Food Trends: Understanding Customer Preferences using Power BI

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Internship Program: Infosys Springboard Program

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Project Abstract: Bridging Data and Dining Decisions

This project focuses on leveraging **Power BI** to conduct a deep analysis of food preferences, consumption patterns, and nutritional data.

Goal: To transform raw data into actionable insights for the food industry, helping stakeholders move from intuition to data-driven strategies for menu design, pricing, and marketing. **Data Source:** The analysis is based on a comprehensive synthetic dataset, Food Trends Dataset.xlsx, simulating real-world customer choices and nutritional compositions.

Problem Statement: The Challenge of Evolving Palates

Changing Consumer Habits

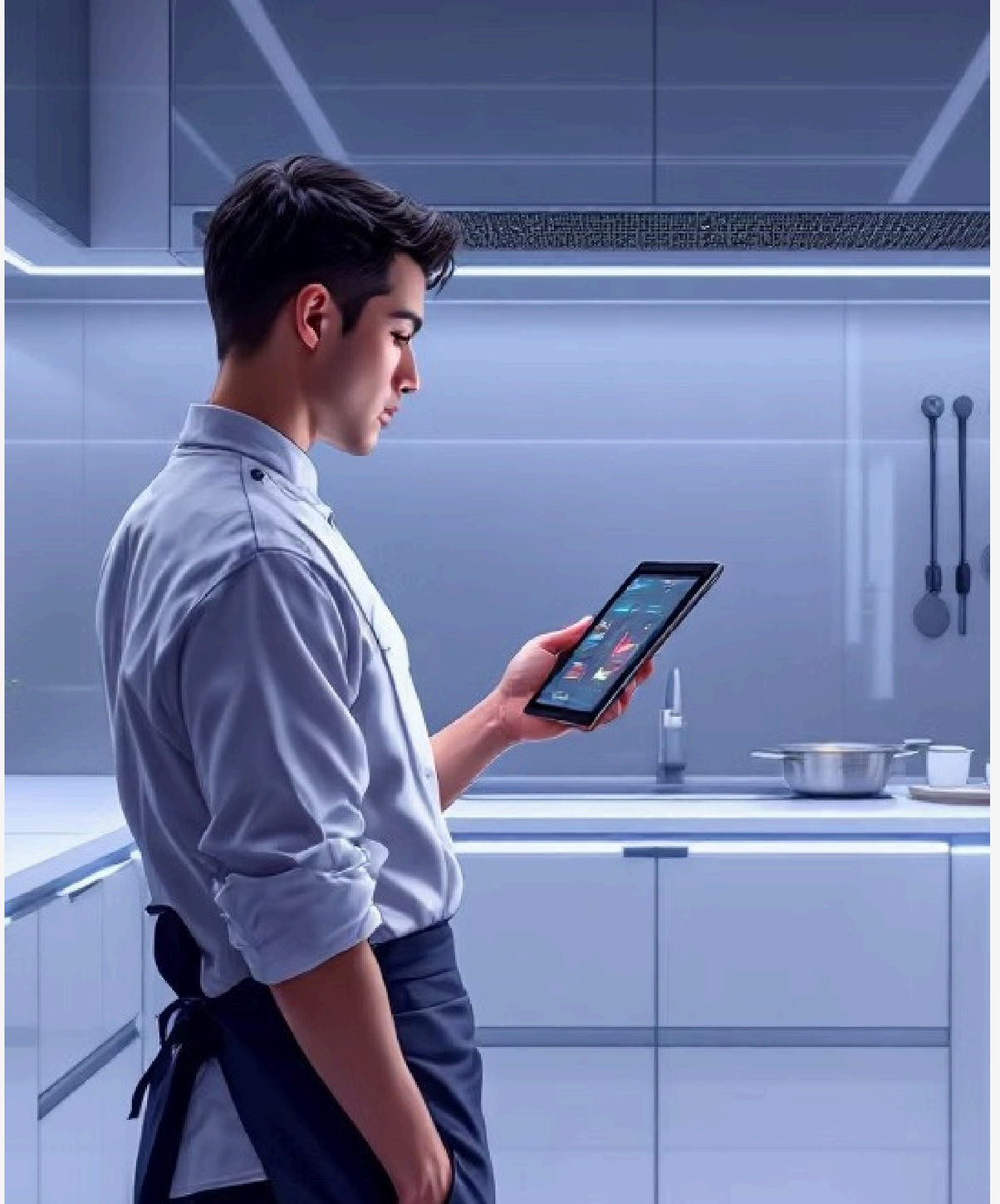
The market is fluid, with rapid shifts in dietary trends, health consciousness, and ethical sourcing demands. Guesswork in product development leads to significant waste and missed opportunities.

