McDonald's Menu Nutritional Analysis - Project

https://github.com/Prasannabhatkhande/McDonald-s-Menu-Nutritional-Analysis---Project1.git (https://github.com/Prasannabhatkhande/McDonald-s-Menu-Nutritional-Analysis---Project1.git) -Prasanna bhatkhande

1. Importing Libraries & Loading the Data ¶

In [31]:
```
import pandas as pd
import seaborn as sns
import matplotlib.pyplot as plt
import warnings
warnings.filterwarnings("ignore")
```

In [32]:
```
mcd_dataset = pd.read_csv('Nutrical Dataset.csv')
```

In [33]:
```
mcd_dataset
```

]:

	Category	Item	Serving Size	Calories	Calories from Fat	Total Fat	Total Fat (% Daily Value)	Saturated Fat	Saturated Fat (% Daily Value)	Trans Fat	...	Carbohydrates	Carbohydrates (% Daily Value)	Dietary Fiber	Dietary Fiber (% Daily Value)	Sugars	Prot
0	Breakfast	Egg McMuffin	4.8 oz (136 g)	300	120	13.0	20	5.0	25	0.0	...	31	10	4	17	3	
1	Breakfast	Egg White Delight	4.8 oz (135 g)	250	70	8.0	12	3.0	15	0.0	...	30	10	4	17	3	
2	Breakfast	Sausage McMuffin	3.9 oz (111 g)	370	200	23.0	35	8.0	42	0.0	...	29	10	4	17	2	
3	Breakfast	Sausage McMuffin with Egg	5.7 oz (161 g)	450	250	28.0	43	10.0	52	0.0	...	30	10	4	17	2	
		Sausage McMuffin	5.7 oz														

In [34]:
```
mcd_dataset.shape
```

Out[34]:
```
(260, 24)
```

After loading the dataset we found the actual shape (with the .shape() function) of the dataframe which comprises of 260 different menu items spread across a range of category menu, where we will go through 22 different columns representing all the nutritional variables, which will help us with the indepth analysis.

2. Data processing

In [35]:
```
mcd_dataset.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 260 entries, 0 to 259
Data columns (total 24 columns):
 #   Column                        Non-Null Count  Dtype
---  ------                        --------------  -----
 0   Category                      260 non-null    object
 1   Item                          260 non-null    object
 2   Serving Size                  260 non-null    object
 3   Calories                      260 non-null    int64
 4   Calories from Fat             260 non-null    int64
 5   Total Fat                     260 non-null    float64
 6   Total Fat (% Daily Value)     260 non-null    int64
 7   Saturated Fat                 260 non-null    float64
 8   Saturated Fat (% Daily Value) 260 non-null    int64
 9   Trans Fat                     260 non-null    float64
 10  Cholesterol                   260 non-null    int64
 11  Cholesterol (% Daily Value)   260 non-null    int64
 12  Sodium                        260 non-null    int64
 13  Sodium (% Daily Value)        260 non-null    int64
 14  Carbohydrates                 260 non-null    int64
 15  Carbohydrates (% Daily Value) 260 non-null    int64
 16  Dietary Fiber                 260 non-null    int64
 17  Dietary Fiber (% Daily Value) 260 non-null    int64
 18  Sugars                        260 non-null    int64
 19  Protein                       260 non-null    int64
 20  Vitamin A (% Daily Value)     260 non-null    int64
 21  Vitamin C (% Daily Value)     260 non-null    int64
 22  Calcium (% Daily Value)       260 non-null    int64
 23  Iron (% Daily Value)          260 non-null    int64
dtypes: float64(3), int64(18), object(3)
memory usage: 48.9+ KB
```

In [36]:
```
mcd_dataset.isnull()
```

:

	Category	Item	Serving Size	Calories	Calories from Fat	Total Fat	Total Fat (% Daily Value)	Saturated Fat	Saturated Fat (% Daily Value)	Trans Fat	...	Carbohydrates	Carbohydrates (% Daily Value)	Dietary Fiber	Dietary Fiber (% Daily Value)	Sugars	Protein	Vi
0	False	False	False	False	False	False	False	False	False	False	...	False	False	False	False	False	False	
1	False	False	False	False	False	False	False	False	False	False	...	False	False	False	False	False	False	
2	False	False	False	False	False	False	False	False	False	False	...	False	False	False	False	False	False	
3	False	False	False	False	False	False	False	False	False	False	...	False	False	False	False	False	False	
4	False	False	False	False	False	False	False	False	False	False	...	False	False	False	False	False	False	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
255	False	False	False	False	False	False	False	False	False	False	...	False	False	False	False	False	False	
256	False	False	False	False	False	False	False	False	False	False	...	False	False	False	False	False	False	

In [37]:
```
mcd_dataset.isnull().sum()
```

Out[37]:
```
Category                          0
Item                              0
Serving Size                      0
Calories                          0
Calories from Fat                 0
Total Fat                         0
Total Fat (% Daily Value)         0
Saturated Fat                     0
Saturated Fat (% Daily Value)     0
Trans Fat                         0
Cholesterol                       0
Cholesterol (% Daily Value)       0
Sodium                            0
Sodium (% Daily Value)            0
Carbohydrates                     0
Carbohydrates (% Daily Value)     0
Dietary Fiber                     0
Dietary Fiber (% Daily Value)     0
Sugars                            0
Protein                           0
Vitamin A (% Daily Value)         0
Vitamin C (% Daily Value)         0
Calcium (% Daily Value)           0
Iron (% Daily Value)              0
dtype: int64
```

.

3. Exploratory Data Analysis

A. Analyze the distribution of calorie counts across menu items.

In [38]:
```
mcd_dataset.head()
```

Out[38]:

	Category	Item	Serving Size	Calories	Calories from Fat	Total Fat	Total Fat (% Daily Value)	Saturated Fat	Saturated Fat (% Daily Value)	Trans Fat	...	Carbohydrates	Carbohydrates (% Daily Value)	Dietary Fiber	Dietary Fiber (% Daily Value)	Sugars
0	Breakfast	Egg McMuffin	4.8 oz (136 g)	300	120	13.0	20	5.0	25	0.0	...	31	10	4	17	3
1	Breakfast	Egg White Delight	4.8 oz (135 g)	250	70	8.0	12	3.0	15	0.0	...	30	10	4	17	3
2	Breakfast	Sausage McMuffin	3.9 oz (111 g)	370	200	23.0	35	8.0	42	0.0	...	29	10	4	17	2
3	Breakfast	Sausage McMuffin with Egg	5.7 oz (161 g)	450	250	28.0	43	10.0	52	0.0	...	30	10	4	17	2
4	Breakfast	Sausage McMuffin with Egg Whites	5.7 oz (161 g)	400	210	23.0	35	8.0	42	0.0	...	30	10	4	17	2

