

Kent Natural Food Store Operations & Sales Dashboard Presentation

Final Project – BA-54050 (Data Visualization)

Group 4: Bhavya Jeevani Thandu, Sairam Jammu, Eric Draper

(Professor Shahla Asadi – May 8, 2025)

We developed an interactive dashboard for Kent Natural Food Store (KNFS) to improve operational and sales insights. This presentation covers the data preparation steps, key findings for eight business questions, and actionable recommendations.

Agenda

1. **Overview:** KNFS background and context
2. **Problem Statement:** Challenges and questions to address
3. **Data Exploration & Cleansing:** Data issues (missing values, etc.) and preparation
4. **Dashboard Development Approach:** Collection, transformation, DAX calculations, visualization
5. **Sales & Product Questions:** Eight key questions (Q1–Q8) to answer
6. **Dashboards (Q1–Q8):** Visual answers to each question
7. **Summary & Conclusion:** KPI highlights and recommendations



Overview – KNFS Background

Kent Natural Food Store (KNFS) is a community co-op grocery specializing in organic and local products. It offers fresh produce, bulk foods, packaged goods, health and beauty items, and supplements – focusing on safe, non-toxic, and eco-friendly products. KNFS's mission is to serve the local community with healthy, sustainable options. This context guided our analysis and dashboard design.



Problem Statement

KNFS currently lacks clear insight into its operations and sales, making it difficult to improve efficiency and fulfill its mission. Management is unsure what items to order, when to order, or how much to order to meet demand. The seven buyers identified a need for better visibility into several areas of store operations. Specifically, they want answers to key questions about sales and inventory, such as which products sell best or least, inventory levels and aging, and overall sales vs. costs (detailed on the next slide).



Sales & Product Questions

- Q1:** Which items are selling the most?
- Q2:** Which items are selling the least (by department)?
- Q3:** How much inventory do we have (quantity and value)?
- Q4:** Are there items we should order soon, and how much?
- Q5:** Which items have been in inventory the longest (especially perishables)?
- Q6:** What are the total sales, and what are the related costs of goods sold?
- Q7:** Which department generates the most sales?
- Q8:** What are the total sales for the store, and what about total cost?



Data Exploration & Cleansing

We began by **loading and inspecting KNFS's datasets** (sales, inventory, etc.). Several data challenges were noted: **datasets were not normalized**, complicating table relationships, and **multiple missing or inconsistent values** were present. To prepare the data:

We **combined data from multiple sources** (sales listings, inventory records, cost data) into a single model for unified analysis.

We **addressed missing values** by cleaning records and standardizing fields (e.g., ensuring item names/codes matched across tables).

We **added calculated fields and metrics** – for example, computing *Total Cost* (for goods sold and inventory value) and *Inventory Age* – using DAX formulas in Power BI.

We ensured the data was formatted consistently (dates, categories, etc.) and established necessary relationships (linking sales to inventory by item).

This cleansing and transformation process resolved data quality issues and provided a solid foundation for building the dashboard.