Need for Data-Driven Insights

Currentdecisions on menu offerings, pricing, and nutritional labeling often lack empirical backing. A data-centric approach is required to minimize risk and maximize customer satisfaction.

Optimizing the Value Chain

There is a critical business need to link customer preference data with key variables like nutrition, cost, and rating to achieve optimal product placement and profit abilit y.



Core Project Objectives

Our methodology was structured around three specific, measurable objectives to ensure the deliverable provided tangible business value.

Analyze Consumer Patterns

To identify and analyze underlying consumer preferences, popular food categories, and mealtime consumption trends using detailed segmentation techniques.

Visualize Key Variables in Power BI

To create dynamic, interactive dashboards focusing on the relationships between nutritional information (Calories, Sugar, Fat) and customer satisfaction ratings.

Support Data-Driven Decisions

To provide stakeholders with clear, actionable insights that directly influence strategic decisions in product development, marketing campaigns, and inventory management.

System Architecture and Workflow

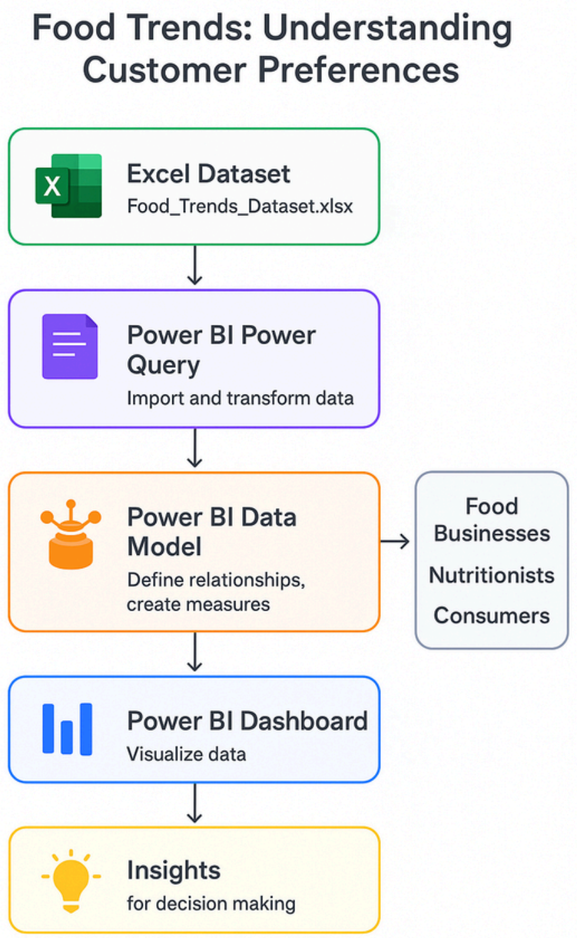
The project followed a standard Business Intelligence workflow, ensuring data integrity and end-to-end traceability from raw input to final insight.

Data Source

Power BI

Data Cleaning

Data Modeling



- This structured workflow ensured that all analytical outputs were based on validated, cleaned, and properly modeled data.

Key Technologies Leveraged

Power BI Desktop

Primary tool for data modeling, visualization design, and report creation. Its interactive capabilities were crucial for exploring complex data relationships.

Microsoft Excel

Used as the initial data container and for preliminary data inspection and preparation before loading into the BI environment.

DAX (Data Analysis Expressions)

Utilized for creating advanced calculated columns and measures (e.g., Weighted Average Rating, Comparative Calorie Indexes) necessary for deeper analysis.

Power Query Editor (M-Language)

Essential for robust data transformation, cleaning, merging disparate tables, and handling missing or inconsistent data types.

Implementation Process: 5 Critical Steps

Data Import

Securely connecting the source Excel file to Power BI Desktop via Power Query.

Data Cleaning & ETL

Applying transformationsinPower Query to ensure high data quality (e.g., removing duplicates, standardizing formats, handling nulls).

DAX Calculations

Defining the dimensional model and writing complex DAX measures to enable detailed segmentation and comparative metrics.

Dashboard Design

Creating visually appealing and interactive reports focusing on hierarchy, filter flow, and user experience (UX).

Publishing & Sharing

Deploying the final report to the Power BI Service for collaboration, sharing with stakeholders, and secure access across the organization.

Key Dashboard Visualisations

The dashboard provides an at-a-glance view of market dynamics, facilitating rapid insight generation.

- **KPI Cards:** Highlight key metrics such as Average Rating, Total Items Analyzed, and Overall Caloric Density.
- **Calorie vs. Rating Scatter Plot:** Visually reveals the inverse or complex relationship between nutritional values and customer satisfaction.
- **Preference Rankings:** Dynamic charts showing the top and bottom performing food types and cuisines based on volume and rating.
- **Time Series Analysis:** Tracking preference shifts over hypothetical time periods to identify emerging trends.