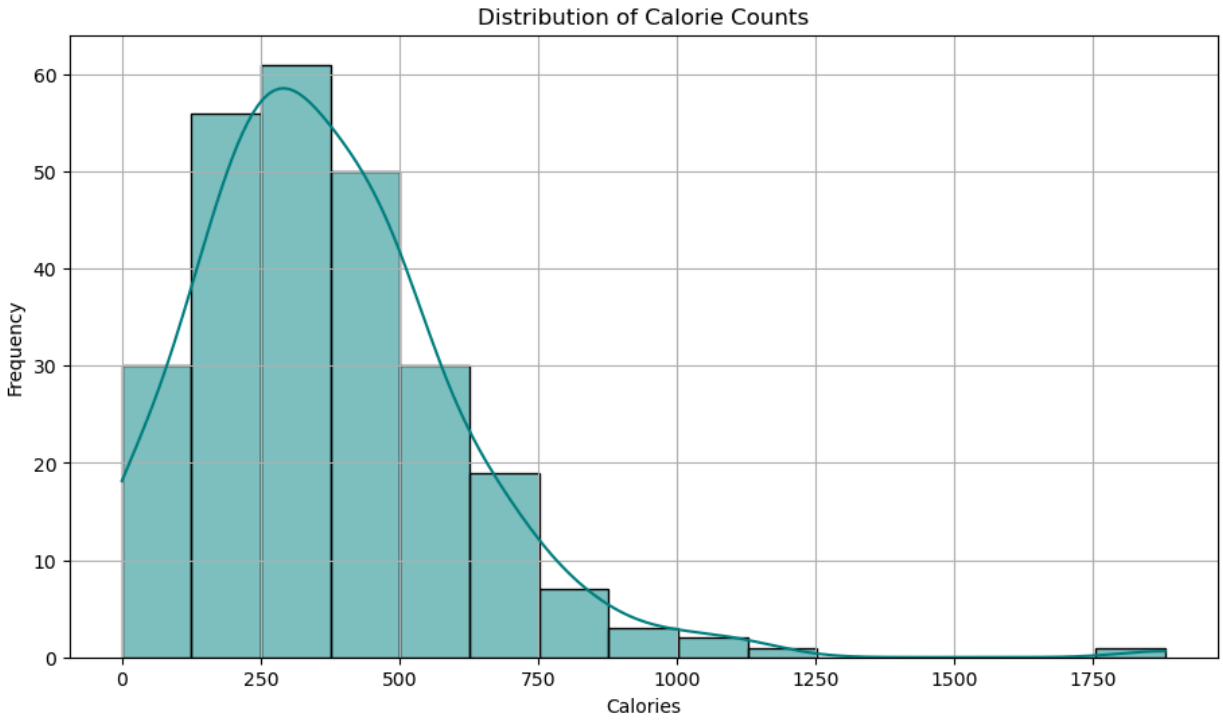
5 rows × 24 columns

A.1] Calories

In [39]:
```
Calories=mcd_dataset['Calories'].describe()
Calories
```

Out[39]:
```
count     260.000000
mean      368.269231
std       240.269886
min         0.000000
25%       210.000000
50%       340.000000
75%       500.000000
max      1880.000000
Name: Calories, dtype: float64
```

In [40]:
```
plt.figure(figsize=(11,6))
sns.histplot(data=mcd_dataset, x='Calories',bins=15, kde = True, color = "teal")
plt.title('Distribution of Calorie Counts')
plt.xlabel('Calories')
plt.ylabel('Frequency')
plt.grid()
plt.show()
```



Descriptive Statistics -

- The mean calorie count is 368.27 calories.
- The standard deviation is 240 calories, indicating the widespread in the calorie counts.
- 25% of the items have 210 or less calories, 50% of items have 340 or less calories & 75% of items have 500 or less calories.

we can see that the majority of items fall within the 125-500 calorie range which makes the distribution heavily skewed towards the right side, with a few outliers on both ends.

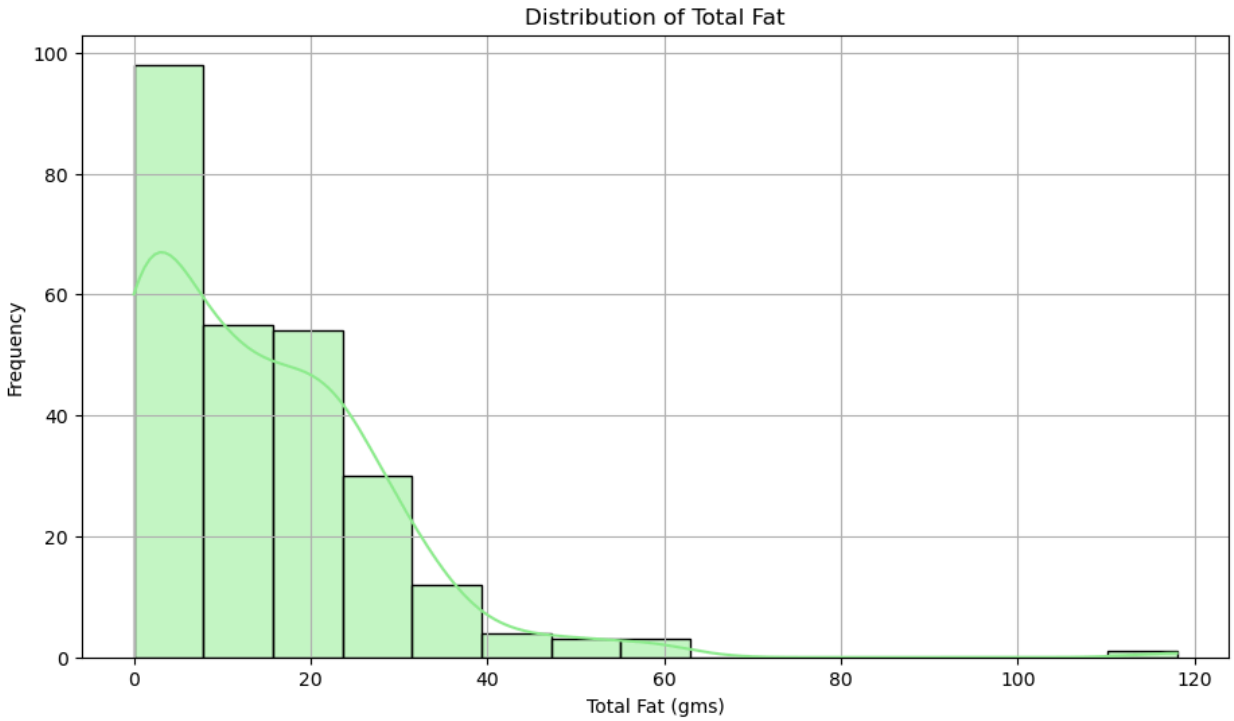
B. Explore the nutritional content (e.g., fat, protein, carbohydrates) of different items.

