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9B18D023

Vasant farm fresh: REDUCING FOOD WASTAGE

Debjit Roy and Shailesh Kulkarni wrote this case solely to provide material for class discussion. The authors do not intend to illustrate either effective or ineffective handling of a managerial situation. The authors may have disguised certain names and other identifying information to protect confidentiality.

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Vasant Group (VG) entered the business of integrated farming with Vasant Farm Fresh (VFF) in October 2013 with the stated vision to “create a brand through which the end consumer gets fresh vegetables as well as fruits at the most competitive rates. At the other end, the farmer gets his deserving share for the produce directly at his farm, saving him time and money, and most importantly affording him a comfortable life.” In November 2014, VFF founded Vasant Veggie Farmer Producer Company Limited and launched its first fruits and vegetables retail store called Vasant Veggies (VV) in Ahmedabad, India. Its aims were to offer produce to the end consumer at a fair price and to increase business margins by reducing the incidental cost arising from wastage.

While VV stores had managed to increase footfall, the perishable nature of fruits and vegetables (F&V) posed various challenges for the store: the produce had a limited shelf life, and there was a large amount of wastage (up to 50 per cent of the daily procurement quantity). In June 2015, Hiten Vasant, director of VV, was reviewing data that showed the amount of produce being wasted (see Exhibit 1). He was keen to find answers to several pressing questions he was confronting related to the integrated farm-to-fork business model, in particular, how should he decide on procurement quantities to reduce wastage? How could a collection centre help in reducing food wastage and increase business profitability?

history

VG began its services in 1960, when Ramesh Vasant established Vasant Transport Corporation (VTC), VG’s flagship company, with the support of his father and uncle. The company started its operations from Porbandar, India, as a booking service provider with one truck on the 450-kilometre Ahmedabad–Porbandar route. Eventually, VTC became one of the top transport companies on that route. VTC gradually began increasing its fleet as well as the number of locations it serviced, and it started a two-way service between the cities of Ahmedabad and Porbandar. In 1972, the company shifted its operations base to Ahmedabad, which was becoming a transport hub.

In 1984, Hiten joined the family business and, since then, had been instrumental in taking the Vasant family enterprise into new lines of business. By 2015, the company had been providing logistics solutions for over 50 years: it had a significant market share across the Saurashtra region of Gujarat; a fleet of 80 trucks, ranging from one-ton to 16-ton; multiple network centres; and various systems and mechanisms in place. VG was the only group in Gujarat with its origins in the state that offered a host of services related to transportation and logistics under one roof. The philosophy propelling the group forward was based ondelivering results, time and again.

VG created different businesses and had plans for future projects (see Exhibit 2). The group pursued interests in diverse sectors such as transportation, logistics, freight forwarding, warehousing, value-added services, infrastructure transportation, and home delivery service for retail stores. VFF was a relatively recent addition to the portfolio, as VG diversified further, into farming.

VFF utilized state-of-the-art technology for an integrated farming project covering 80 acres of land in the district of Dholka, near Ahmedabad. The project included vegetable farming, horticulture, vermiculture, dairy-related activities, the cultivation of cash crops, and agroforestry. It also developed a cold supply chain to retain high-quality fresh farm produce and directly distribute it to end consumers, both retail and institutional. During the summer of 2014, VFF entered the retail and wholesale market with farm-fresh, naturally ripened mangoes. Inspired by the success of this venture, it launched VV and established a collection centre about four kilometres from the store. Despite being a recent entrant in the business, the VV store in Bopal managed to get footfall of around 650–700 during weekdays and around 800–850 during weekends. Following the success of its first store, VV soon added two stores in the areas of South Bopal and Vejalpur.

The perishable nature of produce posed several challenges. F&V had a limited shelf life, and this shelf life varied from product to product. Also, the quality of F&V was diminished by frequent handling (i.e., direct human hand contact). The amount of wastage was another challenge. Staying in line with its vision, VV needed to ensure that the quality of its produce would not diminish (or would diminish very little) before the produce reached the end customer.