Key Results and Actionable Insights

Rating vs. Nutrition Trend

Our analysis indicates a subtle, yet significant trend: while comfort foods remain popular, high-rated items (4.5+) show a better balance of lower sugar/fat content than average items.

Vegetarian Preference:

Vegetarian meal options were consistently rated 12% higher on average than non-vegetarian options, signaling a strong market for plant-based innovation.

Applications and Business Benefits

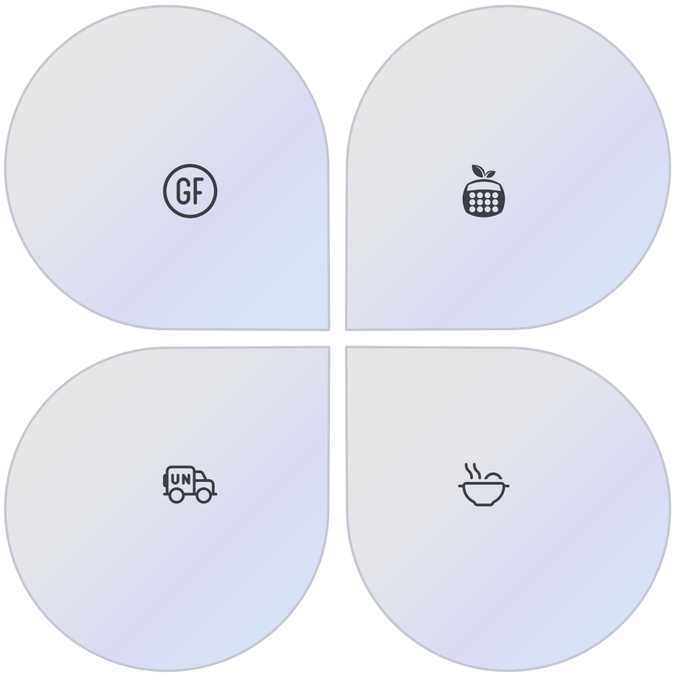
The PowerBI solution offer stangible advantages across various stake holder groups in the food ecosystem.

Restaurants

Enables targeted marketing based on localized preference data and dynamic menu adjustments to maximize profit margins.

Supply Chain

Predictive preference data can inform inventory management, reducing waste and ensuring stock availability for high-demand items.



Nutritionists

Provides data on actual consumption patterns, allowing them to formulate more realistic and effective healthy eating recommendations.

Food Brands

Supports menu optimization and product development by identifying gaps in the market and ensuring new offerings align with top-rated attributes.

DASHBOARD

Food Trends Understanding Customer Preferences

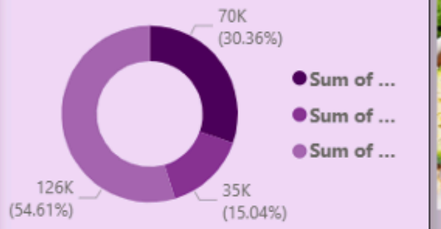
Ages
35 67

Sum of Daily Calorie...
1M

Dietary Preferen...
All

Gender
Female
Male

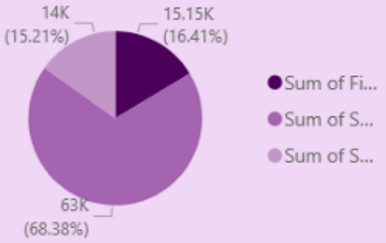
Sum of Protein, Sum of Fat and Sum of Carbohydrates



