A Comparative Study of Consumer Preference: Local Dairy Milk at Shyam Dairy

A Mid-term report for the BDM capstone Project

Submitted by:

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1. Executive Summary

Shyam dairy is a small scale business serving local milk directly to the people. They also have a side business where in the same shop they also sell general store items as well to have an extra income. They are able to pull this off because the milk business is only active in the morning and evening.

It is located in Shahdara, East Delhi and has been in this business for more than 40 years. They also sell packaged milk in their store due to its high demand. However, their main business is focused on fresh milk only because from that, their maximum profit comes from.

The major problems that the business faces is due to their high prices which is Rs 77/litre compared to Rs 68/litre of packaged milk. They find it difficult to acquire new customers. And since it is a small shop and no advertising is done, only word of mouth is working here.

They also face a problem that whenever the price of their fresh milk increases they tend to lose customers as the cheap alternatives are very easily available in the market. These alternatives also have an advantage that they are available at any time of the day but the fresh milk is available only 2 times, which is morning and evening.

They maintain a register in which they daily note down how much fresh milk is sold to whom and how much quantity they bought. They also note down the amount of packaged milk sold in a day. And the fresh milk which is left and not used is then used in the making of other dairy products.
Now, to address the challenges ,

- I'll be conducting a price and demand analysis to understand the customer better and how the price change affects the customers. For this I'll compare the sale of fresh milk and packaged milk on different price points to determine the price elasticity of demand.
- I will then use data analysis to track the customer retention rate,new customer acquisition and sales trends.
- After this we can implement simple advertising strategies like giving discounts to the retaining customers to encourage them in bringing new customers.

2. Proof of originality of the Data

- Shop Name: Shyam Dairy
- Address:Main Kanti Nagar,Shahdara,Delhi-110051
- Owner:Mr Mahesh Chand Sharma

Shyam dairy is a local dairy milk shop which provides fresh milk to their customers two times a day. As a side business to have an extra income they also sell general store items as well. They do not have any workers, and the owner is only helped by his father Mr Radhey Shyam Sharma by handling the shop while he supplies the milk in the morning and evening.