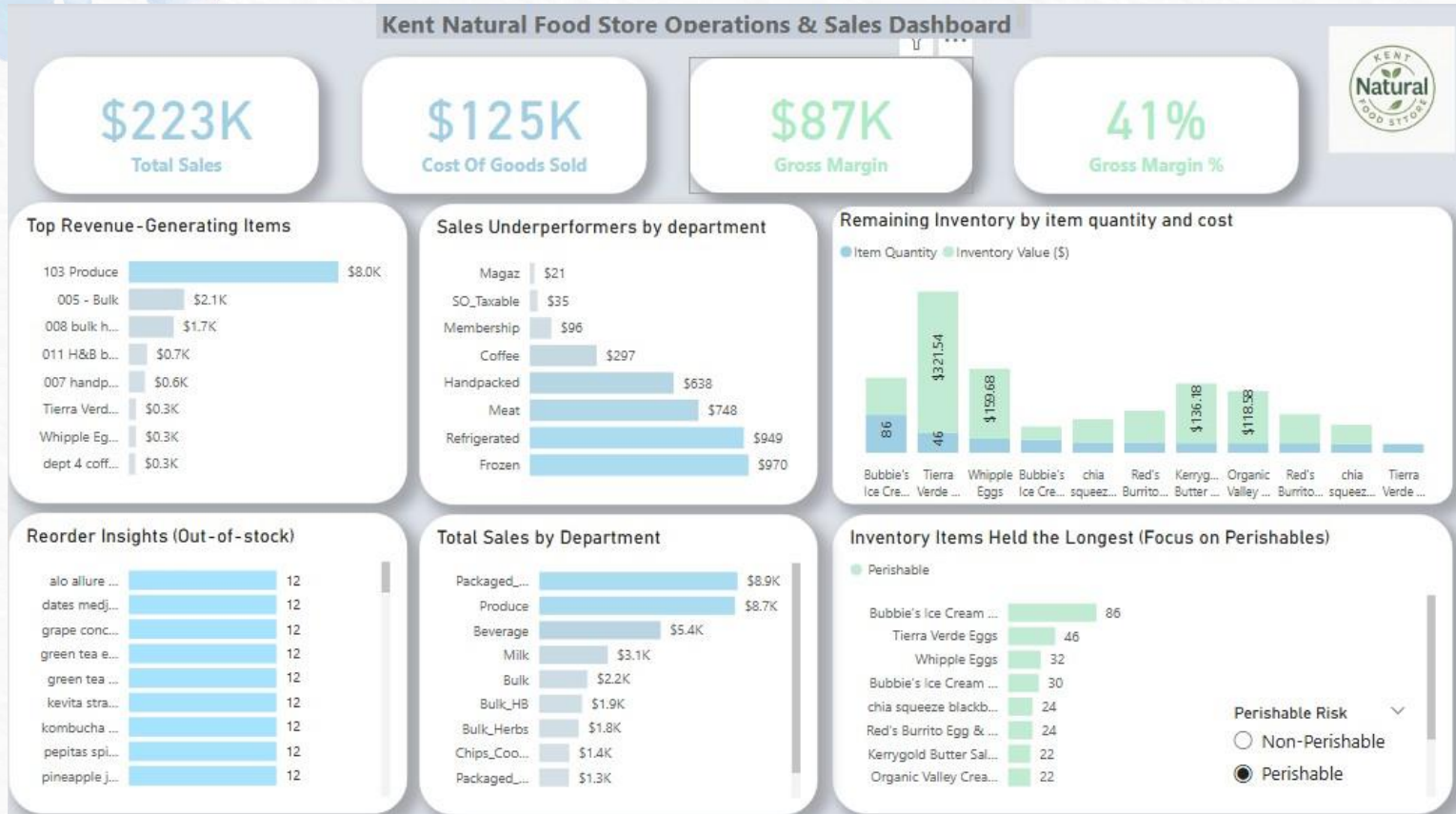
Dashboard Development Approach

Our approach to developing the dashboard involved several steps:

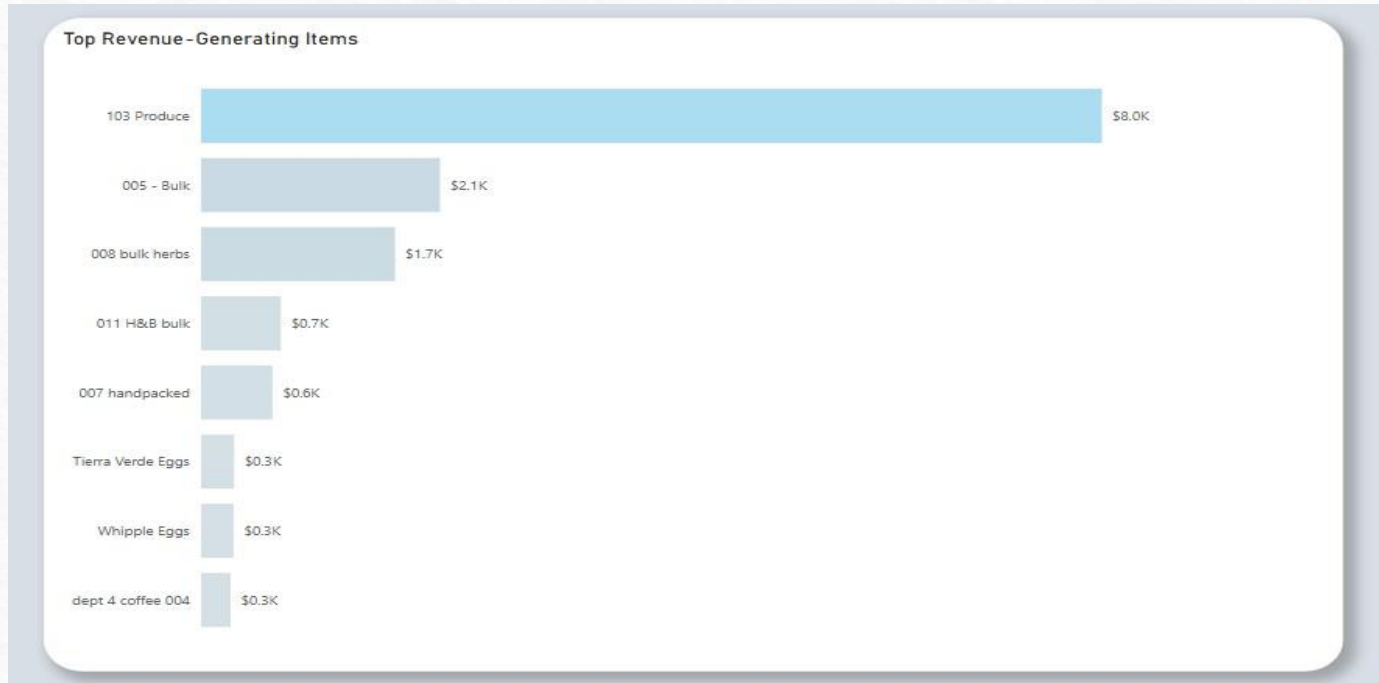
1. **Data Collection:** We gathered all relevant datasets, including sales transactions, inventory levels, reorder reports, and cost structure files.
2. **Data Cleansing:** We cleaned and merged the data as described, resolving inconsistencies and creating a cohesive dataset for analysis.
3. **Data Transformation:** Using Power BI, we established relationships between the tables (e.g., linking sales to product details) since the original data wasn't fully normalized. We also created new columns where needed (e.g., categorizing products).
4. **DAX Calculations:** We created custom measures to answer specific questions – for example, *Total Sales*, *Total Cost of Goods Sold*, *Inventory Value*, *Gross Margin*, and measures to identify *Longest Held Inventory* and *Reorder Needs*. These DAX measures enabled dynamic calculations in the dashboard visuals.
5. **Visualization:** We built an interactive Power BI dashboard with charts, tables, and KPI cards addressing Q1–Q8. We applied KNFS's color theme and ensured each visual directly answers its question for clarity. We also added filters and interactive elements for users to explore the data.

This structured approach ensured the final dashboard is accurate, insightful, and aligned with KNFS's needs.

Dashboards – Key Findings (Q1–Q8)