B.1] Total Fat (grams)

In [41]:
```
Total_fat=mcd_dataset['Total Fat'].describe()
Total_fat
```

Out[41]:
```
count    260.000000
mean      14.165385
std       14.205998
min        0.000000
25%        2.375000
50%       11.000000
75%       22.250000
max      118.000000
Name: Total Fat, dtype: float64
```

In [42]:
```
plt.figure(figsize=(11,6))
sns.histplot(data=mcd_dataset, x='Total Fat',bins=15, kde = True, color="lightgreen")
plt.title('Distribution of Total Fat')
plt.xlabel('Total Fat (gms)')
plt.ylabel('Frequency')
plt.grid()
plt.show()
```



Descriptive Statistics -

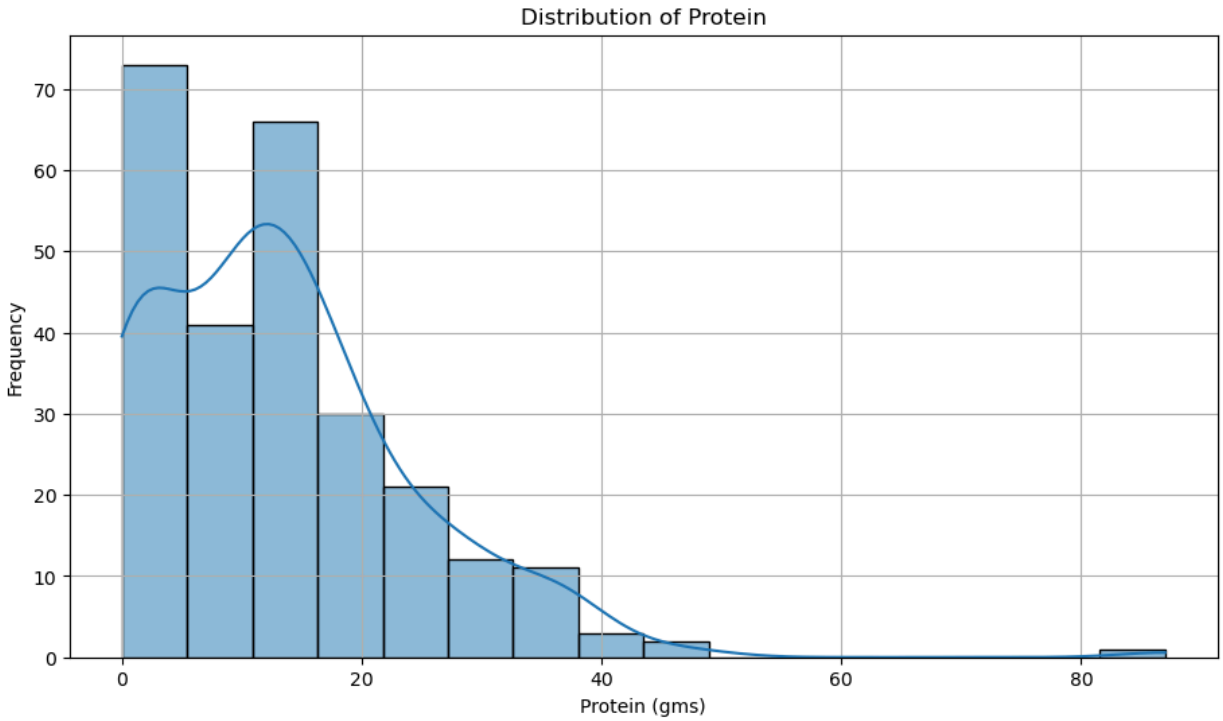
- The mean of the Total fat content is 14.16 grams.
- The standard deviation is 14.2 grams, indicating the moderate spread in the total fat values.
- 25% of the items have 2.37 grams or less total fat, 50% of items have 11 grams or less total fat & 75% of items have 22.25 grams or less total fat.

B.2] Proteins (grams)

In [43]:
```
Proteins =mcd_dataset['Protein'].describe()
Proteins
```

Out[43]:
```
count    260.000000
mean      13.338462
std       11.426146
min        0.000000
25%        4.000000
50%       12.000000
75%       19.000000
max       87.000000
Name: Protein, dtype: float64
```

In [44]:
```
plt.figure(figsize=(11,6))
sns.histplot(data=mcd_dataset, x='Protein',bins=16, kde = True )
plt.title('Distribution of Protein')
plt.xlabel('Protein (gms)')
plt.ylabel('Frequency')
plt.grid()
plt.show()
```



Descriptive Statistics -

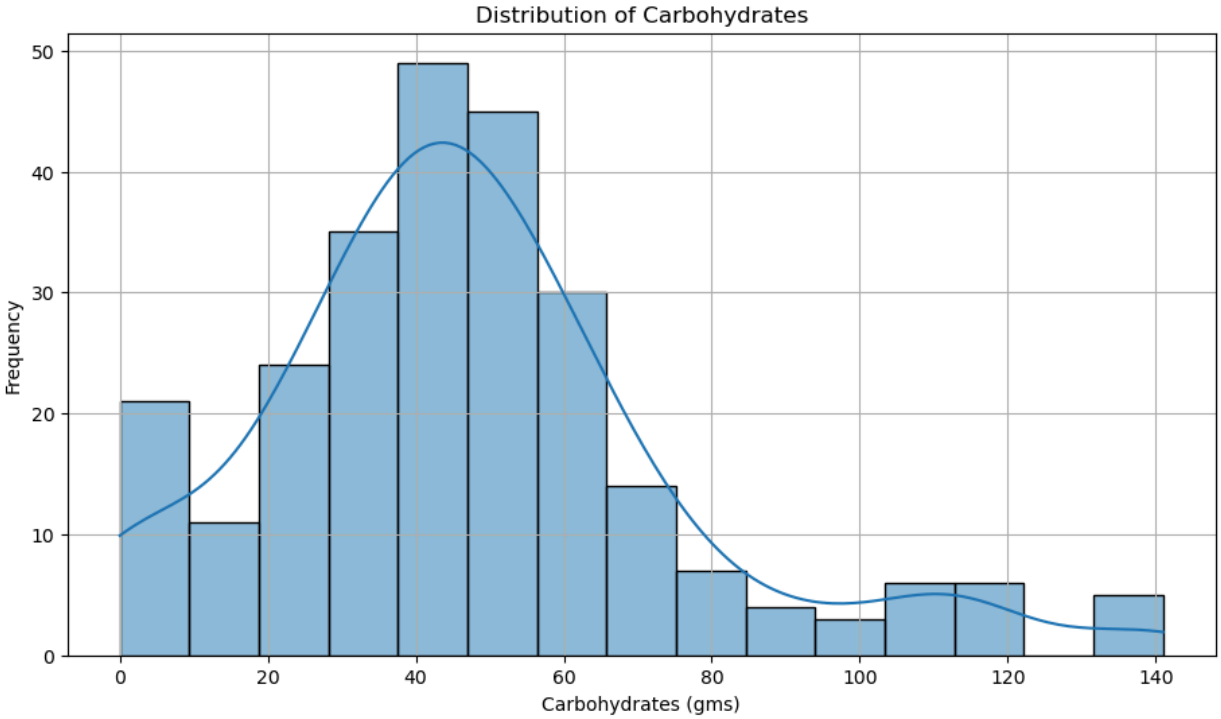
- The mean of the Protein content is 13.33 grams.
- The standard deviation is 11.43 grams, indicating the moderate spread in the protein values.
- 25% of the items have 12 grams or less proteins, 50% of items have 19 grams or less proteins & 75% of items have 87 grams or less proteins.

