CONSUMER PREFERENCE FOR POTATO BASED PRODUCTS: A STUDY IN BENGALURU METROPOLITAN

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Project Report submitted to the

University of Agricultural Sciences, Bangalore

in partial fulfilment of the requirements for the degree of

Masters of Business Administration

(Agribusiness Management)

BENGALURU **August, 2019**

Affectionately dedicated to my Parents, Friends and my Guide

DEPARTMENT OF AGRICULTURAL MARKETING, COOPERATION AND BUSINESS MANAGEMENT
UNIVERSITY OF AGRICULTURAL SCIENCES, GKVK, BANGALORE-560 065

CERTIFICATE

This is to certify that the Project Report entitled "**CONSUMER PREFERENCE FOR POTATO BASED PRODUCTS: A STUDY IN BENGALURU METROPOLITAN**" submitted by **Ms. ANITHA, V. ID. No. MBAL 7006,** in partial fulfilment of the requirements of the degree of Master of Business Administration (Agribusiness Management) to the University of Agricultural Sciences, Bangalore is a bona-fide record of research work done by her during the period of her study in this University, under my guidance and supervision and the project work has not previously formed the basis of the award of any degree, diploma, associateship, fellowship or other similar titles.

Bangalore
August, 2019

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Major advisor

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Bengaluru

August, 2019 ***(ANITHA, V.)***

CONSUMER PREFERENCE FOR POTATO BASED PRODUCTS: A STUDY IN BENGALURU METROPOLITAN

ANITHA, V.

ABSTRACT

The present study was conducted to assess the consumer preference for potato based products in Bengaluru Metropolitan. Descriptive statistics, factor analysis and Garrett's ranking techniques were used to analyse the primary data collected from 60 consumers of different age and income groups. The important potato based products consumed in the study area were potato chips, potato wafers, potato french fries, aloo bhujia, potato twister, aloo tikki, aloo samosa and aloo kachori. Freshness, colour, flavour, brand name and attractive packing were the important factors affecting consumer's preferences for consumption of potato based products. Majority (83.33%) of the consumers purchased potato chips followed by aloo bhujia. Among the consumers of potato chips, more than 50 per cent preferred Lays brand followed by Bingo. Among the consumers of potato based products, 41.67 per cent bought from super markets, followed by hot chips outlets (16.67%) and Departmental Stores (13.33%). More than 50 per cent of the consumers (56.67%), got to know about the potato based products through TV/advertisements followed by friends/relatives (25%) and through display at retail outlets (18.33%). Majority (71.4%) of the retailers indicated high rental value as the major constraint, followed by competition from unbranded vendors (69.04%), insufficient working capital (50.55%) etc. in marketing of potato based products. Consumers preferred potato based products due to crispiness and taste. Hence, there is a great need for popularising these products through advertisements. Further, there is lot of scope for research and development to develop new potato based products for consumers in a bigger way.

August, 2019

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(G. N. NAGARAJA)
Major Advisor

ಬೆಂಗಳೂರು ಮೆಟ್ರೊಪಾಲಿಟನ್ನಲ್ಲಿ ಆಲೂಗಡ್ಡೆ ಆಧಾರಿತ ಉತ್ಪನ್ನಗಳ ಬಗ್ಗೆ ಗ್ರಾಹಕರ ಆದ್ಯತೆಯ ಕುರಿತು ಒಂದು ಅಧ್ಯಯನ

ಅನಿತಾ, ವಿ.

ಸಾರಾಂಶ

ಪ್ರಸ್ತುತ ಅಧ್ಯಯನವನ್ನು ಬೆಂಗಳೂರು ಮಹಾನಗರದಲ್ಲಿ ಮೌಲ್ಯವರ್ಧಿತ ಆಲೂಗಡ್ಡೆ ಉತ್ಪನ್ನಗಳ ಬಗೆಗೆ ಗ್ರಾಹಕರ ಆದ್ಯತೆಯನ್ನು ನಿರ್ಣಯಿಸಲು ಕೈಗೊಳ್ಳಲಾಯಿತು. ಇದಕ್ಕೆ ಸಂಬಂಧಪಟ್ಟ ಮಾಹಿತಿಯನ್ನು ವಿವಿಧ ವಯಸ್ಸು ಮತ್ತು ಆದಾಯದ ಆಧಾರದ ಮೇರೆಗೆ ಬೆಂಗಳೂರು ಮಹಾನಗರದ ಗ್ರಾಹಕರಿಂದ ಸಂಗ್ರಹಿಸಲಾಯಿತು. ಈ ಮಾಹಿತಿಯನ್ನು ವಿವರಣಾತ್ಮಕ ಅಂಕಿ ಅಂಶಗಳು, ಅಂಶ ವಿಶ್ಲೇಷಣೆ ಮತ್ತು ಗ್ಯಾರೆಟ್‌ನ ಶ್ರೇಯಾಂಕ ತಂತ್ರವನ್ನು ಬಳಸಿ ವಿಶ್ಲೇಷಿಸಲಾಯಿತು. ಬಗೆಬಗೆಯ ಆಲೂಗಡ್ಡೆ ಉತ್ಪನ್ನಗಳೆಂದರೆ ಚಿಪ್ಸ್, ವೆಫರ್ಸ್, ಫ್ರೆಂಚ್ ಫ್ರೈಸ್, ಭುಜಿಯಾ, ಟ್ವಿಸ್ಟರ್, ಟಕ್ಕಿ, ಸಮೊಸಾ, ಕಚೊರಿ ಮುಂತಾದವುಗಳಾಗಿವೆ. ಆಲೂಗಡ್ಡೆ ಆಧಾರಿತ ಉತ್ಪನ್ನಗಳ ತಾಜಾತನ, ಬಣ್ಣ, ಪರಿಮಳ, ಬ್ರಾಂಡ್ ಹೆಸರು ಮತ್ತು ಆಕರ್ಷಕ ಪ್ಯಾಕಿಂಗ್ ಇವುಗಳು ಗ್ರಾಹಕರ ಆದ್ಯತೆಯ ಮೇಲೆ ಪರಿಣಾಮ ಬಿರುವ ಪ್ರಮುಖ ಅಂಶಗಳಾಗಿವೆ. ಬೆಂಗಳೂರು ಮಹಾನಗರದ ಬಹುಪಾಲು ಗ್ರಾಹಕರು (ಶೇ. ೮೩.೩೩) ಆಲೂಗಡ್ಡೆ ಚಿಪ್ಸ್ ಖರಿದಿಸುತ್ತಾರೆ ನಂತರ ಶೇ. ೫೦ ಕ್ಕಿಂತ ಹೆಚ್ಚು ಗ್ರಾಹಕರು ಅದರಲ್ಲಿ ಲೇಸ್ ಬ್ರಾಂಡನ ಬಗೆಗೆ ಹೆಚ್ಚು ಆದ್ಯತೆ ನೀಡುತ್ತಾರೆ. ಶೇ. ೪೧.೬೭ ರಷ್ಟು ಗ್ರಾಹಕರು ಆಧುನಿಕ ಮಾರುಕಟ್ಟೆಯಿಂದ ಖರಿದಿಸಲ್ಪಟ್ಟರು, ಶೇ. ೧೬.೬೭ ರಷ್ಟು ಗ್ರಾಹಕರು ಹಾಟ್ ಚಿಪ್ಸ್ ಸೆಂಟರ್‌ಗಳಿಂದ ಖರಿದಿಸುತ್ತಾರೆ ಮತ್ತು ಶೇ. ೧೩.೩೩ ರಷ್ಟು ಗ್ರಾಹಕರು ಡಿಪಾರ್ಟ್‌ಮೆಂಟಲ್ ಸ್ಟೋರ್ಸ್‌ಗಳಿಂದ ಖರಿದಿಸುತ್ತಾರೆ. ಶೇ. ೫೦ ಕ್ಕಿಂತ ಹೆಚ್ಚು ಗ್ರಾಹಕರು ಆಲೂಗಡ್ಡೆ ಆಧಾರಿತ ಉತ್ಪನ್ನಗಳ ಬಗ್ಗೆ ಟಿ.ವಿ/ಜಾಹಿರಾತುಗಳ ಮೂಲಕ ಮಾಹಿತಿ ಸಂಗ್ರಹಿಸುತ್ತಾರೆ ನಂತರ ಶೇ. ೨೫ ರಷ್ಟು ಗ್ರಾಹಕರು, ಸ್ನೇಹಿತರು/ಸಂಬಂಧಿಕರ ಬಳಿ ಸಂಗ್ರಹಿಸುತ್ತಾರೆ. ಮತ್ತು ಶೇ. ೧೮.೩೩ ಗ್ರಾಹಕರು ಚಿಲ್ಲರೆ ಮಾರಾಟ ಮಳಿಗೆಗಳಲ್ಲಿ ಪ್ರದರ್ಶಿಸಿದ ಜಾಹಿರಾತಿನ ಮೂಲಕ ತಿಳಿದುಕೊಳ್ಳುತ್ತಾರೆ. ಆಲೂಗಡ್ಡೆ ಆಧಾರಿತ ಉತ್ಪನ್ನಗಳ ಮಾರಾಟದಲ್ಲಿ ಚಿಲ್ಲರೆ ಮಾರಾಟಗಾರರು (ಶೇ. ೭೧.೪) ಹೆಚ್ಚಿನ ಬಾಡಿಗೆ ಮೌಲ್ಯವು ಪ್ರಮುಖ ತೊಂದರೆಯೆಂದು ಸೂಚಿಸಿರುತ್ತಾರೆ ನಂತರ ಬ್ರಾಂಡ್ ಮಾಡದ ಮಾರಾಟಗಾರರ ಪ್ರವೇಶ (ಶೇ. ೬೯.೦೪), ಕಾರ್ಯ ಬಂಡವಾಳದ ಅಲಭ್ಯತೆ (ಶೇ. ೫೦.೫೫) ಇತ್ಯಾದಿ ಇವುಗಳು ಪ್ರಮುಖ ತೊಂದರೆಗಳಾಗಿವೆ. ಬೆಂಗಳೂರು ಮಹಾನಗರದ ಗ್ರಾಹಕರು ಆಲೂಗಡ್ಡೆ ಆಧಾರಿತ ಉತ್ಪನ್ನಗಳ ರುಚಿ ಮತ್ತು ಗರಿಗರಿಯಾಗಿರುವ ಉತ್ಪನ್ನಗಳಿಗೆ ಹೆಚ್ಚಿನ ಆದ್ಯತೆ ನೀಡುತ್ತಾರೆ. ಆದ್ದರಿಂದ, ಗ್ರಾಹಕರಿಗೆ ಈ ಉತ್ಪನ್ನಗಳನ್ನು ಜನಪ್ರೀಯ ಗೊಳಿಸುವ ಅವಶ್ಯಕತೆ ಇದೆ. ಇದಲ್ಲದೆ, ಗ್ರಾಹಕರಿಗೆ ಹೊಸ ಆಲೂಗಡ್ಡೆ ಆಧಾರಿತ ಉತ್ಪನ್ನಗಳನ್ನು ಅಭಿವೃದ್ಧಿಪಡಿಸಲು ಸಂಶೋಧನೆ ಮತ್ತು ಅಭಿವೃದ್ಧಿಗೆ ಸಾಕಷ್ಟು ಅವಕಾಶಗಳಿವೆ.

ಅಗಸ್ಟ್, ೨೦೧೯

ಕೃಷಿ ಮಾರಾಟ, ಸಹಕಾರ
ಹಾಗೂ ವ್ಯವಹಾರ ನಿರ್ವಹಣಾ ವಿಭಾಗ
ಕೃಷಿ, ವಿಶ್ವವಿದ್ಯಾಲಯ, ಜಿಕೆವಿಕೆ,
ಬೆಂಗಳೂರು–೫೬೦೦೬೫

(ಜಿ. ಎನ್. ನಾಗರಾಜ)
ಪ್ರಮುಖ ಸಲಹೆಗಾರರು

Consumer Preference for Potato based Products: A Study in Bengaluru Metropolitan

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INTRODUCTION

Potato (*Solanum tuberosum* L.) popularly known as 'The king of vegetables', is grown in more than 100 countries in the world.

Karnataka is one of the important Potato growing states in the country grown mainly in the districts of Hassan, Belgaum, Chikkaballapur and Kolar. Less than 50 per cent of Potatoes grown Worldwide are consumed fresh. The rest are processed into Potato food products & food ingredients for several industries.

In India, Potato processing industry mainly comprises four segments *viz*., Potato chips, French fries, Potato flakes/powder and other processed products such as Dehydrated chips, Alu Bhujia, Samosa and Tikkis.

The consumers' demand for processed potato based food products is likely to increase in India due to increased urbanization, increasing middle class population, preference for fast foods, rising per capita income and increased demand for convenience food.

The development of the snack market also has created a growing demand for dehydrated potato products, used as raw material for snacks. The potato processing industry is expanding fast and the sector developing most rapidly is the snack foods sector, including potato chips.

OBJECTIVE

1. To analyse the factors influencing the consumption of potato based products in Bengaluru Metropolitan.

METHODOLOGY

- ✓ **Study area:**
  The study was conducted in Bengaluru Metropolitan.
- ✓ **Sample size:**
  The sum of 60 samples of consumers were selected from different parts of Bengaluru Metropolitan to gather the information on preference of Potato based food products by using pre-tested schedule prepared for the purpose.

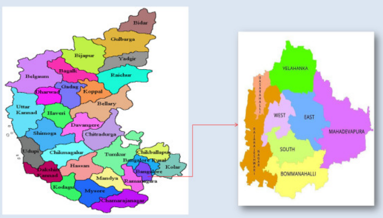

Fig. 1: Map Depicting the Study area

- ✓ **Analytical tools and technique:**
  The data was analyzed by using SPSS software for Factor analysis to explore and analyze various factors affecting consumer preferences for Potato based products. The exploratory factor analysis was done using Principal component analysis based on orthogonal varimax rotation was performed on 12 variables to extract the variables. KMO and Bartlett's test of sphericity were used to check the adequacy of sample.

RESULTS

Table 1: KMO and Barlett's Test for Variance among Factors

Kaiser-Mayer-Olkin Measure of sampling adequacy		0.697
Bartlett's Test of Sphericity	Approx. Chi-Square	211.483
	Degrees of freedom	66
	Significance Level	0.000

Table 2: Rotated Component Matrix for Factors Influencing the Consumer Preference for Potato based Products

Sl. No.	Variables	Factors 1 Product features	2 Marketing strategies	3 Consumer oriented	4 Purchase decision
1.	Freshness	0.837	-0.003	-0.049	-0.014
2.	Color	-0.823	0.084	0.184	0.146
3.	Flavor	0.740	-0.176	-0.295	0.228
4.	Brand name	0.012	0.811	-0.126	0.145
5.	Attractive packing	-0.478	0.698	0.005	-0.037
6.	Advertisement	0.026	0.696	0.092	-0.330
7.	Food habit	-0.119	-0.034	0.799	0.032
8.	Influence of family	-0.367	-0.062	0.791	-0.115
9.	Taste	0.490	0.485	0.525	0.078
10.	Retailer's influence	0.191	0.077	-0.140	0.850
11.	Income	0.431	0.322	-0.109	-0.497
12.	Price	0.460	0.113	-0.147	-0.476

DISCUSSION

KMO value in present study was found to be **0.697** indicating adequate size of sample. Bartlett's test chi-square was found to be **211.483** with significance value **0.000** indicating that present sample has significant correlation matrix to conduct factor analysis (Table 1).

