. This is mainly due to the fact that women are more focussed in the purchase of fruits and vegetables because of their patient nature in examining the produce and accessing the quality, price where majority of the male fail. Also many of the mothers are employed and they may be purchasing vegetables on their way back home. As a result female are exhibiting better decision making ability in the purchase of vegetables as compared to male. These results were in accordance with the observations of Zhen and Manshori (2012).

4.1.3. Education level

The distribution of respondents based on highest academic qualification possessed by them through formal and informal education at the time of interview is represented in the Table below.

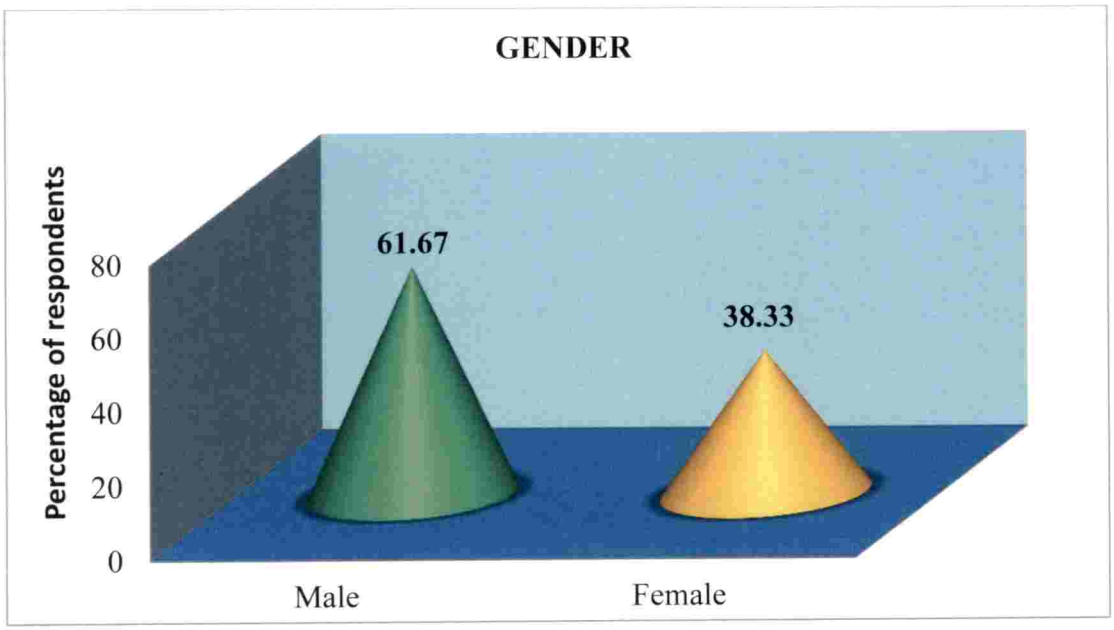

Fig 5. Distribution of respondents based on their gender

Table 4. Distribution of respondents based on their education level

Category	Urban n=60		Rural n=60		Total N=120	
	No.	%	No.	%	No.	%
Illiterate	0	0	0	0	0	0
Write and read	0	0	1	1.66	1	0.84
Primary	5	8.33	10	16.67	15	12.50
High school	20	33.33	25	41.67	45	37.50
Higher secondary	19	31.67	15	25.00	34	28.33
College	16	26.67	9	15.00	25	20.83

It was evident from the Table-4 that 37.50 per cent of the total respondents possessed high school level education followed by 28.33 per cent with higher secondary level, 20.83 per cent with collegiate level, 12.50 per cent with primary level of education and 0.84 per cent belonged to write and read category. There was no respondents found in the illiterate category and there was not much difference in the education levels of urban and rural consumers. This could be attributed to high literacy rate of Kerala.

The percentage of respondents who had pursued collegiate level of education was relatively higher in urban sample. This was due to increased education facilities and infrastructures development in urban area. These results were in agreement with the survey results of NSSO (National Sample Survey Organisation) reported by (Harish, 2015).

4.1.4. Average household monthly income

The distribution of respondents of the selected rural and urban locality based on their average monthly income obtained by them and their family through major and subsidiary occupation is presented in the Table 5.

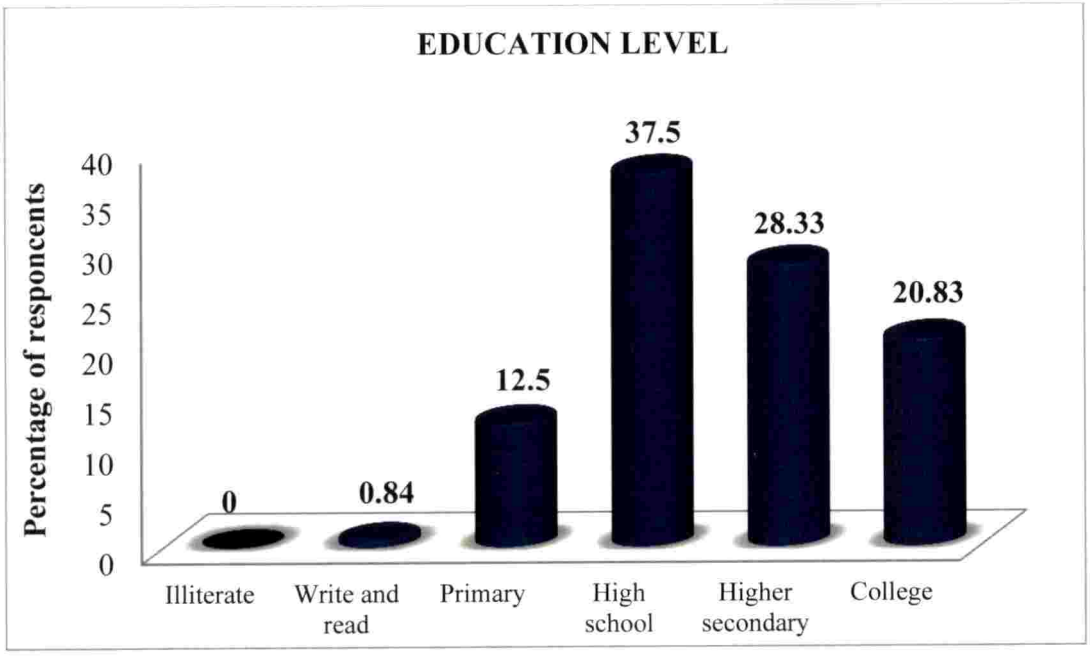

Fig 6. Distribution of respondents based on their education level

Table 5. Distribution of respondents based on average household monthly income

Category (Rs. /month)	Urban n=60		Rural n=60		Total N=120	
	No.	%	No.	%	No.	%
Low (<21525)	4	6.67	18	30.00	22	18.33
Medium (21525-44775)	14	23.33	36	60.00	50	41.67
High (>44775)	42	70.00	6	10.00	48	40.00
Mean=33150, SD=11625 Data range=10000-60000						

It was observed from the Table-5 that 41.67 per cent of total respondents belonged to medium category of household monthly income, followed by 40 per cent were in high income category and 18.33 per cent were in low income category. The income distribution of urban and rural consumers varied widely. In urban area, majority (70%) were having high income (>Rs. 44775) as observed in the study, followed by 23.33 per cent with medium income (Rs. 21525- Rs. 44775) and 6.67 per cent with low income (<21525). These results were in conformity with the findings of Das and Pathak (2012).

In contrary most (60%) of the rural consumers belonged to medium income group, followed by 30 per cent with low income and 10 per cent with high income. This pattern was as a result of high education level, occupation status and diversified employment opportunities of urban population than rural population which would fetch them more income.

4.1.5. Family size

The distribution of respondents based on family size in the selected urban and rural localities are given in Table 6.

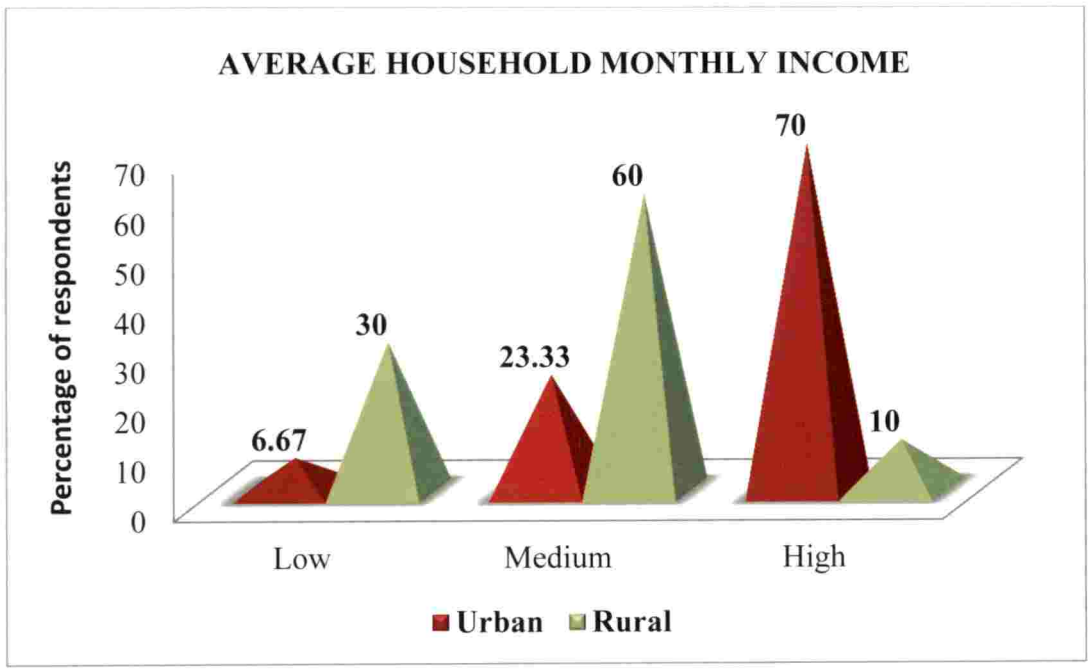

Fig 7. Distribution of respondents based on average household monthly income

Table 6. Distribution of respondents based on family size

Category	Urban n=60		Rural n=60		Total N=120	
	No.	%	No.	%	No.	%
Small (<3)	2	3.33	10	16.67	12	10.00
Medium (3-5)	52	86.67	43	71.67	95	79.17
Large (>5)	6	10.00	7	11.66	13	10.83
Mean= 4, SD= 1						

The distribution of urban and rural respondents with respect to family size, presented in Table-6 showed that majority (79.17%) of respondents belonged to medium family with 3-5 members, 10.83 per cent were having large family of more than five members and 10 per cent were having small family with less than three members. This is a true reflection of the general trend noticed in Kerala, where most of families consist of parents and two children. The findings mentioned above were in accordance with results obtained by Rajalakshmi (2008).

It was interestingly noted that there was not much difference in distribution pattern of rural and urban respondents which is attributed to high literacy of Keralites.

The family size had a greater influence in determining purchase decision, mainly concerned with where to purchase, what quantity to purchase. It was found that family size also limited the choice of fruit and vegetable retail outlets in low income families because they should stick to the stores which provided them more quantity at lesser price like departmental stores. These findings mentioned were in agreement with results of Balaji (2012).

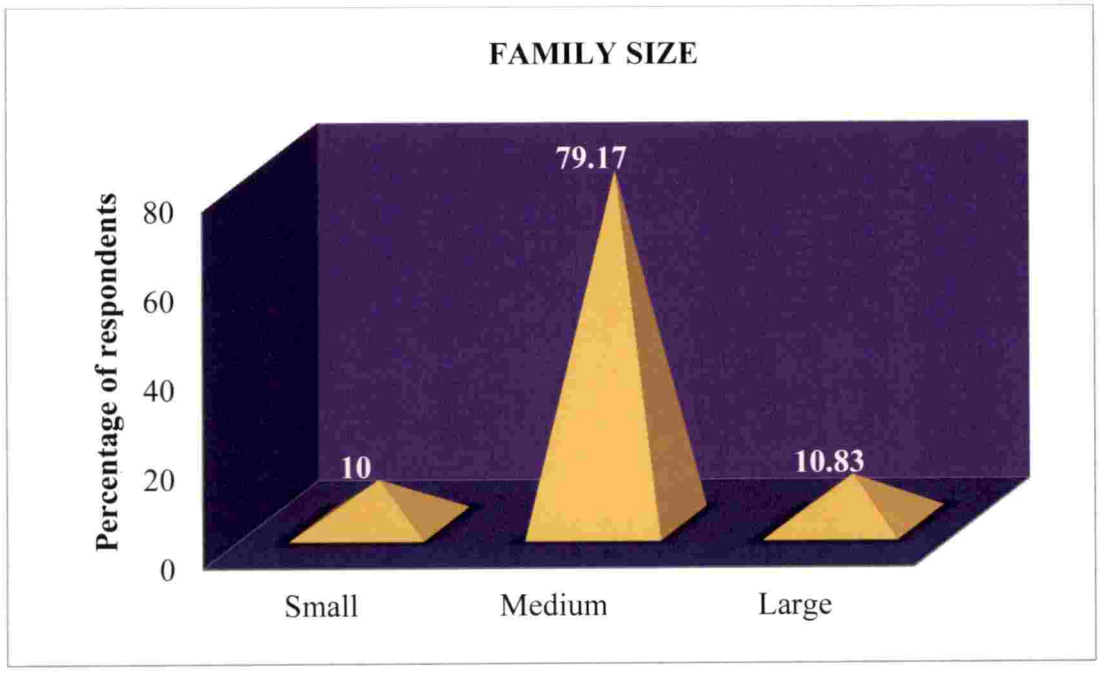

Fig 8. Distribution of respondents based on family size

4.5.6. Health consciousness

The distribution of respondents based on their health consciousness in the selected urban and rural sample population are illustrated in Table 7.

Table 7. Distribution of respondents based on health consciousness

Category	Urban n=60		Rural n=60		Total N=120	
	No.	%	No.	%	No.	%
Low (<18)	4	6.67	15	25.00	19	15.83
Medium (18-22)	54	90.00	41	68.33	95	79.16
High (>22)	2	3.33	4	6.67	6	5.00
Mean= 20, SD= 2 Expected score range=6-30 Data score range=14-24						

It was evident from the Table-7 that, medium health consciousness was displayed by most of the respondents (79.16%), followed by 15.83 per cent with low and 5 per cent with high health consciousness.

The survey report of (Nielson, 2016) on global ingredients and dining-out trends proved young people (>30 years old) were more concerned about health as compared to other age groups and it was evident from Table-2 that respondents in the young age group (<35) was only 10.83 per cent of total respondents. This could be reason for relatively lesser proportion of respondents who were displaying high health consciousness.

The proportion of respondents with low health consciousness was found to be high in rural area than urban area. This might be primarily due to fact that rural consumers were not in a position to exhibit their health concerns completely because of their relatively low income and lack of accessibility of outlets to purchase organic vegetables. These results were in line with findings of Dikieson and Arkus (2009).