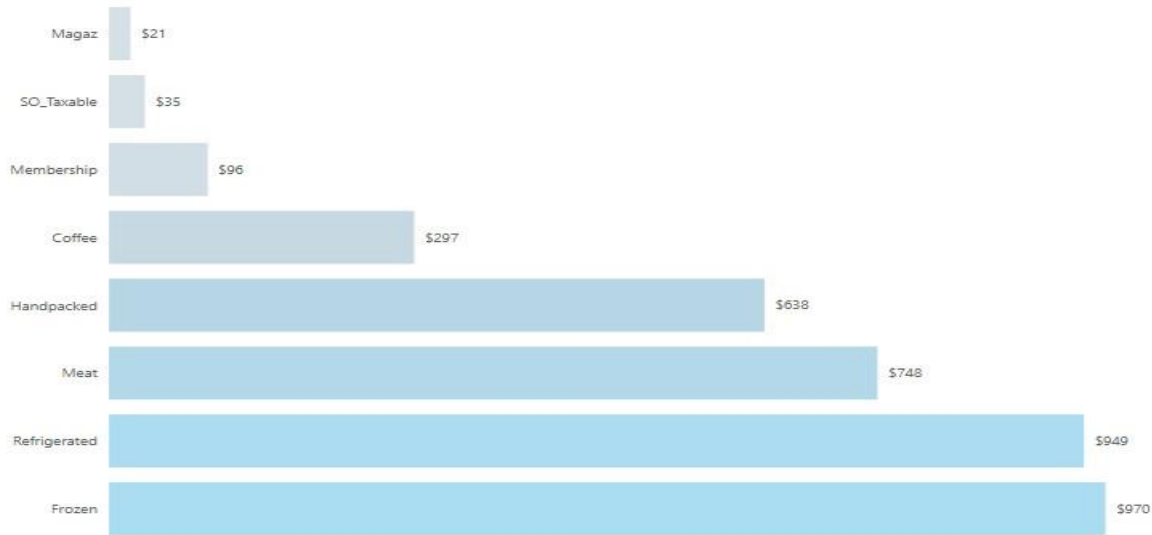


Q1 – Top Revenue-Generating Items: This bar chart shows the **Top 10 revenue-generating items**. We can see that the “103 Produce” category (produce department) contributed the highest sales (approximately \$8.0K), far above other items. This indicates produce items are the strongest sellers in the period analyzed.

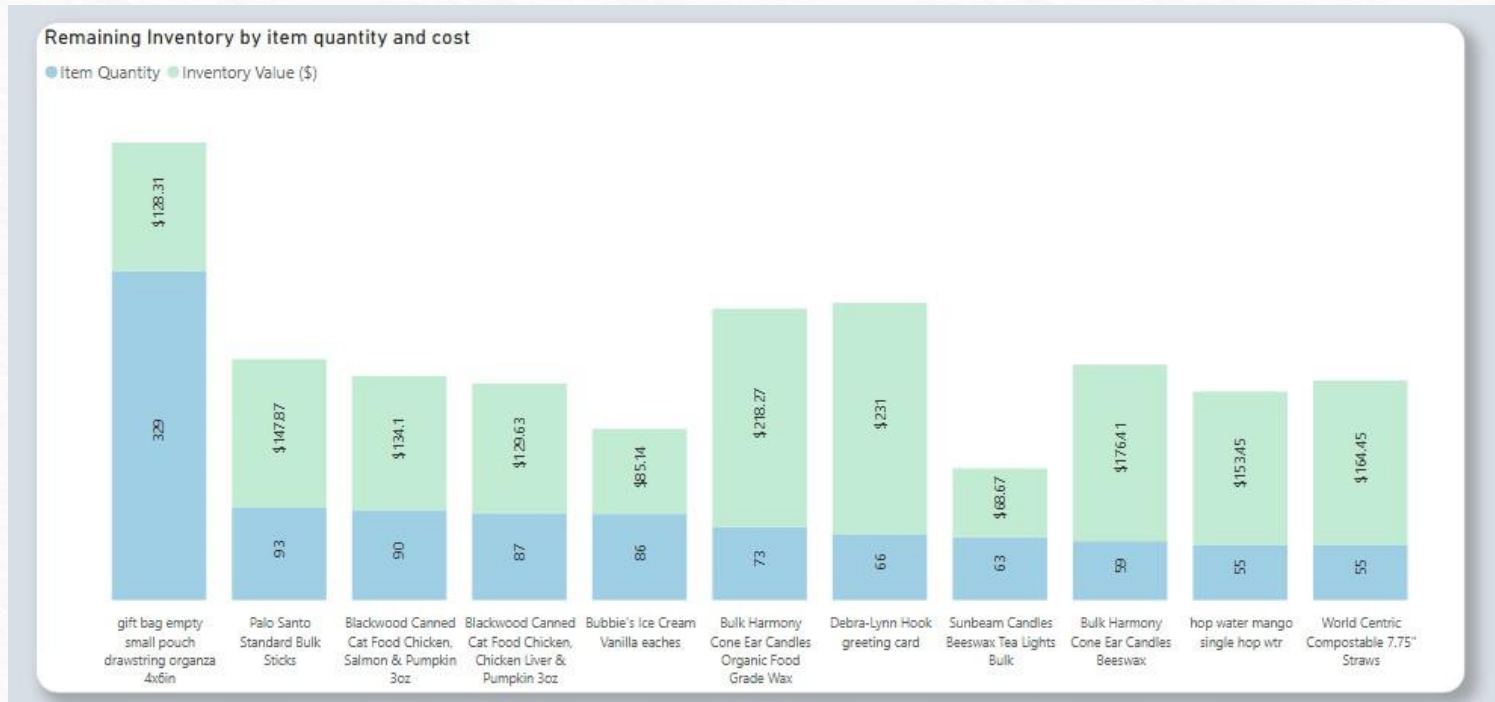


Q2 – *Sales Underperformers by department*: This chart illustrates the **Bottom 10 departments by sales**. The *Vitamin* department had the lowest sales (~\$1.2K), followed by *Bread* and *Frozen* departments. This suggests KNFS may need to investigate why these departments underperform (e.g., fewer products, less demand) and consider strategies to boost sales or reduce inventory in these areas.