The data related to factor loadings calculated with the help of orthogonal varimax rotation. **Factor 1** is most significant factor with **27.417** per cent of total variance. Further the factors are labeled according to the variables loaded on that factor. Factor 1 advocates product features. Consumer preferences for Potato based products depends upon **Product features** which are **Freshness** loaded with a factor loading value of 0.837, **Color** loaded with value -0.823 and **Flavor** with value 0.740. **Factor 2** explaining **18.083** per cent of the variance and emphasize on **Marketing Strategies** opted by manufacturers. This factor contains **Brand Name**, **Attractive Packing** and **Advertisement** having factor loading value of 0.811, 0.698 and 0.696 respectively. **Factor 3** explaining **12.213** per cent of total variance contains variables affecting **Consumer oriented**. These include **Food habit, Influence of Family members** and **Taste** these having factor loading values as 0.799, 0.791 and 0.525 respectively. **Factor 4** highlights the **Purchase decision** of consumer and explains **10.373** per cent of total variance and contains **Retailer's influence, Income** and **Price** having factor loading 0.850, -0.497 and -0.476 respectively (Table 2).

Four factors have Eigen value greater than 1 and total variance accounted by these four factors is **68.087** per cent (Fig 2).

GRAPHS AND PHOTOGRAPHS

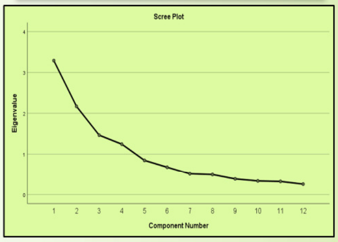

Fig. 2: Cattell's Scree Plot for Factors Influencing Consumer Preference for Potato based Products

Fig. 3: Different Brands of Potato based Products Consumed in Bengaluru Metropolitan

Fig 4: Photographs showing Data collection

SUMMARY

The results revealed that product features, marketing strategies opted by manufactures, consumer oriented factors and purchase decisions made by consumers are the factors affecting consumer's preferences for consumption of Potato based products.

These factors highlight that in today's consumerism World, manufacturers of Potato based products should concentrate on all these factors in their manufacturing and marketing plans and should find the better ways to improve the quality and affordability of product and provide it to consumers.

ADVISORY COMMITTEE

Chairperson: Dr. G. N. Nagaraja

Members: Dr. C. P. Gracy
Dr. B. M. Shashidara
Dr. Mamatha Girish

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I INTRODUCTION

Potato (*Solanum tuberosum* L.) is grown in about 150 countries and is the world's single most important non-cereal crop with a vibrant role in the global food system. The potato is the world's fourth most important food crop after rice, wheat and maize.

1.1 World scenario of Potato

The total world potato production is estimated at 388,191,000 tonnes in 2017 (Anon., 2019). The world potato sector is undergoing major changes. Until the early 1990s, most potatoes were grown and consumed in Europe, North America and countries of the former Soviet Union. Since then, there has been a dramatic increase in potato production and demand in Asia, Africa and Latin America, where output rose from less than 30 million tonnes in the early 1960s to more than 165 million tonnes in 2007. China is the largest potato producer of 99,205,580 tonnes in 2017 and almost a third of all potatoes are harvested in China and India (Anon., 2017).

1.2 Potato cultivation in India

Potato is a temperate crop grown under subtropical conditions in India. The potato is a crop which has always been regarded as the 'poor man's friend'. Potato is being growing in the country since 300 years. Potato has become most popular for vegetable purposes usage in the country. Potatoes are regarded as economical foods; they offer a source of low cost energy to the human diet.

In India, more than 80 per cent of the potato crop is raised in the winter season (rabi) under guaranteed irrigation during short winter days from October to March. The rest of the production from Karnataka and the hilly areas during long summer days. Potato production done in rainy season in Uttaranchal, Himachal Pradesh, Maharashtra and Jammu & Kashmir. The autumn crop is generally grown in the months of August-September to December- January, spring crop from January-February to May-June, and summer crop from March- April to August – September. In July kharif potato is sown and by the month of October the potatoes are available in the market. 12 per cent of the potato total production is contributed by kharif potato. Potato crop period normally is 5-6 months, although potato is a seasonal crop, it is grown in most of the states based on climatic conditions and harvested at different times, thus making it available throughout the year.

1.3 Potato cultivation scenario in Karnataka

Karnataka is one of the major potato-growing states in peninsular India. Potato is one of the main cash crops in some of the districts of the state. The state's agro-ecology favours it's cultivation during two seasons a year. Rabi (winter season) cultivation is popular in Chikkaballapura, Kolar and Bengaluru districts and they mainly grow Kufri Jyothi and Kufri Chipsona varieties of potato. Kharif (rainy season) cultivation is seen in Hassan, Chikmagalur, Dharwad and Belgaum districts and they grow Kufri chandramukhi variety of potato. Potatoes produced in kharif account for the major proportion (70%) of the potatoes produced in Karnataka.

1.4 Potato utilization in the world

Once harvested, potatoes are used for a variety of purposes, and not only as a vegetable for cooking at home. In fact, it is likely that less than 50 percent of potatoes grown worldwide are consumed fresh. The remaining are processed into processed potato food products and food ingredients, processed into starch for industry, and re-used as seed tubers for growing the next season's potato crop.

Potatoes are used in the preparation of starch and alcohol these are having industrial uses. In laundries and for sizing yarn in textile mills and in the production of dextrin and glucose also potatoes are used. Potatoes as food products they are converted into dried products such as 'potato chips', 'sliced' or 'shredded potatoes'. It is a much branched bushy herb, usually 0.5 to 1m in height possessing underground stems bearing the edible tubers. The leaves are odd pinnate with a large terminal leaflet. It flowers in cymose panicles.

1.5 Potato as fresh, frozen, dehydrated products

Home-grown or purchased in markets, fresh potatoes are baked, boiled or fried and used in a staggering range of recipes like mashed potatoes, potato pancakes, potato dumplings, twice-baked potatoes, potato soup, potato salad and potatoes au gratin. But global consumption of potato as food is shifting from fresh potatoes to added-value, processed food products. One of the main items in that category goes by the unappetizing name of frozen potatoes includes french fries which served in restaurants and fast food chains worldwide. The fresh potatoes are peeled and are shot through cutting blades, parboiled, air dried, par fried, frozen and packaged. The world's appetite for factory-made french fries has been put at more than 11 million tonnes a year (www.fao.org/potato-2008/en/potato/index.html).

Another processed product, the potato crisp (chips), is the long-standing king of snack foods in many developed countries. Made from thin slices of deep-fried or baked potato, they come in a variety of flavours - from simple salted to "gourmet" varieties tasting of roast beef and Thai chili. Some crisps are produced using a dough made from dehydrated potato flakes.

Dehydrated potato flakes and granules are made by drying a mash of cooked potatoes to a moisture level of 5 to 8 per cent. Flakes are used in retail mashed potato products, as ingredients in snacks, and even as food aid. Another dehydrated product, potato flour, is ground from cooked, whole potatoes and retains a distinct potato taste. Gluten-free and rich in starch, potato flour is used by the food industry to bind meat mixtures and thicken gravies and soups.

Modern starch processing can retrieve as much as 96 per cent of the starch found in raw potatoes. A fine, tasteless powder with "excellent mouth-feel", potato starch provides higher viscosity than wheat and maize starches, and delivers a tastier product. It is used as a thickener for sauces and stews, and as a binding agent in cake mixes, dough, biscuits and ice-cream. Finally, in eastern Europe and Scandinavia, crushed potatoes are heated to convert their starch to fermentable sugars that are used in the distillation of alcoholic beverages such as vodka and akvavit.

1.6 Potato as glue, animal feed and fuel-grade ethanol

Potato starch is also widely used by the pharmaceutical, textile, wood and paper industries as an adhesive, binder, texture agent and filler, and by oil drilling firms to wash boreholes. Potato starch is a 100 per cent biodegradable substitute for polystyrene and other plastics used, for example, in disposable plates, dishes and knives. Potato peel and other "zero value" wastes from potato processing are rich in starch that can be liquefied and fermented to produce fuel-grade ethanol. A study in Canada's potato-growing province of New Brunswick estimated that 44,000 tonnes of processing waste could produce 4 to 5 million litres of ethanol.

One of the first widespread uses of the potato in Europe was as farm animal feed. In the Russian Federation and other east European countries, as much as half of the potato harvest is still used for that purpose. Cattle can be fed up to 20 kg of raw potatoes a day, while pigs fatten quickly on a daily diet of 6 kg of boiled potatoes. Chopped up and added to silage, the tubers cook in the heat of fermentation.

1.7 Potato processing industry history in India

About less than 0.5 per cent of annual production of potatoes were processed in India. The consumption of processed potato products is expected to rise, at present, the processing sector is mainly comprising various kinds of dehydrated potato products, starch, etc. In India processing scenario has totally changed in the last ten years after the release of India's first processing varieties by the Central Potato Research Institute (CPRI), Shimla in 1998 they are Kufri Chipsona-1 and Kufri Chipsona-2. Followed by in 2005 Kufri Chipsona-3 and in 2007 Kufri Himsona. Due to economic development with rapid urbanisation, market expansion options and improvements in indigenous processing varieties Indian potato processing industry has developed to higher. The demand for dehydrated potato products has been increasing due to the development in the snack market because of, the dehydrated potato products are used as raw material for many of the snacks.

1.8 Problems in Potato processing in India

The unavailability of good quality processing potatoes in desired quantities throughout the year is the main bottleneck for the processing industries. Other major requirements include development of suitable varieties for French fries, early maturing processing varieties for plateau region, development of temperature insensitive processing varieties, breeding varieties resistant to cold sweetening, specific breeding for problematic regions, development of yield and quality enhancing technologies for processing varieties, finding low-cost alternative storage technology, improving infra-structural facilities and developing inexpensive technologies for the production of diverse potato products. A comprehensive, viable and economical scheme for supplying processing potatoes to the industries round the year has been devised which will help the industries in planning the supply from the nearest locations.

1.9 Nutritional importance of Potato

Potatoes are a rich source of starch, vitamins especially vitamin C and vitamin B_1 and minerals. They comprise of 20.6 per cent carbohydrates, 2.1 per cent protein, 0.3 per cent fat, 1.1 per cent crude fibre and 0.9 per cent ash. They also have good amount of essential amino acids like leucine, tryptophan and isoleucine etc.

Potato is a versatile, carbohydrate-rich food highly popular worldwide and prepared and served in a variety of ways. Freshly harvested, it contains about 80 percent water and 20 percent dry matter. About 60 to 80 percent of the dry matter is starch. On a dry weight basis, the protein content of potato is similar to that of cereals and is very high in comparison with other roots and tubers. In addition, the potato is low in fat and are rich source of vitamin C - eaten with its skin, a single medium sized potato of 150g gives nearly 50 per cent the daily adult requirement (100 mg). The potatoes are moderately rich in iron, and its high vitamin C content helps in iron absorption. It is a good source of vitamins B_1, B_3 and B_6 and minerals such as potassium, magnesium, phosphorus and contains pantothenic acid, folate and riboflavin. Potatoes also having dietary antioxidants, which may play a role in preventing diseases related to ageing, and dietary fibre, which promotes health.

The nutritive value of a meal prepared with potato depends on other components added with them and on the method of preparation. By itself, potato is not fattening (and the feeling of satiety that comes from eating potato can actually help people to control their body weight). However, preparing and serving potatoes with high-fat ingredients increases the calories in the dish. Since the starch present in raw potato cannot be digested by humans, they are able to consume by boiling (with or without the skin), baking or frying. Each method of preparation affects potato composition in a different way, but all reduce fibre and protein content, due to loss of proteins into cooking water and oil, damage by heat treatment or chemical changes such as oxidation. Boiling - the most common method of potato preparation worldwide – leads to significant loss of vitamin C, especially in peeled potatoes. For french fries and chips, frying for a short time in hot oil (140ºC to 180ºC) results in high absorption of fat and significantly reduces mineral and ascorbic acid content. In general, baking causes slightly higher losses of vitamin C than boiling, due to the higher oven temperatures, but losses of other vitamins and minerals during baking are lower.

The Potato crop has the capacity to produce more food per unit time and area and has high nutritional value to sustain burgeoning population. It produces 47.6 kg of food/ha/day whereas wheat, rice and maize produce 18.1, 12.4 and 9.1 kg food/ha/day, respectively (Singh *et al*., 2008). It is a versatile food as it can be cooked in many ways, can be processed into a number of products each having its characteristic taste and can fit into any meal. Potatoes can be served in any course of a meal from salads, snacks and soups to the main course in which they can figure either as an accompanying side dish, or as the main dish itself. There has been a sustained change in potato consumption pattern in most of the developing countries.

1.10 Potato processing industry scenario in India

Potato processing is a very important component of agro-processing in India. Rapid urbanization and improvements in living standards have led to phenomenal growth in potato processing in recent years. Easy availability and convenient packaging are among the other reasons for the popularity of processed potato products, even in the far-flung rural areas of India.

Potato processing industry mainly comprises 4 segments: potato chips, French fries, potato flakes/powder and other processed products. However, potato chips still continue to be the most popular processed product.

In addition to established potato processors such as Frito Lay India, Haldiram, McCain Foods India, Golden Fries and Balaji Wafers, new players including ITC, Gee Pee Foods, Merino Industries Ltd, Satnam Agri Industries, Little Bee Impex and Vimal Oil & Foods Ltd have also entered the arena. Small and regional players have a very high collective share in Indian potato processing. Global Potato Processing market is expected to grow from US$ 19.74 billion in 2016 to reach US$ 32.45 billion by 2023 with a CAGR of 7.3 per cent.

By Product, the frozen segment commanded the largest market share during the forecast period due to the frozen potato being consumed on a large scale owing to rise in demand for French fries across the globe. Also with the expansion of foreign Quick Service Restaurants (QSRs) such as KFC, Pizza Hut, McDonald’s, Burger King, Dunkin' Donuts and Subway in countries such as India and China contribute to the growth of the market. These products are gaining significance due to properties such as prolonged shelf life and the lesser time required for meal preparation. French fries, Smiles, Chilli Garlic Potato Bites, Super Wedges, Veggie Burger and Aloo Tikki are some of the famous frozen potato products.

McCain Foods is world's largest French Fries manufacturer and is active in India since 1995. It started the new McCain factory in Gujarat, the production of French Fries in India has been taken to a new level. India is having strong supply chain and it helps the many MNCs and potato processing companies to procure raw materials and to sell the finished goods to consumers. The Central Potato Research Institute (CPRI) certainly has done a good job in developing suitable varieties for processing for the Indian cultivation conditions, the degree of involvement of processing companies in the multiplication and further development offers a lot of promise for the future potato processing potential in India.

Geographically, Asia Pacific is expected to grow at a fastest CAGR due to high production of potatoes for its vast growing population across its countries. In addition, Government policies such as FDI (Foreign Direct investment) being adopted by developing economies, increase in the number of hotels and restaurants serving frozen potato products have led to the growth of potato processing products in this region. Potato Chips are crispy, salty or spicy and consumers prefer fresh quality. Chips are the most popular variety of snacks and they are consumed round the year by the consumers.