B.3] Carbohydrates (grams)

In [45]:
```
Carbohydrates= mcd_dataset['Carbohydrates'].describe()
Carbohydrates
```

Out[45]:
```
count    260.000000
mean      47.346154
std       28.252232
min        0.000000
25%       30.000000
50%       44.000000
75%       60.000000
max      141.000000
Name: Carbohydrates, dtype: float64
```

In [46]:
```
plt.figure(figsize=(11,6))
sns.histplot(data=mcd_dataset, x='Carbohydrates',bins=15, kde = True )
plt.title('Distribution of Carbohydrates')
plt.xlabel('Carbohydrates (gms)')
plt.ylabel('Frequency')
plt.grid()
plt.show()
```



Descriptive Statistics -

- The mean of the Carbohydrates content is 47.34 grams.
- The standard deviation is 28.25 grams, indicating the widespread in the carbohydrates values.
- 25% of the items have 30 grams or less carbohydrates, 50% of items have 44 grams or less carbohydrates & 75% of items have 60 grams or less carbohydrates.

C. Identify trends and patterns in the dataset.

In [47]:
```
nutritional_vars = ['Calories','Total Fat', 'Cholesterol','Carbohydrates','Proteins']
nutritional_vars
```

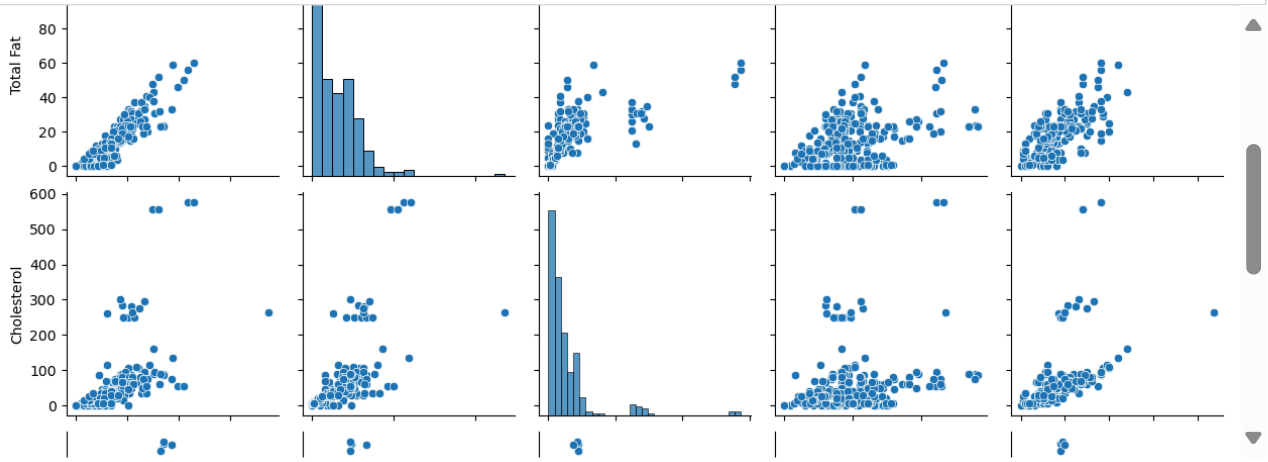
Out[47]:
```
['Calories', 'Total Fat', 'Cholesterol', 'Carbohydrates', 'Proteins']
```

In [48]:
```
calories_vs_nutrients = mcd_dataset[['Calories','Total Fat', 'Cholesterol','Carbohydrates','Protein']].corr()
print(calories_vs_nutrients)
```

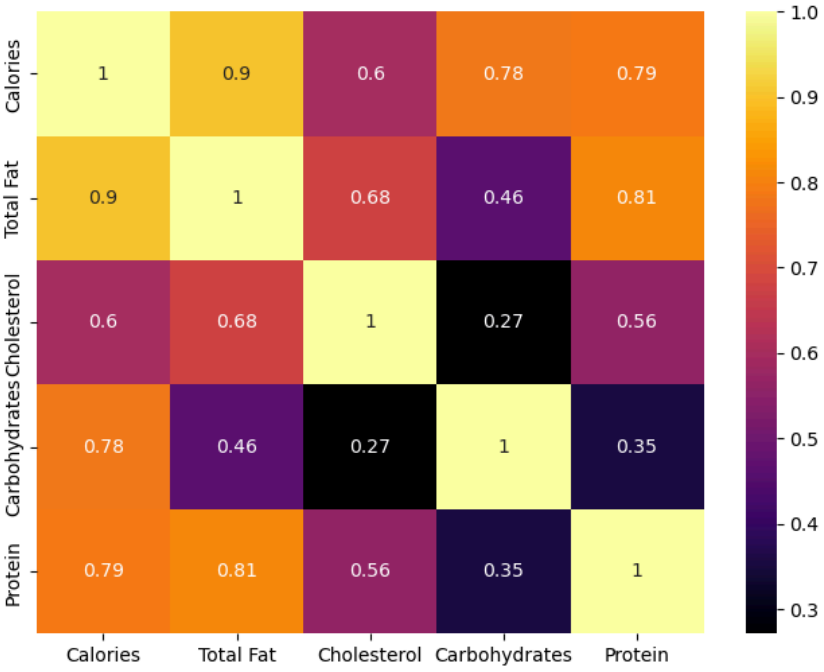
```
              Calories  Total Fat  Cholesterol  Carbohydrates   Protein
Calories      1.000000   0.904409     0.596399       0.781539  0.787847
Total Fat     0.904409   1.000000     0.680547       0.461213  0.807773
Cholesterol   0.596399   0.680547     1.000000       0.270977  0.561561
Carbohydrates 0.781539   0.461213     0.270977       1.000000  0.352122
Protein       0.787847   0.807773     0.561561       0.352122  1.000000
```

Above code gives us a numerical matrix of how the other nutrients correlate with the Calories, but not necessarily can give us a proper idea. So we rather rely on the visual of the matrix and plot the correlations as well.

In [49]:
```
sns.pairplot(mcd_dataset[['Calories','Total Fat', 'Cholesterol','Carbohydrates','Protein']])
```



In [50]:
```
plt.figure(figsize=(8,6))
sns.heatmap(calories_vs_nutrients, annot=True, cmap='inferno')
plt.show()
```



The analysis reveals the following trends and patterns:

1. Calories and Total Fat: There is a strong positive correlation (0.904) between calorie counts and total fat . This suggests that menu items higher in calories tend to be higher in total fat as well.
2. Total Fat and Protein: The correlation between total fat and protein is also high (0.807), indicating that protein-dense items are likely to be higher in total fat.
3. Calories and Protein: The correlation between calories and protein is also positive (0.787), suggesting that menu items with more calories generally have higher protein content.
4. Calories and Carbohydrates: The correlation between calories and carbohydrates also comes closer and have a positive (0.781), which means an item with high calories count can also lead upto having a higher carbohydrates values.

