CONSUMPTION PATTERN OF PROCESSED HORTICULTURAL FOOD PRODUCTS IN DHARWAD DISTRICT

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1. INTRODUCTION

India is bestowed with varied agro-climate, highly favorable for growing a large number of horticultural crops such as fruits, vegetables, root tuber, aromatic and medicinal plants and spices and plantation crops like coconut, areca nut, cashew and cocoa. Presently, horticultural crops occupy around 13 per cent of India's gross cropped area, producing 182.41 million metric tones during 2005-06. The total production of fruits has been estimated at 52.85 million metric tonnes from an area of 5.34 million hectares and the production of vegetables have been estimated at 108.20 million metric tones from an area of 7.05 million hectares during 2005-06. The value of horticulture products was Rs. 3000 crores and accounts to 20 per cent of agricultural GDP and 4 per cent towards national income.

The per capita availability of raw fruits and vegetables is 140 gms per day and 295 gms per day. The daily per capita availability of processed products is very negligible (0.56 gms including traditional products like pickles and murrabba). Country faces major challenges of feeding its growing population. It is reported that a lot of horticultural produce go waste because of improper handling, transporting and storage techniques.

The average expenditure of urban India on food was found to be 43 per cent out of which only six per cent is spent on beverages, refreshments and processed foods where as that of rural India was 55 per cent on food and out of that only five per cent was spent on beverages, refreshments and processed foods. (Anon, 2007) The food processing industry in India is one of the largest in terms of production, consumption, export and growth prospects. The important sub sectors in food processing industries are fruits and vegetables processing, fish- processing, milk- processing, meat and poultry processing, packed and convenience foods, alcoholic beverages and soft drinks and grain processing.

Over the past five decades, India has taken giant steps in producing food grains, milk, fruits and vegetables. There is a large variety of processed food available today to an average citizen. The items like jams, squashes, juices, pickles etc form an important part of our diet.

The market for processed foods in 2014-2015 in comparison to 2003-2004 is expected to increase by 11 times for fruits and vegetables, 1.4 times for milled rice, 1.5 times for milled wheat, 16 times for ready-to-eat (RTE) foods, 9.3 times for sugar and sugar based products, two times for pulses and 4.5 times for spices. The annual growth in processed foods would be about 10 per cent. The primary processed foods would grow by 7 per cent, and value added foods by 15 per cent. The share of value added products would increase from the existing 38 per cent to 58 per cent by 2014-2015. The level of processing in organized sector is expected to be 15 per cent in fruits and vegetables, 30 per cent in dairy, 45 per cent in buffalo meat, 25 per cent in poultry, and 20 per cent in marine products.(www.APEDA.com).

The fruit and vegetable processing industry in India is highly decentralized. A large number of units are in the cottage/home scale and small scale sector, having small capacities up to 250 tonnes/annum though big Indian and multinational companies have capacities in the range of 30 tonnes per hour or so. The prominent processed items are fruit pulps and juices, fruit based ready-to-serve beverages, canned fruits and vegetables, jams, squashes, pickles, chutneys and dehydrated vegetables. More recently, products like frozen pulps and vegetables, frozen dried fruits and vegetables, fruit juice concentrates and vegetable curries in restorable pouches, canned mushroom and mushroom products have been taken up for manufacture by the industry. The processing level in India is estimated to be around 2 per cent, as compared to about 80 per cent in Malaysia, 30 per cent in Thailand, and 60-70 per cent in the UK and USA.

The domestic consumption of value added fruit and vegetable products is however, very low compared to the primary processed food in general and fresh fruits and vegetables in particular which is attributed to higher incidence of tax and duties including that on packaging material, lower capacity utilisation, non-adoption of cost effective technology, high cost of finance, infrastructural constraints, inadequate farmer-processor linkages leading to dependence upon intermediaries. The inability for market promotion is an important reason for inadequate expansion of the domestic market. India's share in the world trade of horticultural processed products too, is miniscule – less than one per cent. This compares very unfavorably with countries like Malaysia (83%), Philippines (78 %), Brazil (70 %) and US

(70 %). India's major exports are in fruit pulp, pickles, chutneys, canned fruits and vegetables, concentrated pulps and juices, dehydrated vegetables and frozen fruits and vegetables.

Food policy is proposed to support projects for reduction in post-harvest losses, enhance the level of processing, encourage value addition, employment generation and ensure remunerative prices to farmers. In the Government of India Budget 2006-2007, food processing has been considered as a priority sector for bank credit. National Bank for Agriculture and Rural Development (NABARD) has set aside Rs. 1,000 crore especially for agro-processing infrastructure and market development.

The diverse agro-ecological conditions prevailing in Karnataka facilitates growth of large varieties of horticulture crops covering fruits, vegetables, flowers, spices, plantations, roots and tuberous crops, aromatic crops, medicinal crops, oil palm etc. There has been a significant development in horticulture sector since the last two to three decades. There is a clear shift from agriculture to horticulture sector which is mainly attributed to the fact that horticulture crops are perennial in nature and are less labour oriented and highly remunerative crops. Karnataka state at the national level stands first in floriculture, second in spice and plantation crops, third in coconut and fifth in fruits and vegetables. Of the total cultivated area of 108 lakh ha in Karnataka, horticulture crops are grown on an area of 15.30 lakh ha with an annual production of 118 lakh tonnes.(www.Horticulture.kar.nic.in)

Karnataka is the first state to set up a separate Department of Horticulture in India for the overall development of horticulture in the state. Horticulture has proved to be the best diversification option for agricultural land use, because of assured and the remunerative returns to the farmers. The diverse agro-climatic conditions prevailing in the state are quite congenial for growing different horticulture crops and another important benefit that the farmers can avail is related to value addition of several horticulture produce, which offers very good scope for meeting the needs of different strata of consumers. With the onset of protected cultivation and consequent high quality produce, the horizons of export have greatly been expanded, offering unlimited scope to hi-tech farmers in the state. Of late, in response to the increasing awareness for nutritional security, consumption of protective foods such as fruits and vegetables has greatly increased and this has helped to hike the production process.

Horticulture crops are high value crops ensuring maximum returns to the growers with multiple scope for value addition. The average per capita availability of fruits and vegetables in India is inadequate to meet the requirements for nutritional and protective diet of the population. Of the total horticulture production, only 67 per cent is used for local consumption while 30 per cent is reported to be post harvest losses, two per cent is used for export and 0.8 per cent for processing. There is immense scope for developing horticultural produce market. Changing food habits, life styles and health consciousness and purchasing power have created an unprecedented opportunity for farmers and horticultural entrepreneurs to enhance the demand for processed products.(www.Bagchee.com(management of horticulture))

Jams, jellies and marmalades form an important class of products in the food breakfast of an Indian consumer. Pickles are generally consumed with meals or snacks for added taste. They also act as a good appetizer. Pickles are made and marketed in various mixes with variety of tastes. Although, traditionally pickles are prepared at home, bottled/tinned pickles are in increasing demand especially in the urban areas. Quite a good number of leading brands are already available having all India marketability. Also, the country has been exporting pickles to cater the needs of Indian immigrants settled abroad. As much there exists a potential market within the region.

India is one of the largest producers of potato. Besides, being used as a daily food item in various vegetable preparations, potato today increasingly finds use in the form of chips or wafers as snack food. The potato chips and wafers are popular processed food items, which give considerable value addition to potatoes. The main consumers of potato chips and wafers are families especially in urban areas. Besides, hotels, restaurants, canteens, army establishments require potato chips in significant quantities. In urban areas, the per capita consumption of potato chips or wafers may be conservatively taken at 500 gms per annum. The annual demand in towns having a population of 2 lakh is estimated at 100 tones per year. Hence, there are good prospects for potato chips especially near the potato growing areas.

Sauce is being increasingly used with snacks like rolls, cutlets and samosas. Tomato is a highly perishable commodity and hence its conversion to sauce indirectly increases the shelf life and confers substantial value addition. At present, the leading brands in the market are Maggi and Kissan.

Fruit juice concentrate is extraction of juice from pulp. It is an important ingredient in soft drink and food industry. It is used in manufacturing marmalades, fruit butters, jams, jellies, and fermented products. It is also an important ingredient for ice-cream. The demand for fruit juice concentrate is increasing with the increase in demand for soft drink and other fruit based products like jam, jelly etc.

The consumption of processed horticultural foods is increasing especially with the increase in the number of urban women taking employment and a considerable change in day to day life of an average Indian due to various reasons, like urbanization, increase in the per capita income, changing life style, scarcity of household labours, the technological developments, breaking up of traditional joint family system, desire for quality, time etc. In view of all these aspects it can be assumed that there will be an increase in consumption of processed horticultural foods as they are more convenient for use. Generally food products are preferred and prepared depending on the habits, tastes, social status, economic factor, availability, traditions etc of people of the region. In this context, a study on the consumption pattern of processed horticultural food products was deemed to be important to understand the buying behaviour and preference of different consumers for different products. The consumers taste and preference were found to change rapidly. Keeping these important factors in view, the present study was taken up with the following objectives.

Objectives of the study

i) To study the per capita consumption of processed horticultural food products;

ii) To assess the expenditure pattern on processed horticultural food products;

iii) To examine the factors influencing the consumption of processed horticultural food products;

iv) To evaluate the consumers preference for processed horticultural food products; and

v) To identify the constraints in the consumption of processed horticultural food products.

Hypotheses

i) There is a significant difference in the per capita consumption of processed horticultural food products between the urban and rural consumers.

ii) There is a significant difference in the expenditure pattern of urban and rural consumers on processed horticultural food products.

iii) Price alone influences the consumption of processed horticultural food products.

iv) Consumers prefer branded processed horticultural food products.

v) There are number of constraints in the consumption of processed horticultural food products.

Presentation of the Study

The study has been presented in six chapters. Chapter-I deals with the nature, importance, specific objectives and hypotheses of the study; Chapter-II describes the comprehensive review of the relevant research work done in the past related to the present study; Chapter-III outlines the features of the study area, sampling design followed, collection of relevant data and analytical tools used in the study; Chapter-IV is devoted to present the main findings of the study through tables; Chapter-V discusses the results of the study; Chapter-VI provides summary of the whole study and also suggests the policy implication based on the findings of the study. At the end, important references relating to the present study have been listed.

2. REVIEW OF LITERATURE

This chapter presents the review of research work done in the past relating to consumption pattern and consumer preferences for food items in general and horticultural processed food products in particular. The reviews are presented under the following heads:

2.1 Consumption pattern

2.2 Factors influencing consumption

2.3 Consumer preferences

2.4 Constraints in consumption

Since adequate number of studies relating to processed horticultural food products alone under the above heads does not exit, work relating to other food items was also reviewed.

2.1 CONSUMPTION PATTERN

Puri and Sanghera (1989) conducted a study on nutritive value and consumption pattern of some processed foods in Chandigarh. The analysis on the consumption of processed mixed fruit jam, orange squash and pineapple juice was based on the survey of 200 households. Jam was found popular in all households irrespective of income, though there was a linear increase in the consumption with education of women and total family income. Orange squash consumption was maximum in high middle-income families. Pineapple juice consumption showed an increase with a raise in the income of the family. The consumption of all these processed foods showed a linear increase with higher education of women. Jam was found to be a concentrated source of energy followed by orange squash and pineapple juice. These foods were convenience foods and could also be used in therapeutic diets, where a low protein, low fat and high calorie diet was required.

Mani and Srinivasan (1990) in their study reported that among the consumers, majority of them were college educated and average per capita income per year was Rs. 4,516 in the study area. Consumers purchased jam in large quantity i.e. 3 kgs per family per year followed by squash (2.4 kgs), juice (2.2 kgs) and pickles (0.7 kgs). The annual average expenditure on processed products was less than 1 per cent of annual income of the respondents.

Desmond (1991) examined the determinants of organic horticultural products consumption based on a sample of California consumers. This study attempted to assess the market penetration of organic foods among California consumers and to analyse the factors that appear to be conducive and favour organic food consumption. The study was based on 1950 randomly selected sample households. The analysis focused on the demographic, economic and attitudinal variables distinguishing between buyers and non-buyers. The demographic and economic variables were significant for buyers and non-buyers included occupation, age, and size of family. The attitudinal variables included price of organic food and levels of concerns for residues, artificial coloring, additives, preservatives and radiation by-products.

Sharma and Ram (1991) examined the consumption pattern of milk and milk products by households belonging to weaker sections of Saharanpur district. The study revealed that per capita total expenditure on milk and milk products was higher in winter, whereas expenditure on other food items was higher in rainy season. The expenditure on pure ghee, milk and other milk products showed variation in different seasons. It was also observed that dairy products and non-food items were expenditure elastic.

Sikka and Azad (1991) found that annual per capita consumption of fruits was about 30 kgs in urban India. Income elasticities for individual fruits ranged between 0.11 and 1.31, the highest being for mango followed by apple, banana and the lowest for sapota.

Srivatsava and Dongra (1991) analysed regional imbalance in production and consumption of fruits and vegetables in India. Examination of the consumption data showed that very little income was spent on fruits and vegetables. However, in all the regions, the consumption of fruits and vegetables was higher in urban areas than that in rural areas.

Shaw et al (1993) conducted a study on consumer's attitude towards processed foods. The survey of 250 respondents revealed that appreciable percentage of respondents consumed processed foods. However, children were the most frequent consumers of processed foods. This indicated that the trend, the products consumed by children in the years to come, would have a higher growth rate with an increase in educational status of people and income.

Goswami (1994) examined the consumption of dairy products among different income groups in 200 households of Shillong town. Families with Rs. 4000 income per month incurred highest expenditure (Rs. 700.08) per month on milk and milk products when compared to other lower income groups. Milk and milk products were expenditure elastic for all income groups. All respondents adjudged butter and ghee as luxury items.

Gursharan (1994) studied the consumption of apples; consumers views, pattern and determinants. For the study, 400 households were randomly interviewed over urban areas of Punjab. The per capita consumption was highest in rich income group followed by middle, upper middle, lower middle and poor people. The per family consumption of apple was more in rich followed by upper middle, middle, lower middle and poor people but the total consumption was highest in lower middle, middle, poor, upper middle and rich people.

Sekar and Senthilnathan (1994) studied the fish consumption pattern in Coimbatore city using data from 150 households post stratified into three income groups. The study revealed that both the per capita consumption and expenditure increased with increase in income. The proportion of expenditure on fish to total consumption expenditure was 4.33 per cent in low income groups, 3.43 per cent in medium income groups and 3.14 per cent in high-income groups showing an inverse relationship between the two. This indicated that lower income group gave more importance to fish vis-à-vis expenditure on other items. It was also observed that as income increased, per capita absolute expenditure on food items including fish increased, but the percentage expenditure on food items including fish decreased.

Rupkumar et al (1995) conducted a study on family consumption pattern in rural sector of Vidarbha region. The objectives of the study were to know the consumer behaviour and nutritional pattern of farm families and to identify the factors responsible for variation in consumption. Three stage stratified sampling procedure was followed. The study revealed that the family consumption expenditure pattern per house per annum in small, marginal and large size groups of farms was Rs 6946.94, Rs 8955.16 and Rs 18877.56 respectively. Among the total expenditure made, major expenditure was made on food items viz., cereals followed by edible oil and lastly on protective foods like fruits and vegetables, meat, milk and milk products. The expenditure made on non-food items was highest on clothing followed by fuel and lighting, religious and social functions. The consumption of cereals was as per recommended level but consumption of fruits and vegetables was closer to recommended level and consumption of pulses, edible oil etc were much lower than the recommended level.

Gupta (1996) studied the consumption pattern of dairy products in Chandigarh. The results showed that 45 per cent of the milk purchased was used for making tea, 25 per cent for preparation of curd and butter and 30 per cent was utilized as such. As regards the consumption of different milk products was concerned, curds ranked the first with per capita per month consumption being more than one kg, next stood butter and paneer that was 300 gms each followed by flavored milk and sweets that averaged around 200 gms each and consumption of ghee was negligible.

Kaur and Gupta (1996) conducted a study in Chandigarh city and found that the percentage expenditure on food was 35 per cent while that on non-food items was 65 per cent. The relative expenditure on food items decreased as income increased. Among the food items, the largest expenditure was on milk and milk products; milk accounted for 75 per cent and milk products accounted for 25 per cent of the expenditure.

Raka (1996) studied the behavioral pattern of consumer-buyers of processed horticultural products. The main objectives of study were to (i) know consumption pattern for horticultural products (ii) estimate the magnitude of inter-class differences (iii) find out the determinants of buying behavior of consumers and (iv) analyze consumer's decision process. The study revealed that the monthly consumption of vegetables in unprocessed form was high in all households.The main source of awareness was television. Among all the processed products, only turmeric powder, coriander powder and red chilli powder was consumed by all the households and among the products, pickle was the only product consumed by all the households. The buying decision was dominated by husband.

Nirmal et al. (1998) conducted a study on consumer's preference and consumption pattern of processed food by working and non-working women. The study was based on 75 working and 75 non-working women selected with stratified random sampling procedure from the university campus at Hissar. The researchers collected data from respondents with the help of structured pre-tested schedules. Majority of the respondents had given higher score to butter due to good taste and nutritive value followed by sauce and jam. Sauce was relatively more popular among the non-working women because of its more convenience in use, where as jam was preferred more by the working women due to its good taste, easy availability and time saving. Jam, sauce and butter were liked and consumed more frequently by children and relatively more by children of working women. Preference as well as consumption was more in house holds with working women.

Daisy Rani et al (1999) conducted a study on consumption pattern and consumer's preference for milk products in Madras city. For their study, they surveyed 300 household samples from 12 divisions of the city using stratified random sampling. The results showed that there was 100 per cent consumption of milk in all income groups. The total quantity of milk products consumed per month varied from 4.37 kgs to 22.52 kgs per unit. The monthly consumption of fluid milk per consumption unit varied from 3.16 kgs to 17.70 kgs and the expenditure of a consumption unit on milk and milk products varied from Rs 42.04 to Rs 215.22 per month among the different income groups.

Padmanabhan (2000) analysed of expenditure on processed spices in South India. For the study, Coimbatore district in Tamilnadu and Palakkad town in Kerala were purposively selected following two stage random sampling technique. The study revealed that the increase in income and increase in education level of housewives increased the consumption of processed spices. The monthly expenditure was highest on chilli in both the study areas i.e Rs.6.91 in Coimbatore and Rs 7.86 in Palakkad.

Datta and Ganguli (2002) analysed the consumer expenditure pattern in Indian states with special reference to milk and milk products using NSS data on consumer expenditure. The study revealed that the per capita monthly expenditure (PCE) was estimated between Rs. 169 and Rs.474. Wide sub-regional fluctuations were observed. In the east, expect for West Bengal, major states like Bihar, Orissa and Assam had less than regional PCE. Delhi's, high PCE (Rs.474) pulled the regions average to Rs.207 offsetting the lower PCE of populous Uttar Pradesh (Rs.168). In south, Kerala had higher PCE (Rs.227) than Karnataka (Rs.180) or Tamil Nadu (Rs.200). In the west, Madhya Pradesh PCE (Rs.169) was found to be well behind Maharastra (Rs.216) and Gujarat (Rs.195).

Bakhshoodeh and Farajzadeh (2004) investigated Iranian urban consumer's behaviour and determined the role of habit effect in forming the consumption pattern over the period 1980-2000. The survey items covered household consumption quantity and total expenditure on foods, including bread, flour and its products, dairy products and eggs, fats, fruits and vegetables, groceries, sugar and tea, etc. The results obtained from decomposing the total effect of price changes indicated that habit effect had a significant role in food consumption changes. That is, despite price changes for most food items, consumers tend to keep their consumption pattern almost unchanged. It was revealed that income and substitution effects were weaker than the habit effect.