1.11 Need for potato processing

India is the second largest potato producer (43.8 million tonnes) after China (99.12 million tonnes) in 2016. Domestic potato research and development have been responsible for higher potato productivity in India. India produces 51.31 million tonnes of potatoes from 2.142 million ha in 2018. (Anon., 2018). Potato is a perishable commodity and its harvest time (Feb/March) coincides with steep rise in temperature in the Indo-Ganges plains which account for 87 per cent of the production in the country. From April onwards, temperatures in the plains start shooting up and the produce has either to be consumed within a short period or is required to be shifted to the cold stores. Due to inadequate, expensive and unevenly distributed refrigerated storage facilities, there are frequent gluts in the market causing considerable economic loss to the farmers and wastage of precious food, such kind of gluts have arisen every 3 to 5 years, whenever there is increase in potato production by 7-8 per cent (Singh *et al*., 2008).

The glut years are followed by a reduction in potato area in the following year and the boom and bust cycle continues. Therefore, it is essential that potato consumption is increased to sustain this increase in production and to ensure remunerative prices to the farmers. Under the existing circumstances, processing of the bulky perishable potato into various processed products is a viable option which can help to extend the shelf-life, save the wastage of precious food during gluts, solve the problem of storage, cater to consumer preferences belonging to different age groups and social strata and serve as a means to increase the supply in off seasons thus maximizing the potato utilization (Marwaha et al., 2006). Both organized and unorganized Indian processing industries presently consume about 4 per cent of the total potato produce in the country as compared to about 30–67 per cent in developed European countries and North America (Rana and Pandey, 2007). With this background, the following specific objectives were framed.

1. To document various types of potato based products and brands purchased in Bengaluru Metropolitan,
2. To analyse the factors influencing the consumption of potato based products,
3. To assess the attitude towards purchase of potato based products and

4. To examine constraints faced by retailers of potato based products.

Based on the above objectives**,** the following hypotheses were formulated.

1. Changing lifestyle of consumer is the important factor that influence towards consumption of potato based products.
2. Majority of the consumers are taste oriented towards the purchase of potato based products and more than fifty per cent of the consumers are loyal customers for Lays brands of potato based products.

1.12 Limitations of the study

The study was based on the primary data collected through well-structured schedule by personal interview method and obtained data from 60 consumers of potato based products. Secondary data was collected from published reports, journals and websites. The study was restricted to Bengaluru only due to constraint of time and resource. The number of outlets selected for the study may not be representative of the total retail outlets in Bengaluru. As indicated above due to the imitations of time and resources, only 20 retail outlets were selected for the study. Hence, the results of the study were interpreted with the above limitations in view.

1.13 Presentation of the study

The project report is structured into six chapters. The first chapter provides a brief introduction, potato processing industry in India, its need along with the specific objectives, the scope of the study, hypotheses and limitations of the study. In the second chapter, includes reviews which are presented in consonance with the study objectives. The third chapter describes the study area, sampling framework, database and analytical tools used in the analysis of data. The observed results are furnished along with discussion in chapter IV, followed by chapter V summarizes the major findings of the study and chapter VI contains references, quoted in the different chapters.

II REVIEW OF LITERATURE

In this chapter, an attempt is made to link the present study with past studies undertaken in the same field. A review of research studies helps to identify gaps in conceptual and methodological issues pertaining to research study. This indirectly helps the researcher to collect the relevant data, and to draw the meaningful interpretations pertaining to the objectives of the study, relevant previous studies were reviewed.

Presentation of the review has been classified into the following sub-headings for easy understanding of the past studies.

2.1 Various types of potato based products and brands purchased

2.2. Factors influencing the consumption of potato based products

2.3 Attitude towards purchase of potato based products

2.4 Constraints faced by retailers of potato based products

2.1 Various types of potato based products and brands purchased

Das and Ezekiel (2001) a market survey carried out in Kolkata (West Bengal) and revealed that potato chips, lachha and bhujia are popular in the metropolitan. Besides, a local product called Sangra farari (a mixture of fried potato slices, fried groundnut, fried mungdal and boondia) was found to be very popular. The results concluded that generally consumers prefer package size of 500g to 1000g for locally processed potato products.

Jame *et al*. (2001) assessed the status of market share of different processed potato products in Meerut, Ghaziabad and Delhi. It was observed that processed potato products constitute a remarkable share in the snack foods. Unorganized sector possessed strong presence in the category of potato processed products in the market. Particularly in case of potato chips unorganized sector shares equally with branded chips. In case of aloo lachha & aloo bhujia, market was still dominated by branded players. From the study it can be said that potato processing in unorganized sector has a great potential provided if they get guaranteed supply of processing quality potatoes throughout the year.

Rani and Ezekiel (2001) conducted a market survey at Shimla, Chandigarh and Mohali. The results revealed that potato chips, potato sticks and Potato bhujia were the most common processed products available in the market. These products were prepared by small-scale local processing units in the unorganised sector depending largely on human labour and generally not using machinery. The quality of the product was poor due to the poor quality of potatoes used, thin slices and unsatisfactory packaging.

Verma *et al.* (2001) a benchmark survey was conducted during the year 1999 and 2000 in the different sectors of rural and urban areas of Meerut district. The data revealed that Frito Lay (Lay's potato chips and Uncle chipps) were more popular with average consumption rate 10.7 to 27 per cent but at Railway station and Cinema halls their consumption rate varied from 20.5-27 per cent, followed by PikNik potato pops (9-11%). In rural areas and general markets of Meerut city, the people preferred to eat chips and local namkeens with a consumption rate of 9-33 per cent. The Haldiram, Crax and Local namkeens were more popular with the consumption rate of 9-30 per cent, 11-14 per cent and 33-39 per cent in rural and urban areas, respectively.

Rana *et al.* (2005) concluded that the current expenditure on potato products from organized sector is 4.93 times than that from the unorganized sector. Potato chips consumption has very strong relation with the level of family income, non-home cooked food and total food expenditure. No consumption growth is expected for aloo bhujia while French fries are expected to show phenomenal growth in the coming years.

2.2 Factors influencing the consumption of potato based products

Koutroulou and Tsourgiannis (2011) identified the factors affecting consumers purchasing behaviour towards local foods in Greece. The factors that influenced people to buy local food products were the topicality of the products, appearance, freshness, quality, health issues, freshness and taste issues, curiosity and prestige. Cluster analysis was employed to classify the consumers with similar buying behaviour. Two groups of customers were identified: a) Those influenced by curiosity, the freshness of the product and prestige, b) those interested in topicality of the product.

Moghana *et al*. (2012) assessed the consumer's awareness and preference towards quality certified products and opined that purity was the major factor which has influenced the Purchase of AGMARK products followed by price and availability. Major reasons for not Purchasing AGMARK products were unavailability and high price as expressed by non-user.

Ali *et al*. (2013) identified the factors affecting consumption of edible oil in Pakistan and opined that increase in income, the growth of population, urbanization, liking and disliking of brands were the factors that have affected edible oil consumption in Pakistan. The outcomes from primary data indicated that price, family size and monthly income have significantly affected on ghee and oil consumption.

Srivastava (2013) studied factors affecting buying behaviour of consumers in unauthorized colonies for FMCG products in Khora of Uttar Pradesh. The results have revealed that consumers in such areas favoured brands upon generic products. Simultaneously reliability, product features and socio-economic aspects had a greater influence on buying behaviour along with promotional offers.

Kaur and Singh (2014) conducted a study on consumer behaviour towards the purchase of cereal food products in Punjab. Results indicated that major factors which had influenced the consumers to buy processed cereal food products were the availability of wide range of flavours, health, brand consciousness and quality along with external factors like attractive packaging design and advertisements.

Nethravati *et al*. (2014) analysed the consumer's preferences in purchasing fruits and vegetables across selected marketing organizations in Bangalore rural and urban districts. Analysed the four marketing organizations (HOPCOMS, Subiksha, My Greens and Rythu Bazaar). The results indicated that consumer's preferred fruits and vegetables marketing organizations based on the freshness, proximity, service and availability of wide range of fruits and vegetables. Preference for Subiksha and HOPCOMS was found in well-educated households using mass media with high annual income in large family size.

Tran *et al*. (2014) identified the factors influencing the consumption of milk in rural households of Northern Vietnam. The results have indicated that household income and convenience in buying milk have strong positive effects on milk consumption of the rural households. Childrens and elders in rural households also has positive effects on the likelihood of milk purchasing among rural households. Educational level was only factor found to affect milk expenditure of the rural households. Age of the rural households and importance of milk price have significant negative effects on both decisions of milk consumption of the rural households, decision to buy milk and level of milk expenditure.

Kpodo *et al.* (2015) studied fruit and vegetable consumption patterns and preferences of students in a Ghanaian Polytechnic and found that availability followed by convenience and attractiveness were major determinants which have influenced the respondents to select fruits to buy and eat simultaneously. Long storage life and cost were the negligible determinants of consumption of fruits.

2.3 Attitude towards purchase of potato based products

Curtis *et al.* (2006) studied that the consumer reference for western-style convenience foods in China and surveyed Beijing residents' consumption of french fries, mashed potatoes, and potato chips. Majority of the consumers were in their late 30's and early 40's. The results varied for potato products between males and females, wherein younger males enjoyed mashed potatoes more often while younger females enjoyed potato chips. Almost 50 per cent of the consumers ate potato chips monthly, while 41 per cent ate french fries and 23.4 per cent ate mashed potatoes. Evaluation of consumer characteristics and attitudes revealed that only 15.5 per cent of the Beijing residents preferred western□style convenience foods. Beijing residents showed an increased consumption of processed potato products.

Hirekenchanagoudar (2008) examined the consumer behaviour towards ready□to□eat food products in Hubli and Dharwad and found that majority of the consumers belongs to the age group of 21 to 40 years. More than 50 per cent of the consumers were females. Most of the consumers were degree holders (44%). Majority of the consumers belongs to nuclear families. The findings revealed that 75 per cent of the consumers were vegetarians. Most of the consumers (40%) belongs to the lower income group (< Rs. 8615.70/month). Two-third of the consumers were found to be students.

Varun (2008) analysed the consumption behaviour of coffee and tea in Karnataka. The results revealed that in the urban districts, majority of the coffee consumers were graduates, while in the rural, more than 50 per cent of the coffee consumers were illiterates. Majority of the consumers lived in nuclear families in both urban and rural areas following Hinduism. Majority of the consumers in the urban areas were Government employees, while in the rural, agriculture was the main occupation. Majority of the coffee consumers were in the middle age group with 48.3 per cent in urban and 50 per cent in the rural areas. More than 50 per cent of the urban coffee consumers belongs to the high income group as compared to a large portion of the rural coffee consumers belonging to the low income group.

Bae *et al.* (2010) evaluated the consumers' behaviour towards ready-to-eat foods based on food-related lifestyles in Korea. Results have indicated that there were significant differences across marital status, age groups, education level, family type, eating-out expenditure, place of purchase and the reason for purchase. The findings revealed that 42.4 per cent of the consumers were males while 57.6 per cent were females. Three fourths of the consumers belong to the younger generation (20 to 39 years). Among the consumers of ready-to-eat foods, 56.3 per cent were single while 43.7 per cent were married.

Kang *et al.* (2010) explored the consumers' perceptions and prediction of consumption patterns for generic health functional foods in Korea. Results have indicated that among the consumers of generic health functional foods, 50.6 per cent were females while 49.4 per cent were males. Findings have indicated that 42 per cent of the consumers were in the age group of 20 to 30 years and one third of them were graduates. One third of the consumers had a household income between 3 to 4 million won. Also, 25.2 per cent of the consumers were housewives while one fourth of the consumers were self employed.

Bharath (2012) analysed the consumer’s preference for store formats in Bengaluru city. He reported that majority (36.67%) of the consumers belonged to the age group of 31 to 40 years followed by 20 to 30 years (25.83%), 41 to 50 years (24.17%) and above 50 years (13.33%). He also reported that majority (44.17%) of the respondents were housewives followed by professionals (35.83%), academicians (8.33%), businessmen (5%), students (5%) and respondents employed in BPO's (1.67%).

Koc and Ceylan (2012) measured the effects of socio-economic status of consumers on purchasing behaviour and attitude to food products in Turkey. The study has revealed that a large percentage of the consumers were public servants and businessmen. It was observed that as the socio-economic status increased, the proportion of businessmen also has increased. Consumers in the lower status groups spent the biggest portion of their income on food products. As the wages increased, the level of spending on food products decreased proportionally and the ability to make savings increased. This was ascertained from Engels law of consumption. More than half of the highest status consumers always checked the price labels of the food products while three fourths of the consumers were open to trying new food products.

Salma and Dey (2012) studied the preference of consumers for rythu bazaars and super markets in Andhra Pradesh. Their study has revealed that 90 per cent of the consumers who visited rythu bazaars were graduates with 64.6 per cent having an annual income between Rs. 5,00,000 and Rs. 10,00,000. The study has reported that consumers with no children in the family have higher propensity to visit super markets.

Sangkumchaliang and Huang (2012) evaluated the consumer's perceptions and attitudes of organic food products in Northern Thailand. The findings have indicated that two thirds of the consumers of organic food products were females while 37 per cent were males. Nearly half of the consumers were over 35 years of age and only 28 per cent were under 25 years of age. More than half of the consumers had a university education followed by 27 per cent who had finished high school. Half of the consumers had a monthly income of less than 10,000 Baht followed by 19 per cent are having a monthly income above 20,000 Baht. A little more than half of the consumers lived in families with more than four members, more than a quarter had two to three family members and one third of the consumers were married.

Swamy *et al.* (2012) assessed the buying behaviour of consumers towards instant food products in Hyderabad city. The general characteristics of the consumers revealed that one third of the consumers had an income between Rs. 10,001 and Rs. 15,000, while consumers with an income of Rs. 15,001-20,000 comprised of 28.89 per cent. The average family size varied from 3 to 6 members, the average age of the consumers varied from 30 to 40 years and majority of the consumers belongs to nuclear families. Also, the results have indicated that more than three fourths of the consumers were non-vegetarians. The results revealed that household income, age, family type, food habit were the major attributes which affect the purchasing behaviour of consumers.

Pradeepa and Kavitha (2013) studied the consumer behaviour towards ready-to-eat food products in Coimbatore City. The study revealed that some of the factors contributing the changes in Indian cooking and lifestyle were Liberalization, Dual income, nuclear families, innovative kitchen applications, media proliferation, changing food habits, etc. Long working hours during the weekdays and weekends that are always spent with kids, preferably outside the house gives them very little time to cook. These factors are a major cause to make ready to eat food products an essential component in the daily lives of people. Greatly changing food habits and a greater demand for ready-made food products have led to the growth of processed and packed food manufacturing industries.

Kavyashree (2014) in her study on the consumers' preference for mushroom in Bengaluru city has reported that majority (52%) of the consumers belonged to the age group of 21 to 25 years. Majority (68%) were females. The families of majority of the consumers were nuclear in nature. Nearly half of the consumers had a monthly income ranging from Rs. 25,001 to Rs. 50,000.

Kumar and Kaur (2016) conducted research on consumer preferences and awareness towards ready to eat products of Cooperatives - A Case of Markfed. Changing lifestyle have influenced majority of people to consume products comes under ready to eat (RTE) category. Findings revealed that Markfed (Marketing Federation) had a customer base mainly consisted of young, highly educated and salaried class people. Most of them used RTE products of Markfed only once in a month. Female customers preferred these RTE products on daily basis. With Effective advertisement and promotional strategies, customer base and usage frequency for RTE products of Markfed can be increased for the newer markets of Punjab and all over India.