4. Data Visualization

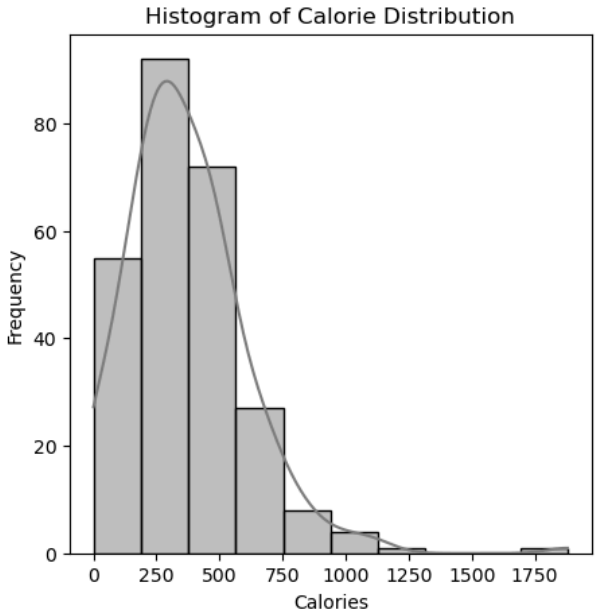
To gain insights into the calorie distribution and nutritional content of these items, I will create several data visualizations. First, I will generate a histogram and a box plot to visualize the distribution of calorie counts across the menu items. This will allow us to understand the range of calorie values, identify any outliers or skewness in the data, and get a sense of the overall calorie distribution. Next, I will create a series of bar charts to compare the nutritional characteristics (total fat, saturated fat, carbohydrates, and protein) of different food categories, such as burgers, salads, and desserts. This will help identify any significant differences in the nutrient profiles of these food groups. Through these visualizations, we can gain a comprehensive understanding of the calorie and nutrient composition of the menu items, which can inform consumer choices and guide menu development efforts.

A. Distribution of Calories

The histogram and boxplot for the said distribution can be plotted together with the help of a subplot, so that we can compare both the visuals side by side to get more comprehensive insights about the distribution as well as the outliers.

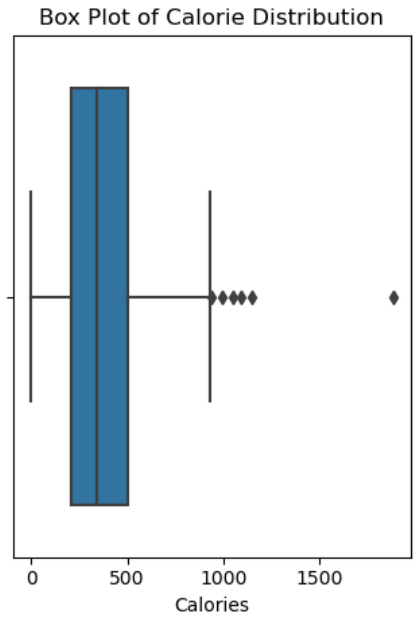
In [51]:
```
plt.figure(figsize=(11, 5))
plt.subplot(1, 2, 1)
sns.histplot(mcd_dataset['Calories'], bins=10, kde=True, color = "grey")
plt.title('Histogram of Calorie Distribution')
plt.xlabel('Calories')
plt.ylabel('Frequency')


plt.show()
```



In [52]:
```
plt.subplot(1, 2, 2)
sns.boxplot(x=mcd_dataset['Calories'])
plt.title('Box Plot of Calorie Distribution')
plt.xlabel('Calories')

plt.tight_layout()
plt.show()
```



The shape of the histogram is right-skewed, with a peak at approximately 125-500 calories and a long tail towards the higher values of calories. The majority of menu items fall on the lower end of the calorie count, and there are only a few high-calorie outliers. The observations are confirmed by the box plot, where the median is approximately 340 calories and the 25th and 75th percentiles are 210 and 500, respectively. The box plot reveals the presence of several outliers, some of which are associated with high calories, starting from the "McFlurry with Reese's Peanut Butter Cups (Medium)" at 810 calories.

B. Nutritional Content Comparison

With the help of several bar-charts and boxplots we compare the nutritional characteristics of different food categories. As the count of nutrients is 22, we create the visualizations for 4 selected list of nutrients namely,

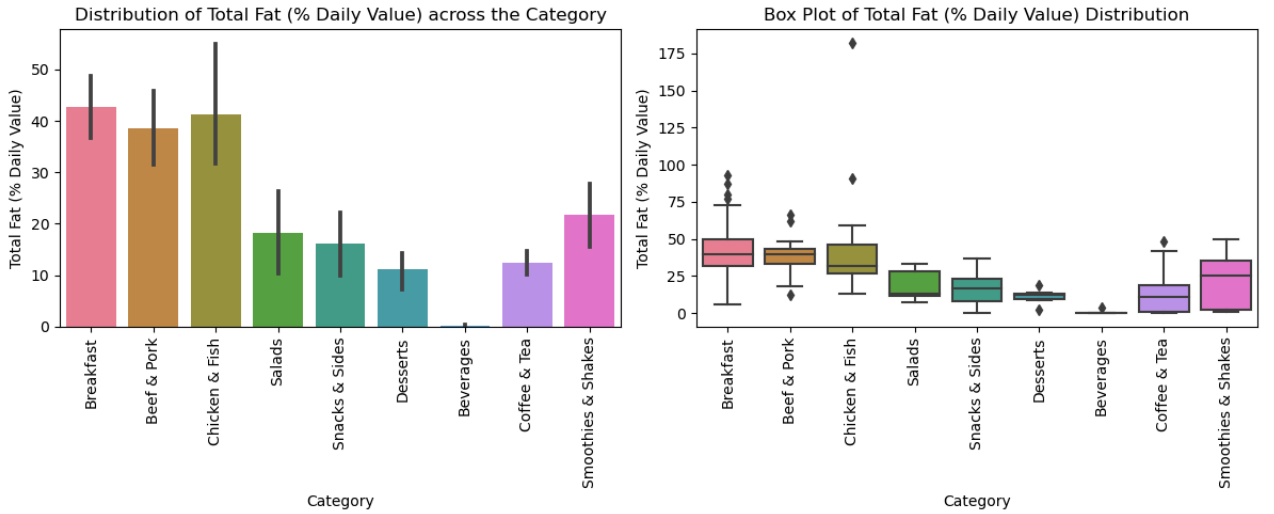
1. Total Fat (% Daily Value)

2. Cholesterol (% Daily Value)
3. Carbohydrates
4. Dietary Fiber

B.1 Total Fat (% Daily Value)

In [53]:
```
plt.figure(figsize=(12, 5))
plt.subplot(1, 2, 1)
sns.barplot(data= mcd_dataset, x= 'Category', y= 'Total Fat (% Daily Value)', palette= 'husl')
plt.title('Distribution of Total Fat (% Daily Value) across the Category')
plt.xlabel('Category')
plt.ylabel('Total Fat (% Daily Value)')
plt.xticks(rotation= 90)

plt.subplot(1, 2, 2)
sns.boxplot(data= mcd_dataset, x= 'Category', y='Total Fat (% Daily Value)',palette= 'husl')
plt.title('Box Plot of Total Fat (% Daily Value) Distribution')
plt.xlabel('Category')
plt.ylabel('Total Fat (% Daily Value)')
plt.xticks(rotation= 90)
plt.tight_layout()
plt.show()
```