Kumar and Birtal (2004) conducted a survey on changes in consumption and demand for livestock and poultry products in India. The study examined long term changes in the consumption of animal products by income classes, and location of household (rural & urban) regions. The analysis was based on household data of four major rounds of NSSO covering the years 1980 (Jan-Dec), 1987-88 (July-June), 1993-94 (July-June) and 1999-2000

(July-June). A multi-stage budgeting framework was used for estimating the price and income elasticity of meat, poultry, eggs and fish. Over the last two decades, the per capita consumption of animal products had increased substantially yet there were significant inter-personal disparities. The consumption levels of the poor were much below than that of rich. The gap however, was narrowing down. Similarly, the gap in consumption levels of urban and rural population was also heading towards a convergence.

Ramappa (2004) conducted a survey to study consumption pattern and consumer's preference of milk and milk products in Hubli-Dharwad twin cities of Karnataka. The objectives were to analyse the consumption pattern of milk and milk products and consumer's preference for liquid milk attributes in urban conglomeration of Northern Karnataka. The information was obtained in the year 2003 from a random sample of 160 households selected from different localities of the twin cities. The results indicated that while all the households used liquid milk, the number of households using the milk products like ghee, panner, butter and curds varied. The unbranded sources were in general less preferred to the branded sources. Expenditure on milk and its products increased with an increase in the income level. The results of conjoint analysis revealed that the price was the most important factor in decision relating to purchase followed by color, fat and brand.

Sable *et al.* (2004) examined household income and expenditure patterns of rural households in four villages of Saoner tehsil, Nagpur district, Maharashtra, India, using data pertaining to agricultural year 1998-99. The households were divided into four categories according to livelihood pattern, namely, crop production, vegetable growing, dairy farming and landless labour. The highest monthly income was observed among vegetable growers and the lowest was among landless labourers. Total expenditure on food item was highest among dairy farmers and lowest among landless labourers.

Usharani and Reddy (2004) studied consumption pattern of milk and milk products of 240 households (120 each from high and middle income groups) in Hyderabad, India. The results showed that the consumption of milk and milk products was influenced by the knowledge on the availability of nutrients and the income level of the respondents. Liquid milk was the major item of daily consumption. Ice cream was the popular milk product showing growth potential in spite of certain concerns in its frequent consumption.

Agrahar and Pal (2005) studied the food consumption pattern of Khasi tribals in 13 tribal villages in Ri-Bhoi, Meghalaya, India, and reported that the dietary pattern of tribes was still traditional. Rice, meat, roots and tubers, fermented foods, green leafy vegetables and fruits were consumed everyday. Dairy products and pulses did not from a significant part in the everyday diet. Alcohol, fermented betel nut and tobacco were widely consumed by both men and women. Farming played a significant role in consumption of cereals and fruits. Urbanization, higher education and income significantly influenced the consumption of non-traditional foods such as dairy products and roots and tubers. Social factors had poor influence on food consumption pattern. These results indicated that an increase in income and educational level did not mean a proportionate improvement in the quality of food consumed. Therefore, nutritional education was important in guiding the tribals to a new milieu of food choices.

Kubendran and Vanniarajan (2005) studied the change in consumption pattern of rural and urban consumers. If income and urbanization increased among consumers, the percentage of income spent on consumption of milk would also increase. The urban consumer's preferred mostly branded milk compared to rural consumers. The most significant factors influencing buying decisions were accessibility, quality, regular supply, door delivery and mode of payment.

Atibudhi (2006) made a comparative analysis of food consumption and monthly per capita expenditure of Orissa vis-à-vis All-India level. The study sought to (i) examine the changes in dietary pattern and food consumption in rural and urban areas of the state and (ii) compare the Engle's ratio and monthly per capita expenditure of Orissa with all India level. The data of households was obtained by National Sample Survey (NSS). The analysis indicated that per capita expenditure on non-food items were significantly increasing compared to expenditure on food items. The expenditure on non-food items was more than that of food items in urban areas and there was a decline in the per centage expenditure on cereals and rapid increase in the consumption of edible oils, milk, meat, egg and fish. The

structural shift in the dietary pattern towards live stock, fisheries was likely to intensify further and needed diversification towards pulses, oilseeds, milk, and vegetables to meet the growing demand for these commodities. The monthly per capita expenditure indicated that there was a wide gap between Orissa and All India level.

Banumathy (2006) conducted an economic analysis of vegetable consumption in Cuddalore district of Tamil Nadu. The study was undertaken to identify the factors influencing the demand for vegetables by rural and urban areas of the district. The study revealed that there were differences in the consumption level of vegetables. The average monthly household expenditure per household indicated that the urban families incurred double the amount of expenditure on vegetables than their rural counterparts. Vegetable consumption in the study area was far below the recommended level. He advocated for enhanced efforts for creation of awareness on the role of vegetables in supplying micronutrients that were vital to good health.

Chengappa et al (2006) examined the consumption pattern and nutritional adequacy levels of rural households under different farming systems. The aim was to know the economies of different farming systems and its impact on income and nutrition with an emphasis on finding the gap in nutritional adequacy. For the study 100 farmers were selected at random from Bangalore rural district. The study indicated that food grains constituted nearly 40 per cent of the total expenditure, which decreased as the farming system diversified to high value commodities. The consumption of milk was much below the recommended level even though milk production was an important component of the diversified farming system and adequacy level of nutrient intake increased in the farming systems that were more diversified. Nutrient deficiency was noticed in the farming systems involving only the crops.

Randhawa (2006) examined the consumption pattern of milk and milk products in rural Punjab. The objectives of the study were to analyse the consumption pattern of milk and milk products and investigate the factors affecting their consumption in rural Punjab. Multistage sampling was followed to obtain the sample data. The results revealed that the per capita expenditure on food items was higher than the per capita expenditure on total milk and milk products.

Rao (2006) attempted to study the consumption pattern, expenditure, calorie intake and variation in various income groups in Udaipur district of Rajasthan. The households were classified into three groups viz lower, middle and higher income classes. The major share of food expenditure of higher and middle income was on milk, while in the lower class it was on cereals. In absolute terms, the expenditure on cereals of lower income class was nearly half the expenditure of middle income class and one-third of higher income class. Meat and eggs were afforded by middle and higher income classes only. The consumption of food was highest in winter and lowest in summer. On the whole, the intake of food items was less than the recommended level in all income groups except in the case of milk where the quantity consumed was more than the recommended level.

Soe and Singh (2006) conducted a survey on household food consumption pattern and demand in North Eastern states of India. The study examined the level and pattern of household food consumption. They estimated expenditure elasticity and projected household food consumption demand for North Eastern states of India based on 55th round of NSS data on household consumption. The analysis has brought out clearly that North Eastern states consumed much lower quantities of food items like pulses, milk and milk products, edible oils and fruits as compared to all India average and recommended levels. Projected household demand for 2016 based on 7 per cent growth in Net State Domestic Product (NSDP) suggested a substantial increase in food demand, which necessitated more capital investment in agriculture including greater financial support to research and extension.

Yeshoda and Kanchan (2007) conducted a study on chicken consumption pattern and consumer's preference for processed chicken in Coimbatore city. For their study they selected 200 samples by simple random sampling method. The data was collected by structured questionnaire. The study revealed that the consumers were aware of processed chicken and the recent emergences of super-markets were likely to support growth. There was a scope in coming decades for the new chicken processing plants to come up and sale of processed products and to cater to domestic and export markets.

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2.2 FACTOR INFLUENCING CONSUMPTION

Sushma (1982) opined that canned food products were boon to a busy wife as they made cooking simpler and quicker job. In India, canned foods were generally regarded with great deal of skepticism, as they were not garden fresh. She suggested that the manufacturers of such foods have to take initiative by a suitable advertising campaign to educate consumers about the advantages of processed foods.

Gluckman (1986) studied the factors influencing wine consumption. The explicit factors identified were the familiarity with the brand name, the price of wine, quality or the mouth feel of the liquid, taste with regard to its sweetness or dryness and the suitability for all tastes. Some of the implicit factors identified through extensive questioning were color and appearance.

Inamke (1995) conducted a study to identify the factors influencing the milk consumption behavior of urban and rural consumers in Western Maharastra. The results indicated that, for both, urban and rural consumers, family income was the factor that most significantly influenced milk consumption. Family-size and occupation were the other significant factors.

Wandel (1995) noted in a study that health-conscious people consumed more fruits and vegetables, while those who preferred fast food consumed less vegetable. Multivariate analysis was employed to identify factors influencing the consumption of fruits and vegetables among the consumers in Norway.

Hugar and Vijaya kumar (1996) carried out a study in Dharwad city to identify various factors influencing the consumption of vegetables. A sample of 90 consumers was chosen at random. It was observed that the personal attributes such as education level and sex had significant influence on the quantity and frequency of purchase. Income also had significant influence with higher family income including purchase of larger quantity. It was also observed that the price had high influence on quantity purchased among the lower income groups, but the effect was not so in high income groups.

Veena (1996) studied the factors affecting the consumption of processed products. The study indicated that jam was most popular processed product among urban and semi-urban population as it was easily available, time saving, long storability and demand by children and higher participation of women in working force in urban areas where as pickles was popular in rural areas due to ignorance of the consumers about the availability of other processed products and also due to poor economic background.

Sharma (1997) conducted a study to determine the factors influencing food consumption. The results indicated that price was the important factor that influenced the consumer's choice of food items. Other factors like sensory attributes, regional preferences, age, gender, interest, motivation, discrimination and income also influenced food consumption.

Amita (1998) studied the factors influencing the consumption of selected dairy products in Bangalore city. The results of the study revealed that income and price were the factors that significantly influenced the consumption of table butter. Price had a negative impact and income a positive impact on consumption. The consumption of ghee was positively influenced by income, price and family size. Cheese, just as in the case of table butter, was influenced by price.

Daisy Rani et al (1999) studied the factors influencing the milk consumption in Madras city. The study revealed that the variables such as family size, monthly income and education levels had significant and positive influence on consumption of milk and milk products. Increases in these factors in the households were found to increase the level of consumption of milk and milk products. It was also observed that the vegetarians consumed more milk to compensate their protein requirement.

Padmanabhan (2000) reported that the monthly income, family size, employment status of house wives were the factors influencing the consumption of processed spices in Coimbatore and in the case of Palakkad only education level, employment status of house wives and food habits were the factors influencing the consumption of processed spices.

Sudhir (2000) examined the factors influencing consumption of Mango. The study revealed that income and family size were the most influencing factors for the urban consumers and in addition to this other two factors influencing the rural consumers were education and age where the age had negative significant influence on consumption.

Nandagopal and Chinnaiyan (2002) conducted a study on brand preference of soft drinks in rural Tamil Nadu using Garrets ranking technique to rank factors influencing the soft drinks preferred by rural consumers. They found that the product quality was ranked as first followed by retail price. Good quality and availability were the main factors which influenced the rural consumers.

Sidhu *et al.* (2006) conducted a study to know the factors affecting the purchase of processed food in rural Punjab. For the study, 144 sample respondents were selected using multistage random sampling. The study revealed that the decision making process was dominated by males in the rural areas. The factors affecting consumption were grouped as socio-personal, socio-psychological and motivational. The factors included family composition and family income, need and interest, friends, career oriented modernization and scientific advancement.

Indumathi *et al.* (2007) studied the consumer buying behaviour of processed spice products. The objectives of the study were to identify the factors influencing purchasing of processed spice products. The study was conducted in Bangalore and Chennai cities. The study consisted of 200 consumers by following simple random procedure. The study revealed the factors influencing purchasing of processed spice products as occupational status of women respondents, income of family and time saving factor in cooking.

2.3 CONSUMER PREFERENCES

Prince *et al.* (1980) conducted a study on the consumer's preference for quality attributes of rose, using the conjoint analysis. Price, variety and the bloom stage of rose were the major attributes considered as important by consumers.

Gluckman (1986) studied the preference for wine consumption. Most consumers preferred white wine to red wine. Packaging, color, appearance, use of foreign language and graphics were taken as important clues for quality and price. Consumers preferred French or German made wines to Spanish wines.

Haripuram *et al.* (1986) conducted a consumer preference analysis of biscuits, using a sample of 470 consumers. From the study it was found that consumers gave the first preference to taste. Freshness, crispness, brand, price and availability in that order were the other attributes given importance by the biscuit consumers.

Shafer and Kelly (1986) conducted a market survey to identify the consumer preferences for quality attributes while buying potted chrysanthemum. Price, longevity and cultivars were the quality attributes short-listed for the survey. The survey results revealed that longevity scored over price in influencing the consumer's decision on buying chrysanthemum. Cultivar was identified as the most important quality attribute of chrysanthemum.

Steenkamp (1987) used conjoint analysis technique to analyse the quality attributes of ham. The study was conducted in Netherlands using a sample size of 250 ham consumers. Quality attributes like brand, packaging, store and price received a relative importance of 29.3, 43.8, 25.4 and 17 per cent respectively. On an average, packaging was found to be the most important quality attribute.

Mani and Srinivasan (1990) analysed in his study that the consumers were loyal to the particular brand of the product for various reasons and also revealed that consumers were more cautious about the taste of the product than price or keeping quality.

Van Gaasbeek and Bouwman (1991) applied conjoint analysis in market research for horticultural products. The main objective was to analyse the market for Dutch onions. A sample of 4000 respondents was considered for the study. The study revealed that price and firmness were the attributes which were much preferred for the purchase of onions.

Vickers (1993) used conjoint analysis to asses the influence of taste, health claim, price and brand on purchasing strawberry yogurt. Taste and health claim had the largest influence on buying intent. Brand had little influence on buying behaviour.

Gursharan (1994) studied consumers views, pattern and determinants of consumption of apples. For the study, 400 households were selected randomly in the urban areas of Punjab. The study revealed that the consumer's preference towards apple was in the sequence of taste followed by nutritive value, medicinal value, relative cheapness, easy digestibility, keeping quality and flavour.

Gerhardy and Ness (1995) used conjoint analysis technique to obtain the relative importance attached by the consumer to the quality attributes of eggs. The study was conducted using a sample of 160 respondents from five locations in the United Kingdom. It was observed that the method of production received the highest relative importance (30.4 %). Price, origin and freshness indicators (date of packing), in that order, also were considered as important by the consumers.

Huang and Fu (1995) interviewed 174 Taiwanese housewives for their evaluation of various Chinese sausages attributes. Conjoint analysis was used to analyze the housewives preferences for the selected sausages attributes.

Mohanram *et al.* (1996) studied the preference for organic vegetables. Among prominent vegetables consumed, bhendi and brinjal were rated as being first and second in preference. Nearly 71 per cent of the consumers perceived the vegetables grown without using chemical fertilizers and pesticides to be tastier and good for health. It was suggested that high middle income group families should be targeted for organic produce.

Sharma (1997) studied the consumer behavior and consumer preference for food items in general. The results of his study indicated that price was the most important factor that influenced the consumer's choice of food items. Other factors that had a significant influence on the consumption of food were age, gender, income and sensory attributes.

Amita (1998) reported that the quality preferences expressed by consumers for table butter in the order of their relative importance were good spreadability, low salt content, price and color. For ghee, granular texture, well-cooked flavor, golden brown color and low price were the important attributes. For cheese, texture and price were the preferred attributes. The results of the conjoint analysis showed that the consumer's were more quality conscious than price.

Srinivasan and Elangovan (2000) examined the consumer perception towards processed fruits and vegetables and reported that consumer with higher educational level were found to consume more processed products. The quantities of processed fruit and vegetable products were consumed more in high income group. The increase in price would result in discontinuance of the use of processed product. Consumers preferred processed products because of convenience of ready to eat form.

Sudhir (2000) examined the quality preference of Mango. The study reported that out of the attributes selected, taste was attached highest importance by the urban consumers and price was attached highest importance by the rural consumers. Colour and variety were not so important attributes considered by both the groups. Hybrid variety was much considered by urban where as local variety was desired by rural consumers. Preference for the mango with creamy pulp had much preference by urban and rural consumers.

Cavard and Moreau (2003) undertook a survey of 2000 French consumers to study their behaviour regarding the purchase of fruit and vegetables. The weekly purchase was noticed. Regarding place of purchase, supermarkets came first, followed closely by markets. In terms of mode of purchase, the self service with assisted weighing was a preferred option. Consumer expectations concern better control of labelling and quality on the selling place, with an indication of consume-by date. The old-aged consumers appeared to be less concerned with the additional information.

Ramasamy *et al.* (2005) in their study suggested that the buying behavior of instant food products was strongly influenced by awareness and attitude towards the product. Commercial advertisements over television was said to be the most important source of information, followed by displays in retail outlets. Consumers did build opinion about a brand on the basis of which various product features played an important role in the decision making process. A large number of respondents laid emphasis on quality and felt that price was an important factor, while others attached importance to image of the manufacturer.

2.4 CONSTRAINTS IN CONSUMPTION

Mani and Srinivasan (1990) analysed the reasons for not purchasing the processed products. The study revealed that the consumer's inspite of very high income, some of them never purchased certain type of processed products for various reasons. Generally some of the consumers did not prefer processed products as they felt that they were costlier and luxurious items. Moreover the processed product such as jam, canned fruits and sauce were considered as products meant for elite group of people and hence the middle and upper middle classes people started consuming these products recently.

Sharma (1997) studied the consumer's quality preference for selected cut flowers in Bangalore city. The study highlighted that all the consumers were highly price conscious. Majority of price conscious consumers had a low income due to which they could not afford to buy expensive cut flowers. All the commercial varieties were exotic which were cultivated only under hi-tech condition resulting in high cost of production.

Sudhir (2000) examined the consumer preference for mango in Bangalore urban and rural areas. The study revealed that most of the consumers both in Bangalore urban and Bangalore rural districts were not aware of the fact that the chemicals used in mango could be injurious to health.

Mutlu (2004) studied food away from home consumption in Spain. The economic framework to study consumer behavior on food away from home was based on the household production Theory by Becker, (Becker's Model). This model states that consumers maximize their utility subject not only to the budget constraint but also to a time constraint. Moreover, this model assumed that consumers demand not only the food product itself but also the associated convenience to save time in food preparation. Therefore, the relation between the value of time and food away from home had a high relevance.

Rammappa (2004) concluded that the high cost was an important reason for non-consumption of panner by significant proportion of households.

Oteku (2006) conducted a study on "An Assessment of the Factors Influencing the Consumption of Duck Meat in Southern Nigeria". The study revealed that consumer acceptability, consumption pattern, and preference for the duck and its meat production in Southern Nigeria were assessed, using Edo state as a case study. About 250 well structured and computer-validated questions were administered to about 200 respondents. Familiarity, degree of likeness, sanitary condition of duck and the consumption constraints were assessed. Also determined were consumption frequency, sensory comparison of duck and chicken meats as well as motivational and preferred methods of preparation of the meat. Duck meat was nevertheless acceptable and rated fairly by most of the respondents. Consumption of duck meat was however constrained by non availability, non-familiarity, inability to slaughter the live duck and some traditional and religious taboos associated with the meat.

Indumathi *et al.* (2007) studied the consumers buying behaviour of processed spice products. The objective of the study was to identify the problems faced in the use of processed spice products. The study was conducted in Bangalore and Chennai cities. The study consisted of 200 consumers by following simple random procedure. The study highlighted the problems faced by consumers in using the processed spice products. The problems identified were the addition of preservatives, decrease in flavour and aroma due to opening and closing of the packets, the product was not standard in consistency and pungency and lastly the high price of the product

3. METHODOLOGY

The present investigation is undertaken to know the important views of the consumers towards the processed horticultural food products. This chapter deals with the brief description of the study area, sampling design, sources of data and analytical techniques adopted to analyze the data.

3.1 DESCRIPTION OF THE STUDY AREA

This study is conducted in Dharwad district of Karnataka state. Dharwad district is selected purposively to study various issues of consumer behaviour and preferences for processed horticultural products. An attempt is made to provide a brief description of the district in this section.

3.1.1 Location

Dharwad district is situated in the Northern part of Karnataka state at 15° 15′ and 15° 35′ Northern latitude and 75° 00′ and 75° 20′ Eastern latitude. The district comes under the transition zone. It is bound by Belgaum in the North, Haveri in the South, from North East to South East by Gadag district. The District is divided into 3 belts geographically, viz; malnad, transition and dry regions. The district has 5 taluks, Kalaghatagi taluk comes under malnad, Dharwad taluk comes under transition and Hubli, Kundgol and Navalgund taluks come under dry regions. The district has 390 villages. Dharwad and Hubli taluks fall in the western part of Dharwad district.