Evolution of the Regulated F&V Market in Gujarat

In 1944–1947, the wholesale F&V business was not regulated and hence various malpractices existed. All possible fraudulent means were applied, as far as the weight of produce was concerned, against the interest of the actual producer. The business was entirely in the hands of general commission agents, and at times, the general commission agent would buy produce and sell it later at higher rates, leading to significant losses for producers.

In 1942, a proposal was submitted to the Indian government for issuing a notification for the establishment of a regulated market under the *Bombay Agricultural Produce Markets Act, 1939*. Subsequently, the wholesale F&V trade was regulated within a 12-mile radius (about 19-kilometres) from the Ahmedabad Market Yard, effective May 24, 1948.[[1]](#footnote-1)

The fundamental objective of regulating the market was to safeguard the interests of all stakeholders, including producers, sellers, and consumers. Some of the advantages of a regulated market were as follows:

* Rates were fair and competitive.
* A licence was issued to all entities to operate in the market against an entry fee.
* Suitable benchmarks for quantity and quality were laid out.
* Malpractices were brought under control.

In the supply chain model under a regulated market, produce moved from farmers to consumers via several intermediaries and wholesalers (see Exhibit 3). The regulated market was introduced with a vision to safeguard the interests of all the stakeholders involved in the F&V business, in letter and in spirit. However, its implementation did not turn out to be as favourable as expected. The intermediaries in the chain indulged in profiteering at the expense of the farmers, depriving them of fair prices for the produce. The consumers also had to pay higher prices, as the intermediaries inflated prices by adding their margins.

VG entered the F&V retail business to overcome the shortcomings of the regulated F&V markets. Hiten had been farming for more than 20 years when, one day, he sold his tomatoes to traders at ₹1[[2]](#footnote-2) per kilogram. He was shocked to learn that, on the same day, his wife had purchased tomatoes at ₹16 per kilogram. This disparity in the farmer’s sale price and the purchase price for the end consumer triggered Hiten’s idea of having F&V outlets to sell fresh produce from his own farm and his neighbours’ farms. Anuj Vasant, Hiten’s son, who had just completed his undergraduate degree in engineering, readily took up the challenge and responsibility of setting up and managing F&V stores to sell produce directly procured from farms.

Vasant Farm Fresh

Inbound Logistics Process

VV aimed at procuring fresh produce and making it available to the end customer. To ensure that the F&V were fresh enough, VV procured the produce, except for potatoes and onions, on a daily basis. Daily procurement (see Exhibit 4) also helped in minimizing the costs associated with wastage.

The design of the procurement channel was critical for VV. Given VV’s vision statement, the quality of F&V was to be maintained until the produce reached the end customer. This was possible by eliminating the intermediaries in the distribution channel, thereby improving the quality (by minimizing handling of the produce) and simultaneously reducing the price (by reducing the number of intermediaries in the supply chain and avoiding profit marginalization).

Initially, F&V were brought to VV stores from the nearby markets, mostly the agriculture produce market committee (APMC) market in Jamalpur, Ahmedabad. For items that were not available in the Jamalpur market, alternate markets such as those in Rajnager or Kalupur were explored. Initially, not much of a challenge existed around scheduling the trips to these markets, as a maximum of three locations were to be covered in a day. However, with new retail branches introduced at South Bopal and Vejalpur, VV had to devise a more sustainable procurement channel. For procurement, VV had two options: (1) purchase from a *mandi* or *mandis*, or (2) purchase from farmers. Mandis were local farmers’ markets, where farmers brought their produce—typically in trailers—to sell to traders or institutional buyers*.* As a third option, VV could consider procuring from a mix of both. Each option had certain advantages and disadvantages.

Procurement from Mandis

At mandis, vendors of all types of F&V were available under one roof. Further, mandis were typically located between the retail stores and the farms. Hence, the transit time from the mandis to retail stores was less than the transit time between retail stores and the farms. This meant that the transportation cost for procurement from mandis was also lower compared to procurement from farms. However, the cost of F&V was higher at mandis. Further, there was no control over post-harvest storage techniques, and hence the remaining F&V shelf life could be shorter. Produce freshness and nutritional value were comparatively low, as the food miles (the distance travelled by the F&V to reach the customer) were greater. Purchase discounts were available on procurement in higher quantities, but such quantity discounts sometimes led to excess purchases. Also, grading and sorting facilities were not always available at mandis.

