

A-PLUS (A+) Food Retail: Challenges in Minimizing Fruits and Vegetables Wastage

by Pragati Mishra, Kamendra Kumar & Sanjiv Kumar

Abstract

Food and grocery contributes to a major part of Indian online and offline retail. Food, particularly fruits and vegetables face huge post-harvest losses in the country which is high due to lack of infrastructure like cold storage, cold chain, unscientific handling right from farm till these reach the consumers along with many other factors. The case pertains to A-Plus (A+) Food Retail which is facing problems related to wastage of fruits and vegetables (F&V) in stores and is looking to overcome this challenge. The company is witnessing irregular patterns (mostly high) in wastage of F&V in different stores in its retail chain which affects the total sales and profit margins of the company despite the fact that the system is highly organized and equipped with latest technology throughout its supply chain. The employees attached with the stores seem to be extremely worried about the same but are struggling to arrive at some suitable solution. For this, the company has engaged a person and expects him to come out with all the possible factors resulting in irregular F&V wastage and the corrective measures thereon.

Keywords

Food Retail, Fruits and Vegetables, Wastage, Retail Operation, Supply Chain

Background

India is witnessing one of the fastest growing retail industry in the world. It is expected to grow to US\$ 1.3 billion by 2020, registering a Compound Annual Growth Rate (CAGR) of 16.7 per cent over 2015-20. (KPMG, 2014). India is the fifth largest preferred retail destination globally. The country is among the highest in the world in terms of per capita retail store availability. The Indian retail industry is generally divided into: Organized retailing and Unorganized retailing (Exhibit 1). India's retail sector is experiencing exponential growth, with retail development taking place not just in major cities and metros, but also in Tier-II and Tier-III cities. Healthy economic growth, changing demographic profile, increasing disposable incomes, urbanization, changing consumer tastes and preferences are the other factors driving growth in the organized retail market in India.

Food Retail in India

In 2014, food & grocery accounted for nearly 69% of the total revenues in the retail sector, followed by apparel (8%). Big retail chains and food brands from across the globe are eyeing towards Indian retail market after opening up of FDI which has been made up to 100% for food made in India. The spending on food is about 40% by an average Indian. (KPMG, 2016) (Exhibit 2 & 3). Food retail is facing various challenges both on supply as well as demand side. On demand side, poor distribution network, lack of cold chain, wastage, currency fluctuation and many more are there. On supply side, price sensitive customers, inflation etc. are playing role.

About the Company

A-PLUS (A+) Food Retail, is a \$41 billion corporation that follows the best industry practices. The company ventured into food and grocery retail in 2008 and expanded its presence across the country under the brand 'A+ Fresh' with two formats— Supermarkets and Hypermarkets and it is now among the top five retail outlets in India. These initiatives were taken by the company after the retail boom in India in 2005-06 when the market touched \$330 billion.

The company started with supermarkets in the self-service format, located close to the residential areas and mainly sold fruits and vegetables (F&V). With rapid urbanization taking place in the country, the company forayed into hypermarkets which had product assortment of some large and small appliances and clothing items apart from routinely purchased items.

Supermarket

A-Plus (A+) Supermarket is conveniently located in neighbor hoods. The product offerings include a wide range of fresh fruits and vegetables, groceries, personal care, home care, general merchandise and a basic range of apparels. Currently, there are 500 supermarkets across the country (Exhibit 4).

Hypermarket

A-PLUS (A+) Hypermarket is a one-stop shopping destination for the entire family. It provides wide range of products comprising fruits and vegetables, groceries, FMCG products and more. They also have general merchandise, apparel, consumer durables and IT goods. Generally, stores are opened in vicinity of society so that maximum customers can come to purchase things from their stores. The product offerings are divided into Food Grocery (Processed Foods, Beverages) and Non Food Grocery (Home Care, Personal Care) (Exhibit 5)

Fruit and Vegetable Wastage in India

India has been bestowed with wide range of climate and physio-geographical conditions which ensures availability of most kind of fruits and vegetables. The country is the second largest producer of fruits (81.285 million tonnes) and vegetables (162.19 million tonnes) in the world, contributing 12.6% and 14.0% of the total world production of fruits and vegetables respectively (Mistry, Singh & Gandhi, 2013). India exported fruits and vegetables worth Rs. 8760.96 crores in 2014-15 (comprised of fruits worth Rs. 3298.03 crores and vegetables worth Rs. 5462.93 crores). Mangoes, walnuts, grapes, bananas, pomegranates as small account for larger portion of fruits exported from the country while onions, okra, bitter gourd, green chilies, mushrooms and Potatoes contribute largely to the vegetable export basket (APEDA, 2016).