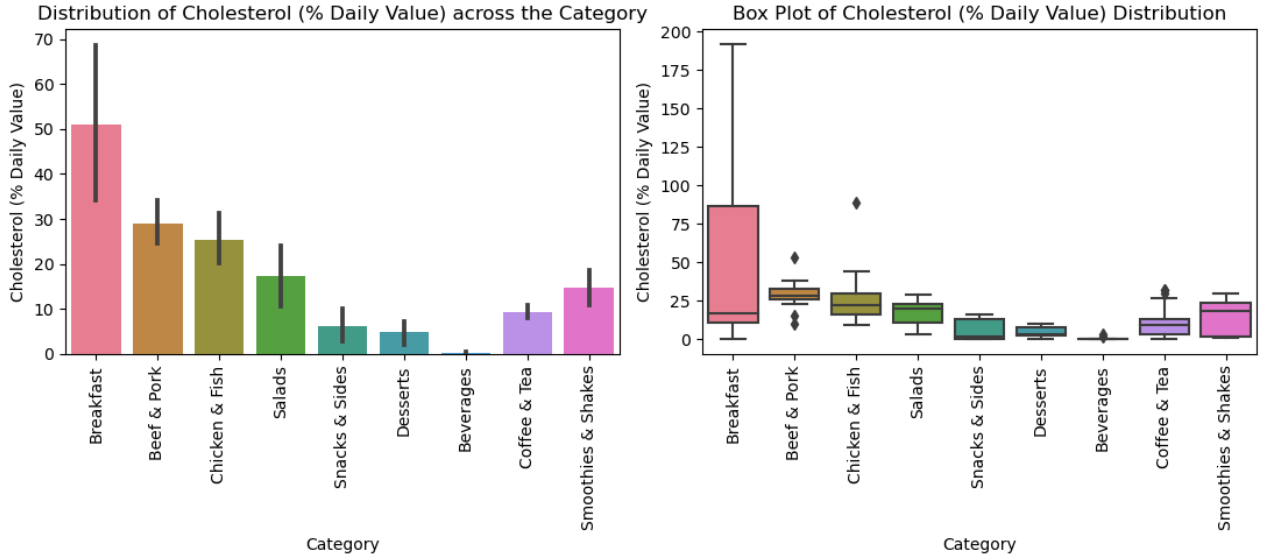
1. From barplot- The bar plot indicates that the Breakfast category has the highest average Total Fat (% Daily Value) at approximately 43%, followed closely by the Chicken & Fish category at approx. 40%. The Beverages category has the lowest average Total Fat (% Daily Value) showing a negligible set of value.
2. From boxplot(For the top two categories having highest average Total Fat (% Daily Value)) -

   - Breakfast: The box plot shows a relatively even distribution of Total Fat (% Daily Value) across the breakfast items, with a median of 43%. The 25th percentile is around 30%, and the 75th percentile is 50%. There are several outliers with higher Total Fat (% Daily Value) values.
   - Chicken & Fish: The box plot shows a skewed distribution of Total Fat (% Daily Value) across the chicken & fish items, with a median of around 40%. The 25th percentile is roughly around 28%, and the 75th percentile is about 48%. There are a few outliers with higher Total Fat (% Daily Value) values..

B.2 Cholesterol (% Daily Value)

In [54]:
```
plt.figure(figsize=(11, 5))
plt.subplot(1, 2, 1)
sns.barplot(data= mcd_dataset, x= 'Category', y= 'Cholesterol (% Daily Value)', palette= 'husl')
plt.title('Distribution of Cholesterol (% Daily Value) across the Category')
plt.xlabel('Category')
plt.ylabel('Cholesterol (% Daily Value)')
plt.xticks(rotation= 90)

plt.subplot(1, 2, 2)
sns.boxplot(data= mcd_dataset, x= 'Category', y='Cholesterol (% Daily Value)',palette= 'husl')
plt.title('Box Plot of Cholesterol (% Daily Value) Distribution')
plt.xlabel('Category')
plt.ylabel('Cholesterol (% Daily Value)')
plt.xticks(rotation= 90)
plt.tight_layout()
plt.show()
```



1. From barplot- The Breakfast category has the highest average Cholesterol (, followed by the Beef & Pork category at around 30%, and the Chicken & Fish category at around 25%. The Beverages category again stands out to be the category with lowest cholesterol content with a very deniable cholesterol values.
2. From boxplot(For the top two categories having highest average Cholesterol (% Daily Value))-

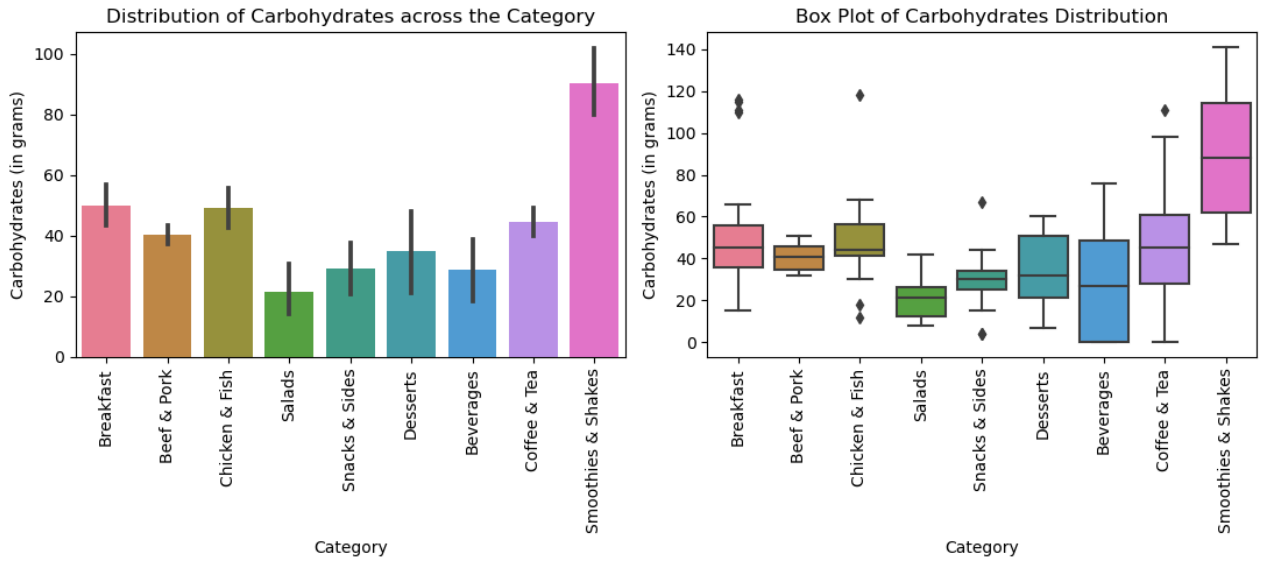
    - Breakfast: A more considerable range of cholesterol values is provided in the Breakfast category – some items reach approximately 90% of the daily value. Additionally, the median cholesterol level is also higher in comparison with the other categories.
    - Beef & Pork: The Beef & Pork category has a more compact distribution, as the majority of data falls between 25-35% of the daily cholesterol value.

