

McDonalds Nutritional values Analysis

Importing libraries

```
In [1]: import pandas as pd  
import matplotlib.pyplot as plt  
import seaborn as sns
```

Reading dataset

```
In [2]: nutrition=pd.read_csv("C:\\\\Users\\\\hp\\\\OneDrive\\\\Desktop\\\\Nutrition.csv")
```

```
In [3]: nutrition
```

Out[3]:

		Category	Item	Calories	Saturated Fat	Saturated Fat (% Daily Value)	Trans Fat	Cholesterol	Cholesterol (% Daily Value)	Sodium	...
0	Breakfast	Egg McMuffin		300	5.0	25	0.0	260	87	750	
1	Breakfast	Egg White Delight		250	3.0	15	0.0	25	8	770	
2	Breakfast	Sausage McMuffin		370	8.0	42	0.0	45	15	780	
3	Breakfast	Sausage McMuffin with Egg		450	10.0	52	0.0	285	95	860	
4	Breakfast	Sausage McMuffin with Egg Whites		400	8.0	42	0.0	50	16	880	
...
256	Smoothies & Shakes	McFlurry with Oreo Cookies (Medium)		690	12.0	58	1.0	55	19	380	
257	Smoothies & Shakes	McFlurry with Oreo Cookies (Snack)		340	6.0	29	0.0	30	9	190	
258	Smoothies & Shakes	McFlurry with Reese's Peanut Butter Cups (Medium)		810	15.0	76	1.0	60	20	400	
259	Smoothies & Shakes	McFlurry with Reese's Peanut Butter Cups (Snack)		410	8.0	38	0.0	30	10	200	
260	Breakfast	Sausage McMuffin		370	8.0	42	0.0	45	15	780	

261 rows × 20 columns

Applying some basic functions

Indexes

```
In [4]: nutrition.index
Out[4]: RangeIndex(start=0, stop=261, step=1)
```

Columns

```
In [5]: nutrition.columns
Out[5]: Index(['Category', 'Item', 'Calories', 'Saturated Fat',
       'Saturated Fat (% Daily Value)', 'Trans Fat', 'Cholesterol',
       'Cholesterol (% Daily Value)', 'Sodium', 'Sodium (% Daily Value)',
       'Carbohydrates', 'Carbohydrates (% Daily Value)', 'Dietary Fiber',
       'Dietary Fiber (% Daily Value)', 'Sugars', 'Protein',
       'Vitamin A (% Daily Value)', 'Vitamin C (% Daily Value)',
       'Calcium (% Daily Value)', 'Iron (% Daily Value)'],
      dtype='object')
```

Detailed information of rows and columns

```
In [6]: nutrition.info()
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 261 entries, 0 to 260
Data columns (total 20 columns):
 #   Column           Non-Null Count  Dtype  
 ---  --  
 0   Category        261 non-null    object 
 1   Item            261 non-null    object 
 2   Calories        261 non-null    int64  
 3   Saturated Fat  261 non-null    float64
 4   Saturated Fat (%) Daily Value 261 non-null  int64  
 5   Trans Fat       261 non-null    float64
 6   Cholesterol     261 non-null    int64  
 7   Cholesterol (%) Daily Value 261 non-null  int64  
 8   Sodium          261 non-null    int64  
 9   Sodium (%) Daily Value 261 non-null  int64  
 10  Carbohydrates  261 non-null    int64  
 11  Carbohydrates (%) Daily Value 261 non-null  int64  
 12  Dietary Fiber  261 non-null    int64  
 13  Dietary Fiber (%) Daily Value 261 non-null  int64  
 14  Sugars          261 non-null    int64  
 15  Protein          261 non-null    int64  
 16  Vitamin A (%) Daily Value 261 non-null  int64  
 17  Vitamin C (%) Daily Value 261 non-null  int64  
 18  Calcium          261 non-null    int64  
 19  Iron             261 non-null    int64  
dtypes: float64(2), int64(16), object(2)
memory usage: 40.9+ KB
```

shape of dataset

```
In [7]: nutrition.shape
```

```
Out[7]: (261, 20)
```

First ten records

```
In [8]: nutrition.head(10)
```

Out[8]:

	Category	Item	Calories	Saturated Fat	Saturated Fat (% Daily Value)	Trans Fat	Cholesterol	Cholesterol (% Daily Value)	Sodium	Sodium Daily Value
0	Breakfast	Egg McMuffin	300	5.0	25	0.0	260	87	750	
1	Breakfast	Egg White Delight	250	3.0	15	0.0	25	8	770	
2	Breakfast	Sausage McMuffin	370	8.0	42	0.0	45	15	780	
3	Breakfast	Sausage McMuffin with Egg	450	10.0	52	0.0	285	95	860	
4	Breakfast	Sausage McMuffin with Egg Whites	400	8.0	42	0.0	50	16	880	
5	Breakfast	Steak & Egg McMuffin	430	9.0	46	1.0	300	100	960	
6	Breakfast	Bacon, Egg & Cheese Biscuit (Regular Biscuit)	460	13.0	65	0.0	250	83	1300	
7	Breakfast	Bacon, Egg & Cheese Biscuit (Large Biscuit)	520	14.0	68	0.0	250	83	1410	
8	Breakfast	Bacon, Egg & Cheese Biscuit with Egg Whites (R...	410	11.0	56	0.0	35	11	1300	
9	Breakfast	Bacon, Egg & Cheese Biscuit with Egg Whites (L...	470	12.0	59	0.0	35	11	1420	

Last ten records

```
In [9]: nutrition.tail(10)
```

Out[9]:

		Category	Item	Calories	Saturated Fat	Saturated Fat (% Daily Value)	Trans Fat	Cholesterol	Cholesterol (% Daily Value)	Sodium
251	Smoothies & Shakes	Shamrock Shake (Large)		820	15.0	73	1.0	90	29	260
252	Smoothies & Shakes	McFlurry with M&M's Candies (Small)		650	14.0	72	0.5	50	17	180
253	Smoothies & Shakes	McFlurry with M&M's Candies (Medium)		930	20.0	102	1.0	75	25	260
254	Smoothies & Shakes	McFlurry with M&M's Candies (Snack)		430	10.0	48	0.0	35	11	120
255	Smoothies & Shakes	McFlurry with Oreo Cookies (Small)		510	9.0	44	0.5	45	14	280
256	Smoothies & Shakes	McFlurry with Oreo Cookies (Medium)		690	12.0	58	1.0	55	19	380
257	Smoothies & Shakes	McFlurry with Oreo Cookies (Snack)		340	6.0	29	0.0	30	9	190
258	Smoothies & Shakes	McFlurry with Reese's Peanut Butter Cups (Medium)		810	15.0	76	1.0	60	20	400
259	Smoothies & Shakes	McFlurry with Reese's Peanut Butter Cups (Snack)		410	8.0	38	0.0	30	10	200
260	Breakfast	Sausage McMuffin		370	8.0	42	0.0	45	15	780

All Food Categories

```
In [10]: nutrition["Category"].value_counts()
```

```
Out[10]:
```

Coffee & Tea	95
Breakfast	43
Smoothies & Shakes	28
Chicken & Fish	27
Beverages	27
Beef & Pork	15
Snacks & Sides	13
Desserts	7
Salads	6

Name: Category, dtype: int64

All items list

```
In [11]: nutrition["Item"].value_counts()
```

```
Out[11]:
```

Sausage McMuffin	2
Egg McMuffin	1
Nonfat Hazelnut Latte (Large)	1
Nonfat Latte with Sugar Free French Vanilla Syrup (Large)	1
Nonfat Latte with Sugar Free French Vanilla Syrup (Medium)	1
.	.
Honey Mustard Snack Wrap (Crispy Chicken)	1
Honey Mustard Snack Wrap (Grilled Chicken)	1
Ranch Snack Wrap (Crispy Chicken)	1
Ranch Snack Wrap (Grilled Chicken)	1
McFlurry with Reese's Peanut Butter Cups (Snack)	1

Name: Item, Length: 260, dtype: int64

Statistics data

```
In [12]: nutrition.describe()
```

Out[12]:

	Calories	Saturated Fat	Saturated Fat (% Daily Value)	Trans Fat	Cholesterol	Cholesterol (% Daily Value)	Sodium	Sodium (% Daily Value)
count	261.000000	261.000000	261.000000	261.000000	261.000000	261.000000	261.000000	261.000000
mean	368.275862	6.015326	30.011494	0.203065	54.904215	18.379310	496.83908	20.7241
std	239.807408	5.313060	26.598364	0.428493	87.103444	29.036413	576.18429	24.0008
min	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00000	0.00000
25%	210.000000	1.000000	5.000000	0.000000	5.000000	2.000000	110.00000	5.00000
50%	340.000000	5.000000	24.000000	0.000000	35.000000	11.000000	190.00000	8.00000
75%	500.000000	10.000000	48.000000	0.000000	65.000000	21.000000	860.00000	36.00000
max	1880.000000	20.000000	102.000000	2.500000	575.000000	192.000000	3600.00000	150.00000

Data Cleaning

Checking if there are any null values having records

In [13]: `nutrition[nutrition.isnull().any(axis=1)]`

Out[13]:

Category	Item	Calories	Saturated Fat	Saturated Fat (% Daily Value)	Trans Fat	Cholesterol	Cholesterol (% Daily Value)	Sodium	Sodium (% Daily Value)

In [14]: `nutrition.isnull().sum()`

```
Out[14]: Category      0
          Item        0
          Calories     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
```

There are no null values in this data set

Checking for duplicate records

```
In [15]: nutrition[nutrition.duplicated()]
```

Out[15]:

Category	Item	Calories	Saturated Fat	Saturated Fat (% Daily Value)	Trans Fat	Cholesterol	Cholesterol (% Daily Value)	Sodium	So
260 Breakfast	Sausage McMuffin	370	8.0	42	0.0	45	15	780	\

One duplicate record present

Removing duplicates

```
In [16]: nutrition.drop_duplicates(inplace=True)
nutritio
```

Out[16]:

		Category	Item	Calories	Saturated Fat	Saturated Fat (% Daily Value)	Trans Fat	Cholesterol	Cholesterol (% Daily Value)	Sodium
0	Breakfast	Egg McMuffin		300	5.0	25	0.0	260	87	750
1	Breakfast	Egg White Delight		250	3.0	15	0.0	25	8	770
2	Breakfast	Sausage McMuffin		370	8.0	42	0.0	45	15	780
3	Breakfast	Sausage McMuffin with Egg		450	10.0	52	0.0	285	95	860
4	Breakfast	Sausage McMuffin with Egg Whites		400	8.0	42	0.0	50	16	880
...
255	Smoothies & Shakes	McFlurry with Oreo Cookies (Small)		510	9.0	44	0.5	45	14	280
256	Smoothies & Shakes	McFlurry with Oreo Cookies (Medium)		690	12.0	58	1.0	55	19	380
257	Smoothies & Shakes	McFlurry with Oreo Cookies (Snack)		340	6.0	29	0.0	30	9	190
258	Smoothies & Shakes	McFlurry with Reese's Peanut Butter Cups (Medium)		810	15.0	76	1.0	60	20	400
259	Smoothies & Shakes	McFlurry with Reese's Peanut Butter Cups (Snack)		410	8.0	38	0.0	30	10	200

260 rows × 20 columns

Checking again for duplicates

```
In [17]: nutrition[nutrition.duplicated()]
```

Out[17]:

Category	Item	Calories	Saturated Fat	Saturated Fat (% Daily Value)	Trans Fat	Cholesterol	Cholesterol (% Daily Value)	Sodium	Sodium (% Daily Value)
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All duplicates removed