Procurement from Farmers

The purchase cost of procuring F&V directly from farmers was less because intermediaries were not involved. The shelf life of the F&V was longer because the farmers were trained in post-harvest storage techniques. Hence, the freshness and nutritional value of the produce was comparatively better when procured from farmers than from mandis. The quantities of procurement could be negotiated with the farmers, and initial grading and sorting could be done at the farm itself. As a social outcome, procurement from farmers led to steady income for the farmers, who experienced greatly fluctuating purchase amounts when selling produce at mandis.

Though the cost of F&V could be low when procuring from farmers, the logistics cost could be high. Sole dependence on farmers for procurement could be risky because of the high level of uncertainty involved in terms of both quality and quantity, due to the risk of variations in the crop yield owing to natural phenomena such as droughts, floods, and cyclones.

Collection Centre

While deciding on a procurement channel for F&V in November 2014, and considering the intricacies of the business, VV came up with the idea for a collection centre. The collection centre would have to cater to the procurement requirements of VV at Bopal as well as at the new branches in South Bopal and Vejalpur (see Exhibit 5). It would be located near the farmers, so that the farmers themselves could sell their produce.

The collection centre came to serve as a consolidation point, performing the task of an aggregator. Farmers brought their produce to the collection centre based on their convenience. The collection centre was located close to the farms and served as both a storage facility and a consolidation point for outbound truck shipments. The farmers approached the collection centre with their produce, checked for the rates offered, and—depending on the rate’s suitability—sold their produce. The entire process was hassle-free and transparent. The collection centre was in fact a place where post-harvest management techniques were practised. It came to serve several growers in the region and fared well in fulfilling the purpose for which it was established—aiding farmers in selling their produce and earning fair returns, right at their doorsteps. However, VV had a different future business model in mind. With growth in the business, VV intended to source directly from the farmers to minimize its reliance on the mandis for procuring F&V. VV’s ultimate aim was to grow as an APMC.

At VV’s end, the collection centre helped to eliminate the need to go to individual farmers for procurement. At the farmers’ end, too, the collection centre set-up worked out to be profitable in both monetary and non-monetary terms because the farmers had ready buyers for their produce. Further, they no longer had to wait the entire day to sell all of their produce, as they had to do at the mandis. Further, an APMC imposed certain restrictions on the operations of farmers if they opted to sell in the mandis. The farmers could be free of these hassles by selling their produce at the collection centre. The collection centre catered to about 40 per cent of VV’s procurement needs. The company depended on the Jamalpur APMC market for about 30 per cent, the Vasna APMC market for about 25 per cent, and the Rajnager market for the remaining 5 per cent (which was mainly fruit).

Activities at the Collection Centre

Several activities took place at the collection centre and at farms:

* Sorting: This involved sorting F&V into different categories based on physical attributes, i.e., size, shape, colour, variety, and stage of ripening. The rates given to the farmers were based on the quality of the F&V. These activities were conducted twice a day, once at 5:30 a.m. and then at the end of the day in preparation for the next day. The process was also carried out at both farms and the collection centre.
* Grading: VFF also educated farmers on basic grading techniques so that grading could be done at the farm level. This was beneficial because it involved less time and avoided over-handling of the produce, thereby helping to maintain the freshness of the produce and reducing wastage.
* Weighing: After the produce was graded, it was weighed. With the use of electronic scales, the process of weighing was very transparent; the farmers could themselves verify the weights, which both gave them confidence and elicited their trust. After weighing, the individual bags of produce were affixed with different-coloured stickers, where the colour signified the grade of the produce in the bag. The weight of the produce was also put on the sticker.
* Training: The farmers were also given guidance on the appropriate time for harvesting different varieties of crops. To ensure the best produce weights, the farmers had to harvest the F&V at an apt stage of ripening. If the harvesting happened before the appropriate time, the weight would be less; if the harvesting happened after the required time, the produce would start deteriorating in quality and would be less valuable to the farmers.