In addition, there are a few outliers in the Chicken & Fish and Beef & Pork categories, indicating that some items in these categories have exceptionally high cholesterol content.

B.3 Carbohydrates (in grams)

In [55]:
```
plt.figure(figsize=(11, 5))
plt.subplot(1, 2, 1)
sns.barplot(data= mcd_dataset, x= 'Category', y= 'Carbohydrates', palette= 'husl')
plt.title('Distribution of Carbohydrates across the Category')
plt.xlabel('Category')
plt.ylabel('Carbohydrates (in grams)')
plt.xticks(rotation= 90)

plt.subplot(1, 2, 2)
sns.boxplot(data= mcd_dataset, x= 'Category', y='Carbohydrates',palette= 'husl')
plt.title('Box Plot of Carbohydrates Distribution')
plt.xlabel('Category')
plt.ylabel('Carbohydrates (in grams)')
plt.xticks(rotation= 90)
plt.tight_layout()
plt.show()
```



.

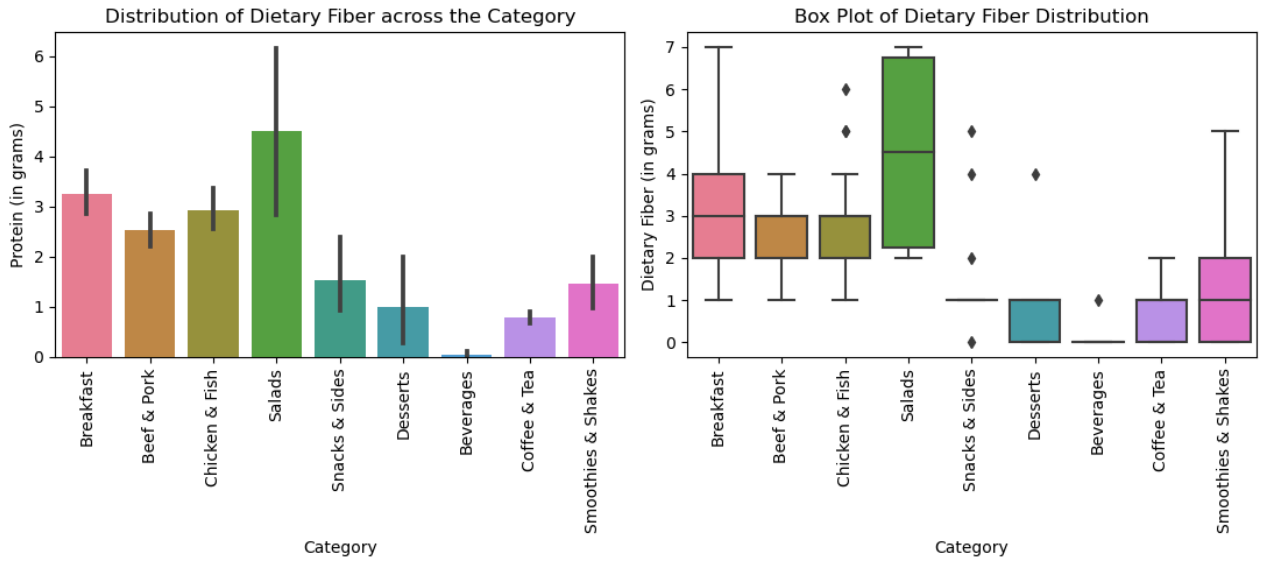
1. From barplot-
   The bar plot indicates that the smoothies & shakes has the highest averag carbohydrate at approximately 90 gram , follo. The salad has the lowest average carbohydrate showing a negligible set of value.

2. From boxplot(For the top two categories having highest average carbohydrate) -
   - smoothies & SHAKES : The box plot shows a relatively even distribution of Total Fat

B.4 Dietary Fiber (in gram)

In [56]:
```
plt.figure(figsize=(11, 5))
plt.subplot(1, 2, 1)
sns.barplot(data= mcd_dataset, x= 'Category', y= 'Dietary Fiber', palette= 'husl')
plt.title('Distribution of Dietary Fiber across the Category')
plt.xlabel('Category')
plt.ylabel('Protein (in grams)')
plt.xticks(rotation= 90)

plt.subplot(1, 2, 2)
sns.boxplot(data= mcd_dataset , x= 'Category', y='Dietary Fiber',palette= 'husl')
plt.title('Box Plot of Dietary Fiber Distribution')
plt.xlabel('Category')
plt.ylabel('Dietary Fiber (in grams)')
plt.xticks(rotation= 90)
plt.tight_layout()
plt.show()
```



From barplot- The bar plot indicates that the salad has the highest average Dietary Fiber , followed closely by breakfast category . The Beverages category has the lowest Dietary Fiber showing a negligible set of value.

2. From boxplot(For the top two categories having highest average Dietary Fiber) -
   - salad: The box plot shows a relatively even distribution of Dietary Fiber

5. Nutrition-Based Insights

The main motive is to analyze the data to identify the menu items with the highest and lowest values specifically focused towards the calorie counts, as well as determine the average nutritional content of popular menu categories. To achieve this we will use the .idxmax() & .idxmin() functions to determine the highest and lowest values, and to determine the average nutritional content we'll use the .describe() function.

A. Identify menu items with the highest and lowest calorie counts.

In [57]:
```
highest_calorie_item = mcd_dataset.loc[mcd_dataset['Calories'].idxmax()]
print(f"The item with the highest calorie count: \n\t Item - {highest_calorie_item['Item']} \n\t Calorie Count- {highest_ca
```

```
The item with the highest calorie count:
         Item - Chicken McNuggets (40 piece)
         Calorie Count- 1880
```

In [58]:
```
lowest_calorie_item = mcd_dataset.loc[mcd_dataset['Calories'].idxmin()]
print(f"The item with the lowest calorie count: \n\t Item - {lowest_calorie_item['Item']} \n\t Calorie Count- {lowest_calor
```

```
The item with the lowest calorie count:
         Item - Diet Coke (Small)
         Calorie Count- 0
```

B. Determine the average nutritional content of popular menu categories.

We'll start by making a new dataframe to achieve this task. In this dataframe we will exclude the 'Item' & 'Serving Size' columns as they both contain categorical values and won't be suitable in an aggregation step.