Now our data set is clean and is ready for analysis

Data Filtering

What if we want to search for break fast category food items?

```
In [18]: nutrition[nutrition["Category"]=="Breakfast"]
```

Out[18]:

		Category	Item	Calories	Saturated Fat	Saturated Fat (% Daily Value)	Trans Fat	Cholesterol	Cholesterol (% Daily Value)	Sodium	Sc
0	Breakfast	Egg McMuffin		300	5.0	25	0.0	260	87	750	1
1	Breakfast	Egg White Delight		250	3.0	15	0.0	25	8	770	
2	Breakfast	Sausage McMuffin		370	8.0	42	0.0	45	15	780	
3	Breakfast	Sausage McMuffin with Egg		450	10.0	52	0.0	285	95	860	
4	Breakfast	Sausage McMuffin with Egg Whites		400	8.0	42	0.0	50	16	880	
5	Breakfast	Steak & Egg McMuffin		430	9.0	46	1.0	300	100	960	
6	Breakfast	Bacon, Egg & Cheese Biscuit (Regular Biscuit)		460	13.0	65	0.0	250	83	1300	
7	Breakfast	Bacon, Egg & Cheese Biscuit (Large Biscuit)		520	14.0	68	0.0	250	83	1410	
8	Breakfast	Bacon, Egg & Cheese Biscuit with Egg Whites (R...)		410	11.0	56	0.0	35	11	1300	
9	Breakfast	Bacon, Egg & Cheese Biscuit with Egg Whites (L...)		470	12.0	59	0.0	35	11	1420	
10	Breakfast	Sausage Biscuit (Regular Biscuit)		430	12.0	62	0.0	30	10	1080	
11	Breakfast	Sausage Biscuit (Large Biscuit)		480	13.0	65	0.0	30	10	1190	
12	Breakfast	Sausage Biscuit with		510	14.0	71	0.0	250	83	1170	

Category	Item	Calories	Saturated Fat	Saturated Fat (% Daily Value)	Trans Fat	Cholesterol	Cholesterol (% Daily Value)	Sodium	Sc
Egg (Regular Biscuit)									
13 Breakfast	Sausage Biscuit with Egg (Large Biscuit)	570	15.0	74	0.0	250	83	1280	1
14 Breakfast	Sausage Biscuit with Egg Whites (Regular Biscuit)	460	12.0	62	0.0	35	11	1180	1
15 Breakfast	Sausage Biscuit with Egg Whites (Large Biscuit)	520	13.0	65	0.0	35	11	1290	1
16 Breakfast	Southern Style Chicken Biscuit (Regular Biscuit)	410	8.0	41	0.0	30	10	1180	1
17 Breakfast	Southern Style Chicken Biscuit (Large Biscuit)	470	9.0	45	0.0	30	10	1290	1
18 Breakfast	Steak & Egg Biscuit (Regular Biscuit)	540	16.0	78	1.0	280	93	1470	1
19 Breakfast	Bacon, Egg & Cheese McGriddles	460	9.0	44	0.0	250	84	1250	1
20 Breakfast	Bacon, Egg & Cheese McGriddles with Egg Whites	400	7.0	34	0.0	35	11	1250	1
21 Breakfast	Sausage McGriddles	420	8.0	40	0.0	35	11	1030	1
22 Breakfast	Sausage, Egg & Cheese McGriddles	550	12.0	61	0.0	265	89	1320	1

		Category	Item	Calories	Saturated Fat	Saturated Fat (% Daily Value)	Trans Fat	Cholesterol	Cholesterol (% Daily Value)	Sodium	Sc
23	Breakfast		Sausage, Egg & Cheese McGriddles with Egg Whites	500	10.0	52	0.0	50	17	1320	1
24	Breakfast		Bacon, Egg & Cheese Bagel	620	11.0	56	0.5	275	92	1480	
25	Breakfast		Bacon, Egg & Cheese Bagel with Egg Whites	570	9.0	45	0.5	60	20	1480	
26	Breakfast		Steak, Egg & Cheese Bagel	670	13.0	63	1.5	295	99	1510	
27	Breakfast		Big Breakfast (Regular Biscuit)	740	17.0	87	0.0	555	185	1560	
28	Breakfast		Big Breakfast (Large Biscuit)	800	18.0	90	0.0	555	185	1680	
29	Breakfast		Big Breakfast with Egg Whites (Regular Biscuit)	640	14.0	69	0.0	35	12	1590	
30	Breakfast		Big Breakfast with Egg Whites (Large Biscuit)	690	14.0	72	0.0	35	12	1700	
31	Breakfast		Big Breakfast with Hotcakes (Regular Biscuit)	1090	19.0	96	0.0	575	192	2150	
32	Breakfast		Big Breakfast with Hotcakes	1150	20.0	100	0.0	575	192	2260	

Category	Item	Calories	Saturated Fat	Saturated Fat (% Daily Value)	Trans Fat	Cholesterol	Cholesterol (% Daily Value)	Sodium	Sc
(Large Biscuit)									
33 Breakfast	Big Breakfast with Hotcakes and Egg Whites (Re...	990	16.0	78	0.0	55	19	2170	1
34 Breakfast	Big Breakfast with Hotcakes and Egg Whites (La...	1050	16.0	81	0.0	55	19	2290	
35 Breakfast	Hotcakes	350	2.0	9	0.0	20	7	590	
36 Breakfast	Hotcakes and Sausage	520	7.0	36	0.0	50	17	930	
37 Breakfast	Sausage Burrito	300	7.0	33	0.0	115	38	790	
38 Breakfast	Hash Brown	150	1.5	6	0.0	0	0	310	
39 Breakfast	Cinnamon Melts	460	9.0	43	0.0	15	5	370	
40 Breakfast	Fruit & Maple Oatmeal	290	1.5	8	0.0	5	2	160	
41 Breakfast	Fruit & Maple Oatmeal without Brown Sugar	260	1.5	8	0.0	5	2	115	

When we want to search a food item from list

In [19]: `nutrition[nutrition["Item"]=="Egg McMuffin"]`

Out[19]:

Category	Item	Calories	Saturated Fat	Saturated Fat (% Daily Value)	Trans Fat	Cholesterol	Cholesterol (% Daily Value)	Sodium	Sodium Daily Value
0 Breakfast	Egg McMuffin	300	5.0	25	0.0	260	87	750	100



Food items having calories greater than 400 kcal

In [20]: nutrition[nutrition["Calories"]>400]

Out[20]:

		Category	Item	Calories	Saturated Fat	Saturated Fat (% Daily Value)	Trans Fat	Cholesterol	Cholesterol (% Daily Value)	Sodium	...
3	Breakfast	Sausage McMuffin with Egg		450	10.0	52	0.0	285	95	860	
5	Breakfast	Steak & Egg McMuffin		430	9.0	46	1.0	300	100	960	
6	Breakfast	Bacon, Egg & Cheese Biscuit (Regular Biscuit)		460	13.0	65	0.0	250	83	1300	
7	Breakfast	Bacon, Egg & Cheese Biscuit (Large Biscuit)		520	14.0	68	0.0	250	83	1410	
8	Breakfast	Bacon, Egg & Cheese Biscuit with Egg Whites (R...		410	11.0	56	0.0	35	11	1300	
...
254	Smoothies & Shakes	McFlurry with M&M's Candies (Snack)		430	10.0	48	0.0	35	11	120	
255	Smoothies & Shakes	McFlurry with Oreo Cookies (Small)		510	9.0	44	0.5	45	14	280	
256	Smoothies & Shakes	McFlurry with Oreo Cookies (Medium)		690	12.0	58	1.0	55	19	380	
258	Smoothies & Shakes	McFlurry with Reese's Peanut Butter		810	15.0	76	1.0	60	20	400	

Category	Item	Calories	Saturated Fat	Saturated Fat (% Daily Value)	Trans Fat	Cholesterol	Cholesterol (% Daily Value)	Sodium
Cups (Medium)								
259	Smoothies & Shakes	McFlurry with Reese's Peanut Butter Cups (Snack)	410	8.0	38	0.0	30	10 200
100	100	100	100	100	100	100	100	100

Food items having carbs in between 60 g and 80 g

```
In [21]: nutrition[(nutrition["Carbohydrates"]>60) & (nutrition["Carbohydrates"]<80) ]
```

Out[21]:

		Category	Item	Calories	Saturated Fat	Saturated Fat (% Daily Value)	Trans Fat	Cholesterol	Cholesterol (% Daily Value)	Sodium
36	Breakfast		Hotcakes and Sausage	520	7.0	36	0.0	50	17	930
39	Breakfast		Cinnamon Melts	460	9.0	43	0.0	15	5	370
63	Chicken & Fish		Bacon Clubhouse	750	10.0	51	0.5	90	31	1720
			Crispy Chicken Sandwich							
74	Chicken & Fish		Premium McWrap	670	8.0	40	0.5	60	21	1480
			Southwest Chicken (Crispy Chicken)							
76	Chicken & Fish		Premium McWrap	540	4.5	23	0.0	50	16	1260
			Chicken Sweet Chili (Crispy Chi...							
98	Snacks & Sides		Large French Fries	510	3.5	17	0.0	0	0	290
112	Beverages		Coca-Cola Classic (Large)	280	0.0	0	0.0	0	0	5
120	Beverages		Dr Pepper (Large)	270	0.0	0	0.0	0	0	90
128	Beverages		Sprite (Large)	280	0.0	0	0.0	0	0	60
135	Beverages		Minute Maid Orange Juice (Large)	280	0.0	0	0.0	0	0	5
153	Coffee & Tea		Caramel Latte (Large)	430	8.0	39	0.0	40	14	180
156	Coffee & Tea		Hazelnut Latte (Large)	430	8.0	39	0.0	40	14	180
168	Coffee & Tea		Nonfat Caramel Latte (Large)	310	0.0	0	0.0	10	3	180
171	Coffee & Tea		Nonfat Hazelnut Latte (Large)	310	0.0	0	0.0	10	3	180
180	Coffee & Tea		Mocha (Large)	500	10.0	49	0.5	50	17	240

	Category	Item	Calories	Saturated Fat	Saturated Fat (% Daily Value)	Trans Fat	Cholesterol	Cholesterol (% Daily Value)	Sodium
183	Coffee & Tea	Mocha with Nonfat Milk (Large)	390	2.5	12	0.0	20	6	240
186	Coffee & Tea	Caramel Mocha (Large)	480	10.0	49	0.5	50	17	270
189	Coffee & Tea	Nonfat Caramel Mocha (Large)	370	2.5	11	0.0	20	6	270
191	Coffee & Tea	Hot Chocolate (Medium)	440	9.0	47	0.5	50	16	220
192	Coffee & Tea	Hot Chocolate (Large)	540	12.0	58	0.5	60	20	280
194	Coffee & Tea	Hot Chocolate with Nonfat Milk (Medium)	340	2.0	11	0.0	15	6	220
195	Coffee & Tea	Hot Chocolate with Nonfat Milk (Large)	400	2.5	12	0.0	20	7	280
213	Coffee & Tea	Iced Mocha (Large)	480	10.0	49	0.5	50	17	220
216	Coffee & Tea	Iced Mocha with Nonfat Milk (Large)	390	3.5	18	0.0	25	8	220
219	Coffee & Tea	Iced Caramel Mocha (Large)	460	10.0	48	0.5	50	17	250
222	Coffee & Tea	Iced Nonfat Caramel Mocha (Large)	370	3.5	17	0.0	25	8	250
223	Coffee & Tea	Frappé Mocha (Small)	450	12.0	59	1.0	65	21	125
226	Coffee & Tea	Frappé Caramel (Small)	450	12.0	60	1.0	65	22	125
227	Coffee & Tea	Frappé Caramel	550	15.0	73	1.0	80	27	160