Solanki and Jain (2016) conducted the study on consumer buying behaviour towards ready to eat food industry in Northern India. The results revealed that people who are unmarried, who live alone and the family in which both husband & wife do the job consume Ready to eat foods. The final findings were consumers are aware about the industry but are unable to completely rely upon it.

Jain and Sharma (2017) conducted study on comparative analysis of buying behaviour towards ready-to-eat food products among Indian & American consumers. It is found from the study that convenience is the most important factor behind the purchasing of ready-to-eat food products followed by increasing number of working population who do not have enough time and energy to cook food opt to go in for ready-to-eat/packaged food products.

2.4 Constraints faced by retailers of potato based products

Chauhan and Mehta (2002) identified the problems and constraints in vegetable marketing in Himachal Pradesh. The study has revealed that remunerative prices for vegetables especially during peak season and lack of storage facilities were the main constraints faced by vegetable growers. In addition, road blockage due to landslides, expensive packing material and grading, absence of pucca roads, lack of skilled labour for grading, shortage of packing material and non□availability of modern inputs were the other constraints.

Emana and Gebremedhin (2007) conducted study and found major constraints faced by farmers in the marketing of horticulture production, which include low price for the products, large number of middlemen in the marketing system, lack of marketing institutions safeguarding farmers' interest and rights over their marketable produces, lack of coordination among producers to increase their bargaining power, poor product handling and packaging, imperfect pricing system, lack of transparency in market information system mainly in the export market.

Marwaha *et al.* (2010) conducted study on Potato processing scenario in India: Industrial constraints, future projections, challenges faced by the industries. The results revealed that arranging round the year supply of processing varieties at reasonable price was found to be the major constraint faced by the industries.

Rajesh (2011) conducted a study on the Indian potato processing industry: Global comparison and business prospects. In this study, the results were revealed that the marketing of potato processing products has facing many constraints like competition from traditional foods, costly cold chain and higher transportation costs etc.

Sedaghat (2011) examined the constraints faced by farmers and traders in production and marketing of Iran's Pistachio. Results indicated that; Inadequate irrigation, Unsuitable domestic market structure accompanied with low received prices and price fluctuations and Lack of appropriate chemical fertilizers were the major problems from the farmers point of view, while Aflatoxin contamination standards, Changing government policies toward export and Irregular supply of produce to the market during the year were the sole hindrances from the traders/exports point of view.

Sori and Gauraha (2014) identified the constraints in production, marketing and processing of the paddy. Data was collected from the selected farmers, trader and processors through personnel interview by using pre structured survey schedule. Results of the study revealed that the in marketing of paddy lack of transportation and road facility, lack of regulated market and unremunerated price were observed as major problems while processing problems perceived by processors of study area as a severe constraint are related to electricity problem and efficiency problem of processing unit.

III METHODOLOGY

The study was conducted to know the consumer preference for potato based products in Bengaluru metropolitan. This chapter presents a brief discussion on the methodology used in the study under the following headings.

3.1 Selection and description of study area

3 2 Description of the study unit -Retail outlet

3.3 Sampling procedure

3.4 Source of data

3.5 Analytical tools and techniques

3.1 Selection and description of study area

3.1.1 Selection of study area

Bengaluru was selected purposefully for the study since Bengaluru has lot of retail outlets of potato based products spread in different parts of metropolitan. Further, Bengaluru is composed of income groups like urban rich, middle class and urban poor. It is also the Information Technology (IT) and Bio-Technology (BT) hub of India, with industrial estates and large number of financial and educational institutions with vast potential for marketing of potato based products through retail outlets. The urban rich and middle class are health conscious and potato based products are versatile foods as they can be cooked in many ways, can be processed into a number of products. Potato based products have characteristic taste and can fit into any meal this provides the sustainable market for potato based products. Potato based products can be used as compliment food with other dish as well. (Fig. 1)

3.1.2 Description of study area

Bengaluru is located in the Deccan plateau in south-eastern Karnataka. It lies at an altitude of approximately 920 m (3018 feet). Spread over an area of 2190 sq. km, the city is positioned at 12.97° N 77.56° E. It is located at a height of over 3000 feet (914.40 m) above sea level and is known for its pleasant climate throughout the year.

According to 2011 census of India, Bengaluru had a population of 96,21,551 of which males and females were 50,22,661 and 45,98,890, respectively with a sex-ratio of 908 females/1000 males. Bengaluru is the third largest populous city and the fifth largest metropolitan area experiencing a massive growth in its population and is the 18th most populous city in the world. The total literates in Bengaluru city were 67,75,942, with an average literacy rate of 89.59 per cent and is home of prestigious colleges and research institutions have the second-highest literacy rate among the metropolitan cities in the nation. 79.40 per cent of Bengaluru's population comprise of Hindus, Muslims comprise about 13.4 per cent of the population, Christians and Jains account for 5.8 per cent and 1.1 per cent of the population, respectively. The city's workforce is predominantly non agrarian, with only 6 per cent being engaged in agriculture-related activities. In Bengaluru, 65 per cent of the population speaks Kannada and the remaining population speaks Tamil, English, Hindi, Telugu, Malayalam and Urdu. Bengaluru is a Cosmopolitan city of the country. With a Gross Domestic Product (GDP) of US$ 83 billion, Bengaluru is listed fourth among the top 15 cities contributing to India's overall GDP. As of 2011, Bengaluru shares Rs. 1660 crore (US$ 400 million) in Foreign Direct Investment.

3.2 Description of the study unit -Retail outlet of potato based products

Bengaluru is the fastest-growing Indian metropolis and is considered the hub of retail revolution. As per industry estimates, for every 100 households, there is more than one retail outlet in Bengaluru which is not so in other cities like Mumbai. Bengaluru itself has more than 25000 retail outlets. Presently, Bengaluru alone has more than 10 organised retailers with more than 100 outlets including Metro AG operating in the city. Major retailers present in Bengaluru are Big Bazaar, Star Bazaar, Vishal Mega Mart, Spar hypermarket, Reliance fresh, More mega store and Total hyper Market, etc.

3.3 Sampling procedure

The data for the present study pertaining to consumer preference for potato based products in Bengaluru metropolitan was obtained from 60 consumers and 20 retailers of

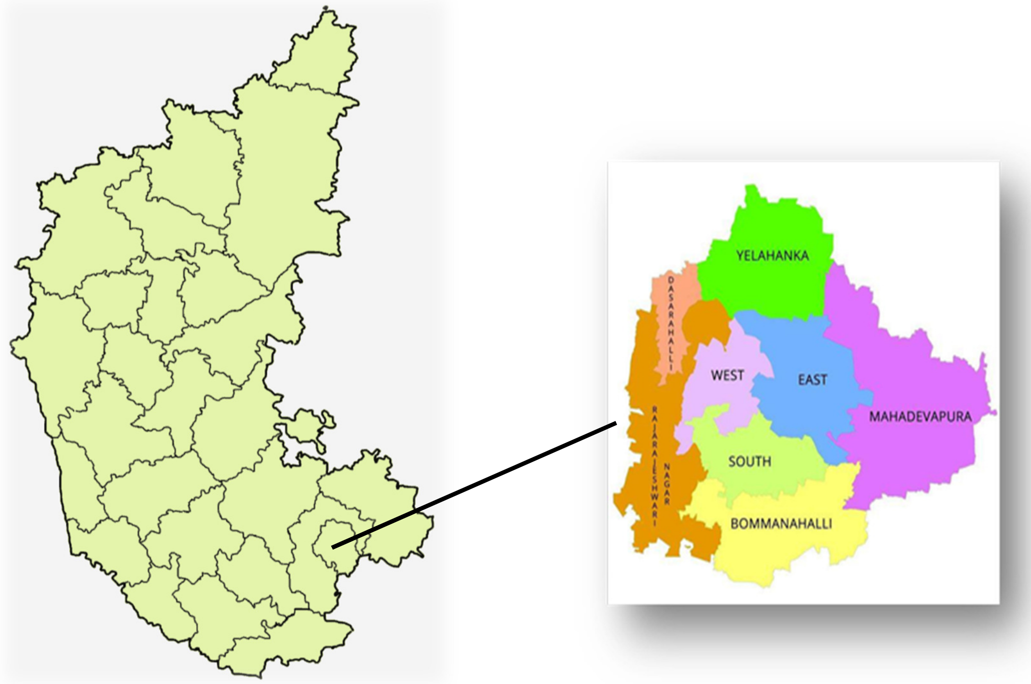

Fig. 1: Map depicting the Study Area (Bengaluru Metropolitan)

potato based products by personal interview method through pre-tested schedule. The sampling was done in different localities of north, south, east and western Bengaluru metropolitan to have fair representation of different socio-economic strata using simple random sampling method at the selected retailers of potato based products. Respondents were selected randomly irrespective of characteristics.

The consumer respondents were selected from different localities of Bengaluru Metropolitan namely Jayanagar, Hebbal, Yelahanka, Tinfactory, Electronic City, and Sahakarnagar to get a diversity in the sample mainly based on region, per capita income, profession and social class. The composition and distribution of the consumers selected for the study is presented in Table 3.1.

Table 3.1: Composition and distribution of consumers selected in Bengaluru city

Sl. No.	Name of the locality	No. of consumers
1.	Jayanagar	10
2.	Hebbal	10
3.	Yelahanka	10
4.	Tinfactory	10
5.	Electronic City	10
6.	Sahakara nagar	10
	Total	**60**

3.4 Source of data

In the current study, primary and secondary data were collected and used. However, the study is mostly based on the primary data. Required primary data was collected by personally interviewing the consumers using a structured schedule. The required secondary data for the study was collected from journals and websites. The schedule comprises of both general and specific information of the sample respondents. The general information pertaining to socio‑economic characteristics of consumers such as age, gender, education, occupation and household characteristics like monthly household family income, family type, food habits and consumer expenditure on potato based products was collected from sample respondents and with respect to retailers age, education, experience in marketing and place of retail shop was collected. The specific information includes particulars regarding the frequency of purchase, source of purchase, purchasing details and factors influencing consumption of potato based products. Constraints faced by retailers in the marketing of potato based products were collected from retailers of potato based products.

3.4.1 Period of study

The reference year of the study was 2018-19 and the data were collected during the months of March and April 2019.

3.5 Analytical tools and techniques used

The methods of analysis used in the present study are presented under the following headings:

3.5.1 Descriptive statistics

3.5.2 Factor analysis

3.5.3 Garrett's ranking technique

3.5.1 Descriptive statistics

The data was analysed by working out simple averages (wherever applicable). Percentages were calculated for variables indicating socio‑economic characteristics or of the consumers like age, gender, education, occupation, monthly household family income, family type and consumption habits. The tools provided simple summaries about the sample and helped in arriving at meaningful conclusions.

3.5.2 Factor analysis

Factor analysis was used to find important factors among observed variables. In other words, factor analysis was used to reduce the number of variables. Grouping of the variables within the total variables was done by factor analysis. Therefore, with factor analysis can able to generate less number of factors from large number of variables which are capable of explaining the observed variance within the variables so that for further analysis one can use reduced factors. From factor analysis the first output was descriptive statistics table containing all the variables. Typically, the mean, standard deviation and number of respondents (n) who participated in the survey. The variable which is having highest mean is the major variable that influence the consumer to buy potato based products.

A correlation matrix is a simple rectangular group of numbers which provides the correlation coefficients between a single variable and every other variable. The correlation coefficient between a variable and itself is always 1, hence the principal diagonal of the correlation matrix contains 1s. The correlation coefficients above and below the principal diagonal are the same.

The KMO (Kaiser-Mayer-Olkin) measure was used to know the adequacy of the sample size. From this measure one can find whether the sample size is adequate to conduct factor analysis. Usually the sample size should be 5 times more than the number of variables. The KMO value should be higher than 0.5 for a satisfactory factor analysis to proceed. KMO value of 0.5 is accepted, 0.7-0.8 is good and the values above 0.9 are superb.

Bartlett's test is conducted to know whether the correlation matrix is there between the variables this tests the null hypothesis that the correlation matrix is an identity matrix. The significance level should be less than 0.05 to reject the null hypothesis. Which indicates that correlation matrix is not an identity matrix.

Communalities which shows how much of the variables need to be removed to extract the factors. Eigenvalue actually represented the number of extracted factors whose sum should be equal to number of items which are subjected to factor analysis. The Cattell's scree plot is a graph of the eigenvalues against all the factors. The graph is useful for determining how many factors to retain. The idea of rotation is to reduce the number factors on which the variables under investigation have high loadings. The factors which are having eigenvalue more than 1 those factors are considered as important factors which influences the consumption of potato based products.

3.5.3 Garrett's Ranking Technique

Garrett's Ranking Technique was used to rank the constraints faced by retailers in the marketing of potato based products. As per this method, respondents were asked to assign the rank for all the factors, after which the assigned ranks were counted into per cent position using the formula given below. Accordingly, the per cent position of each rank was converted to scores by referring to tables given by Garrett and Woodworth (1969).

In the first stage, ranking given by respondents for each attribute was analysed. In the second stage, the assigned ranks by the individual respondents were converted into per cent position value by using the formula.

Per cent Position = 100*(Rij-0.50)/Nj

Where, Rij = Rank given for the i^{th} item by the j^{th} individual,

Nj = Number of items ranked by the j^{th} individual.

In the third stage, for each per cent position scores were obtained with reference to the Garrett's tables and each per cent position value was converted into scores by referring to Garrett's table.

In the fourth stage, summation of these scores for each factor was worked out for the number of respondents who ranked for each factor.

In the fifth stage, mean scores were calculated by dividing the total scores by the number of respondents.

In the last stage, overall ranking was obtained by assigning ranks such as 1,2,3…. etc. in the descending order of the mean score (Dhanavandan, 2016).

IV RESULTS AND DISCUSSION

Major findings of the study are presented in this chapter in consonance with the objectives of the study.

4.1 Socio- economic profile of consumers and retailers of potato based products

4.2 Product portfolio of potato based products purchased in Bengaluru Metropolitan

4.3 Factors influencing the consumption of potato based products

4.4 Attitude towards purchase of potato based products

4.5 Constraints faced by retailers of potato based products

4.1.1 Socio- economic profile of consumers of potato based products

The socio-economic characteristics of the consumers provides an idea about the households attitude towards the purchase and consumption of potato based products. The details of general information of consumers is presented in the Table 4.1. The table includes information about age, gender, education, occupation, income, food habit and family type. It could be seen from table that, 73.33 per cent of the consumers belongs to the age group of 20-40 years, 16.67 per cent of the consumers belongs to the age group of 15 to 20 years, and the remaining 10.00 per cent of the consumers belongs to the age group of 40-60 years. Majority of the consumers of potato based products are in the age group of 20-40 years, and resulting that they were younger generation who are addicted to eating processed products.

The educational level of sample consumers was analysed and found that 53.33 per cent of the consumers had completed their post-graduation and above, 18.33 per cent of consumers studied Pre-university course, 16.67 per cent of the consumers studied Under graduation, 6.67 per cent of the consumers studied Secondary education and 5.00 per cent of the consumers were illiterates. The results revealed that majority of the consumers had completed post□graduation and above, were well aware of the nutritional importance of the potato based products.

Among the consumers interviewed, 53.33 per cent were female and the rest (46.67%) were male. With regard to occupation of respondents, 60 per cent were students, 16.67 per cent were working in Govt. sector, 10 per cent respondents were working in private sector. As Bengaluru city is a hub of IT and BT that promotes private jobs on a large scale, 8.33 per cent of the respondents were entrepreneurs and 5 per cent of them were homemakers. Majority of the consumers were students usually they love to prefer potato based products more than compared to the other section of the society.