Various countries have adopted measures to deal with food wastage. For instance, France has passed unanimous legislation requiring supermarkets to either give unsold food to charity or send it to farmers for use as feed and fertiliser. Similarly, institutions in Canada are recovering unused and unspoiled food from retailers,

manufacturers, restaurants and caterers and sending them to charities (Chrisafis, 2016). In India, 31% of the retail food supply goes uneaten. Reducing this food wastage is the biggest challenge for the retailers. (Sinha, 2013).

Fruits and vegetables in India are prone to high wastage resulting in huge losses for the companies. Eighteen per cent of India's fruit and vegetable production - valued at INR 133 billion - is wasted annually, as per the data from the Central Institute of Post-Harvest Engineering and Technology (Sinha, 2013). Two of the biggest contributors to food wastage are: the lack of refrigerated transport and the lack of high quality cold storage facilities for food manufacturers and food sellers. Currently, India has 6,300 cold storage facilities unevenly spread across the country, with an installed capacity of 30.11 million metric tonnes. This is half the amount of cold storage facilities that India actually needs. Cold storage capacity for all food products in the country should be more than 61 million metric tonnes. In order to reach that target, the report says an investment of more than INR 550 billion is needed by 2015-2016 just to keep up with growing fruit and vegetable production levels (Narayanaswami & Balan, 2012). A recent study by IIM-Kolkata revealed that only 10 percent of food get cold storage facility in our country (Patel, 2016). In addition to this, inappropriate supply chain management also plays a big role in fruits and vegetables along with cereals and pulses wastage both before as well as after harvesting.

Supply Chain of Fruits and Vegetables at A-PLUS (A+) Food Retail

At A-PLUS (A+) Food Retail, vegetables are procured from vendors and then supplied to nearby store within 24 hours and under 6 hours in a few cities. This is done while following well-established quality norms and shelf-life norms, with quality checks carried out at multiple levels to ensure freshest produce. With their 'Full & Fresh' initiative, they ensure that their store always has stock of the freshest leafy vegetables. This is done through multiple deliveries on daily basis and optimized stocking systems that prevent stock out, the store staff constantly monitors quality and freshness once the stock reaches the shelves.

The company has its Distribution Centres (DC) which procures and supplies F&V to all the retail stores. DC procures F&V from big vendors on auction basis who collect the required quantity and quality either from farmers or import from other countries (mostly for exotic F&V). Once the DC receives indent from all the

stores, they calculate and make order to their vendors for required quantity. Vendors bring F&V to the DC where they are graded and weighed. According to the indent made by the stores these F&V are kept in dispatch area from where they are loaded in to lorries by LIFO method (Last In, First Out) which carry them to their allotted stores/retail outlet according to their road map and time allotted (Exhibit 6). When F&V reaches the respective stores, authorized Customer Service Associates (CSA) weigh and keep them in store display for the customers. Indent system in the company is through oracle ERP system and it is filled manually every day by trained CSAs who take care of fruits and vegetable availability.

Operations in Distribution Centre

The procurement department procures fresh fruits and vegetables from the farmers, 'mandi', or from the traders. These fruits and vegetables after being brought to the DC are graded, weighed and distributed according to the indent received by the stores. Every day indent is given to the DC. by the respective stores. If F&V procured in DC is less than overall indent received, it is managed and distributed accordingly but if procured quantity is in excess it can't be given to the stores. Excess amount is either stored for next day or may be thrown away in garbage if shelf-life is less (Exhibit 7).

Sometimes the fruits and vegetables are dispatched wrongly to stores other than the assigned ones. This is mostly a mistake on part of the employees at DC. These fruits and vegetables are sent back to the DC. and that stock has to be recorded as wrong dispatch and thrown away in the garbage. Exotic fruits and vegetables procured in cold condition also pass through the same procedure and kept in normal DC temperature due to less facility for cold storage.