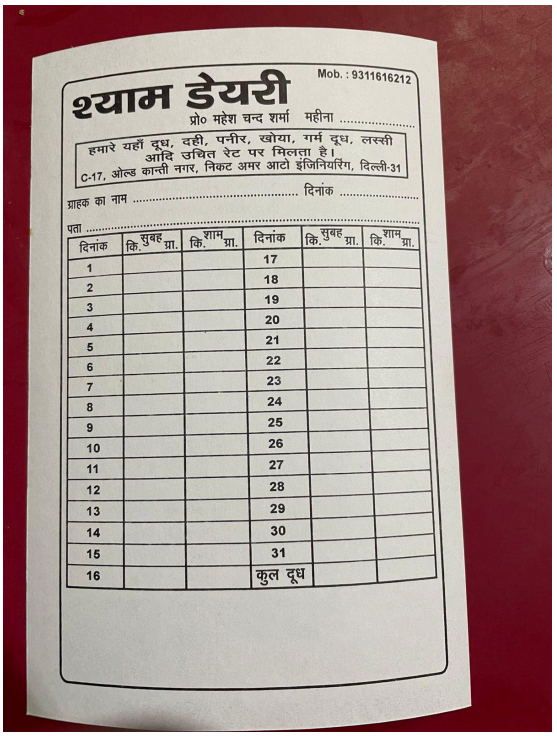
Data link: BDM Project Data

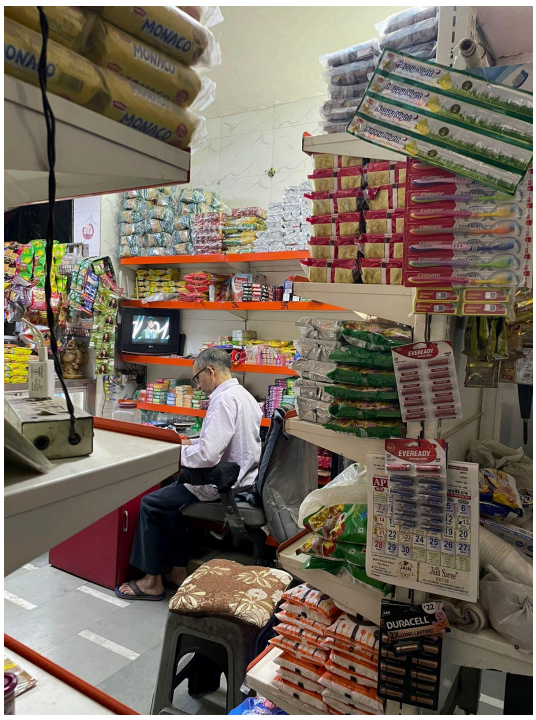
Authorisation letter: Authorization letter.pdf

Interaction video: InteractionVideo.mov

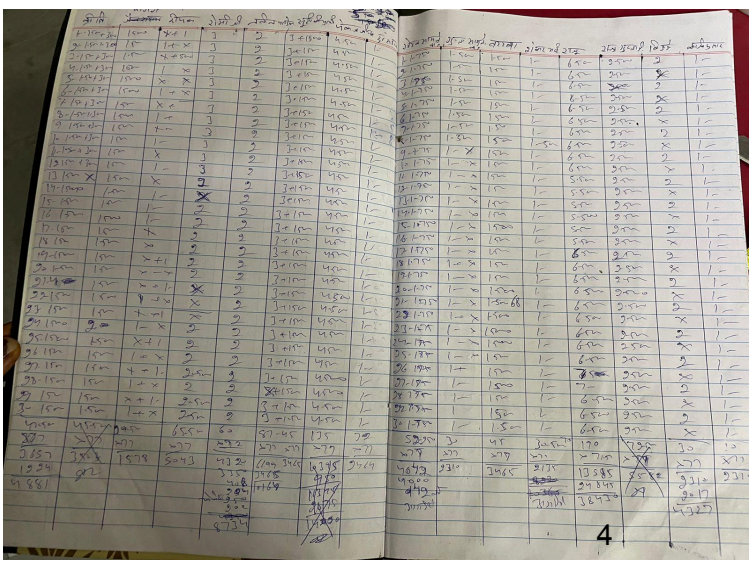
Images:

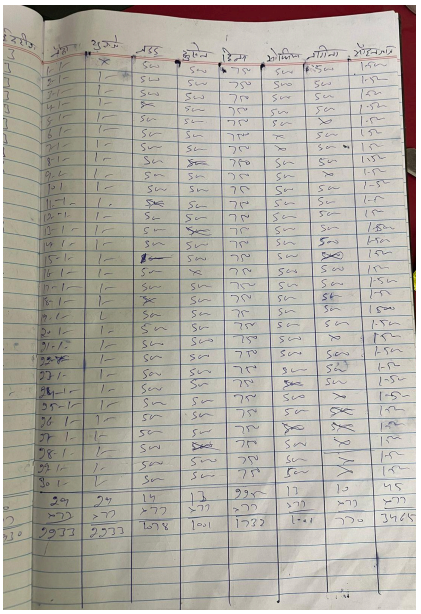
I have added some images for your reference and to provide proof of my claims.





These are some photos of how data is stored on a daily basis:

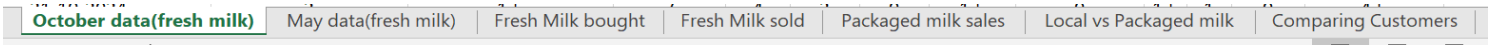




3. Metadata

In my workbook there are 7 sheets namely:

- October data (fresh milk)
- May data(fresh milk)
- Fresh Milk bought
- Fresh milk sold
- Packaged milk sales
- Local vs Packaged milk
- Comparing customers



1.October data (fresh milk)

Date	Kaagaz wali/Aggarwal	Allah miya/shehnawaz	Anil Sharma	Arun ji	Rakesh	Yogesh	Bramjeet	Gaurav Gupta	Kriti	Ravi	Deepak	Vikas Khantwal	Naveen Pandey	Romi	Pankaj
01-10-2024	2	0	5	4	2	0	1.5	1.5	1.5	0	1	4.5	2	2.5	4.5
02-10-2024	2	0	7	4	2	0	1.5	1.5	2.5	0	1	4.5	2	2.5	4.5
03-10-2024	2	1	7	4	2	1.5	1.5	1.5	1.5	1	1	4.5	2	2.5	4.5
04-10-2024	2	1.5	7.5	4	2	0	1.5	1.5	1.5	1	1	4.5	2	2.5	4.5

In this sheet, names of the customers are stored and the amount of milk they bought on a particular date.