3.1.2 Geographic and Demographic Features

The salient geographic and demographic features of the study area (Fig. 1) and the sample taluks are presented in Table 3.1. Dharwad district is having an area of 4263.00 sq. km. Dharwad, Hubli and Navalgund taluks have an area of 1032.00 sq. km, 631.00 sq km and 1080.00 sq. km respectively. The total population of Dharwad district as per 2001 census was 16.04 lakhs of which Dharwad taluk had 2.19 lakhs, Hubli taluk 2.28 lakhs and Navalgund 1.77 lakhs population. The density of population of Dharwad district was 377 persons per sq. km as against 219 persons, 163 persons and 207 persons per sq. km in Dharwad, Hubli and Navalgund taluks, respectively.

The literacy per cent in the district is 71.87 per cent and that of the sample taluks is 59.31 per cent, 63.88 per cent and 64.11 per cent in Dharwad, Hubli and Navalgund taluks respectively. The average annual rainfall of the district is 772mms and actual rainfall is 969 mm. There are 540 fair price shops in the district of which highest of 212 are in Hubli, followed by 177 in Dharwad and 49 in Navalgund taluks. The number of ration card holders in the district is 3, 53,697, and it is 1, 29,142 in Hubli and 1, 18,791 in Dharwad and 39,169 in Navalgund taluks.

The net irrigated area of the district is 40,356 ha. The highest net irrigated area of 23,888 ha was in Navalgund. The district has 14 hoblies of which 4 are in Dharwad, 3 in Hubli and 2 in Navalgund. The district has 152 commercial banks, 52 grameena banks, 15 urban cooperative banks and 5 P.L.D.Banks. The district also has 16 markets with a fair distribution in taluks.

Soils in Dharwad district comprise of red, medium and deep black soils. The Malaprabha is the only major river that flows in the district. Most of the rainfall in the district is confined to the period from June- September. The maximum temperature is 38^0 c. The temperature is very cool from the month of December to January.

3.1.3 Land Utilization Pattern

The land utilization pattern of the study area is furnished in Table 3.2. The total geographic area of the district is 4, 27,329 ha. The share of net sown area of Dharwad, Hubli and Navalgund taluks to the district is 23.22 per cent, 16.97 per cent and 28.64 per cent respectively. The area under forest was 35,235 ha for Dharwad district and 13,676 ha and 2,033 ha in Dharwad and Hubli taluks respectively. The district has 26,876 ha of the fallow land and it is 8,046 ha, 8,049 ha and 9,378 ha for Dharwad, Hubli and Navalgund taluks respectively.

Table 3.1: Salient features of Dharwad district and sample taluks

Sl.No.	Particulars	Dharwad district	Dharwad Taluk	Hubli Taluk	Navalgund Taluk
1.	Geographical area (in 00's sq. km)	4263	1032	631	1080
2.	Inhabited village (No.)	372	110	58	58
3.	Population (No.)	1604253	218961	228380	176648
4.	Rural population (No.)	722336	202671	128380	128736
5.	Urban population (No.)	881917	16290	10000	47912
6.	Population density (No. per sq km)	377	219	207	163
7.	Literacy (%)	71.87	59.31	63.88	64.11
8.	Normal rainfall (mm)	772	838	693	612
9.	Actual rainfall (mm)	969	905	1496	629
10.	Fair price shops (No.)	540	177	212	49
11.	Ration card holders (No.)	353697	118791	129142	39169
12.	Net irrigated area (in ha)	40356	5915	5721	23888
13.	Hoblies (No.)	14	4	3	2
14.	Banks (No.)				
	i) Commercial banks	152	45	89	8
	ii)Grameena banks	52	17	14	8
	iii)Urban cooperative banks	15	2	11	1
	iv)P.L.D. Banks	5	1	1	1
15.	Markets (No.)	16	2	4	6

Source: Dharwad district at a glance, 2005-06, District Statistical Office, Dharwad

Fig.1. Map showing study area

The area irrigated by different sources in Dharwad district has been presented in Table 3.3. The canals and bore wells are the major sources of irrigation in Dharwad district. The total irrigated area came to 40,356 ha in Dharwad district and it is 5,915 ha, 5,721 ha and 23,888 ha for Dharwad, Hubli and Navalgund taluks respectively. The canals are the major sources of irrigation in Navalgund taluk while bore wells are the major sources of irrigation in Dharwad taluk.

3.1.4 Cropping pattern

The major crops grown in the district are represented in Table 3.4. The major crops grown are jowar, wheat, paddy and maize in cereals crops and gram and tur in pulses. The major cereal crops in Dharwad, Hubli and Navalgund taluks are paddy, jowar and wheat. The share of Navalgund taluk in area of both jowar and wheat crops was highest. Gram is grown extensively in Navalgund and Dharwad taluks.

The area under of spices was highest in Hubli taluk (15,129 ha) followed by Navalgund (11,349 ha) taluk. The area under fruits was highest in Dharwad taluk (3,096 ha) followed by Hubli taluk (1,001 ha). The area under sugarcane was highest in Dharwad taluk (1,652 ha). The oilseed area was more in Dharwad taluk (25,558 ha) followed by Navalgund taluk (17,577 ha). The area under non-food crops was 31,300 ha, 34,365 ha and 37,028 ha in Dharwad, Hubli and Navalgund talukas respectively.

3.2 NATURE AND SOURCE OF DATA

The present study is mainly based on the primary data collected from the sample respondents spread in urban, semi-urban and rural areas of the Dharwad district. The information on various issues of processed horticultural food products was obtained with the help of well structured and pre tested schedules.

3.2.1 Selection of processed horticultural food products

Increased urbanization, education, income, number of working women and changing lifestyle has brought about considerable changes in the consumption pattern in the recent years. The processed ready to eat foods have become popular. Among the different processed food products only the important processed horticultural food products were selected for the study based on the opinions elicited from the consumers and marketers. The important processed horticultural food products consumed by the households in the district were chips, pickles, chilli powder, jam, sauce and turmeric powder. Hence, these food products are selected for the study.

3.2.2 Sampling procedure

To study the consumption pattern of processed horticultural food products multi-stage random sampling technique was adopted. In the initial stage Dharwad district was selected purposively as no such studies are conducted in the district and the district was quite familiar to the researcher.

The objectives of the study are analysed using primary data collected through survey in Dharwad district. Processed horticultural food products among other things, is likely to vary across locations. Therefore, it was decided to select a sample of 60 consumers each located in urban area, semi-urban and rural areas of the selected district. The consumers located in taluka places of Dharwad district were considered to represent urban area while those located in the hoblies and villages were respectively considered to represent semi-urban and rural consumers. To give a fair representation, three taluks out of a total of five taluks in the district were chosen randomly in the first stage. In the next stage 20 consumers were selected randomly from each of the selected taluk to make a sample of 60 urban consumers. The three taluks selected were Dharwad, Hubli and Navalgund taluks.

For the selection of semi-urban consumers, the hoblies of the taluks which were already selected to represent urban consumers were considered in the first stage. In the second stage, one hobli from each of the three selected taluks was randomly chosen and in the third stage 20 consumers were randomly selected from each of three hoblies to make a sample of 60 semi-urban consumers. The hoblies selected were Aminbhavi, Sirguppi and Morab. For selection of rural consumers, the taluks and hoblies selected to represent urban

Table 3.2: Land utilization pattern in the study area and sample taluks (2005-06)

(Area in ha)

Sl no	Particulars	Dharwad district	Dharwad taluk	%*	Hubli taluk	%*	Navalgund Taluk	%*
1.	Geographical area	427329	111788	26.16	73707	17.25	108218	25.32
2.	Area under forest	35235	13676	38.81	2033	5.77	0	0.00
3.	Land not available for cultivation	3571	19.59	54.86	652	18.26	8	0.22
4.	Cultivable waste	2669	1531	57.36	106	3.97	61	2.29
5.	Fallow land	26876	8046	29.94	8049	29.95	9378	34.89
6.	Net sown area	333310	77388	23.22	56567	16.97	95453	28.64

Source: Dharwad district at a glance 2005-06, District Statistical Office, Dharwad.

* Percentages are share of the taluk in the district.

Table 3.3: Irrigation status in Dharwad district

(Area in ha)

Sl No.	Source of irrigation	Dharwad district	Dharwad taluk	Hubli taluk	Navalgund taluk
1	Canals	26726	-	2934	23792
2	Tanks	191	191	-	-
3	Bore wells	13212	5654	2630	96
4	Others	227	70	157	-
	Total irrigation	40356	5915	5721	23888

Source: Dharwad district at a glance 2005-06, District Statistical Office, Dharwad.

Table 3.4 Area under major crops in Dharwad district

(in ha)

Sl.No	Crops	Dharwad district	Dharwad Taluk		Hubli Taluk		Navalgund Taluk	
			Area	%*	Area	%*	Area	%*
1.	Paddy	23825	13328	55.94	724	3.039	26	0.11
2.	Jowar	57816	15299	26.46	11314	19.57	15543	26.9
3.	Wheat	39502	6941	17.57	5591	14.15	20004	50.6
4.	Maize	20723	5416	26.14	3835	18.51	2439	11.8
5.	Ragi	129	0	0	26	20.16	0	0
6.	Other cereals	3716	1861	50.08	1216	32.72	0	0
7.	Total cereals	145711	42845	29.40	22706	15.58	44059	30.2
8.	Gram	39111	14077	35.99	3970	10.15	18594	47.50
9.	Tur	2893	897	31.01	845	29.21	109	3.77
10.	Other pulses	50714	12267	24.19	8027	15.83	23575	46.50
11.	Total pulses	92718	27241	29.38	12842	13.85	42278	45.60
12.	Total food grains (7+11)	238429	70086	29.39	35548	14.91	86337	36.20
13.	Spices	60583	868	1.43	15129	24.97	11349	18.70
14.	Fruits	5569	3096	55.59	1001	17.97	43	0.77
15.	Vegetables	40741	7104	17.44	8883	21.80	20658	50.70
16.	Sugarcane	2018	1652	81.86	61	3.02	0	0.00
17.	Oil seeds	87416	25558	29.24	13156	15.05	17577	20.10
18.	Non-food crops	176150	31300	17.77	34365	19.51	37028	21.00

Source: Dharwad district at a glance, 2005-06, District Statistical Office, Dharwad.

* Percentages are share of the taluk in the district.

and semi-urban consumers were considered in the first and second stage. In the third stage, two villages from each of the selected hoblies were randomly selected. Thus, six villages spread in three taluks of Dharwad district were randomly selected. The names of the villages selected were Marevad, Somapur, Hebsur, Byahatti, Yamnur and Shirkol. In the final stage, 10 consumers from each of the six villages were randomly selected to make a sample of 60 rural consumers. Thus, the total sample for the study was 180 consumers located in urban, semi-urban and rural areas of Dharwad district. The sample households were post classified into three income groups for further analysis. The income classification was made based on the annual income. The mean and standard deviation (SD) for income were calculated. The mean ± 0.425 SD is categorized as middle income group (IG_2). The mean minus 0.425 standard deviation was categorized as low income group (IG_1). The mean plus 0.425 standard deviation was categorized as high income group (IG_3). The income classification for urban, semi-urban and rural households was made separately, because of wide gap in their income levels and the range of income is given in Appendix.1.

Based on food consumption pattern in urban, semi-urban and rural areas of Dharwad district, the food items selected include rice, wheat, ragi, maize and jowar among cereals, red gram, black gram, bengal gram, green gram, peas and soyabean among pulse, fruits, vegetables, edible oil, milk and milk products, nut/dry fruits, meat, egg, sugar, salt, spices, beverages, etc. The processed horticultural food products included jam; sauce/ketchup, chips, pickles, chilli powder and turmeric powder. The non- food expenditure items included expenditure on fuels, electricity, clothing, footwear, education, medical, institutional, entertainment, rent, taxes, durable goods, minor personal effects, toilet articles, conveyance, other consumer services and other consumables.

Data was collected from the household consumer's i.e decision makers of the respective consuming units. The data was collected in the month of February –March of 2008. The information collected from the consumers pertained to (i) general information from individual respondents on their social, economic, cultural and demographic characteristics like age, educational status, occupation, annual income, family size and family type etc.(ii) annual family expenditure on food and non-food items in general and processed horticultural food products in particular; (iii) information regarding the quantity of processed horticultural food products consumed; (iv) the type of processed product and their sources (purchased and home made and their expenditure pattern ; (v) consumers preference in terms of ranks for different types of processed horticultural food products; and (vi) the information like constraints in the consumption of processed horticultural food products.

3.3 ANALYTICAL TOOLS USED

The details of analytical tools employed in the study to analyse the data are presented in this section.

3.3.1 Tabular Analysis

Tabular presentation was used to compute averages and percentages for various socio-economic characters of consumers. The averages of household consumption and expenditure pattern were computed. Frequencies were used to study the consumption pattern of the selected products. The constraints in consumption were analysed by frequency and percentages.

3.3.2 Multiple Regression analysis

In order to examine the influence of socio-economic and cultural factors on consumption of processed horticultural food products, multiple regression analysis was carried out. The different forms of functions were tried and the one which gave a better fit as indicated by explanatory power, that is, the coefficient of multiple determination (R^2) and significance of the regression coefficients was selected. The dependent variable included in the model was the quantity of annual consumption of processed horticultural food products by the respondents. The functional form of the models used in the study were

i) Linear form

$$Y = A + b_i \sum_{i=1}^{3} Xi + u$$

ii) Log – linear form

$$\ln Y = \ln A + b_i \sum_{i=1}^{3} \ln X_i + \ln u$$

Y = quantity of processed horticultural food product consumed annually (kg)

A = intercept

b_i = regression coefficients

X_1= Price of the product (Rs/kg)

X_2 = Annual income (Rs.)

X_3 = Family size (numbers)

u = random error.

3.3.3 Conjoint Analysis

The conjoint analysis is a versatile marketing technique used in consumer evaluation of value judgments. The conjoint measurement has been developed primarily by mathematical psychologists and in recent years, it has been increasingly used in consumer market research. It is used in the assessment of consumer preferences towards a product and focuses on the evaluation of alternative product 'concept' or types which are defined in terms of specific levels of attributes. The method assumes that overall utility or satisfaction is determined by the utilities contributed by each attribute level and that this can be estimated from respondent's preference rankings and the rating of a set of factorially designed alternative product types. An appealing feature of conjoint analysis is that, it starts at the level of an individual. This feature facilitates the researcher to identify market segments based on the individual consumer's quality perception instead of classifying respondents a priori on socio-economic criteria, which may not always correspond to differences between consumers with respect to the quality evaluation process of the product in question. The conjoint measurement can also be used to explore new product opportunities through combinations of attribute levels that receive high quality evaluations which are not currently met by the existing products. Conjoint measurement is based on the following assumptions that are commonly made in economics and marketing.

i) A product can be described according to the list of set of attributes

ii) The consumers overall judgment in respect to that product is based on these attribute levels.

One of the important requirements in the conjoint measurement is the identification of appropriate attributes to describe the product and the specific and feasible levels of these attributes (Gerhardy and Ness, 1995). On the basis of the objective attributes, representative indicators for a given quality attribute are chosen. Further, the overall judgement of consumers is broken down into the contribution of each attribute level. The contributions of the various attribute levels to the overall judgement are called part-worth's or relative utilities. Another important requirement for the use of the technique is the specification of the basic form of relationship between product attribute and overall judgement. In the present study, the additive conjoint model was used instead of other forms like the interactive and the multiplicative models. The additive model is the simplest and by far the most frequently used model. Moreover, previous studies have shown that this model has comparatively a better fit to the data than the other two models. Further, in this model, the omission of the attribute does not have a major impact on part-worth estimates. The additive model assumes that the

overall evaluations are formed by the sum of separate part –worths or utilities of the attribute levels. The model has been formulated as:

$$Y = \sum_{i=1}^{n} \sum_{j=1}^{m} V_{ij} X_{ij}$$

Where Y denotes the consumers overall estimate on of the product alternative measured in terms of ranks.

V is the part-worth associated with level j (1, 2, 3 . . . . . m) of attributes 'i' (i =1, 2, . . . n) and

X is a dummy variable representing the presence (=1) or absence (=0) of the j^{th} level of i^{th} attribute.

The Ordinary Least Squares (OLS) technique is the most commonly used procedure to estimate the part –worths. The goodness of fit of the model to the data is indicated by the Spearman's rank correlation coefficient between input and estimated values of the dependent variable.

In the present study, it was used to asses the consumers preference for selected processed horticultural food products. Attributes for the selected products were identified based on expert's opinion. The attributes were chosen for each product along with levels is given in Table 3.5. Each combination of attribute levels represented a specific product alternative. For example for Jam high price, good taste, branded was one product alternative. For each product, three attributes with two to three levels for each were chosen which resulted in 12 different product alternatives (2×3×2). The consumers were asked to rank the product alternatives based on attributes they preferred.

Table 3.5 Attributes of selected processed horticultural food products

Sl no	Attributes Levels	Jam	Sauce /ketchup	Pickles	Chilli powder	Chips	Turmeric powder
1	Good Taste High Price Branded						
2	Good Taste Medium Price Branded						
3	Good Taste Low Price Branded						
4	Good Taste High Price Unbranded						
5	Good Taste Medium Price Unbranded						
6	Good Taste Low Price Unbranded						
7	Bad Taste High Price Branded						
8	Bad Taste Medium Price Branded						
9	Bad Taste Low Price Branded						
10	Bad Taste High Price Unbranded						
11	Bad Taste Medium Price Unbranded						
12	Bad Taste Low Price Unbranded						

4. RESULTS

Keeping the objectives in view, the data collected from the respondents was subjected to analysis and summarized in the form of tables. The results of the study are presented under the following headings.

4.1 Socio-economic features of the sample respondents

4.2 Consumption pattern of processed horticultural food products

4.3 Expenditure pattern of sample households

4.4 Expenditure pattern on different processed horticultural food products

4.5 Factors influencing consumption of processed horticultural food products

4.6 Consumer's preference for processed horticultural food products

4.7 Constraints in the consumption of processed horticultural food products

4.1 SOCIO-ECONOMIC FEATURES OF THE SAMPLE RESPONDENTS

The socio-economic profile of the consumers in urban, semi-urban and rural area is presented in Table 4.1. The average annual income of urban, semi-urban and rural consumers was Rs. 2,05,476, Rs. 1,47,709 and Rs. 1,56,327 respectively. The average family size was 4.96, 6.58 and 6.45 in urban, semi-urban and rural families respectively. The average education of the respondents in urban, semi-urban and rural area was 10, 8 and 5 years of schooling respectively. The average age of respondents was 36.55, 34.32 and 38.15 years in urban, semi-urban and rural areas respectively. The average number of children per family was about 2 in all the groups.

The classification of consumers according to their family type revealed that in urban area the proportion of joint families was 20 per cent and the remaining 80 per cent was nuclear families. In semi-urban area, the proportion of joint family was 43.30 per cent and that of nuclear family was 54.67 per cent whereas, it was in the proportion of 63.30 per cent joint family and 36.70 per cent nuclear family in the case of rural area.

The proportion of vegetarian and non-vegetarian consumers in urban area were 68.30 per cent and 31.70 per cent respectively and in the case of semi-urban area the proportion was similar whereas in rural area, the proportion was 73.30 per cent and 26.70 per cent.

Agriculture was the major occupation of the decision maker for 3.30 per cent of the consumers in urban area, for 10 per cent in semi-urban area and for 31.70 per cent in rural areas. The proportion of respondents perusing business was 11.70 per cent, 3.30 per cent and 6.70 per cent respectively in urban, semi-urban and rural areas. The proportion of agricultural labours or coolie in the sample was 6.70 per cent, 16.70 per cent and 10.00 per cent whereas the proportion of housewives in the sample was 55 per cent, 61.70 per cent and 43.30 per cent in urban, semi-urban and rural area respectively. The proportion of working women in the sample was 21.70 per cent, 1.70 per cent and 1.70 per cent in urban, semi-urban and rural area respectively.

