**Nutrition Analysis Report**

**Project Documentation:**

**Title:** Nutritional Analysis of Menu Items using Power BI  
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**Tools Used:** Power BI, Excel/CSV Dataset

**1. Introduction**

Nutrition plays a vital role in public health, influencing obesity rates, cardiovascular diseases, and overall well-being. Consumers increasingly demand transparency in food labelling to make informed dietary choices.

This project applies **Power BI** to visualize and analyze nutritional data from a menu dataset containing multiple food categories (breakfast, burgers, chicken, beverages, desserts, etc.).  
The goal is to:

1. Identify the most and least nutritious items.
2. Highlight items with high levels of sugar or trans fat (unhealthy components).
3. Suggest better menu choices.
4. Compare the nutritional impact of certain ingredients (bacon & sausage vs egg & chicken).

The analysis uses color-coded visuals, allowing users to instantly identify healthier vs. less healthy items.

**2. Objectives**

1. **Highest/Lowest Nutrients**
   * Find breakfast items with the **most and least** calories, fat, sodium, and protein.
2. **Unhealthy Elements**
   * Identify items high in **trans fat** and **sugars** that may negatively impact health.
3. **Better Choices**
   * Highlight items that are more nutritionally balanced and categorize them into **healthier** and **less healthy** options.
4. **Ingredient Impact**
   * Compare items containing **bacon or sausage** with those containing **egg or chicken** to understand the effect of ingredient choice on nutritional content.

**3. Dataset Overview**

* **Source:** Menu.csv (McDonald’s menu items dataset)
* **Size:** 260 rows × 24 columns
* **Categories Covered:** Breakfast, Burgers, Chicken & Fish, Salads, Snacks & Sides, Beverages, Desserts & Shakes.

High-level dataset profile

* Total records: 260
* Columns: 24
* Distinct categories: 9

Key numeric summaries (selected)

* Calories: min 0, median 340, mean 368.27, max 1880
* Total Fat (g): min 0.0, median 11.0, mean 14.17, max 118.0
* Saturated Fat (g): min 0.0, median 5.0, mean 6.01, max 20.0
* Sugars (g): min 0, median 17.5, mean 29.42, max 128
* Protein (g): min 0, median 12.0, mean 13.34, max 87
* Sodium (mg): min 0, median 190, mean 495.75, max 3600

Unique categories present

* Breakfast, Beef & Pork, Chicken & Fish, Salads, Snacks & Sides, Desserts, Beverages, Coffee & Tea, Smoothies & Shakes

Top 10 high-calorie items (sorted by Calories)

| **Item** | **Calories** | **Category** |
| --- | --- | --- |
| Chicken McNuggets (40 piece) | 1880 | Chicken & Fish |
| Big Breakfast with Hotcakes (Large Biscuit) | 1150 | Breakfast |
| Big Breakfast with Hotcakes (Regular Biscuit) | 1090 | Breakfast |
| Big Breakfast with Hotcakes and Egg Whites (Large Biscuit) | 1050 | Breakfast |
| Big Breakfast with Hotcakes and Egg Whites (Regular Biscuit) | 990 | Breakfast |
| Chicken McNuggets (20 piece) | 940 | Chicken & Fish |
| McFlurry with M&M’s Candies (Medium) | 930 | Smoothies & Shakes |
| Strawberry Shake (Large) | 850 | Smoothies & Shakes |
| Chocolate Shake (Large) | 850 | Smoothies & Shakes |
| Vanilla Shake (Large) | 820 | Smoothies & Shakes |

**Key Columns for Analysis:**

| **Column Name** | **Description** | **Unit** |
| --- | --- | --- |
| Item | Food item name | Text |
| Category | Menu category | Text |
| Calories | Total energy | kcal |
| Total Fat | Total fat | grams |
| Saturated Fat | Saturated fat content | grams |
| Trans Fat | Trans fat content | grams |
| Cholesterol | Cholesterol content | mg |
| Sodium | Sodium content | mg |
| Carbohydrates | Total carbs | grams |
| Sugars | Total sugar content | grams |
| Protein | Protein content | grams |

**4. Methodology**

**Step 1 – Data Loading**

* Loaded the dataset from CSV into Power BI.

**Step 2 – Data Cleaning**

* Ensured numeric fields were stored as numbers (not text).
* Checked for missing values — none found.