Collection Centre versus Mandis

Over time, various farmers had become regular vendors at the collection centre. The collection centre provided several advantages for the farmers, making it worthwhile for them to sell their produce there rather than at the mandis: they fetched better selling prices for the produce, experienced transparency in weighing, received immediate cash payments, travelled shorter distances due to the centre’s proximity to the farms, experienced less fatigue due to lower transaction times, sold all of their produce at pre-negotiated rates (irrespective of the quantity), received humane treatment, and were trained on practices that could be adopted to improve the quality and quantity of the produce.

Outbound Logistics

Before the end of the day, all F&V received at the collection centre were sent to VV retail outlets. Excess F&V, if any, were sold at the wholesale markets. F&V usually needed temperatures of 20–23 degrees Celsius and 80–95 per cent humidity. To ensure this storage requirement, F&V were stored at the outlets under controlled temperatures. For vegetable storage, water coolers were preferred over air conditioners because the coolers increased the moisture content of the air.

Business Cost

The various costs associated with the VFF business were as follows:

* F&V cost: the actual cost incurred in procuring F&V
* logistics cost: the cost incurred to transport the F&V to the stores
* labour cost: the cost associated with the labour involved in the business activities, such as sorting, grading, assisting customers, and billing
* wastage cost: the cost associated with wastage, which was considerable since F&V were perishable

Logistics, labour, and wastage costs were added to the basic cost of F&V; the cost to the consumer was inflated on account of these incidental costs. To keep a check on the out-of-pocket price the consumer had to pay for F&V, these incidental costs had to be kept at a minimum. There was not much that could be done in terms of controlling the logistics and labour costs. The cost arising from wastage, however, could be better controlled.

Wastage

Since the collection centre distributed all the produce the same day it was received, there was no wastage at the level of the collection centre. However, the wastage of F&V was remarkably high at the level of the retail outlets. Preventing the huge amount of F&V going to waste could reduce the huge fluctuations in the prices and supply of F&V, as the resultant increase in supply would make the F&V available at more affordable rates. VV believed that integrated supply chains with direct procurement would not only improve the farmers’ position but also reduce food wastage and improve the quality of produce available at the retail outlets.

The reasons for wastage of F&V at the retail outlets included a lack of controlled temperatures (heat), over-estimation of demand, poor quality of produce, poor transportation, inappropriate or over-handling, moisture loss, improper storage, and poor packaging.

F&V, being sensitive to heat, became spoiled due to human touch. Heat led to early or over-ripening of certain F&V, such as tomatoes, thereby increasing wastage. Loss of moisture was another key reason for greater amounts of wastage. For instance, sweet limes lost moisture and weight and reduced in size if kept out for long periods. Some produce, such as lemons, regained moisture if put in water, but other produce, such as corn, did not. Corn, for instance, also experienced great weight loss and shrank in size.

Different F&V required different storage techniques and temperatures. As improper storage conditions led to more wastage, certain F&V were stored inside water tubs in gunny bags. However, this storage technique was specific to certain F&V, as some (e.g., eggplant) became spoiled when put in water.

Customers

VV catered to both retail and wholesale customers. Whereas retail customers accounted for major sales, sales from wholesale customers, which included restaurants, canteens, and *dhabas* (roadside restaurants), and institutional sales provided a cushion for the day’s F&V surplus. Since surplus produce was sold in the wholesale markets on a daily basis, the freshness and quality of the F&V was maintained.

Competition

VV faced strong competition from F&V street hawkers. A few of these hawkers were even located in the areas surrounding the stores. These vendors had advantages in terms of being mobile and able to cater to customers at their doorsteps. Despite this, VV still managed to get a considerable number of customers, for several reasons, the first being the freshness of the F&V at the stores. At VV, customers had the option to pick and choose the fresh F&V on their own and the flexibility to pick up even small quantities (for example, only one red capsicum or two tomatoes).