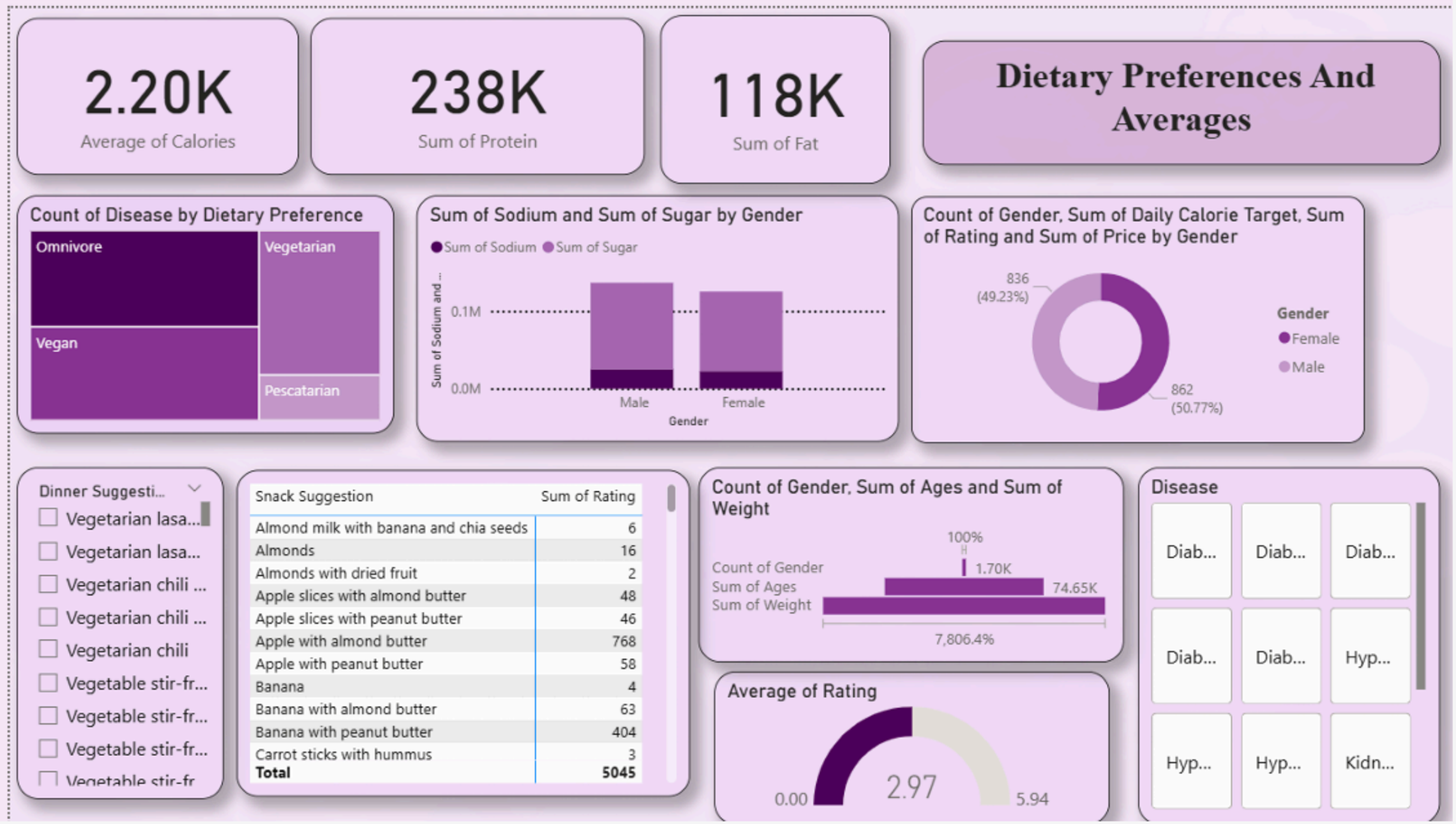
Lunch Suggestion	Sum c
Veggie stir-fry	11
Vegetarian pasta with marinara sauce	
Vegetarian chili with a side of whole-wheat bread	
Vegetarian burrito bowl with brown rice	
Vegan lentil stew with brown rice	
Turkey sandwich with whole-wheat bread	
Turkey sandwich on whole-wheat bread with vegetables	
Turkey sandwich on whole-wheat bread with salad	
Turkey sandwich on whole-wheat bread	
Turkey sandwich on whole wheat bread with vegetables	
Turkey sandwich on whole grain bread	
Turkey sandwich	7
Total	**1,07**

Breakfast Suggestion	Sum of Rating
Yogurt with granola and fruit	6
Yogurt with fruit and granola	5
Whole-wheat toast with egg and avocado	3
Wholegrain toast with avocado	5
Vegan pancakes with syrup	99
Tofu scramble with whole-wheat toast	2
Tofu scramble with whole wheat toast and fruit	11
Tofu scramble with whole wheat toast	1
Tofu scramble with veggies and whole-wheat toast	6
Tofu scramble with veggies	134
Tofu scramble with vegetables and whole-wheat toast	9
Total	**1433**

