

Navigating Price Volatility: Optimizing Edible Oil Inventory Management for Rahil Enterprise

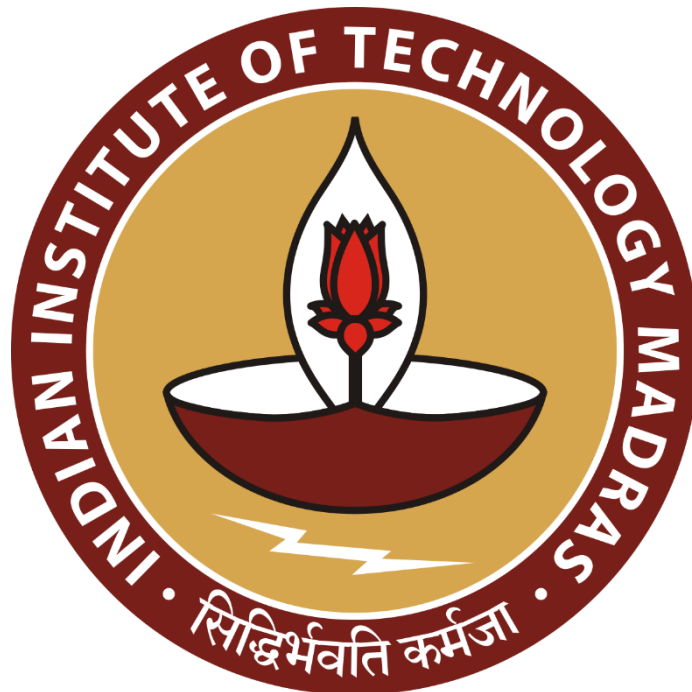
A Final report for the BDM capstone Project

Submitted by

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Declaration Statement

I am currently working on a project titled "*Navigating Price Volatility: Optimizing Edible Oil Inventory Management for Rahil Enterprise*." I extend my sincere appreciation to Rahil Enterprise for providing the necessary resources that enabled me to conduct this project.

I hereby assert that the data presented and assessed in this project report is genuine and precise to the utmost extent of my knowledge and capabilities. The data has been gathered from primary sources and carefully analyzed to ensure its reliability.

Additionally, I affirm that all procedures employed for the purpose of data collection and analysis have been thoroughly explained in this report. The outcomes and inferences derived from the data accurately depict the findings acquired through comprehensive analytical procedures.

I am committed to adhering to the principles of academic honesty and integrity, and I am open to any additional examination or validation of the data contained in this project report.

I understand that the execution of this project is intended for individual completion and is not to be undertaken collectively. Therefore, I affirm that I have not engaged in any form of collaboration with other individuals, and all work undertaken has been solely conducted by me. In the event that plagiarism is detected in the report at any stage of the project's completion, I am fully aware and prepared to accept disciplinary measures imposed by the relevant authority.

I understand that all recommendations made in this project report are within the context of the academic project undertaken for course fulfillment in the BS Degree Program offered by IIT Madras. The institution does not endorse any of the claims or comments.



Signature of Candidate

Name: Azarudin Bihari

Date: 15/05/2024

1. Executive Summary

This report analyzes the performance of six key edible oil products distributed by Rahil Enterprise, owned by Samir Bihari. The analysis addresses concerns regarding inventory management and pricing strategies amidst fluctuating market conditions. Due to limited access to structured and reliable production data for the past two fiscal years, the analysis focuses on Rahil Enterprise's internal financial data and India's import data for relevant crude oils. The primary suppliers for Rahil Enterprise are Gokul Agro Resources LTD. and Adani Wilmar LTD.

The report provides insights into sales patterns, pricing trends, and inventory dynamics for each of the following products:

1. Fortune Refined Soyabean Oil
2. Fortune Refined Cottonseed Oil
3. Fortune Refined Sunflower Oil
4. Puffpride Vanaspati
5. RAAG Gold Refined Palmolein Oil
6. Vitalife Refined Soyabean Oil

Key Findings:

- **Significant Price Fluctuations:** All six products exhibit varying levels of price volatility, directly impacting sales quantities and overall revenue. Rahil Enterprise's reliance on imported soybean and sunflower oils from suppliers like Gokul Agro Resources Ltd. and Adani Wilmar Ltd. makes it susceptible to global market shifts.
- **Seasonal Demand Patterns:** Distinct seasonality in demand exists for each product, likely influenced by festivals and culinary practices. Understanding these patterns is crucial for optimizing inventory levels and maximizing sales.
- **Inefficient Reordering Practices:** Inconsistencies in reordering contribute to frequent stockouts and potential overstocking. This inefficiency translates to lost sales and increased storage costs.

Recommendations:

- **Proactive Market Monitoring:** Continuously monitor global market trends, supplier activities, and geopolitical events to anticipate price fluctuations and adjust purchasing strategies.
- **Data-Driven Inventory Management:** Implement a data-driven approach using calculated reorder points and safety stock levels. Exploring inventory management software can enhance efficiency and accuracy.
- **Dynamic Pricing Strategies:** Adapt pricing strategies to seasonal demand, global market conditions, and individual product performance.
- **Supply Chain Diversification:** Explore alternative sourcing options to mitigate risks associated with specific suppliers and ensure a more stable and predictable supply.

By implementing these recommendations, Rahil Enterprise can effectively navigate price volatility, optimize inventory practices, and meet customer demand. These actions will position the business for sustained growth and profitability in the competitive edible oil market.

2. Detailed Explanation of Analysis Process/Method

To gain a comprehensive understanding of Rahil Enterprise's edible oil product performance, inventory dynamics, and pricing strategies, we utilized a multi-faceted approach. This involved integrating internal financial data with external market insights, specifically focusing on India's import data for relevant crude oils.

The analysis process progressed through several distinct stages:

1. Data Collection and Preparation

Internal Data: Transactional data, including sales, purchases, and inventory records for the six key edible oil products, were sourced from Rahil Enterprise's internal systems.

External Data: Import data for relevant crude oils, used to assess external market dynamics and price influences, was collected from the Ministry of Commerce, Government of India website (tradestat.commerce.gov.in).

2. Descriptive Analysis

The collected data was aggregated and summarized to calculate key metrics, including:

- Total quantities bought and sold
- Total transaction values
- Average buy and sell values per unit for each product across different time periods

3. Trend Analysis

Time series analysis was conducted to identify:

- Seasonal variations and patterns in sales, pricing, and inventory levels
- Peak demand periods
- Correlations between internal data and external factors like global market fluctuations or festive seasons

4. Inventory Metrics Calculation

Essential inventory metrics, detailed in the mid-term report, were calculated for each product. These metrics included:

- Average Daily Sales
- Demand Variability (Standard Deviation of Daily Sales)
- Safety Stock Level (Based on desired service level and lead time)
- Reorder Point (Based on lead time and safety stock)

These calculations provided insights into the efficiency of current inventory management practices and identified potential areas for optimization.

5. External Factors Consideration

The analysis incorporated external factors impacting edible oil prices, such as:

- Global market conditions (supply and demand, geopolitical events)
- Government policies (import duties, trade agreements)
- Industry trends (consumer preferences, alternative oils)

These factors were considered to contextualize internal data and provide a more holistic understanding of pricing dynamics and market influences.

6. Integration and Interpretation

Internal financial data and external market insights were integrated to interpret the findings and develop actionable recommendations for Rahil Enterprise. This integrated analysis allowed for the identification of:

- Key trends
- Potential inefficiencies
- Opportunities for improvement in inventory management and pricing strategies

7. Tools Used

Microsoft Excel was used for data organization, calculations, charting, and table creation.

The analysis process was iterative, with findings from each stage informing subsequent steps. This ensured a comprehensive and insightful evaluation of Rahil Enterprise's edible oil products and facilitated the development of data-driven recommendations for business optimization.

3. Results and Findings

This section analyzes Rahil Enterprise's six key edible oil products, integrating insights from the company's internal financial data with external market data, particularly focusing on India's edible oil import trends. India plays a crucial role in the global edible oil market, standing as one of the largest consumers. However, domestic production falls short of meeting this vast demand, necessitating a significant reliance on imports.

