**DIVINE FOODS INC.**

**DATA ANALYSIS**

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1. **INTRODUCTION**

Divine Foods Inc. is an emerging cookie manufacturer company which is based in USA. They have 5 clients located in different areas in USA currently. They produce 6 types of cookies and have different pricing strategies for them.

Even they are a new company in USA cookie market, they have caught a great growth rate recent years by adding new clients in their portfolio. They have some investment plans, and the senior managers would like to better understand the sales figures, products and customers so they can improve their processes and sales, and make effective decisions for their future activities.

1. **AIM**

I have been tasked with the job of carrying out a complete analysis project of their data from Jan-Mar 2022 sales figures.

I am planning to find out answers to below questions, share my insights and make some recommendations around my findings.

* Which cookie sells best, makes highest revenue/profit, has highest margin?
* Which customer sells best, makes highest revenue/profit, has highest margin?
* Does the high revenue mean high profit? Is our pricing policy correct?
* Is there any seasonality of cookie sales? (Days, months, holidays, etc)
* Is the customer categorisation correct? (Is ACME Bites really better than others, in terms of sales numbers/revenue/profit?)
* How is the sales trend, what could we expect from future sales? (per customer)

1. **OBSTACLES**

Dataset is containing first three months of 2022, has not peak seasons like holiday times (Christmas time, Easter season, summer holiday etc.) included. As this is very limited time data is not suitable for make long term future predictions. To be able to realise predictive and prescriptive analysis efficiently, I recommend company provide at least 1 year sales figures data.

1. **DATA PREPARATION**
   1. **Dataset**

The dataset is provided by Divine Foods contains below details.

|  |  |
| --- | --- |
| **Column Name** | **Column Explanation** |
| OrderID | Unique ID for each order |
| OrderDate | The date is order placed |
| OrderTotal | Total order value ($) - Repeated in each row of each OrderID |
| CookieID | Unique ID for each type of cookie |
| CookieName | Unique name for each type of cookie |
| RevenuePerCookie | Revenue (selling value) per cookie ($) |
| CostPerCookie | Cost value per cookie ($) |
| Quantity | Order units for each type of cookie in each order |
| CustomerID | Customer code |
| CustomerName | Customer name (provided dummy) |
| Phone | Customer phone number (provided dummy) |
| Address | Customer address details (provided dummy) |
| City | Customer city |
| State | Customer state |
| Zip | Customer zip (provided dummy) |
| Country | Customer country |
| Notes | Insights about customer for sales personnel |

* 1. **Tools**

As Dataset does not contain huge amount of data and I will both use Excel and Power BI in analysis I prefer to use MS Excel to clean the data. Most of the cleaning process could be implemented with Power Query, too.

* 1. **Missing Values**

There is not any missing value in the dataset.

* 1. **Duplicates**

It is not easy to see the duplicates at a first glance in the dataset as each Order ID is repeated for each Cookie ID in rows. To find out duplicates I have done some column combinations.

Initially, I assumed each Order ID and Cookie ID should have repeated once in the rows and combination of these two values must be unique. To check it I have used CONCATENATE function in a new ‘Duplicate Check’ column and combined them together. And then, I have highlighted the Duplicate Check column by using Conditional Formatting’ to find any duplicates. As a result, I found Fortune Cookie with the ID 2 in Order ID 13 is repeated with same quantities. If the quantity was different this row would be acceptable, but as it is different, I assumed that there is a mistake, and I removed the second one (in row 43).

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* 1. **Errors**

There is one misspelling in Cookie Name column, which was spelled as ‘Shugar’. As the Cookie ID is the same with Cookie Name ‘Sugar’, I assumed it is the same product and changed it to ‘Sugar’.

There is no other structural error in the dataset like misspelling, capitalization mistake, incorrect word etc.

* 1. **Value Totals Control**

Order Total value is repeated for each Order ID row, and I have checked if there is any mistake in that column and also calculated the order total value from total revenue of items in each order. There is no mistake on order total values.

* 1. **Irrelevant Data**

In data set for each customer there is only one contact information, and I is repeated for each order item. If we could see the different branches, addresses, cities of the customers we would be able to include address info to analyse. For that reason, I removed Phone, Address, City, State, Zip, Country columns and notes column columns from analysis sheet. Additionally, I created another customer Details table in another sheet in case I need it for the future analysis. And also added the table into Power BI with linking it to main Product Sales table.

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* 1. **Formatting**

Columns that I have formatted again are listed below.

Order Date -to date format

Order Total– to currency format

Revenue Per Cookie – to currency format

Cost per Cookie - to currency format

Quantity – to number / decimal format

* 1. **New Columns / Calculations**

I have added new columns with calculated fields that listed below, to be able to analyse profit, total revenue, total cost and total profit.

Profit per Cookie – by revenue per cookie and cost per cookie

Total Revenue – by revenue per cookie and quantity

Total Cost – by cost per cookie and quantity

Total Profit – by profit per cookie and quantity

Margin Per Cookie – by profit and revenue per cookie

* 1. **Change in Data Values**

I have made below changes in dataset:

* Cookie type name ‘White Chocolate Macadamia Nut’ to ‘White Choc MN’,
* Customer name ‘Park & Shop Convenience Store’ to ‘Park & Shop CS’

as they are too long and makes the charts ineffective in terms of visualization.