ID	Category	Item	Calories	Saturated Fat			Cholesterol	Cholesterol (% Daily Value)	Sodium
				Total	Fat (%)	Daily Value			
229	Tea	Frappé Chocolate Chip (Small)	530	1.0	0.0	0	65	22	135
233	Smoothies & Shakes	Blueberry Pomegranate Smoothie (Medium)	260	0.0	0	0.0	5	1	50
234	Smoothies & Shakes	Blueberry Pomegranate Smoothie (Large)	340	0.5	3	0.0	5	2	65
237	Smoothies & Shakes	Strawberry Banana Smoothie (Large)	330	0.5	3	0.0	5	2	80
239	Smoothies & Shakes	Mango Pineapple Smoothie (Medium)	260	0.0	0	0.0	5	1	45
240	Smoothies & Shakes	Mango Pineapple Smoothie (Large)	340	0.5	3	0.0	5	2	60
254	Smoothies & Shakes	McFlurry with M&M's Candies (Caramel)	430	10.0	48	0.0	35	11	120

Food items with maximum Dietary Fiber

```
In [22]: nutrition[(nutrition["Dietary Fiber"])==(nutrition["Dietary Fiber"].max())]
```

Out[22]:

		Category	Item	Calories	Saturated Fat	Saturated Fat (% Daily Value)	Trans Fat	Cholesterol	Cholesterol (% Daily Value)	Sodium	Sodium (% Daily Value)
32	Breakfast		Big Breakfast with Hotcakes (Large Biscuit)	1150	20.0	100	0.0	575	192	2260	192
34	Breakfast		Big Breakfast with Hotcakes and Egg Whites (La...	1050	16.0	81	0.0	55	19	2290	19
88	Salads		Premium Southwest Salad with Crispy Chicken	450	4.5	22	0.0	50	17	850	17
89	Salads		Premium Southwest Salad with Grilled Chicken	290	2.5	13	0.0	70	23	680	23



Grouping

Grouping Items

```
In [23]: grp=nutrition.groupby("Item")
grp.ngroups ## Total number of food items
```

Out[23]: 260

```
In [24]: grp.get_group("Egg McMuffin") ## Displaying Egg McMuffin item
```

Out[24]:

		Category	Item	Calories	Saturated Fat	Saturated Fat (% Daily Value)	Trans Fat	Cholesterol	Cholesterol (% Daily Value)	Sodium	Sodium (% Daily Value)
0	Breakfast		Egg McMuffin	300	5.0	25	0.0	260	87	750	87



Grouping cholesterol

```
In [25]: grp1=nutrition.groupby("Cholesterol")
grp1.ngroups
```

Out[25]: 35

```
In [26]: grp1.get_group(260)
```

Out[26]:

	Category	Item	Calories	Saturated Fat	Saturated Fat (% Daily Value)	Trans Fat	Cholesterol	Cholesterol (% Daily Value)	Sodium	Sodium Daily Value
0	Breakfast	Egg McMuffin	300	5.0	25	0.0	260	87	750	19

Grouping Vitamin A (% Daily Value)

```
In [27]: grp2=nutrition.groupby("Vitamin A (% Daily Value)")
grp2.ngroups
```

Out[27]: 19

Getting item records having higher vitamin A(% Daily Value) by grouping

```
In [28]: grp2.get_group(nutrition["Vitamin A (% Daily Value)"].max())
```

Out[28]:

	Category	Item	Calories	Saturated	Saturated	Trans	Cholesterol	Cholesterol	Sodium	Sodium	Sodium
				Fat	Fat (% Daily Value)			(% Daily Value)			
84	Salads	Premium Bacon Ranch Salad (without Chicken)	140	3.5	18	0.0	25	9	300	100	100
88	Salads	Premium Southwest Salad with Crispy Chicken	450	4.5	22	0.0	50	17	850	100	100
89	Salads	Premium Southwest Salad with Grilled Chicken	290	2.5	13	0.0	70	23	680	100	100



Sorting

Sorting of food items according protein

In [29]: `nutrition.sort_values("Protein")`

Out[29]:

		Category	Item	Calories	Saturated Fat	Saturated Fat (% Daily Value)	Trans Fat	Cholesterol	Cholesterol (% Daily Value)	Sodium
129	Beverages	Sprite (Child)	100	0.0	0	0.0	0	0	0	25
146	Coffee & Tea	Coffee (Medium)	0	0.0	0	0.0	0	0	0	0
145	Coffee & Tea	Coffee (Small)	0	0.0	0	0.0	0	0	0	0
144	Coffee & Tea	Sweet Tea (Child)	110	0.0	0	0.0	0	0	0	5
140	Coffee & Tea	Iced Tea (Child)	0	0.0	0	0.0	0	0	0	5
...
64	Chicken & Fish	Bacon Clubhouse Grilled Chicken Sandwich	590	8.0	42	0.0	110	37	1560	
60	Chicken & Fish	Premium Grilled Chicken Club Sandwich	510	7.0	36	0.0	105	35	1250	
81	Chicken & Fish	Chicken McNuggets (20 piece)	940	10.0	50	0.0	135	44	1800	
47	Beef & Pork	Double Quarter Pounder with Cheese	750	19.0	96	2.5	160	53	1280	
82	Chicken & Fish	Chicken McNuggets (40 piece)	1880	20.0	101	1.0	265	89	3600	

260 rows × 20 columns



Top 5 food items containing higher calories

In [30]: `nutrition.sort_values("Calories", ascending=False).head(5)`

Out[30]:

		Category	Item	Calories	Saturated Fat	Saturated Fat (% Daily Value)	Trans Fat	Cholesterol	Cholesterol (% Daily Value)	Sodium	Carbohydrates
82	Chicken & Fish	Chicken McNuggets (40 piece)		1880	20.0	101	1.0	265	89	3600	440
32	Breakfast	Big Breakfast with Hotcakes (Large Biscuit)		1150	20.0	100	0.0	575	192	2260	440
31	Breakfast	Big Breakfast with Hotcakes (Regular Biscuit)		1090	19.0	96	0.0	575	192	2150	440
34	Breakfast	Big Breakfast with Hotcakes and Egg Whites (La...		1050	16.0	81	0.0	55	19	2290	440
33	Breakfast	Big Breakfast with Hotcakes and Egg Whites (Re...		990	16.0	78	0.0	55	19	2170	440



Top 5 food items containing lower calories

In [31]: `nutrition.sort_values("Calories", ascending=False).tail(5)`

Out[31]:

		Category	Item	Calories	Saturated Fat	Saturated Fat (% Daily Value)	Trans Fat	Cholesterol	Cholesterol (% Daily Value)	Sodium	Sc
117	Beverages	Diet Coke (Child)		0	0.0	0	0.0	0	0	15	,
116	Beverages	Diet Coke (Large)		0	0.0	0	0.0	0	0	35	
115	Beverages	Diet Coke (Medium)		0	0.0	0	0.0	0	0	20	
114	Beverages	Diet Coke (Small)		0	0.0	0	0.0	0	0	10	
146	Coffee & Tea	Coffee (Medium)		0	0.0	0	0.0	0	0	0	

Analysis of data set

% Daily value=(amount of nutrient present in food item)/(Total recommended daily amount)*100

Actually we compare % daily values to choose a better food item

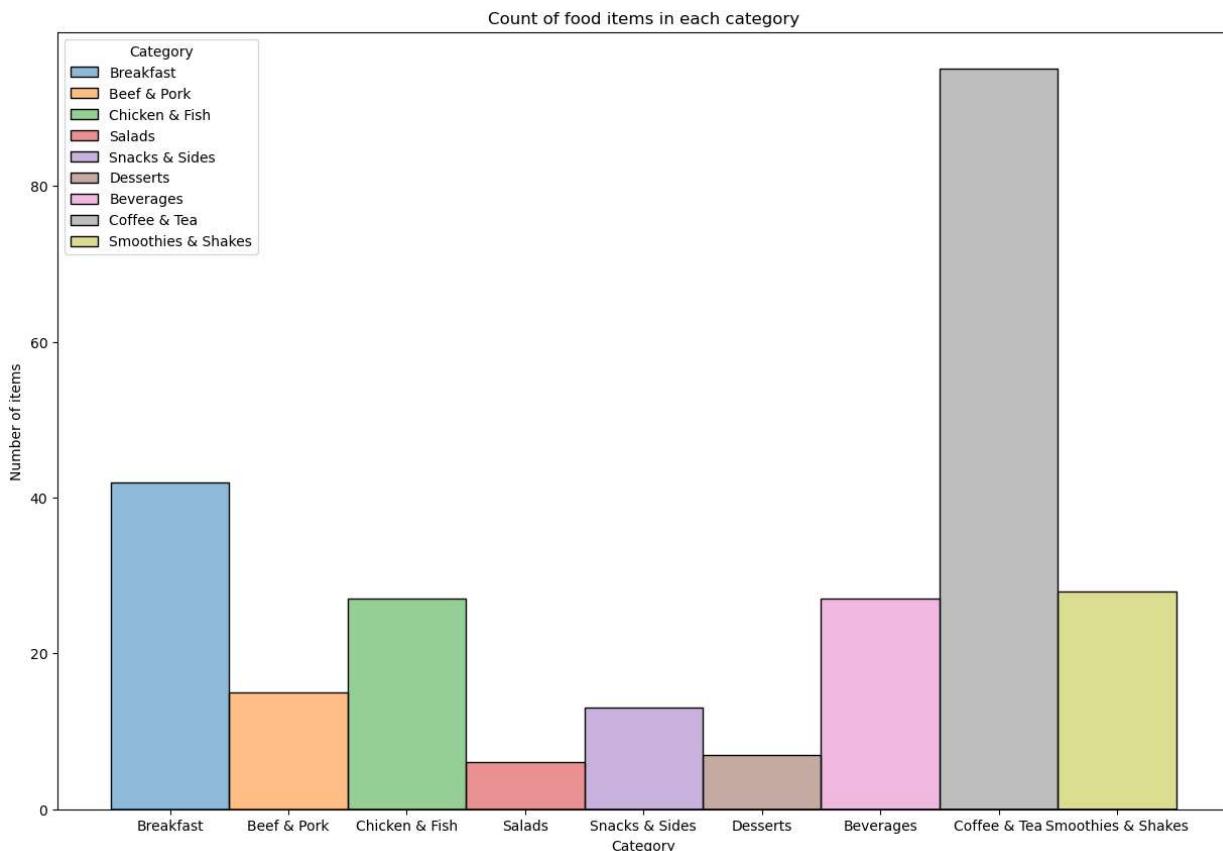
Among all nutrients saturated fats, trans fats, sodium, sugars, cholesterol are harmful to health. They have to be $\leq 5\%$ daily value in a food item.

Remaining nutrients are good for health and they have to be more than 20% daily value in a food item to call that food item as best.