Factors Affecting Edible Oil Pricing and Availability

Numerous factors, both internal and external, contribute to the volatility in edible oil prices and availability within India. These factors impact both domestic production and imports, creating a complex interplay that influences Rahil Enterprise's operations.

Factors Affecting Production:

- **Monsoon:** The success of the monsoon season holds significant sway over oilseed crop yields. Insufficient rainfall can lead to lower production of soybeans, groundnuts, and sunflower seeds, driving up prices and increasing reliance on imports.
- **Government Policies:** Minimum Support Prices (MSP) for oilseeds impact farmer income and production incentives. High fertilizer prices can increase cultivation costs, potentially discouraging farmers and affecting output.
- **Pest Infestations and Diseases:** Outbreaks of pests and diseases can significantly impact crop yields, leading to supply shortages and price fluctuations.

Factors Affecting Imports:

- **Global Market Conditions (Supply and Demand):** International supply and demand dynamics for key edible oils, particularly soybean and sunflower oil, play a major role in determining import prices. Events like droughts, floods, or geopolitical instability in major producing countries can disrupt supply chains and inflate costs.

- **Wars and Geopolitical Events:** Major geopolitical events, such as wars and trade disputes, can significantly disrupt global trade flows, affecting edible oil availability and price.
- **Import and Export Duties:** Government policies on import duties and taxes directly influence the cost of imported oils. Changes in these duties can significantly impact the profitability of importing certain oils.
- **Currency Exchange Rates:** Fluctuations in currency exchange rates, particularly the INR/USD rate, affect import costs. A weaker rupee increases the price of imported oils.
- **Production and Weather in Exporting Countries:** Weather conditions and production levels in major exporting countries like Argentina, Brazil, and Ukraine have a direct impact on global supply and prices, influencing the Indian market.

Inventory Analysis Metrics

To gain a deeper understanding of Rahil Enterprise's inventory management, key metrics were calculated for each product during the midterm phase of this project. These metrics provide initial insights into the dynamics of each product and help inform recommendations for improvement. The following table summarizes these key inventory metrics:

Inventory Analysis Metrics by Product			Desired Service Level (%)		95	Average Lead Time (Days)		5
Item Name	Average Daily Sales (FY 2022-23)	Average Daily Sales (FY 2023-24)	Average Daily Sales (Overall)	Demand Standard Deviation (FY 2022-23)	Demand Standard Deviation (FY 2023-24)	Demand Standard Deviation (Overall)	Safety Stock	Reorder Point
VITALIFE REFINED SOYABEAN OIL 15KG TIN	18 TIN	17 TIN	17 TIN	23.71491276	23.16257052	23.43874164	86 TIN	173 TIN
RAAG GOLD REFINED PALMOLEIN OIL 15KG TIN	34 TIN	31 TIN	33 TIN	42.70338653	26.046256	34.37482126	127 TIN	289 TIN
PUFFPRIDE VANASPATI GHEE 15KG BOX	62 TIN	93 TIN	77 TIN	71.37184227	154.538812	112.9553271	417 TIN	803 TIN
FORTUNE REFINED SOYABEAN OIL 15KG TIN	109 TIN	108 TIN	109 TIN	120.8426417	107.8023366	114.3224892	422 TIN	965 TIN
FORTUNE REFINED COTTONSEED OIL 15KG TIN	20 TIN	25 TIN	23 TIN	21.75102753	25.66074461	23.70588607	87 TIN	201 TIN
FORTUNE REFINED SUNFLOWER OIL 15LTR TIN	22 TIN	24 TIN	23 TIN	23.61946903	23.62853965	23.62400434	87 TIN	202 TIN

Table 1: Inventory Analysis Metrics by Product with Desired Service Level of 95% and Average Lead Time of 5 Days.

The detailed analysis for each product, considering both internal and external factors and utilizing these inventory metrics, will be presented in the following sections, providing a comprehensive picture of Rahil Enterprise's edible oil product portfolio and informing actionable recommendations for business optimization.

1. FORTUNE REFINED SOYABEAN OIL

India is a major consumer of soybean oil, but its domestic production falls short of meeting demand. The country relies heavily on imports to bridge this gap. Soybean production is concentrated in states like Madhya Pradesh, Maharashtra, and Rajasthan.

A significant portion of India's soybean oil consumption, estimated to be around 60-70%, is met through imports, primarily from countries like Argentina and Brazil, as evidenced by Figures 7 and 8, which showcase import quantities for FY 2022-23 and 2023-24 respectively.

Here are the key results and findings regarding FORTUNE REFINED SOYABEAN OIL, based on the analysis:

Sales and Revenue:

- **Consistent Sales:** Rahil Enterprise sold approximately 27,922 tins in FY 2022-23 and 29,789 tins in FY 2023-24, showcasing consistent demand.
- **Fluctuating Revenue:** Despite consistent sales, total revenue fluctuated between the two fiscal years. FY 2022-23 saw a total sell value of INR 59,476,948.17, while FY 2023-24 had a total of INR 48,706,788.98. This indicates a potential impact of price volatility on overall revenue.

Price Volatility and its Impact:

- **High Price Fluctuations:** Figures 1 and 2 depict significant fluctuations in both buying and selling prices across both fiscal years. For instance, the average buy price in April 2022 was INR 2405.41, while in May 2022 it dropped to INR 2526.88. This volatility is further reflected in the average sell prices, directly impacting the profitability of this product.
- **Imported Crude Oil Prices:** Figures 5 and 6 highlight the fluctuating import prices of crude soybean oil in India. The import value per metric ton fluctuates significantly across both fiscal years, reaching a high of INR 1,44,872.08 in June 2022 and dropping to INR 84,080.13 in June 2023. This directly impacts the cost of raw materials for Rahil Enterprise's suppliers, influencing their selling prices.
- **Major Suppliers:** Gokul Agro Resources LTD. and Adani Wilmar LTD., Rahil Enterprise's primary suppliers, are directly affected by these fluctuating import prices, influencing their selling prices to Rahil Enterprise.

Seasonality:

- **Demand Peaks:** Figures 1 and 2 indicate potential peak demand periods for soybean oil. October, November, and December show higher sales quantities compared to other months in both fiscal years, suggesting a potential link to festivals and holiday seasons in India.



Figure 1: This chart illustrates the monthly buy and sell quantities, total values, and average prices of Fortune Refined Soybean Oil 15KG TIN during the fiscal year 2022-23.

Figure 2: This chart illustrates the monthly buy and sell quantities, total values, and average prices of Fortune Refined Soybean Oil 15KG TIN during the fiscal year 2023-24.

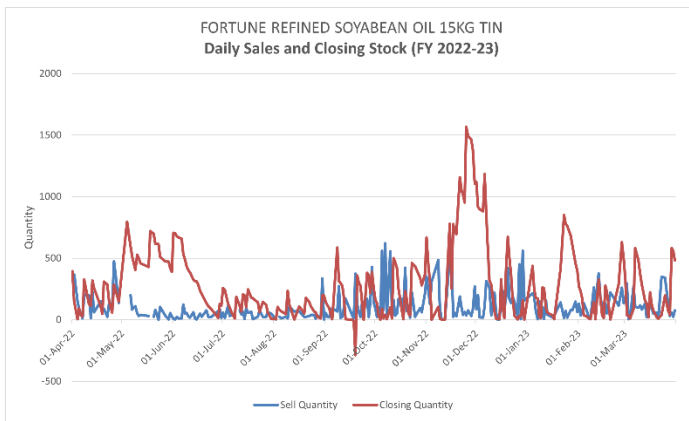


Figure 3: This chart illustrates the daily sales and closing stock levels of Fortune Refined Soybean Oil 15KG TIN during FY 2022-23.

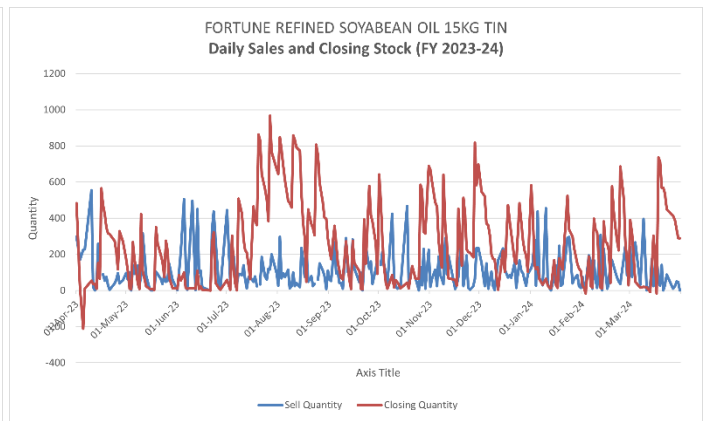


Figure 4: This chart illustrates the daily sales and closing stock levels of Fortune Refined Soybean Oil 15KG TIN during FY 2023-24.