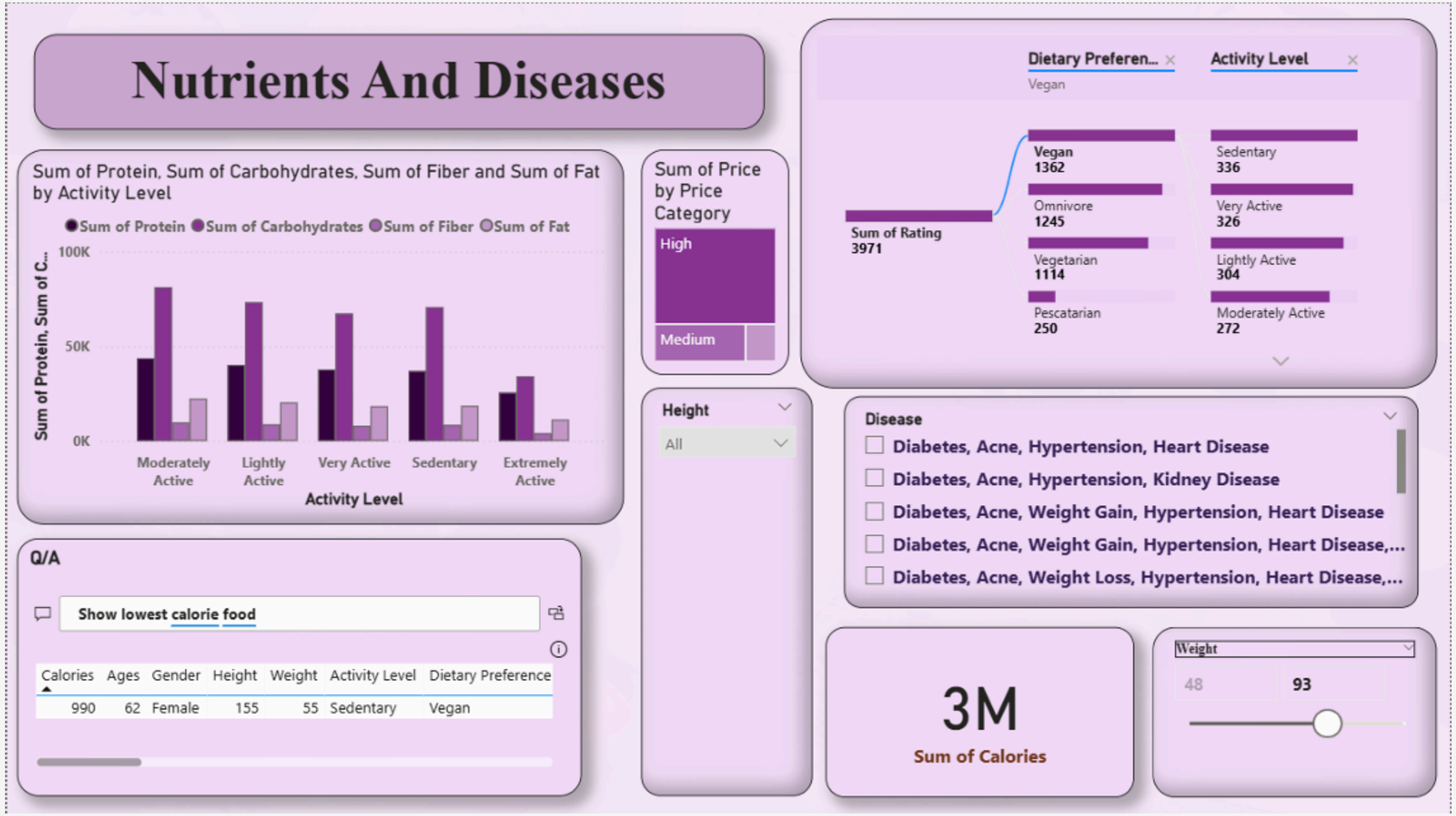
Sum of Fiber, Sum of Sugar and Sum of Sodium