2.May data(fresh milk)

Date	Kaagaz wali/Aggarwal	Allah miya/shehnawaz	Anil	Rakesh	Arun ji	Gaurav	Sohan Kumar	Kriti	Deepak	Romi	Naveen Pandey	Suri	suri	Pankaj	Sajauddin Doctor	Gaurav S
01-05-2024	2	1.5	7	2	4	1	1.5	2	2	2.5	2	2.5	1.5	4.5	1	1.7
02-05-2024	2	1.5	7	2	4	1	1.5	2	1	2.5	2	2.5	1.5	4.5	1	1.7

Similar to the October data here also customers names are stored along with the milk they bought on a particular date.

3. Fresh Milk bought

Date	Bought Morning	Bought evening	Total bought per day in October	Date	Bought morning	Bought Evening	Total Bought per day in May
01-10-2024	70	70	140	01-05-2024	75	80	155
02-10-2024	80	75	155	02-05-2024	75	85	160

This sheet stores the milk bought in morning and evening on a particular day for the month of may and october.

4. Fresh milk sold

Date	Total milk sold Per Day in May		Date	Total milk sold Per Day in October
01-05-2024	145.25		01-10-2024	143.5
02-05-2024	141.75		02-10-2024	151.5

This sheet stores how much milk was sold in the months of may and october.

5.Packaged milk sales

	Date	Total milk sold in may			Date	Total milk sold in october
2	01-05-2024	157			01-10-2024	138
3	02-05-2024	148			02-10-2024	143

This sheet stores the sales of packaged milk in the months of may and october.

6. Local vs Packaged milk

Date	Local -Milk sold	Packaged - Milk sold per day		Date	Local - Milk sold per day	Packaged - Milk sold per day
01-05-2024	145.25	157		01-10-2024	143.5	143
02-05-2024	141.75	148		02-10-2024	151.5	155

This sheet stores the data of both local and packaged milk for comparison.

7.Comparing customers

Names	Total purchase of the May month	Total purchase of the October month	Customer Status
Allah miya/shehnawaz	34.5	43	Retained
Anil BC	46.5	46.5	Retained

This sheet stores the names of the customers and their purchases in the months of may and october to calculate the customer status.

4. Descriptive Statistics

For doing descriptive analysis I used the formulas from the excel like mean,median,standard deviation etc. The statistics are done so as to understand the sales trend of both the local and packaged milk and learn more about the customer retention and impact of price change.

1.

	Total Milk Sold per Month (May and October)	
Column1	May	October
Mean	143.8790323	140.016129
Median	145	145.5
Standard Deviation	3.13639321	13.54220801
Minimum	135.5	108.5
Maximum	148.5	159

This table compares the overall sales of fresh milk in the months of may and october, showing the average sales of each month, the middle value of daily sales, variability in daily sales and shows the range of the daily sales.

Interpretation:From the table we can understand that October shows a slightly lower average and higher variability in sales, which might be due to price sensitivity or changing customer preferences.

2.

		Daily Milk Sales Analysis: Local vs. Packaged (May & October)	
Metric	Local Milk - Ma	Packaged Milk - May	Local Milk - Octobe
Average Daily Sales	145.25	157	143.5
Median Daily Sales	145	149	145.5
Standard Deviation	3.13639321	6.1323661	13.54220801
Total Monthly Sales	4460.25	4636	4340.5
Max Daily Sales	148.5	160	159
Min Daily Sales	135.5	139.5	108.5

This table breaks down the daily sales for both local and packaged milk in the month of may and october, showing the average and median daily sales, higher variability for packaged milk in May and local milk in October, total monthly sales, and peak and low demand days for each milk.