With respect to monthly household income of consumers, 45 per cent of them were in the range of Rs. 10,000 - 20,000 per month which belongs to the poor group, 38.33 per cent of them were in the range of Rs. 20,000 - 50,000 per month which belongs to the lower middle class group, 6.67 per cent of them were earning more than one lakh which belongs to high class group, 5.00 per cent of the respondents family income was in the range of Rs. 5000 - 10,000 per month which belongs to the very poor group and remaining 5.0 per cent of the respondents were in the range of Rs. 50,000 - 1 lakhs per month which belongs to upper middle class group. From the results it can be inferred that majority of the consumers were having monthly income of Rs. 10,000 - Rs. 20,000.

With regard to the family type; majority of families in the study area were of nuclear type. This could be attributed to the changing life style of the families in the present days and diversion in the socio-economic attitudes which has discouraged joint family trend. Therefore, the number of nuclear families (85.00%) were more than the joint families (15.00%). With regard to the consumption habits, more than half (76.67%) were non-vegetarians and the rest (23.33%) were vegetarians.

4.1.2: Consumers expenditure on potato based products

Consumers expenditure on potato based products is represented in the Table 4.2. With respect to consumers expenditure on potato based products, 45.0 per cent of the consumers spent Rs. >50/- to 150/- per month, 28.33 per cent of the consumers spent Rs. >150/- to 250/- per month, 16.67 per cent of the consumers spent Rs. >250/- per month and 10.0 per cent of the consumers spent about Rs. <50/- per month. Majority (45%) of the consumers were spending Rs. 50/- to 150/- per month per person on potato based products.

Table 4.1: Socio-economic profile of consumers using potato based products

(n = 60)

Sl. No.	Particulars	No. of Consumers	Percentage
A.	**Age (Years)**		
1.	15-20 (late adolescent)	10	16.67
2.	>20-40 (early adults)	44	73.33
3.	>40-60 (late adults)	06	10.00
	Total	**60**	**100.00**
B.	**Educational level**		
1.	Illiterate	03	05.00
2.	Secondary Education	04	06.67
3.	PUC	11	18.33
4.	Under Graduation	10	16.67
5.	Post-Graduation and above	32	53.33
	Total	**60**	**100.00**
C.	**Gender**		
1.	Male	28	46.67
2.	Female	32	53.33
	Total	**60**	**100.00**
D.	**Occupation**		
1.	Student	36	60.00
2.	Homemaker	03	05.00
3.	Govt. sector	10	16.67
4.	Private sector	06	10.00
5.	Entrepreneurs	05	08.33
	Total	**60**	**100.00**
E.	**Monthly income (Rs.)**		
1.	5000 – 10,000	03	05.00
2.	>10,000 – 20,000	27	45.00
3.	>20,000 – 50,000	23	38.33
4.	>50,000 - 1 lakh	03	05.00
5.	1 - 10 lakh	04	06.67
	Total	**60**	**100.00**
F.	**Type of family**		
1.	Nuclear	51	85.00
2.	Joint	09	15.00
	Total	**60**	**100.00**
G.	**Food habit**		
1.	Vegetarian	14	23.33
2.	Non - vegetarian	46	76.67
	Total	**60**	**100.00**

Table 4.2: Consumers expenditure on potato based products

Sl. No.	Consumers expenditure on Potato based products (Rs./month)	No. of Consumers	Percentage to the total
1.	<50	06	10.00
2.	>50-150	27	45.00
3.	>150-250	17	28.33
4.	>250	10	16.67
	Total	**60**	**100.00**

4.1.3 Socio-economic profile of retailers

The retailers profile of potato based products is furnished in the Table 4.3. It could be clearly seen from the table that, majority (55%) of the retailers belongs to the age group between 20 to 40 years *i.e.* early adults. 45 per cent of the retailers were above 40 years and below 60 years *i.e.* Late adults. With respect to the education level of retailers, majority (55%) of the retailers studied Under-graduation, 25 per cent of them had studied Pre-university course, 20 per cent of retailers studied secondary education. Hence, it could be inferred that all the retailers in the study area were literates and majority of them are well educated.

The results pertaining to experience in retailing has revealed that, 50 per cent of the retailers were having 5 to 10 years of experience, 30 per cent of them were having 1 to 5 years of experience, 10 per cent of them were having 10 to 15 years of experience and 10 per cent of them were having >15 years of experience in retailing sector.

Majority (70%) of the retail outlets were located in commercial areas of the city and remaining 30 per cent of the retail outlets were located in residential area.

Table 4.3: Socio-economic profile of retailers

(n=20)

Sl. No.	Particulars	No. of Retailers	Percentage to the total
A.	**Age (Years)**		
1.	>20-40 (early adults)	11	55.0
2.	>40-60 (late adults)	09	45.0
	Total	**20**	**100.00**
B.	**Educational level**		
1.	Secondary Education	04	20.0
2.	Pre University course	05	25.0
3.	Under Graduation	11	55.0
	Total	**20**	**100.00**
C.	**Experience in marketing**		
1.	1-5 years	06	30.0
2.	>5-10 years	10	50.0
3.	>10-15 years	02	10.0
4.	>15 years	02	10.0
	Total	**20**	**100.00**
D.	**Place of Retail shop**		
1.	Residential	06	30.0
2.	Commercial	14	70.0
	Total	**20**	**100.00**

4.2 Product portfolio of potato based products purchased in Bengaluru Metropolitan

Product portfolio of potato based products purchased in Bengaluru Metropolitan is presented in Table 4.4. Products were categorised into potato manufactured products and potato baked products. Under that 19 products were manufactured products and 15 were baked products available in Bengaluru Metropolitan. There are different brands under potato chips category viz., Lays, Uncle chipps, Ruffles, Munchos, Dorito, Bingo, Haldiram’s, Garden, Utz original, Yellow Diamond, Popchips, Priniti, Kettle, Kellogg’s, Tat-O, Harley, Kings and Cape Cod. Similarly, under potato wafers product category the brands were Parle’s, Balaji, kellogg’s. Under French fries category McCain brand is the major one. Under Aloo bhujia category Haldiram’s is the major brand. Some of the major players in the potato snack industry are PepsiCo, ITC Ltd, Haldiram’s, Snacks Pvt. Ltd.

and Parle Products Pvt. Ltd., Balaji Wafers Pvt. Ltd., Cavin Kare Pvt. Ltd., Utz Quality Foods, Inc., Prataap Snacks Ltd., Popchip Ltd., Priniti Foods Pvt. Ltd., Diamond Foods, McCain Foods Ltd., Kellogg comp., GCL Gopal Group, Harley Food Products Pvt. Ltd., Largo Foods and Cape Cod Potato Chips. Among 21 brands of potato products top brands in India are Pringles, Lays, Uncle chipps and Haldiram's (https://www.worldblaze.in/best-potato-chips-brands-in-india/).

Table 4.4: Product portfolio of potato based products purchased in Bengaluru Metropolitan

Sl. No.	Company name	Brand name	Products
1.	PepsiCo	Lays	Chips
		Uncle chips	Chips
		Ruffles	Chips
		Munchos	Chips
		Dorito	Chips
2.	ITC Limited	Bingo	Chips
3.	Haldiram Snacks Pvt. Ltd.	Haldiram's	Aloo Bhujia
			Kettle Chips
4.	Parle Products Pvt. Ltd.	Parle's	Wafers
5.	Balaji Wafers Pvt. Ltd.	Balaji	Wafers
6.	Cavin Kare Pvt. Ltd.	Garden	Chips
7.	Utz Quality Foods, Inc.	Utz original	Chips
8.	Prataap Snacks Ltd.	Yellow Diamond	Chips
9.	Popchip Ltd.	Popchips	Chips
10.	Priniti Foods Pvt. Ltd.	Priniti	Chips
11.	Diamond Foods	Kettle	Chips
12.	McCain Foods Ltd.	McCain	French fries
13.	Kellogg comp.	Kellogg's	Chips, Wafers
		Pringle's	Chips
14.	GCL Gopal Group	Tat-O	Chips
15.	Harley Food Products Pvt. Ltd.	Harley	Chips
16.	Largo Foods	Kings	Chips
17.	Cape Cod Potato Chips	Cape Cod	Chips

Product category of potato based products consumed in Bengaluru Metropolitan are presented in Table 4.5. It can be observed from the table that, under the processed potato products category some of the products are potato chips, potato wafers, potato french fries, Potato sticks, aloo bhujia, potato flakes, potato twister, frozen potato products, potato wedges, potato cheese balls, croquetts, aloo lachcha, potato patties, potato papad, potato shots, potato gratin, potato lite, potato powder and potato starch.

Table 4.5: Product category of potato based products consumed in Bengaluru Metropolitan

Sl. No.	Processed Potato Products	Sl. No.	Baked Potato Products
1.	Potato Chips	1.	Potato bun
2.	Potato Wafers	2.	Potato rosti
3.	Potato French fries	3.	Potato French fries
4.	Potato Sticks	4.	Potato bites
5.	Alu Bhujia	5.	Potato bread
6.	Potato Wedges	6.	Potato slices
7.	Potato Flakes	7.	Aloo tikki
8.	Potato twister	8.	Aloo wrap
9.	Frozen Potato products	9.	Aloo naan
10.	Potato cheese balls	10.	Masala wedges
11.	Croquettes	11.	Mashed potatoes
12.	Potato patties	12.	Cheesy tots
13.	Potato papad	13.	Aloo samosa
14.	Potato shots	14.	Aloo kachori
15.	Potato gratin	15.	Aloo Masala
16.	Potato lite		
17.	Aloo lachcha		
18.	Potato powder		
19.	Potato starch		

Under the baked potato products category some of the important products are potato French fries, aloo tikki, aloo samosa and aloo kachori. Other baked products include potato bun, potato rosti, potato bites, potato bread, potato slices, aloo wrap, aloo nan, mashed potatoes, cheesy tots and aloo masala. Potato French fries comes under both processed and baked potato products.

4.3 Factors influencing the consumption of potato based products

Factor analysis was used to identify the important factors influencing the consumption of potato based products. freshness, colour, flavour, brand name, attractive packing, advertisement, regular food habit, influence of family members, taste, retailer's influence, income and price were the variables considered.

Before the results of factor analysis are analysed assumptions of factors analysis are tested. For checking the adequacy of data for factor analysis, adequacy of sample size and existence of correlation among variables are tested.

Table 4.6: KMO and Bartlett's test for variance among factors influencing consumers preference for potato based products in Bengaluru Metropolitan

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.697
Bartlett's Test of Sphericity	Approx. Chi-Square	211.483
	Degree of freedom	66
	Significance level	0.000

KMO (Kaiser-Meyer-Olkin) measures and Bartlett's test results were presented in the Table 4.6. KMO value in present study was found to be 0.697 indicating adequate size of sample. The overall significance of correlation matrix was tested with Bartlett's test of Sphericity. Bartlett's test chi-square was found to be 211.483 with significance value 0.000 indicating that present sample has significant correlation matrix to conduct factor analysis. The chi-square value for Bartlett's test was significant, thus rejecting the null hypothesis of independence among the variables.

Eigenvalues greater than one were considered for determining the number of factors influencing consumption of the Potato based products. With the help of Cattell's scree plot the factors were determined. The initial Eigenvalues for 4 factors were found to be more than 1 and the eigenvalues for factor 1, factor 2, factor 3 and factor 4 are 3.290, 2.170, 1.466 and 1.245 respectively and total variance accounted by these four factors is 68.087 per cent (Fig. 2).

The rotated component matrix for factors influencing the consumption of Potato based products is furnished in the Table 4.7. The data related to factor loadings calculated with the help of orthogonal varimax rotation. Factor 1 is most significant factor with 27.417 per cent of total variance. Further the factors are labelled according to the variables loaded on that factor. Factor 1 advocates product features. Consumer preferences for Potato based products depends upon product features which are freshness loaded with a factor loading value of 0.837, colour loaded with value -0.823 and flavour with value 0.740. Factor 2 explaining 18.083 per cent of the variance and emphasize on marketing strategies opted by manufacturers. this factor contains brand name, attractive packing and advertisement having factor loading value of 0.811, 0.698 and 0.696 respectively.

Factor 3 explaining 12.213 per cent of total variance contains variables affecting consumer oriented. These include food habit, influence of family members and taste these having factor loading values as 0.799, 0.791 and 0.525 respectively. Factor 4 highlights the purchase decision of consumer and explains 10.373 per cent of total variance and contains retailer's influence, income and price having factor loading 0.850, -0.497 and -0.476 respectively.

The results revealed that product features, marketing strategies opted by manufactures, consumer oriented factors and purchase decisions made by consumers are the factors affecting consumer's preferences for consumption of Potato based products. These factors highlight that in today's consumerism World manufacturers of Potato based products should concentrate on all these factors in their manufacturing and marketing plans and should find the better ways to improve the quality and affordability of product and provide it to consumers. Koutroulou and Tsourgiannis (2011) reported similar results in their studies.

Table 4.7: Factors influencing consumers preference for potato based products in Bengaluru Metropolitan

Sl. No.	Variables	Factors			
		1	2	3	4
		Product features	**Marketing strategies**	**Consumer oriented**	**Purchase decision**
1.	Freshness	**0.837**	-0.003	-0.049	-0.014
2.	Colour	**-0.823**	0.084	0.184	0.146
3.	Flavour	**0.740**	-0.176	-0.295	0.228
4.	Brand Name	0.012	**0.811**	-0.126	0.145
5.	Attractive Packing	-0.478	**0.698**	0.005	-0.037
6.	Advertisement	0.026	**0.696**	0.092	-0.330
7.	Food Habit	-0.119	-0.034	**0.799**	0.032
8.	Influence of Family	-0.367	-0.062	**0.791**	-0.115
9.	Taste	0.490	0.485	**0.525**	0.078
10.	Retailer's influence	0.191	0.077	-0.140	**0.850**
11.	Income	0.431	0.322	-0.109	**-0.497**
12.	Price	0.460	0.113	-0.147	**-0.476**

Note *Principal component extraction method

4. 4 Consumer attitude towards purchase of potato based products

Consumers attitude towards purchase of the potato products is discussed under following headings.