* 1. **Validation**

Dataset contains the sales figures of 3 months in Jan-Mar 2022 terms. It is a limited time range to get effective insights with a limited time range.

1. **DATA PROTECTION & REGULATIONS**

As I am working as a contractor consultant for the company, I have no real customer details available to use. I received the dataset with a dummy details Divine Foods has provided.

Divine Foods provided me the laptop with authorizations provided by them. I use just for the analysis process and not allowed to take it out of the company.

1. **FINDINGS AND INSIGHTS**

I have used Descriptive analysis methods to identify any patterns and trends in dataset.

**Product Prices**

I have analysed product details to find out the prices, profits, margins and quantities of products.

White Choc MN is the highest priced product ($6.00), with a highest profit value per unit ($3.25), but as the cost is high. It’s margin (54%) is under Snickerdoodle’s margin which has the highest margin among all products with 63% (cost $2.5, revenue $4.00).

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If White Choc MN is compared with the others, even the quantity is the lowest with 2489 for 3 months, the profit is the second highest with $8K.

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Chocolate Chip is the third best-selling product in units with highest profit and second highest margin.

Fortune Cookie sells best, but as the price and the margin is lowest it has very limited contribution to company growth.

**Monthly Sales**

Sales quantities and values are fluctuating by weeks, but they have a trend of decrease in March by 57%. In February 7% increase based on the January values.

Except Sugar cookie (9.5% inc comparing January quantity), all the product sales have decrease trend and the significant one is Chocolate Chip with 82%.

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**Seasonality**

In terms of seasonality, as the term is too short like 3 months, it is not possible to identify any seasonality, but if current short term is evaluated, the significant peak in sales in March can be seen. If we look into the detail, we can see there is increase in quantities of Park & Shop and Tres Delicious customers. The reasons of this peak could be analysed to find out the reasons and take actions.

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**Customers**

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Tres Delicious customer has the highest margin with 59% even their sales revenue and profit are the lowest comparing with other customers. Their product mix contains high amount of Snickerdoodle and Sugar products with 25% and 18%, which is among the highest three products.

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Even, Park & Shop CS is the new customer their purchase amount (profit and revenue) is the highest and stays as second in terms of margin with a 57.5%.

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ABC Groceries and ACME Bites have similar in revenue and profit values, ABC Groceries makes higher values with less quantity (3973 vs 3544). ABC Groceries’ product mix contains Chocolate Chip and Oatmeal Raisin cookies with a total of 50%, which has high revenue value, but ACME Bites highest selling two products are the lowest priced products, with a total of 46%.

ABC Groceries ACME Bites

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Wholesome Foods’s product mix contains 22% Fortune Cookies and 18% Sugar cookies, which are the lowest priced products.

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ABC Groceries does not have any order in March, and ACME Bites does not have an order before 20th January, which shows frequency of order is low.

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1. **DASHBOARD**

I prepared the dashboard in Power BI as I believe is more functional than Excel dashboard with its interactive features.

I have 3 different sheets in my dashboard. In the beginning, I prepared just a single dashboard but as it wasn’t effective to tell the story in my report and in terms of visualisation, then I splitted them into three sheets.

First dashboard shows the values based on products.

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Second dashboard shows customer-based values.

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Third one shows the tables and charts that I used in this report.

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1. **CONCLUSION AND RECOMMENDATIONS FOR ACTION**

**Customers**

In general, for all the customers, product mix is so effective to identify the revenue and profit. Increasing the high-priced and high-margin products in the orders will make positive contribution to profit.

ABC Groceries has no placed order in March and ACME Bites has his first order on 20th January. The reasons of the low frequency or lack of order need to be further analysed.

Tres Delicious customer must be focused on to increase order quantities as they have the highest margins. As their product mix gives the highest margin, increase in quantities especially in high margin cookies will benefit to increase profit too. Contrary to the notes (High maintenance, not sure if it's worth having them as a customer, but don't tell them that!) this customer worth to have as a customer if they have a potential of growth.

Park & Shop Convenience Stores are doing very well although they are new customer. Spending effort to retain this customer by keeping the product mix and purchase amounts at same level will give positive results.

As ABC Groceries and ACME Bites have similar values, I evaluated them together. ACME Bites is the second highest in terms of quantities, with a product mix of low-priced cookies, they have lowest margin. ACME Bites seems to have good potential in terms of quantities, needs some effort to change product mix with high-priced products.

Comparing ACME Bites, ABC Groceries seems to be a candidate for best customer with their high profit and revenue and quantities.

Wholesome Food’s product mix should be evaluated to increase high-priced and high-margin product proportions to increase the margin and profit values.

**Products**

High-priced products sell less than low-priced products, but they have higher profit and revenue in total. This shows that to increase sales values, I recommend focusing on increasing high-priced products sales quantities for each customer.

Company doesn’t have any product in the range of $1.5 – $2.5. As the market is price sensitive, adding new products in this price range would benefit to cover this gap.

Fortune Cookies has very low contribution to company growth but keeping it in product mix would be beneficial as they help to increase turnover.

The significant decrease in sales in March needs to be analysed in detail.

**Future Sales Predictions**

I recommend further analysis with at least 1 year data to make effective comments which would be beneficial for future planning and strategies.