Sales Underperformers by department



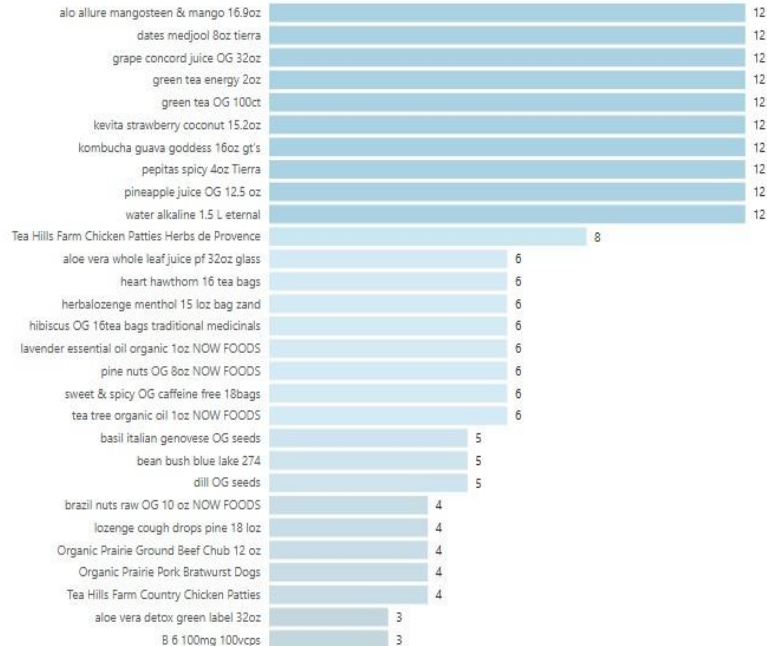
Q3 – Remaining Inventory by Item quantity and cost: The combo chart above shows **remaining inventory by item (quantity in stock and inventory value)**. Blue bars represent item quantities on hand, and green bars represent the inventory value in dollars for each item. We observe items like *Bulk herbs* and *Bulk foods* have significant quantities and value, indicating substantial stock levels. This visualization helps KNFS understand current inventory investment and identify if any high-value items might be overstocked.



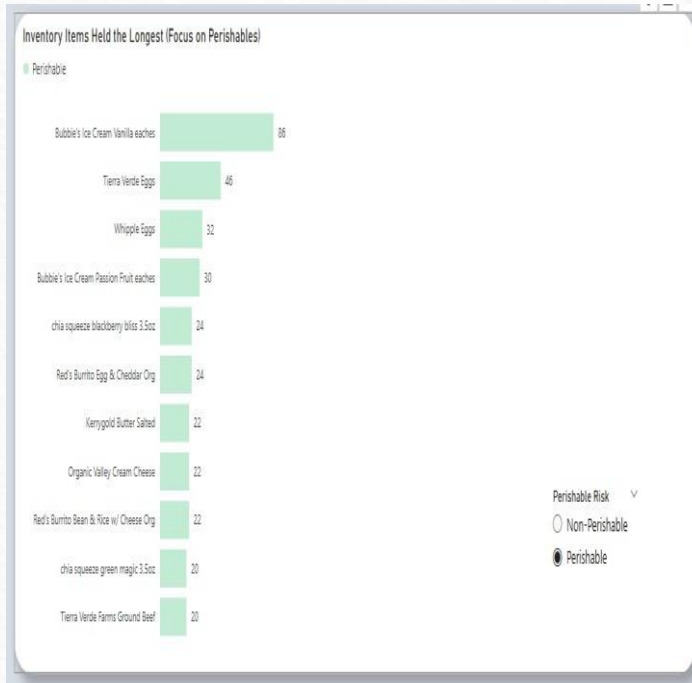
Q4 – Reorder Insights (Out -of-Stock): The chart above lists **top items below their reorder points** and the *quantity* needed to replenish each. For example, *Alo Allure Mangosteen & Mango Juice (16 oz)* is shown with a needed quantity of 12, as are several other items, indicating they are **below the desired stock level**. Buyers should prioritize reordering these items (many are beverages and bulk goods) to avoid stockouts. This visual answers when and what to reorder, and how much.



