RESEARCH ARTICLE :

Growth and supply chain management of food retail chains

■ **G. Netravathi and Deepa B. Hiremath**

SUMMARY : Bangalore has witnessed a boom in retail chains in the past few years with many new players like Fab mall, Namdhari fresh, Reliance fresh, etc. entering the market. The major findings of the study were that the retail outlets were selling vegetables at a lesser price than the conventional stores in the city. With respect to fruits, it was the conventional stores which were selling at a lesser price. The consumers purchasing from a food retail outlet placed more importance on premium quality products offered by the outlet, showing that the retail outlets provided the best quality fruits and vegetables. The conventional stores had an advantage of their neighbour-hood store location and also reasonable price offered by them with credit facilities. Thus, by practicing improved supply chain management practices, there will be significant reduction in the wastages of fruits and vegetables which in turn will benefit both the farmers as well as the consumer.

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BACKGROUND AND OBJECTIVES

Supply chain management (SCM) has come up as a source of gaining competitive advantage in the business world. Supply-chain management (SCM) is 'the management of the entire set of production, distribution, and marketing processes by which a consumer is supplied with a desired product' (Cooper *et al.,*1997). A supply chain is "an integrated process wherein anumber of various business entities work together in an effort to acquire raw materials, convert these raw materials into specified final products and deliver these specified finalproducts to retailers". SCM is a philosophy for integrating all the activities in the life of a product or a service from the earliest source of raw materials to the ultimate customer, and beyond to disposal (MANAGE, 2003). The supply chain comprises the production and supply of materials and parts, and its serves both the manufacturing logistics chain and distribution logistics chain (Beamon, 1998). Supply chain management focuses on how firms utilise their suppliers' processes, technology and capability to enhance competitive advantage. It is a management philosophy that extends traditional intra-enterprise activities by bringing trading partners together with the common goal of

optimisation and efficiency (Schuster *et al.*, 2007).

Food retailing is one of the important parts of the present organized retail industry in the world. Growing at a rate of 30 per cent the Indian food retail is going to be a major driving force for the retail industry. The changing life styles, tastes and higher disposable income, growing need for convenience, have revolutionalized the food retail scenario of the country. After half a decade of unorganized activity and fragmented "mom and pop" stores, organized food retailing in India is developing rapidly, accounting for about 14 per cent of the total organized retail trade in the country. Although modern formats such as supermarkets and hypermarkets constitutes less than 1 per cent of the total food retailing, it is fast picking up to be the next major industry as India is experiencing a consumption boom driven by rising incomes and rapid urbanization. Food accounts for over 60 per cent of the customers spending, thus its retailing has greater opportunity to grow.

The establishment of Nilgiris Super market way back in 1971 paved the way for the starting of the food retail chains in Bangalore. As there were no new players entering for the next two decades, there was not much growth in food retail chains in Bangalore. But with the entry of food World in 1996, there has been a rapid expansion of organized food retail chains in Bangalore with many new players like Fab mall, Subiksha, Namdhari fresh, Reliance fresh, etc. entering the market and opening up their outlets in the city. The rapid rise in the super market chains can also be attributed to many international and national players showing interest in Bangalore to start their retail outlets.

Despite several obstacles, there has been a growth in food retail chains owing to favourable environment for the establishment of food retail chains in Bangalore. International formats of retailing such as supermarkets, grocery chains, convenience stores, fast food chains, have sprung up in Bangalore. The modern food retail chains in Bangalore are self-service stores with a wider range of products and also having their own brand for groceries and home products. They have different sections devoted for fresh fruits and vegetables, bakery products, dairy products as well as frozen meat and fish. A typical food retail chain has about 6,000 stock keeping units. It has been observed that due to lack of availability of quality store space, some food retail chains like Spencer's and Fab mall have started small store formats in different parts of the city. These stores have a floor space of about 2,000 sq. ft. By adopting these formats the food retail chains are targeting more customers as they can establish their stores in the neighbourhood.