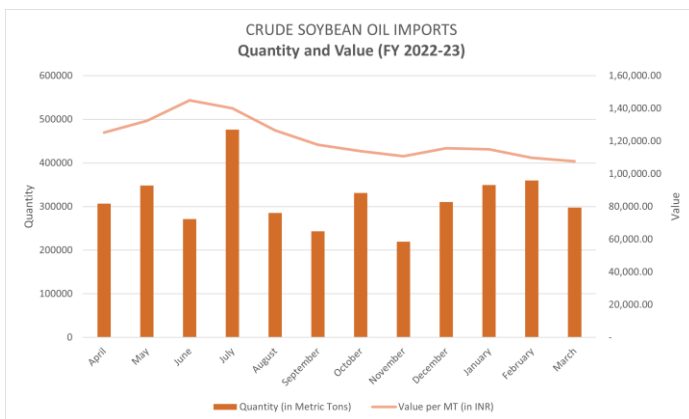


Figure 5: This chart illustrates the monthly quantity and value per metric ton of crude soyabean oil imported into India during the fiscal year 2022-23.

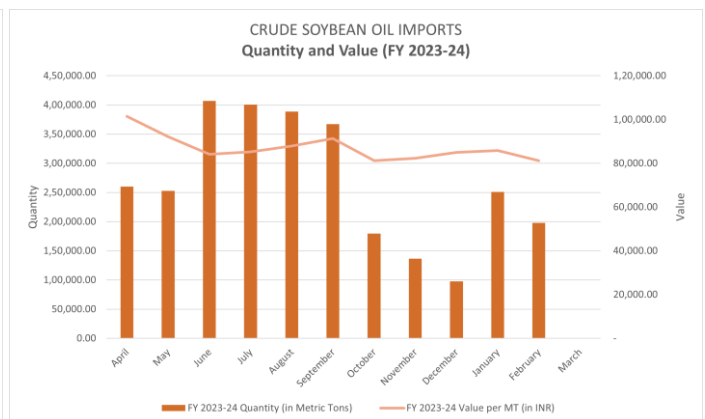


Figure 6: This chart illustrates the monthly quantity and value per metric ton of crude soyabean oil imported into India during the fiscal year 2023-24.

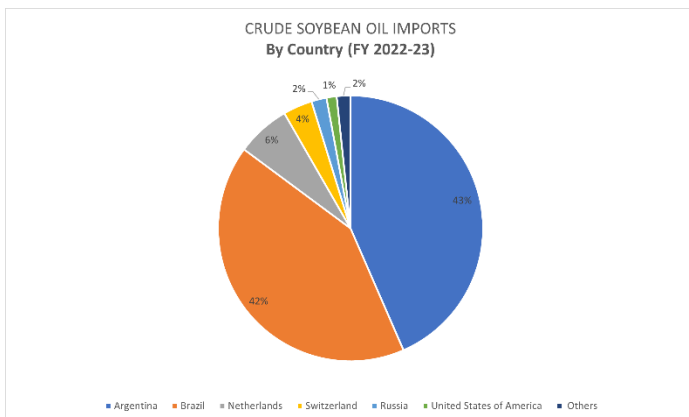


Figure 7: This chart illustrates the percentage of crude soybean oil imported by India in the fiscal year 2022-23, segmented by the source country.

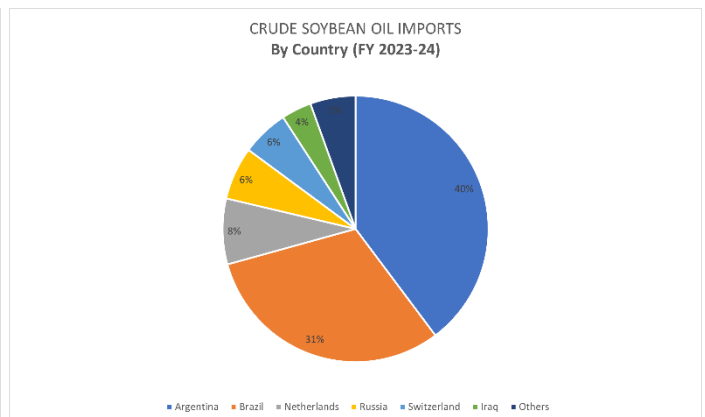


Figure 8: This chart illustrates the percentage of crude soybean oil imported by India in the fiscal year 2023-24, segmented by the source country.

Inventory Management:

- **Inefficient Reordering:** Figures 3 and 4 reveal inconsistent closing stock levels, suggesting inefficient reordering practices. Frequent stockouts, reflected by negative closing quantities, indicate potential lost sales opportunities. On the other hand, high closing quantities in certain periods imply potential overstocking and increased storage costs.

- **Reorder Point and Safety Stock:** Based on calculated inventory metrics, a reorder point of 965 tins and a safety stock of 422 tins are recommended to ensure a 95% service level with a 5-day lead time. This data-driven approach can help mitigate stockouts and overstocking.

External Factors and their Influence:

- **Global Supply and Demand:** As seen in Figures 7 and 8, Argentina and Brazil are major crude soybean oil exporters to India. Any production disruptions or changes in export policies in these countries will directly impact import prices and availability in India, affecting Rahil Enterprise's costs and operations.
- **Geopolitical Events:** Wars and geopolitical instability can disrupt global trade, impacting edible oil supply chains. The ongoing war in Ukraine, a significant sunflower oil producer, has likely impacted global edible oil markets and potentially influenced soybean oil prices due to shifting demand.

These results highlight the significant impact of price volatility on Rahil Enterprise's profitability, driven by both internal and external factors. The inefficient inventory management practices further exacerbate the challenges posed by this volatility. Addressing these issues is crucial for optimizing operations and achieving sustainable growth in the edible oil market.

2. FORTUNE REFINED SUNFLOWER OIL

India's sunflower oil consumption has been steadily increasing due to its health benefits and affordability. While domestic production exists, concentrated in Karnataka, Andhra Pradesh, and Maharashtra, it's insufficient to meet the rising demand. Consequently, India imports a significant portion, estimated at around 70-80%, of its crude sunflower oil, primarily from Ukraine and Russia, as evident in Figures 15 and 16. This heavy reliance on imports makes the sunflower oil market susceptible to global supply chain disruptions and price volatility.

Here are the key results and findings regarding FORTUNE REFINED SUNFLOWER OIL, based on analysis:

Sales and Revenue:

- **Increasing Sales:** Rahil Enterprise sold approximately 2,853 tins in FY 2022-23 and 5,338 tins in FY 2023-24, demonstrating a substantial increase in sales. This trend aligns with the overall rising demand for sunflower oil in India.
- **Revenue Growth:** Total sell value also increased significantly from INR 6,041,131.34 in FY 2022-23 to INR 8,149,465.9 in FY 2023-24, likely driven by both increased sales and fluctuating prices.

Price Volatility and its Impact:

- **Significant Price Fluctuations:** Figures 9 and 10 showcase fluctuating buying and selling prices across both fiscal years. For instance, the average buy price in April 2022 was INR 2,082.32, which jumped to INR 2,670.00 in June 2022. Similarly, the average sell prices fluctuate, impacting the profitability of this product.

- **Impact of the Ukraine War:** The war in Ukraine, a major sunflower oil exporter to India, likely contributed to price volatility in FY 2022-23, as seen in the high import value per metric ton in June 2022 (INR 1,65,162.54) shown in Figure 13.
- **Shifting Import Sources:** Figure 16 shows that Russia became the primary sunflower oil exporter to India in FY 2023-24, likely influencing the price dynamics observed in Figure 14.