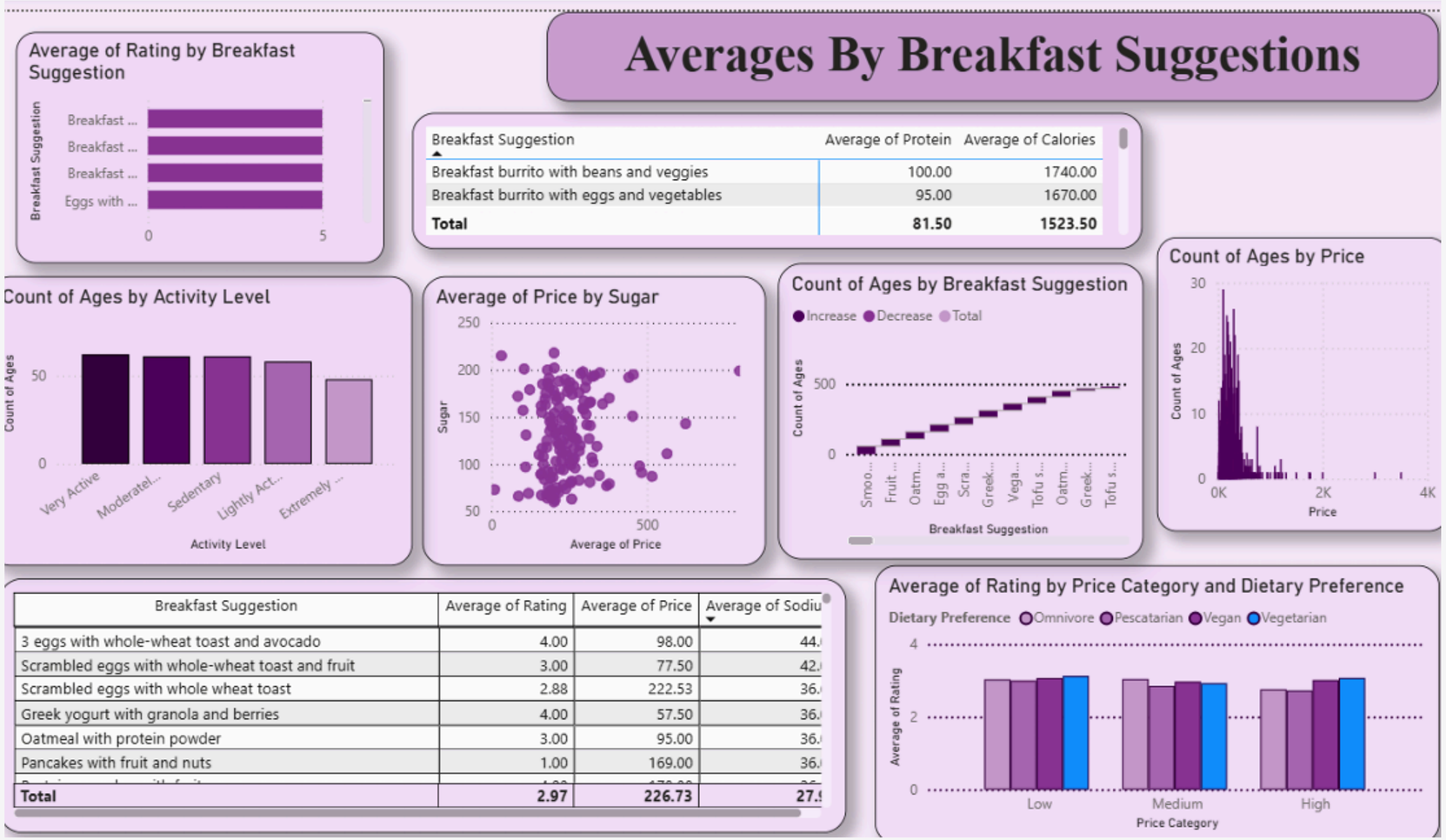
Dietary Preference and averages



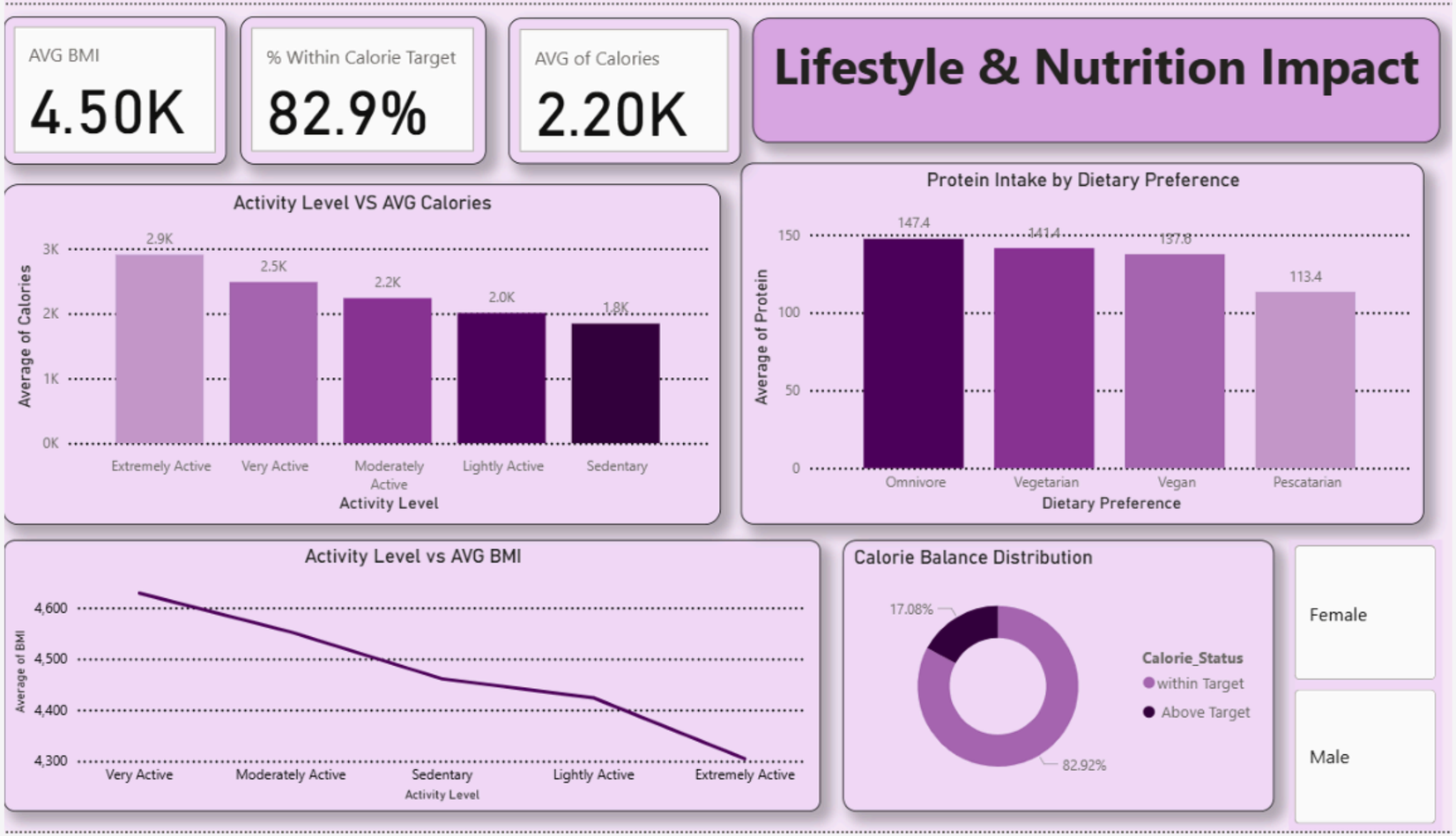