F&V Wastage in Retail Store

Dump of fruits and vegetables in retail can be defined as the part/amount of total received stock of F&V which cannot be used for sales, it can only be discarded or may be thrown away in garbage. This is wastage or loss of value spent in purchasing or making them available to retail stores. There are various types of dumps, viz:

- *Arrival dump:* The part of F&V stock which was damaged when the store received it.
- *Transportation dump:* This is the part of F&V stock destroyed during transportation
- *Display dump:* This is a part of F&V stock which gets destroyed due to mishandling of particular item when kept in store display.

All these dumps are recorded in already prepared excel sheets in the retail stores and their value is calculated and inventory is maintained accordingly (Exhibit 8).

Procedure for Registration of Dump

All products that are discarded are registered via the item-code and also the reason behind the discard is recorded. The amount is registered in monetary terms. Only products that are sold by weight are registered by weight, either by estimated weight or by actual weight. The purpose of this comprehensive registration is not only to quantify waste for the retail sector, but also to get statistics about product loss that might have a significant influence on the performance of each retail outlet and in turn of the company, as this will certainly have a significant negative impact on the profit for the outlet and the retail company as a whole.

F&Vs which are sorted out in the morning are discarded everyday on routine basis. The routine starts with an inventory in the morning where products considered unsaleable are sorted out. Products are considered unsaleable if they cross their 'best before' or 'use-by date' life. Since F&V are sold without a date label, the sorting of these products is based on visual appearance.

Handling Wastage

Since F&V are highly perishable and delicate to handle, the management of the store observed that wastage was being generated every day. This was a huge area of concern as the value of the wasted F&V was eating away the potential revenue of the store. There were multiple reasons due to which the wastage occurred. To analyse the causes and solutions for this problem, the company hired Mr. Johnson to study the reasons for wastage/dump produced in the whole supply chain i.e. right from the procurement in the DC till the F&V reaches the consumers. He made observations in the DC for one week and tried to find out the possible reasons for wastage. He was also allotted a store with a view to observe each and every operation. It was presumed that the activities in each store remain same.

The store chosen for study was located in a posh area of Hyderabad. This chosen store had opened ten months back, and was not recording good sales on per day basis. There were two more supermarkets located nearby. These supermarkets were the biggest competitors for A-PLUS (A+) Food Retail. Apart from these supermarkets local vegetable vendors gave competition to A-PLUS (A+) Food Retail.

At A-PLUS (A+), the stores opens at 6:00a.m. and receive F&V in between 6:00 to 7:30 a.m. Mr Johnson had to observe the store from 6:00 a.m. to 5:00 p.m. While observing, he was also looking to identify ways of improving the systems. He observed the shelf-life of F&V and their availability in the store, quantity present in the store, consumer behaviour toward available fruits and vegetable and their daily sales, early stock out of any items and quantity of dump produced every day.

As in retail stores, sales and foot fall in the stores for F&V and grocery varied during various days in the week. Hence, it was imperative to observe on weekdays as well as on weekends along with competitors in that area, customer targeting in addition with the factors which were directly or indirectly related with the cause of dump in the stores.

Mr. Johnson witnessed an incidence where around 21 kg of dragon fruit, which was not in good condition was received in the store and he was keen to know what had gone wrong with those fruits, According to the supervisor the whole lot was kept in DC without maintaining optimum temperature. When probed, the CSA stated that such instances occurred frequently with other fruits like Kiwi, Litchi, etc.

Another instance Mr. Johnson witnessed when one day 65 kg of partly ripe Robusta bananas were received in the store. This led to less sale on that particular day as Robusta banana is a major contributor to fruit sale. Next day order arrived as usual resulting into piling up of previous day bananas and eventually excess bananas were recorded as dump. Same happened in the case of mangoes as well.

Minimizing Wastage

Incidentally one day Mr Johnson was glancing through the register with the supervisor of DC and saw the dump statement of whole week at the DC. Twice in a week some green vegetables were brought back to the DC which is not a normal procedure. When asked for the reason supervisor mentioned that those stocks were not dispatched to proper location (Exhibits 9 & 10).