4.4.1 Consumption pattern of processed potato based products by consumers

Consumption pattern of processed potato based products is presented in the Table 4.8. Majority (83.33%) of the consumers bought potato chips. Among them highest percentage of the consumers purchased Lays brand (53.33%), followed by Bingo (13.33%), unbranded (16.67%). Majority of them are purchasing the Lays because of its quality and

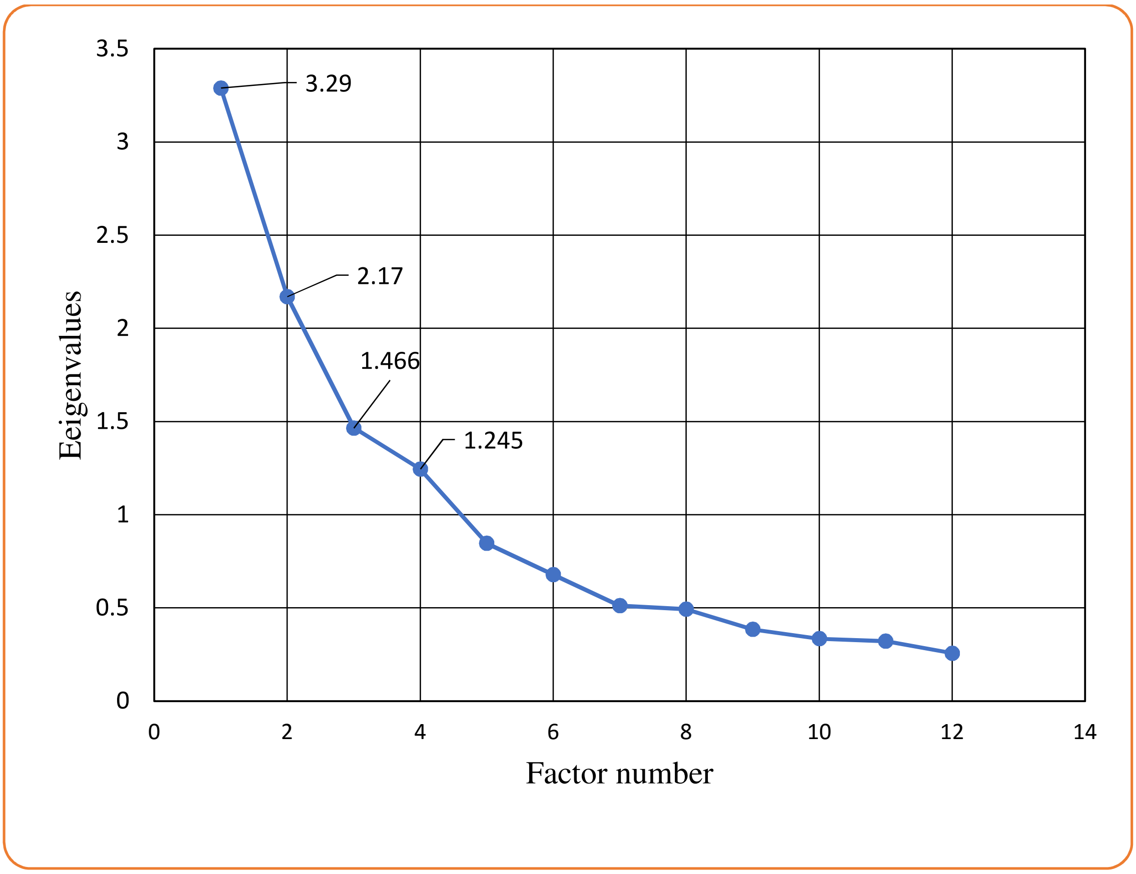

Fig. 2: Cattell's scree plot for factors influencing consumers preference for Potato based products in Bengaluru Metropolitan

popularity of the brand. Average quantity of potato chips consumed by individual is 105gm/person/month and average expenditure is Rs. 50/person/month.

26.67 per cent of the consumers purchased potato wafers. Among them 15 per cent of them purchasing parle's and 11.67 per cent were purchasing Balaji wafers. Majority of them purchasing parle's wafers because of its popularity and good quality. Average quantity of potato wafers by individual is 80gm/person/month and average expenditure is Rs. 20/person/month.

21.67 per cent of the potato French fries consumers purchased the McCain brand. Average quantity of potato French fries consumed by individual is 73gm/person/month and average expenditure is Rs. 80/person/month. 33.33 per cent of the potato sticks consumers purchasing the unbranded potato sticks. Average quantity of potato sticks consumed by individual is 200gm/person/month and average expenditure is Rs. 50/person/month.

53.33 per cent of the Aloo bhujia consumers purchased the Haldiram's brand because of the popularity of the brand. Average quantity of aloo bhujia consumed by individual is 100gm/person/month and average expenditure is Rs. 20/person/month. 20 per cent of the potato wedges consumers purchasing the unbranded (20.0%) and McCain (10.0%). Due to the unawareness of the product and its brands majority of the consumers purchasing unbranded. Average quantity of potato wedges consumed by individual is 130gm/person/month and average expenditure is Rs. 50/person/month.

24.0 per cent of the potato flakes consumers purchased unbranded due to unawareness of the brands and more convenient to buy unbranded products. Average quantity of potato flakes consumed by individual is 100gm/person/month and average expenditure is Rs. 25/person/month. 40 per cent of the potato twister consumers purchasing unbranded. Average quantity of potato flakes consumed by individual is 2 pieces/person/month and average expenditure is Rs. 40/person/month.

38.33 per cent of the frozen potato products consumers purchased unbranded due to unavailability of the branded products. Average quantity of frozen potato products consumed by individual is 200gm/person/month and average expenditure is Rs. 80/person/month.

Consumption pattern of baked potato based products is presented in the Table 4.9. 41.67 per cent of the consumers purchased potato french fries. Among them majority of them were purchasing McDonalds brand (16.67%), followed by KFC (15.0%), unbranded (10.0%). Average quantity of potato french fries consumed by individual is 150gm/person/month and average expenditure is Rs. 120/person/month. The results revealed that majority of the consumers purchasing McDonalds because of its popularity.

48.33 per cent of the consumers were found to purchase aloo tikki. Among them 30 per cent of the consumers bought Berger King because of the reasonable price of the product followed by McDonalds (18.33%). Average quantity of aloo tikki consumed by individual is 2 pieces and average expenditure is Rs. 90/person/month.

61.67 per cent of consumers purchased aloo samosa and 41. 67 per cent of the consumers purchasing aloo kachori. Both the consumers purchasing unbranded products. Average quantity of both the products consumed by individual is 2 pieces/person/month and average expenditure is Rs. 30/person/month and Rs. 20/person/month respectively.

The results revealed that majority of the consumers in Bengaluru Metropolitan will prefer Lays in potato chips category and aloo bhujia of Haldiram's. Verma *et al*. (2001) reported similar results in their studies.

The results also provide the inference that consumers of potato flakes, potato twister and frozen potato products were purchasing the unbranded products because of the reason that consumers are unaware about the different brands available in potato flakes, potato twister and frozen potato products.

Even though many brands available in aloo bhujia, consumers are preferring to buy the Haldiram's brand because of its popularity.

The consumers of potato wedges were buying the unbranded products more than the McCain brand of potato wedges this shows that consumers are unaware of the many brands.

Table 4.8: Consumption pattern of processed potato based products by consumers

(n = 60)

Sl. No.	Potato based product	No. of consumers	Preferred brand	Percentage	Avg. qty. consumed (gm/ /p/m)	Avg. Expenditure (Rs./p/m)
1.	Potato Chips	50 (83.33)	Lays	53.33	105	50
			Bingo	13.33		
			Unbranded	16.67		
2.	Potato Wafers	16 (26.67)	Balaji	11.67	80	20
			Parle’s	15.00		
3.	Potato French fries	13 (21.67)	McCain	21.67	73	80
4.	Potato sticks	20 (33.33)	Unbranded	33.33	200	50
5.	Aloo bhujia	32 (53.33)	Haldirams	53.33	100	20
6.	Potato wedges	18 (30.0)	Mccain	10.00	130	50
			Unbranded	20.00		
7.	Potato flakes	12 (24.0)	Unbranded	24.00	100	25
8.	Potato twister	24 (40.0)	Unbranded	40.00	2 pieces	40
9.	Frozen potato products	23 (38.33)	Unbranded	38.33	200	80

Note: Figures in the parentheses indicate percentage to the total sample

Table 4.9: Consumption pattern of baked potato based products by consumers

(n=60)

Sl. No.	Potato based product	No. of consumers	Preferred brand	Percentage to the total	Avg. qty. consumed (gm/ /p/m)	Avg. Expenditure (Rs./ p/m)
1.	Potato french fries	29 (41.67)	KFC	15.00	150	120
			McDonalds	16.67		
			Unbranded	10.00		
2.	Aloo tikki	31 (48.33)	Berger king	30.00	2 pieces	90
			McDonalds	18.33		
3.	Aloo samosa	37 (61.67)	Unbranded	61.67	2 pieces	30
4.	Aloo kachori	25 (41.67)	Unbranded	41.67	2 pieces	20

Note: Figures in the parentheses indicate percentage to the total sample

4.4.2 Sources of purchase of potato based products

Sources of purchase of processed potato products is presented in the Table 4.10. Among 83.33 per cent of consumers of potato chips majority of the them (41.67%) buy from super markets, followed by Neighbourhood store (11.67%), hot chips centre (16.67%) and departmental stores (13.33%). 26.67 per cent of the consumers of potato wafers majority of the consumers (16.67%) buy from super markets, followed by departmental stores (10.0%). 21.67 per cent of consumers of potato French fries 16.67 per cent of the consumers buy from super markets, followed by departmental stores (5.0%). 33.33 per cent of consumers of potato sticks, 20 per cent buy from Neighbourhood store, followed by hot chips centre (13.33%). 53.33 per cent of consumers of aloo bhujia majority of them purchasing from Neighbourhood store (33.33%), followed by super markets (20.0%). 30 per cent of consumers of potato wedges purchase from hot chips centre (20.0%), followed by departmental stores (6.67%), super markets (3.33%). 20 per cent of consumers of potato flakes, 40 per cent of consumers of potato twisters and 38.33 per cent of consumers of frozen potato products purchasing from hot chips centre.

Sources of purchase of baked potato products is presented in the Table 4.11. Among the potato french fries purchasing consumers 31.67 per cent were buy from fast food restaurants, followed by hot chips centre (10.0%). Among the consumers purchasing aloo tikki, 48.33 per cent were purchasing from fast food restaurants. Among the consumers purchasing aloo samosa 26.67 per cent of the consumers purchasing from hotels, followed by bakeries (18.33%) and chat centres (16.67%). Among the consumers of aloo kachori 23.33 per cent of the consumers purchasing from hotels and 18.33 per cent from chat centres.

The results revealed that consumers sources of purchase of potato based products were more from super markets, Neighbourhood store and very less frequent in departmental stores. An increase in consumer preference for potato based products, the hot chips centres were creating huge demand for potato based products in Bengaluru Metropolitan.

Table 4.10: Sources of purchase of processed potato based products

(n=60)

Sl. No.	Potato based product	No. of consumers	Source of purchase	Percentage
1.	Potato Chips	50	Super market	41.67
			Neighbourhood store	11.67
			Departmental store	13.33
			Hot chips centre	16.67
2.	Potato Wafers	16	Departmental store	10.00
			Super market	16.67
3.	Potato French fries	13	Super market	16.67
			Departmental store	5.00
4.	Potato sticks	20	Hot chips centre	13.33
			Neighbourhood store	20.00
5.	Aloo bhujia	32	Neighbourhood store	33.33
			Super market	20.00
6.	Potato wedges	18	Departmental store	6.67
			Hot chips centre	20.00
			Super market	3.33
7.	Potato flakes	12	Hot chips centre	20.00
8.	Potato twister	24	Hot chips centre	40.00
9.	Frozen potato products	23	Hot chips centre	38.33

Table 4.11: Sources of purchase of baked potato based products

(n=60)

Sl. No.	Potato based product	No. of consumers	Source of purchase	Percentage
1.	Potato french fries	25	Fast food restaurant	31.67
			Hot chips centre	10.00
2.	Aloo tikki	29	Fast food restaurant	48.33
3.	Aloo samosa	37	Bakery	18.33
			Hotels	26.67
			Chat centres	16.67
4.	Aloo kachori	25	Hotels	23.33
			Chat centres	18.33

4.4.1: Frequency of purchase of potato based products by consumers

Frequency of purchase of potato based products is presented in the Table 4.12. Among the total consumers 75.0 per cent of the consumers purchased the potato based products from modern retail formats among them 23.33 percent of the consumers regularly purchased and 51.67 per cent of the consumers purchased occasionally. 56.67 per cent of the consumers purchased from departmental stores, among them 8.33 per cent of the consumers regularly purchased and 48.33 per cent of the consumers purchased occasionally. 53.33 per cent of the consumers purchased from fast food restaurants, among them 3.33 per cent consumers regularly purchased and 50.0 per cent consumers purchased occasionally. 55.0 per cent of the consumers purchased from grocery shops, among them 15.0 per cent of the consumers regularly purchased and 40.0 per cent consumers purchased occasionally. 25.0 per cent of the consumers purchased from online shopping, among them no one bought regularly only from online. 60.0 per cent of the consumers purchased from Kirana shops, among them 25.0 per cent consumers regularly purchased and 35.0 per cent consumers purchased occasionally. 45.0 per cent of the consumers purchased from Petty shops, among them 13.33 per cent consumers purchased regularly and 31.67 per cent consumers purchased occasionally. 40.0 per cent of the consumers purchased from street vendors, among them 3.33 per cent consumers purchased regularly and 36.67 per cent consumers purchased occasionally.

From the results it can be conclude that majority (75.0%) of the consumers of the potato based products were purchasing from modern retail formats and majority of them were occasional visitors because of lower accessibility from residents.

Table 4.12: Frequency of Purchase of Potato based Products by Consumers

(n = 60)

Sl. No.	Source of Purchase	Frequency of Purchase	No. of Consumers	Percentage
1.	Modern Retail formats	Always	14	23.33
		Sometimes	31	51.67
2.	Departmental stores	Always	5	8.33
		Sometimes	29	48.33
3.	Fast Food Restaurant	Always	2	3.33
		Sometimes	30	50.00
4.	Grocery Shops	Always	9	15.00
		Sometimes	24	40.00
5.	Online Purchase	Always	0	0.00
		Sometimes	15	25.00
6.	Kirana shops	Always	15	25.00
		Sometimes	21	35.00
7.	Petty shops	Always	8	13.33
		Sometimes	19	31.67
8.	Street Vendors (unbranded)	Always	2	3.33
		Sometimes	22	36.67

4.4.2 Influential attributes towards the purchase of Potato based products

The attributes responsible for purchase of potato based products is presented in the Table 4.13 and Fig. 3. Most of the consumers (36.96%), buy on their self-preference, followed by influence of friends (30.43%), influence of advertisements (19.57%), convenience (6.52%) regular food habit (4.35%) and influence of shop keeper (2.17%).

Table 4.13: Influential attributes towards the purchase of Potato based products

(n=60)

Sl. No.	Attributes	No. of Consumers	Percentage
1.	Shopkeeper	03	2.17
2.	Friends	16	30.43
3.	Self-Experience	21	36.96
4.	Advertisement	11	19.57
5.	Convenience	05	6.52
6.	Regular food habit	04	4.35
	Total	**60**	**100.00**

4.4.3 Preferential attributes for selection of particular brand of potato based products

Preferential attributes for selection of potato based products is presented in the Table 4.14 and Fig. 4. Majority of the consumers (58.33%) shows preference towards the particular brand because of its good quality, followed by popularity of the brand (25.0%) and reasonable price of the product (16.67%).

Table 4.14: Preferential attributes for selection of particular brand of potato based products

(n = 60)

Sl. No.	Attributes	No. of Consumers	Percentage to the total
1.	Popularity of brand	15	25.00
2.	Good quality	35	58.33
3.	Reasonable price	10	16.67
	Total	**60**	**100.00**

The results revealed that majority of them, while purchasing the potato based products select the brands by considering the quality of the product. Because consumers give more importance to the quality rather than the price of the product.

4.4.4 Criteria for purchase of Potato based Products

While purchasing, consumers keep some criterion for selecting the products. Criterion for purchase of potato based Products is presented in the Table 4.15 and Fig. 5. From the table it can be concluded that 23.33 per cent of the consumers don't refer the labels on the product while purchasing, it is because of the lack of interest and negligence. 76.66 per cent of the consumers refer the labels on the product. Among them majority of the consumers (26.67%) consider date of expiry as a major criterion for purchase of the Potato based products, followed by price (21.67%), nutritional value (13.33%), brand name (8.33%), certification (3.33%) and manufacturing details (3.33%).