India is the second largest producer of the fruits and vegetables in the World after China. She produces nearly 15 per cent and 11 per cent of the world's fruits and vegetables and its production costs are less than half when compared with other parts of the world. Despite all these advantages, its share in global trade in fruits and vegetables are only 0.5 per cent and 1.7 per cent, respectively. However, India wastes more fruits and vegetables than it consumes. This wastage is higher than the entire annual consumption of UK. Because of the presence of so many layers and the lack of adequate storage facilities, 35 – 40 per cent of all perishable food produce in India is spoilt before reaching the end consumer. Shortage of cold storage facilities and refrigerated transport facilities lead to inefficiencies in handling perishable products. By practicing improved supply chain management practices, there will be significant reduction in the wastages of fruits and vegetables which in turn will benefit both the farmers as well as the consumer by means of increased returns and decrease in price respectively. Given the fragmented nature of the food supply chain, few companies have access to capital and the ability to invest in supply chain and quality control is driven by retailers as cost squeezing is one part of a successful supermarket chain. They also set quality standards, establish warehouses and minimize spoilage, set up cold chains to ensure reliability and maintain inventory control to reduce waste.

Supply chain management in Indian agricultural sector suffers mainly due to lack of market infrastructure like connectivity, transportation, storage, warehousing, etc. The wastage occurs because of multiple points of handling. The average wastage in horticultural crops in India according to the World Bank stood at 12 per cent. The physical wastage is one component of the inefficiency in the supply chain. There are other inefficiencies as well, in terms of the deterioration in quality and the cost of intermediation in the food chain. There is a compelling requirement for appropriate infrastructure for storage and transportation such as temperature controlled warehouses and vans. Farmers share in the end product price is as low as 15 to 20 per cent for many products. Also the long supply chain distorts

the flow of information from the farmer to the consumer and *vice versa*. Unlike other goods, fresh produce decay faster and has a higher requirement for safety. Consumers demand for products diversify owing to changing tastes and preferences. Hence, there is urgent need for strengthening supply chain management in Indian agriculture. India, the second most populous country in the world requires mass employment opportunities, especially in the urban areas, in view of the fact that the employment opportunities in the other sectors have gone down. The sector which can provide such opportunities for job creation is the organized retail sector. With a retail revolution round the corner, we need to examine the shape of the retail sector in the coming years and policy initiatives from the government, regulatory bodies, the industry and financial service providers to make this revolution a success.

The Indian consumer visits about 8 to 10 outlets to purchase various food products, which constitute the daily consumption basket, which is not only time consuming but also inefficient way of shopping for food. With changing lifestyle, paucity of time and convenience in food shopping is emerging as an important driver of growth of one-stop retail formats that can offer consumer, value of time, in addition to value for money. There are strong opportunities in food retail, as a result of changes in consumer purchasing patterns and supply chain development. The successful operation of supermarkets is determined by the successful selling of fresh produce. According to the experience of the developed countries, 80-95 per cent fresh produce is sold in supermarkets and groceries.

Keeping the above aspects in consideration the study was carried out with the following objectives:
– To document the growth and development of retail food chains in Bangalore metropolitan city.
– To compare the pricing efficiency between the conventional and retail chain system.
– To study the factors influencing the consumer choice between conventional and retail food chains.
– To study the supply chain management of a selected retail chain.

RESOURCES AND METHODS

The present study was carried out to identify the growth of food retail chains in Bangalore, their comparative pricing efficiency compared to the conventional stores and the attributes influencing the consumers to purchase from a food retail outlet and conventional store. The study also focused on the supply chain management practices followed by food retail chains in order to gain competitive advantage over the conventional stores.

Selection of the study area:

Bangalore, the capital city of Karnataka was selected purposively for the study, as it is one of the fastest growing metropolitan and is highly cosmopolitan in nature with people of different religions, castes, occupations, cultures, languages and food preferences. It is the IT and BT hub of India, with industrial estates and numerous financial and educational institutions with an immense potential for retail food outlets.

Sampling procedure:

Bangalore city was selected as the study area for documenting the emergence and growth of food retail chains. Bangalore was the hub of retail revolution and has different food retail chains operating from a long period of time. In order to find out the pricing efficiency, data was collected from 20 retail outlets of different food retail chains and 2 conventional stores nearby each retail outlets. Thus, a total of 40 conventional stores were studied. Data was collected during alternative weeks so as to minimize any bias occurring due to fluctuation of prices of fruits and vegetables. In order to compare the price, the wholesale prices of the selected fruits and vegetables *viz.,* onion, potato, tomato, banana (pachbale) and mango (mallika, raspoori and baiganpalli) were collected from the wholesale market.