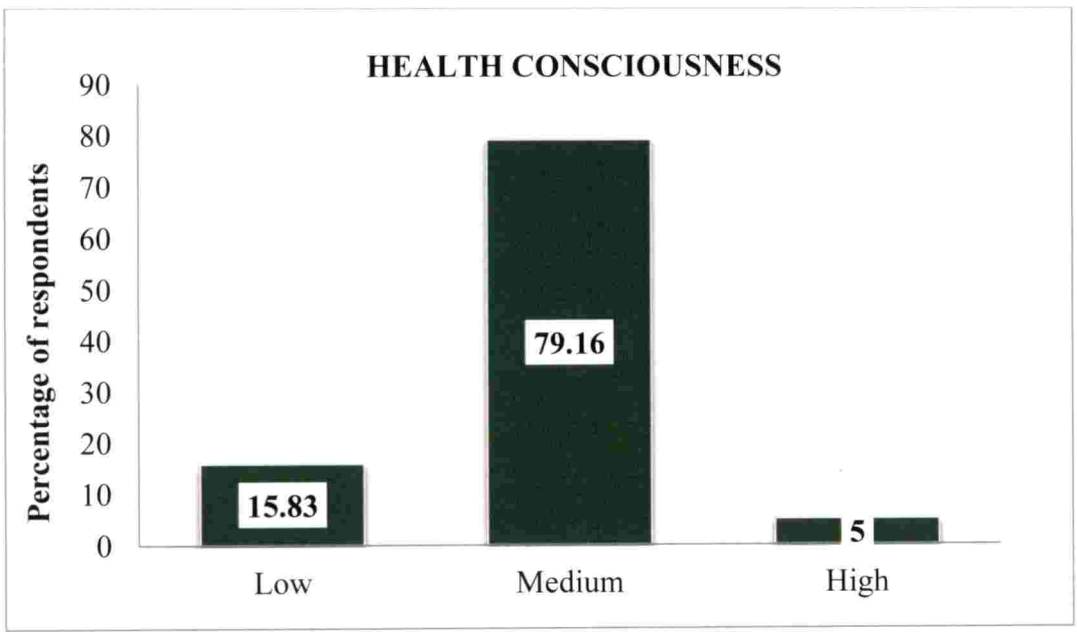

Fig 9. Distribution of respondents based on health consciousness

PURCHASE RELATED CHARACTERS

4.5.7. Periodicity of purchase

The Table- 8 shows the distribution of respondents from selected urban and rural samples based on their time period between consecutive vegetable purchase.

Table 8. Distribution of respondents based on periodicity of purchase

Category	Urban n=60		Rural n=60		Total N=120	
	No.	%	No.	%	No.	%
Fortnightly once	3	5.00	5	8.33	8	6.67
Weekly once	29	48.33	10	16.67	39	32.50
Weekly twice	17	28.33	10	16.67	27	22.50
Alternate days	11	18.34	14	23.33	25	20.83
Daily	0	0	21	35.00	21	17.50

It was observed from the Table-8 that 32.50 per cent of total respondents purchased vegetables on weekly basis, followed by 22.50 per cent of respondents purchased twice in a week, 20.83 per cent purchased in alternate days, 17.50 per cent purchased daily and 6.67 per cent of respondents purchased once in a month.

A detailed analysis of locality wise distribution of respondents based on their periodicity of purchase of vegetables inferred that there was a significant difference in their periodicity of vegetable purchase. The results in the urban area, clearly indicated that most of respondents (48.33%) purchased vegetables on weekly basis in large quantity mainly from wholesale markets. The prime reason for this might be their high income status and also busy life which forced them to purchase weekly and store in refrigerator. A riverse pattern was seen in rural area where most (35%) of the consumers purchased vegetables on daily basis in very small quantities mainly from nearby retail outlets or cart vendors. This could be

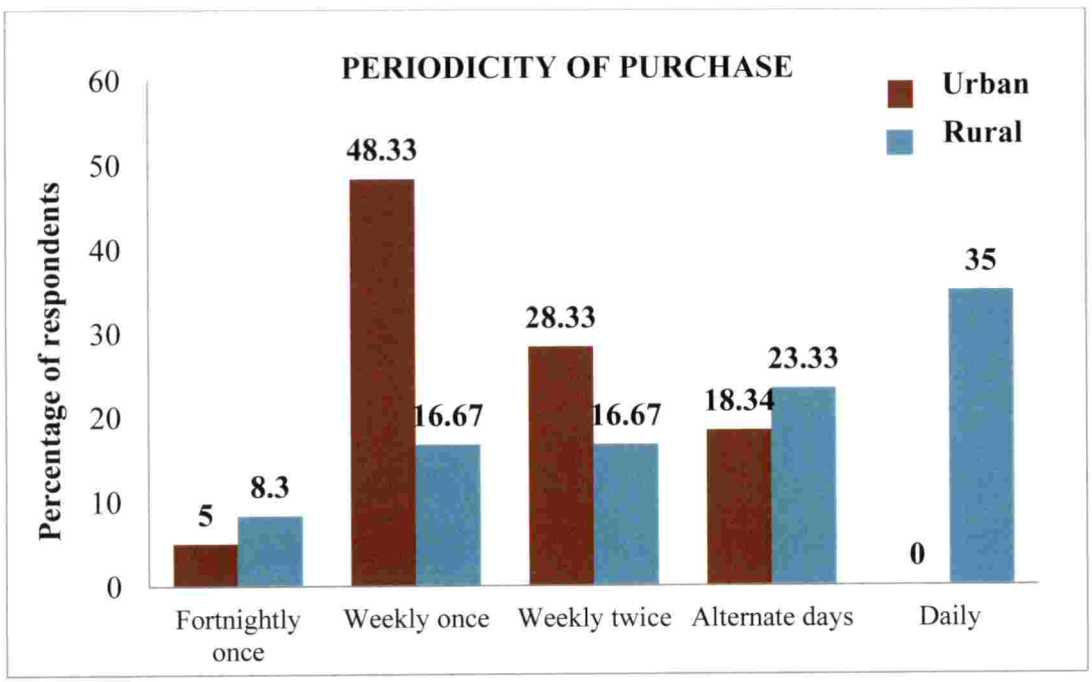

Fig 10. Distribution of respondents based on periodicity of purchase

attributed to their concern of perishability, comparatively low income level, and less busy life in consideration with urban people.

The percentage of respondents who purchased monthly once was vey low i.e five per cent in urban area and almost eight per cent in rural area. These were respondents who were consuming vegetables grown in their own farm or homesteads and so they rarely purchases vegetables except fortnightly purchase of vegetables like onion, potato, which can't be grown in the Kerala weather conditions. These results were in accordance with the findings of Chikkamath *et al.* (2012) and in contradiction with observations of Khan and Sharma (2015).

4.5.8. Source of vegetables

The distribution of respondents of selected rural and urban area based on their source of obtaining vegetables are presented in the Table below.

Table 9. Distribution of respondents based on source of vegetables

Category	Urban						Rural						Total					
	R		O		N		R		O		N		R		O		N	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Own farm	5	8.33	29	48.37	26	43.33	8	13.33	39	65.00	13	21.67	13	10.83	68	56.67	39	32.50
Neighbourhood farm	0	0	6	12	54	90.00	0	0	22	36.67	38	63.33	0	0	28	23.33	92	76.67
Wholesale	19	31.67	7	11.67	34	56.67	6	10.00	4	6.67	50	83.33	25	20.83	11	9.17	84	70.00
Retail	36	60	13	21.67	11	18.33	47	78.33	7	11.67	6	10.00	83	69.17	20	16.67	17	14.16

R- Regular, O- Occasional, N- Never

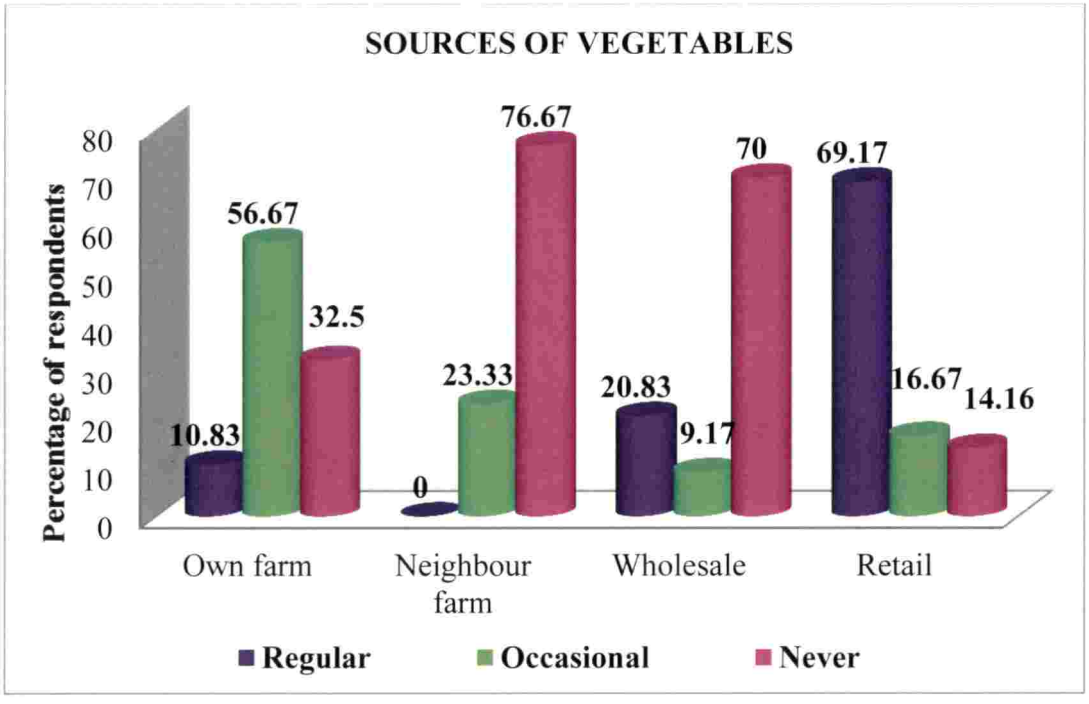

Fig 11. Distribution of respondents based on source of vegetables

The residing locality wise distribution of total respondent illustrated in Table- 9 showed that majority of respondents (69.17%) regularly purchased from retail outlets, 56.67 per cent occasionally consume vegetables grown in their own farm and 76.67 per cent of them never obtained vegetables from neighbourhood farm. The reason for large proportion of respondents relying on retail market was its close proximity in both urban and rural area, choice for quantity of vegetables, availability of competitive price, convenient shopping area. The inferences from the Table 9 was in conformity with Vijayan (2015) and Bulsara and Trivedi (2016).

The urban consumers followed the same trend but rural consumers showed a slight deviation. The majority of rural respondents (83.33%) had never relied on wholesale market for vegetables as against 31.67 per cent of regular and 11.67 per cent of occasional purchasers of urban area. This was primarily due to their relatively low socio economic status and lack of accessibility to wholesale market. Apart from these rural consumers required comparatively less quantity per purchase which was not practically possible in wholesale market. At the same time urban consumers considered wholesale market as a second option for regular purchase of vegetables after retail outlets because most of them preferred weekly purchase of vegetables in large quantity for which wholesale markets were best.

4.5.9. Nature of vegetables consumed

The distribution of respondents based on their nature of vegetables consumed in selected urban and rural area is presented in the Table 10.

Table 10. Distribution of respondents based on nature of vegetables consumed

Category	Urban n=60		Rural n=60		Total N=120	
	No.	%	No.	%	No.	%
Organic (2)	2	3.33	1	1.67	3	2.50
Both (1)	25	41.67	30	50.00	55	45.83

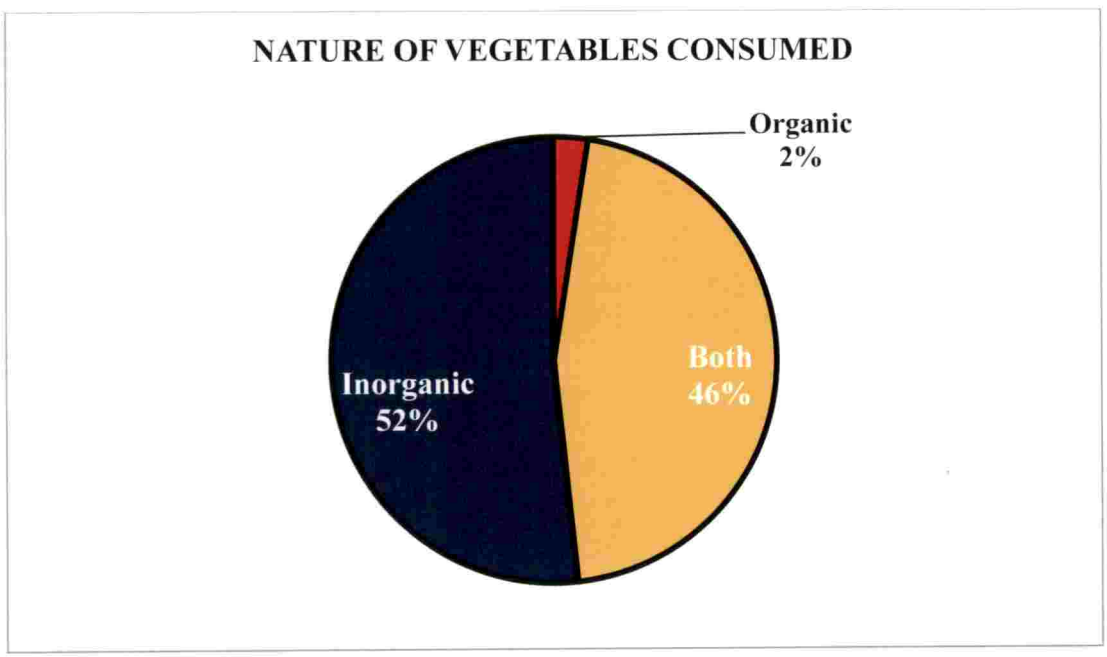

Fig 12. Distribution of respondents based on nature of vegetables consumed

Inorganic (0)	33	55.00	29	48.33	62	51.67

A detailed analysis of the results depicted in the Table-10 revealed that 51.67 per cent of total consumer respondents consumed inorganic vegetables, followed by 45.83 per cent consumed both organic and inorganic and only 2.50 per cent completely relied on organic vegetables.

Even with its increased health benefits, enriched nutrients, respondents were not in a position to consume organic vegetables. The main reasons identified as perceived by respondents were expensive nature of organic vegetables, lack of adequate number of organic outlets, irregular availability and less proximity to outlets. The respondents who belonged to second category 'both' were occasional consumers of organic vegetable and respondents in first category were regular consumers. Their motives for purchases varied widely. The regular consumers considered ethical motivation as a driving force for their purchase of organic vegetables, and at the same time it was health concerns for occasional consumers. These findings were in agreement with results of study done by Pino et al. (2012) and in contradiction with findings of Ward (2013).

4.5.10. Preferred vegetable category

The distribution of selected rural and urban respondents based on their preference for different kind of vegetable is illustrated in the Table- 11.