Interpretation: Packaged milk has slightly higher average daily sales compared to local milk, and local milk sales in October are more variable, potentially indicating customer response to pricing.

3.

	Customer Retention and Churn Analysis
Metric	Value
Total Customers	76
Retained Count	22
New Count	9
Lost Count	14
Retention Rate(in %)	69.73684211
Churn Rate(in %)	18.42105263

This table is used to show the customer loyalty and acquisition,showing the total customers, count of retained, lost and new customers, retention rate and churn rate.

Interpretation: The retention rate is relatively high, suggesting a loyal customer base, but the churn rate also indicates that some customers may be switching to alternatives, likely due to price or availability.

5. Detailed Explanation of Analysis Methods

For the analysis I have done both descriptive analysis as well as data visualisations to determine the trends in the sales and learn about the customer behaviour. I used this approach because it is easy to understand and gives a clear understanding of the data.The analysis I did helped me clearly. The step by step procedure is as follows:

1. Data collection

- I worked on collecting data for 2 months namely May and October. I chose these two because they would have varying data that would help me analyse. Also, I worked on not only collecting the data for their fresh milk but also for the packaged milk so as to have data for proper comparison.
- I used their data which they stored in their registers and mapped it to excel so I can easily work on analysing the data using the help of rows and columns.

2. Data Cleaning and Removing Redundancies

- The second step after mapping the data in excel was cleaning the available data. I worked on manually checking the customers name and removing any duplicates from the data. This step ensured that I have a clean dataset which further helped me to work on it much more efficiently.

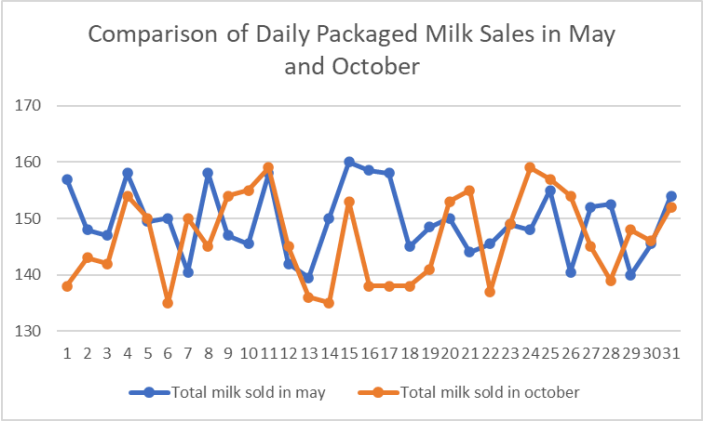
3. Descriptive Analysis
    - Once I had the cleaned data, I now worked on calculating the key statistics that would help me give the major overview of the data and help me understand it. The statistics I calculated were mean, median, standard deviation, max, min and more.
    - I chose these statistics as although they are very simple they help to summarise the data well and give a better and clear understanding.
4. Customer Retain Rate and Churn Analysis
    - I even focussed on calculating the customers retention rate and churn analysis, meaning, how many of the customers were loyal to the business. This analysis over the 2 months helped me understand the customer base of the business.
    - I was even able to figure out the number of customers the business lost and also the number of customers the business gained over the period of the months which helped me analyse the ability of the business to attract new customers and retain them.
5. Data Visualisation and comparisons
    - Using the data I created many graphs to understand the pattern and trends. I worked on creating many bar graphs, line charts and even many comparison tables .
    - The main purpose of visualising the data was that , Visualisation helps in simplifying complex data and makes it easier to spot differences in data and compare them effectively.
    - This helped me get a clear and immediate comparison between the fresh milk sales and the packaged milk sales ensuring quick and easy decisions and solutions.

To sum everything up, the main reason I chose these methods for my analysing approach was that it was a simple yet fundamentally efficient way to calculate data trends. Working on excel helped me create visualisations with ease and helped me understand comparisons, retention rate and churn analysis.