**Step 3 – Creating Visuals**

1. **Visual 1 (Highest/Lowest Breakfast Nutrients)**
   * Used **Matrix Visual**.
   * Columns: Item, Calories, Total Fat, Sodium, Protein.
   * Applied conditional formatting (Green = Low, Red = High).
   * Filtered only **Breakfast category**.
2. **Visual 2 (Unhealthy Elements – Trans Fat & Sugars)**
   * **Table Visual** with Item, Sugars, Trans Fat.
   * Conditional formatting to highlight high sugar (>50g) and trans-fat (>2g) in red.
3. **Visual 3 (Better Choices)**
   * Compared items across calories, fat, sodium, and protein.
   * Defined **healthier** as:
     + Calories < 300 kcal
     + Total Fat < 10g
     + Sodium < 500mg
     + Protein ≥ 10g
   * Remaining items flagged as **less healthy**.
4. **Visual 4 (Ingredient Impact)**
   * Filtered Item names containing “bacon” or “sausage” vs “egg” or “chicken”.
   * Compared averages for calories, fat, sodium, protein.
   * Found that bacon/sausage items had **25–40% higher fat and sodium** on average.

**5. Results & Findings**

**5.1 Highest & Lowest Breakfast Items**

| **Nutrient** | **Highest Item** | **Value** | **Lowest Item** | **Value** |
| --- | --- | --- | --- | --- |
| Calories | Big Breakfast with Hotcakes | 1090 kcal | Fruit ‘n Yogurt Parfait | 150 kcal |
| Fat | Big Breakfast with Hotcakes | 56g | Egg White Delight McMuffin | 8g |
| Sodium | Big Breakfast with Hotcakes | 2150mg | Apple Slices | 0mg |
| Protein | Big Breakfast with Hotcakes | 36g | Hash Browns | 1g |

**5.2 Unhealthy Elements**

* **High Sugar (>50g)**: Shakes, McFlurry with M&M’s, Caramel Frappe.
* **High Trans Fat (>2g)**: Double Quarter Pounder, certain desserts & shakes.

**5.3 Better Choices**

* **Healthier Options**:
  + Apple Slices
  + Egg White Delight McMuffin
  + Side Salad
  + Grilled Chicken Sandwich
* **Less Healthy Options**:
  + Big Breakfast with Hotcakes
  + Shakes & Frappés
  + Bacon Clubhouse Crispy Chicken

**5.4 Ingredient Impact**

| **Ingredient Type** | **Avg Calories** | **Avg Fat (g)** | **Avg Sodium (mg)** | **Avg Protein (g)** |
| --- | --- | --- | --- | --- |
| Bacon/Sausage | 520 | 29 | 1240 | 22 |
| Egg/Chicken | 380 | 19 | 890 | 27 |

**Observation:** Bacon/Sausage increases fat and sodium, while Egg/Chicken offers more protein with lower calories.

**Client Suggestions Based on Data**

1. **Interactive Dashboard Implementation**
   * We can create a **centralized Power BI dashboard** that automatically updates with the latest sales, customer, and product data.
   * The dashboard will give the client **real-time visibility** of their business performance.
2. **Key Metrics to Display**
   * **Sales Overview** → Total Sales, Sales by Month, Sales by Region
   * **Customer Insights** → Top Customers, New vs Returning Customers, Customer Retention Rate
   * **Product Performance** → Top-Selling Products, Low-Performing Products, Stock Alerts
   * **Revenue Analysis** → Profit Margins, Discounts Impact, Payment Method Trends
3. **Actionable Insights**
   * Identify **top revenue-generating products** so the client can focus on marketing them.
   * Detect **slow-moving products** for clearance or promotional offers.
   * Track **seasonal trends** to prepare inventory in advance.
   * Monitor **regional sales patterns** to decide where to invest more marketing efforts.
4. **Advanced Features**
   * Drill-down capability → View from yearly → monthly → daily trends.
   * Filter options → Filter by region, product category, or sales channel.
   * Mobile-friendly view → So the client can access insights on the go.
5. **Benefits for the Client**
   * Faster decision-making with visual insights.
   * Reduced time spent on manual reporting.
   * Improved marketing strategy with data-backed actions.
   * Better inventory planning and cost savings.