Table 11. Distribution of respondents based on preferred vegetable category

Category	Urban						Rural						Total					
	LP		P		MP		LP		P		MP		LP		P		MP	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Leafy vegetables	3	2.50	21	17.5	36	30.00	9	7.50	16	13.33	35	29.17	12	10.00	37	30.83	71	59.17
Solanaceae	0	0	24	20.00	36	30.00	0	0	22	18.33	38	31.67	0	0	46	38.33	74	61.67
Cucurbitaceae	8	6.67	37	30.83	15	12.50	6	5.00	22	18.33	32	26.67	14	11.67	59	49.17	69	57.50
Brassicaceae	2	1.67	22	18.33	36	30.00	45	37.50	13	10.83	2	1.67	47	39.17	35	29.16	38	31.67
Umbeliferae and Chenopodiaceae	4	3.33	29	24.16	27	22.50	14	11.67	31	25.83	15	12.50	18	15.00	60	50	42	35
Malvaceae	28	23.33	26	21.67	6	5.00	33	27.50	18	15	9	7.5	61	50.83	44	36.67	15	12.50
Moringaceae	19	31.67	24	40.00	17	28.33	14	23.33	21	35.00	25	41.67	33	27.50	45	37.50	42	35.00
Leguminaceae	15	12.50	36	30.00	9	7.5	5	4.17	35	29.17	20	16.67	20	16.67	71	59.17	29	24.16
Euphorbiaceae and araceae	23	38.33	20	33.33	17	28.34	15	25.00	28	46.66	17	28.34	38	31.67	48	40.00	34	28.33
Alliaceae	14	11.67	34	28.33	12	10.00	36	36.00	17	14.17	7	5.83	50	41.67	51	42.50	19	15.83

LP- Less preferred, P- Preferred, MP- More preferred

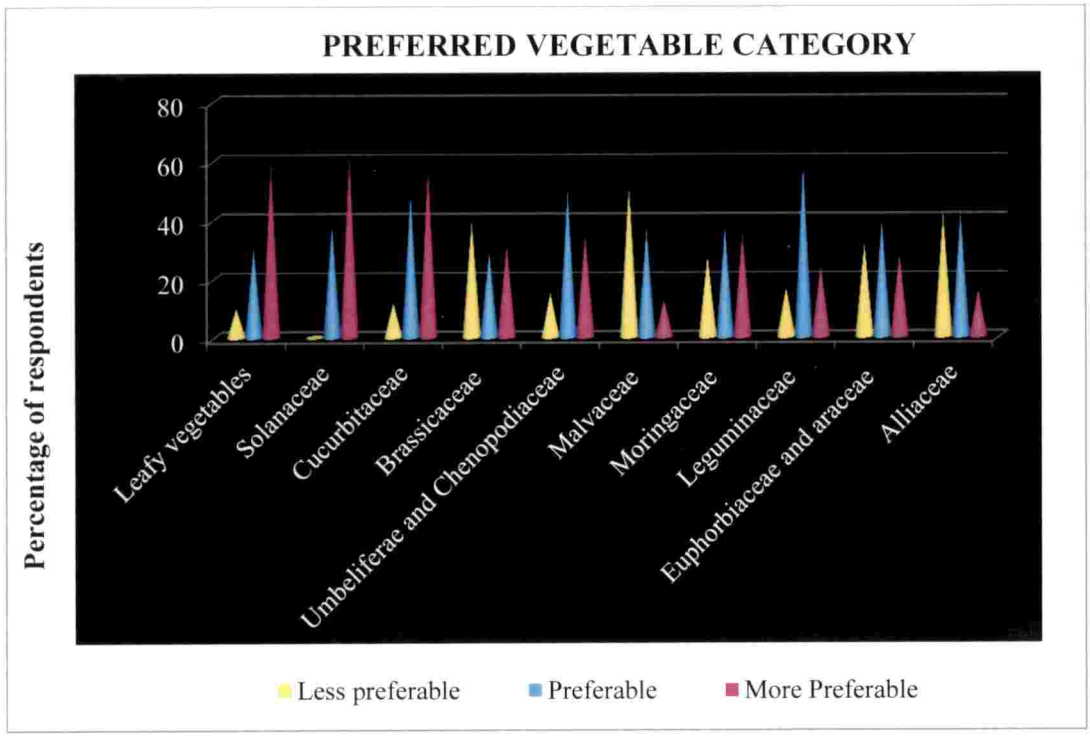

Fig 13. Distribution of respondents based on preferred vegetable category

It was evident from the Table -11 that the more preferred vegetable by respondents (61.67%) were included in the solanaceous family. The solanaceous vegetables like tomato, potato, brinjal were the regular vegetables consumed by all Indian consumers irrespective of their residing locality, socio-economic status or cultural values because of its year round availability, reasonable price, and taste. More than half (59.17%) of respondents showed medium preference for leguminaceous vegetable like pulses due to its protein supplementing nature but at the same time moderate taste which were not liked by everyone made it their second choice. Most of respondents (50.83%) agreed that they had less or no preference for malvaceous vegetables mainly ladys finger. The reason identified as perceived by them were its slimy nature after cooking.

A difference was observed for vegetable preference between urban and rural consumers. The rural consumers were having more preference for vegetables belonging to families like solanaceae, moringaceae, cucurbitaceae, euphorbiaceae and leafy vegetables as they were easily available in rural area and least preference for brassicaceae due to its relatively high price and scanty availability. The urban consumers exhibited high preference for leafy vegetables because of their health concern and least preference for euphorbiaceous vegetables due to its acridity and seasonal availability. The alliacea family vegetables mainly onion was relatively less preferred both in urban and rural area is due to its high price. The inclusion of Brahmins in the sample size who were restricted by their community to consume onions also contribute to this result. These results were in accordance with the findings of Liu *et al.* (2014).

4.5.11. Average household monthly expenditure on vegetables

The distribution of respondents from selected urban and rural sample population based on their average household monthly expenditure on vegetables is presented in the Table 12.

Table 12. Distribution of respondents based on average household monthly expenditure onvegetables

Expenditure (Rs.)	Urban n=60		Rural n=60		Total N=120	
	No.	%	No.	%	No.	%
Low (<550)	4	6.67	9	15.00	13	10.83
Medium (550-1400)	42	70.00	48	80.00	90	75.00
High (>1400)	14	23.33	3	5.00	17	14.17
Mean=980, SD=413 Data range=150-2300						

A critical analysis of the Table 12 revealed that majority (75%) of total respondents fall under medium expenditure category in the purchase of vegetables, 14.17 per cent of respondents had allotted relatively large amount of money towards vegetable consumption and 10.83 per cent of respondents incurred only low expenditure as perceived in the study for vegetable purchase.

The same trend was observed in urban consumers but rural consumers displayed a slight deviation from this trend. The proportion of low expenditure group was more in rural area when compared to urban area because of the dominance of low income families in rural sample taken for the study. The low income limits their choices and quantity for vegetables to be purchased and force them to allocate money towards fulfillment of basic amenities. Inspite of dominance of high income families in urban area, the expenditure on vegetables had fallen under medium category. A survey conducted by National Sample Survey Organisation had found that urban consumers spent 47 per cent of consumption expenditure on food items and out of which vegetables and fruits only contributed 16 per cent. These finding were in in contradiction with conclusions of Rajalakshmi (2008).

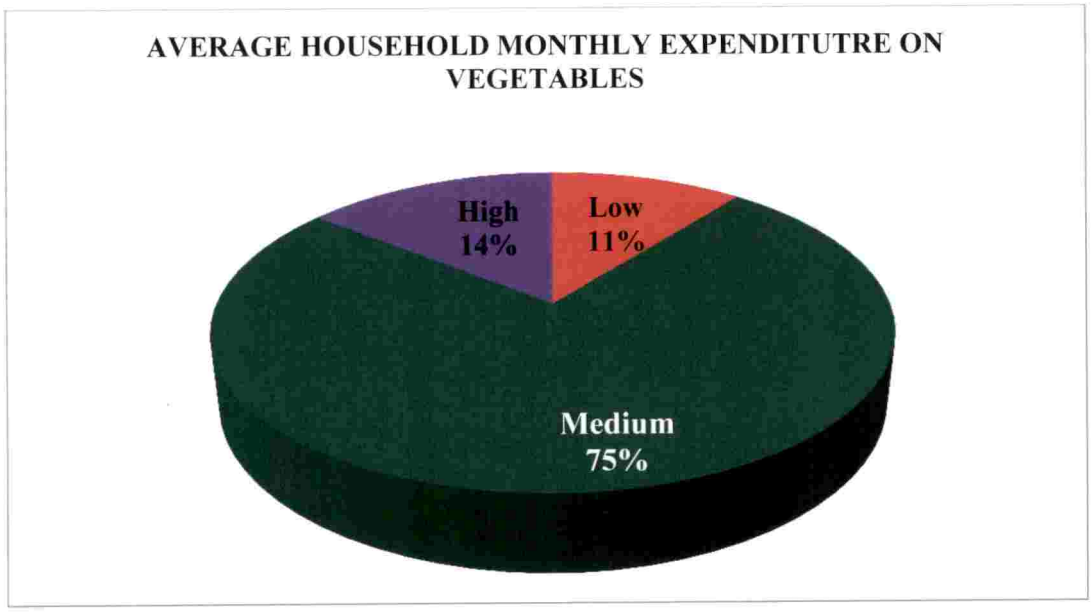

Fig 14. Distribution of respondents based on average monthly expenditure on vegetables

4.5.12. Proximity to outlet

The distribution of respondents of rural and urban localities based on the nearness of outlets of vegetables from their house are depicted in the Table below.

Table 13. Distribution of respondents based on proximity to outlet

Distance (km)	Urban n=60		Rural n=60		Total N=120	
	No.	%	No.	%	No.	%
Less (>3)	6	10.00	7	11.67	13	10.83
Moderate (1-3)	31	51.67	38	63.33	69	57.50
More (<1)	23	38.33	15	25.00	38	31.67
Mean=2, SD=1						

The residing area wise distribution of respondents based on nearness of their house and vegetable outlet showed that most (57.50%) of the total respondent's house was at moderate distance of one to three kilometres, followed by 31.67 per cent respondent's home was having more proximity (<1km) to outlets and 10.83 per cent respondent's house were having less proximity (>3km) to outlets.

The same trend was observed in urban and rural population under study. This was primarily due to fact that all consumer preferred outlets or farm nearby their residing place or work place for purchase of vegetables irrespective of its retail format because of accessibility, convenience in shopping, perishability of vegetables and trustworthiness of produce. These results and inferences were in conformity with the findings of Mittal and Prashar (2010).

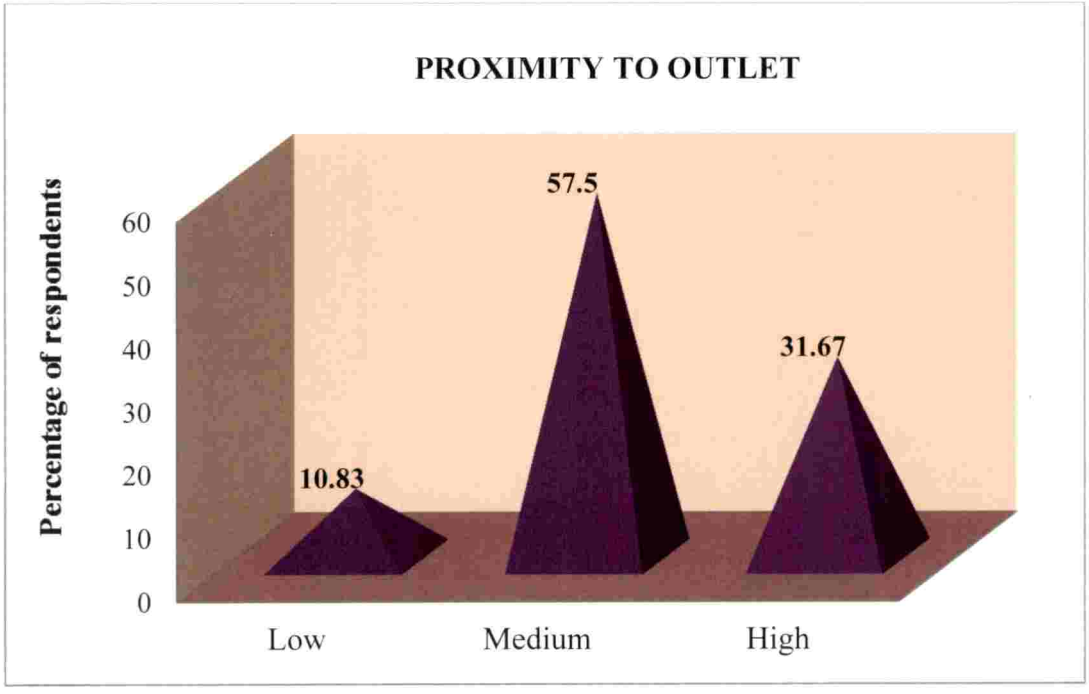

Fig 15. Distribution of respondents based on proximity to outlet

4.5.13. Quantity of vegetables purchased per month

The distribution of respondents of urban and rural area with respect to quantity of vegetables purchased by them is presented in Table-14.

Table 14. Distribution of respondents based on quantity of vegetables purchased per month

Quantity (kg)	Urban n=60		Rural n=60		Total N=120	
	No.	%	No.	%	No.	%
Low (<10)	5	8.33	23	38.34	28	23.33
Medium (10-28)	36	60.00	32	53.33	68	56.67
High (>28)	19	31.67	5	8.33	24	20.00
Mean=19, SD=9						

A detailed analysis of the Table 14 revealed that majority of respondents purchased ten kg to twenty eight kg of vegetables for a month who were categorized as medium quantity purchasers, followed by 23.33 per cent of respondents who belonged to low quantity purchasing group who purchased less than 10 kg for one month and 20 per cent of respondents purchased more than 28 kg for a month. Almost similar proportion of respondents were found under low and high category. This was attributed to the involvement of rural population in the sample.

Most of the rural respondents were not in a position to incorporate adequate quantity of vegetables in their diet due to its expensive nature compared to other food items. As a result the relative proportion of rural consumer were more (38.84%) in low quantity category as compared to 8.33 per cent of urban consumer in same category. These results were in agreement with results of Srinivasan (2006).