Nutrients and Diseases



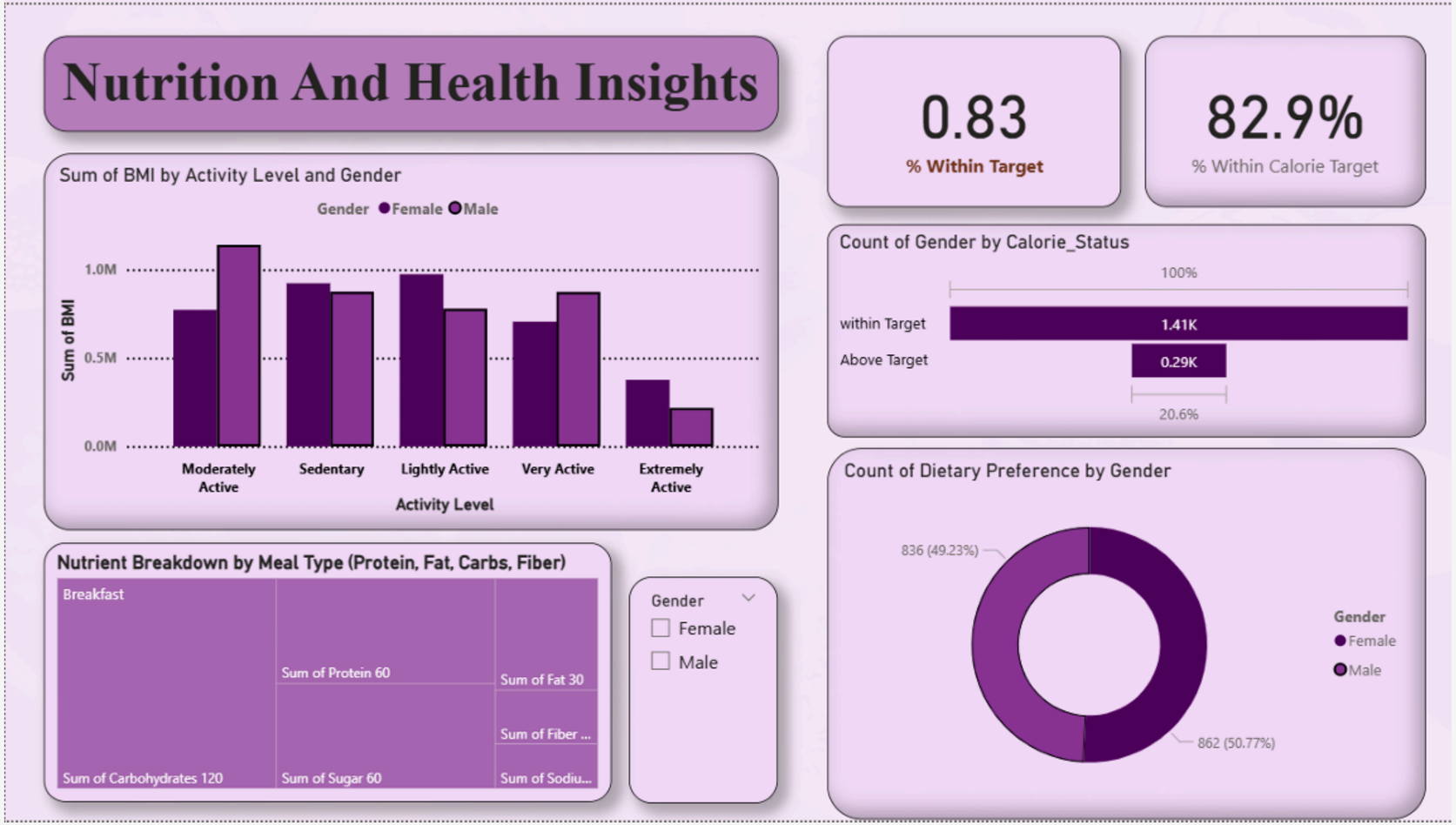
Averages by Breakfast Suggestions