Seasonality:

- **Demand Peaks and Dips:** While the data shows sales throughout the year, potential peak demand is observed in January, February, and October in FY 2022-23 (Figure 9), and in March, April, June, and July in FY 2023-24 (Figure 10). This suggests a complex seasonality potentially influenced by multiple factors, including festivals and agricultural cycles.



Figure 9: This chart illustrates the monthly buy and sell quantities, total values, and average prices of FORTUNE REFINED SUNFLOWER OIL 15LTR TIN during the fiscal year 2022-23.

Figure 10: This chart illustrates the monthly buy and sell quantities, total values, and average prices of FORTUNE REFINED SUNFLOWER OIL 15LTR TIN during the fiscal year 2023-24.

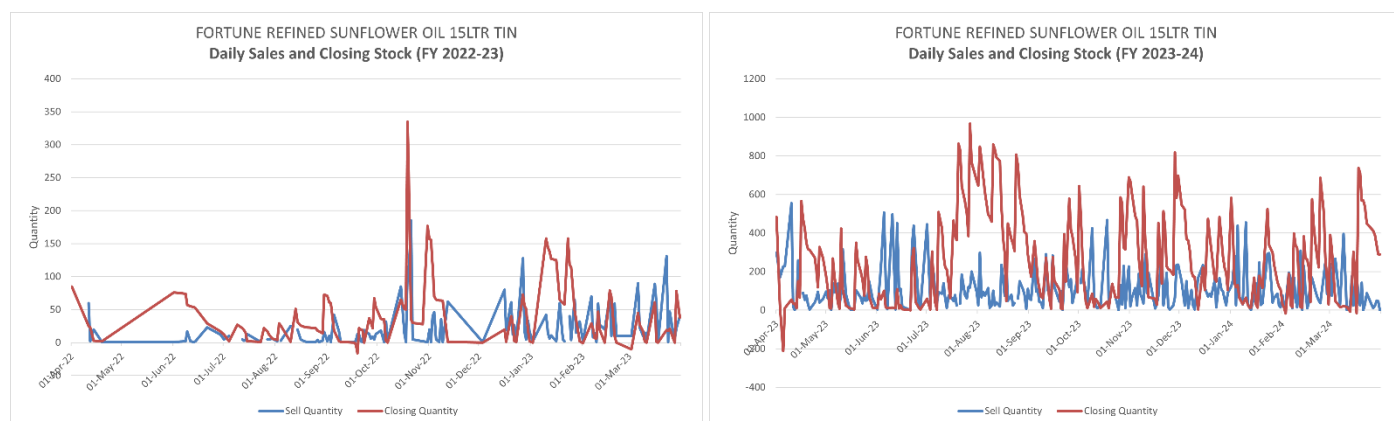


Figure 11: This chart illustrates the daily sales and closing stock levels of FORTUNE REFINED SUNFLOWER OIL 15LTR TIN during FY 2022-23.

Figure 12: This chart illustrates the daily sales and closing stock levels of FORTUNE REFINED SUNFLOWER OIL 15LTR TIN during FY 2023-24.

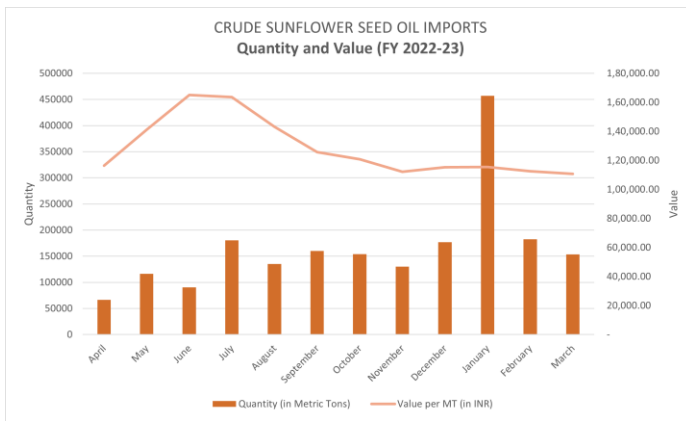


Figure 13: This chart illustrates the monthly quantity and value per metric ton of crude sunflower seed imported into India during the fiscal year 2022-23.

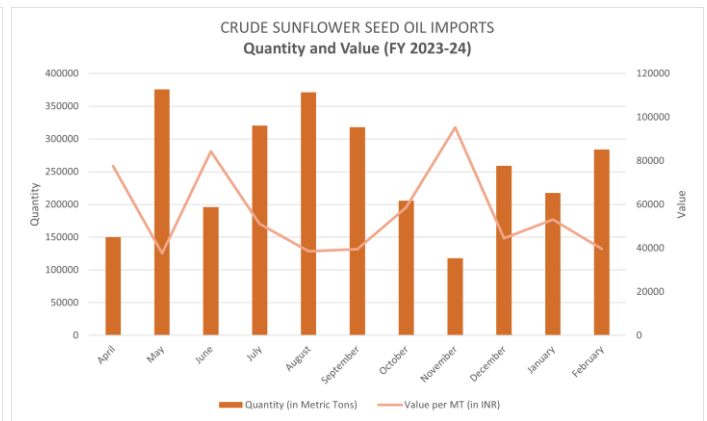


Figure 14: This chart illustrates the monthly quantity and value per metric ton of crude sunflower seed imported into India during the fiscal year 2023-24.

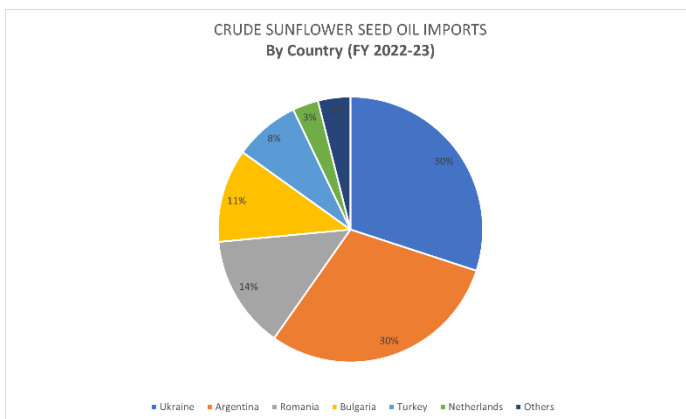


Figure 15: This chart illustrates the percentage of crude sunflower seed oil imported by India in the fiscal year 2022-23, segmented by the source country.

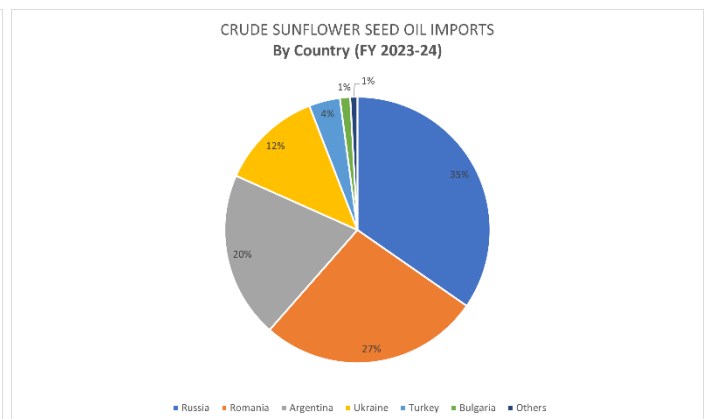


Figure 16: This chart illustrates the percentage of crude sunflower seed oil imported by India in the fiscal year 2023-24, segmented by the source country.

Inventory Management:

- **Frequent Stockouts:** Figures 11 and 12 reveal frequent stockouts, indicated by negative closing stock quantities throughout both fiscal years. This suggests inefficient reordering practices, leading to lost sales opportunities.
- **Low Average Daily Sales:** The calculated average daily sales are relatively low (22 tins in FY 2022-23 and 24 tins in FY 2023-24), suggesting a potentially high holding cost for this product if overstocked.
- **Data-Driven Reordering:** The calculated reorder point of 202 tins and safety stock of 87 tins for a 95% service level and 5-day lead time can help Rahil Enterprise improve inventory management and mitigate stockouts.