*****Visualization*****

1. Showing number of food items in each category using histogram

```
In [32]: plt.figure(figsize=(15,10))
sns.histplot(data=nutrition,x="Category",hue="Category")
plt.ylabel("Number of items")
plt.title("Count of food items in each category")
plt.show()
```

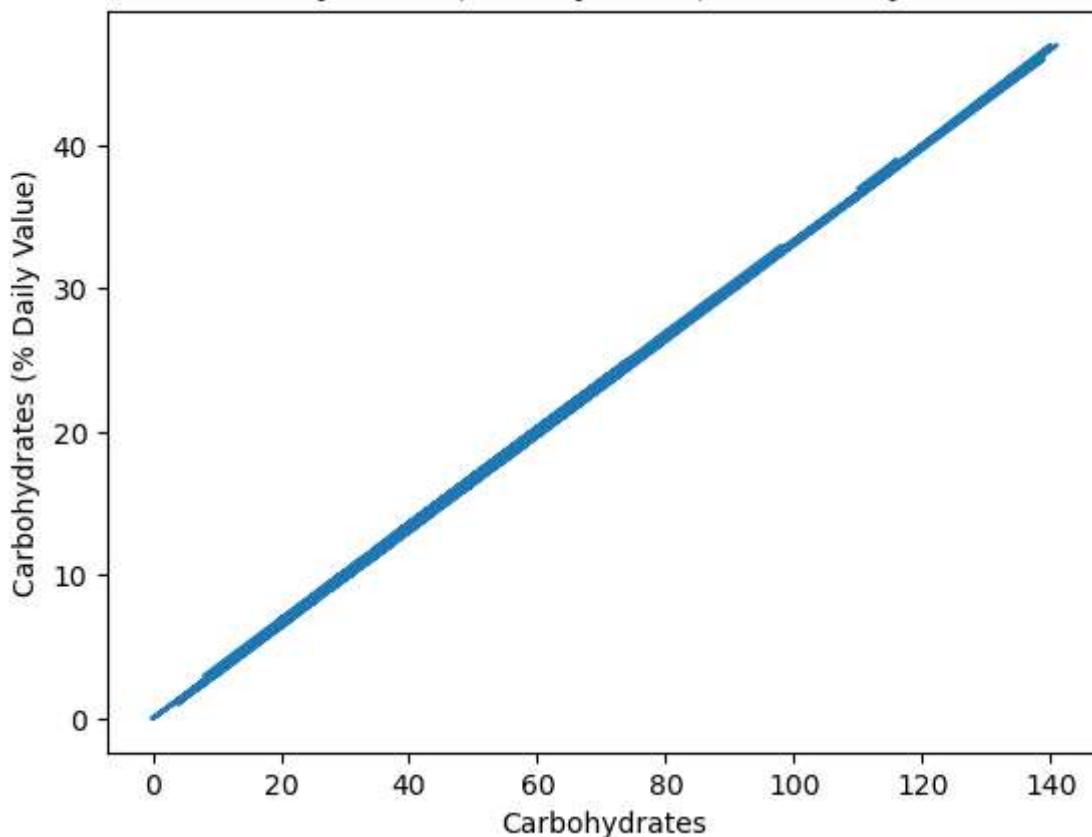


-> That means there are more varieties in coffee and tea

2. Plotting between actual amount of nutrient and % Daily value

```
In [33]: plt.plot(nutrition["Carbohydrates"],nutrition["Carbohydrates (% Daily Value)"])
plt.title("Carbohydrates (% Daily Value) vs Carbohydrates")
plt.xlabel("Carbohydrates")
plt.ylabel("Carbohydrates (% Daily Value)")
plt.show()
```

Carbohydrates (% Daily Value) vs Carbohydrates

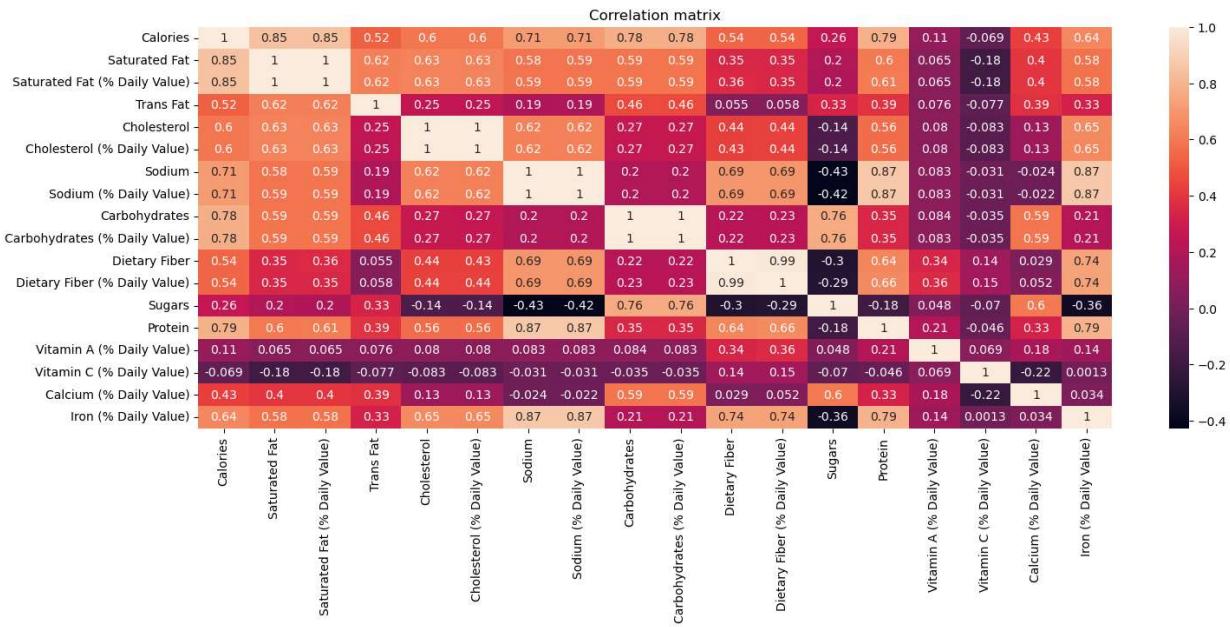


Plotting between them is always a straight line

3. Correlation Matrix

```
In [34]: plt.figure(figsize=(17,6))
numeric_columns=nutrition.select_dtypes(include="number")
plt.title("Correlation matrix")
sns.heatmap(numeric_columns.corr(), annot=True)
```

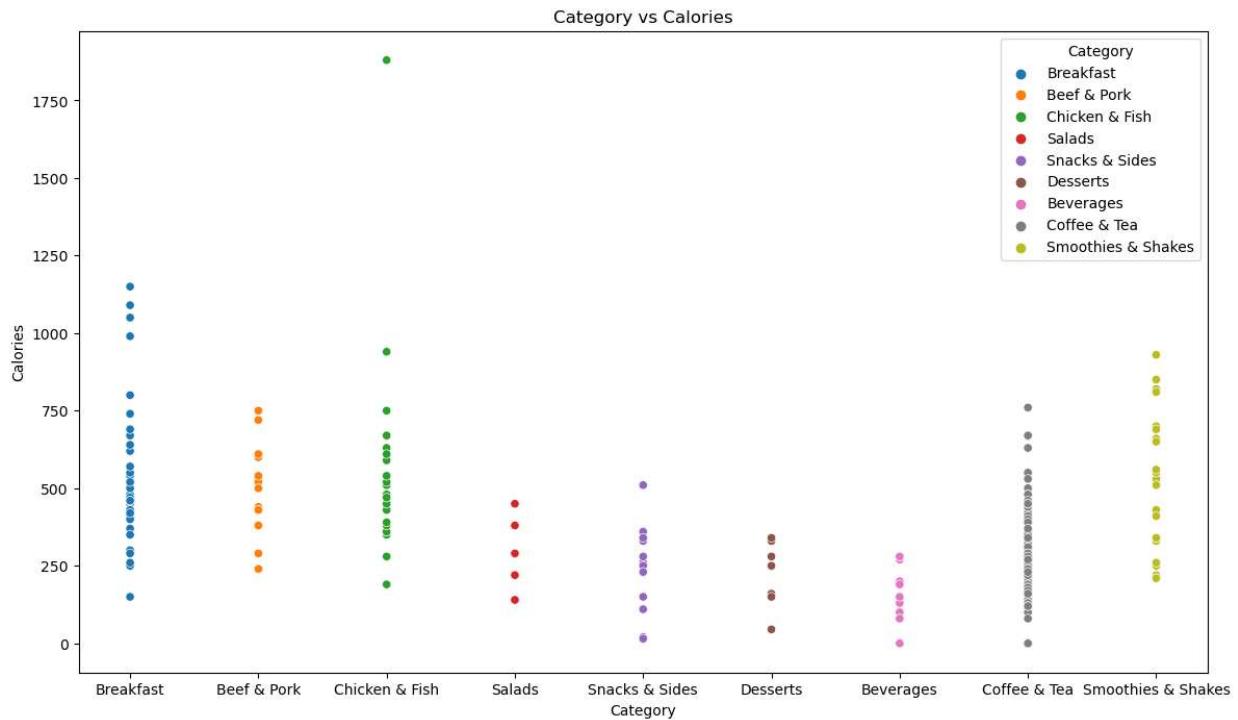
```
Out[34]: <Axes: title={'center': 'Correlation matrix'}>
```



4. Calories Analysis

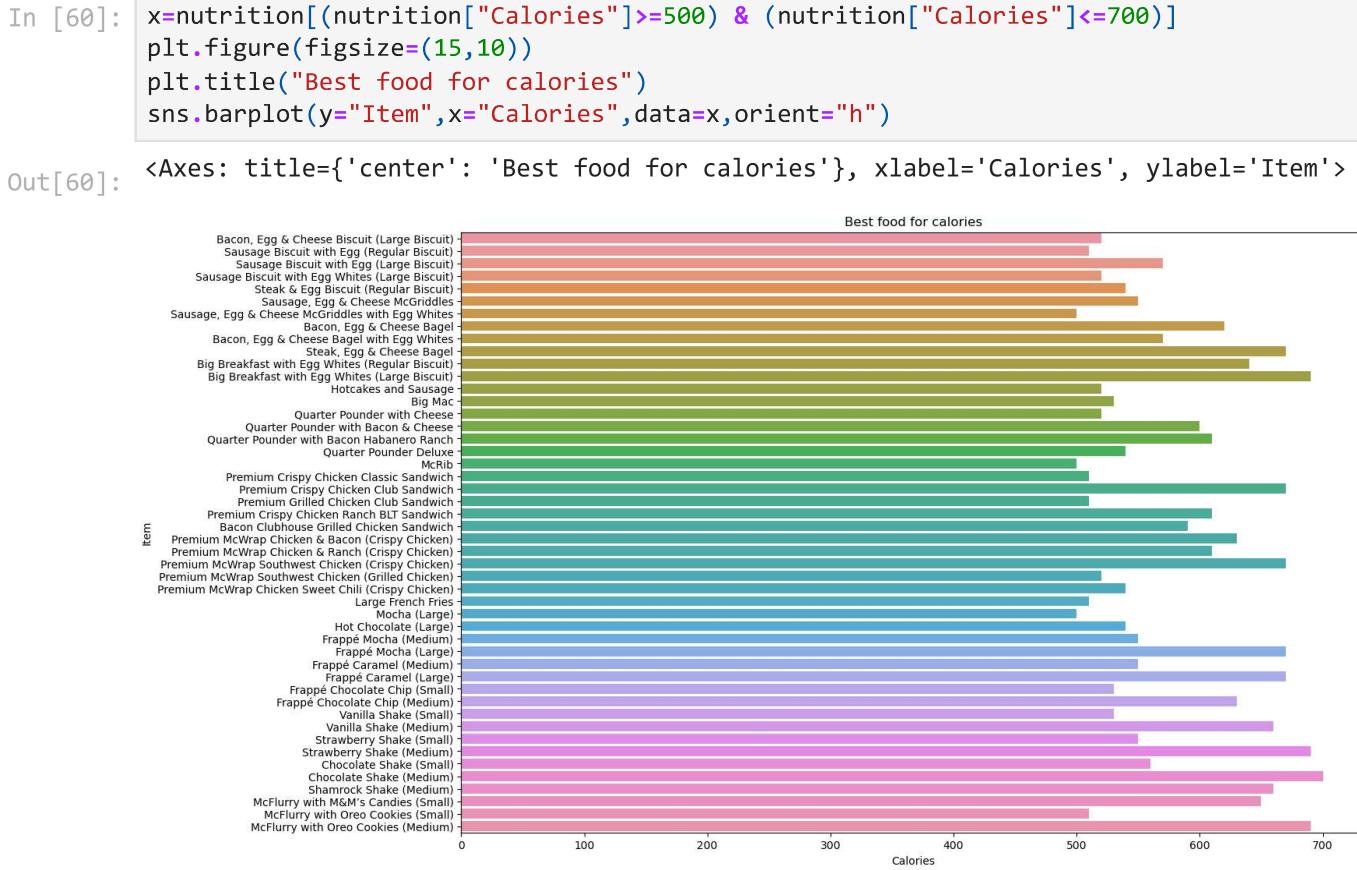
Food items having calories in between 500-700 kcal are better.

```
In [35]: plt.figure(figsize=(14,8))
sns.scatterplot(x="Category",y="Calories",data=nutrition,hue="Category")
plt.title("Category vs Calories")
plt.show()
```