6. Results and Findings

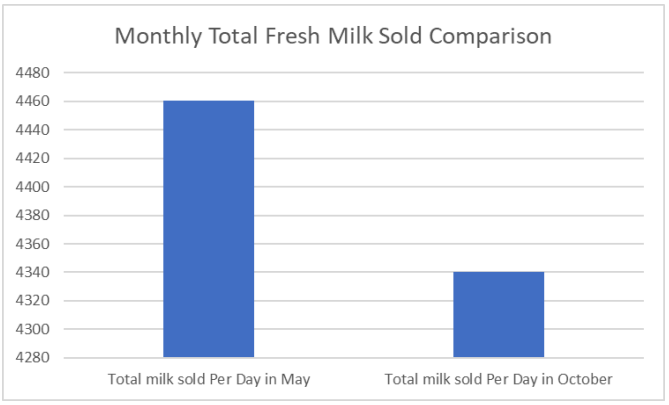
This section provides the overall and final analysis of Shyam Dairy's sales data for may and october, using graphs and visualisations to understand the trends in packaged milk vs fresh milk sales.

1. **Comparison of Daily Packaged Milk Sales in May and October**



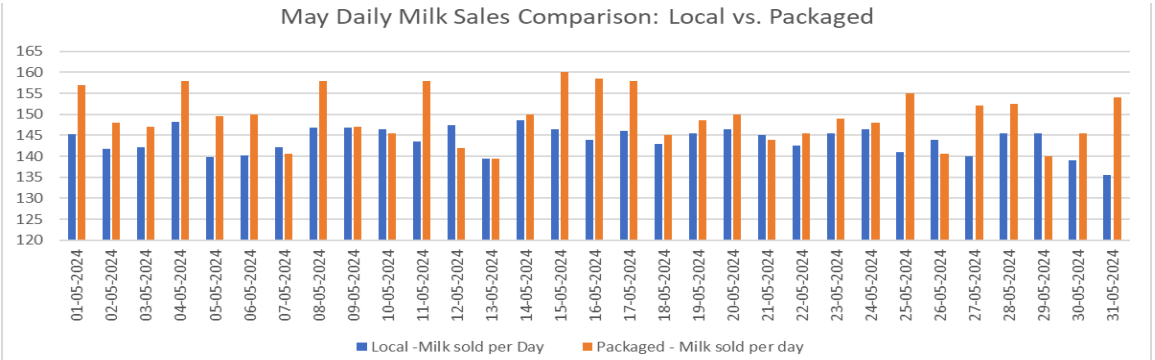
This graph shows the difference between the sales of packaged milk in the month of May in October. Packaged milk sales were generally higher and more consistent in May compared to october. This trend shows that while packaged milk is always in demand, changes in price or seasonal preferences might cause ups and downs.

2. **Monthly Total Fresh Milk Sales Comparison**



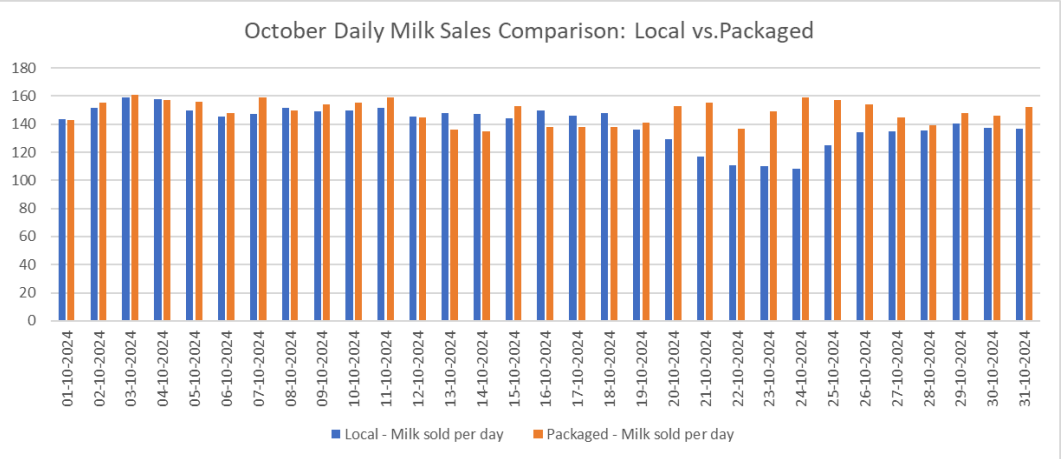
This graph shows the difference between the sales of Fresh milk in the month of May and October. May showed better sales than October, possibly showing better demand and more customer retention. The drop in October may be due to higher prices or more people choosing packaged milk instead.