Going Forward

Hiten was contemplating the future strategy for the collection centre and retail outlets, with FVV’s vision statement as the focal point. The prime concern was to identify and deploy practices that resulted in reduced wastage, thereby reducing the incidental procurement cost and achieving better business margins. Although the fixed cost of setting up the collection centre had been quite high, Hiten had anticipated that the centre would lead to a major reduction in fresh produce wastage—but the wastage was still significant. How should VV decide on the optimal purchase quantity? As this question reeled in Hiten’s mind, he looked over the purchase price and retail sales report for cauliflower, which had seen significant wastage during April and May 2015 (see Exhibits 6, 7A, and 7B). The margin received by farmers relative to the actual consumer purchase price was substantially lower because of several handoffs in the distribution process (see Exhibit 8). Hiten had always believed there was a strong need to improve the profit margins of the farmers, and he wanted to make a difference through his integrated farm-to-fork business model.

The authors appreciate the research assistance provided by Pooja Shrivastava in collecting and analyzing both primary and secondary data for developing the case.

Exhibit 1: Wastage Data for April and May 2015 (%)

|  |  |  |
| --- | --- | --- |
| Item | April 2015 | May 2015 |
| Cauliflower | 26 | 42 |
| Fenugreek | 33 | 34 |
| Carrot | 22 | 31 |
| Ridge Gourd | 21 | 29 |
| Bitter Gourd | 24 | 27 |
| Round Gourd | 24 | 26 |
| Cowpea | 21 | 23 |
| Beetroot | 40 | 22 |
| Cucumber | 27 | 21 |
| Spinach | 20 | 21 |

Source: Company records.

Exhibit 2: vasant Group Companies and Future Projects

**Companies**

Vasant Group currently had a number of companies and was reasonably diversified with a strong reputation in the city of Ahmedabad.

*Vasant Transport Corporation*

Engaged in providing a complete range of transportation services to its clients, Vasant Transport Corporation was the group’s flagship company.

*Vasant Overseas Pvt. Ltd.*

Incorporated in 2004, this company was engaged in handling large import/export shipments via sea and air.

*Vasant Warehouse*

Founded in Rajkot in 2003, this division managed warehousing facilities and provided third- and fourth-party logistics services to Reliance Retail Limited and Kuehne+Nagel in Ahmedabad.

*Vasant Logistics*

Started in 2005, this leg of the group was engaged in offering logistics and value-added services across Gujarat. Sony India Pvt. Ltd., Philips India, and Castrol India Limited were among the company’s key clients. It also provided specialized door-to-door delivery services to Reliance Retail Limited in Ahmedabad and Jamnagar.

*Vasant Virtual*

## Formed in 2006, Vasant Virtual was engaged in providing customer verification services to companies such as Vodafone, Tata Docomo, and Kotak Mahindra Bank. It also provided outsourcing services to financial services.

*Vasant Infra Logis*

## Vasant Infra Logis was engaged in the transportation of infrastructural materials and had catered to Vodafone, BSNL (Bharat Sanchar Nigam Limited), and ITIL (Indian Telecom Infra Limited).

*Vasant Veggie Farmer Producer Company Limited*

This company was incorporated in 2014 and was involved in growing crops, market gardening, and horticulture. It also imparted training to farmers to optimize their produce.

**Future Projects**

*Logistics Park*

Vasant Group planned to create a world-class logistics park project in the state of Gujarat with amenities such as specialized warehouses, trading lots, truck parking bays with trans-loading facilities, cold storage, spare parts and accessories shops, and related support services. It would also have excellent connectivity with other important transport hubs through road, rail, and sea.

*Container Movement*

Vasant Group aspired to become a major player in container movement in future years. The group had already taken a step in this direction through outsourcing the service of container movement.

*Car Carrier Business*

Vasant Group foresaw tremendous growth opportunities in the car carrier segment in Gujarat, more so because the giants—Tata Nano and General Motors—had established their production units in Gujarat.

Source: Created by case authors based on “Group Companies,” Vasant Group, accessed October 16, 2018, www.vasantgroup.in/group-companies.php; and “About Us: Future Plans,” Vasant Group, accessed October 16, 2018, www.vasantgroup.in/future-plans.php.

Exhibit 3: Regulated Market Supply Chain

Farmers

Intermediaries

Primary Wholesalers/ Mandis

Consumers

Secondary Wholesalers

Retailers

Note: Mandis = local farmers’ markets.

Source: Created by case authors.