The distribution of sample respondents according to income groups is represented in Table 4.2. The sample households were post classified into three income groups based on their annual family income. The urban households with an annual income up to Rs. 1,33,896 (Appendix.1) of urban area were classified as low income group (IG_1); those with an income between Rs. 1,33,896 and Rs. 1,98,318 were classified as medium income group (IG_2); and those with an income more than Rs. 1,98,318 were classified as high income group (IG_3). The classification was based on mean ± 0.425 SD. The proportion of urban households falling under these income groups were 46.67 per cent, 15 per cent and 38.33 per cent respectively in IG_1, IG_2 and IG_3.

Table 4.1. Socio-economic characteristics of sample respondents

Particulars	Urban	Semi-urban	Rural
Family annual income (Rs)	205476	147709	156327
Family size (No's)	4.96	6.58	6.45
Education of respondents (Yrs)	10	8	5
Age of respondents (Yrs)	36.55	34.32	38.15
No. of children / family	1.52	2.00	1.70
Family type :			
Proportion of households with Joint family (%)	12 (20.00)	26 (43.30)	38 (63.30)
Proportion of households with Nuclear family (%)	48 (80.00)	34 (54.67)	22 (36.70)
Food type :			
Proportion of Vegetarian households (%)	41 (68.30)	30 (50.00)	44 (73.30)
Proportion of Non-vegetarian households (%)	19 (31.70)	30 (50.00)	16 (26.70)
Occupation of decision maker			
a) Agriculture	2 (3.30)	6 (10.00)	19 (31.70)
b) Business	7 (11.70)	2 (3.30)	4 (6.70)
c) Agricultural labours (Coolie)	4 (6.70)	10 (16.70)	6 (10.00)
d) House wives	33 (55.00)	37 (61.70)	26 (43.30)
e) Working women	13 (21.70)	1 (1.70)	1 (1.70)
f) Others	1 (1.70)	4 (6.70)	4 (6.70)

Note: Figures in the parentheses indicates percentages

For semi-urban area, the households with an annual income up to Rs. 90,385 were considered to belong to low income group (IG_1), those with an annual income between Rs. 90,385 and Rs. 2,05,033 were classified as medium income group (IG_2); and finally those with an income of more than Rs. 2,05,033 were classified in high income group (IG_3). Accordingly, the number of households in different groups was 21 (35 %), 26 (43.33 %) and 13 (21.67 %) respectively in IG_1, IG_2 and IG_3.

The rural households with an annual income up to Rs. 93,922 were considered to belong to low income group (IG_1), those with an income between Rs. 93,922 and Rs. 2,18,730 were classified as medium income group (IG_2), and those with an income of more than Rs. 2,18,730 were classified as high income group (IG_3). The number of households in different groups was 20 (33.33 %), 29 (48.33 %) and 11 (18.33 %) in IG_1, IG_2 and IG_3 respectively.

4.2 CONSUMPTION PATTERN OF PROCESSED HORTICULTURAL FOOD PRODUCTS

The distribution of sample respondents according to the sources of processed horticultural food products consumed in urban, semi-urban and rural is represented in Table 4.3. The two major sources of products were identified. They were purchased and home made. The source wise distribution of the sample respondents in urban area revealed that in the case of jam, 39 out of 60 respondents (65 .00%) purchased branded product and 21 (35.00 %) did not use. Only five per cent and 10 per cent of consumers in semi-urban area and rural area respectively purchased jam. With regard to sauce/ ketchup, 28 respondents (46.70 %) consumed branded product and 32 (53.30%) were found to be not using. Not even a single consumer in rural area was found to use sauce/ ketchup while it was used by only 3.30 per cent of the semi-urban respondents. In the case of pickles, 23 (37.70 %) purchased a branded product, three (5.00 %) purchased unbranded product, 35 (57.30 %) were found to use home made product and one respondent (1.70 %) did not use. More than 83 per cent of semi-urban and rural consumers used home made pickles. Majority of the urban consumers (56.70 %) depended on home made product and only 35 per cent of them purchased the unbranded chips. Most of the consumers in semi-urban and rural areas preferred home made chips for consumption. In the case of chilli powder, 10 (16.70 %) consumers purchased branded product and 50 (83.30 %) consumers used home made product. Majority of the rural and semi-urban consumers used home made chilli powder. With regard to turmeric powder, three out of 60 respondents (5.00 %) used branded product, 43 (71.70 %) used unbranded product and 14 (23.30 %) used home made product in urban area. The use of unbranded turmeric powder was very high in semi-urban and rural areas.

The proportion of semi-urban and rural consumers not using jam was to the extent of 95 per cent and 90 per cent respectively. Most of the consumers did not use sauce/ketchup. In the case of pickles, seven (10.70 %) semi-urban consumers consumed a branded product, four respondents (6.15 %) used unbranded product while 54 consumers (83.07 %) used home made product. The main source of chips was home made as 92 per cent of the respondents prepared this at home. In the case of chilli powder none of the respondents purchased branded product. With regard to turmeric powder, unbranded product was more popular in semi-urban and rural area. None of the rural consumers used sauce/ ketchup. In the case of pickles, only 15 per cent of the rural consumers used branded product, while 83 per cent of them used home made pickles.

4.2.1 Consumption of processed horticultural food products across income groups

Table 4.4 represents the distribution of house holds consuming different kinds of processed horticultural food products across income groups in urban, semi-urban and rural areas. In urban area, out of 39 urban households consuming jam, the number of households in IG_3 were 19 (82.61 %), 13 (46.43 %) were in IG_1 and seven (77.77 %) were in IG_2. In the case of sauce/ketchup out of 28 households, there were more number of consumers in income group IG_1 followed by IG_3 with 12 consumers (42.86 %). With regard to pickles and chips, 59 and 58 households respectively consumed them out of which in IG_2 and IG_3 all the respondents consumed while in IG_1 more than 90 per cent respondents consumed. All the households consumed chilli powder and turmeric powder.

Table 4.2. Distribution of sample respondents according to income groups

Income groups (IG)	Annual income levels		
	Urban	**Semi-urban**	**Rural**
Low income group (IG_1)	28 (46.67)	21 (35.00)	20 (33.33)
Medium income group (IG_2)	09 (15.00)	26 (43.33)	09 (48.33)
High income group (IG_3)	23 (38.33)	13 (21.67)	11 (18.33)
Total	60 (100.00)	60 (100.00)	60 (100.00)

Note: Figures in the parentheses indicate percentage to the total

Of the three semi-urban consumers using jam two were in IG_2 and one was in IG_1. None of the respondents used jam in IG_2. In the case of sauce/ketchup, out of two households, the main consuming group was IG_2. No one consumed this product in the other two groups. With regard to pickles, all the households consumed. There were 57 households consuming chips in which 26 (100 %) were in IG_2, 20 consumers (95.24 %) were in IG_1 and 11 consumers (84.61 %) were in IG_3. All the households consumed chilli powder and turmeric powder.

In rural area, only six households consumed jam. The number of jam consuming rural households was three in IG_1, two in IG_2 and one in IG_3. None of the rural households were found to consume sauce/ketchup. All the rural households consumed pickles. There were 55 households consuming chips of which 11 (100.00 %) were in IG_3, 18 (90 %) were in IG_1 and 26 consumers (89.65 %) were in IG_2. All the households consumed chilli powder and turmeric powder.

4.2.2 Annual consumption of processed horticultural food products

Table 4.5 and Fig.2 presents the quantity of annual consumption of processed horticultural food products across different income groups in different locations. In the case of urban area, the overall quantity of jam consumed was 2.33 kgs. The quantity consumed annually was highest (3.43 kgs) in IG_3, followed by IG_1 (1.37 kgs) and IG_2 (1.13 kgs). In the case of sauce/ketchup, the annual consumption was 2.25 kgs. It was highest in IG_3 (3.98 kgs), followed by IG_2 (0.88 kgs) and IG_1 (0.81 kgs). With regard to pickles, the annual quantity consumed was 4.87 kgs. The highest quantity (15 kgs) consumed was by IG_2, followed by IG_3 (7.79 kgs) and IG_1 (5.13 kgs). The quantity of chips used was 7.79 kgs. The highest quantity of chips (9.52 kgs) was consumed by households of IG_3, followed by 7.26 kgs by IG_1 and 4.33 kgs by IG_2 households. With respect to chilli powder, the annual quantity consumed was 6.70 kgs. The highest quantity consumed was 7.31 kgs by IG_1, followed by 6.76 kgs by IG_3 and 5.49 kgs by IG_2 households. The quantity of turmeric powder consumed was 2.66 kgs. There was no much variation in the consumption of turmeric powder across the income groups.

Table 4.3. Distribution of sample respondents according to sources of processed horticultural food products consumption

(No`s)

Products	Urban					Semi-urban					Rural				
	Purchased		HM	N U	Total	Purchased		H M	NU	Total	Purchased		HM	N U	Total
	B	UB				B	UB				B	UB			
Jam	39 (65.0)	0 (0.0)	0 (0.0)	21 (35.0)	60 (100.0)	3 (5.0)	0 (0.0)	0 (0.0)	57 (95.0)	60 (100.0)	6 (10.0)	0 (0.0)	0 (0.0)	54 (90.0)	60 (100.0)
Sauce /ketchup	28 (46.7)	0 (0.0)	0 (0.0)	32 (53.3)	60 (100.0)	2 (3.3)	0 (0.0)	0 (0.0)	58 (96.7)	60 (100.0)	0 (0.0)	0 (0.0)	0 (0.0)	60 (100.0)	60 (100.0)
Pickles	23 (37.7)	3 (4.9)	35 (57.3)	1 (1.7)	61* (100.0)	7 (10.7)	4 (6.1)	54 (83.0)	0 (0.0)	65* (100.0)	9 (15.0)	1 (1.7)	50 (83.3)	0 (0.0)	60 (100.0)
Chips	3 (5.0)	21 (35.0)	34 (56.7)	2 (3.3)	60 (100.0)	0 (0.0)	2 (3.3)	55 (91.7)	3 (5.0)	60 (100.0)	0 (0.0)	2 (3.3)	53 (88.3)	5 (8.3)	60 (100.0)
Chilli powder	10 (16.7)	0 (0.0)	50 (83.3)	0 (0.0)	60 (100.0)	0 (0.0)	3 (5.00)	57 (95.0)	0 (0.0)	60 (100.0)	0 (0.0)	1 (1.7)	59 (98.3)	0 (0.0)	60 (100.0)
Turmeric powder	3 (5.0)	43 (71.7)	14 (23.3)	0 (0.0)	60 (100.0)	1 (1.7)	58 (96.7)	1 (1.7)	0 (0.0)	60 (100.0)	1 (1.7)	58 (96.7)	1 (1.7)	0 (0.0)	60 (100.0)

Note: * Indicates the number has exceeded the total sample as the product was prepared at home and also purchased by some respondents

Figures in the parentheses indicates percent

B-Branded
UB-Unbranded
HM-Home Made
NU-Not Using

Table 4.4. Distribution of sample respondents consuming processed horticultural food products according to income groups

(No`s)

Products	Income Groups			Total
	IG_1	IG_2	IG_3	
URBAN				
Jam	13 (46.43)	7 (77.77)	19 (82.61)	39 (65.00)
Sauce/ketchup	12 (42.86)	4 (44.44)	12 (52.17)	28 (46.67)
Pickles	27 (96.42)	9 (100.00)	23 (100.00)	59 (98.33)
Chips	26 (92.86)	9 (100.00)	23 (100.00)	58 (96.66)
Chilli powder	28 (100.00)	9 (100.00)	23 (100.00)	60 (100.00)
Turmeric powder	28 (100.00)	9 (100.00)	23 (100.00)	60 (100.00)
SEMI-URBAN				
Jam	1 (4.76)	2 (7.69)	0 (0.00)	3 (5.00)
Sauce/ketchup	0 (0.00)	2 (7.69)	0 (0.00)	2 (3.33)
Pickles	21 (100.00)	26 (100.00)	13 (100.00)	60 (100.00)
Chips	20 (95.24)	26 (100.00)	11 (84.62)	57 (95.00)
Chilli powder	21 (100.00)	26 (100.00)	13 (100.00)	60 (100.00)
Turmeric powder	21 (100.00)	26 (100.00)	13 (100.00)	60 (100.00)
RURAL				
Jam	3 (15.00)	2 (6.89)	1 (9.10)	6 (10.00)
Sauce/ketchup	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)
Pickles	20 (100.00)	29 (100.00)	11 (100.00)	60 (100.00)
Chips	18 (90.00)	26 (89.65)	11 (100.00)	55 (91.66)
Chilli powder	20 (100.00)	29 (100.00)	11 (100.00)	60 (100.00)
Turmeric powder	20 (100.00)	29 (100.00)	11 (100.00)	60 (100.00)

Note: Figures in the parentheses indicate percentage to total number of consumers in the respective income groups

Table 4.5.Quantity of annual consumption of processed horticultural food products

(Kgs)

Products	Income Groups			Overall
	IG_1	IG_2	IG_3	
URBAN				
Jam	1.37	1.13	3.43	2.33
Sauce/ketchup	0.81	0.88	3.98	2.25
Pickles	5.13	15.0	7.79	4.87
Chips	7.26	4.33	9.52	7.79
Chilli powder	7.31	5.49	6.76	6.70
Turmeric powder	2.54	2.33	2.90	2.66
SEMI-URBAN				
Jam	0.50	1.50	0.00	1.17
Sauce/ketchup	0.00	0.50	0.00	0.50
Pickles	8.69	11.85	11.69	10.71
Chips	9.25	14.42	9.09	11.58
Chilli powder	11.71	10.73	12.38	11.43
Turmeric powder	2.67	3.97	2.81	3.26
RURAL				
Jam	0.50	0.65	0.50	0.97
Sauce/ketchup	0.00	0.00	0.00	0.00
Pickles	7.45	11.63	11.18	10.96
Chips	14.56	5.07	9.73	12.15
Chilli powder	7.40	6.69	6.73	7.72
Turmeric powder	2.98	3.09	2.50	3.18

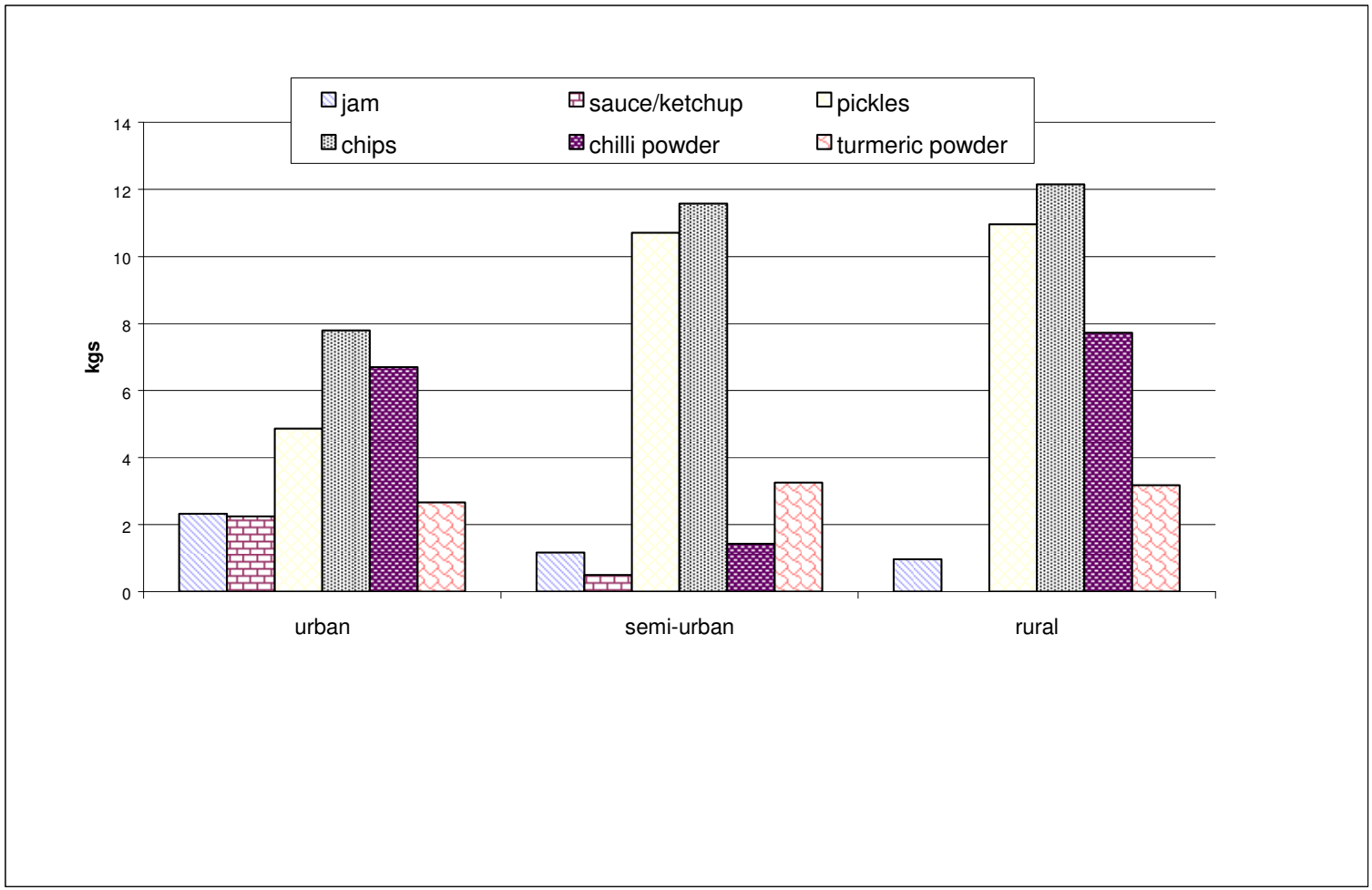


Fig 2. Annual consumption of processed horticultural food products

In semi-urban households, the annual consumption of jam was 1.17 kgs. As far as consumption of sauce/ketchup was concerned, the annual consumption was 0.5 kgs. The annual quantity of pickles consumed was 10.71 kgs. The annual consumption of chips, chilli powder and turmeric powder, was 11.58 kgs, 11.43 kgs and 3.26 kgs. Across the income groups of semi-urban households, the annual consumption of different products varied slightly. The annual consumption of pickles was highest (11.85 kgs) in IG_2 and lowest (8.69 kgs) in IG_1. The annual consumption of chips varied between 14.42 kgs in IG_2 and 9.09 kgs in IG_3. No much variation in the annual consumption of chilli powder across the different income groups was observed.

In the case of rural area, the overall quantity of jam consumed was 0.97 kgs. The quantity of jam consumed was highest in IG_2 (0.65 kgs). With regard to pickles, the annual quantity consumed was 10.96 kgs. The highest quantity of pickles was consumed by IG_2 (11.63 kgs), followed by IG_3 (11.18 kgs) and IG_1 (7.45 kgs). The quantity of chips consumed was 12.15 kgs. Across the income groups, 14.56 kgs of pickles was consumed annually by IG_1 of rural areas. With respect to chilli powder, the annual quantity consumed was 7.72 kgs. There was no glaring difference in the consumption of chilli powder across the income groups. The annual quantity of turmeric powder consumed was 3.18 kgs. The highest quantity of 3.09 kgs was consumed by IG_2 followed by IG_1 and IG_3.

4.2.3. Per capita annual consumption of processed horticultural food products

Table 4.6 and Fig. 3 presents the per capita annual consumption of processed horticultural food products across different income groups in different locations. In the case of urban area, the per capita quantity of jam consumed was 0.52 kgs. The quantity consumed was highest in IG_3 (0.71 kgs). The quantity of sauce/ketchup consumed was 0.48 kgs with the highest of 0.84 kgs being consumed by IG_3. the average quantity of pickles consumed was 1.45 kgs. The highest quantity of 2.00 kgs was consumed by IG_2. The quantity of chips consumed was 1.60 kgs and across the income groups there was no much difference. With respect to chilli powder, the quantity consumed was 1.38 kgs and the highest quantity (1.62 kgs) was consumed by IG_1, followed by IG_3. The quantity of turmeric powder consumed was 0.56 kgs.