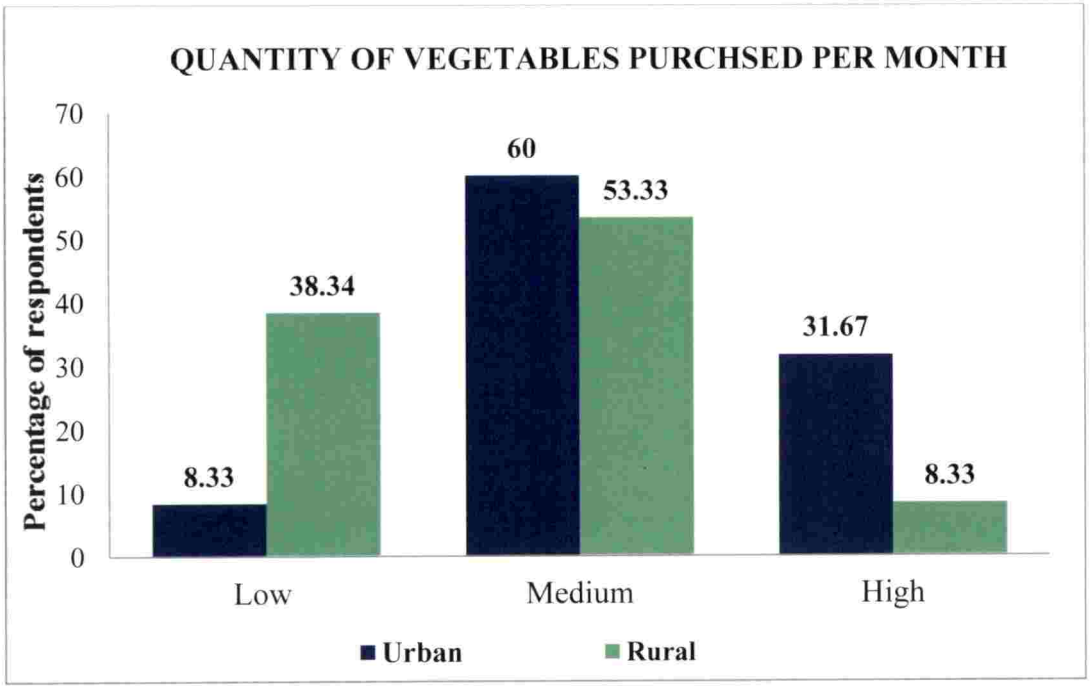

Fig 16. Distribution of respondents based on quantity of vegetables purchased per month

4.2. CONSUMER BEHAVIOUR OF RURAL AND URBAN FAMILIES ON VEGETABLES

Consumer behaviour is operationally defined as the sum total of consumer's attitude, preferences, intentions, and decisions in market place when purchasing vegetables. It consist of 4 components *viz.,* consumer attitude, consumer preference, consumer decision making and consumer intentions. Each component was analysed using different scales, all of them having 8 statements and was measured on a five point continuum as strongly agree, agree, undecided, disagree and strongly disagree with scores 0,1,2,3,4 respectively. The consumer behaviour was assessed by summing up of total scores of all the four components. The distribution of respondents based on four components and consumer behaviour are described under following heads

4.2.1. Consumer attitude

The distribution of total respondents based on their consumer attitude towards vegetable is presented in Table 15.

Table 15. Distribution of respondents based on consumer attitude

Category	Urban n=60		Rural n=60		Total N=120	
	No.	%	No.	%	No.	%
Less favourable (<21)	0	0	8	13.33	8	6.67
Moderately favourable (21-27)	48	80.00	49	81.67	97	80.83
Highly favourable (>27)	12	20.00	3	5.00	15	12.50
Mean=24, SD=3 Expected score range= 0-32 Data score range=18-29						

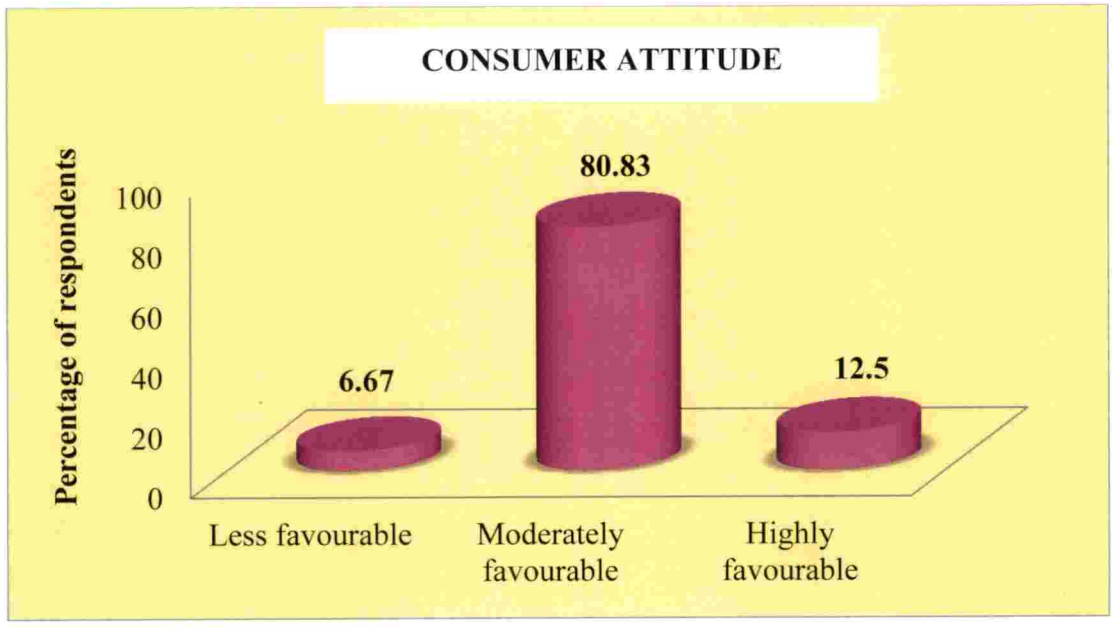

Fig 17. Distribution of respondents based on consumer attitude

It was evident from the Table 15 that 80.83 per cent of respondents possessed moderately favourable attitude towards vegetables, followed by 12.5 per cent of respondents showed highly favourable attitude and 6.67 per cent showed less favourable attitude regarding vegetable consumption. This was mainly because, most of the respondents agreed upon on the nutritional status, taste, dietary fibre supplementation, and easy availability of vegetables but perishability and price was a limiting factor which restricted them to have highly favourable attitude towards vegetables.

This effect of price factor had increased the proportion of rural population in the less favourable attitude category, where urban consumers were not found. The rural consumers were having a negative attitude towards sealed vegetables as they believed that they are not fresh, natural would cause health problems.

Majority of the respondents revealed appealing nature and freshness of produce also inculcated a positive attitude towards vegetables. They also revealed that positive attitude regarding vegetables has decreased decision making period in vegetable purchase. These results were in line with findings of Amarnath and Vijayudu (2011).

4.2.2. Consumer Preference

The distribution of respondents based on their preferences for different vegetable characters is depicted in Table-16.

Table 16. Distribution of respondents based on consumer preference

Category	Urban n=60		Rural n=60		Total N=120	
	No.	%	No.	%	No.	%
Low (<20)	20	33.33	6	10.00	26	21.66
Medium(20-24)	39	65.00	39	65.00	78	65.00

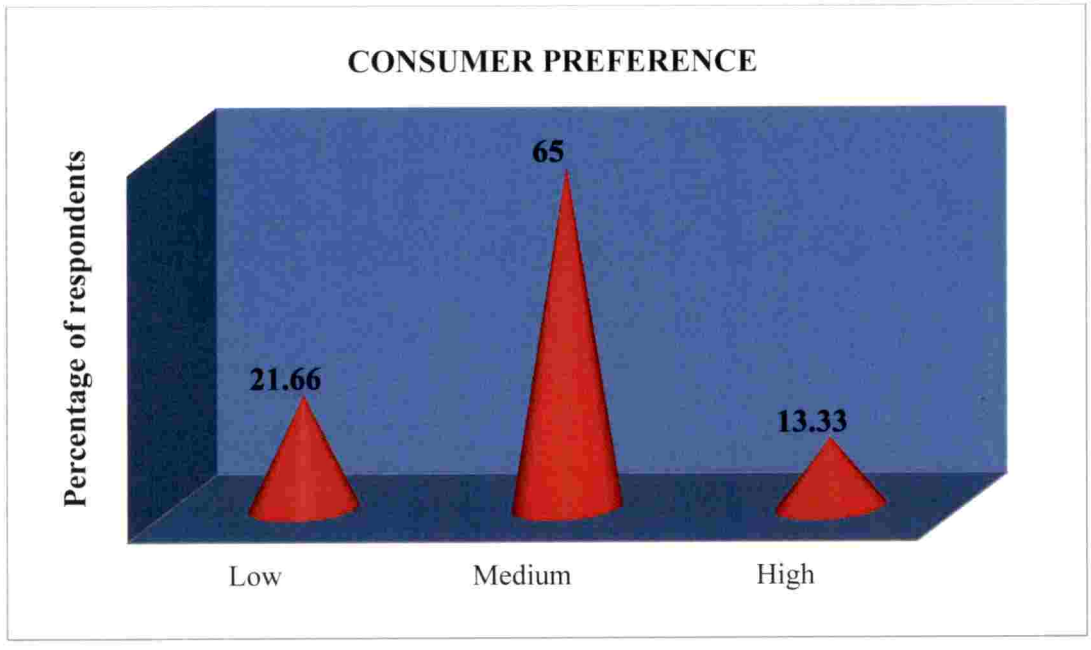

Fig 18. Distribution of respondents based on consumer preference

High(>24)	1	1.67	15	25.00	16	13.33
Mean=22, SD=2 Expected score range=0-32 Data score range=16-28						

A detailed analysis of Table 16 showed that majority (65%) were having medium preferences of vegetable attributes in purchase and consumption of vegetables, followed by 21.66 per cent of respondents displayed low preferences and 13.33 per cent of them displayed high preferences for vegetable attributes.

This reasons for most of respondents in medium category was that it was less practical for consumers to demand on vegetable attributes like freshness, low pesticide residue, shelf life which compelled them to remain in 'medium' category and 'low' category rather than in 'high' category.

The distribution of urban consumers followed the same pattern but rural consumers slightly deviated. This was due to their consideration of large number of factors including accessibility, better value for money, eco-friendliness, lower residue etc with regard to vegetable consumption. These inferences were further confirmed by chi square analysis. These findings were in conformity with results of Ragaert *et al.* (2004).

The results of chi-square analysis of consumer preference of urban an rural samples are illustrated in Table-17.

Table 17. Chi-square analysis of consumer preferences for vegetable attributes of urban consumers and rural consumers

Category	**Urban n=60**	**Rural n=60**
	No.	**No.**
Low	20	6
Medium and High	40	54

Chi- square (observed value)	9.62
Chi- square (critical value)	3.58
Alpha (level of significance)	0.05

The respondent who were in medium and high category was clubbed into one group and respondents in low category was clubbed into another group for easy conduct of chi square analysis. The test results in Table 17 confirmed that since the observed value was greater than the critical value at a significance level alpha =0.05 there existed a difference between consumer preference of vegetables for urban and rural consumers.

4.2.3. Consumer decision making

The distribution of urban and rural respondents based on their decision making in vegetable purchase is presented Table 18.

Table 18. Distribution of respondents based on decision making

Category	Urban n=60		Rural n=60		Total N=120	
	No.	%	No.	%	No.	%
Less favourable (<15)	13	21.67	5	8.34	18	15.00
Moderately favourable (15-23)	45	75.00	38	63.33	83	69.17
Highly favourable (>23)	2	3.33	17	28.33	19	15.83
Mean=19, SD=4 Expected score range=0-32 Data score range=9-28						

A perusal of data illustrated in Table- 18 indicated that most (69.17%) of the respondents displayed moderately favourable decision making capacity in

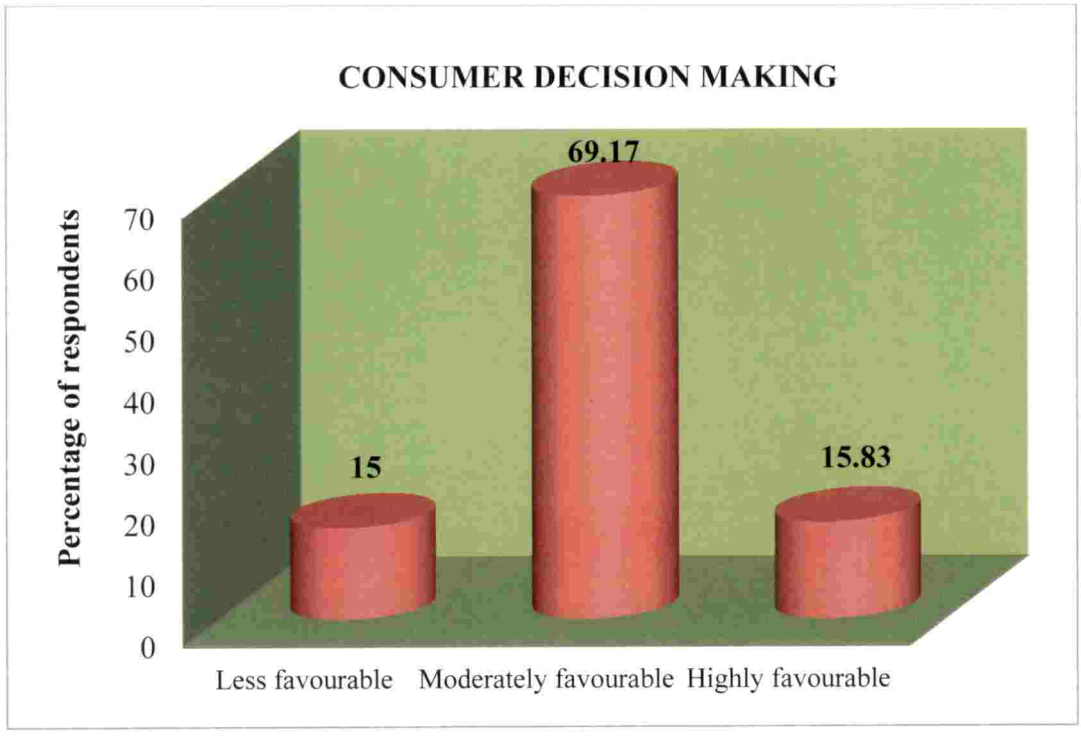

Fig 19. Distribution of respondents based on decision making

purchase of vegetables. It was surprisingly observed that proportion of respondents who possessed less favourable (15%) and highly favourable (15.83%) decision making ability was almost same. This was attributed to routine nature of vegetable purchase to meet the nutritional requirement and decisions were taken mostly in store prior to purchase. Hence majority of respondents would go for purchase despite of not having highly favourable decision making ability.

The distribution of urban population showed similar trend. The percentage of rural respondents who possessed highly favourable decision making were comparatively more (28.33%) . This was due to fact that, consumer decision were mainly based on cognitive aspects like best price and emotional aspects such as product which is liked best by them. The low purchasing power of rural consumers, had made them more price conscious which was the prime reason behind their rational and collective decision making. These results were in agreement with the results of Patil (2017) and Chikkamath *et al.* (2012).

This difference in decision making ability between urban and rural consumers with respect to vegetable purchase were further statistically proved by performing a chi-square analysis as shown in Table-19.

Table 19. Chi-square analysis for consumer decision making of urban consumers and rural consumers

Category	**Urban n=60**	**Rural n=60**
	No.	**No.**
Less favourable	13	5
Moderately favourable and Highly favourable	47	55
Chi-square (observed value)	4.18	
Chi-square (critical value)	3.58	
Alpha (level of significance)	0.05	

(64)

The moderately and highly favourable decision makers was made into one group and less favourable decision makers into another group for the ease of conducting chi square analysis. In the Table 19, as observed value was greater than the critical value at a significance level alpha=0.05, there existed a dependence between consumer's decision making of vegetables and the attributes of their respective residing locality.

4.2.4. Intentions to buy from an outlet

The distribution of respondents based on their store choice behaviour or intention to buy from an outlet is depicted in Table -20.

Table 20. Distribution of respondents based on intentions to buy from an outlet

Category	Urban n=60		Rural n=60		Total N=120	
	No.	%	No.	%	No.	%
Low (<18)	11	18.33	3	5.00	14	11.67
Medium (18-24)	43	71.66	50	83.33	93	77.50
High (>24)	6	10.00	7	11.67	13	10.83
Mean=21, SD=3 Expected score range=0-32 Data score range=9-31						

A critical analysis of distribution of respondents based on store choice behaviour in the Table 20 had showed that 77.50 per cent of total respondents belonged to medium category, followed by 11.67 per cent in low category and 10.83 in high category of consumer intention as perceived in the study.