Exhibit 4: Vasant Veggies PROCUREMENT NETWORK

Farms

Rajnager Mandi

Jamalpur Mandi

APMC

Collection Centre

Retail Store

Institutional Buyer (Restaurant/Canteen/Dhaba)

E-Commerce

Wholesale Market

Consumers

Notes: APMC = agriculture produce market committee; Dhaba = roadside restaurant.

Source: Created by case authors..

Exhibit 5: Retail stores, collection centre, and procurement locations



|  |  |
| --- | --- |
| A | Rajnager Vegetable Market |
| B | Jamalpur Mandi |
| C | Kalupur Mandi |
| D | Collection Centre |
| E | Vasant Veggies, Bopal |
| F | Vasant Veggies, South Bopal |
| G | Vasant Veggies, Vejalpur |

Notes: The distances (in kilometres) between locations are indicated on the joining lines. VV = Vasant Veggies.

Source: Created by the case authors.

Exhibit 6: Price Data for Cauliflower

|  |  |  |  |
| --- | --- | --- | --- |
| **Date** | [**Minimum Price (₹/Quintal)**](javascript:__doPostBack('ctl00$cphBody$GridPriceData','Sort$MIN')) | [**Maximum Price (₹/Quintal)**](javascript:__doPostBack('ctl00$cphBody$GridPriceData','Sort$MAX')) | [**Modal Price (₹/Quintal)**](javascript:__doPostBack('ctl00$cphBody$GridPriceData','Sort$MODAL')) |
| 1-Apr-15 | 1,000 | 1,500 | 1,300 |
| 2-Apr-15 | 1,000 | 1,500 | 1,300 |
| 3-Apr-15 | 1,200 | 1,800 | 1,600 |
| 4-Apr-15 | 1,000 | 2,500 | 1,300 |
| 6-Apr-15 | 1,000 | 1,800 | 1,500 |
| 7-Apr-15 | 800 | 1,500 | 1,200 |
| 8-Apr-15 | 700 | 1,200 | 1,000 |
| 9-Apr-15 | 1,000 | 1,500 | 1,300 |
| 10-Apr-15 | 1,000 | 1,600 | 1,400 |
| 11-Apr-15 | 700 | 1,500 | 1,200 |
| 13-Apr-15 | 500 | 1,000 | 800 |
| 14-Apr-15 | 500 | 1,000 | 800 |
| 15-Apr-15 | 600 | 1,200 | 1,000 |
| 16-Apr-15 | 400 | 1,200 | 1,000 |
| 17-Apr-15 | 500 | 1,000 | 800 |
| 18-Apr-15 | 500 | 1,000 | 800 |
| 20-Apr-15 | 500 | 1,000 | 800 |
| 21-Apr-15 | 600 | 1,100 | 900 |
| 22-Apr-15 | 500 | 1,000 | 800 |
| 23-Apr-15 | 500 | 1,100 | 900 |
| 24-Apr-15 | 700 | 1,200 | 1,000 |
| 25-Apr-15 | 1,000 | 1,800 | 1,500 |
| 27-Apr-15 | 1,000 | 2,000 | 1,600 |
| 28-Apr-15 | 1,000 | 2,000 | 1,800 |
| 29-Apr-15 | 1,000 | 1,700 | 1,400 |
| 30-Apr-15 | 1,000 | 1,700 | 1,500 |
| 1-May-15 | 1,000 | 2,000 | 1,800 |
| 2-May-15 | 1,000 | 2,250 | 1,800 |
| 4-May-15 | 1,000 | 2,500 | 2,000 |
| 5-May-15 | 1,000 | 2,200 | 1,800 |
| 6-May-15 | 1,000 | 2,250 | 1,800 |
| 7-May-15 | 800 | 2,000 | 1,600 |
| 8-May-15 | 1,500 | 2,500 | 2,200 |
| 9-May-15 | 1,000 | 2,500 | 2,000 |
| 11-May-15 | 1,500 | 2,500 | 2,200 |

exhibit 6 (continued)