With reference to semi-urban area, the annual per capita consumption of jam was 0.16 kgs. The middle income group was found to consume 0.19 kgs. As far as consumption of sauce/ketchup is concerned, the consumption was 0.07 kgs. The respondents in IG_1 and IG_3 were not consuming this product. In case of pickles, the per capita consumption was 1.83 kgs. It was found to be highest of 1.90 kgs by IG_1 followed by 1.84 kgs by IG_2 and 1.68 kgs by IG_3. The per capita consumption of chips was 1.67 kgs with no much variation across the income groups. In the case of chilli powder, the average consumption across income groups was 2.02 kgs and it was 3.05 kgs for IG_1, 1.77 kgs for IG_3 and 1.37 kgs for IG_2. The per capita consumption of turmeric powder was 0.54 kgs with marginal variation across income groups.

The average per capita consumption of jam in rural area was 0.15 kgs. Sauce/ketchup was not found to be consumed in rural area. With regard to pickles, the overall per capita consumption was 1.72 kgs. The quantity consumed was 2.03 kgs in IG_3, and it was 1.73 kgs for IG_2. The quantity of chips consumed per capita was 1.83 kgs. It was highest (2.73 kgs) in IG_1, followed by IG_3 (1.81 kgs) and IG_2 (0.74 kgs). The quantity of chilli powder consumed was 1.23 kgs which varied from 1.29 kgs by IG_1 to 1.09 kgs by IG_2. The per capita quantity of turmeric powder consumed was 0.52 kgs with no much variation across the income groups.

Table 4.6: Quantity of annual per capita consumption of processed horticultural food products

(Kgs)

Products	Income Groups			Overall
	IG_1	IG_2	IG_3	
URBAN				
Jam	0.38	0.27	0.71	0.52
Sauce/ketchup	0.21	0.23	0.84	0.48
Pickles	1.07	2.00	1.64	1.45
Chips	1.54	0.75	1.96	1.60
Chilli powder	1.62	1.02	1.30	1.38
Turmeric powder	0.55	0.49	0.61	0.56
SEMI-URBAN				
Jam	0.08	0.19	0.00	0.16
Sauce/ketchup	0.00	0.07	0.00	0.07
Pickles	1.90	1.84	1.68	1.83
Chips	1.80	1.72	1.48	1.67
Chilli powder	3.05	1.37	1.77	2.02
Turmeric powder	0.65	0.53	0.45	0.54
RURAL				
Jam	0.08	0.10	0.13	0.15
Sauce/ketchup	0.00	0.00	0.00	0.00
Pickles	1.33	1.73	2.03	1.72
Chips	2.73	0.74	1.81	1.83
Chilli powder	1.29	1.09	1.20	1.23
Turmeric powder	0.56	0.49	0.45	0.52

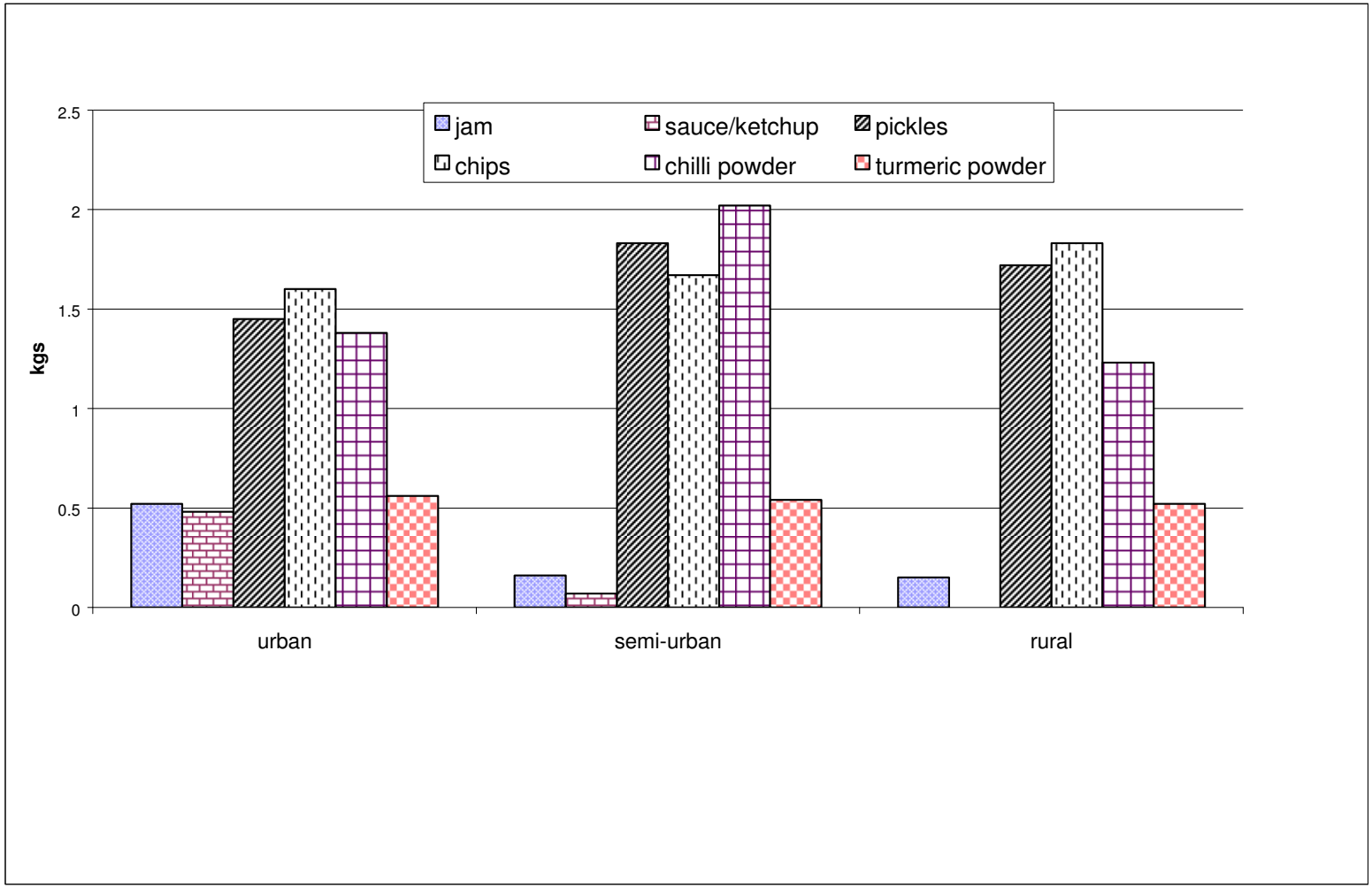


Fig 3.Annual per capita consumption of processed horticultural food products

4.3: EXPENDITURE PATTERN OF THE SAMPLE HOUSEHOLDS

4.3.1 Annual family expenditure of the sample respondents

Table 4.7 and Fig.4 presents the annual expenditure on food, processed horticultural food products and non-food products by households of different income groups of urban, semi-urban and rural consumers. The average annual family expenditure of urban, semi-urban and rural consumers was Rs. 83,237, Rs. 65,377 and Rs. 68,534 respectively. The annual expenditure on processed horticultural food products worked out to be Rs. 2,164 for urban consumers, Rs. 2,037 for semi-urban and Rs. 1,749 for rural consumers. The average food consumption expenditure for the families of urban, semi-urban and rural consumers was respectively Rs. 40,585, Rs. 39,844 and Rs. 42,854. In the case of urban consumers, the average expenditure on non-food items by IG_1 was 40.34 per cent of their total expenditure. The proportion of annual expenditure set aside for non-food items by IG_2 and IG_3 was around 48.30 per cent and 55.65 per cent respectively. The average expenditure on non food item by urban consumers was Rs. 40,487 (48.66 %). The proportion of expenditure made on food items by IG_1, IG_2 and IG_3 was 57.25 per cent, 50.30 per cent and 41.38 per cent respectively and across the income groups the money spent was Rs. 40,585 (48.76 %). The proportion of expenditure made on processed horticultural food products in IG_1, IG_2 and IG_3 was 2.41 per cent, 1.40 per cent and 2.96 per cent respectively. The annual family expenditure on these products was Rs. 2,164 forming about 2.60 per cent of total expenditure across all the income groups.

The share of expenditure on non-food item for IG_1, IG_2 and IG_3 of semi-urban consumers was 38.71 per cent, 35.49 per cent and 34.32 per cent respectively. The average expenditure was Rs. 23,496. The proportion of expenditure made on food by IG_1, IG_2 and IG_3 was 57.99 per cent, 61.36 per cent and 63.48 per cent respectively and with an average expenditure of Rs. 39,845 (60.95 %) across income groups. The proportion of expenditure on processed horticultural food products for IG_1, IG_2 and IG_3 was 3.30 per cent, 3.16 per cent and 2.20 per cent respectively with an annual expenditure of Rs. 2,037 which formed 3.12 per cent of total annual expenditure.

The IG_1, IG_2 and IG_3 of rural consumers were found to spend 38.35 per cent, 35.27 per cent and 28.38 per cent of their total income on non-food items respectively. The average expenditure on non-food items was Rs. 23,930 (34.92 %). The proportion of food expenditure by IG_1, IG_2 and IG_3 was 59.35 per cent, 61.84 per cent and 69.72 per cent respectively with average annual expenditure of Rs. 42,855 forming 62.53 per cent of total expenditure. The proportion of expenditure on processed horticultural food products for IG_1, IG_2 and IG_3 was 2.29 per cent, 2.89 per cent and 1.89 per cent respectively with an average share of 2.55 per cent (Rs. 1,749) in total expenditure.

4.3.2 Annual per capita expenditure of the sample respondents

The annual per capita expenditure on food, processed horticultural food products and non-food products by households of different income groups of urban, semi-urban and rural consumers is presented in Table 4.8 and Fig.5. In the case of urban area, the per capita annual expenditure made on non-food items was Rs. 8,627. The average expenditure made on food items was of Rs. 8,496 across different income groups. The expenditure made on processed horticultural food products by different income groups was Rs. 366 in IG_1, Rs. 306 in IG_2 and Rs. 603 in IG_3 with an average expenditure of Rs. 456.

The annual per capita expenditure on non-food items by semi-urban consumers was Rs. 4,325 forming about 36 per cent of total per capita expenditure (Rs. 12,045). The annual food expenditure was Rs. 7,402. The proportion of expenditure made on food by IG_1, IG_2 and IG_3 was 56.59 per cent, 62.39 per cent and 64.77 per cent respectively and across income groups it was 61.45 per cent. The per capita expenditure on processed horticultural food products by IG_1, IG_2 and IG_3 was Rs. 373, Rs. 308 and Rs. 218 respectively with an average expenditure of Rs. 319 per annum per person.

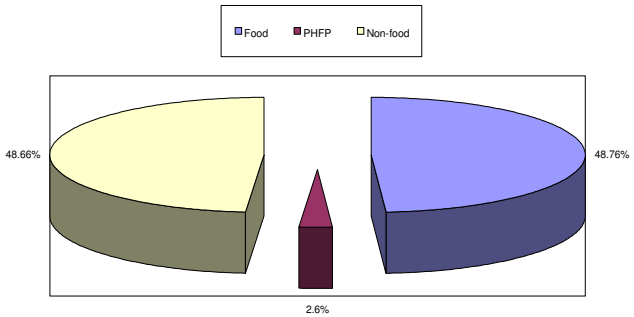
Table 4.7. Annual family expenditure of the sample respondents

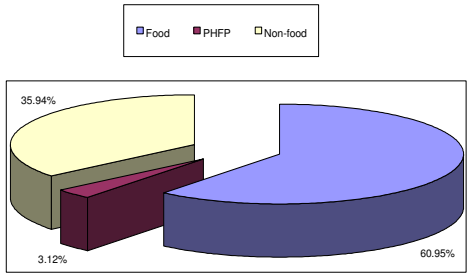
(in Rs)

Products	Urban				Semi-urban				Rural			
	IG_1	IG_2	IG_3	Overall	IG_1	IG_2	IG_3	Overall	IG_1	IG_2	IG_3	Overall
Food	37924.88 (57.25)	47941.83 (50.30)	40945.43 (41.38)	40585.30 (48.76)	25548.95 (57.99)	50139.79 (61.36)	42348.00 (63.48)	39844.78 (60.95)	35292.98 (59.35)	46500.88 (61.84)	46990.91 (69.72)	42854.75 (62.53)
PHFP	1597.10 (2.41)	1334.54 (1.40)	2930.30 (2.96)	2164.64 (2.60)	1455.79 (3.30)	2580.92 (3.16)	1468.40 (2.20)	2037.2 (3.12)	1363.93 (2.29)	2173.70 (2.89)	1275.27 (1.89)	1749.45 (2.55)
Non – food	26727.86 (40.34)	46044.44 (48.30)	55062.96 (55.65)	40487.13 (48.66)	17054.24 (38.71)	28999.00 (35.49)	22895.15 (34.32)	23495.83 (35.94)	22806.45 (38.35)	26526.45 (35.27)	19129.18 (28.38)	23930.28 (34.92)
Total	66249.84	95320.81	98938.69	83237.07	44058.98	81719.71	66711.55	65377.81	59463.36	75201.03	67395.36	68534.48

NOTE: Figures in the parentheses indicate percentage to the total

PHFP- Processed Horticultural Food Products





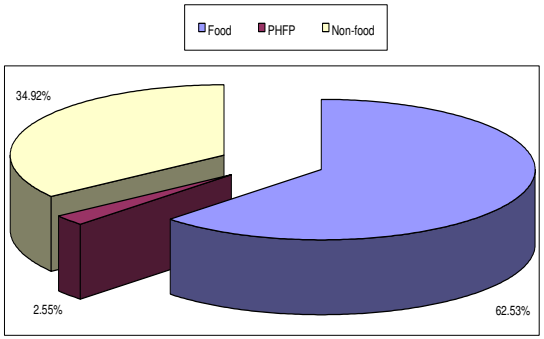


Fig 4: Annual family expepnditure

Table 4.8. Annual per capita expenditure of sample respondents

(in Rs)

Products	Urban				Semi-urban				Rural			
	IG_1	IG_2	IG_3	Overall	IG_1	IG_2	IG_3	Overall	IG_1	IG_2	IG_3	Overall
Food	7920.75 (56.33)	9343.30 (50.76)	8863.67 (41.20)	8495.59 (48.33)	4354.12 (56.59)	10565.29 (62.39)	5997.31 (64.77)	7401.65 (61.45)	6508.07 (58.52)	6762.54 (62.63)	8222.91 (69.04)	6945.45 (62.53)
PHFP	366.06 (2.60)	305.81 (1.66)	602.96 (2.80)	455.5 (2.59)	372.65 (4.84)	307.69 (1.82)	218.35 (2.36)	319.17 (2.65)	242.75 (2.18)	264.28 (2.45)	233.72 (1.96)	250.01 (2.25)
Non – food	5774.28 (41.07)	8758.67 (47.58)	12047.31 (56.00)	8626.60 (49.08)	2967.79 (38.57)	6061.00 (35.79)	3043.68 (32.87)	4324.62 (35.90)	4370.39 (39.30)	3770.15 (34.92)	3453.50 (29.00)	3912.18 (35.22)
Total	14061.09	18407.78	21513.94	17577.69	7694.56	16933.98	9259.34	12045.44	11121.21	10796.97	11910.13	11107.64

NOTE: Figures in the parentheses indicate percentage to the total

PHFP- Processed Horticultural Food Products

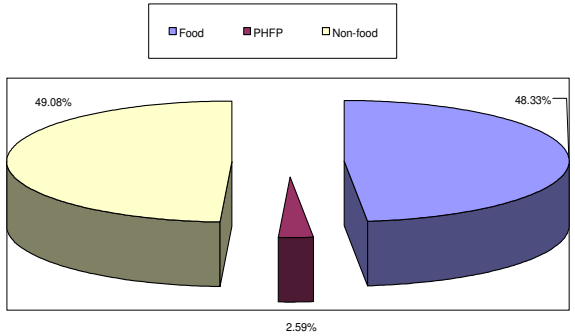


Fig. 5a. Annual per capita family expenditure

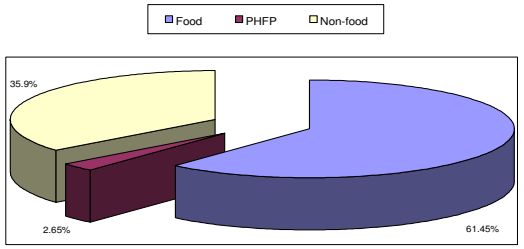


Fig. 5b. Annual per capita family expenditure

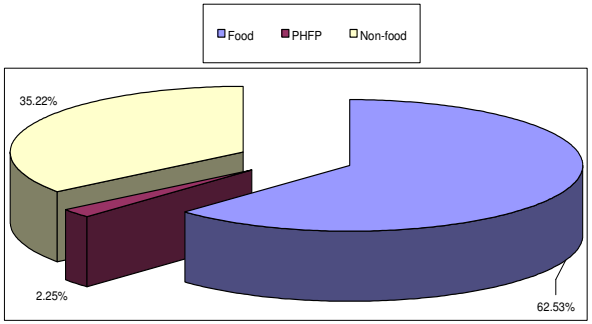


Fig. 5c. Annual per capita family expenditure

Fig 5: Annual per capita family expenditure

The rural consumers were found to spend Rs. 11,107 annually per person of which as much as Rs. 6,945 was spent on food, Rs.250 was spent on processed horticultural food products and Rs. 3,912 was spent on non-food items. The proportion of expenditure made on food, processed horticultural food products and non-food in the total expenditure was respectively 62.53 per cent, 2.25 per cent and 35.22 per cent. Across the income groups of rural consumers there was no much difference either in terms of absolute values or in terms of percentages with respect to per capita annual expenditure on processed horticultural food products.

4.4 EXPENDITURE PATTERN ON DIFFERENT PROCESSED HORTICULTURAL FOOD PRODUCTS

The annual family expenditure on different processed horticultural food products of urban, semi-urban and rural consumers is presented in Table 4.9 and Fig.6. The annual family expenditure on the selected processed horticultural food products was Rs. 2,165 for urban consumers, Rs. 2,037 for semi-urban and Rs. 1,745 for rural consumers. Across the income groups of the consumers located in urban, semi-urban and rural areas no much variation was noticed. However, the expenditure made on processed horticultural food products was slightly more among the IG_3 of urban consumers and IG_2 of semi-urban and rural consumers. Across the income groups and locations, the expenditure made on chilli powder was more when compared to the expenditure made on other products. The annual food expenditure on chilli powder was Rs. 636 in the case of IG_1 of urban consumers and it was Rs.901 in the IG_3 of semi-urban consumers. The proportion of money spent on chilli powder in the total expenditure of processed horticultural food products was varying between 26 per cent for urban consumers and 43 per cent for semi-urban consumers. The share of family expenditure on chips was around 20 per cent of expenditure on processed horticultural food products. The money spent on chips varied between Rs.90 in the IG_3 and Rs. 697 in the case of IG_2 semi-urban consumers. Pickles were next important product consumed by urban, semi-urban and rural consumers. Urban consumers were found to spend Rs. 325 on pickles and it was little less than 300 in the case of semi-urban and rural consumers.

The annual food expenditure on jam and also on sauce/ ketchup by urban families worked to around Rs. 300. The rural and semi-urban consumers spent very little amount on jam. Turmeric powder was another important item consumed by different types of consumers. The expenditure made on turmeric powder was Rs. 227 in the case of urban consumers, Rs. 290 in the case of semi-urban consumers and Rs. 302 in the case of rural consumers. No much variation was noticed with respect to the expenditure made on turmeric powder across different income groups and across locations.