The rural and urban consumers followed more or less same distribution pattern. Majority of the urban and rural respondents agreed to the fact that their

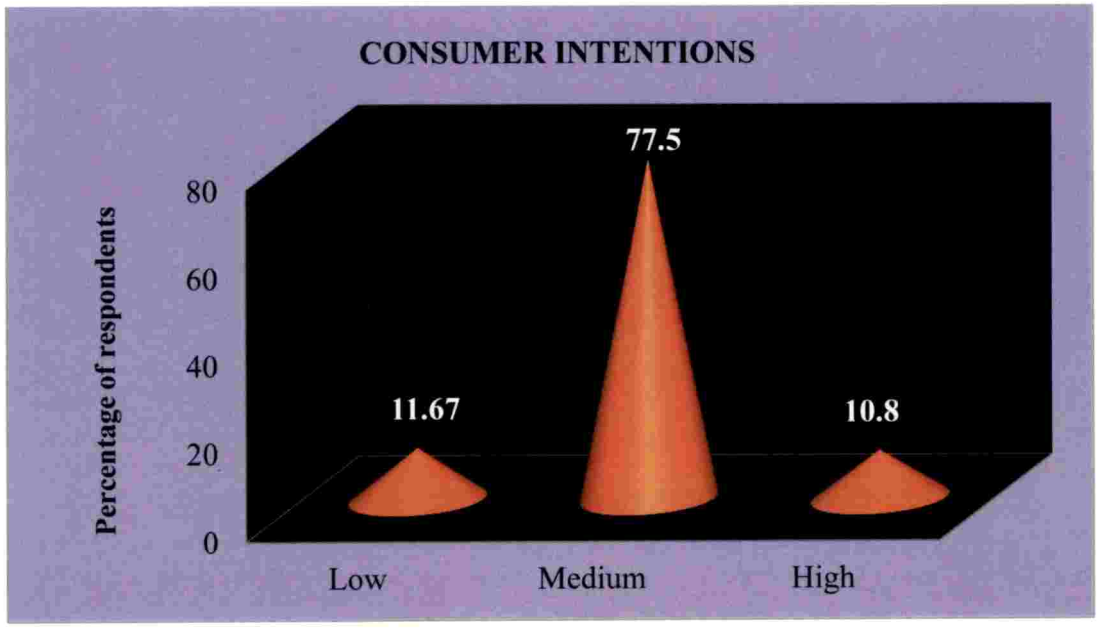

Fig 20. Distribution of respondents based on intentions to buy from an outlet

store selection for vegetable purchase was mainly based on proximity and acquaintance with shopkeeper.

It was interestingly found that consumer intention varied among young and old aged consumers. The proximity was major concern of old aged people but shopping was a recreational activity for youth and they preferred shops which offered more ambience and entertainment. These results were in accordance with the findings of Sinha *et al.* (2002).

These results were further confirmed by conducting a chi square analysis as shown in Table -21.

Table 21. Chi-square analysis for consumer intention of urban consumers and rural consumers

Category	**Urban n=60**	**Rural n=60**
	No.	**No.**
Low	54	53
Medium and High	6	7
Chi-square (observed value)	0.01	
Chi-square (critical value)	3.58	
Alpha (level of significance)	0.05	

The respondents with medium and high intention to purchase were grouped to one category and respondents with low intention were grouped to another category for the ease of performing chi square test. It was proved from Table 21 that there was no significant difference between urban and rural consumer's store choice behaviour.

The consumer behaviour of individual consumer was computed by summing up the scores obtained for all the four components *viz.*, consumer attitude,

consumer preference, consumer decision making and consumer intentions. Later the consumers were categorized based on mean and standard deviation of their total scores into 3 groups as shown in Table-22.

Table 22. Distribution of respondents based on consumer behaviour

Category	Urban n=60		Rural n=60		Total N=120	
	No.	%	No.	%	No.	%
Less favourable (<77)	11	18.33	4	6.67	15	12.50
Moderately favourable (77-95)	46	76.67	47	78.33	93	77.50
Highly favourable (>95)	3	5.00	9	15.00	12	10.00
Mean=86, SD=9 Expected score range=0-128 Data score range=61-109						

A detailed analysis of Table-22 revealed that most of the respondents (77.50%) exhibited moderately favourable consumer behaviour towards vegetables, 12.50 per cent of respondents displayed less favourable and 10 per cent of respondents displayed highly favourable consumer behaviour with regard to vegetable purchase and consumption. This is a reflection of the increased health concerns, purchasing power, educational qualifications and occupation status of urban and rural consumers.

The same trend was seen in distribution of urban consumers. The rural consumers exhibited relatively highly favourable consumer behaviour than urban consumers in vegetable consumption. This was attributed to their relative dominance over urban consumers in consumer preferences for vegetable attributes and decision making ability which were included as components of consumer

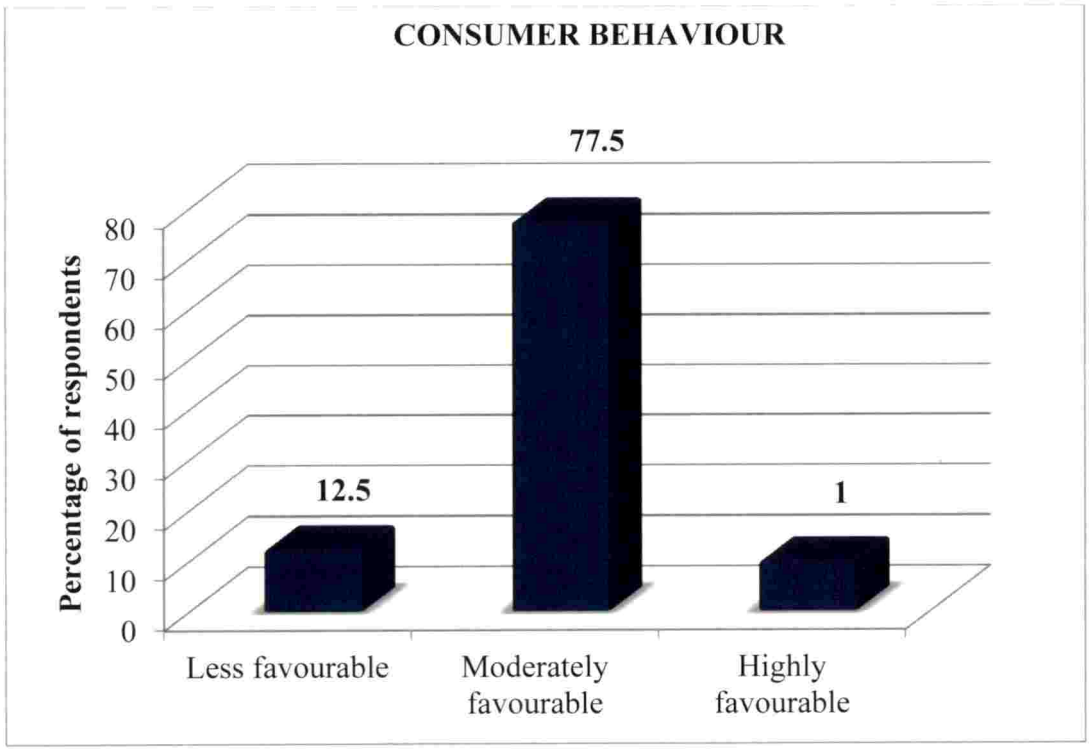

Fig 21. Distribution of respondents based on consumer behaviour

behaviour. The results and inferences were in line with the findings of Sabeson (1991).

The consumer behaviour was further studied through comparative analysis of consumer behaviour of different combinations of consumers. The student's t-test was administered for this purpose. The results for different combinations and their respective inferences are presented under the following heads

4.2.5. Comparative analysis of consumer behaviour among rural and urban consumers

The results of student's t-test for comparing consumer behaviour of rural and urban consumer is given in Table-23.

Table 23. Comparison of consumer behaviour between rural and urban consumers

Category	Urban(60)	Rural(60)
Mean	84.63	87.88
Variance	74.47	70.48
t-test (observed value)	2.09	
t- test (critical value)	1.98	
Alpha (level of significance)	0.05	

It was inferred from the Table-23 that there existed a significant difference between the consumer behaviour of urban and rural consumers and mean values of two samples proved that rural consumers had shown relatively more consumer behaviour towards vegetables. The typical rural consumer characteristics including low per capita income, education level, low purchasing power and culture bound nature had forced them for demanding better value for money spent

on produce. This had improved their consumer decision making ability during purchase of vegetables which in turn resulted in better consumer behaviour.

4.2.6. Comparative analysis of consumer behaviour among rural mixed and urban mixed (excluding Vegetarians) consumers

The results of student's t-test performed for comparing consumer behaviour of urban mixed and rural mixed consumers are illustrated in Table-24.

Table 24. Comparison of consumer behaviour between rural mixed and urban mixed (excluding vegetarians) consumers

Category	Urban mixed(48)	Rural mixed(48)
Mean	87.79	86.35
Variance	33.98	53.60
t-test (observed value)	1.06	
t- test (critical value)	1.99	
Alpha (level of significance)	0.05	

It was found from the Table -24 that there was no significant difference between the urban mixed and rural mixed category of consumers because vegetable consumption habits were more or less similar for mixed category of consumers of rural and urban areas. The overall slight difference in consumer behaviour of rural urban was attributed to differences in consumer behaviour towards vegetables shown by vegetarian population of urban and rural localities.

4.2.7. Comparative analysis of consumer behaviour between rural mixed and rural vegetarian consumers

The results of student's t-test for comparing consumer behaviour of rural mixed and rural vegetarian consumers are presented in Table- 25.

Table 25. Comparison of consumer behaviour between rural mixed and rural vegetarian consumers

Category	Rural mixed(48)	Rural vegetarian(12)
Mean	86.35	94.00
Variance	53.59	98.00
t-test (observed value)	3.01	
t- test (critical value)	2.00	
Alpha (level of significance)	0.05	

It was evident from the Table-25 that there was significant difference between consumer behaviour of rural mixed and rural vegetarian population samples. The mean values of both samples inferred that rural vegetarian exhibited superior consumer behaviour than rural mixed because vegetable consumption was high in vegetarians as vegetables were their main source for acquiring nutrients whereas mixed category of consumers tend to have many alternatives like egg, meat, fish etc.

4.2.8. Comparative analysis of consumer behaviour between urban mixed and urban vegetarian consumers

The results of student's t-test for comparison of consumer behaviour of urban mixed and urban vegetarian consumers are presented in Table-26.

Table 26. Comparison of consumer behaviour between urban mixed and urban vegetarian consumers

Category	Urban mixed(48)	Urban vegetarian(12)
Mean	72.00	87.79
Variance	36.54	33.98
t-test (observed value)	8.33	
t- test (critical value)	2.00	
Alpha (level of significance)	0.05	

A detailed analysis of Table 26, showed that there existed a significant difference between consumer behaviour of urban mixed and urban vegetarian consumers. From the mean values of both samples, it can be concluded that urban vegetarians displayed better consumer behaviour than urban mixed category because vegetarians relied mainly on vegetables for meeting nutrient requirements.

4.2.9. Comparative analysis of consumer behaviour between urban vegetarian and rural vegetarian consumers

The results of student's t-test for comparison of consumer behaviour of urban vegetarian and rural vegetarian consumers are displayed in Table-27.

Table 27. Comparison of consumer behaviour between urban vegetarian and rural vegetarian consumers

Category	Urban vegetarian (12)	Rural vegetarian (12)
Mean	72.00	94.00

(710)

Variance	36.54	98.00
t-test (observed value)	6.57	
t- test (critical value)	2.07	
Alpha (level of significance)	0.05	

A critical analysis of Table-27 proved that the consumer behaviour of urban vegetarian and rural vegetarian differed significantly. The mean values indicated that rural vegetarian showed better consumer behaviour than urban vegetarians. The vegetarians in rural sample occasionally consumed vegetables produced in their own homesteads apart from purchasing them but urban vegetarians completely depended on retail or wholesale outlets which could be the reason for observed result.

4.2.10. Comparative analysis of consumer behaviour of mixed population of the two selected rural panchayats

The results of student's t-test for comparing consumer behaviour of mixed population of 2 rural panchayats is depicted in Table-28.

Table 28. Comparison of consumer behaviour of mixed population of the two selected rural panchayats

Category	**Balussery (24)**	**Ulliyeri (24)**
Mean	88.79	83.91
Variance	30.35	66.77
t-test (observed value)	2.42	
t- test (critical value)	2.02	
Alpha (level of significance)	0.05	

It was found from Table-28 that there was significant difference between the consumer behaviour of respondents in selected rural panchayats who belonged to mixed category. The mean values of two tested populations confirmed that respondents in Balussery panchayat exhibited relatively better consumer behaviour as compared to Ulliyeri panchayat. Most respondents of Balussery panchayat revealed that they regularly purchased vegetables from retail outlets and occasionally consumed vegetables bought from wholesale outlet , neighbourhood farm or produced in their own houses. But retail outlets were the only source of vegetables for most of respondents of Ulliyeri panchayat and hence the result.

4.2.11. Comparative analysis of consumer behaviour of mixed population in two selected urban wards

The results of student's t-test for comparison of consumer behaviour of 2 urban ward of mixed population is illustrated in Table-29.

Table 29. Comparison of consumer behaviour of mixed population in two selected urban wards

Category	Ward 8 (24)	Ward 11 (24)
Mean	88.87	86.71
Variance	26.81	40.21
t-test observed value	1.30	
t- test critical value	1.68	
Alpha (Level of significance)	0.05	

A detailed analysis of Table-29 revealed that consumer behaviour of mixed population of the two urban wards showed no significant difference. Majority of

respondents in urban area in both wards showed similar preferences of vegetables and retail outlets were their main source for obtaining vegetables.

4.2.12. Comparative analysis of consumer behaviour between male and female

The results of student's t-test for comparing the consumer behaviour of male and female is depicted in Table-30

Table 30. Comparison of consumer behaviour between male and female

Category	Male (73)	Female (47)
Mean	84.56	88.38
Variance	60.03	839.4
t-test observed value	2.45	
t- test critical value	1.98	
Alpha (Level of significance)	0.05	

It was evident from the Table-30 that consumer behaviour of male and female differed significantly. The mean values shown in Table inferred that female displayed relatively better consumer behaviour than male. This was attributed to effective decision making ability of women in purchase of food items especially fruits and vegetables. They would spent lot of time in examination of quality of produce and purchased optimum quantity where majority of male failed.

4.2.13. Correlation analysis of dependent and independent variables

A simple correlation analysis was performed to identify the relation between dependent variable consumer behaviour and ten independent variables. The correlation coefficients are presented in the Table 31.