Data regarding the consumer preference towards different attributes to shop in a retail outlet and Conventional store was collected using a structured questionnaire and plan cards developed using conjoint analysis. A convenient sampling method was adopted to select the respondents. The sampling was done in different localities of Bangalore to get a diversification in the sample mainly based on region, per capita income and social class. Data was collected from various age groups, income groups and from both the sexes. Data was collected from consumers who visited food retail chains and conventional stores separately using different set of plan cards and questionnaire. A total of 100 respondents belonging to different fields such as software industry, marketing, medicine, academicians, etc. were

interviewed. Data regarding supply chain management of food retail chain was collected from Spencer's retail chain, as it was found to be operating from a long period of time and had different sourcing and distribution channels so as to meet the competitive retail environment prevailing in Bangalore.

Analytical tools and techniques employed:

Conjoint analysis:

Conjoint analysis is a versatile marketing research technique that can provide valuable information for new product development forecasting, market segmentation and pricing decisions, advertising and distribution, competitive analysis and responding. It is a technique used in evaluation of consumer value judgements. Hence, it was used to measure the consumer's preference towards retail food chains and conventional stores. One of the important requirements in the conjoint analysis is the identification of the appropriate attributes that describe the product and the specific and feasible levels of attributes (Gerhardy and Ness, 1995). On the basis of objective attributes, representative indicators for the given attribute was chosen. Further the overall judgement of the consumer was broken down into the contribution of each attribute level. Another important requirement of the study was the specification of the basic form of relationship between the product attribute and overall judgement. Further, in this model, the omission of the attribute does not have a major impact on the estimates. This model assumes the part worth of each attribute level is independent and that total utility is the sum of the attribute level part worth. Assuming four attributes (A to D), a consumers preference for a particular product combining the attribute i from A, attribute j from B, attribute k from C and attribute l from D was:

$$Pref_{ijkl} = a_i + b_j + c_k + d_l$$

where,

$Pref_{ijkl}$ = Consumers' total utility or preference rating for a product combining attribute levels ijkl from the attributes a, b, c and d, respectively.

a_i = Utility or part worth of attribute level i from attribute a.

b_j = Utility or part worth of attribute level j from attribute b.

c_k = Utility or part worth of attribute level k from attribute c

d_l = Utility or part worth of attribute level l from attribute d

The model has been formulated as:

n m

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

where,

Y= Consumers overall evaluation of the product alternative.

V_{ij} = Part worth associated with j (1,2,3,…m) of attributes i (1,2,3,…n)

X_{ij} = dummy variable representing the preference of the jth level of ith attributes

To determine the consumer preference towards food retail chains and conventional stores, different attributes were identified. Then by using the computer software SPSS (Statistical package for Social Sciences) these attributes were used to generate a set of 12 profiles. Each profile as described on a separate card called the plan card. The randomly mixed cards were shown to the respondents and were asked to arrange them in order of their preference. Before administering these cards, initial briefing regarding the meaning of the cards and the purpose of the study was given so that the respondents understood what was expected from them. The ranks given to each of these 12 cards were noted down.

Tabular analysis:

Simple conventional method of tabular analysis was used in order to study the socio-economic characters, expenses on food and fruits and vegetables, etc. Average and percentage analysis were adopted to examine the distribution of income, education, household size and expenses of the household towards purchase of food and fruits and vegetables. Tabular analysis was also used to determine the pricing efficiency of different retail outlets by computing the weekly average prices of fruits and vegetables, procurement costs, transportation costs, etc. This analysis was also used to know the different costs incurred by a retail chain towards their supply chain of fruits and vegetables.

OBSERVATIONS AND ANALYSIS

The results obtained from the present study as well as discussions have been summarized under following heads:

Growth of food retail chains:

The establishment of food World in 1996 paved the way for starting of the food retail chains in Bangalore. As there were no new players entering for the next two decades, there was not much growth in food retail chains in Bangalore. But with the entry of Nilgiris super market way back in 1971 there has been a rapid expansion of organized food retail chains in Bangalore with many new players like Fab mall, Namdhari fresh, Reliance fresh, etc. entering the market and opening up their outlets in the city. As shown in Table 1, there were a total of 189 food retail outlets in Bangalore till the end of May 2016. The maximum share by the Nilgiri's (46) and followed by Feb mall (39) and food world (27).