External Factors and their Influence:

- **Global Supply Chain Disruptions:** The ongoing war in Ukraine significantly impacted the global sunflower oil market, affecting prices and availability. India's reliance on imports for sunflower oil makes it highly vulnerable to such disruptions.
- **Shifting Trade Dynamics:** The emergence of Russia as a primary supplier in FY 2023-24 signifies shifting trade dynamics in response to geopolitical events, creating new challenges and opportunities for Rahil Enterprise.

The analysis reveals a growing market for sunflower oil in India, offering significant growth potential for Rahil Enterprise. However, navigating the price volatility and implementing efficient inventory management practices, especially in light of geopolitical events and global supply chain disruptions, are crucial for maximizing profitability and ensuring a consistent supply to meet the rising demand.

3. RAAG GOLD REFINED PALMOLEIN OIL

India is the world's largest consumer of palm oil, heavily reliant on imports to meet its vast demand. Domestic production of palm oil is limited, concentrated primarily in states like Andhra Pradesh, Telangana, Karnataka, and Kerala, contributing only a small fraction of the total consumption. Estimates suggest that roughly 85-90% of India's palm oil needs are met through imports, predominantly from Indonesia and Malaysia, as seen in Figures 23 and 24. This significant reliance on imports makes the domestic market highly susceptible to fluctuations in global palm oil prices and supply chain disruptions.

Here are the key results and findings regarding RAAG GOLD REFINED PALMOLEIN OIL 15KG TIN, based on the analysis:

Sales and Revenue:

- **Fluctuating Sales:** Rahil Enterprise sold 1,896 tins in FY 2022-23 and 4,953 tins in FY 2023-24. The significant increase in sales in FY 2023-24 might be attributed to factors like increased demand, competitive pricing, or improved availability.
- **Revenue Growth:** Total sell value also increased considerably, from INR 3,195,114.88 in FY 2022-23 to INR 7,319,756.77 in FY 2023-24. This growth aligns with the overall increase in sales.

Price Volatility and its Impact:

- **Moderate Price Fluctuations:** Figures 17 and 18 show some fluctuations in both buying and selling prices across both fiscal years. For example, the average buy price in April 2022 was INR 2,310.00, while in October 2022 it was INR 1,545.57.
- **Imported Crude Palm Oil Prices:** Figures 21 and 22 depict fluctuating import prices for crude palm oil in India. While these prices directly influence supplier costs, the impact on RAAG GOLD REFINED PALMOLEIN OIL's prices seems less pronounced compared to soybean or sunflower oil.

Seasonality:

Limited Data on Seasonality: Data for RAAG GOLD is limited, particularly in FY 2022-23. While February and March show relatively higher sales in both years, more data is needed to establish conclusive seasonal patterns.

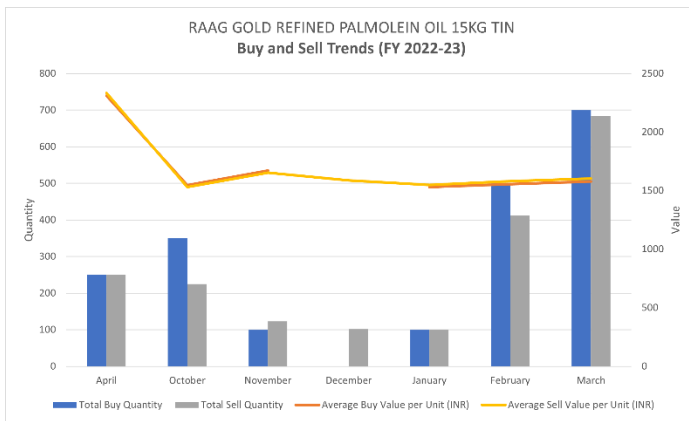


Figure 17: This chart illustrates the monthly buy and sell quantities, total values, and average prices of RAAG GOLD REFINED PALMOLEIN OIL 15KG TIN during the fiscal year 2022-23.

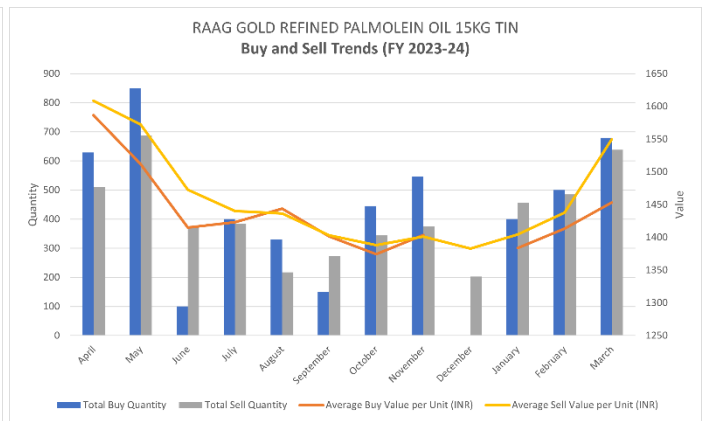


Figure 18: This chart illustrates the monthly buy and sell quantities, total values, and average prices of RAAG GOLD REFINED PALMOLEIN OIL 15KG TIN during the fiscal year 2023-24.

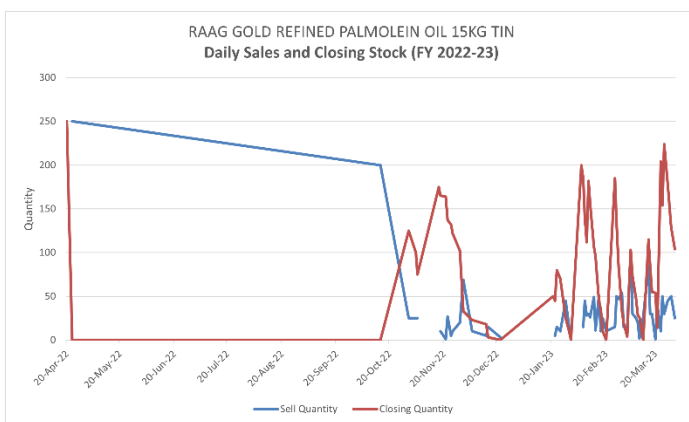


Figure 19: This chart illustrates the daily sales and closing stock levels of RAAG GOLD REFINED PALMOLEIN OIL 15KG TIN during FY 2022-23.

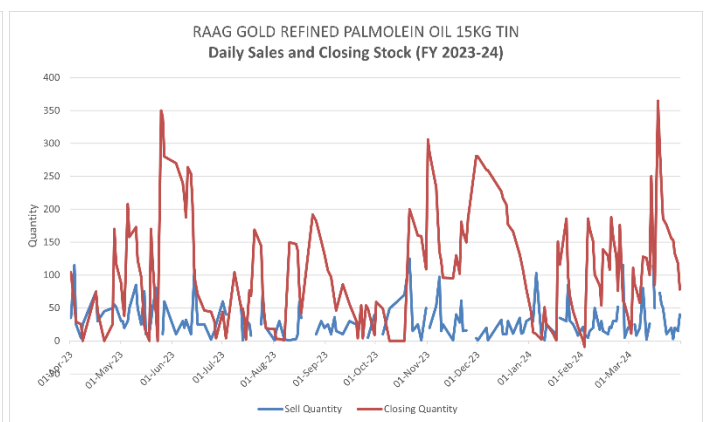


Figure 20: This chart illustrates the daily sales and closing stock levels of RAAG GOLD REFINED PALMOLEIN OIL 15KG TIN during FY 2023-24.

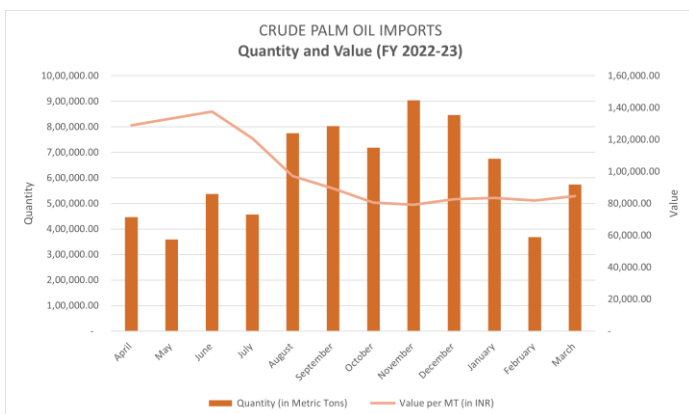


Figure 21: This chart illustrates the monthly quantity and value per metric ton of crude palm oil imported into India during the fiscal year 2022-23.