From the results it can be concluded that majority of the consumers consider date of expiry as important criterion while purchasing the products. Because, now a day's consumers are well educated, more concern about their health and they are smart as well.

Table 4.15: Criteria for purchase of Potato based Products

(n=60)

Sl. No.	**Attributes**	**No. of consumers**	**Percentage to the total**
1.	Nutritional value	8	13.33
2.	Date of expiry	16	26.67
3.	Certification	2	3.33
4.	Price	13	21.67
5.	Brand name	5	8.33
6.	Manufacturing details	2	3.33
7.	Others (Those who won't refer product labels)	14	23.33
	Total	**60**	**100.00**

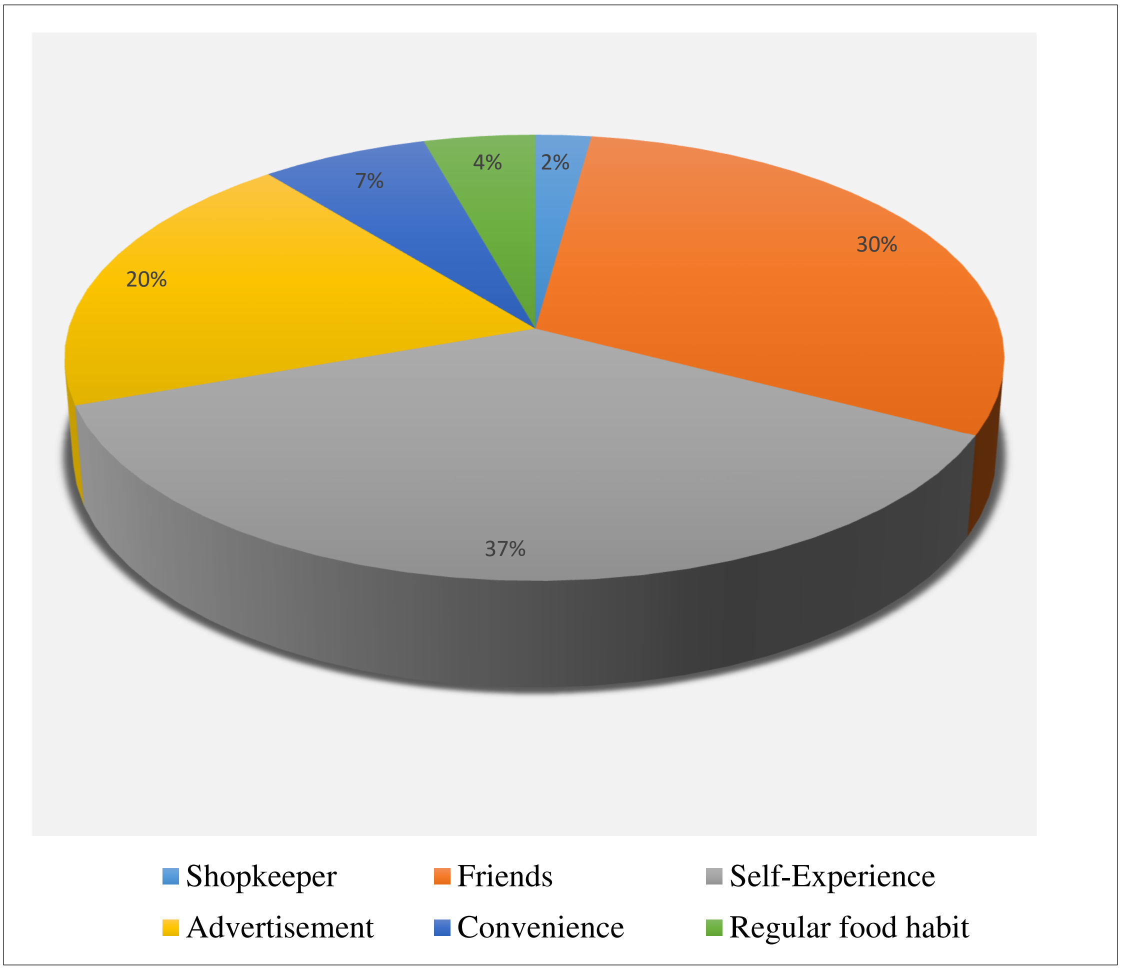

Fig. 3: Influential attributes towards Purchase of Potato based Products

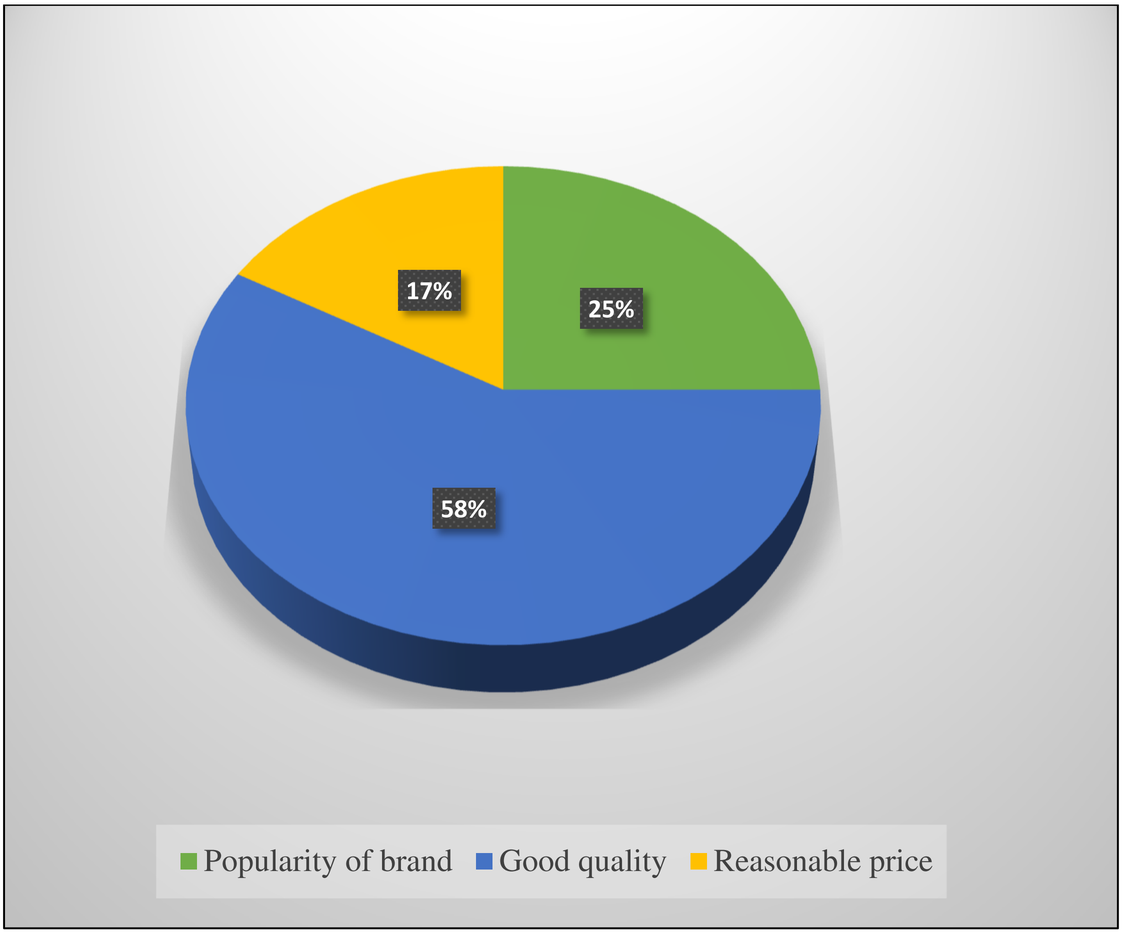

Fig. 4: Preferential attributes for selection of particular brand of potato based products

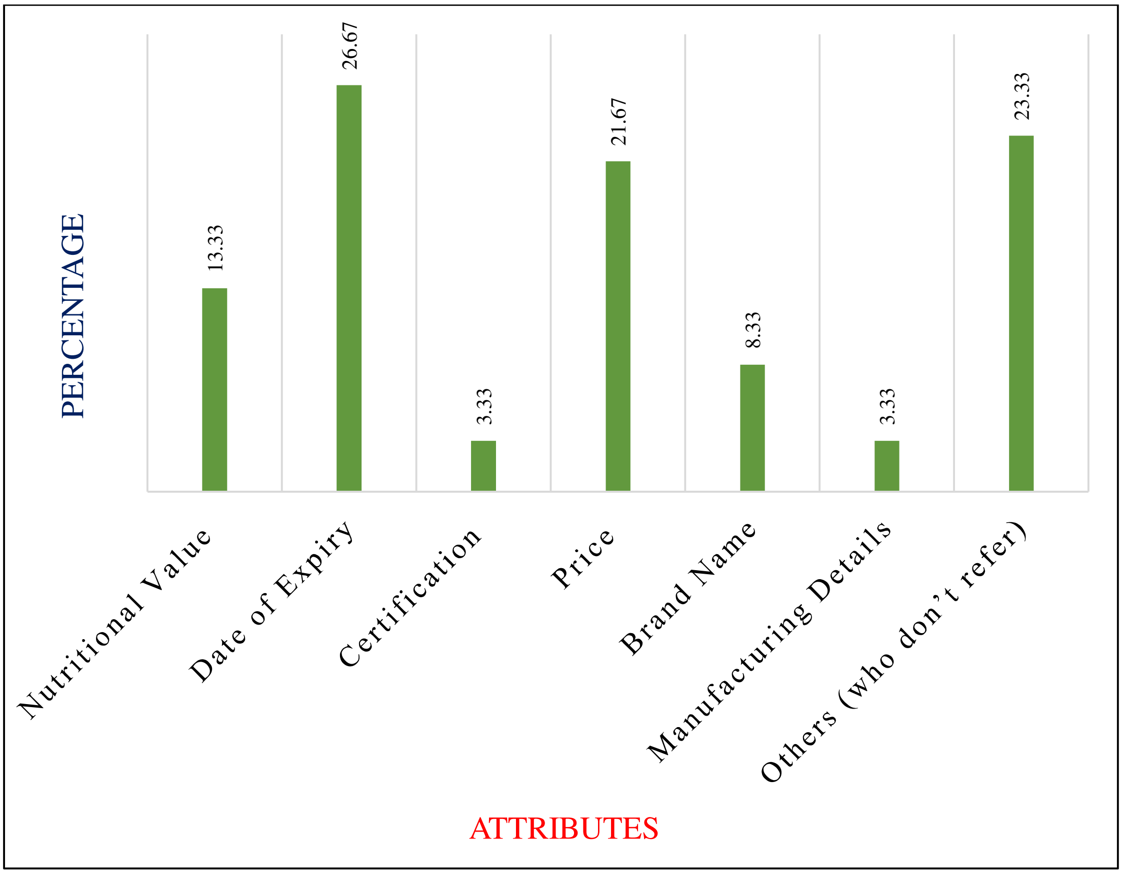

Fig. 5: Criteria for purchase of potato based products

4.4.5 Consumer awareness towards the potato based products

Awareness towards potato based products by consumers is presented in the Table 4.16 and Fig. 6. More than 50 per cent of the consumers (56.67%), get to know about the potato based products through TV/advertisements, followed by friends/relatives (25%) and through retailers (18.33%).

Table 4.16: Awareness towards potato based products

(n = 60)

Sl. No.	Attributes	No. of Consumers	Percentage to the total
1.	TV/ Advertisement	34	56.67
2.	Friends / Relatives	15	25.00
3.	Retailers	11	18.33
	Total	**60**	**100.00**

From the results it can be inferred that because of intervention of social media, internet, the users of internet increasing rapidly and many of the people got access to it from there by they get to know lot of things including the products of Potato

4.4.6: Purchase behaviour of consumers of potato based products

Frequency of purchase of processed potato based products is presented in Table 4.17. In case of Potato chips, majority of them (32%) purchase during travel followed by weekly (20%), fortnightly (14%), daily (10%), occasionally (12%) and monthly (10%).

In case of Potato wafers, majority of them (37.50%) purchase fortnightly followed by occasionally (25.0%), monthly (18.75%), weekly (12.50%) and daily (6.25%). In case of Potato French fries, majority of them (38.46%) purchase occasionally, followed by monthly (23.08%), fortnightly (15.38%), during travel (15.38%), weekly (7.69%).

In case of Potato sticks, majority of them (45%) purchase during celebrations followed by during travel (20%), monthly (15%), occasionally (10%), weekly (5%) and daily (5%). In case of Aloo Bhujia, majority of them (50%) purchase monthly, followed by during travel (21.88%), occasionally (12.50%), during celebrations (9.38%), weekly (6.25%).

In case of Potato wedges, majority of them (44.44%) purchase occasionally, followed by during travel (22.22%), during celebrations (16.67%), monthly (11.11%) and weekly (5.56%). In case Potato flakes, majority of them (6.67%) purchase during travel, followed by weekly (5%), fortnightly (3.33%), occasionally (3.33%) and monthly (1.67%).

In case of Potato twister, majority of them (58.33%) purchase occasionally, followed by during celebrations (20.83%), during travel (8.33%), fortnightly (8.33%) and monthly (4.17%). In case of Frozen Potato products, majority of them (30.43%) purchase monthly, followed by during celebrations (26.09%), occasionally (21.74%), weekly (8.70%), fortnightly (8.70%) and during travel (4.35%).

Frequency of purchase of baked potato based products is presented in Table 4.18. In case of Potato French fries 40 per cent of them purchased occasionally, followed by during travel (20%), during celebrations (16%), monthly (12%), weekly (8%) and fortnightly (4%).

In case of Aloo tikki, majority of them (41.38%) purchase monthly, followed by occasionally (17.24%), during celebrations (13.79%), fortnightly (10.34%), during travel (10.34%) and weekly (6.90%).

In case of Aloo samosa, majority of them (37.84%) purchase monthly, followed by occasionally (18.92%), fortnightly (16.22%), weekly (10.81%), during celebrations (10.81%) and during travel (5.41%). In case of Aloo kachori, majority of them (48%) purchase occasionally, followed by during travel (24%), weekly (12%), monthly (8%), fortnightly (4%) and during celebrations (4%).

The results revealed that majority of the consumers of potato twisters prefer to purchase occasionally and potato chips during travel. In case of aloo kachori majority of them were purchasing occasionally and aloo tikki during monthly purchases.