In [59]:
```
columns_to_drop = ['Item', 'Serving Size']
df_new = mcd_dataset.drop(columns_to_drop, axis=1)
df_new.head()
```

Out[59]:

	Category	Calories	Calories from Fat	Total Fat	Total Fat (% Daily Value)	Saturated Fat	Saturated Fat (% Daily Value)	Trans Fat	Cholesterol	Cholesterol (% Daily Value)	...	Carbohydrates	Carbohydrates (% Daily Value)	Dietary Fiber	Dietary Fiber (% Daily Value)
0	Breakfast	300	120	13.0	20	5.0	25	0.0	260	87	...	31	10	4	17
1	Breakfast	250	70	8.0	12	3.0	15	0.0	25	8	...	30	10	4	17
2	Breakfast	370	200	23.0	35	8.0	42	0.0	45	15	...	29	10	4	17
3	Breakfast	450	250	28.0	43	10.0	52	0.0	285	95	...	30	10	4	17
4	Breakfast	400	210	23.0	35	8.0	42	0.0	50	16	...	30	10	4	17

5 rows × 22 columns

In [60]:
```
average_nutritional_content = df_new.groupby('Category').mean()
average_nutritional_content
```

Out[60]:

Category	Calories	Calories from Fat	Total Fat	Total Fat (% Daily Value)	Saturated Fat	Saturated Fat (% Daily Value)	Trans Fat	Cholesterol	Cholesterol (% Daily Value)	Sodium	...	Carbohydrates	Carb
Beef & Pork	494.000000	224.666667	24.866667	38.600000	10.466667	52.000000	1.100000	87.333333	28.933333	1020.666667	...	40.133333	
Beverages	113.703704	0.740741	0.092593	0.148148	0.055556	0.296296	0.000000	0.555556	0.185185	41.481481	...	28.814815	
Breakfast	526.666667	248.928571	27.690476	42.666667	10.654762	53.428571	0.107143	152.857143	50.952381	1211.071429	...	49.761905	
Chicken & Fish	552.962963	242.222222	26.962963	41.333333	6.166667	31.111111	0.129630	75.370370	25.222222	1257.777778	...	49.074074	
Coffee & Tea	283.894737	71.105263	8.021053	12.357895	4.921053	24.368421	0.142105	27.263158	9.378947	136.894737	...	44.526316	
Desserts	222.142857	64.285714	7.357143	11.142857	4.285714	21.285714	0.000000	15.000000	4.857143	117.142857	...	34.857143	
Salads	270.000000	108.333333	11.750000	18.333333	3.750000	18.500000	0.000000	51.666667	17.333333	588.333333	...	21.666667	
Smoothies & Shakes	531.428571	127.678571	14.125000	21.714286	8.375000	41.785714	0.535714	45.000000	14.714286	183.571429	...	90.428571	
Snacks & Sides	245.769231	94.615385	10.538462	16.230769	2.692308	13.384615	0.000000	18.461538	6.230769	395.769231	...	29.153846	

9 rows × 21 columns

6. Summarizing the Analysis

Findings and Insights:

1. Menu Items Analysis
2. The dataset encompasses a range of menu items classified into various categories such as Breakfast, Beef & Pork, Chicken & Fish, Beverages, Coffee & Tea, among others. Notably, items like "Chicken McNuggets (40 pieces)" from the Chicken & Fish category boast the highest calorie counts, while beverages like "Diet Coke (small)" exhibit the lowest calorie content2. . When scrutinizing the nutritional profiles, it's evident that the Beef & Pork category typically contains higher protein levels, w
3. Average Nutritional Content:
4. The dataset encompasses a range of menu items classified into various categories such as Breakfast, Beef & Pork, Chicken & Fish, Beverages, Coffee & Tea, among others. Notably, items like "Chicken McNuggets (40 pieces)" from the Chicken & Fish category boast the highest calorie counts, while beverages like "Diet Coke (small)" exhibit the lowest calorie content2. . When scrutinizing the nutritional profiles, it's evident that the Beef & Pork category typically contains higher protein levels, w

Conclusions

Healthier Options:

Access to the nutritional content of the menu items enables customers to identify and choose healthier options, such as the Egg White Delight, Premium Grilled Chicken Classic Sandwich, and Fruit & Maple Oatmeal without Brown Sugar, which have lower calorie, fat, and sodium levels. This promotes better eating habits and supports customers in maintaining a balanced diet.

Unhealthy Side of the table

Based on the detailed analysis of the nutritional information provided some of the unhealthy food categories include:

1. Breakfast Category: The Breakfast Category features items with high levels of calories, total fat, saturated fat, cholesterol, and sodium, exemplified by the "Big Breakfast with Hotcakes (Large Biscuit)" with 1,150 calories, 60g of total fat, 20g of saturated fat, and 2,260 mg of sodium.
2. Beef & Pork Category: Beef & Pork Category offerings, such as the "Bacon Clubhouse Burger," are characterized by their high calorie, total fat, saturated fat, and sodium content, like the mentioned burger with 720 calories, 40g of total fat, 15g of saturated fat, and 1,470 mg of sodium
3. While the Chicken & Fish Category generally contains lower levels of unhealthy nutrients compared to Breakfast and Beef & Pork, some items still register as less healthy due to their calorie, fat, and sodium content.

Recommendations to Improve McDonald's Menu Nutritional Profile:

.Increase Healthy Options:Introduce more low-calorie, low-fat, and low-sodium menu items to cater to health-conscious customers.

- Expand the selection of salads, grilled chicken options, and fruit-based sides to provide healthier alternatives. 2.Nutritional Information Transparency:
- Enhance transparency by prominently displaying nutritional information on menus and packaging to help customers make informed choices.
- Include allergen information to assist individuals with dietary restrictions or food allergies. 3.Reduce Added Sugars:
- Decrease the amount of added sugars in menu items, especially in beverages, desserts, and breakfast items, to align with dietary guidelines 4.Promote Balanced Meals:
- Create meal deals that include balanced options like lean protein, whole grains, and vegetables to encourage healthier eating habits.
- Offer combo meals with side salads or fruit instead of fries to increase the availability of nutritious choices.

Benefit of Nutritional Analysis

Benefit for Customers:

1. Informed Food Choices: Customers can make informed decisions about their food choices based on the detailed nutritional information provided in the dataset. Understanding the calorie, fat, protein, and other nutrient contents of menu items can help customers select options that align with their dietary preferences and health goals.
2. Health Conscious Decisions: The nutritional analysis allows customers to be more health-conscious when selecting items from the menu. Customers can identify healthier options with lower calorie, fat, and sodium content, promoting better eating habits and overall well-being.
3. Dietary Restrictions and Preferences: Customers with specific dietary restrictions or preferences, such as low-fat, low-sodium, or high-protein diets, can easily identify menu items that meet their nutritional needs. This information empowers customers to tailor their meal choices to suit their individual dietary requirements.

Benefit for Organization:

1. Benefits for McDonald's Organization: Menu Development: The nutritional analysis can guide McDonald's in developing a more diverse and balanced menu that caters to a wider range of customer preferences. By understanding the nutritional profiles of menu items, McDonald's can introduce healthier options and adjust existing recipes to meet customer demands for healthier choices.
2. Customer Satisfaction: Providing transparent and detailed nutritional information demonstrates McDonald's commitment to customer well-being and transparency. Customers appreciate having access to this information, which can enhance their overall dining experience and satisfaction with the brand.
3. Health and Wellness Initiatives: Utilizing the nutritional analysis data, McDonald's can align with health and wellness trends by promoting healthier menu options and supporting customers in making healthier food choices. This proactive approach can position McDonald's as a health-conscious brand and attract customers who prioritize nutritious eating habits.

In conclusion, the nutritional analysis benefits both McDonald's customers and the organization by promoting informed food choices, health-conscious decisions, and menu development strategies that cater to diverse dietary needs and preferences.