--> Chicken & fish, Breakfast category food items have high calories

--> Beverages,Desserts and Coffee & tea category food items have low calories



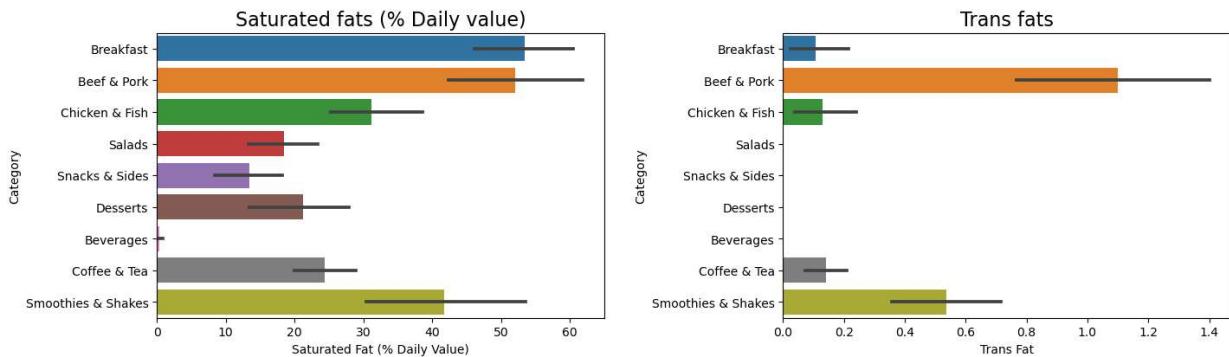
Above food items have good calories content.By having them we can have better energy levels all the day

5. Saturated fats and trans fats analysis using bar graphs

Saturated fats (% Daily value) should be less than 5%

Trans fats should be <0.5 grams

```
In [37]: plt.figure(figsize=(16,10))
plt.subplots_adjust(wspace=0.4, hspace=0.4, top=0.9)
plt.subplot(2,2,1)
g=sns.barplot(y="Category",x="Saturated Fat (% Daily Value)",data=nutrition,orient="h")
g.set_title("Saturated fats (% Daily value)",fontsize=16)
plt.subplot(2,2,2)
g1=sns.barplot(y="Category",x="Trans Fat",data=nutrition,orient="h")
g1.set_title("Trans fats",fontsize=16)
plt.show()
```



From above two graphs we can conclude that

--> Beef & Pork , Smoothies & Shakes ,Chicken & Fish food categories have more fat content.

--> Beverages,Snacks & sides Category, Salads categories have less fat content

Food items to eat to avoid total fat content

```
In [38]: x=nutrition[(nutrition["Saturated Fat (% Daily Value)"]<=5) & (nutrition["Trans Fat"]<
x[["Item","Saturated Fat (% Daily Value)","Trans Fat"]]
```

Out[38]:

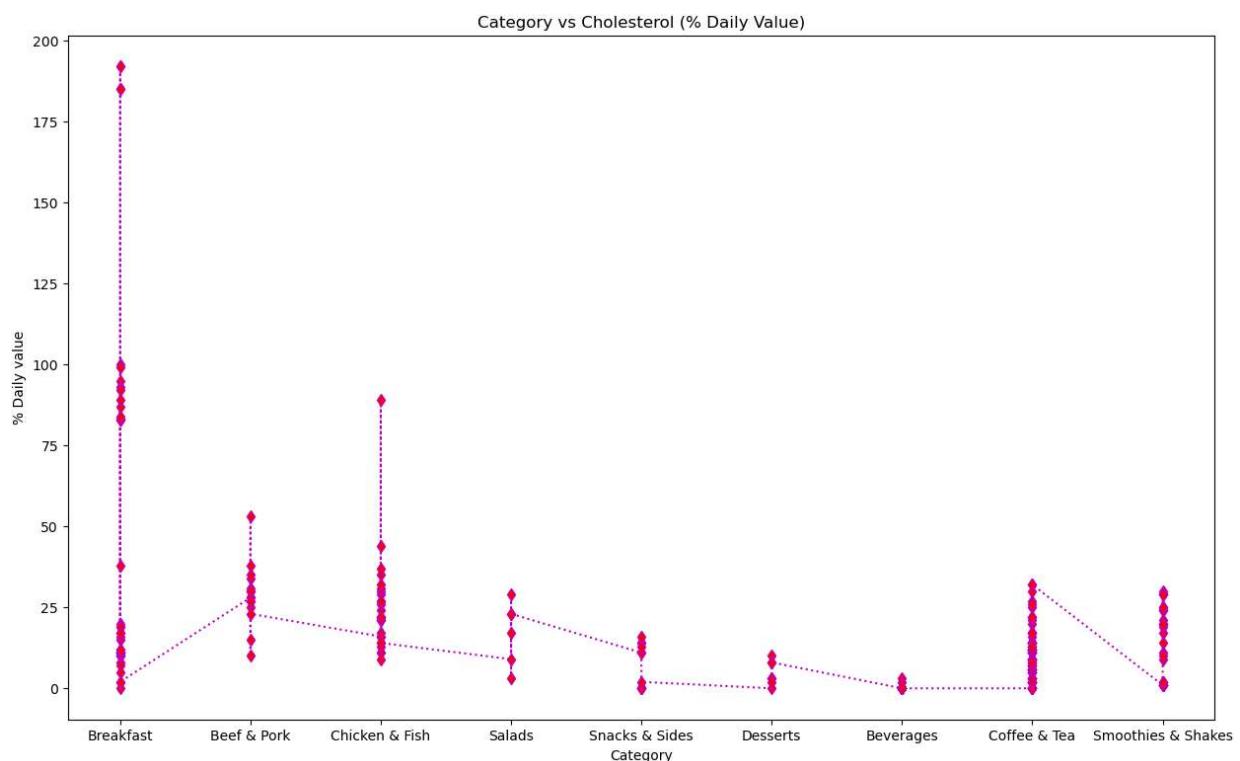
	Item	Saturated Fat (% Daily Value)	Trans Fat
99	Kids French Fries	4	0.0
100	Side Salad	0	0.0
101	Apple Slices	0	0.0
102	Fruit 'n Yogurt Parfait	5	0.0
106	Kids Ice Cream Cone	4	0.0
...
236	Strawberry Banana Smoothie (Medium)	0	0.0
237	Strawberry Banana Smoothie (Large)	3	0.0
238	Mango Pineapple Smoothie (Small)	0	0.0
239	Mango Pineapple Smoothie (Medium)	0	0.0
240	Mango Pineapple Smoothie (Large)	3	0.0

66 rows × 3 columns

6. Cholesterol (% Daily Value) Analysis using line plot

Cholesterol (% Daily Value) should be <=5

```
In [39]: plt.figure(figsize=(15,9))
plt.plot(nutrition["Category"],nutrition["Cholesterol (% Daily Value)"],color="m",line
plt.title("Category vs Cholesterol (% Daily Value)")
plt.ylabel("% Daily value")
plt.xlabel("Category")
plt.show()
```



--> So Breakfast, Beef & Pork , Chicken & Fish will increase risk of heart diseases due to high cholesterol levels.

--> Bevarages, Desserts, Snacks & Sides categories will reduce the risk of heart diseases due to low cholesterol levels.

Food items to eat to avoid heart diseases.

```
In [40]: x=nutrition[nutrition["Cholesterol (% Daily Value)"]<=5]
x[[ "Item", "Cholesterol (% Daily Value)"]]
```

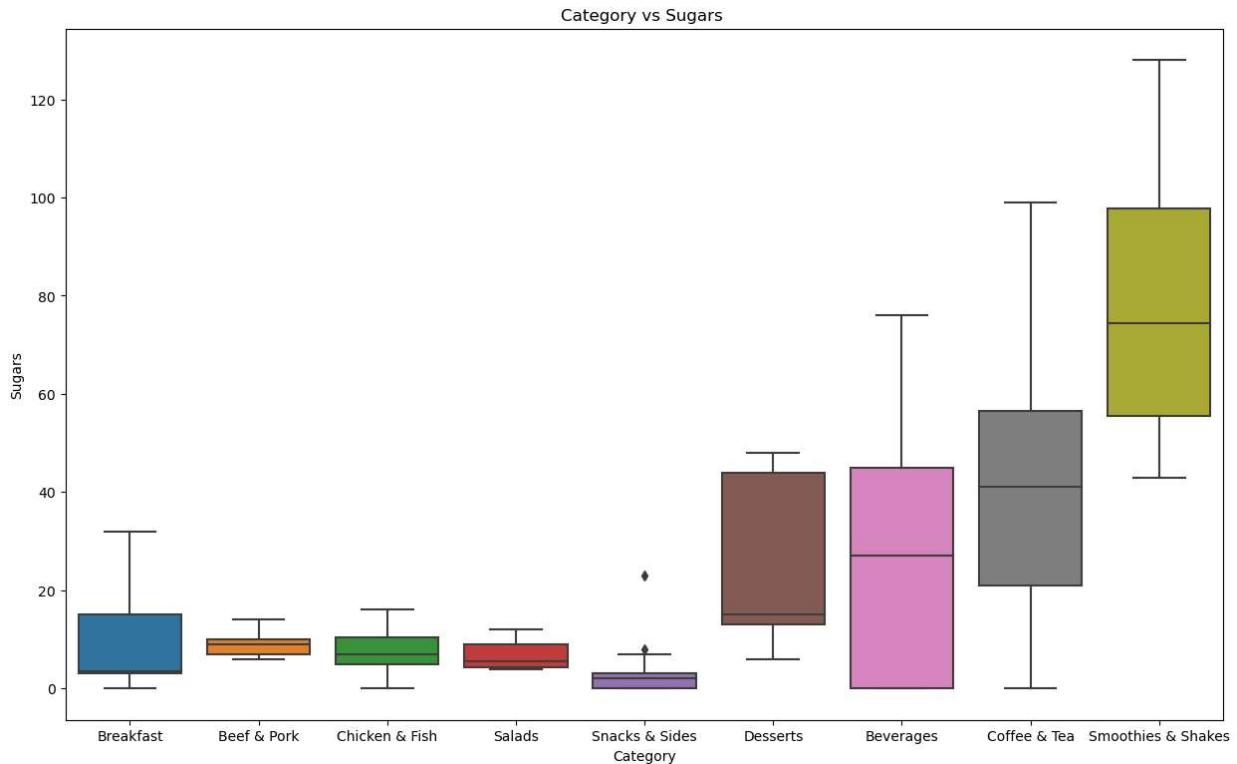
Out[40]:

	Item	Cholesterol (% Daily Value)
38	Hash Brown	0
39	Cinnamon Melts	5
40	Fruit & Maple Oatmeal	2
41	Fruit & Maple Oatmeal without Brown Sugar	2
87	Premium Southwest Salad (without Chicken)	3
...
236	Strawberry Banana Smoothie (Medium)	1
237	Strawberry Banana Smoothie (Large)	2
238	Mango Pineapple Smoothie (Small)	1
239	Mango Pineapple Smoothie (Medium)	1
240	Mango Pineapple Smoothie (Large)	2

83 rows × 2 columns

7. Sugars analysis

```
In [41]: plt.figure(figsize=(15,9))
sns.boxplot(x="Category",y="Sugars",data=nutrition)
plt.title("Category vs Sugars ")
plt.show()
```



From above box plot we can see

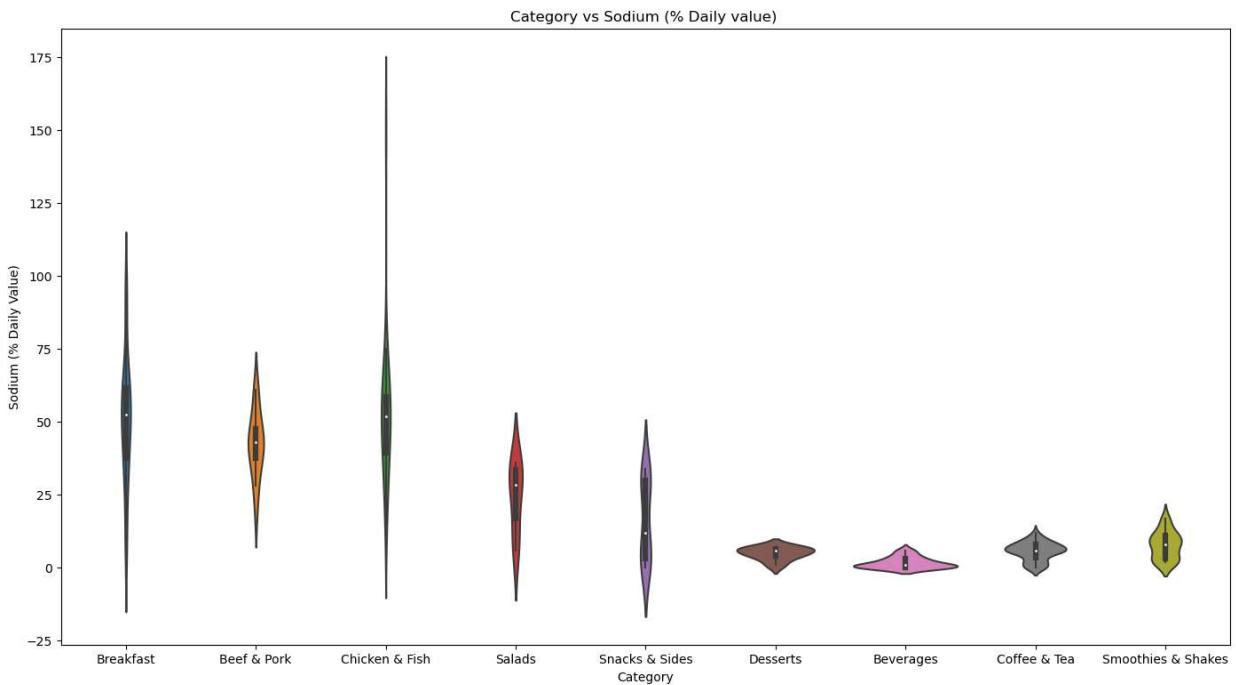
--> Smoothies & Shakes , Coffee & Tea , Bevarages have high sugar content.

--> Salads, Snacks & Sides category have low sugar content.

8. Sodium (% Daily Value) Analysis.

Sodium (% Daily Value) should be ≤ 5

```
In [42]: plt.figure(figsize=(17,9))
sns.violinplot(x="Category",y="Sodium (% Daily Value)",data=nutrition)
plt.title("Category vs Sodium (% Daily value) ")
plt.show()
```



From above violin plot we can see

--> Chicken & Fish , Beef & Pork , Breakfast categories have higher sodium levels these

food items can lead to brain related diseases.

--> Bevarages, Desserts, Coffee & Tea have low sodium levels and have less chances to get brain related diseases

Food items with better sodium levels

```
In [43]: x=nutrition[nutrition["Sodium (% Daily Value)"]<=5]
x[["Item","Sodium (% Daily Value)"]]
```

Out[43]:

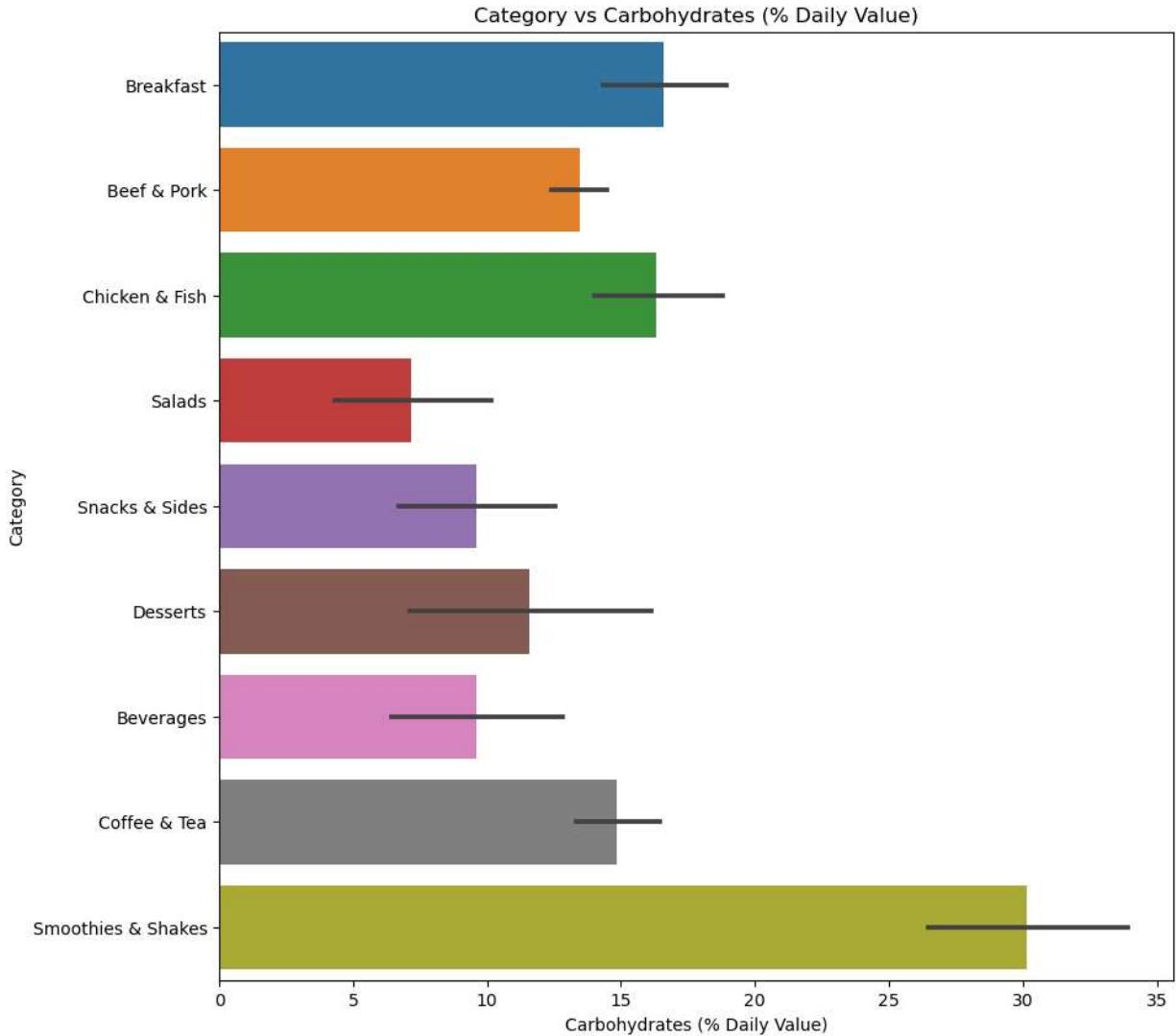
	Item	Sodium (% Daily Value)
41	Fruit & Maple Oatmeal without Brown Sugar	5
96	Small French Fries	5
99	Kids French Fries	3
100	Side Salad	0
101	Apple Slices	0
...
237	Strawberry Banana Smoothie (Large)	3
238	Mango Pineapple Smoothie (Small)	2
239	Mango Pineapple Smoothie (Medium)	2
240	Mango Pineapple Smoothie (Large)	3
254	McFlurry with M&M's Candies (Snack)	5

81 rows × 2 columns

9. Carbohydrates (% Daily Value) analysis

Carbohydrates (% Daily Value) should be ≥ 20 for better energy levels.

```
In [44]: plt.figure(figsize=(10,10))
sns.barplot(y="Category",x="Carbohydrates (% Daily Value)",data=nutrition,width=0.8,or
plt.title("Category vs Carbohydrates (% Daily Value)")
plt.show()
```



from above bar graph

--> Smoothies & Shakes ,Breakfast ,Chicken & Fish have higher carbohydrate levels.

--> Salads, Beverages have lower carbohydrate levels

.