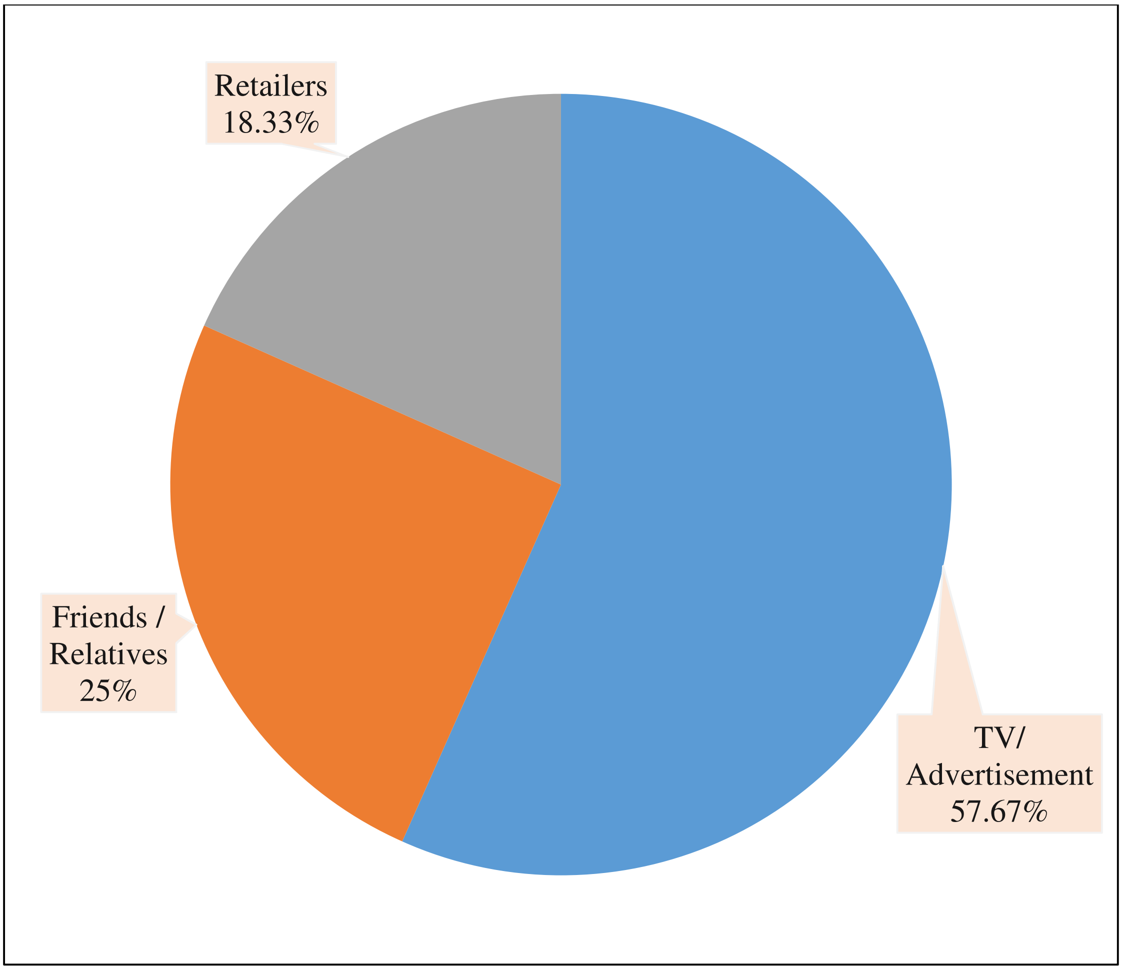

Fig. 6: Awareness towards potato based products

Table 4.17: Frequency of purchase of processed potato based products by consumers

(n=60)

Sl. No.	Potato based products	Daily	Weekly	Fortnightly	Monthly	Occasionally	Celebrations	During travel
1.	Potato Chips	6 (12.00)	10 (20.00)	7 (14.00)	5 (10.00)	6 (12.00)	0 (0.00)	16 (32.00)
2.	Potato Wafers	1 (6.25)	2 (12.50)	6 (37.50)	3 (18.75)	4 (25.00)	0 (0.00)	0 (0.00)
3.	Potato French fries	0 (0.00)	1 (7.69)	2 (15.38)	3 (23.08)	5 (38.46)	0 (0.00)	2 (15.38)
4.	Potato Sticks	1 (5.00)	1 (5.00)	0 (0.00)	3 (15.00)	2 (10.00)	9 (45.00)	4 (20.00)
5.	Alu Bhujia	0 (0.00)	2 (6.25)	0 (0.00)	16 (50.00)	4 (12.50)	3 (9.38)	7 (21.88)
6.	Potato Wedges	0 (0.00)	1 (5.56)	0 (0.00)	2 (11.11)	8 (44.44)	3 (16.67)	4 (22.22)
7.	Potato Flakes	0 (0.00)	3 (5.00)	2 (3.33)	1 (1.67)	2 (3.33)	0 (0.00)	4 (6.67)
8.	Potato twister	0 (0.00)	0 (0.00)	2 (8.33)	1 (4.17)	14 (58.33)	5 (20.83)	2 (8.33)
9.	Frozen Potato products	0 (0.00)	2 (8.70)	2 (8.70)	7 (30.43)	5 (21.74)	6 (26.09)	1 (4.35)

Note: Figures in the parentheses indicate percentage to the total sample

Table 4.18: Frequency of purchase of baked potato based products by consumers

(n=60)

Sl. No.	Potato based products	Daily	Weekly	Fortnightly	Monthly	Occasionally	Celebrations	During travel
1.	Potato French fries	0 (0.0)	2 (8.0)	1 (4.00)	3 (12.00)	10 (40.00)	4 (16.00)	5 (20.00)
2.	Aloo tikki	0 (0.0)	2 (6.90)	3 (10.34)	12 (41.38)	5 (17.24)	4 (13.79)	3 (10.34)
3.	Aloo samosa	0 (0.0)	4 (10.81)	6 (16.22)	14 (37.84)	7 (18.92)	4 (10.81)	2 (5.41)
4.	Aloo kachori	0 (0.0)	3 (12.00)	2 (4.0)	2 (8.00)	12 (48.00)	1 (4.00)	6 (24.00)

Note: Figures in the parentheses indicate percentage to the total sample

4. 5 Constraints faced by retailers of potato based products

The constraints faced by retailers of potato based products was analysed and ranked using Garrett's ranking technique and is presented in Table 4.19 and Fig. 7. Among the constraints faced, high rental value for retail outlets was the major constraint with a Garrett score of 71.40 per cent followed by competition from unbranded vendors (69.04%), high operating capital (50.55%), entry of new competitors (49.11%), low keeping quality (42.49%), availability of various kinds of products (39.84%), high storage cost (31.94%), consumer retention (25.87%), high transportation cost (20.41%) and Rodents attack (19.48%).

The emergence of new urban configuration in Bengaluru Metropolitan leading to a vast change in the commercial structures like modern retail formats resulting in high rental value in commercial areas this will be the major constraint facing by retailers in marketing of potato based products. Rana (2011) reported similar results in their studies.

Table 4.19: Constraints faced by retailers in marketing of Potato based Products in Bengaluru Metropolitan

Sl. No.	Constraints	Garrett's	
		Mean Score	Rank
1.	High rental value	71.40	I
2.	Competition from unbranded vendors	69.04	II
3.	Insufficient operating capital	50.55	III
4.	Entry of new competitors	49.11	IV
5.	Low keeping quality	42.49	V
6.	Availability of various kinds of products	39.84	VI
7.	High storage cost	31.94	VII
8.	Consumer retention	25.87	VIII
9.	High transportation cost	20.41	IX
10.	Rodents attack	19.48	X

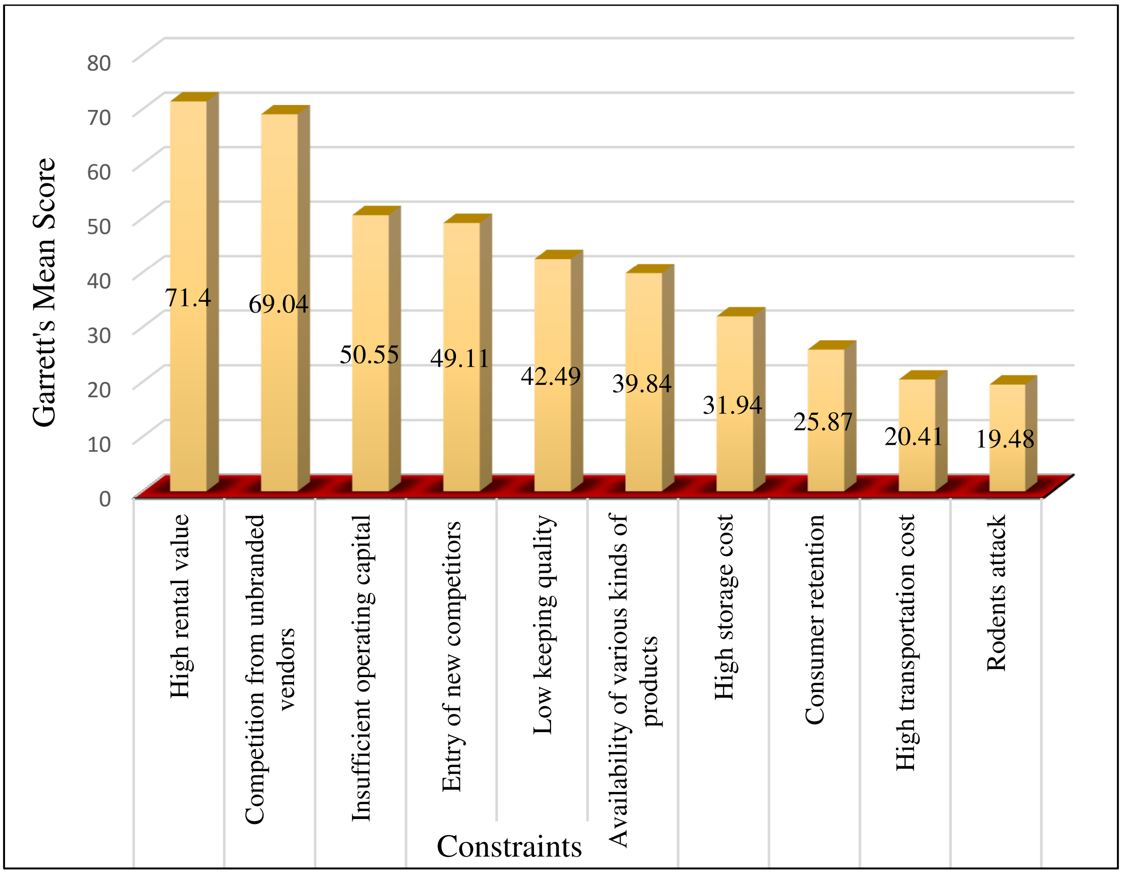

Fig. 7: Constraints faced by retailers in marketing of Potato based Products in Bengaluru Metropolitan

V SUMMARY AND IMPLICATIONS

Potato is grown in about 150 countries and is the world's single most important non- cereal crop with vital role in the global food system. The potato is the world's fourth most important food crop after rice, wheat and maize.

In India potato crops are cultivated in nearly every state. The biggest however, are Uttar Pradesh, Bihar, West Bengal, Gujarat and Karnataka. For reasons, potatoes are used, not just as a vegetable in fact less than 50 percent of potatoes grown worldwide are consumed fresh. The remaining are processed into potato food products and food ingredients. In the world consumption of potato as food is shifting from fresh potatoes to added-value, processed food products. In India, processed potato comprises less than 0.5 per cent of annual production. Although the intake of processed potato products is expected to increase, at currently, the processing sector is primarily consisting of various types of dehydrated potato products, starch, etc. Potato processing industry primarily includes 4 sections: potato chips, French fries, potato flakes/powder and other processed products. However, potato chips were most popular among the processed potato product.

Indian potato processing industry has emerged fast due to economic growth coupled with growing urbanisation, expanding market options and development of indigenous processing varieties. Snack foods industry is growing rapidly including potato chips. The growth of the snack market created an increasing demand for dehydrated potato products which are used as raw material for snacks. Potato processing is a vital component of agro-processing in India. Rapid urbanization and improvements in living standards have led to phenomenal growth in potato processing in recent years. Easy availability and convenient packaging are among the other reasons for the popularity of processed potato products, even in the far-flung rural areas of India.

The current study is accompanied on consumers preference for potato based products by different categories of sample respondents in Bengaluru Metropolitan.

The specific objectives of the study were.

1. 1. To document various types of potato based products and brands purchased in Bengaluru Metropolitan,
2. To analyse the factors influencing the consumption of potato based products,
3. To assess the attitude towards purchase of potato based products and
4. To examine constraints faced by retailers of potato based products.

Since Bengaluru is a Metropolitan city with a big amount of retail outlets, Bengaluru was selected purposefully for the research. The data for the present study pertaining to consumer preference for potato based products was obtained from 60 consumers and 20 retailers of potato based products, by personal interview method through pre-tested schedules. The data was collected in different localities of north, south, east and western Bengaluru Metropolitan using simple random sampling method. The current research used both primary data and secondary information, but the survey is mainly based on primary data. Required primary data was gathered using a structured schedule by interviewing the consumers personally. The required secondary data have collected through websites and journals. Analytical tools and techniques used in the study were descriptive statistics, factor analysis and Garrett's ranking technique.

Major findings of the study

1. Majority (73.33%) of the sample consumers belonged to the age group of >20 to 40 years.
2. Majority (53.33%) of the sample consumers were studied post-graduation and above.
3. Majority (60%) of the sample consumers were students.
4. Fourty-five per cent of the sample consumers were having monthly income of Rs. >10,000 to Rs. 20,000.

5. Fourty-five per cent of the sample consumers were spending Rs. >50/- to Rs. 150/- per month.
6. Majority (55%) of the sample retailers belongs to the age group of >20 to 40 years.
7. Fifty per cent of the sample retailers having experience of 5 to 10 years in marketing.
8. Seventy per cent of the retail outlets considered for study were located in commercial areas of the Bengaluru Metropolitan.
9. Potato chips, Aloo bhujia and Potato twister were the most preferred products of potato by consumers in potato processed product category.
10. Aloo samosa, Aloo tikki and Potato French fries were the most preferred products of potato by consumers in potato baked product category.
11. The KMO value was 0.697 it shows that a reasonable quantity of variance will be explained by the factors extracted. The general meaning of the matrix of correlation was assessed with the Bartlett's test of Sphericity. The factors were determined with the help of Cattell's scree plot; and it was observed that four factors had Eigen value greater than 1 and as such, only four factors were retained.
12. Freshness, colour and flavour was the major factors influencing consumer preference for potato based products. Brand name, attractive packing and advertisement are the next important factors, followed by regular food habit, influence of family members, taste, retailers influence, income and price.
13. Majority (83.33%) of the sample consumers purchasing Potato chips. Among them more than 50 per cent were prefer to purchase Lays (53.33), followed by Bingo (13.33).
14. Sixty-one per cent of the sample consumers purchasing Aloo samosa and everyone purchasing unbranded.

15. Most of the consumer respondents were buying potato based products from Super markets, followed by Hot chips centres.
16. On their self-interest, the majority of sample consumers were buying potato products.
17. By considering the quality of the item, the majority of the sample consumers show preference for the specific brand.
18. Twenty-five per cent of the sample consumers consider date of expiry as important criterion while purchasing the potato products.
19. More than 50 per cent of the sample consumers getting awareness about potato products through TV/advertisement.
20. Thirty-two per cent of the potato chips consumers prefer to purchase during travel.
21. Thirty-eight per cent of the aloo samosa consumers prefer to purchase monthly.
22. Majority (71.4%) of the retailers facing high rental value was the major constraint, followed by competition from unbranded vendors, insufficient operating value etc. in marketing of potato based products.

Policy implications

1. Consumers like to consume potato based products due to its crispiness and taste. Hence, there is a great need for popularising these products for the consumers. Further, there is lot of scope for research and development to develop new potato based products for consumers.
2. The following marketing strategies need to be made for potato based products.
   a) Conducting awareness campaigns to popularize potato based products
   b) Creating awareness to consumers with respect to nutritional importance of the potato based products.

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