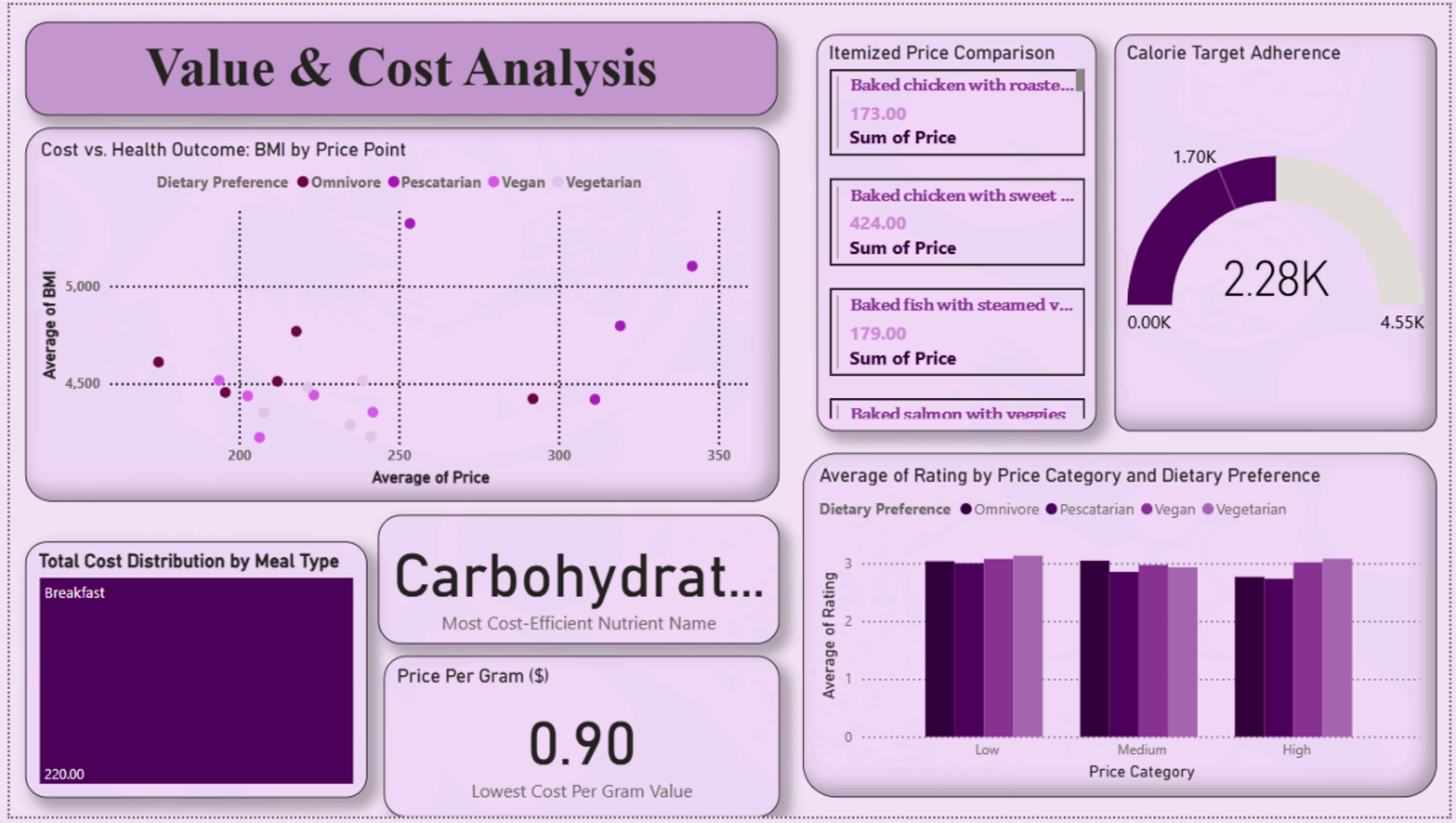
Lifestyle & Nutrition Impact



Nutrition and Health Insight



Value & Cost Analysis



Thank You