

# Nutritional Analysis Report: McDonald's Menu Items

## 1. Introduction

The purpose of this analysis is to evaluate the nutritional profile of McDonald's menu items, uncover patterns and trends, and provide actionable recommendations for improving the nutritional value of the menu. The dataset analyzed contains information on 260 menu items, covering various categories such as beverages, breakfast, desserts, salads, and more. Key metrics include calories, fat, protein, carbohydrates, and vitamins, among others.

## 2. Key Findings

### 2.1 Calorie Distribution

- The calorie content across items ranges from 0 (Diet Coke) to 1,880 (40-piece Chicken McNuggets), with an average of 368 calories per item.
- Beverages and salads tend to have the lowest calorie counts, while breakfast items and chicken & fish items rank higher on average.

### 2.2 Nutritional Components

- **Fat:** Total fat content averages 14g per item, with certain breakfast and chicken & fish items containing significantly higher values.
- **Protein:** The average protein content is 13g, with chicken & fish items providing the highest values.
- **Carbohydrates:** Smoothies and shakes lead in carbohydrate content, with an average of 90g per item in this category.

### 2.3 High- and Low-Calorie Items

- **Top High-Calorie Items:**
  - Chicken McNuggets (40-piece): 1,880 calories
  - Big Breakfast with Hotcakes (Large Biscuit): 1,150 calories
- **Top Low-Calorie Items:**
  - Diet Coke (Small, Medium, Large, and Child): 0 calories
  - Diet Dr. Pepper (Small): 0 calories

### 2.4 Correlations

- Strong positive correlation observed between total fat and calorie content (correlation coefficient: 0.87).
- Weak correlations exist between sugar and protein content, highlighting the varied composition of menu items.

### 2.5 Protein-to-Calorie Ratio

- The top 10 items with the highest protein-to-calorie ratios include grilled chicken and other lean protein options, emphasizing their role as healthier choices.

## 3. Visual Highlights

- **Calorie Distribution:**

- Histograms reveal a skewed distribution, with most items clustering under 500 calories.
- Outliers include high-calorie breakfast and chicken items.
- **Category Comparisons:**
  - Boxplots highlight the wide range of calorie values within categories like "Breakfast" and "Chicken & Fish."
- **Macronutrient Pair Plots:**
  - Clear clustering by category, with shakes and smoothies dominating the carbohydrate axis.
- **Heatmap:**
  - Nutritional correlations demonstrate the interconnectedness of fat, calories, and protein across items.

#### **4. Recommendations for McDonald's**

1. **Increase Protein-Rich Options:**
  - Introduce more high-protein, low-calorie items such as grilled chicken, plant-based proteins, and enhanced salads.
2. **Reduce Saturated Fat Content:**
  - Reformulate recipes to utilize healthier oils and reduce reliance on high-fat components.
3. **Low-Calorie Alternatives:**
  - Develop smaller portion sizes and lighter versions of popular items to cater to health-conscious consumers.
4. **Enhanced Transparency:**
  - Clearly display nutritional information on packaging and menus to help customers make informed choices.
5. **Educational Campaigns:**
  - Promote balanced meal options through campaigns highlighting high-protein and low-fat choices.

#### **5. Conclusion**

This analysis highlights significant opportunities for McDonald's to enhance its menu's nutritional profile while maintaining consumer satisfaction. By implementing the recommended changes, McDonald's can cater to health-conscious customers, improve public perception, and foster customer loyalty. Future analyses can focus on consumer feedback to refine these strategies further.