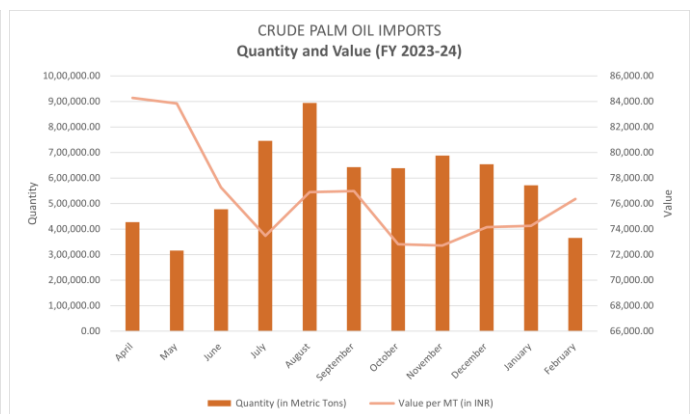


Figure 22: This chart illustrates the monthly quantity and value per metric ton of crude palm oil imported into India during the fiscal year 2023-24.



Figure 23: This chart illustrates the percentage of crude palm oil imported by India in the fiscal year 2022-23, segmented by the source country.

Figure 24: This chart illustrates the percentage of crude palm oil imported by India in the fiscal year 2023-24, segmented by the source country.

Inventory Management:

- **Frequent Stockouts:** Figures 19 and 20 reveal a recurring pattern of stockouts, indicated by zero or negative closing stock quantities. This suggests insufficient inventory management, potentially leading to lost sales opportunities.
- **High Demand Variability:** The calculated demand standard deviation for FY 2022-23 (42.70 tins) highlights the unpredictable nature of demand for this product, emphasizing the need for appropriate safety stock.
- **Reorder Point and Safety Stock:** A calculated reorder point of 289 tins and a safety stock of 127 tins are recommended to ensure a 95% service level with a 5-day lead time. Implementing these measures can help minimize stockouts and capitalize on demand.

External Factors and their Influence:

- **Global Palm Oil Market:** As the world's largest consumer, India is significantly affected by global palm oil supply and demand. Production fluctuations in Indonesia and Malaysia, the dominant exporters (Figures 23 and 24), directly impact Indian palm oil prices.
- **Government Policies:** Import duties and taxes on palm oil directly affect its domestic price. Changes in government policies aimed at boosting domestic production or managing inflation can significantly influence the palm oil market and Rahil Enterprise's operations.

The analysis reveals that while RAAG GOLD exhibits moderate price volatility compared to other edible oils, its demand is marked by high variability, necessitating efficient inventory management. Given India's heavy reliance on palm oil imports, Rahil Enterprise must closely monitor global market trends and government policies to anticipate price fluctuations and ensure a steady supply of this essential product.

4. VITALIFE REFINED SOYABEAN OIL

Due to page limitations and the comprehensive analysis already conducted on Fortune Refined Soyabean Oil, a flagship product for Rahil Enterprise, detailed analysis of Vitalife Refined Soyabean Oil is omitted in this report.

The external factors affecting Fortune Refined Soyabean Oil, such as global market dynamics, import dependence, and price volatility, also significantly influence the performance of Vitalife Refined Soyabean Oil. Therefore, the insights and recommendations derived from the analysis of Fortune Refined Soyabean Oil can be largely extrapolated to inform inventory management and pricing strategies for Vitalife Refined Soyabean Oil as well.

5. FORTUNE REFINED COTTONSEED OIL

India has a significant domestic production of cottonseed oil, primarily concentrated in states like Gujarat, Maharashtra, and Andhra Pradesh. Unlike other edible oils analyzed, Fortune Refined Cottonseed Oil enjoys relative stability in India due to the country's self-sufficiency in its production. This insulation from global market fluctuations is reflected in the data, but opportunities for improved inventory management still exist.

Here are the key results and findings regarding FORTUNE REFINED COTTONSEED OIL 15KG TIN, based on analysis:

Sales and Revenue:

- **Increased Sales:** Rahil Enterprise sold 1,450 tins in FY 2022-23 and 2,721 tins in FY 2023-24, showing a significant increase in sales. This suggests a potential rise in demand for cottonseed oil, possibly driven by factors like changing consumer preferences or its competitive pricing compared to other oils.
- **Revenue Growth:** Total sell value increased from INR 3,010,580.24 in FY 2022-23 to INR 4,357,246.31 in FY 2023-24, driven by the significant growth in sales.

Price Volatility and its Impact:

- **Relatively Stable Prices:** Compared to soybean and sunflower oil, Figures 25 and 26 showcase relatively stable buying and selling prices for cottonseed oil across both fiscal years. This stability likely stems from India's self-sufficiency in cottonseed oil production, insulating it from global price fluctuations.
- **Price Increases:** While generally stable, some price increases are observed, particularly in April of both FY 2022-23 (average buy price of INR 2,105.57) and FY 2023-24 (average buy price of INR 1,770.40). These increases might be due to seasonal factors influencing domestic production or demand.

Seasonality:

- **Limited Data on Seasonality:** The available data doesn't provide conclusive evidence of strong seasonal patterns for cottonseed oil. More data points, particularly for specific months in FY 2022-23, are needed to determine if any significant seasonal demand fluctuations exist.

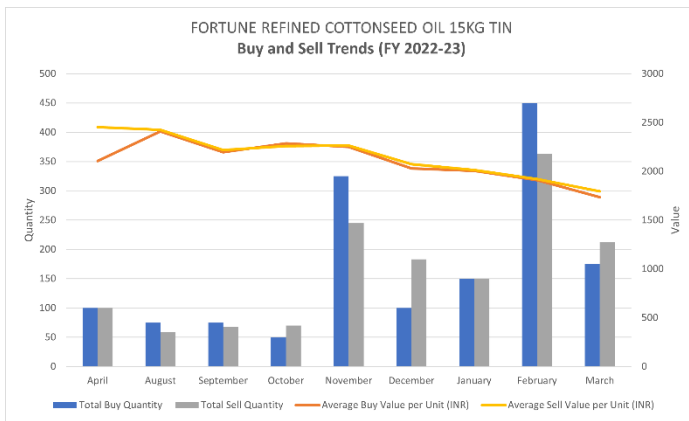


Figure 25: This chart illustrates the monthly buy and sell quantities, total values, and average prices of FORTUNE REFINED COTTONSEED OIL 15KG TIN during the fiscal year 2022-23.

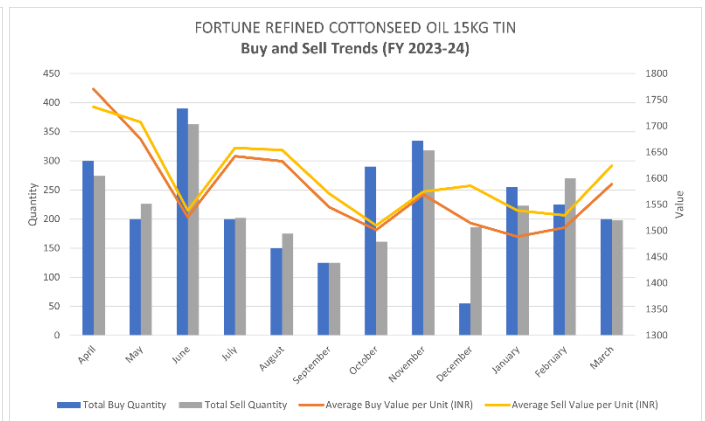


Figure 26: This chart illustrates the monthly buy and sell quantities, total values, and average prices of FORTUNE REFINED COTTONSEED OIL 15KG TIN during the fiscal year 2023-24.