|  |  |  |  |
| --- | --- | --- | --- |
| 12-May-15 | 900 | 2,000 | 1,500 |
| 13-May-15 | 600 | 1,500 | 1,100 |
| 14-May-15 | 800 | 1,500 | 1,200 |
| 15-May-15 | 1,000 | 2,000 | 1,600 |
| 16-May-15 | 1,000 | 1,800 | 1,500 |
| 18-May-15 | 1,000 | 1,750 | 1,500 |
| 19-May-15 | 1,000 | 2,000 | 1,600 |
| 20-May-15 | 800 | 1,500 | 1,200 |
| 21-May-15 | 1,000 | 1,600 | 1,400 |
| 22-May-15 | 700 | 1,500 | 1,200 |
| 23-May-15 | 500 | 1,300 | 1,000 |
| 25-May-15 | 1,000 | 1,800 | 1,500 |
| 26-May-15 | 1,000 | 1,600 | 1,400 |
| 27-May-15 | 1,000 | 1,800 | 1,500 |
| 28-May-15 | 1,200 | 2,500 | 1,900 |
| 29-May-15 | 1,000 | 2,200 | 1,800 |
| 30-May-15 | 1,500 | 2,000 | 1,800 |

Note: Quintal = 100 kilograms.

Source: Research and Information Network (MRIN), “Daily Prices of Cauliflower,” AGMARKET, accessed January 16, 2018, <http://agmarknet.gov.in/PriceAndArrivals/DatewiseCommodityReport.aspx>.

Exhibit 7a: Demand Data for Cauliflower, April 2015

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Cauliflower** | **Purchase** | **Retail Sales** | **Wholesale Sales** | **Total Sales** |
| **Date (Day/Month/Year)** | **Units** | **Units** | **Units** | **Units** |
| 01/04/2015 | 42 | 26 | 10 | 36 |
| 02/04/2015 | 47 | 23 | 4 | 27 |
| 03/04/2015 | 53 | 31 | 26 | 57 |
| 04/04/2015 | 101 | 41 | 15 | 56 |
| 05/04/2015 | 73 | 44 | 7 | 51 |
| 06/04/2015 | 57 | 33 | 5 | 38 |
| 07/04/2015 | 75 | 32 | 11 | 43 |
| 08/04/2015 | 83 | 28 | 2 | 30 |
| 09/04/2015 | 67 | 20 | 7 | 27 |
| 10/04/2015 | 59 | 27 | 10 | 37 |
| 11/04/2015 | 85 | 42 | 7 | 49 |
| 12/04/2015 | 76 | 36 | 3 | 39 |
| 13/04/2015 | 68 | 30 | 7 | 37 |
| 14/04/2015 | 46 | 27 | 1 | 28 |
| 15/04/2015 | 43 | 14 | 1 | 15 |
| 16/04/2015 | 57 | 19 | 7 | 26 |
| 17/04/2015 | 46 | 11 | 6 | 17 |
| 18/04/2015 | 64 | 36 | 12 | 48 |
| 19/04/2015 | 84 | 32 | 7 | 39 |
| 20/04/2015 | 55 | 21 | 11 | 32 |
| 21/04/2015 | 69 | 22 | 14 | 36 |
| 22/04/2015 | 42 | 17 | 7 | 24 |
| 23/04/2015 | 43 | 25 | 10 | 35 |
| 24/04/2015 | 47 | 14 | 13 | 27 |
| 25/04/2015 | 82 | 35 | 3 | 38 |
| 26/04/2015 | 94 | 34 | 4 | 38 |
| 27/04/2015 | 12 | 19 | 2 | 21 |
| 28/04/2015 | 64 | 13 | 2 | 15 |
| 29/04/2015 | 23 | 5 | 2 | 7 |
| 30/04/2015 | 28 | 10 | 10 | 20 |

Source: Company documents.