The per capita annual expenditure on these products is presented in Table 4.10 and Fig.7. The per capita annual expenditure on different processed horticultural food products was Rs. 456 in urban areas, Rs. 319 in semi-urban areas and Rs. 250 in rural areas. The annual per capita expenditure on chilli powder was highest for the consumers in different locations. This is also true across different income groups. The next important item of per capita expenditure was chips. The urban consumer spent around Rs. 95 on chips while their counter parts in semi-urban and rural area spent little less than Rs. 40 on this product. The annual per capita expenditure on turmeric powder was between Rs. 45 in the case of semi-urban consumers and Rs. 48 in the case of urban consumers.

The IG_3 of urban consumers were found to spend Rs. 54 on turmeric powder. The IG_1 of semi-urban consumers and IG_2 of rural consumers spent Rs. 49 on turmeric powder. The per capita annual expenditure on pickles was Rs. 63 for urban consumers. The IG_2 and IG_3 of urban consumers spent almost the double the amount spent by IG_1. The per capita annual expenditure on pickles for semi-urban and rural consumers was around Rs. 45. The different income groups of rural consumers were found to spend similar amount on pickles. Sauce/ ketchup were not consumed by any consumers in rural area. Only IG_2 semi-urban consumers were found to spend Rs. 8 on this product. The per capita expenditure on sauce/ ketchup was Rs. 62 for urban consumers. The IG_3 consumers of urban area spent 18 per cent of the money spent on processed horticultural food products where as the proportion of per capita expenditure on this product by the other two income groups was less than 10 per cent. The per capita annual expenditure on jam came to Rs. 70 for urban consumers, Rs. 20 for semi-

Table 4.9. Annual family expenditure on processed horticultural food products

(in Rs)

Products	Urban				Semi-urban				Rural			
	IG_1	IG_2	IG_3	Overall	IG_1	IG_2	IG_3	Overall	IG_1	IG_2	IG_3	Overall
Jam	180.00 (11.27)	155.40 (11.64)	459.70 (15.59)	311.87 (14.41)	68.00 (4.67)	195.00 (7.56)	0.00 (0.00)	152.67 (7.49)	175.33 (12.85)	81.00 (3.73)	68.00 (5.33)	126.00 (7.20)
Sauce /ketchup	99.17 (6.21)	108.75 (8.15)	517.30 (17.65)	289.33 (13.37)	0.00 (0.00)	58.00 (2.25)	0.00 (0.00)	58.00 (2.85)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Pickles	189.30 (11.85)	326.39 (24.46)	398.70 (13.61)	325.09 (15.02)	167.38 (11.50)	406.92 (15.77)	238.46 (16.24)	286.58 (14.07)	222.55 (16.32)	361.93 (16.65)	275.00 (21.56)	299.53 (17.12)
Chips	272.50 (17.06)	116.00 (8.69)	748.70 (25.55)	444.19 (20.52)	125.65 (8.63)	696.90 (27.00)	89.55 (6.10)	379.26 (18.62)	131.67 (9.65)	673.65 (30.99)	144.09 (11.30)	390.36 (22.31)
Chilli powder	636.10 (39.83)	453.67 (33.99)	546.00 (18.63)	567.11 (26.20)	889.43 (61.10)	839.40 (32.52)	901.31 (61.38)	870.32 (42.72)	586.35 (42.99)	693.17 (31.89)	550.91 (43.20)	631.48 (36.10)
Turmeric powder	220.10 (13.78)	174.33 (13.06)	259.90 (8.87)	227.05 (10.49)	205.33 (14.10)	384.70 (14.91)	239.08 (16.28)	290.38 (14.25)	248.03 (18.18)	363.95 (16.74)	237.27 (18.61)	302.08 (17.27)
Total	1597.10	1334.54	2930.30	2164.64	1455.79	2580.92	1468.40	2037.2	1363.93	2173.70	1275.27	1749.45

Note: The figures in the parenthesis indicates the percent to the total

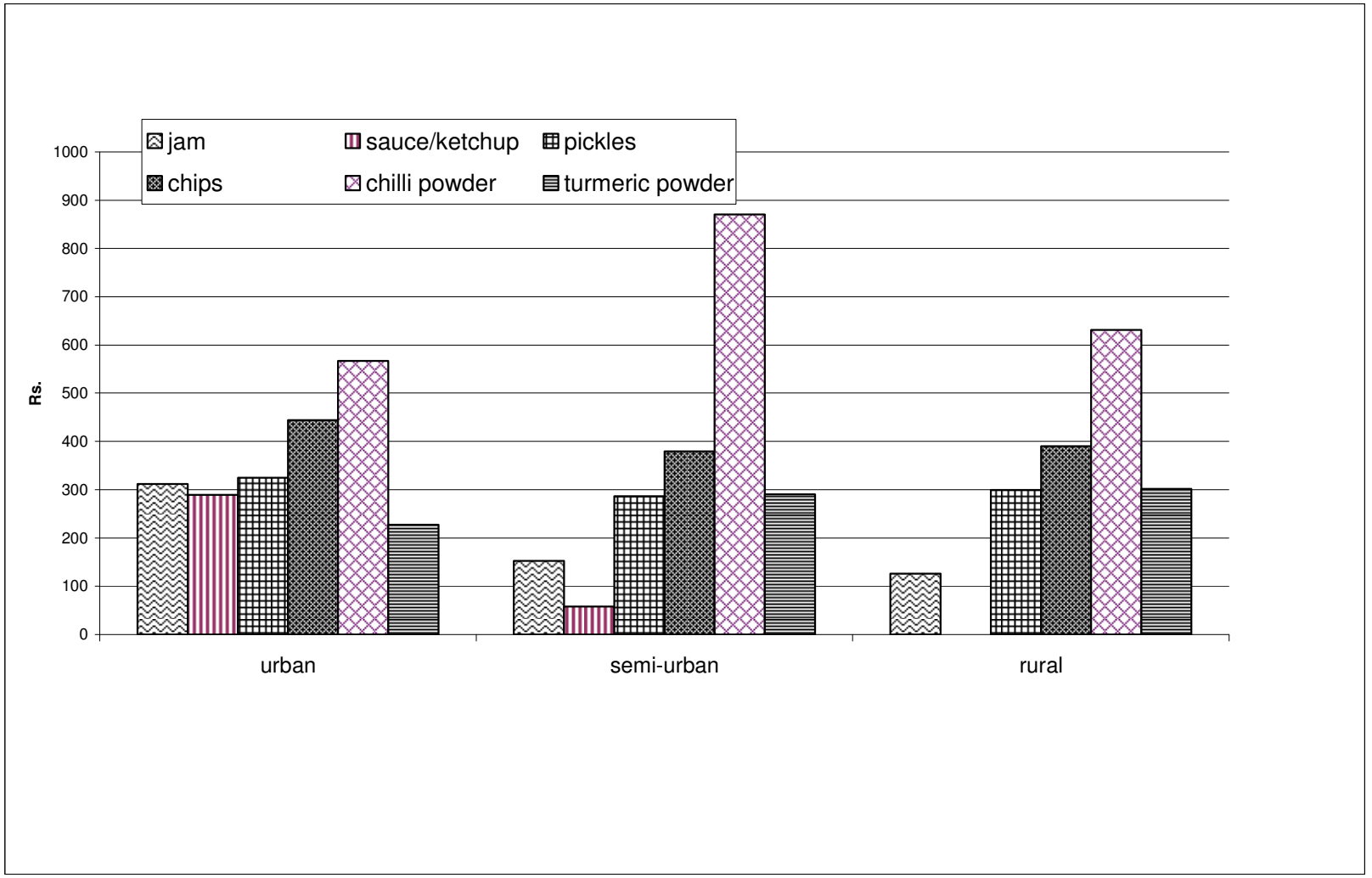


Fig 6. Annual family expenditure on processed horticultural food products

Table 4.10: Annual per capita expenditure on processed horticultural food products

(in Rs)

Products	Urban				Semi-urban				Rural			
	IG_1	**IG_2**	**IG_3**	**Overall**	**IG_1**	**IG_2**	**IG_3**	**Overall**	**IG_1**	**IG_2**	**IG_3**	**Overall**
Jam	49.33	38.50	96.49	70.40	11.33	25.28	0.00	20.63	26.13	12.75	17.00	20.15
	(13.48)	(12.59)	(16.00)	(15.46)	(3.04)	(8.22)	(0.00)	(6.46)	(10.76)	(4.82)	(7.27)	(8.06)
Sauce / ketchup	26.11	27.98	109.50	62.10	0.00	8.06	0.00	8.06	0.00	0.00	0.00	0.00
	(7.13)	(9.15)	(18.16)	(13.63)	(0.00)	(2.62)	(0.00)	(2.53)	(0.00)	(0.00)	(0.00)	(0.00)
Pickles	41.72	87.04	83.07	62.50	39.17	63.65	35.23	48.93	44.44	48.61	47.74	47.06
	(11.40)	(28.46)	(13.78)	(13.72)	(10.51)	(20.69)	(16.13)	(15.33)	(18.31)	(18.39)	(20.43)	(18.82)
Chips	58.98	30.39	155.53	94.40	28.02	59.73	14.34	39.55	26.15	55.54	27.69	36.99
	(16.11)	(9.94)	(25.79)	(20.72)	(7.52)	(19.41)	(6.57)	(12.39)	(10.77)	(21.02)	(11.85)	(14.80)
Chilli powder	142.10	86.31	104.56	118.00	245.26	103.07	133.05	157.40	101.74	98.40	99.13	99.65
	(38.82)	(28.22)	(17.34)	(25.91)	(65.82)	(33.50)	(60.93)	(49.32)	(41.91)	(37.23)	(42.41)	(39.86)
Turmeric Powder	47.82	35.59	53.81	48.10	48.87	47.90	35.73	44.60	44.29	48.98	42.16	46.16
	(13.06)	(11.64)	(8.92)	(10.56)	(13.11)	(15.57)	(16.36)	(13.97)	(18.25)	(18.53)	(18.04)	(18.46)
Total	366.06	305.81	602.96	455.5	372.65	307.69	218.35	319.17	242.75	264.28	233.72	250.01

Note: The figures in the parenthesis indicates the percent to the total

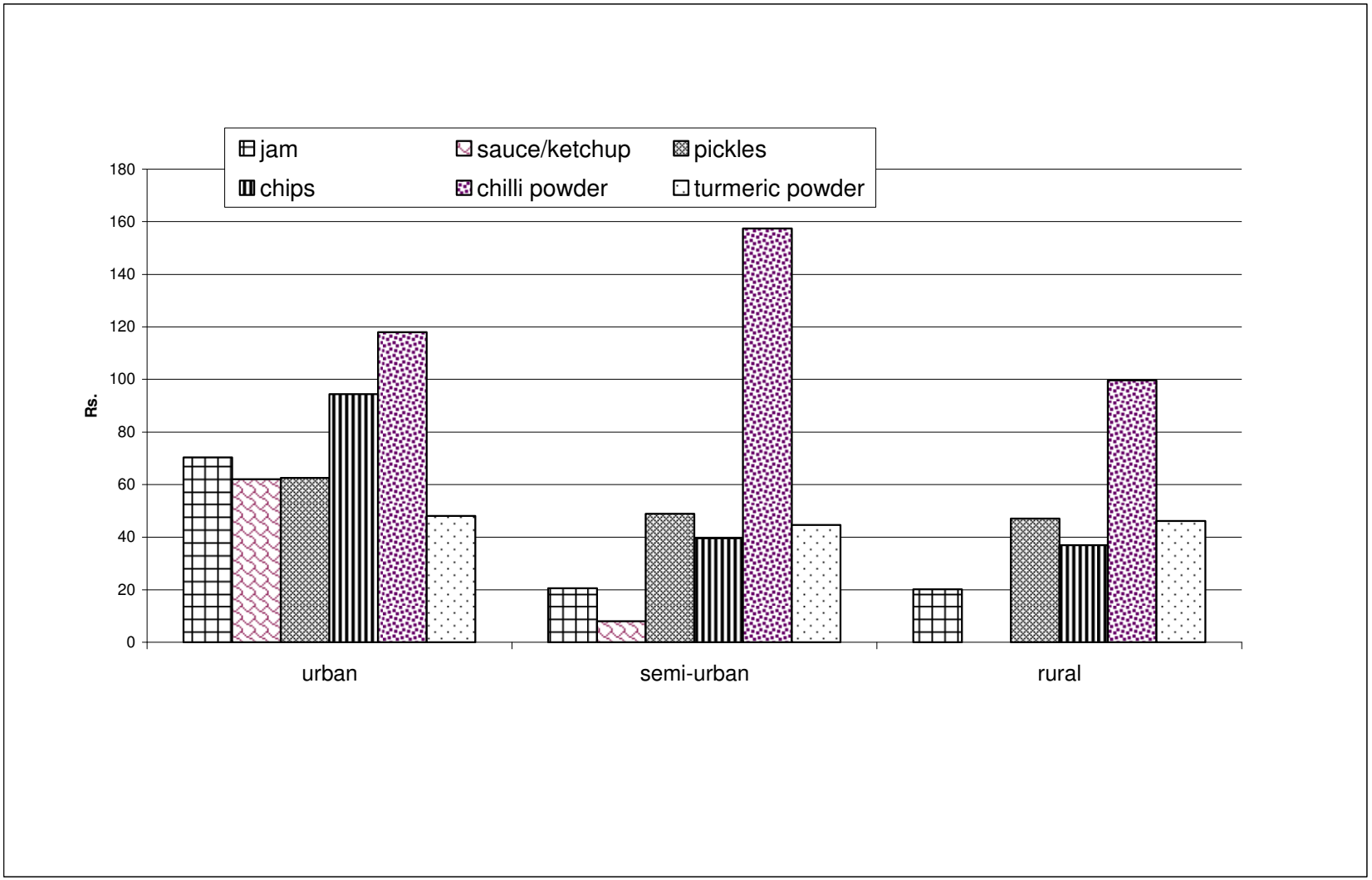


Fig 7: Annual per capita expenditure on processed horticultural food products

urban and rural consumers. The high income urban consumers spent about Rs. 95 on this product.

4.5 FACTORS INFLUENCING CONSUMPTION OF PROCESSED HORTICULTURAL FOOD PRODUCTS

The consumption of processed horticultural food products is influenced by many social, cultural and economic factors. To examine the factors influencing consumption of processed horticultural food products, multiple regression analysis was carried out. Both linear and non-linear functional forms were specified. The dependent variable considered in the model was the quantity of annual family consumption of processed horticultural food products measured in kgs. The independent variables considered were family income (Rs. per annum), price of the product (Rs. per kg) and family size (numbers). The results of the regression analysis for different products are presented in Table 4.11.

The functional form selected for jam was linear. Among the various factors considered, only annual income significantly influenced the consumption. The co-efficient of multiple determination (R^2) was 0.3946, although the R^2 was low it was significant at one per cent level. Price exerted a negative influence on the jam consumption with co-efficient of -0.013255 and was not significant. The regression co-efficient of annual income was 0.000014 and it was significant at one per cent level. This means that with every one unit increase in annual income, the quantity consumed increased by 0.000014 unit which was very meager. The other factors were not significant.

The functional form explaining the variation in sauce/ketchup consumption was linear. The number sample was 30. Among the various factors considered, only annual income significantly influenced the consumption. The co-efficient of multiple determination (R^2) was 0.4540, and it was significant at one per cent level. The price factor had a negative influence on consumption with regression coefficient of -0.089551. It was found not significant. The regression coefficient of annual income (0.000017) was found to be significant at one per cent level which means that with every rupee increase in annual income, the quantity consumed increased by 0.000017 units. The regression co-efficient of family size was negative and not significant.

The functional form of the analysis for pickles was linear. The product price and family size significantly influenced the consumption. The co-efficient of multiple determination (R^2) was 0.3371. It was significant at one per cent level. The price had a negative influence on consumption with regression coefficient of -0.040022 and it was found to be significant at one per cent level implying that with every unit increase in price, the quantity consumed decreased by 0.04 units. The regression coefficient of annual income (0.000004) was found to be not significant. The regression co-efficient of family size was 1.491663 and it was significant at one per cent level. With the increase in family size the quantity consumed would increase by 1.49 units.

The functional form which gave a better fit for the consumption of chips was non-linear. The price and family size significantly influenced the consumption. The co-efficient of multiple determination (R^2) was very low, but found to be significant at one per cent level. The price factor had a negative influence on consumption (-0.153312) and it was found to be significant at five per cent level which indicated that with every one per cent increase in price, the quantity consumed would decrease by 0.15 per cent. The regression coefficient of annual income was found to be not significant. The regression co-efficient of family size (0.721783) was significant at one per cent level which implied that every one per cent increase in family size would increase the consumption by 0.72 per cent.

The functional form used for chilli powder was non-linear. Price, annual income and family size significantly influenced the consumption. The co-efficient of multiple determination (R^2) was 0.2042, and it was significant at one per cent level. The price factor had a negative (-0.469339) influence on consumption and it was significant at one per cent level. With every one per cent increase in price, the quantity consumed decreased by 0.47 per cent. The regression coefficient of annual income (-0.116661) was found to be significant at five per cent level which means with every one per cent increase in annual income, the quantity consumed decreased by 0.12 per cent. The regression co-efficient of family size was

Table 4.11 .Factors influencing consumption of processed horticultural food products

Products /Particulars		**Jam**	**Sauce /Ketchup**	**Pickles**	**Chips**	**Chilli Powder**	**Turmeric Powder**
Functional form	Linear/ Non-linear	Linear	Linear	Linear	Non-linear	Non-linear	Linear
Number of households	n	48	30	179	170	180	180
Intercept		0.534793	9.771359	1.608552	-0.316880	4.316435	0.222499
Price	(X1)	-0.013255 (0.015317)	-0.089551 (0.070417)	-0.040022* (0.013300)	-0.153312** (0.072789)	-0.469339* (0.176197)	0.009544** (0.003995)
Annual Income	(X2)	0.000014* (0.000003)	0.000017* (0.000004)	0.000004 (0.000003)	0.105763 (0.084747)	-0.116661** (0.051646)	0.000001 (0.000001)
Family Size	(X3)	0.065263 (0.231244)	-0.061972 (0.478114)	1.491663* (0.189512)	0.721783* (0.168993)	0.611910* (0.105208)	0.344842* (0.042176)
Co-efficient of multiple determination	(R^2)	0.3946*	0.4541*	0.3372*	0.1601*	0.2042*	0.3446*
F value		9.56	7.21	29.67	10.55	15.05	30.84

Note: Figures in the parentheses indicates standard error

** indicates significance at 5 %
* indicates significance at 1 %

0.611910 and it was significant at one per cent level. This indicated that with every one per cent increase in family size, the quantity consumed increased by 0.61 per cent.

The functional form that gave a better fit for turmeric powder was linear. The price and family size variables significantly influenced the consumption. The co-efficient of multiple determination (R^2) was 0.3446 and it was significant at one per cent level. The price factor with regression coefficient of 0.009544 was found to be significant at five per cent level which means that with every unit increase in price, the quantity consumed increased by 0.009 units. The regression coefficient of annual income was found to be not significant. The regression co-efficient of family size was 0.344842 and it was significant at one per cent level which indicated that with every unit increase in family size the quantity consumed increased by 0.34 unit.

4.6 CONSUMERS PREFERENCE FOR PROCESSED HORTICULTURAL FOOD PRODUCTS

A product is not just a physical object but a bundle of attributes or characteristics which a consumer desires to obtain by which he derives satisfaction. In order to study the important characteristics or attributes consumers look for in processed horticultural food products, conjoint analysis was carried out. For each product considered, most important quality attributes were identified along with their levels. The consumers were asked to rank the attributes according to their preference. The results of the conjoint analysis are presented in Table 4.12.

Jam: The consumers on an average gave 35.66 per cent relative importance to price with a better preference to low priced (utility -0.492) product followed by taste which attracted a relative importance of 33.44 per cent and preference was given to good taste (utility 0.344) and 30.89 per cent the relative importance was given for brand with better preference to branded product (utility -0.116).