Dump percent is used by the company as a criterion to measure the level of wastage in the store. Generally, more than 12% is considered as high dump. Local vegetable vendors were more prominent competitors along with the two more supermarkets in that area. Local vegetable vendors have their loyal customers while other supermarkets were coming with new strategy and advertisements every weekend.

Observations revealed that factors responsible for wastage/dump if taken care appropriately at the store may result in decrease of 3 to 4% wastage (Exhibit 11).

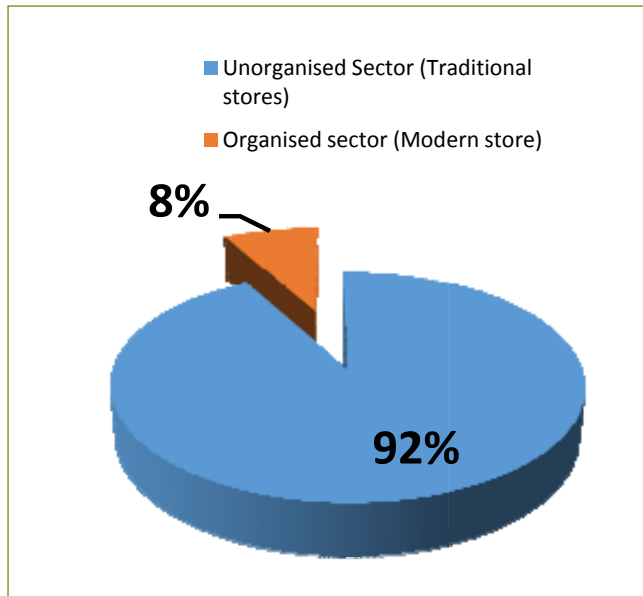
With the above information in hand, it was now the time to analyze and provide recommendations for minimizing the wastage of fruits and vegetables at A-PLUS (A+) Food Retail.

References

- APEDA. (2016). *Fresh Fruits & Vegetables*. Retrieved from http://www.apeda.gov.in/apedawebpage/six_head_product/FFV.htm
- Arivazhagan, R., Geetha, P., & Parthasarathy, R. (2012). Analysis of sources of fruit wastages in retail outlets in Chennai, Tamil Nadu, India. *International Journal of Trade, Economics and Finance*, 3(3).
- Chrisafis, A. (2016, February 04). *French law forbids food waste by supermarkets*. Retrieved from <https://www.theguardian.com/world/2016/feb/04/french-law-forbids-food-waste-by-supermarkets>
- CRISIL Research. (2013). *CRISIL Opinion: Organised: Fast food in the fast lane*. Retrieved from http://crsil.com/pdf/research/CRISIL_Research_Article_QSR_17Sep2013.pdf.
- Emerson Climate Technologies (2013). *The food wastage and cold storage infrastructure relationship in India: Developing realistic solutions*. Retrieved from http://www.indiaenvironmentportal.org.in/files/file/food_waste_india.pdf.
- FICCI. (2011). *The Indian Kaleidoscope: Emerging Trends in Retail*. PwC Brand & Communications, India.
- Gupta, R., Chauhan, T. R., & Lall, D. (1993). Nutritional potential of vegetable waste products for ruminants. *Bioresource Technology*, 44(3), pp. 263-265.
- KPMG. (2012). *Human Resource and Skill Requirement in the Retail Sector*.
- KPMG. (2014). *Indian Retail: The Next Growth Story*.
- Mistry, N. C., Singh, B., & Gandhi, C. P. (2014). *Indian horticulture database-2013*. National Horticulture Board, Ministry of Agriculture, Government of India, New Delhi.
- Patel, A. (2016). October 16, World Food Day: Making India Free from Hunger. *International Journal of Research- Granthalayah*, 4(9), pp. 113-123.
- Sen, A., & Lee, B. (2016). *Sustainable and inclusive supply chains: A key business driver for food industry*. Retrieved from http://www.ifc.org/wps/wcm/connect/industry_ext_content/ifc_external_corporate_site/agribusiness/resources/agri_sustainable+and+inclusive+supply+chains.
- Singh, S., & Singla, N. (2010). *Fresh Food Retail Chains in India: Organisation and Impacts*. CMA Publication No. 238.
- Singhi, A., Mall, A., Mathur, R., Bajaj, P. (2015). Retail 2020- Retrospect, Reinvent, Rewrite. *The Boston Consulting Group & Retailers Association of India*. Retrieved from <http://www.bcgindia.com/documents/file181823.pdf>
- Sinha, K. (2013, September 12). One-third of food produced globally wasted annually. *The Times of India*. Retrieved from <http://timesofindia.indiatimes.com/world/uk/One-third-of-food-produced-globally-wasted-annually/article-show/22503145.cms>