3. **May Daily Milk Sales Comparison: Local vs. Packaged**



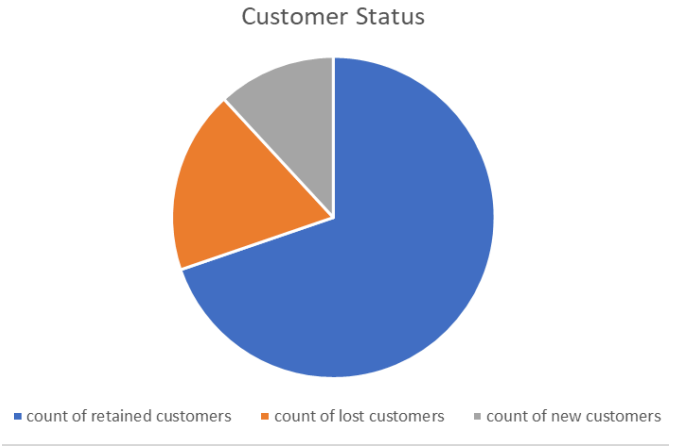
This graph compares the daily sales of both Fresh milk and packaged milk for the month of May. The packaged milk outperformed local milk and had a much stable sale.

4. **October Daily Milk Sales Comparison: Local vs. Packaged**



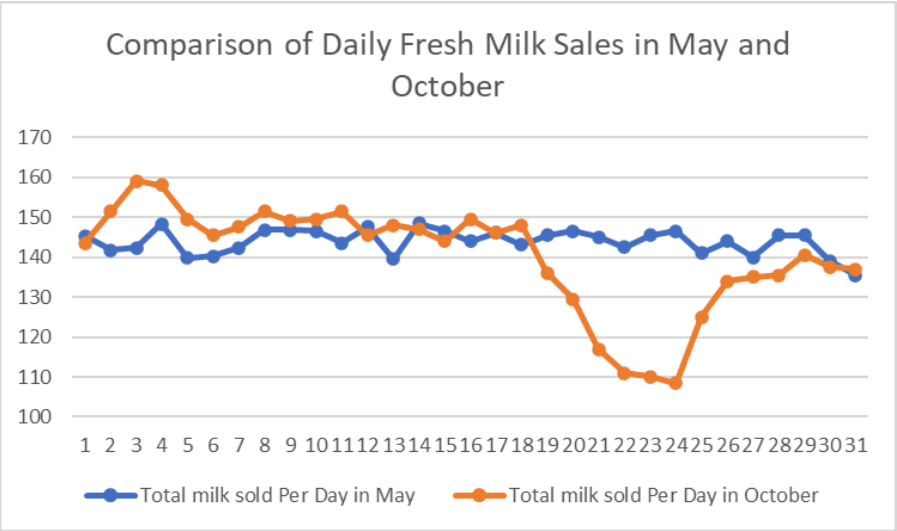
This graph compares the daily sales of both Fresh milk and packaged milk for the month of October. The packaged milk demand remained high while fresh milk sales fluctuated more which portrayed customer's sensitivity to price.

5. **Customer Retention and Churn Analysis**



The pie chart gives an understanding of the customers which were retained and also the customers which were either new or lost. There is a notable churn rate as the number of customers lost is higher than the customers gained, as some customers are choosing alternatives, possibly due to price factor.

6. **Comparison of Daily Fresh Milk Sales in May and October**



This line graph compares the sales of fresh milk in May and October, where there was a major decline in October sales. This pattern suggests customers migration to the packaged alternatives.

To sum it up, these visualisations help to understand that the packaged milk consistently has better sales than the fresh milk, which suggests a clear preference of customer for packaged milk due to price factors. There is also a notable Churn rate that is portrayed in the number of customers lost rather than gained.

They give Shyam Dairy useful insights and better understanding to refine their sales approach, retain customers, and gather a much larger customer base to ensure their fresh milk sales increase.