Food items to eat to get more carbohydrates

```
In [45]: x=nutrition[nutrition["Carbohydrates (% Daily Value)"]>=20]
x[["Item","Carbohydrates (% Daily Value)"]]
```

Out[45]:

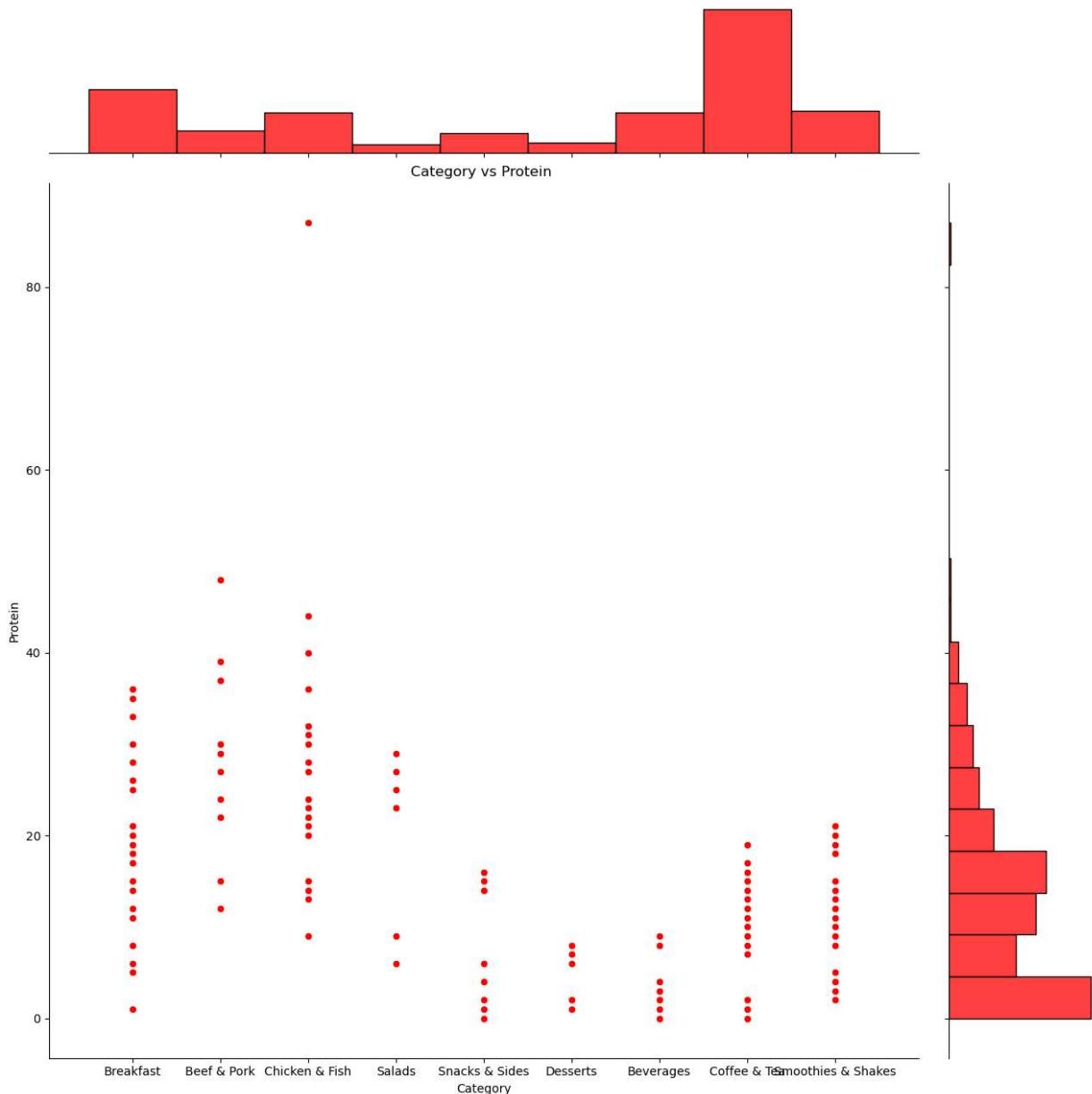
		Item	Carbohydrates (% Daily Value)
31	Big Breakfast with Hotcakes (Regular Biscuit)		37
32	Big Breakfast with Hotcakes (Large Biscuit)		39
33	Big Breakfast with Hotcakes and Egg Whites (Re...		37
34	Big Breakfast with Hotcakes and Egg Whites (La...		38
35	Hotcakes		20
...
253	McFlurry with M&M's Candies (Medium)		46
254	McFlurry with M&M's Candies (Snack)		21
255	McFlurry with Oreo Cookies (Small)		27
256	McFlurry with Oreo Cookies (Medium)		35
258	McFlurry with Reese's Peanut Butter Cups (Medium)		38

69 rows × 2 columns

10. Protein Analysis

Food items having ≥ 25 grams proteins are best for body building

```
In [46]: sns.jointplot(x="Category",y="Protein",data=nutrition,height=13,color="red")
plt.title("Category vs Protein ")
plt.show()
```



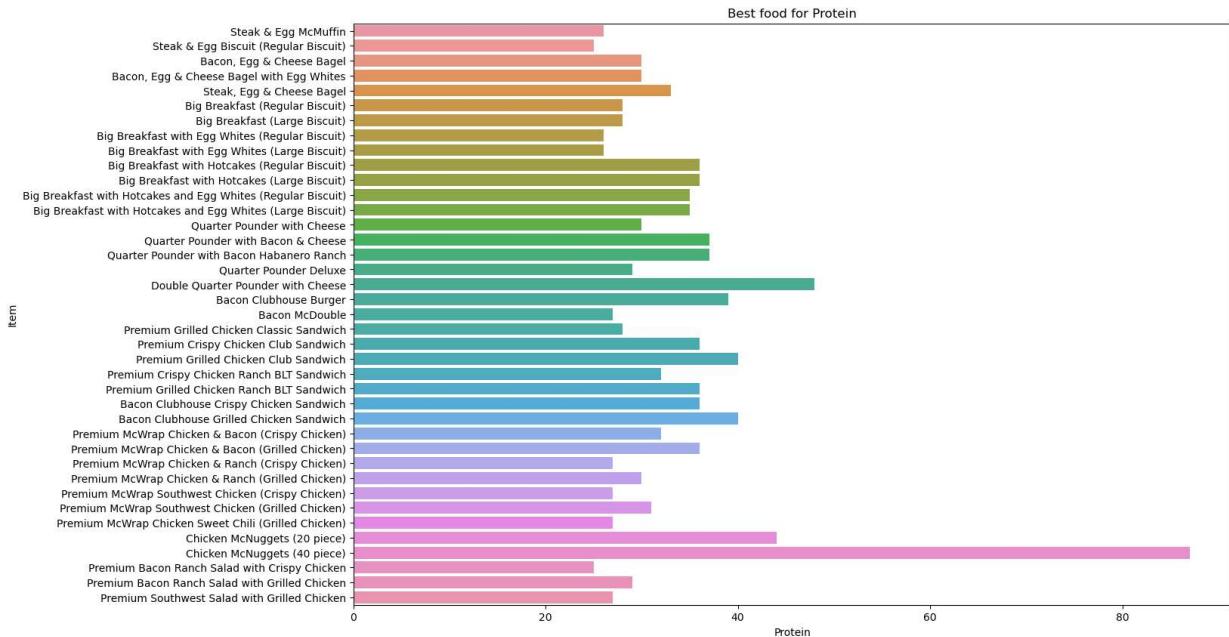
-->Beef & Pork , Chicken & Fish have high proteins.

-->Deserts, Beverages have low proteins.

Food items with good protein levels

```
In [61]: x=nutrition[nutrition["Protein"]>=25]
plt.figure(figsize=(15,10))
plt.title("Best food for Protein")
sns.barplot(y="Item",x="Protein",data=x,orient="h")
```

Out[61]: <Axes: title={'center': 'Best food for Protein'}, xlabel='Protein', ylabel='Item'>



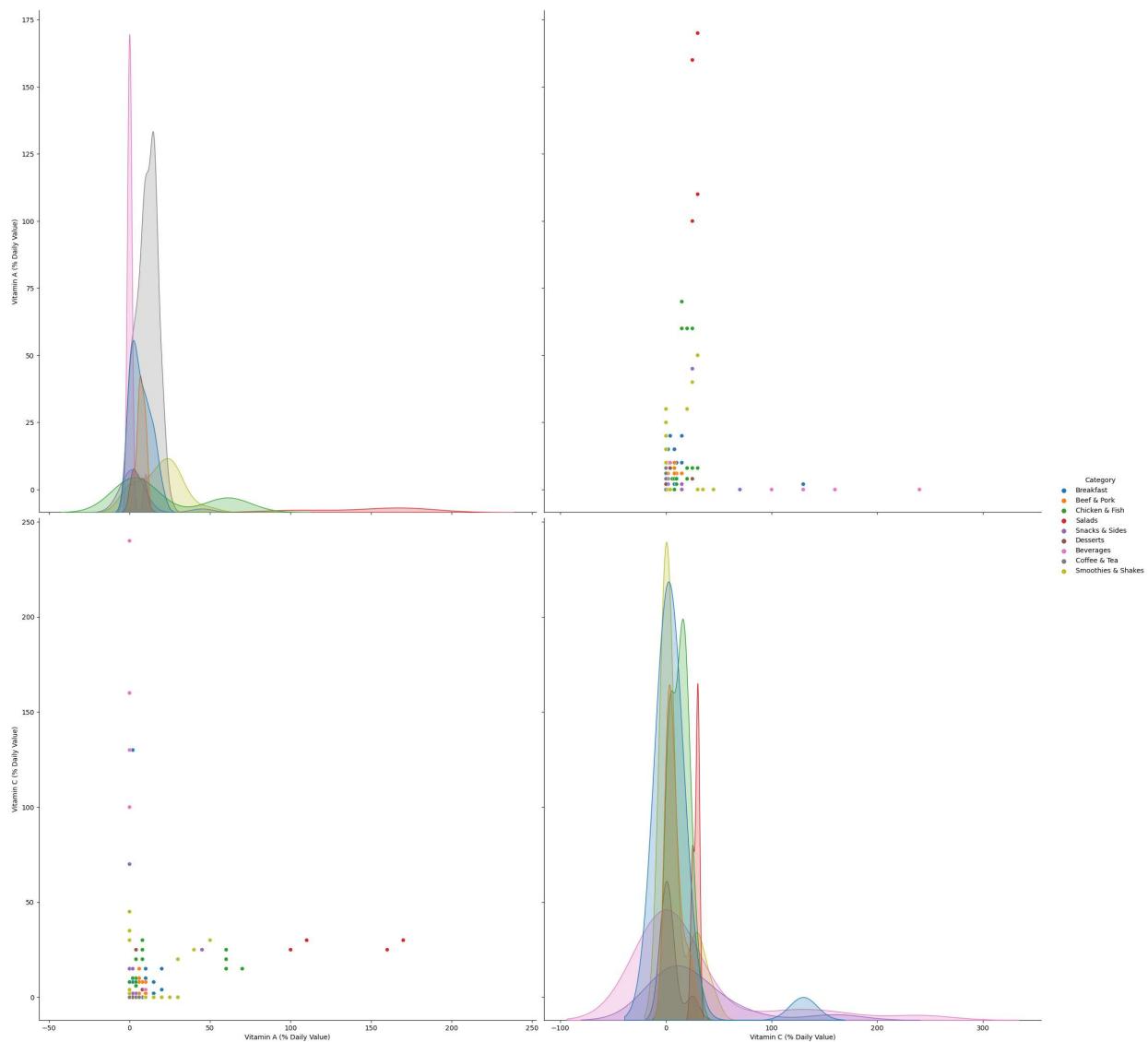
11. Vitamin A (% Daily Value) and Vitamin C (% Daily Value) analysis.

Both have to be $\geq 20\%$

Vitamin A for good eye sight.