Table 1: Number of food retail chains in Bangalore

Retain chain name	Number
Food world	27
Fab mall	39
Nilgiris	46
Food bazaar	15
Reliance fresh	12
Namdhari fresh	16
Fresh @	3
Spencer's	20
Others	11
Total	189

As shown in the Table 2, 63 new outlets were opened during 1999-03 with food world and Namdhari fresh opening 13 new stores and Fab mall opened 11 stores. Followed by Nilgiris, Spencer's and food bazaar established 8, 3 and 10 new stores during this period,

Table 2: Growth of food retail outlets over the years in numbers

Retain chain name	No. of outlets 1996-1999	No. of outlets 2000-2003	No. of outlets 2015-2016
Food world	10	23	27
Fab mall	14	25	39
Nilgiris	16	24	46
Food bazaar	2	5	15
Reliance fresh	0	0	12
Namdhari fresh	0	13	16
Fresh @	0	0	3
Spencer's	6	16	20
Others	3	8	11
Total	51	114	189

respectively. As shown in Table 2, during 2003-16, a total of 75 new retail outlets were established in Bangalore. During this period Nilgiris (22), Fab mall (14), Reliance fresh (12), Food bazaar (10), Food world and Spencer's (4) and Namdhari fresh and fresh @ (3) stores were opened.

As shown in the Table 3, the percentage increase of food retail chains in Bangalore for the period 2003-2016 was total 60.48 per cent. The number of outlets in the food retail chain Reliance fresh, food bazaar, Nilgiris showed a percentage increase of 120 per cent, 66.67 per cent and 64.71 per cent between the period 2000 to 2016. It was followed by Fab mall (40%), Fresh @ (30 %) and Spencer's (15.38).

Table 3: Percentage increase food retail outlets in Bangalore for period 2000-03 to 2015-16

Retail chain name	% increase
Food world	12.12
Fab mall	40.00
Nilgiris	64.71
Food bazaar	66.67
Reliance fresh	120.00
Namdhari fresh	13.04
Fresh @	30.00
Spencer's	15.38
Others	16.67
Total	60.48

Pricing efficiency between the food retail outlets and conventional stores:

Store type of conventional stores:

Of the total of 40 stores studied 28 stores (70%) were rented. 37 stores (92.5) were sole proprietors (Table 4 and 5).

Table 4 : Store type of conventional stores

Conventional stores	No. of stores	Per cent
Owned	9	22.5
Rented	28	70
Leased	3	7.5
Total	40	100

Table 5 : Type of ownership

Ownership	No. of stores	Per cent
Sole proprietor	37	92.5
Partnership	3	7.5
Total	40	100

Employment pattern:

In conventional stores, it was found that 1.9 of the persons employed was among family members and 2.1 were hired. Among the food retail outlets, it was found that an average of 8.97 persons were employed which shows that the conventional stores were using the own family labour and reducing their monthly recurring costs compared to the retail outlets which were employing more persons compared to a conventional stores (Table 6 and 7).

Table 6 : Employment pattern (Conventional stores)

Family	Male	1.2
	Female	0.7
	Avg	1.9
Employed	Male	1.8
	Female	0.3
	Avg.	2.1
Total		2.00

Table 7 : Employment pattern (Retail outlet)

Male	4.45
Female	4.52
Total (Avg.)	8.97

Average recurring costs:

The average recurring costs of a conventional stores was Rs.43, 748 per month. Monthly salary to the employees was the major cost with Rs. 23, 654 followed by the rent with Rs. 12, 265 (Table 8). The average cost incurred by a food retail outlet per month was Rs. 83, 379 with the monthly salary to the employees being the highest with Rs. 41, 574 followed by rent with Rs. 26, 348 (Table 9).