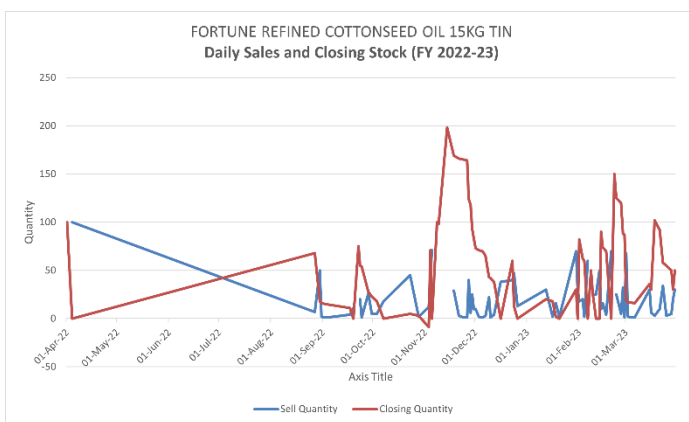


Figure 27: This chart illustrates the daily sales and closing stock levels of FORTUNE REFINED COTTONSEED OIL 15KG TIN during FY 2022-23.

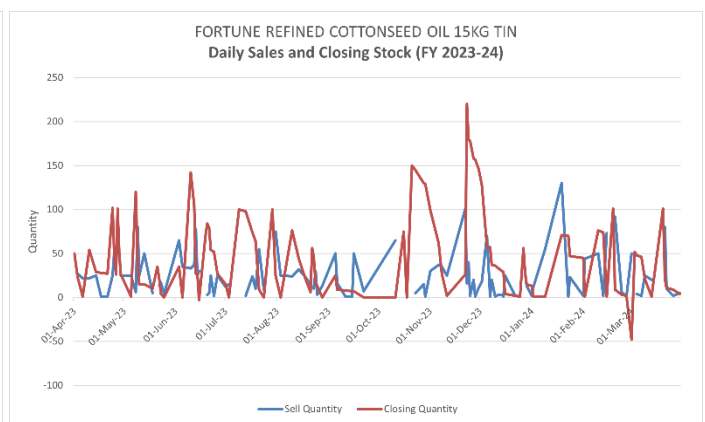


Figure 28: This chart illustrates the daily sales and closing stock levels of FORTUNE REFINED COTTONSEED OIL 15KG TIN during FY 2023-24.

Inventory Management:

- **Frequent Stockouts:** Figures 27 and 28 reveal a persistent pattern of stockouts, reflected by zero or negative closing stock quantities. This indicates inefficient inventory management practices, potentially leading to lost sales opportunities.
- **Reorder Point and Safety Stock:** The calculated reorder point of 201 tins and safety stock of 87 tins, based on a 95% service level and 5-day lead time, can help Rahil Enterprise optimize inventory and minimize stockouts.

External Factors and their Influence:

- **Domestic Cotton Production:** As cottonseed oil is a byproduct of cotton production, factors impacting the cotton industry, such as weather conditions, pest infestations, or government policies related to cotton, can indirectly influence cottonseed oil prices and availability.
- **Competition from Other Oils:** Fluctuating prices of other edible oils, particularly palm oil, might impact consumer preferences and influence demand for cottonseed oil, potentially explaining the sales increase observed in FY 2023-24.

The analysis highlights the relative price stability of cottonseed oil compared to other edible oils analyzed, likely due to India's self-sufficiency in its production. However, Rahil Enterprise's frequent stockouts point to inefficient inventory management, hindering its ability to fully capitalize on the potential demand for this product. Addressing these inventory challenges through data-driven practices is crucial for maximizing profitability and meeting customer needs effectively.

6. PUFFPRIDE VANASPATI

Puffpride Vanaspati holds a prominent place in the Indian edible oil market, favored as a cost-effective alternative to ghee. Its widespread use in various culinary applications makes it a staple in many households. The production of vanaspati relies heavily on vegetable oils, notably palm oil, which is subject to a complex interplay of factors influencing its pricing. These factors range from global supply and demand dynamics, weather patterns in major palm oil-producing regions, to government policies and import regulations.

Given this complexity in the vanaspati supply chain, this analysis focuses primarily on Rahil Enterprise's internal financial data for Puffpride Vanaspati 15kg boxes over the past two fiscal years (FY 2022-23 and FY 2023-24) to understand its sales patterns, pricing trends, and inventory dynamics.

Here are the key results and findings regarding PUFFPRIDE VANASPATI 15KG BOX, based on the analysis:

Sales and Revenue:

- **Strong Sales Growth:** Rahil Enterprise sold 8,428 boxes in FY 2022-23 and 9,907 boxes in FY 2023-24, demonstrating a significant increase in sales volume. This suggests growing demand for Puffpride Vanaspati, likely driven by its affordability and widespread use.
- **Significant Revenue Increase:** Total sell value rose from INR 13,809,895.44 in FY 2022-23 to INR 14,128,718.58 in FY 2023-24, aligning with the increase in sales volume.

Price Volatility and its Impact:

- **Moderate Price Fluctuations:** Figures 29 and 30 depict moderate fluctuations in both buying and selling prices for Puffpride Vanaspati across the two fiscal years. The average buy price varied from a low of INR 1,390.00 in October 2022 to a high of INR 2,466.66 in May 2022. Similarly, average sell prices show fluctuations, impacting overall profitability.
- **Potential Impact of Palm Oil Prices:** While not directly analyzed, fluctuations in global palm oil prices (a key ingredient in vanaspati) likely contributed to the price variability observed in Puffpride Vanaspati.

Seasonality:

- **Potential Demand Peaks:** Figures 29 and 30 suggest potential peak demand periods for Puffpride Vanaspati. October, November, and December show higher sales quantities compared to other months in both fiscal years, potentially linked to festivals and the winter season when vanaspati is commonly used in various dishes.

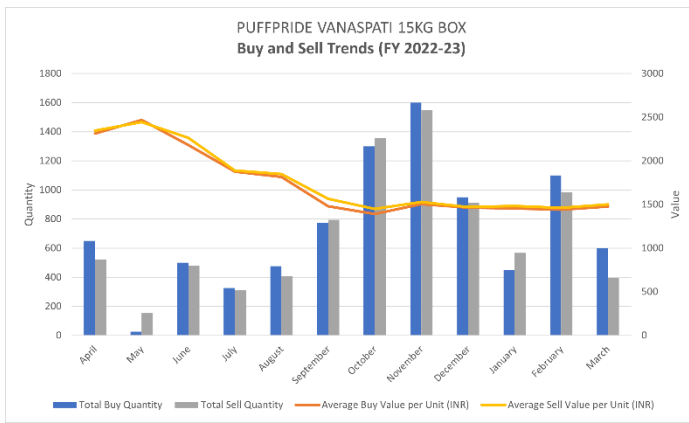


Figure 29: This chart illustrates the monthly buy and sell quantities, total values, and average prices of PUFFPRIDE VANASPATI 15KG BOX during the fiscal year 2022-23.

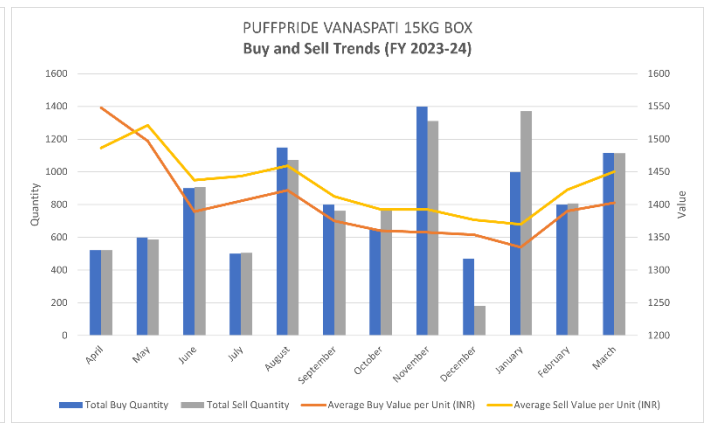


Figure 30: This chart illustrates the monthly buy and sell quantities, total values, and average prices of PUFFPRIDE VANASPATI 15KG BOX during the fiscal year 2023-24.