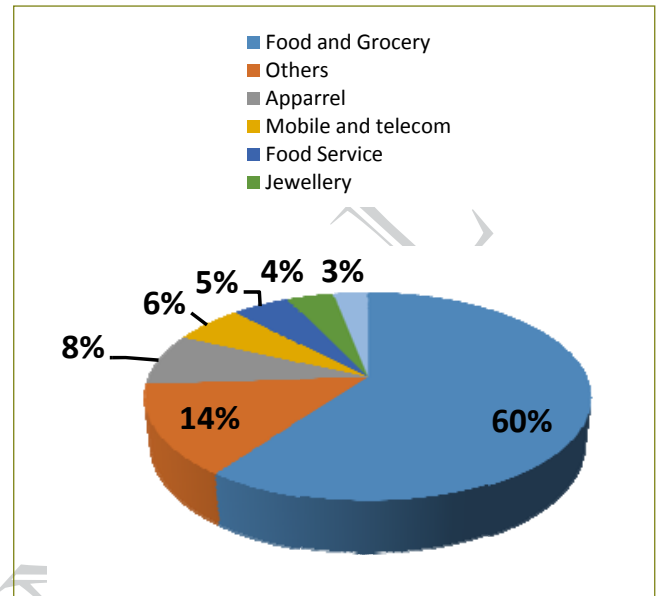
Appendix

Exhibit 1. Retail Sector in India



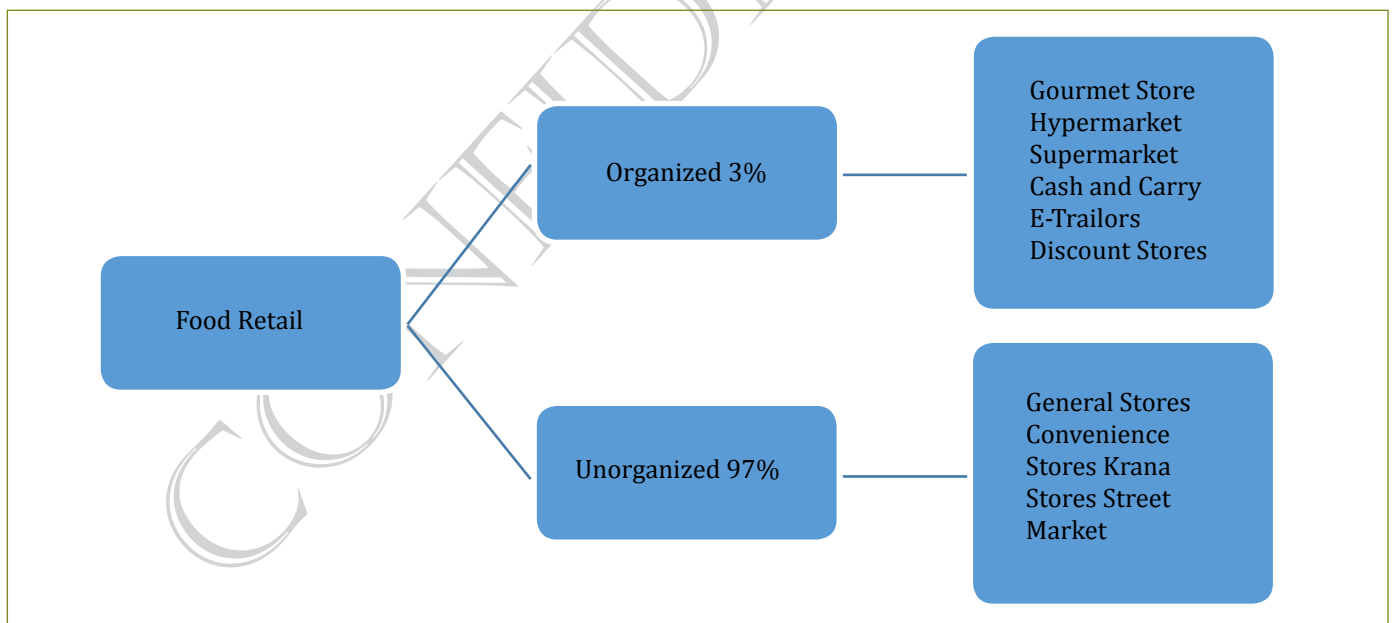
Source: KPMG, 2016

Exhibit 2. Organised Retail Market in India



Source: KPMG, 2016

Exhibit 3. Various Formats of Food Retail



Source: Singhi, Mall & Bajaj, 2015

Exhibit 4. State-wise Distribution of A Plus (A+) Food Retail Outlets

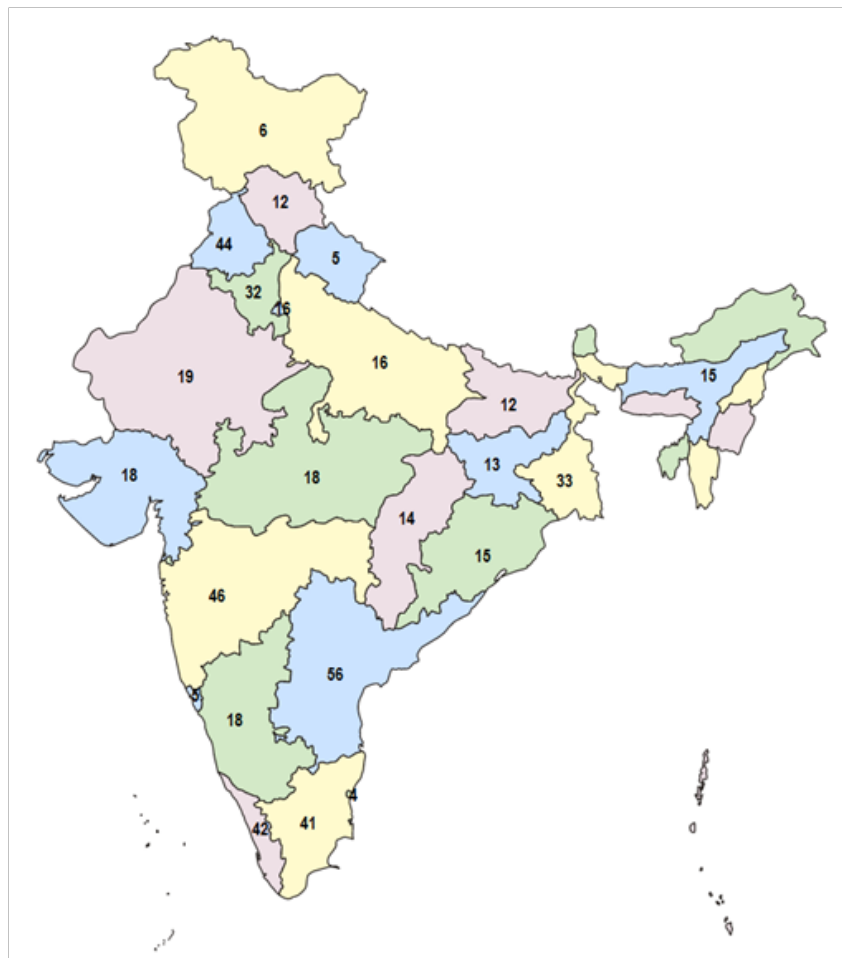


Exhibit 5. Product Offerings at A-Plus(A+) Food Retail

Division	Group	Departments
Fresh	Fruits & Vegetables	Fruits , Vegetables, Bread, Cakes and Pastries
	Bakery	
	Frozen & Dairy	Butter, Cheese, Egg, Curd, Milk, ice creams
Grocery Food	Staples	Cereals, Pulses, Flours, Salt, Sugar, Spices and Dry fruits
	Beverages	Carbonated drinks, Fruit juices, Water, Health Drinks, Tea and Coffee and concentrated Drinks
Grocery Non Foods	Processed Foods	Baby Food, Breakfast Cereals, Instant Prepared Food, Snacks, Jams and Pickles, Biscuit, Confectionary
	Home Care	Housekeeping, Laundry, Insecticides
General Merchandise	Personal Care	Baby Care, Hair Care, Shaving, Personal wash, Beauty, Skin Care, Oral Care
		Utensils, LEDs and CFL, Bucket