Sauce/ketchup: The consumers assigned more relative importance to price (39.17 %) with preference to low priced (utility -0.694) product followed by taste for which relative importance assigned was 32.53 per cent with a preference to good (utility 0.063) product and 28.30 per cent importance was attached to brand with preference to branded product (utility -1.195).

Pickles: The consumers on an average assigned 33.89 per cent relative importance to brand with preference to branded (utility -0.690) products followed by price for which the relative importance assigned was 33.38 per cent and preference was given to low price product (utility -0.481). The relative importance assigned was 32.73 per cent for taste with preference to good taste (utility 0.200) product.

Chips: The consumers gave more importance to brand as indicated by 44.40 per cent relative importance to it with preference to branded (utility -1.253) products followed by price for which the relative importance assigned was 28.42 per cent and preference was given to low price (utility -0.225). The importance assigned was 27.19 per cent for taste with preference to good taste (utility 0.114) product.

Chilli powder: The consumers on an average gave 40.73 per cent relative importance to brand with preference to branded (utility -1.189) products followed by price which attracted 34.25 per cent relative importance and preference was given to low price (utility -0.201) and 25.03 per cent importance was assigned for taste with preference to good taste (utility 0.041).

Turmeric powder : The consumers assigned 38.97 per cent relative importance to brand with preference to branded (utility -1.446) products followed by price for which weight assigned was 31.49 per cent and preference was given to low price (utility -0.421) and 29.54 per cent importance was given for taste with preference to good taste (utility 0.113).

Table 4.12. Relative utility and importance of different processed horticultural food products

Sl no.	Parameters	Attributes	Jam		Sauce/ ketchup		Pickles		Chips		Chilli powder		Turmeric powder	
			RU	RI	RU	RI	RU	RI	RU	RI	RU	RI	RU	RI
1.	Taste	Bad	- 0.344	33.44	-0.063	32.53	-0.200	32.73	-0.114	27.19	-0.041	25.03	-0.113	29.54
		Good	0.344		0.063		0.200		0.114		0.041		0.113	
2.	Price	Low	- 0.492	35.66	-0.694	39.17	-0.481	33.38	-0.225	28.42	-0.201	34.25	-0.421	31.49
		Medium	- 0.984		-1.388		-0.962		-0.450		-0.402		-0.843	
		High	- 1.476		-2.082		-1.443		-0.675		-0.602		-1.264	
3.	Brand	Branded	- 0.116	30.89	-1.195	28.30	-0.690	33.89	-1.253	44.40	-1.189	40.73	-1.446	38.97
		Unbranded	- 0.232		-2.391		-1.380		-2.507		-2.378		-2.892	
4.	Constant		7.658		9.681		8.497		8.830		8.685		9.512	

Note: R U – Relative Utility
R I - Relative Importance

4.7 CONSTRAINTS IN CONSUMPTION OF PROCESSED HORTICULTURAL FOOD PRODUCTS

Table 4.13 presents the constraints faced by the sample respondents in urban area in the consumption of processed horticultural food products. Non-availability was not a constraint in processed horticultural food products. Unawareness was expressed by 4 (6.70 %) respondents and high cost was viewed as constraint by 3 (5.00 %) respondents, not liked by the family was viewed as constraint by 21 (35.00 %) respondents. Two (3.30 %) respondents viewed in sufficient income as constraint.

Not liked by the family was quoted by 30 (50.00 %), unawareness about sauce/ketchup was expressed as constraint by 3 (5.00 %) respondents and high cost was reported by 3 (3.30 %) respondents, respondents and 3 (5.00 %) respondents expressed insufficient income as constraint for consumption of sauce/ketchup.

The high cost was quoted as constraint by 2 (3.30 %) respondents in the case of pickles, not liked by family if purchased was quoted by 41 (68.30 %) respondents and 2 (3.30 %) respondents expressed in sufficient income as major constraint.

With respect to chips, not liked by the family if purchased (55 %), high cost (3.30 %) and income not sufficient (3.3%) were viewed as major constraints.

In the case of chilli powder 70 per cent and 5 per cent of the respondents reported, not liked by the family if purchased and high cost as major constraints. In case of turmeric powder, the major constraint reported was not liked by family if purchased (21.70 %).

Table 4.14 presents the constraints faced by the sample respondents in semi-urban area in consumption of processed horticultural food products. In the case of jam, unawareness (31.70 %), high cost (16.60 %), not liked by family (90.00 %) and insufficient income were (1.70 %) viewed as major constraints.

In the case of sauce/ketchup consumption, unawareness, (35.00 %), high cost (11.70 %), not liked by the family members (93.30 %), and inadequate income were viewed as major constraints for consuming this product.

In the case of pickles, the major constraints reported were high cost (3.30 %) and not liked by the family members if it was purchased (93.30 %).With respect to chips, the constraints were high cost, 3 (5.00 %) and the family members did not like chips if it were to be purchased (98.40 %). In the case of chilli powder the major constraints were high cost (3.30 %) the family members did not like if purchased (96.70 %).

Table 4.15 presents the constraints faced by the sample respondents in rural area in consumption of processed horticultural food products. In the case of jam the constraints reported were unawareness (33.30 %), high cost (15.00 %), not liked by family (88.30 %) and income in sufficient (3.30 %).

The major constraints in sauce/ketchup consumption were unawareness (33.30 %), high cost (5.00 %), not liked by the family (90.00 %) and in sufficient income (5.00 %). In the case of pickles, not liked by family if purchased (85.00 %) was viewed as a major constraint for the consumption of the product. With respect to chips, not liked by the family members if purchased (81.70 %), was reported as major constraint. In the case of chilli powder and turmeric powder not liked by the family members if purchased was reported as a major constraint by majority of respondents.

Table 4.13. Constraints faced by urban sample respondents in consumption of processed horticultural food products

(No's)

Products /Problems	Jam	Sauce /Ketchup	Pickles	Chips	Chilli Powder	Turmeric Powder
Un-awareness	4 (6.7)	3 (5.0)	-	-	-	-
High cost	3 (5.0)	2 (3.3)	2 (3.3)	2 (3.3)	3 (5.0)	-
Not-liked by family	21 (35.0)	30 (50.0)	-	-	-	-
Not-liked by family if purchased	-	-	41 (68.3)	33 (55.0)	42 (70.0)	13 (21.70)
Income not sufficient	2 (3.3)	3 (5.0)	2 (3.3)	2 (3.3)	-	-

*Figures in parentheses indicate percentage to the total number of sample respondents

Table 4.14.Constraints faced by Semi-urban sample respondents in consumption of processed horticultural food products

(No's)

Products /Problems	Jam	Sauce /Ketchup	Pickles	Chips	Chilli Powder	Turmeric Powder
Un-awareness	19 (31.7)	21 (35.0)	-	-	-	-
High cost	10 (16.6)	7 (11.7)	2 (3.3)	3 (5.0)	2 (3.3)	-
Not-liked by family	54 (90.0)	56 (93.3)	-	-	-	-
Not-liked by family if purchased	-	-	56 (93.3)	59 (98.4)	58 (96.7)	1 (1.7)
Income not sufficient	1 (1.7)	1 (1.7)	-	-	-	-

*Figures in parentheses indicate percentage to the total number of sample respondents

Table 4.15.Constraints faced by rural sample respondents in consumption of processed horticultural food products

(No's)

Products /Problems	Jam	Sauce /Ketchup	Pickles	Chips	Chilli Powder	Turmeric Powder
Un-awareness	20 (33.3)	20 (33.3)	-	-	-	-
High cost	9 (15.0)	3 (5.0)	1 (1.7)	1 (1.7)	1 (1.7)	-
Not-liked by family	53 (88.3)	54 (90.0)	-	-		-
Not-liked by family if purchased	-	-	51 (85.0)	49 (81.7)	45 (75.0)	6 (10.0)
Income not sufficient	2 (3.3)	2 (3.3)	1 (1.7)	1 (1.7)	-	-

*Figures in parentheses indicate percentage to the total number of sample respondents

5. DISCUSSION

The results of the study are discussed under the following headings.

5.1 Socio-economic features of the sample respondents

5.2 Consumption pattern of processed horticultural food products

5.3 Expenditure pattern of households

5.4 Expenditure pattern on processed horticultural food products

5.5 Factors influencing consumption of processed horticultural food products

5.6 Consumer's preference for processed horticultural food products

5.7 Constraints in consumption of processed horticultural food products

5.1 SOCIO-ECONOMIC FEATURES OF THE SAMPLE RESPONDENTS

The average annual income of urban, semi-urban and rural respondents was Rs. 2,05,476, Rs. 1,47,709 and Rs. 1,56,327 (Table 4.1) respectively. The annual income of the urban consumers was slightly higher than that of their counter parts in semi-urban and rural area. This was because of better job opportunities and higher education, income/wage levels in urban area. The source of income was also different in urban areas. The average family size was small in urban area which may be because of higher education in the case of urban families and better exposure to the problems of large families. The average education of respondents was more in urban areas due to better schooling facilities available in urban area compared to other locations. There was no much difference in the consumer characters across the locations with respect to age and number of children. The proportion of nuclear families in urban area was high. The family members in urban area moved from place to place in search of better occupation. The proportion of vegetarian families across the locations was more or less similar. Majority of the decision makers with respect to food across the locations were housewives.

Large majority of urban consumers were found to have income up to 1.33 lakh per annum (Table 4.2). About 38 per cent of them also earned income more than 1.98 lakh. It was evident that in urban area low income group (IG_1), medium income group (IG_2) and high income group (IG_3) were in the proportion of 46.67 per cent, 15 per cent and 38.33 per cent respectively. Similarly the proportion in semi-urban area was 35 per cent, 43.33 per cent and 21.67 percent respectively. For the rural households, it was 33.33 per cent, 48.33 per cent and 18.33 percent respectively. Better employment opportunities, higher educational level and better payments enabled urban consumers to earn higher income. In some cases the income earned by the wives was also added to the income. There was no much difference in the annual income of semi-urban and rural consumers. The proportion of consumers in different income groups also did not vary greatly between semi-urban and rural consumers. Around 45 per cent of them were found to earn income in the range of Rs. 90,000 to Rs. 2, 00,000. This implied that the occupational opportunity and wage/salary rates did not differ in rural and semi-urban areas. Most of the housewives in rural and semi-urban areas are not gainfully employed. There fore they had relatively low income when compared to the income of their counterparts in urban area.

5.1.2 Consumption pattern of processed horticultural food products

Only 65 per cent of the sample (Table 4.3) urban consumers used jam. Most of the semi-urban and rural consumers were not consuming jam. All those who were using jam, preferred to buy the branded product. Jam was easily available in urban area and the income of urban consumers permitted them to buy branded product. Sauce was not a popular product in semi-urban and rural areas. About 47 per cent of the urban sample consumers preferred to buy branded sauce. Unawareness, ignorance about the use of sauce could be the reasons for lack of popularity of this product. Pickle was a most popular product across all the locations as it was used by almost all the sample consumers. The users of home made pickle out

scored the branded and unbranded pickles users. This was because the pickles preparation process was not all that difficult and consumers wish to prepare according to their own taste and preference. This was also true for chips and chilli powder. Further home preparation reduces the unit cost. Unbranded turmeric powder was more popular among the consumers of different locations. Branded product was viewed as expensive by most of the consumers. The findings of this study were in line with the findings of the studies by Veena (1996) and Mani and Srinivasan (1990).

5.1.3 Processed horticultural food products consumption across households

Among the six processed horticultural food products considered for the study, four were found to be highly popular as most of the consumers irrespective of their location and income groups (Table 4.4) were using these four products. Jam and sauce were used by less than 10 per cent of the rural and semi-urban consumers. More than 46 per cent of urban consumers were found using jam and sauce. Across the income groups, more number of middle income rural consumers was found to use pickles, chips, chilli powder and turmeric powder. The proportion of rural consumers using these products was slightly less in high income group. In semi-urban area, the number of consumers using the four popular processed horticultural food products was more or less similar in low income and middle income groups. In terms of the proportion of respondents consuming the product to the number of respondents in each group, no much variation was observed across the income groups. Similar trend was observed for semi-urban consumers across different income groups. The proportion of urban consumers using jam and sauce increased with an increase in income. Almost all the urban consumers across different income groups used pickles, chips, chilli powder and turmeric powder. Increased proportion of working women, easy availability, higher income and low family size were the factors helped to consume jam and sauce in urban area. Pickles, chips, chilli and turmeric powder are considered as essential items. The findings of the study were in line with the study by Saxena and Arora (1996) where they noticed the use of turmeric, coriander, chilli powder and pickles by all the sample respondents by all classes. Jam, murraba, fruits squash, sauce etc were not consumed by rural consumers.

5.2 CONSUMPTION PATTERN OF PROCESSED HORTICULTURAL FOOD PRODUCTS

The annual average quantity of jam consumed by urban consumers was 2.33 kgs and it was around one kg for semi-urban and rural consumers. Across the income groups, there was no much variation in the quantity consumed for rural consumers. Considerably high quantity was used by high income urban consumers. The annual consumption of sauce increased with an increase in income. This implied that increase in income facilitated the increased consumption of jam and sauce in urban areas. Thus increased education, awareness and easy availability coupled with higher income prompted the use of more quantity of these two products in urban areas. The quantity of pickles, chips, chilli and turmeric powders consumed annually was slightly higher for semi-urban and rural consumers when compared to that by their urban counterparts. The family size for semi-urban and rural consumers was slightly higher when compared to that for urban consumers. This might be one of the reasons for the difference in annual consumption across the locations. The results of this study were in line with the findings by Veena (1996), Rao (1989) and Mani and Srinivasan (1990) where in they noticed that jam was most popular product among urban consumers and pickles were most popular in rural consumers. Jam was popular in urban areas on account of easy availability, its ready to use character and taste and rural people preferred traditional products like pickles. The results of study by Srinivasan et al (2000) indicated that jam was found to be purchased in high quantity by high income group followed by medium income group and also found that low income group purchased pickles in larger quantity. The consumption of chilli powder and turmeric powder was high in semi-urban and rural areas. This might be due to the reasons that the family size of semi-urban area was slightly high and also the proportion of non-vegetarians and the number of agricultural labours/ coolie were found to be more in rural and semi-urban areas and they required more spicy food.

The examination of the per capita consumption of these four products (Table 4.6) revealed that the semi-urban consumers used slightly higher quantities of these products than their counterparts did in urban and rural areas. The per capita consumption of jam and sauce was much higher for urban consumers. No glaring difference in the per capita consumption of all these products was seen across the income groups. However, the consumers in higher income groups in different locations were seemed to be using slightly higher quantities with one or two exceptions here and there. The per capita consumption of jam, sauce/ketchup and turmeric powder was high in urban areas in view of their easy availability and awareness about the product use or consumption. Soe and Singh (2006) reported that the annual per capita consumption of these products in urban areas was high when compared to that in rural areas. The per capita consumption of pickles was higher both in semi-urban and rural areas. The per capita chips consumption was high for rural consumers which might be due to liking nature and low cost of the product, easy availability of raw material which was produced on their own field. The per capita chilli powder consumption was more in semi-urban area due to higher proportion of non-vegetarians and spicy nature of food required by them.

5.3 EXPENDITURE PATTERN OF THE SAMPLE RESPONDENTS

The share of annual family expenditure made on food in total expenditure (Table 4.7) was highest across all the three locations. The annual family total expenditure in urban areas was understandably higher when compared to that in semi-urban and rural areas. It was about Rs. 20,000 more than that in semi-urban and rural areas. The annual family expenditure on food for urban, semi-urban and rural consumers was around Rs. 40,000. Thus, there was no much difference in the expenditure on food across the locations. Across the income groups within the location, there was a slight variation in the expenditure on food items. The proportion of food expenditure in total expenditure seemed to decline as anticipated with an increase in income for urban consumers. However, no such tendency was observed for semi-urban and rural consumers. In fact the proportion has increased with an increase in the income level for the consumers of these two locations. This might be because of slightly more number of family members in these locations. The annual expenditure on processed horticultural food products was more or less similar for urban and semi-urban consumers (around Rs. 2,000). The share of non-food expenditure was very high for urban consumers and more or less similar for semi-urban and rural consumers. The fact that urban consumers spent more on rent, fuel and durables had resulted in larger proportion of this expenditure in total expenditure. The higher income group of urban consumers and middle income group of semi-urban and rural consumers seemed to spend slightly more on processed horticultural food products than their counterparts did in the other income groups. The non-food expenditure for urban consumers had increased with an increase in income. However, no such definite tendency was observed for semi-urban and rural consumers. The non-food expenditure was highest for urban, semi-urban and rural consumers. Richard and Kumar (2006) noticed that increased educational level of the household heads resulted in the fall of expenditure on food items. The study indicated that the educational level of the household heads had favoured more expenditure on non-food items. The study also reported that highest expenditure on food was made by very poor classes of households. The slightly higher expenditure on processed horticultural food products for urban consumers might be due to higher income, easy availability and awareness of these products. The results were in line with the study by Srinivasan et al (2000). They reported that higher total income of the households significantly led to higher expenditure on the processed fruits and vegetables products and increased size of the family would result in increased expenditure on processed fruit and vegetable products. The increase in the number of working women in urban areas also resulted in higher expenditure. Similar results were reported by Kubendran and Vannirajan (2005). The expenditure made on processed horticultural food products in rural area was lowest. Low income levels, lack of knowledge regarding these products, non-availability of required products and low education level in rural area could be the reasons for less spending on these products. Singh et al (1998), Rao (1989) and Boura et al (1991) concluded that literacy favoured the consumption of processed foods. Shaw et al (1993) reported that approximately 60 per cent of the respondents spend 25 to 50 per cent of their income on food and the tendency was to spend very little on processed foods.

The annual per capita expenditure on food was around Rs. 7,000 across the locations (Table 4.8). In the case of non-food items, the urban consumers spent almost twice as that of semi-urban and rural consumers due to higher rent and higher expenditure on other items. The per capita annual expenditure on processed horticultural food products was more in urban areas as they were found to consume slightly higher quantities of all the processed horticultural food products than their counter parts did in other areas.

5.4. EXPENDITURE PATTERN ON PROCESSED HORTICULTURAL FOOD PRODUCTS

Table 4.9 depicted the annual family expenditure on processed horticultural food products. The expenditure made on jam was highest in urban area (14.41 %) followed by semi-urban and rural areas (7.20 %) in view of high income, better education and easy availability. Similar trend was also true for sauce/ketchup. The annual expenditure on jam and sauce appeared to increase with an increase in the income of urban consumers. However this tendency could not be observed for semi-urban and rural consumers. Probably it was because of the fact that these two products were not popular in semi-urban and rural area. The annual per capita expenditure on pickles across the locations was around Rs. 300. There was no glaring difference in the expenditure on pickles across the income groups of different locations except that the low income consumers across the locations were found to spend slightly less amount on this product. The annual expenditure on chips was around Rs. 400 in the study area. The expenditure on chips was slightly more for urban consumers. It was interesting to note that urban consumers were consuming slightly less quantity (Table 4.6) but spending more on chips when compared to the consumers in the other locations. This was because the urban consumers opted to use branded products. The high income urban consumers and middle income semi-urban and rural consumers were found to spend more on this product. The urban consumers annually spent Rs. 567 for consuming chilli powder. The annual expenditure was highest (Rs. 870) for semi-urban consumers. This was because they consumed more quantity (Table 4.6). Since the quantity of turmeric powder consumed by the semi-urban consumers was more when compared to that by their counterparts in urban area, they spent slightly more on this product. The quantity consumed and annual expenditure was more or less similar for semi-urban and rural consumers. The expenditure on chilli powder was the most important component of expenditure on processed horticultural food products for semi-urban and rural consumers.