Table 8: Average recurring costs of conventional stores (Rs./month)

Particulars	Amount (Rs.)
Rent	12265
Electricity	1924
Maintenance	1654
Transportation	1829
Salary	23654
Others	2422
Total	43748

Table 9 : Average recurring costs of a retail outlet (Rs./month)

Particulars	Amount (Rs.)
Rent	26348
Electricity	4796
Maintenance	3614
Transportation	2359
Salary	41574
Others	4688
Total	83379

Price difference among retail outlets and conventional stores:

With respect to the prices of selected vegetables, the food retail outlets were selling at a lesser price than the conventional stores (Table 10). But with respect to the fruits, the conventional stores were selling at a lesser price than the food retail outlets.

Table 10 : Average price difference between retail outlets and conventional store

	Onion	Potato	Tomato	Banana	Mango
Avg. price difference (Rs.)	0.08	0.36	0.38	-0.66	-1.15
Avg. price difference (%)	0.64	2.08	5.56	-4.45	-6.35

Consumer preference:

Frequency of visit/purchase:

Among the consumers purchasing from a retail outlet, 17 (28.33%) and 19 (31.66%) of them purchased grocery once in a week and once in a fortnight, respectively. With respect to the purchasing of fruits and vegetables, 23 (38.33%) and 17 (28.33%) of them purchased daily and every alternate days, respectively (Table 11). There were 9 (22.50%), 10 (25.00%) and 9 (22.50%) consumers who purchased their grocery

Table 11: Frequency of visit/purchase by the consumer purchasing from a food retail outlet

Sr. No.	Category	Food and grocery	F and V
1.	Daily	2 , (3.33)	23, (38.33)
2.	Every alternate day	6, (10.00)	17, (28.33)
3.	Twice a week	13, (21.66)	11, (18.33)
4.	Once in a week	17, (28.33)	9, (15.00)
5.	Fortnightly	19, (31.66)	-
6.	Monthly	3, (5.00)	-
	Grand total	60, (100)	60, (100)

requirements twice a week, once in a week and once in a fortnight from a conventional stores. With respect to fruits and vegetables, 17 (42.50%) and 13 (32.50%) respondents purchased daily and every alternate day (Table 12).

Table 12: Frequency of visit/purchase by the consumer purchasing from a conventional stores

Sr. No.	Category	Food and grocery	F and V
1.	Daily	3, (7.50)	17, (42.50)
2.	Every alternate day	6, (15.00)	13, (32.50)
3.	Twice a week	9, (22.50)	6, (15.00)
4.	Once a week	10, (25.00)	4, (10.00)
5.	Fortnightly	9, (22.50)	-
6.	Monthly	3, (7.50)	-
	Grand total	40, (100)	40, (100)

Mode of payment:

With respect to the mode of payment in a retail outlet, 46 (76.66%) of them paid through cash and 14 (23.33%) paid through card.19 (47.5%) respondents visiting a conventional store made their payment through cash and 21(52.5%) of them had maintained monthly credit (Table 13).

Table 13: Mode of payment

	Cash	Card	Monthly credit
Retail outlet	46 (76.66)	14 (23.33)	-
Conventional stores	19 (47.5)	-	21 (52.5)

Conjoint results:

According to the Table 14, the attribute product quality had the more averaged importance with 30.13 per cent followed by the price offered by the food retail outlets with an averaged importance of 24.67 per cent

showing that the consumers visited the food retail outlet for the quality products the outlet offered at a reasonable price. With respect to the consumer preference towards conventional stores, the attribute price of the products topped the importance of the consumers with 25.35 per cent. It was closely followed by the attribute location of the outlet and quality of the products which were 24.96 per cent and 23.64 per cent, respectively (Table 15). This shows that the conventional stores were visited more often not only for the relatively less price they offer but also due to their easy accessibility and quality products.