Table 31. Simple correlation analysis between consumer behaviour and independent variables

Independent variables	Correlation coefficient
Age	0.584**
Education level	0.488**
Family size	-0.023
Average household monthly income	-0.214*
Health consciousness	-0.020
Periodicity of purchase	-0.051
Nature of vegetables consumed	0.103
Average monthly expense on vegetables	-0.412**
Proximity to vegetable outlet from home	0.182*
Quantity of vegetables purchased per month	-0.098

**- Significance at 1 percent level *- Significance at 5 percent level

It was evident from the Table-31 that independent variables including age, education level, and proximity to outlet are positively correlated with consumer behaviour, of which age and education are showed a correlation at one per cent level significance and proximity showed correlation at five per cent level of significance. The independent variables, average household monthly income and average household monthly expense on vegetables were found to be negatively correlated with consumer behaviour at five per cent and one per cent level of significance respectively. Other five independent variables showed no significant correlation with dependent variable.

It was found from Table -31 that age of respondent is positively correlated with consumer behaviour at 1 per cent level of significance. Elderly people may shop more frequently than other age groups due to their less competing demands

on their time. Their decision making ability is also better than young and middle aged consumers in purchase of vegetables.

The education level had a positive correlation at 1 per cent level of significance with consumer behviour. The respondents with higher education level exhibited more favourable consumer behaviour in purchase of vegetable in rural and urban localities. As the education status of consumer increases, there would be an increase in their health consciousness and diet consciousness, which inturn increases the fruits and vegetable consumption in them.

The education is also a yard stick for gainful employment in establishment that would increases the income level of consumers and enable them to purchase more fruits and vegetables which are generally costly compared to other food items. These findings are in agreement with the results of Goksel *et al.* (2009) and contradiction with findings of Gabe (2009).

It is evident from Table-31 that proximity to vegetable outlet is positively correlated with consumer behaviour at 5 per cent level of significance. This implies that as the distance from home to vegetable outlet increases, the respondents would display more favourable consumer behaviour. This is the reflection of general trend of consumers. If the store proximity is more, consumers exhibit favourable decision making ability because they will have clear idea what to purchase, how much to purchase and when to purchase with minimum cost of transportation.

It is observed from Table-31 that average monthly expenditure on vegetables is negatively correlated with consumer behaviour at 1 per cent level of significance. This is the general trend in all societies. As expenditure increases, consumer limit their choices, and purchase some vegetables at low prices to meet their dietary needs.

It is found from Table-31 that average monthly household income of families are negatively correlated with consumer behaviour at 5 per cent level of

significance. In the case of lower and middle-income households even with the decrease in income, respondents showed cautious behaviour in purchase of food items so as to meet their nutritional requirement with limited money.

4.3. AWARENESS OF RURAL AND URBAN FAMILIES ABOUT ORGANIC VEGETABLES AND THEIR OUTLETS

The distribution of respondents based on their awareness pertaining to organic vegetables and its outlets is presented in Table-31

Table 32. Distribution of respondents based on awareness of about organic vegetables and their outlet

Category	**Urban n=60**		**Rural n=60**		**Total N=120**	
	No.	**%**	**No.**	**%**	**No.**	**%**
Low (<5)	4	6.67	5	8.33	9	7.50
Medium (5-11)	38	63.33	46	76.67	84	70.00
High (>11)	18	30.00	9	15.00	27	22.50
Mean=8, SD=3						

A perusal of results illustrated in Table- 31 revealed that majority (70%) of respondents were having medium awareness with regard to organic vegetables and its outlets, followed by 22.50 per cent with high awareness and 7.50 per cent with low awareness. A similar distribution was observed among urban and rural consumers. The relatively high awareness of urban respondents regarding organic vegetables was mainly attributed to increased use of mass and social media by them.

Despite of this high awareness level, consumption of organic vegetables as showed in Table-10 was found to be very low. This was mainly due to high price,

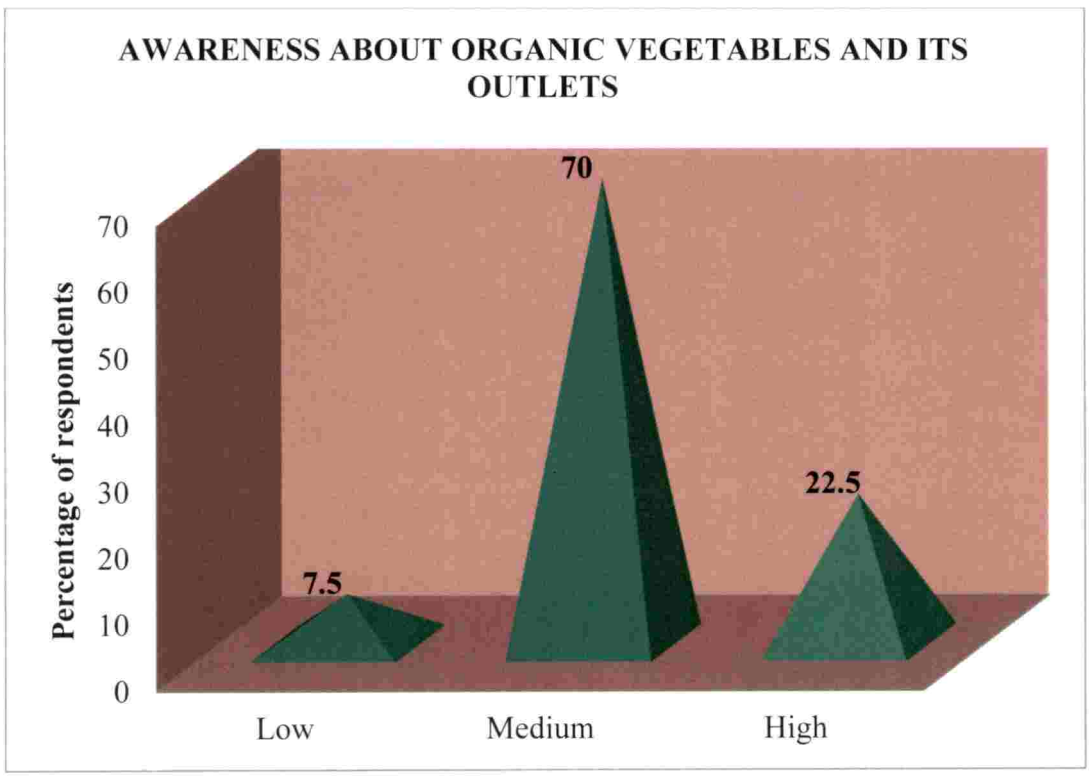

Fig 22. Distribution of respondents based on awareness of about organic vegetables and their outlet

irregular supply, absence of organic labels of organic vegetables. These findings were in conformity with the results of Chandrashekar (2014).

4.4. SOURCES OF AWARENESS OF ORGANIC VEGETABLES AND THEIR OUTLETS

The distribution of respondents based on different sources for obtaining awareness regarding organic vegetables and its outlets is displayed in Table-33.

Table 33. Distribution of respondents based on source of awareness of organic vegetables and their outlets

Category	Urban						Rural						Total					
	R		O		N		R		O		N		R		O		N	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Newspaper	15	25.00	41	68.33	4	6.67	23	38.33	32	53.33	5	8.34	38	31.67	73	60.83	9	7.50
Magazine	0	0	21	35.00	39	65.00	0	0	14	23.33	46	76.67	0	0	30	29.17	85	70.83
Television	31	51.67	29	48.33	0	0	35	58.33	25	41.67	0	0	66	55.00	54	45.00	0	0
Radio	0	0	17	28.33	43	71.67	22	36.67	16	26.67	22	36.67	22	18.33	33	27.50	65	54.17
Internet	0	0	43	71.67	17	28.33	0	0	26	43.33	34	56.67	0	0	69	57.50	51	42.50
Agricultural institutions	0	0	5	8.33	55	91.67	20	33.33	30	50.00	10	16.67	20	16.66	35	29.17	65	54.17
Friends and relatives	22	36.67	27	45.00	11	18.33	47	78.33	13	21.67	0	0	69	57.50	40	33.33	11	9.17

R- Regular, O- Occasional, N- Never

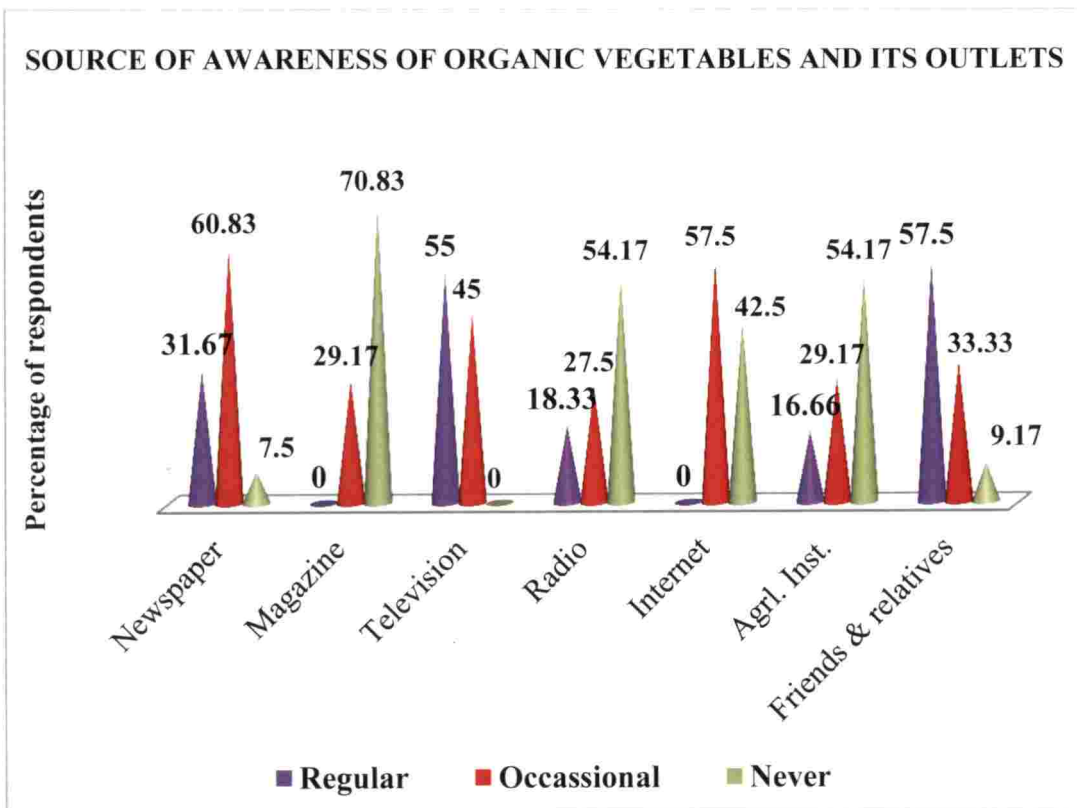

Fig 23. Distribution of respondents based on source of awareness of organic vegetables and their outlets

It was revealed from the Table-33 that most of the total respondents received awareness regarding organic vegetables and their outlets regularly (57.50%) from friends and relatives, occasionally (60.83%) from newspaper and never (70.83%) from magazines and agricultural institutions like Krishibhavan.

The urban consumers regularly received awareness from television and rural consumers regularly received from friends and relatives which is a regular reflection of nature of rural and urban society. It was interestingly observed that even with increased penetration of internet in rural and urban area, the proportion of respondents who received awareness from internet was very low in both case. These results were in contradiction with the findings of Vijayan (2015) and Russo and Simeon (2017).

4.5. KNOWLEDGE OF KAU RECOMMENDED PRACTICES TO REMOVE PESTICIDE RESIDUE

The distribution of respondents based on their knowledge of practices to remove pesticide residue in vegetables as per Kerala Agricultural University (KAU) recommendations is illustrated in Table -34.

Table 34. Distribution of respondents based on knowledge of KAU recommended practices to remove pesticide residue

Category	Urban n=60		Rural n=60		Total N=120	
	No.	%	No.	%	No.	%
Low (<1)	8	13.34	7	11.67	15	12.50
Medium (1-3)	50	83.33	51	85.00	101	84.17
High (>3)	2	3.33	2	3.33	4	3.33
Q1=1, Q3=2 Expected score range=0-8 Data score range=0-3						

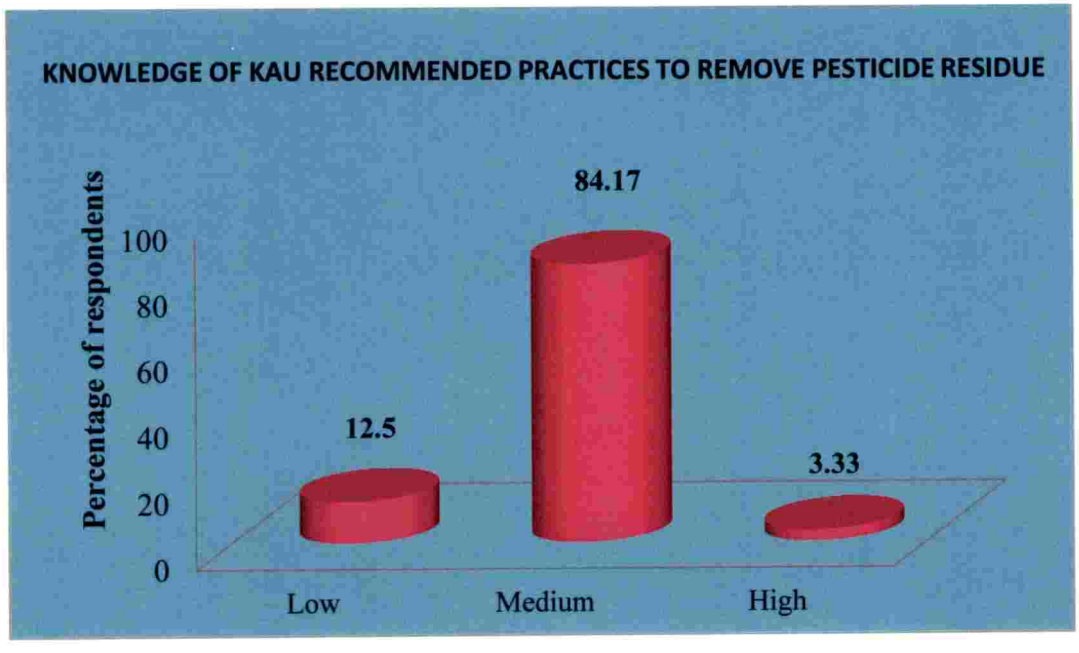

Fig 24. Distribution of respondents based on knowledge of KAU recommended practices to remove pesticide residue

A critical analysis of Table-34 revealed that 84.17 per cent of total respondents possessed medium level of knowledge, followed by 12.50 per cent with low level and 3.33 per cent with high level of knowledge with respect to removal of pesticide residue as recommended by KAU.

The rural and urban consumers displayed similar trend. The prime reason for this trend would be that these practices mainly consisted of age old cleansing operations which were already known to consumers but was only standardized by researchers in KAU for effective utilization. These conclusions were in line with report published by (Muringatheri, 2017).

4.6. ADOPTION OF KAU RECOMMENDED PRACTICES TO REMOVE PESTICIDE RESIDUE

The distribution of selected respondents based on the adoption of KAU recommended practices to remove pesticide residue in vegetables is presented in Table -35.