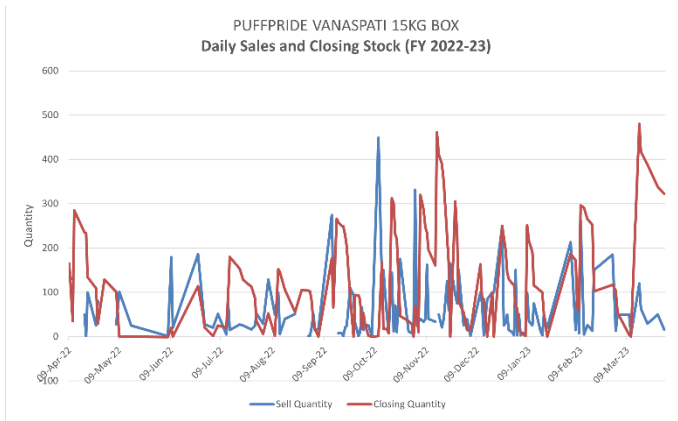


Figure 31: This chart illustrates the daily sales and closing stock levels of PUFFPRIDE VANASPATI 15KG BOX during FY 2022-23.

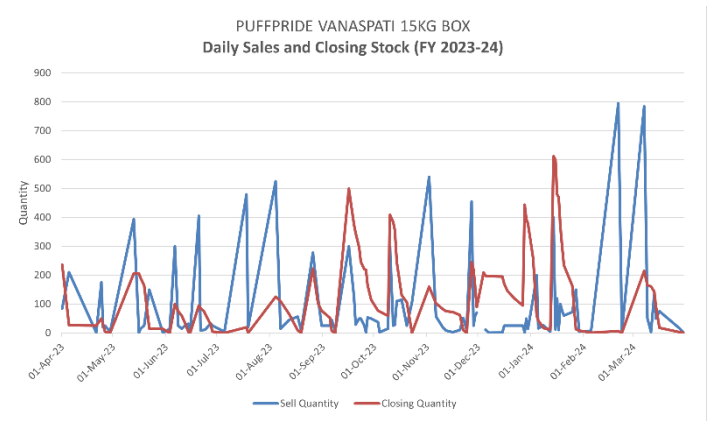


Figure 32: This chart illustrates the daily sales and closing stock levels of PUFFPRIDE VANASPATI 15KG BOX during FY 2023-24.

Inventory Management:

- **Recurring Stockouts:** Figures 31 and 32 reveal frequent stockouts throughout both fiscal years, indicated by zero or negative closing stock quantities. This signifies inefficient reordering practices and potentially lost sales opportunities due to insufficient stock.
- **High Demand Variability:** The calculated demand standard deviation, particularly for FY 2023-24 (154.54 boxes), indicates the unpredictable nature of Puffpride Vanaspati demand, emphasizing the need for sufficient safety stock.
- **Data-Driven Reordering:** The calculated reorder point of 803 boxes and safety stock of 417 boxes, based on a 95% service level and 5-day lead time, can help Rahil Enterprise optimize inventory levels and minimize stockouts.

External Factors and their Influence:

- **Global Palm Oil Market Dynamics:** Given vanaspati's reliance on palm oil, fluctuations in global palm oil prices and supply chain disruptions directly impact Puffpride Vanaspati's pricing and availability.
- **Government Policies:** Import duties and taxes on palm oil significantly influence vanaspati prices. Government policies aimed at promoting domestic oilseed production or managing inflation can also indirectly affect the market.
- **Consumer Preferences:** The affordability and cultural significance of vanaspati make it a staple in many Indian households. However, changing consumer preferences towards healthier oil alternatives can potentially influence demand for Puffpride Vanaspati in the long run.

The analysis reveals strong and growing demand for Puffpride Vanaspati, presenting a significant opportunity for Rahil Enterprise. However, the recurring stockouts indicate inefficient inventory management practices, preventing the business from fully capitalizing on this demand. Implementing data-driven inventory management, considering the calculated reorder point and safety stock, is crucial for optimizing operations and ensuring a consistent supply to meet customer needs. Additionally, monitoring global palm oil market trends and government policies related to edible oils is essential for navigating potential price fluctuations and maintaining profitability in this dynamic market segment.

4. Interpretation of Results and Recommendation

The analysis of Rahil Enterprise's six key edible oil products reveals a complex interplay of internal and external factors influencing their performance. While specific insights vary for each product, some overarching themes emerge, requiring strategic action to optimize operations and ensure sustained growth.

Key Interpretations:

- **Price Volatility is a Major Challenge:** All six products exhibit varying levels of price volatility, significantly impacting sales quantities and overall revenue. This volatility is primarily driven by external factors, particularly the global market conditions for imported oils like soybean and sunflower oil.
- **Seasonal Demand Patterns are Significant:** While distinct seasonality exists for each product, Rahil Enterprise does not seem to be leveraging these patterns effectively. This indicates a lack of proactive demand forecasting and planning, which leads to stockouts during peak seasons and potentially overstocking during low seasons.
- **Inventory Management is Inefficient:** Frequent stockouts are a recurring issue across all products, indicating inefficient reordering practices. These stockouts represent lost sales opportunities and potentially dissatisfied customers. Conversely, high closing stock levels in certain periods suggest potential overstocking and increased storage costs.
- **Rahil Enterprise is Vulnerable to External Factors:** The heavy reliance on imported oils makes Rahil Enterprise vulnerable to global market fluctuations, geopolitical events, and government policies. These external factors can impact both supplier costs and consumer demand, creating significant challenges for the business.

Recommendations:

To optimize inventory management and navigate price volatility effectively, Rahil Enterprise should implement the following recommendations:

1. Proactive Market Monitoring:

- **Continuously Monitor Global Market Trends:** Track global market conditions, including supply and demand dynamics for relevant crude oils, production levels in major exporting countries, and geopolitical events that could impact supply chains.
- **Track Supplier Activities:** Monitor the pricing strategies and supply chain activities of key suppliers like Gokul Agro Resources LTD. and Adani Wilmar LTD. to anticipate potential cost fluctuations.
- **Analyze Government Policies:** Keep abreast of government policies related to import duties, trade agreements, and regulations that can impact edible oil prices and availability.

2. Data-Driven Inventory Management:

- **Implement Calculated Reorder Points and Safety Stock Levels:** Use the calculated inventory metrics for each product (detailed in the mid-term report) to determine optimal reorder points and safety stock levels. This data-driven approach can minimize stockouts and overstocking.
- **Explore Inventory Management Software:** Consider investing in inventory management software to automate processes, improve accuracy, and provide real-time insights into stock levels, demand trends, and potential supply chain disruptions.
- **Leverage Seasonality:** Develop a detailed seasonal demand forecasting model for each product, taking into account festivals, agricultural cycles, and other relevant factors. This will allow for more accurate inventory planning and strategic procurement.

3. Dynamic Pricing Strategies:

- **Adapt Pricing to Market Conditions:** Adjust pricing strategies based on global market trends, seasonal demand patterns, and individual product performance. This can help maintain profitability during price fluctuations and capitalize on market opportunities.
- **Consider Competitive Pricing:** Monitor competitor pricing strategies for similar products to ensure competitiveness and maintain market share.

4. Supply Chain Diversification:

- **Explore Alternative Sourcing Options:** Investigate alternative suppliers or sourcing options to mitigate risks associated with specific suppliers and ensure a more stable and predictable supply chain.
- **Consider Domestic Sources:** Explore opportunities to source oils from domestic producers to reduce dependence on imports and potentially mitigate price volatility.

By implementing these recommendations, Rahil Enterprise can effectively navigate the volatile edible oil market, optimize inventory practices, and meet customer demand. These actions will position the business for sustained growth and profitability in the competitive edible oil market.

5. Data Availability and Access

The analysis and insights presented in this report are based on data from Rahil Enterprise's internal financial records and India's edible oil import data. To provide transparency and allow for further exploration, all the excel files used in the analysis are available in the following folder:

[Folder Containing Excel Files](#)

This folder contains all the excel files used in generating the charts and tables within the report, enabling further exploration and analysis of the data by Rahil Enterprise. These files include:

- **Sales and Purchase Data:** Raw data on monthly sales, purchases, and inventory levels for each product.
- **Calculated Metrics:** Excel sheets with calculated inventory metrics, such as reorder points, safety stock levels, and demand variability.
- **Import Data:** Data on India's monthly import quantities and values for relevant crude oils (soybean, sunflower, and palm oil) obtained from the Ministry of Commerce, Government of India website.

By providing access to these files, Rahil Enterprise can independently verify the analysis, conduct further exploration, and utilize the data for ongoing monitoring and decision-making.