Table 14 : Conjoint results for consumers buying from a retail outlet

Attributes of the food retail chain	Averaged importance
Product quality	30.13
Price of products	24.67
Location	22.08
Product range	8.39
Service offered	5.31
Mode of payment	9.42

Table 15: Conjoint results for buying from a conventional store

Attributes of the conventional stores	Averaged importance
Price	25.35
Location of the outlet	24.96
Quality of the products	23.64
Mode of payment	19.47
Product range	6.58

Supply chain management of fruits and vegetables:

Spencer's followed two different supply chains in order to procure fruits and vegetables. The retail chain incurs a cost of Rs. 409.96, Rs.1101.20 and Rs. 628.32 towards procurement of a quintal of tomato, potato and mango (Table 16) from the local markets/SAFAL through

Table 16 : Procurement cost (Rs./qtl) from SAFAL/local market

	Tomato	Potato	Mango
Procurement cost	275.97	935.07	484.36
Transportation to FVCC	32	32	32
Commission charges	6.89	23.37	12.10
Sorting and grading	9.5	9.5	9.5
Transportation to storage	17.4	18	18
Storage costs	27.59	43.26	32.36
Transportation to retail outlets	40.6	40	40
Total per qntl	409.96	1101.20	628.32

the consolidator. Spencer's procures directly from the farmers who are registered with them. This model has helped in shrinking the traditional fresh fruits and vegetables supply chain through the elimination of intermediaries. In this chain, the retail chain incurs a cost Rs.365.52, Rs.1036.93 and Rs.575.95, respectively towards procurement of a quintal of tomato, potato and mango (Table 17). By procuring the fruits and vegetables directly from the farmers the retail chain was able to reduce the cost of procurement by Rs.44.43, Rs.64.27 and Rs.52.37 for tomato, potato and mango, respectively. The reduction in cost for the above is about 10.83, 5.83 and 8.33 per cent (Table 18). The reduction in cost was mainly due to the reduction in transportation cost from the local market/SAFAL and deduction of commission charges towards the consolidator.

Conclusion:

There has been a rapid expansion of organized food retail chains in Bangalore with many new players like Fab mall, Namdhari fresh, Reliance fresh, etc. entering the market and opening up their outlets in the city. The major findings of the study were that there has been a steady growth of food retail chains over the years in Bangalore. 60 stores during 1996-99 to 204 stores in 2007. The major part of the recurring costs, both for the retail outlets and the conventional stores was towards monthly salary of the employees (Rs. 41, 574 and Rs. 23654, respectively) and towards the store rent (Rs. 26, 348 and Rs. 12, 265, respectively). The retail outlets were selling vegetables at a lesser price than the conventional

stores in the city. Whereas with respect to fruits, it was the conventional stores which were selling at a lesser price.The average monthly expenditure on fruits and vegetables was Rs. 1191.34 and Rs. 1035.82 for the consumers shopping at a retail outlet and conventional store, respectively with majority of the respondents visiting the outlets daily for their purchase of fruits and vegetables. The consumers purchasing from a food retail outlet placed more importance on premium quality products offered by the outlet, showing that the retail outlets provided the best quality fruits and vegetables. The conventional stores had an advantage of their neighbourhood store location and also reasonable price offered by them with credit facilities. Spencer's retail chain followed two different supply chains in order to procure fruits and vegetables, thus ensuring continuous supply of fruits and vegetables to its retail outlets. Spencer's, by procuring directly from the farmers were able to save 10.83 per cent, 5.83 per cent and 8.33 per cent respectively for tomato, potato and mango. Thus, by practicing improved supply chain management practices, there will be significant reduction in the wastages of fruits and vegetables which in turn will benefit both the farmers as well as the consumer by means of increased returns and decrease in price, respectively.

Recommendations:

In many developing countries, the growth of organized retailing was achieved only after allowing FDI in retailing. Thus, the regulations relating FDI in food

Table 17: Procurement cost (Rs./q) from farmers

	Tomato	Potato	Mango
Procurement cost	270.43	926.17	476.09
Sorting and grading	9.5	9.5	9.5
Transportation to storage	17.4	18	18
Storage costs	27.59	43.26	32.36
Transportation to retail outlets	40.6	40	40
Total per qntl	365.52	1036.93	575.95

Table 18: Price difference between procurement from SAFAL/local farmers

	Tomato	Potato	Mango
SAFAL	409.96	1101.20	628.32
Farmers	365.52	1036.93	575.95
Difference (Rs.)	44.43	64.27	52.37
Difference (%)	10.83	5.83	8.33

retailing should be made flexible.

The Government should encourage has setting up an innovative formats like collection depots and consolidation centres for fruits and vegetables.

Limitations:

The monetary aspects of the supply chain management could not be captured, as the firms have not maintained the database regarding the costs incurred at each link of the supply chain specific to individual commodity.

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