Table 35. Distribution of respondents based on their adoption of KAU recommended practices to remove pesticide residue

Category	Urban n=60		Rural n=60		Total N=120	
	No.	%	No.	%	No.	%
Low (<34)	23	38.33	22	36.67	45	37.50
Medium (34-48)	24	40.00	25	41.67	49	40.83
High (>48)	13	21.67	13	21.66	26	21.67
Mean=41, SD=7 Expected score range=4-12 Data score range=4-7						

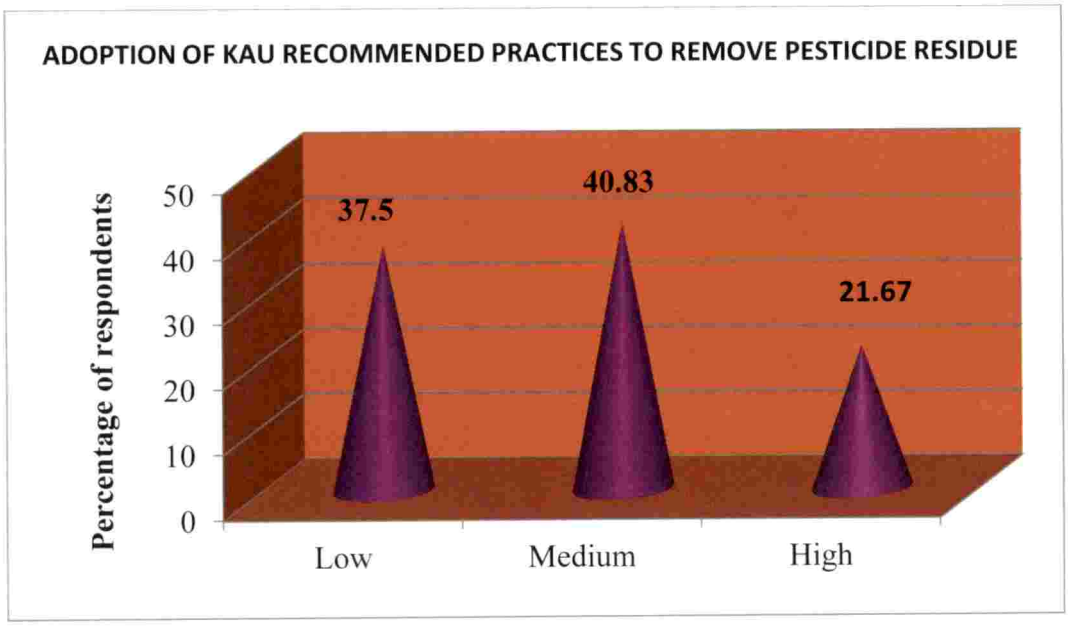

Fig 25. Distribution of respondents based on their adoption of KAU recommended practices to remove pesticide residue

It was evident from the Table-35 that 40.83 per cent of respondents belonged to medium adoption category, followed by 37.50 per cent belonged to low adoption category and 21.67 per cent were in high adoption category with regard to adoption of KAU recommended practices to remove pesticide residues in vegetables.

The distribution pattern exhibited by urban and rural consumers were almost same. But it was surprisingly found that despite of large proportion (84.17%) belonged to medium category of knowledge level, 40.83 per cent respondents only had adopted the practices. This could be because many of consumers were partially adopting the practices which resulted in lower adoption score. Hectic life, less health consciousness and negligence attitude might have contributed to this. These results were in agreement with the findings reported by (Nandakumar, 2014).

4.7. ADOPTION OF OTHER PRACTICES BY RESPONDENTS TO REMOVE PESTICIDE RESIDUE

The distribution of selected respondents based on other practices adopted by them to remove pesticide residue in vegetables is displayed in Table -36.

Table 36. Distribution of respondents based on their adoption of other practices to remove pesticide residue

Practices	Urban		Rural		Total	
	No.	%	No.	%	No.	%
Tap water washing	60	100	60	100	120	100
Dipping in 1% Nacl solution	15	25	19	31.67	34	28.33
Cooking	60	100	60	100	120	100

Blanching with potassium meta Bisulphate	0	0	0	0	0	0
Combination of tap water followed by Nacl solution(1%), and tamarind solution(2%) dipping	0	0	0	0	0	0
If any other, specify	0	0	0	0	0	0

A critical analysis of Table-36 found that all of the respondents practiced tap water washing and cooking as a measure of pesticide residue removal, followed by 28.33 per cent of respondents had practiced dipping in salt water solution, and none of the respondents had followed any practices apart from these and KAU recommended practices.

The cooking and tap water washing were very easy to practice and less time consuming but certain pesticides were not removed by these practices. There was no difference in the distribution pattern of urban and rural respondents with respect to other practices followed to remove pesticide residues from vegetables. These findings were in line with the results of Liu *et al.* (2014) and Wanwimolurk *et al.* (2015).

4.8. SUGGESTIONS FOR CREATING AWARENESS ABOUT SAFE FOOD HABITS

A number of suggestions were identified after thorough review of literature and discussion with subject matter specialists and they are listed below

- Awareness creation should be made by competent authority about pesticide residues in vegetables through mass media like radio, television. print media and other social network
- Training should be imparted to inhabitants of residential area regarding the ill effects of consuming vegetables with pesticide residue as well as measures to remove them

- Conscientization of housewives should be undertaken through residence associations to motivate them to purchase vegetables from known and neighbourhood farmers to keep a check on pesticide residues in vegetables
- Organic outlets like Niravu, Thanal, Jaiva veg, Aroma fresh etc should be popularised through social media
- The Department of Agriculture Development and Farmer's Welfare have to organise field trips to organic farms to motivate people to cultivate vegetables in the homesteads with ecofriendly practices
- The department also should popularise terrace cultivation in urban areas with minimum use of chemicals

4.9. EMPIRICAL MODEL FOR THE STUDY

The main objective of developing conceptual framework for this study was to provide an abstract idea with regard to relationship between dependent variable and 10 independent variables selected for the study. The dependent variable is consumer behaviour represented by central portion and independent variables including profile and purchase related characters are shown around the dependent variables which were connected to dependent variable through arrows. The emipirical model derived as per conceptual framework of the study is depicted in Fig 26.

Fig 26. Empirical model for the study

Summary

CHAPTER 5

SUMMARY

The per capita consumption of fresh fruit and vegetables increased 9.7 per cent per annum between 1996 and 2002 whereas growth in population was only 1.6 per cent during the same period, implying higher demand for fruits and vegetables. In addition recent spur in economic growth and improvement in income in the country, had led to emergence of middle and high income consumers, who were more concerned on their health and hygiene and craved for consuming fresh produces especially leafy vegetables, salad vegetables, cooked or blanched vegetables and juices. This changing environment is reducing gap between Indian rural an urban consumers, but still a noticeable difference existed between socio-economic and cultural environment of both the regions resulting in change in rural and urban consumers' behaviour. In this context, the present study was undertaken with following objectives

- To compare consumer behaviour of rural and urban families on vegetables.
- To study awareness of rural and urban families about organic vegetables and its outlets
- To determine knowledge and adoption of KAU recommended measures to remove pesticide residue in vegetables

The study was administered in Kozhikode district. A total of 120 respondents were randomly selected i.e 60 each from urban and rural area for the study.

The independent variables selected for the study were age, gender, education level, average household monthly income, family size, health consciousness, periodicity of purchase, source of vegetables, nature of vegetables consumed, preferred vegetable category, average household monthly expenditure on vegetables, proximity to outlet, and quantity of vegetables purchased per month. The dependent variable consumer was measured by an arbitary scale developed consisting of four components *viz* consumer attitude, consumer preference, consumer decision making and consumer intentions, with eight statements each

expressed on five point continuum. The dependence of these components with locality of consumers were determined by chi-square test. The comparative analysis of consumer behaviour was studied by performing student's t-test. The knowledge of respondents regarding KAU recommended practices to remove pesticide residues from vegetables were analysed with help of teacher made test developed. The adoption of these practices and other practices to get rid of pesticide residues from vegetables were studied by computing adoption index. A correlation analysis was also conducted to determine relations between dependent and independent variables. The data were collected by conducting personal interviews with the rural and urban household, using well-structured and pre-tested interview schedule developed for the purpose. Percentage analysis, means, standard deviation, quartile deviation, Chi-square analysis, simple correlation and student's t-test were the statistical tools employed in the analysis of the data and interpreting the results.

The salient finding of the study include

1. More than 55 per cent of respondents belonged to middle aged category which was between 35 and 55 years of age and were male.
2. About 40 per cent of respondents possessed high school level of education and belonged to medium income category with an income range of Rs. 21525 to Rs. 44775.
3. Around 80 per cent of respondents were having medium sized family of 3-5 members and displayed medium level of health consciousness.
4. More than 30 per cent of respondents had gone for weekly purchase of vegetables, followed by almost equi distribution in biweekly and alternate day purchase.
5. Around 70 per cent of consumer respondents regularly purchased vegetables from retail outlets, more than 55 per cent occasionally consumed vegetables produced in their home and more than 75 per cent never received from neighbour's farm.
6. Around 50 per cent of respondents consumed only inorganic vegetables.

7. More than 60 per cent of respondents mostly preferred solanaceous vegetables
8. Seventy five per cent of respondents belonged to medium household monthly expenditure category in vegetable consumption.
9. More than 55 per cent of respondents were at medium proximity (1km-3km) to outlet and belonged to medium category (10kg-28kg) in the quantity of vegetables purchased for a month.
10. Around 80 per cent of respondents had moderately favourable attitude towards vegetables
11. Sixty five per cent of respondents had medium preference for vegetable attributes.
12. Around 70 per cent of the respondents exhibited moderately favourable decision making ability in vegetable purchase.
13. More than 75 per cent of respondents had medium intentions to purchase vegetable from an outlet and displayed moderately favourable consumer behaviour with respect to vegetables
14. The chi square analysis found that there was a dependence between consumer preference and consumer intention with residing locality of consumers whereas consumer intension were independent of locality.
15. The t-test carried out for comparative analysis of consumer behaviour revealed that there was a significant difference between urban and rural consumers, rural mixed and rural vegetarian, urban mixed and urban vegetarian, urban vegetarian and rural vegetarian, mixed consumer of 2 rural panchayats, male and female consumers and there was no significant difference between urban mixed and rural mixed, and mixed consumers of 2 urban wards.
16. Seventy per cent of respondents had medium awareness regarding organic vegetables and its outlets.
17. More than 80 per cent of respondents possessed medium level of knowledge with respect to KAU recommended practices for removing pesticide

residues in vegetables and only 40 per cent of them had adopted KAU recommended practices.

18. All the respondents had performed tap water washing and cooking apart from KAU practices for pesticide residue removal from vegetables.

Suggestions for future research

- A multidisciplinary research team must explore factors affecting consumer behaviour and develop strategies for improving consumer behaviour of both rural consumers and urban consumers
- As this study was administered in only Kozhikode district, generalizations was difficult so it has to be conducted in various parts of Kerala.
- More location specific research on consumer behaviour linked with vegetable production should be undertaken.

Plate 1. Interviewing a vegetarian respondent in Balussery panchayat

Plate 2. Interviewing a respondent in Ulliyeri panchayat

Plate 3. Interviewing a respondent in Balussery panchayat

Plate 4. Interviewing a respondent in ward no. 8 of Kozhikode corporation

Plate 5. Interviewing a respondent in ward no. 11 of Koyilandy municipality

Plate 6. Interviewing a vegetarian respondent in Ulliyeri panchayat

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Abstract

CONSUMER BEHAVIOUR OF URBAN AND RURAL FAMILIES IN VEGETABLES- A COMPARATIVE ANALYSIS

by

SILPA R. C

(2016-11-074)

Abstract of the thesis

Submitted in partial fulfillment of the

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MASTER OF SCIENCE IN AGRICULTURE

Faculty of Agriculture

Kerala Agricultural University

DEPARTMENT OF AGRICULTURAL EXTENSION

COLLEGE OF AGRICULTURE

VELLAYANI, THIRUVANANTHAPURAM-695 522

KERALA, INDIA

2018

ABSTRACT

Consumer behaviour of urban and rural families in vegetables- A comparative analysis

The study entitled 'Consumer behaviour of urban and rural families in vegetables - A comparative analysis' was conducted in Kozhikode district. The objective focussed on comparative analysis of consumer behaviour of rural and urban families on vegetables, awareness of rural and urban families about organic vegetables and its outlets, knowledge and adoption of KAU recommended measures to remove pesticide residue in vegetables. The study comprised of 120 respondents who were selected randomly with 60 each from urban and rural area. The 48 respondents out of 60 were of mixed category and 12 were of vegetarian category.

The profile and purchase related characteristics (independent variables) including age, gender, education level, average household monthly income, family size, health consciousness, periodicity of purchase, source of vegetables, nature of vegetables consumed, preferred vegetable category, average monthly expenditure on vegetables, proximity to outlet, and quantity of vegetables purchased per month were studied. The percentage analysis of these independent variables revealed that majority of respondents were under medium category. The consumer behaviour (dependent variable) was also studied.

The consumer behaviour was analyzed based on the cumulative effect of consumer attitude, consumer preference, consumer decision making, and consumer intensions (store choice behaviour). Based on the analysis of data, it was found that majority (80.83%) of the consumers were having moderately favourable attitude towards vegetables. About 65 per cent were having medium preference for vegetables and a chi square analysis revealed that there was a dependence between consumer preference and their locality. More than 69.17 per cent of respondents were moderately favourable decision makers in the purchase of vegetables and a chi square analysis revealed that there was a dependence between consumer decision

making and their locality. Majority (77.50%) of them were having medium intentions to purchase from an outlet and a chi square analysis revealed that there was no dependence between consumer intensions and their locality.

The majority of respondents (77.50%) were exhibiting moderately favourable consumer behaviour towards vegetables. The student's t test was performed for the comparative analysis of consumer behaviour for different combinations of consumers. The results revealed that there was a significant difference between urban and rural consumers, rural mixed and rural vegetarian, urban mixed and urban vegetarian, urban vegetarian and rural vegetarian, mixed consumer of 2 rural panchayats, male and female consumers and there was no significant difference between urban mixed and rural mixed, and mixed consumers of 2 urban wards.

The awareness of rural and urban families about organic vegetables and their outlet were analyzed and found that majority (70%) of them were of medium category. Most of them have received awareness regularly from friends and relatives(57.50%), occasionally from newspaper(60.83%), and never(70.83%) from magazines. The knowledge and adoption of consumers on KAU recommended practices to remove pesticide residue was studied and it was observed that most of them were having medium knowledge (84.17%) and followed medium adoption (40.83%). Other practices adopted by respondents to remove pesticide residue in vegetables were tap water washing followed by cooking, and dipping in sodium chloride solution.

The correlation between consumer behaviour and 10 independent variables revealed that three of the variables i.e age, education level, proximity to outlet had positive and significant correlation and two of variables i.e average household monthly income and average monthly expenditure on vegetables had negative and significant correlation with consumer behaviour.

The suggestions identified for creating awareness about safe food habits among the consumers were: The social media should promote organic outlets for vegetables through advertisements, mass media awareness should be promoted by competent authorities to purchase vegetables from small and marginal farmers

rather than profit oriented outlets considering their freshness and less pesticide residue. The department of agricultural development and farmer's welfare can impart training to people in residential areas regarding the harmful effects of consuming contaminated vegetables and measures to remove the pesticide residues in vegetables. The department can also provide training to people to cultivate vegetables in homesteads like terrace cultivation with eco-friendly practices.