Reorder Insights (Out-of-stock)



Q5 – Inventory Items Held the Longest (Focus on Perishables): The bar chart highlights **inventory items held the longest**, with a focus on differentiating *Non-Perishable (blue)* vs. *Perishable (Green)* goods. The top bar indicates an item (gift bag packs) has been in stock for 329 days, which is non-perishable. Several perishable items (e.g., certain candles, ice cream) have been in inventory ~86–87 days. KNFS should consider strategies to sell or write-off these long-held items (especially perishables) to free up space and capital, and prevent spoilage.



Q6 – Total Sales & COGS: These KPI cards show the **total sales** and **cost of goods sold** for the period. Total Sales amount to **\$222.86K**, while COGS total **\$124.89K**. This yields a gross margin of about \$98K (not shown here, but calculated) – roughly a 44% margin. This answers the question that sales are significantly higher than the direct costs, which is a positive sign for profitability. It also provides a benchmark for further financial analysis.

\$223K

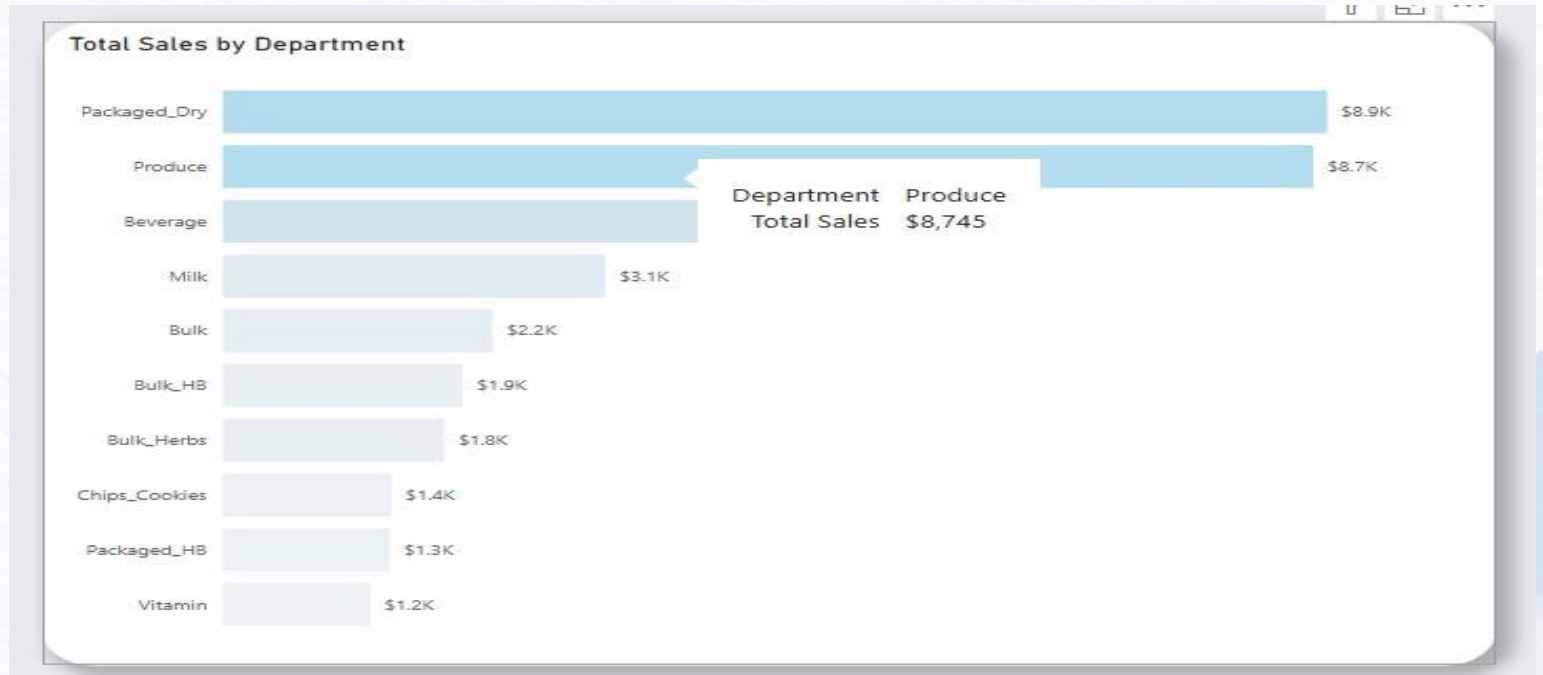
Total Sales

\$125K

Cost Of Goods Sold



Q7 – Total Sales by Department: The horizontal bar chart ranks **total sales by department**. *Packaged Dry Goods* generated the highest sales (\$8.9K), closely followed by *Produce* (\$8.7K). Other departments like *Beverage*, *Milk*, and *Bulk* trail behind. This indicates Packaged Dry and Produce are the top-performing departments, contributing most to revenue. KNFS can focus on these areas for continued success, while looking to improve sales in lower-performing departments (at the bottom of the chart, e.g., Bulk_Herbs, Chips/Cookies, Vitamins).



Q8 – Overall Store Performance: The final set of KPIs provides an **overall summary**: Total Sales **\$222.86K**, Total Cost of Goods Sold **\$124.89K**, Gross Margin **41.15%**, and Gross Margin in dollars **\$97.97K** (which is the profit). These figures give management a high-level view of the store's performance over the period. A gross margin of ~41% is observed, which is a healthy indicator for a natural foods retailer. This addresses the question of total sales vs. total cost – sales were about \$222K while the total cost (of goods sold) was about \$125K, yielding the mentioned profit margin.

\$223K

Total Sales

\$125K

Cost Of Goods Sold

\$87K

Gross Margin

41%

Gross Margin %

Exploratory Data Analysis:

Buyer Insights:



Observations and Recommendations:

Limitations of analyses based on data provided: Additional Questions (1-6) were posed, but data were not provided to support visualizations that to provide insight and answers to these. Examples include customer data for repeat business, physical dimensions to explore the shelf space and sales and information related to expired items that are written off to minimize waste.

Data standardization, uniformity and quality: Differences between common fields across tables make joining data difficult without significant alteration. For example, differences in Department values in inventory, sales and cost of goods, limit robustness of the visualizations, and insights. A common product key such as UPC code in sales, inventory and reorder would allow for additional visualizations to be produced based on joined data.

Missing values, upper/lowercase differences, spaces and other quality issues make for inaccurate results.

Summary of Key KPIs & Conclusion

Total Sales (Jan 1–Apr 16, 2024): Approximately **\$222,860** (just over \$222K).

Total Cost of Goods Sold: Approximately **\$124,890**, resulting in a gross profit of about \$98K (≈44% margin).

Inventory On-Hand Value: The dashboard (Q3) shows significant inventory value tied up in bulk items and herbs. KNFS's current inventory value is substantial, but much of it is in non-perishables that turn over slowly.

Top-Performing Areas: Produce and Packaged Dry Goods drive the most sales, indicating strong customer demand in these categories.

Under-Performing Areas: Departments like Vitamins and certain Membership/Taxable categories have very low sales, and may require marketing attention or stock reduction.

Reorder & Aging: Several popular items are **below reorder points** and should be restocked promptly to avoid lost sales (Q4). Conversely, some products have sat in inventory for almost a year (329 days) – especially non-perishables like gift bags – and **perishables held over 2–3 months** (Q5), which should be addressed via promotions or markdowns.

Conclusion & Recommendations: By leveraging these dashboard insights, **KNFS can optimize its operations**. The store should **ensure high-selling items (Produce, Dry Goods)** are always in stock and reorder them in a timely manner. For **low-selling departments**, KNFS might consider promotions or reducing the assortment to improve turnover. **Long-held inventory (especially perishables)** should be discounted or donated before expiration to minimize waste. The clear visibility into total sales vs. COGS and departmental performance will help management make data-driven decisions, improving efficiency and aligning inventory with customer demand. Ultimately, the dashboard empowers KNFS to better fulfill its community-focused mission through informed action.



Thank You – Questions & Discussion