The per capita annual expenditure on processed horticultural food products (Table 4.10) was Rs. 456 for urban consumers, Rs. 319 for semi-urban consumers and Rs. 250 for rural consumers. The annual per capita expenditure on chilli powder was a major component of total expenditure on processed horticultural food products in semi-urban and rural areas. This was followed by the expenditure on pickles, turmeric powder and chips. The per capita annual expenditure on pickles, chips and chilli and turmeric powder put together accounted for more than 92 per cent of the total expenditure on processed horticultural food products in semi-urban and rural areas. Pickles, chilli and turmeric powder were essential components of consumer food expenditure. The per capita annual expenditure on jam and sauce formed about 15 per cent of expenditure on processed horticultural food products. The per capita expenditure on different products showed increasing tendency with an increase in urban consumer income. However, for semi-urban and rural consumers no such definite pattern was observed. Generally, middle income semi-urban and rural consumers spent slightly higher amount than that did by their counterparts in semi-urban and rural areas.

5.5 FACTORS INFLUENCING CONSUMPTION OF PROCESSED HORTICULTURAL FOOD PRODUCTS

The consumption of processed horticultural food products was influenced by many social, cultural and economic factors. The influence of some such factors on annual quantity consumption of processed horticultural food products was analysed and the results were depicted in Table 4.11. The extent of variation explained by the variables included in the model was around 35 per cent in most of the cases.

The annual income positively and significantly influenced the consumption of these (Jam and Sauce/ketchup) products. This implied that the consumer demand for these two products was likely to increase with an increase in income of the consumers. As anticipated price exerted a negative influence on the quantity demanded. The number of family members produced a positive influence indicating that the quantity demanded would increase with an increase in family size. However, the negative influence of price and positive influence of family size could not be statistically established.

Pickles, chips, chilli and turmeric powder were popular across all the three locations as they were essential ingredients of Indian food. The quantity demanded of these products was negatively influenced by the price and positively influenced by the number of persons in the family and these relations were statistically significant. An increase in the price of these products has brought about a decrease in the quantity consumed. The quantity demanded of chilli was negatively and significantly influenced by annual income. The annual income though exerted a positive influence on the quantity demanded of pickles, chips and turmeric powder, the relationship was not significant and the regression coefficients were also very small.

5.6 CONSUMERS PREFERENCE FOR PROCESSED HORTICULTURAL FOOD PRODUCTS

The consumers preferred low priced with good taste and branded products of jam and sauce. Similar finding were reported by Vickers (1993) where it was reported that brand had little influence on buying intent of strawberry yoghurt. Also Ramappa (2006) reported that among the four attributes (price, colour, fat and brand) of liquid milk, price received maximum relative importance by the consumers in overall decision regarding the purchase of liquid milk.

The consumers preferred branded low priced and good taste products of pickles, chips, and chilli and turmeric powder. The study revealed that only when price of a particular brand was comparatively lower to prices of other brands in the market, the consumers would prefer branded products. The utility appeared to decline with the increase in the price of jam and sauce as the utility coefficients were not only negative but also very high for high priced products. This tendency was also true for other processed horticultural food products. Thus price appeared to be crucial factor in determining the consumption of these products. Branded products appeared to outscore the unbranded products in consumer preferences. The relative importance given for brand attribute was very high in chips. The different levels of taste attribute did not attract clear consumer preferences. From the conjoint analysis it could be inferred that consumers preferences were high for branded low priced processed horticultural food products in the study area.

5.7. CONSTRAINTS IN CONSUMPTION PROCESSED HORTICULTURAL FOOD PRODUCTS

The major constraints in consumption of processed horticultural food products in urban areas were (a) jam and sauce are not liked by majority of the family members and (b) pickles, chips, chili and turmeric powder were not liked by family members if these products were purchased from the market. Unawareness about these products particularly jams and sauce and insufficient income were viewed as constraints only by less than 5 per cent of the urban consumers.

Not liked by the family members was a major constraint for majority of the semi-urban consumers with respect to jam and sauce, where as not liked by family members if purchased was the major problem for majority of the consumers with respect to pickles, chips and chilli powder. About one third of the semi-urban consumers reported that they were unaware about jam and sauce.

The problems or constraints expressed by rural consumers in the consumption of processed horticultural food products were similar to those expressed by their counterparts in semi-urban areas. Purchased pickles, chips, chilli and turmeric powder particularly unbranded ones were not liked by the family members irrespective of the location of consumers. This was probably because the purchased products might not be in accordance with their tastes and preferences.

6. SUMMARY AND POLICY IMPLICATIONS

India is bestowed with a varied agro-climate, highly favorable for growing a large number of horticultural crops such as fruits, vegetables, root tuber, aromatic and medicinal plants and spices and plantation crops like coconut, areca nut, cashew and cocoa. Presently, horticultural crops occupy around 13 per cent of India's gross cropped area, producing 182.41 million metric tones during 2005-06. The total production of fruits has been estimated at 52.85 million metric tonnes from an area of 5.34 million hectares and the production of vegetables has been estimated at 108.20 million metric tones from an area of 7.05 million hectares during 2005-06. The value of horticulture products is Rs. 3000 crores and accounts for 20 per cent of agricultural GDP and 4 per cent towards national income.

The per capita availability of raw fruits and vegetables respectively is 140 gms per day and 295 gms per day. The daily per capita availability of processed products is very negligible (0.56 gms including traditional products like pickles and murrabba). Country faces major challenges of feeding its growing population. It is reported that a lot horticultural of products go waste because of improper handling, transporting and storage facilities.

The average expenditure of urban India on food was found to be 43 per cent out of which only 6 per cent is spent on beverages, refreshments and processed foods where as that of rural India was 55 per cent on food and out of that only 5 per cent was spent on beverages, refreshments and processed foods. (Anon, 2007) The food processing industry in India is one of the largest in terms of production, consumption, export and growth prospects. The important sub sectors in food processing industries are fruits and vegetables processing, fish- processing, milk- processing, meat and poultry processing, packed and convenience foods, alcoholic beverages and soft drinks and grain processing.

The consumption of processed horticultural foods is increasing especially with the increase in the number of urban women taking employment. There is a considerable change in day to day life of an average Indian due to various reasons, like urbanization, increase in the per capita income, changing life style, scarcity of household labours, the technological developments, breaking up of traditional joint family system, desire for quality, time etc. In view of these factors the consumption of processed horticultural foods has increased as they are more convenient for use. Generally, food products are preferred and prepared depending on the habits, tastes, social status, economic factors, availability, traditions etc of people of the region. The consumers taste and preference were found to change rapidly. In this context, a study on consumer behaviour on processed horticultural food products was deemed to be important to understand the buying behaviour and preference of consumers for different processed horticultural food products. Hence, this study was undertaken with the following objectives.

6.1 OBJECTIVES

i) To study the per capita consumption of processed horticultural food products,

ii) To assess the expenditure pattern on processed horticultural food products,

iii) To examine the factors influencing the consumption of processed horticultural food products,

iv) To evaluate the consumer preferences for processed horticultural food products, and

v) To identify the constraints in the consumption of processed horticultural food products.

6.2 METHODOLOGY

The present study is mainly based on the primary data collected from 180 sample respondents spread in urban, semi-urban and rural areas of the Dharwad district. The information on various consumption issues of processed horticultural food products was obtained with the help of well structured and pre tested schedules from the sample respondents. Multi-stage random sampling technique was adopted for selection of sample respondents. In the initial stage, Dharwad district was selected purposively since no such studies are conducted in the district and the district was quite familiar to the researcher. In the second stage, three out of five taluks in the district namely Hubli, Dharwad and Navalgund

were selected to give adequate representation to the district. The taluk headquarters namely Dharwad city, Hubli city and Navalgund town represented urban area. In the next stage, one hoblie from each taluk was selected randomly to represent the semi-urban area and further two villages each from the hoblie were selected randomly to represent rural area. A sample of 60 consumers from each location was selected randomly. Data were collected from the household consumer's i.e. decision makers of the respective consuming units. The information collected from the consumers pertained to (i) general information from individual respondents on their social, economic, cultural and demographic characteristics like age, educational status, occupation, annual income, family size and family type etc.(ii) annual family expenditure on food and non-food items in general and processed horticultural food products in particular; (iii) information regarding the quantity of processed horticultural food products consumed; (iv) The type of processed horticultural food products and their sources viz. branded, unbranded and home made and their expenditure pattern; (v) consumers preference for different types of processed horticultural food products; and (vi) the information like constraints in consumption of processed horticultural food products. The information was collected during February –March 2008.

Tabular analysis was used to compute averages and percentages for various socio-economic characters of consumers. The household consumption and expenditure pattern were computed using averages, frequencies and percentages. The constraints in consumption were analysed by frequency and percentages. In order to examine the influence of socio-economic and cultural factors on consumption of processed horticultural food products, multiple regression analysis was carried out. The conjoint analysis, a versatile marketing technique was used to asses the consumer preference for different attributes of selected processed horticultural food products.

6.3 MAJOR FINDINGS OF THE STUDY

The important findings of the study are summarized and presented below. The average annual income of urban, semi-urban and rural sample respondents of Dharwad district was Rs. 2,05,476, Rs. 1,47,709 and Rs. 1,56,327 respectively. The family size of urban consumers was less than that of their counterparts in semi-urban and rural areas. The average age of respondent's ranged from 34 to 38 years in the study area. The average children per family in the study area were two. Nuclear families dominated in urban areas while joint family system is the feature in rural areas. Majority of the respondents are vegetarians. The proportion of non-vegetarian families is more in semi-urban areas. A large majority of decision makers with respect to food consumption in urban, semi-urban and rural areas were housewives.

With regard to the consumption of processed horticultural food products, jam and sauce were found to be used only by urban consumers. Home made pickles, chips and chilli powder were popular as they are used by majority of the sample households. In the case of turmeric powder, unbranded product was purchased by majority of the households.

The annual quantity of jam and sauce/ketchup consumed was highest for urban consumers whereas the quantity of pickles and chips consumed was highest for rural consumers. The quantity of chilli powder and turmeric powder used was highest in semi-urban area.

The per capita consumption of jam, sauce/ketchup and turmeric powder was highest in urban area whereas the quantity of pickles and chilli powder consumed was highest in semi-urban area. The quantity of chips consumed was highest in rural area.

The annual family expenditure of the households on food items was highest in rural areas. They are found to spend 63 per cent of their income on food. The proportion of food expenditure increased with income. This was also true for semi-urban consumers. The proportion of food expenditure for urban consumers decreased with increase in income. The proportion of expenditure on processed horticultural food products was around three per cent of the total expenditure. It was around Rs. 2,000 annually per family across different sections of the consumers. The per capita expenditure on processed horticultural food products was 456 for urban consumers. Among the different processed horticultural products the share of expenditure on chilli powder was highest followed by the expenditure on chips for urban consumers. The expenditure on chilli powder and chips were major items of

expenditure for semi-urban and rural consumers. The annual family expenditure on pickles was almost similar across different sections of consumers. Jam and sauce together shared about 28 per cent of the total expenditure on processed horticultural food products in urban areas. The per capita expenditure across different sections of consumers was highest for chilli powder.

Among the various factors considered, only annual income significantly influenced the consumption of jam. Price produced a negative influence on consumption of jam where as annual income had a positive impact on its consumption. Annual income significantly influenced the consumption of sauce. Price had a negative influence on pickles consumption whereas annual income had positive influence on its consumption. The price and family size significantly influenced the consumption of pickles. Price exerted a negative influence on the consumption of chips while family size had positive influence on consumption. The price and family size significantly influenced the consumption of chips. Price had a negative influence on its consumption while family size produced a positive influence on its consumption. The chilli powder consumption was influenced by price, annual income and family size. Price and annual income exerted negative influence on its consumption while family size produced a positive impact on consumption. Among the various factors considered, price and family size significantly influenced the consumption of turmeric powder. Price, annual income and family size exerted positive impact on the consumption of turmeric powder.

The results of conjoint analysis revealed that low priced, good taste and branded jam was the preferred by consumers. The consumers appeared to be more price conscious as they attached more value to it followed by taste and brand. The preferred attributes in the case of sauce/ketchup were low price, good taste and brand. The branded, low price and good taste were the preferred attributes in the case of pickles. The consumers preference attributes in chips were brand, low price and good taste. The brand was given high preference first followed by low price and good taste. The preferred attributes in chilli powder were brand, low price and good taste. For turmeric powder, consumers attached more importance for branded low priced and good taste product. The consumers gave first preference to brand of the product.

The product was not liked by family in case of jam and sauce/ketchup and not liked by family if purchased in the case of pickles, chips and chilli powder were the major constraints in the consumption of different processed horticultural food products by the majority of the consumers of Dharwad district.

6.5 POLICY IMPLICATION

The policy implications emerged from the study are as follows

1. Jam and sauce are not popular in semi-urban and rural areas due to lack of awareness. Hence, the manufacturers of these two products may take up propaganda programmes in semi-urban and rural areas.
2. Price of the product exerted a significant negative influence on the consumption of processed horticultural food products. Hence, the manufacturers of processed horticultural food products should be very careful while fixing the prices for these products. The conjoint analyses revealed that low priced and branded processed horticultural food products are likely to be attracted by the consumers. Hence, price and brand attributes should be selectively used to popularise the processed horticultural food products particularly in rural areas.
3. Majority of the consumers both in semi-urban and rural areas revealed that the purchased products particularly chilli, pickles, turmeric powder and chips are not liked by their family members if purchased and prefer to prepare these products on their own to suit their taste and preferences. Hence, trainings may be organized to impart skills in the preparation of these products. The products so prepared would be less costly besides using locally available materials. This would enhance the popularity of processed horticultural food products in rural areas.

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Appendix-1. Income classification of sample respondents

Income groups (IG)	Annual income levels		
	Urban	Semi-urban	Rural
Low income group (IG_1)	Up to Rs.1,33,896.87	Up to Rs.90,385.26	Up to Rs.93,922.88
Medium income group (IG_2)	Rs.1,33,896.87 to Rs.1,98,318.36	Rs.90,385.26 to Rs.2,05,033.50	Rs.93,922.88 to Rs.2,18,730.45
High income group (IG_3)	Above Rs.1,98,318.36	Above Rs.2,05,033.50	Above Rs.2,18,730.45

UNIVERSITY OF AGRICULTURAL SCIENCES, DHARWAD

Research Topic: "Consumption pattern of processed horticultural food products by rural and urban people of Dharwad district".

(Information used for research purpose only) Sch no:

1. Name :
2. Age :
3. Place :
4. Edu Quali:I/L (P/H/S/PU/D)
5. Occuption:
6. Food habit : Veg/ Non-veg
7. Family type : Joint /Nuclear
8. Religion :
9. Land holding :
10. R/SU/U :

11. Family particulars

Sl.no	Members	Sex	Age	Education	Occupation	Monthly income

12. Family income (monthly)

13. Do you consume?

1. Jam Y/N
2. Sauce/Ketchup Y/N
3. Pickles Y/N
4. Chips Y/N
5. Canned products Y/N
6. Red chilly powder Y/N
7. Turmeric powder Y/N

If yes, is it prepared by you at home Y/N?

If Yes

Products prepared	Qnty prepared	Cost incurred in preparation	Freq of consumption

14. Annual consumption expenditure for the family (in Rs):

S. L	Items	Unit	Quantity			Amount(Rs.)			Frequency of purchase	Place of purchase
			Purchased	Home Produced	Total	Purch-ased	Home Produce	Total	(D/W/ F/M/A)	(GS/DS /M/HD/O)
1	Cereals									
	Rice									
	Wheat									
	Ragi									
	Maize									
	Jowar									
	Others									
2	Pulses									
	Bengal gram									
	Red gram									
	Green gram									
	Black gram									
	Pea									
	Cow pea									
	Soya bean									
	Ground nut									
3	Fruits a) b)									
4	Vegetables a) b)									
5	Edible oil									
6	Milk & milk products									
7	Nuts /Dry fruits									
8	Meat									
9	Egg									
10	Sugar									
11	Salt									
12	Spices									
13	Beverages									
14	Pan									
15	Tobacco									
16	Intoxicants									
17	Liquors									
18	others									
	Processed food items									
a	Jam									
b	Sauce									
c	Ketchup									

d	Chips									
e	Pickles									
f	Red chilly powder									
g	Turmeric powder									
h	Canned products									

D –Daily, W-Weekly, F-Fortnight, M-Monthly, A-Annually, GS-Grossery shop, DP-Department store, M-market, HD-Home delivery, O-Others

15) Annual expenditure made on Non-Food

Sl no.	Item group	Units	Quantity	Amount(Rs.)
1	Fuel			
2	Electricity			
3	Clothing			
4	Footwear			
5	Education			
6	Medical			
7	Entertainment			
8	Rent			
9	Taxes			
10	Durable goods			
11	Minor personal effects			
12	Toilet articles			
13	Conveyance			
14	Other consumer services			
15	Other consumables			
16				
17				

16. Annual consumption of Processed Horticultural Food Products

Sl no	Products	Brand	Quantity	Total amt	Frequency (D/W/M/HY/Y)

D-Daily,W-Weekly,M-Monthly,HY-Half Yearly,Y-Yearly

17. Who makes the buying decision: **Occupation:** **Age:**

18. Constraints in consumption

Sl no	Products	Un-Aware-ness (Y/N)	Cost Y(H/M/L) /N	Not-Liked by family (Y/N)	Not-Liked by family if purchased (Y/N)	Poor quality (Y/N)	Income NS (Y/N)	Cooking problems (Y/N)	Health problem (Y/N)
1	Jam								
2	Sauce/ Ketchup								
3	Turmeric powder								
4	Pickles								
5	Chips								
6	Red chilly powder								
7	Canned products								

Y-Yes,N-No.,L-Low,M-Medium,H-High
NS-Not-sufficient,Nut-val-Nutritive value

19. Quality preference (Give ranks I-IX)

Sl no	Attributes Levels	Jam	Sauce /ketchup	Pickles	Chilli powder	Chips	Turmeric powder
1	Good Taste High Price Branded						
2	Good Taste Medium Price Branded						
3	Good Taste Low Price Branded						
4	Good Taste High Price Unbranded						
5	Good Taste Medium Price Unbranded						
6	Good Taste Low Price Unbranded						
7	Bad Taste High Price Branded						
8	Bad Taste Medium Price Branded						
9	Bad Taste Low Price Branded						
10	Bad Taste High Price Unbranded						
11	Bad Taste Medium Price Unbranded						
12	Bad Taste Low Price Unbranded						

CONSUMPTION PATTERN OF PROCESSED HORTICULTURAL FOOD PRODUCTS IN DHARWAD DISTRICT

SHILPA U. L. 2008 Dr. H. BASAVARAJA
MAJOR ADVISOR

ABSTRACT

The objective of the present study was to analyze the consumption pattern of processed horticultural food products in Dharwad district. The study is based on primary data collected from sample respondents located in urban area, semi-urban area and rural area of Dharwad district. A total sample of 180 respondents (60 urban, 60 semi-urban and 60 rural households) formed the sample for the study. Data was processed using tabular analysis, regression analysis and conjoint analysis.

The products used by the consumers was mostly home made like pickles, chips, chilli powder. Majority of the consumers purchased unbranded turmeric powder branded product is popular in the case of jam and sauce/ketchup. The annual consumption of jam and sauce/ketchup was highest by urban consumers i.e. 2.33 and 2.25 kgs respectively. Pickles and chips were consumed highest by rural consumers i.e. 10.96 and 12.15 kgs respectively and in the case of chilli and turmeric powder it was highest by semi-urban consumers 11.43 and 3.26 kgs respectively. The annual family expenditure on processed horticultural food products was nearly 2.5 to 3.1 per cent and ranged from Rs. 2165 (urban consumers) to Rs. 1745 (rural consumers). The factors influencing consumption of different products was annual income in the case of jam, sauce/ketchup and chilli powder and family size in the case of pickles, chips and chilli and turmeric powder consumed. The consumer's preference was different for different processed horticultural food products i.e. in the case of jam and sauce/ketchup they preferred price followed by taste and brand. In the case of pickles, chips and chilli and turmeric powder first preference was given to brand followed by price and taste. The most preferred product combination by the consumers was good taste, low priced and branded products.