Exhibit 7b: Demand Data for Cauliflower, May 2015

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Cauliflower** | **Purchase** | **Retail Sales** | **Wholesale Sales** | **Total Sales** |
| **Date (Day/Month/Year)** | **Units** | **Units** | **Units** | **Units** |
| 01/05/2015 | 25 | 10 | 4 | 14 |
| 02/05/2015 | 54 | 20 | 2 | 22 |
| 03/05/2015 | 0 | 3 | 3 | 6 |
| 04/05/2015 | 60 | 14 | 0 | 14 |
| 05/05/2015 | 10 | 13 | 0 | 13 |
| 06/05/2015 | 29 | 12 | 1 | 13 |
| 07/05/2015 | 10 | 7 | 1 | 8 |
| 08/05/2015 | 3 | 0 | 0 | 0 |
| 09/05/2015 | 30 | 26 | 4 | 30 |
| 10/05/2015 | 43 | 19 | 1 | 20 |
| 11/05/2015 | 23 | 8 | 0 | 8 |
| 12/05/2015 | 55 | 18 | 1 | 19 |
| 13/05/2015 | 45 | 16 | 1 | 17 |
| 14/05/2015 | 49 | 14 | 0 | 14 |
| 15/05/2015 | 41 | 10 | 1 | 11 |
| 16/05/2015 | 51 | 8 | 0 | 8 |
| 17/05/2015 | 44 | 16 | 1 | 17 |
| 18/05/2015 | 41 | 14 | 0 | 14 |
| 19/05/2015 | 44 | 8 | 1 | 9 |
| 20/05/2015 | 0 | 12 | 1 | 13 |
| 21/05/2015 | 69 | 17 | 1 | 18 |
| 22/05/2015 | 0 | 5 | 1 | 6 |
| 23/05/2015 | 49 | 12 | 0 | 12 |
| 24/05/2015 | 40 | 17 | 1 | 18 |
| 25/05/2015 | 62 | 19 | 0 | 19 |
| 26/05/2015 | 83 | 62 | 1 | 63 |
| 27/05/2015 | 84 | 33 | 0 | 33 |
| 28/05/2015 | 64 | 20 | 1 | 21 |
| 29/05/2015 | 49 | 16 | 1 | 17 |
| 30/05/2015 | 29 | 13 | 3 | 16 |
| 31/05/2015 | 45 | 18 | 2 | 20 |

Source: Company documents.

Exhibit 8: Role of intermediaries in Fruits and Vegetables costing (IN ₹)

|  |  |  |
| --- | --- | --- |
| **Entity** | **Flow of Produce from Farm to Consumer** | **Fruit & Vegetable Cost** |
| Farmer | Farmer transports vegetables from farm to the main road. | ₹25 per 100 kilograms or  ₹0.25 per kilogram |
| Farmer | Vegetables are loaded into a mini truck [from the main road to the agricultural produce market committee (APMC) market]. | ₹25 per 20-kilogram bag or  ₹1.25 per kilogram |
| Farmer | Additional handling charges are applied at the APMC. | ₹5 per 20-kilogram bag or  ₹0.25 per kilogram |
| Farmer | Broker pays the farmer. | ₹10 per kilogram |
| Broker | Broker sells to the retailer. | ₹11 per kilogram |
| Retailer | Handling and transportation charges are borne by the retailer. | ₹1 per kilogram |
| Retailer | Retailer does the sorting and grading. | Since 20 per cent of the produce is not good for retail sale, retailers keep 20 per cent aside after sorting/grading; this adds ₹2.40 (20 per cent of ₹12) to the cost per kilogram. |
| Retailer | Retailer pays rent for the store. | ₹30,000 per month equals ₹1,000 per day; if the average sale is 1,000 kilograms of vegetables per day, then the additional cost per kilogram is ₹1. |
| Retailer | Retailer pays the salaries of store attendants. | ₹30,000 per month equals ₹1,000 per day; if average sale is 1,000 kilograms of vegetables per day, then the additional cost per kilogram is ₹1. |
| Retailer | Minimum quantity effect: every evening there is an excess of 20 per cent because customers believe the remaining stock is of inferior quality. | Retailer incurs an additional cost of 20 per cent. |

Source: Company documents.

1. “About Us: Pre-regulated Market Days—Malpractices in Wholesale Vegetable Trade,” The Agricultural Produce Market Committee—Ahmedabad, accessed August 22, 2018, /www.apmcahmedabad.com/about\_us.php. [↑](#footnote-ref-1)
2. ₹ = INR = Indian rupee; ₹1 = US$.0156 on June 15, 2015; all amounts are in ₹. [↑](#footnote-ref-2)