Exhibit 6. Supply Chain of Fruits and Vegetables at A-Plus (A+) Food Retail



Exhibit 7. Pictures of Wastage from Store



Exhibit 8. Fruits and Vegetables Received in Distribution Centre (Two Weeks Data)

Date		Indent received by DC (kg)	Total procurement (kg)	Less/ Excess (kg)
25/5/2016	Fruits	44350	44320	-30
	Vegetables	28380	28305	-75
26/5/2016	Fruits	37627	37627	0
	Vegetables	28383	28320	-63
27/5/2016	Fruits	45120	45140	20
	Vegetables	31776	31720	-56
28/5/2016	Fruits	48320	48320	0
	Vegetables	32700	32632	-68
29/5/2016	Fruits	48220	48280	60
	Vegetables	32840	32814	-26
30/5/2016	Fruits	48400	48320	-80
	Vegetables	32956	32986	30
31/5/2016	Fruits	43340	43340	0
	Vegetables	28140	28120	-20
1/6/2016	Fruits	42280	42196	-84
	Vegetables	28532	28590	58
2/6/2016	Fruits	44358	44328	-30
	Vegetables	28380	28380	0
3/6/2016	Fruits	37427	37425	-2
	Vegetables	28383	28323	-60
4/6/2016	Fruits	45320	45320	0
	Vegetables	31776	31776	0
5/6/2016	Fruits	48230	48210	-20
	Vegetables	32700	32642	-58
6/6/2016	Fruits	48570	48570	0
	Vegetables	32840	32650	-190
7/6/2016	Fruits	49200	49005	-195
	Vegetables	32956	32998	42

Exhibit 9. Some Exotic Fruits and Vegetables in Stores during May '16 (One-Week Data)

Name of vegetable		Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Broccoli green (kg) (Rs. 200)	Received	5	3	3	3	8	10	15
	Sold	0	1	0	.5	0	8	8
	Dump	1	2	4	1	2	3	2
Zucchini yellow (kg) (Rs. 160)	Received	3	3	3	3	5	5	5
	Sold	0	0	0	0	0	1	1.5
	Dump	2	3	1	.5	3	2	2
Avocado (pc) (Rs. 20)	Received	10	10	10	10	10	15	15
	Sold	2	1	5	0	0	5	8
	Dump	5	4	5	6	3	4	4
Kiwi (in pc) (Rs. 25)	Received	30	30	30	30	30	150	100
	Sold	5	0	0	0	10	50	92
	Dump	12	17	8	13	10	10	5
Lettuce iceberg (kg) (Rs. 225)	Received	3	3	3	3	3	5	5
	Sold	0	0	0	1	0	2	3
	Dump	1	.8	0	2	0	3	1.8

*Stock of present day = Stock received today + Stock of previous day after removing dump
Dragon Fruit - Rs. 650/ kg

Exhibit 10. Non-Selling Fruits and Vegetables in Stores during May-June, 2016.

Name	Rates (Rs.)*
Fig	28/6 pieces
Row Groundnuts	54/kg
Plum	520/kg
Elephant foot yam	104/kg
Ash gourd	45/kg

*Rates correspond to 2016, June 15

Exhibit 11. Dump Percentage (Data Recorded for 45 Days)

Comparison of Store Data (Rs.)						
Month	Dump (15days)	Dump (30 days)	Sales (15days)	Sales (30days)	Dump% (15 days)	Dump% (30 days)
April 2016	30065.92	64247.22	205882.54	457921.66	14.60	14.03
May 2016	36555.19	76403.83	329858.07	624410.4	11.08	12.24
June 2016	24138.53		287218.59		8.40	

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