The study revealed that majority of the respondents were showing moderately favourable behaviour towards vegetables. There was a significant difference between the consumer behaviour of rural and urban consumers. The prime reason could be the socio-economic and cultural differences in urban area and rural area. The knowledge and adoption of consumers on KAU recommended practices to remove pesticide residue had fallen under medium category. All these findings demand a need for creating awareness in society regarding the use of safe food and promotion of organic vegetables.

Appendices

APPENDIX I

KERALA AGRICULTURAL UNIVERSITY
COLLEGE OF AGRICULTURE
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Professor and Head
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Date: 21-02-2018

Sir/Madam,

Miss Silpa R.C (Ad. No. 2016-11-074), the post graduate scholar in the Department of Agricultural Extension, College of Agriculture, Vellayani is undertaking a research study entitled "Consumer behaviour of urban and rural families in vegetables - A comparative analysis" as part of her research work. Variables supposed to have close association with the study have been identified after extensive review of literature.

Considering your vast experience and knowledge on the subject, I request you to kindly spare some of your valuable time for examining the variables critically as a judge to rate the relevancy of them. Kindly return the list duly filled at the earliest in the self-addressed stamped envelope enclosed with this letter.

Thanking you

Yours faithfully

Dr. B. Seema

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OBJECTIVES OF THE STUDY

Comparative analysis of consumer behaviour of rural and urban families on vegetables. Awareness of rural and urban families about organic vegetables and its outlets will be studied. Knowledge and adoption of KAU recommended measures to remove pesticide residue in vegetables will also be studied.

Personal, Socio-Psychological variables taken for the study

Variables are given in bold cases and their respective meaning is explained for easy understanding of intended meaning. You may please rate the statement with a tick mark in the appropriate column against the statement with special reference to its importance to meet the objectives of the study.

Sl. No.	Variable	Operational definition	Relevancy rating (R- relevant)				
			Most R	More R	R	Less R	Least R
1.	**Age**	Age is referred as number of calendar years completed by the respondent at the time of interview					
2.	**Gender**	Defined as dichotomized variable having only two categories namely 'male' and 'female' who purchases the vegetables for the family					
3.	**Educational level**	The extend of formal education attained by respondents					
4.	**Type of family**	It is defined as family type of respondent like					

		nuclear or joint					
5.	**Family size**	Total number of members in the family of respondents living together					
6.	**Marital status**	Refers to whether the respondent is married, unmarried or divorced					
7.	**Religion**	It refers the particular system of faith and worship respondent follows					
8.	**Health consciousness**	Defined as awareness and interest of the respondent regarding the dietary requirements, personal hygiene and environmental sanitation.					
9.	**Occupation status**	It refers to major occupation of respondent like government sector, private sector, self employed					
10.	**Average household monthly income**	It is defined as average income obtained by respondents and their family for a month through major and subsidiary occupation					
11.	**Average household monthly expenditure on vegetables**	Refers to average income spend on purchasing vegetables by family for a month					

12.	**Mode of purchase**	Mode of purchase is referred as method of purchase of vegetables by consumers like online or offline					
13.	**Mode of payment**	Refers to cash or credit payments of consumers					
14.	**Periodicity of purchase**	Defined as the time period between consecutive vegetable purchase by consumer					
15.	**Source of vegetables**	Refers to different outlets for purchasing vegetables like own farm production, retail, wholesale markets etc					
16.	**Choice of retail format**	Choice of retail format is defined as the consumer's preference for organized or unorganized retail outlets					
17.	**Proximity to outlet**	Refers to nearness of outlets of vegetables from the house of consumers					
18.	**Preferred purchasing time**	Defined as time preferred by consumer in buying vegetables like morning , afternoon , evening					
19.	**Daily per**	Refers to quantity of					

	capita consumption of vegetables	vegetables consumed by entire family for a day					
20.	**Quantity of vegetables purchased per month**	Refers to quantity of vegetables purchased by consumer for entire family for a month					
21.	**Preferred vegetable category**	Preferred vegetable category refers to whether the consumer prefer for regular, exotic or basic vegetables					
22.	**Nature of vegetables consumed**	Refers to whether the consumer prefer organic or inorganic vegetables					
23.	**Edible portion preferred**	Edible portion preferred refers to which portion of vegetable is preferred for cooking and consumption like tuber, leaf, stem etc					
24.	**Washing procedure before cooking**	It refers to whether washing is done before or after peeling and cutting of vegetables					
25.	**Knowledge about KAU recommendations for pesticide residue removal**	It is defined as the consumers knowledge regarding KAU recommendations for pesticide residue removal in vegetables before consumption					
26.	**Adoption of KAU recommendations for**	Refers to whether consumers are adopting KAU recommendations for					

	pesticide residue removal	pesticide residue removal in vegetables before consumption					
27.	**Storage period**	It refers to time period for which vegetables are stored by consumers					
28.	**Type of storage**	Type of storage refers to the practices followed by consumers for storage like open or refrigeration					
29.	**Willingness to purchase pre packed vegetables**	Refers to whether the consumer is willing or not willing to purchase pre packed vegetables					
30.	**Willingness to offers and discounts**	It refers to whether consumers are willing or not willing to the offers and discounts put forward by sellers					
31.	**Type of offers preferred**	Refers to different kinds of offers preferred by consumer					
32.	**Factors influencing purchase**	It can be defined as different factors influencing the consumer to buy vegetables from an outlet					
33.	**Awareness about organic vegetables and its outlets**	Refers to whether consumer is aware, not aware or partially aware about the organic vegetables					
34.	**Sources of**	It refers to different					

	awareness about organic vegetables and its outlets	mass media like newspaper, television, radio and other sources through which consumer get awareness about organic vegetables and its outlets					
35.	**Consumer intensions**	Intentions of them to purchase vegetable from an outlet					
36.	**Consumer attitude towards vegetables**	Refers to predisposition to feel or act in a given manner towards vegetable purchase and consumption					
37.	**Consumer preference for vegetable characters**	It refers to different characteristic like price, availability, quality etc which are preferred by consumers during vegetable purchase.					
38.	**Level of consumer satisfaction**	It can be defined as consumer's satisfaction obtained from consuming vegetables					
39.	**Consumer decision making**	The choice of consumer between two or more alternative actions involved in purchase of vegetables.					
40.	**Consumer perception of customer services**	It refers to the consumer's preconceived ideas regarding customer services of a vegetable outlet					
41.	**If any other, specify**						

APPENDIX II

The variables with the mean relevancy score

Sl. No.	Independent variables	Mean score
1	Age	**4.59**
2	Gender	**4.86**
3	Educational level	**4.95**
4	Type of family	3.68
5	Family size	**4.88**
6	Marital status	3.73
7	Religion	3.58
8	Health consciousness	**4.36**
9	Occupation status	3.56
10	Average household monthly income	**4.80**
11	Average household monthly expenditure on vegetables	**4.91**
12	Mode of purchase	3.88
13	Mode of payment	3.67
14	Periodicity of purchase	**3.84**
15	Source of vegetables	**4.59**
16	Choice of retail format	3.90
17	Proximity to outlet	**4.97**
18	Preferred purchasing time	3.67
19	Daily per capita consumption of vegetables	3.94
20	Quantity of vegetables purchased per month	**4.65**
21	Preferred vegetable category	**4.70**
22	Nature of vegetables consumed	**4.42**
23	Adoption of KAU recommendations for pesticide residue removal	3.66

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24	Washing procedure before cooking	3.39
25	Knowledge about KAU recommendations for pesticide residue removal	3.60
26	Adoption of other practices for pesticide residue removal	3.55
27	Storage period	3.74
28	Type of storage	3.86
29	Willingness to purchase pre packed vegetables	3.67
30	Willingness to offers and discounts	3.55
31	Type of offers preferred	3.97
32	Factors influencing purchase	3.91
33	Awareness about organic vegetables and its outlets	3.83
34	Sources of awareness about organic vegetables and its outlets	3.75
35	Consumer intensions	3.87
36	Consumer attitude towards vegetables	3.80
37	Consumer preference for vegetable characters	3.92
38	Level of consumer satisfaction	3.54
39	Consumer decision making	3.75
40	Consumer perception of customer services	3.64
	Mean	**4.01**

APPENDIX III

KERALA AGRICULTUTAL UNIVERSITY
COLLEGE OF AGRICULTURE, VELLAYANI, TRIVANDRUM
DEPT. OF AGRICULTURAL EXTENSION

INTERVIEW SCHEDULE

No. Date:
Name of Panchayat/Ward :

Name and address of respondent:

1. Name of the respondent :
2. Address :

3. Phone number :

4. Age :
5. Gender :
6. Educational level: Please indicate your response by putting tick mark in appropriate alternative

Sl. No.	Category	
1	Illiterate	
2	Write and read	
3	Primary	
4	High school	
5	Higher secondary	
6	College	

7. Average household monthly income :
8. Family size :
9. Health consciousness:

Please indicate your response in the appropriate alternative by putting tick mark in each of the following statements.

(SA- Strongly agree, A- Agree, UD- Undecided, DA- Disagree, SDA- Strongly disagree)

Sl. No.	Statements	SA	A	UD	DA	SDA
1	The health could be maintained only if we take balanced diet					
2	Only those who have clear vision about the life would be concerned about the personal hygiene.					
3	One should find time for cleaning his environment along with caring about his own health					
4	The children who would be brought up in an unclean and dirty atmosphere will physically as well as mentally ill.					
5	One should throw away household waste outside, concerning about only himself and his family					
6	One should be more concerned about the economic profits rather than personal and environmental hygiene and balanced diet					

10. Periodicity of purchase: Please indicate your response by putting tick mark

Sl. No.	Periodicity	
1	Fortnightly once	
2	Weekly once	
3	Weekly twice	
4	Alternate days	
5	Daily	

11. Source of vegetables: Please indicate your response by putting tick mark

Sl. No.	Sources	Regular	Occasional	Never
1	Own farm production			
2	Neighbourhood farm			
3	Wholesale outlet			
4	Retail outlet			

12. Nature of vegetables consumed: Please indicate your response by putting tick mark for following alternative

Sl. No.	Category	
1	Organic	
2	Inorganic	
3	Both	

13. Preferred vegetable category: Please indicate your response for different alternatives by putting tick mark

Category	Less preferred	Preferred	More preferred
Leafy vegetables			
Solanaceae			
Cucurbitaceae			
Brassicaceae			
Umbeliferae and Chenopodiaceae			
Malvaceae			
Moringaceae			
Leguminaceae			
Euphorbiaceae and araceae			
Alliaceae			

14. Average household monthly expenditure(Rs.) on vegetables :

15. Proximity to outlet(Km) :

16. Quantity of vegetables purchased per purchase(Kg) :

17. Consumer attitude:

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Please indicate your response in the appropriate alternative by putting tick mark in each of the following statements.

(SA- Strongly agree, A- Agree, UD- Undecided, DA- Disagree, SDA- Strongly disagree)

Sl. No.	Statement	SA	A	UD	DA	SDA
1	Vegetables are highly nutritious					
2	Price fluctuations are common in vegetables					
3	Vegetables are perishable					
4	Fresh vegetables are easily available in market					
5	Vegetables have good cooking quality					
6	Packing and packaging are poor in vegetables					
7	Vegetables are supplementing dietary fibres					
8	Vegetable have high pesticide residue					

18. Consumer preference:

Please indicate your response in the appropriate alternative by putting tick mark for each of the following vegetable characters.

(SA- Strongly agree, A- Agree, UD- Undecided, DA- Disagree, SDA- Strongly disagree)

Sl. No.	Statements	SA	A	UD	DA	SDA
1	Ecofriendly					
2	Quality					
3	Better taste					
4	Lower residue					
5	Nutrient value					
6	Shelf life					
7	Accessibility					
8	Better value of money					

19. Consumer decision making:

Please indicate your response in the appropriate alternative by putting tick mark for each of the following statements.

(SA- Strongly agree, A- Agree, UD- Undecided, DA- Disagree, SDA- Strongly disagree)

Sl. No.	Statements	SA	A	UD	DA	SDA
1	I can decide upon the optimum quantity to be purchased					
2	I take purchase decision only after evaluating the quality of vegetables					
3	I do have ability to weigh the prices of vegetables and take correct decision in purchase of vegetables					
4	I can decide where to buy fresh vegetables					
5	I apply my bargaining ability in purchase decision of vegetables					
6	I can decide where to purchase					

	organic vegetables					
7	I will take purchase decision after consulting with peers and nears					
8	I need adequate time to take purchase decision of vegetables					

20. Intentions to buy from a an outlet:

Please do indicate your response in the appropriate alternative by putting tick mark for each of the following statements.

(SA- Strongly agree, A- Agree, UD- Undecided, DA- Disagree, SDA- Strongly disagree)

Sl. No.	Statements	SA	A	UD	DA	SDA
1	Availability of all kinds of vegetables					
2	Absence of decayed or deteriorated produce					
3	Accurate weighing measures and standards used					
4	Prevalence of competitive price					
5	Convenient shopping area					
6	Hygiene of shop					
7	Offers available in the shop					
8	Acquaintance with shopkeeper					

21. Awareness of rural and urban families about organic vegetables, their outlet:

Please indicate your response in the appropriate alternative by putting tick mark for each of the following statements.

Sl. No.	Statements	Fully aware	Partially aware	Not aware
1	Organic vegetables are available in market			
2	Organic vegetables are of best quality			
3	Organic vegetables are nutritious than inorganic vegetables			
4	Organic vegetables are healthier			
5	Organic vegetables are costlier			
6	Standards are fixed for organic vegetable producers			
7	Certification of organic vegetables			
8	Organic vegetables are labelled with accurate information or organic status of product			
9	Retail outlets of organic vegetables			

23. Source of awareness of organic vegetables and their outlets:

Please indicate your response in the appropriate alternative by putting tick mark for each of the following sources of awareness regarding organic vegetables and their outlets.

Sl. No.	Sources	Regular	Occasional	Never
1	Newspaper			
2	Magazine			
3	Television			
4	Radio			
5	Internet			
6	Agricultural institutions			
7	Friends and relatives			

24. Knowledge of KAU recommended practices to remove pesticide residue:

Please do mark your response by putting tick mark in the appropriate alternative.

Sl. No.	Practices	Yes	No
1	Veggiewash(10ml/ litre)		
2	Tamarind paste(20g/ litre water)		
3	Turmeric (2% solution)		

4	Vinegar(3 lids of bottle /litre water)		

25. Adoption of KAU recommended practices to remove pesticide residue:

Please do mark your response by putting tick mark in the appropriate alternative.

Sl. No.	Practices	Fully adopt	Partially adopt	Non adopt
1	Veggiewash(10ml/ litre)			
2	Tamarind paste(20g/ litre water)			
3	Turmeric (2% solution)			
4	Vinegar(3 lids of bottle per litre of water)			

26. Adoption of other practices by respondents to remove pesticide residue:

Please do mark your response by putting tick mark in the appropriate alternative.

Sl. No.	Practice	Yes	No
1	Running water washing		
2	Dipping in 1% Nacl solution		
3	Cooking		
4	Blanching with potassium meta Bisulphate		

5	Combination of tap water followed by Nacl solution(1%), and tamarind solution(2%) dipping		
6	If any other, specify		