Vitamin C for good skin,bones and clean blood.

```
In [48]: sns.pairplot(data=nutrition, vars=["Vitamin A (% Daily Value)", "Vitamin C (% Daily Value")]
plt.show()
```



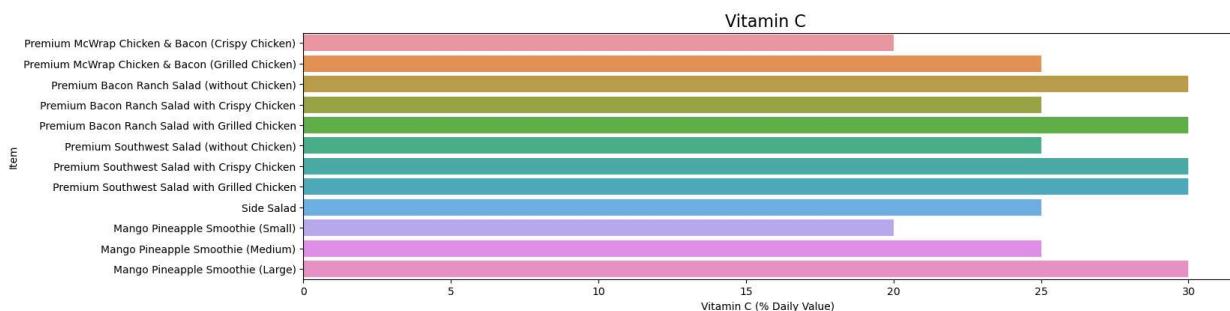
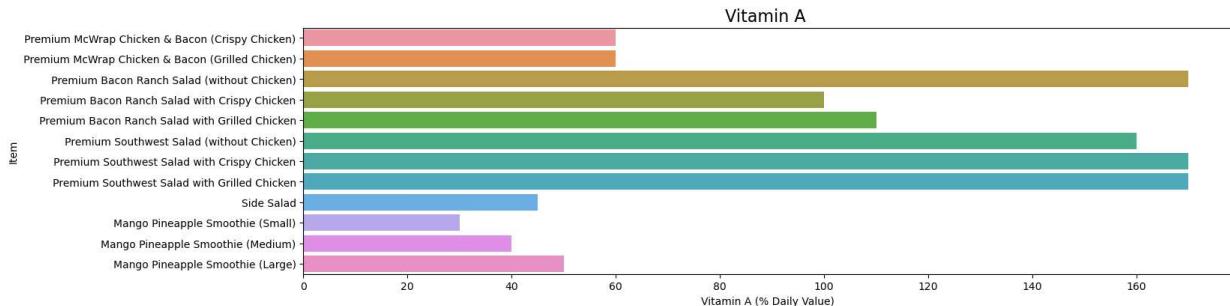
--> Beverages, Snacks & Sides, Breakfast have high vitamin A percentages.

--> Salads, Chicken & Fish , Smoothies & Shakes have high vitamin C percentages.

Food items having both vitamin A and vitamin C levels high

```
In [49]: x=nutrition[(nutrition["Vitamin C (% Daily Value)"]>=20) & (nutrition["Vitamin A (% Daily Value)"]>=20)]
plt.figure(figsize=(16,10))
plt.subplots_adjust(wspace=0.4, hspace=0.4, top=0.9)
plt.subplot(2,1,1)
g=sns.barplot(y="Item",x="Vitamin A (% Daily Value)",data=x,orient="h")
g.set_title("Vitamin A ",fontsize=16)
plt.subplot(2,1,2)
g1=sns.barplot(y="Item",x="Vitamin C (% Daily Value)",data=x,orient="h")
```

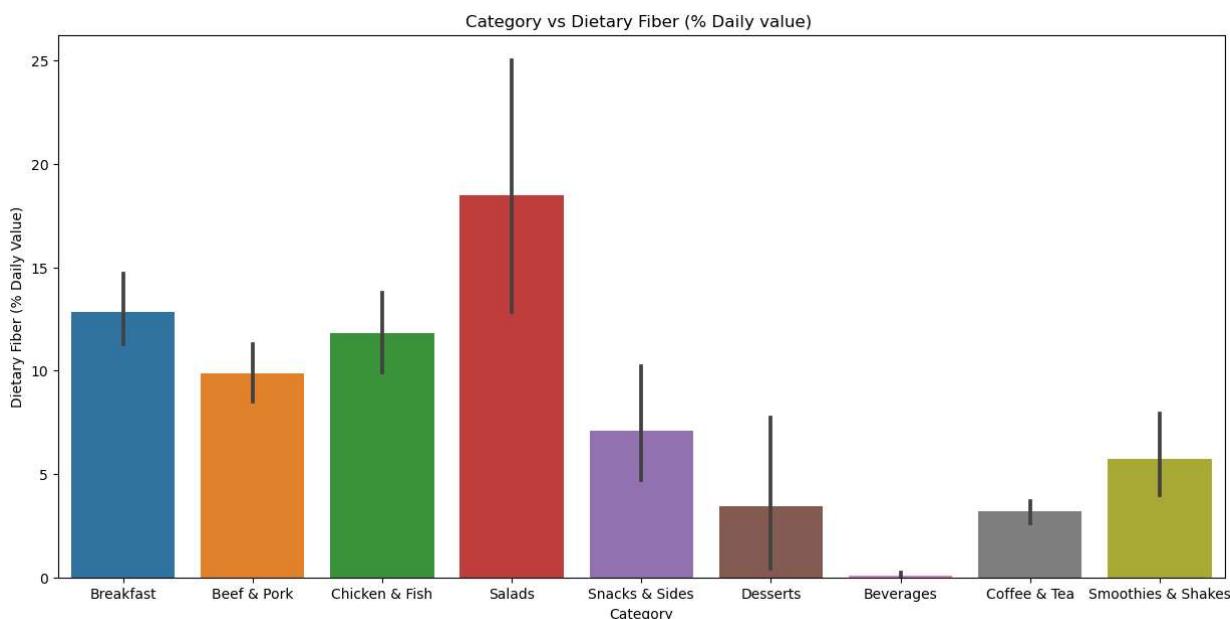
```
g1.set_title("Vitamin C ", fontsize=16)
plt.show()
```



12. Dietary Fiber analysis

Dietary Fiber (% Daily Value) should be $\geq 20\%$ for better digestion.

```
In [50]: plt.figure(figsize=(15,7))
sns.barplot(x="Category",y="Dietary Fiber (% Daily Value)",data=nutrition)
plt.title("Category vs Dietary Fiber (% Daily value) ")
plt.show()
```



From above bar graph we can observe

--> Salads, Breakfast and Chicken & Fish categories have high Dietary Fiber levels.

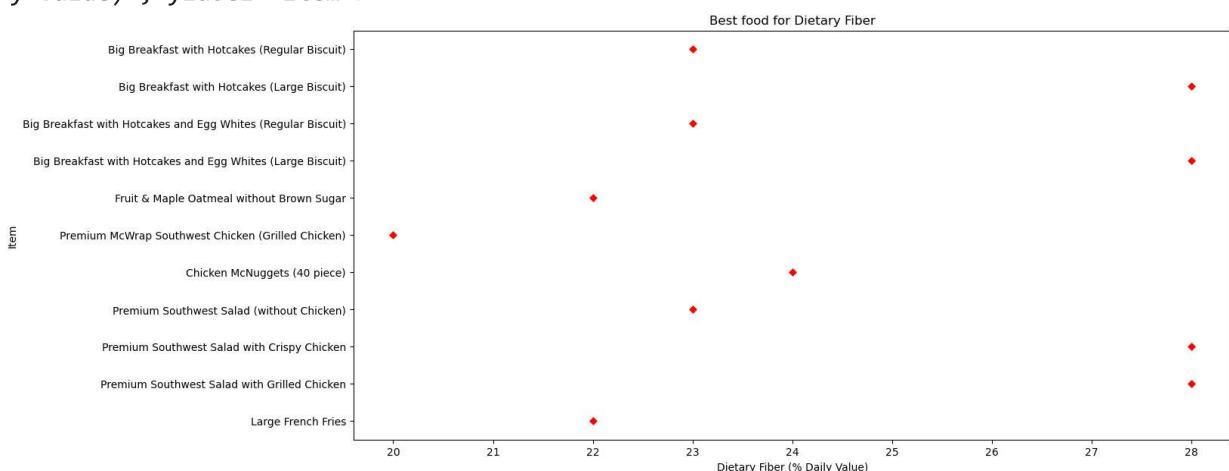
--> Beverages, Coffee & Tea have low Dietary Fibers

.

Food items which have good Dietary Fiber

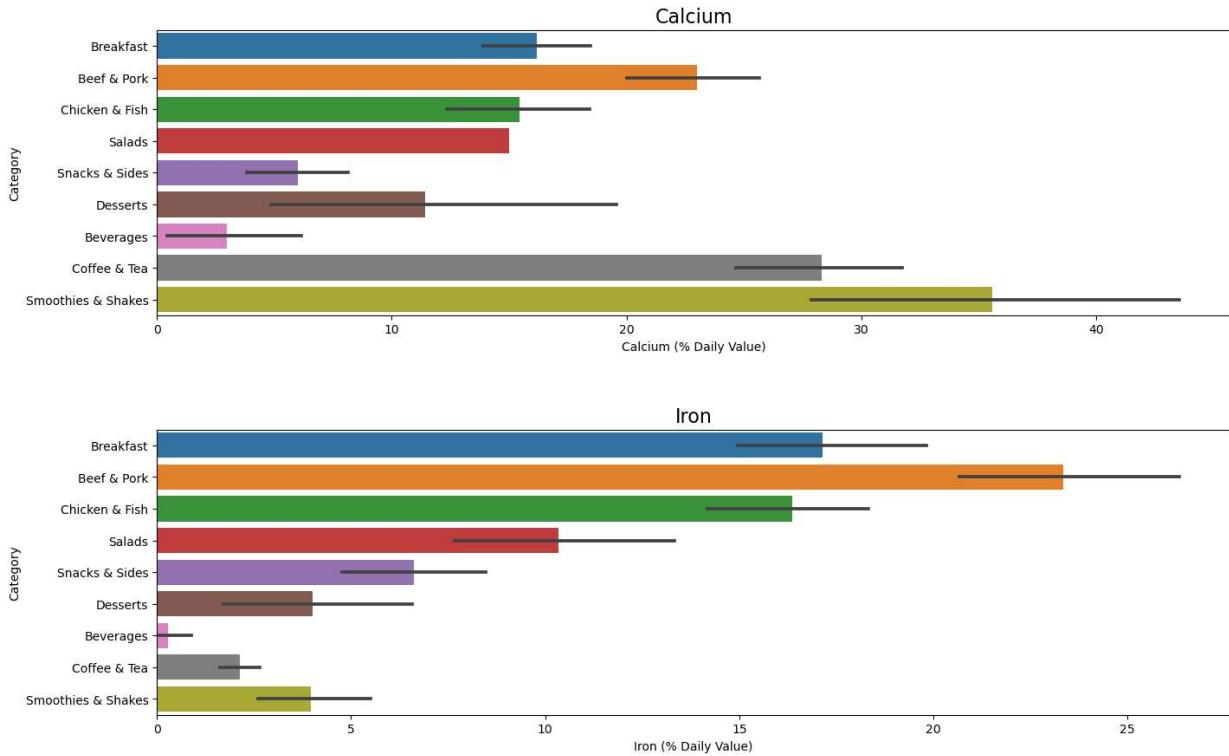
```
In [62]: x=nutrition[nutrition["Dietary Fiber (% Daily Value)"]>=20]
plt.figure(figsize=(15,7))
plt.title("Best food for Dietary Fiber")
sns.scatterplot(y="Item",x="Dietary Fiber (% Daily Value)",data=x,marker="D",color="red")
```

```
Out[62]: <Axes: title={'center': 'Best food for Dietary Fiber'}, xlabel='Dietary Fiber (% Daily Value)', ylabel='Item'>
```



13. Calcium and Iron % Daily values Analysis

```
In [52]: plt.figure(figsize=(16,10))
plt.subplots_adjust(wspace=0.4, hspace=0.4, top=0.9)
plt.subplot(2,1,1)
g=sns.barplot(y="Category",x="Calcium (% Daily Value)",data=nutrition,orient="h")
g.set_title("Calcium",fontsize=16)
plt.subplot(2,1,2)
g1=sns.barplot(y="Category",x="Iron (% Daily Value)",data=nutrition,orient="h")
g1.set_title("Iron",fontsize=16)
plt.show()
```



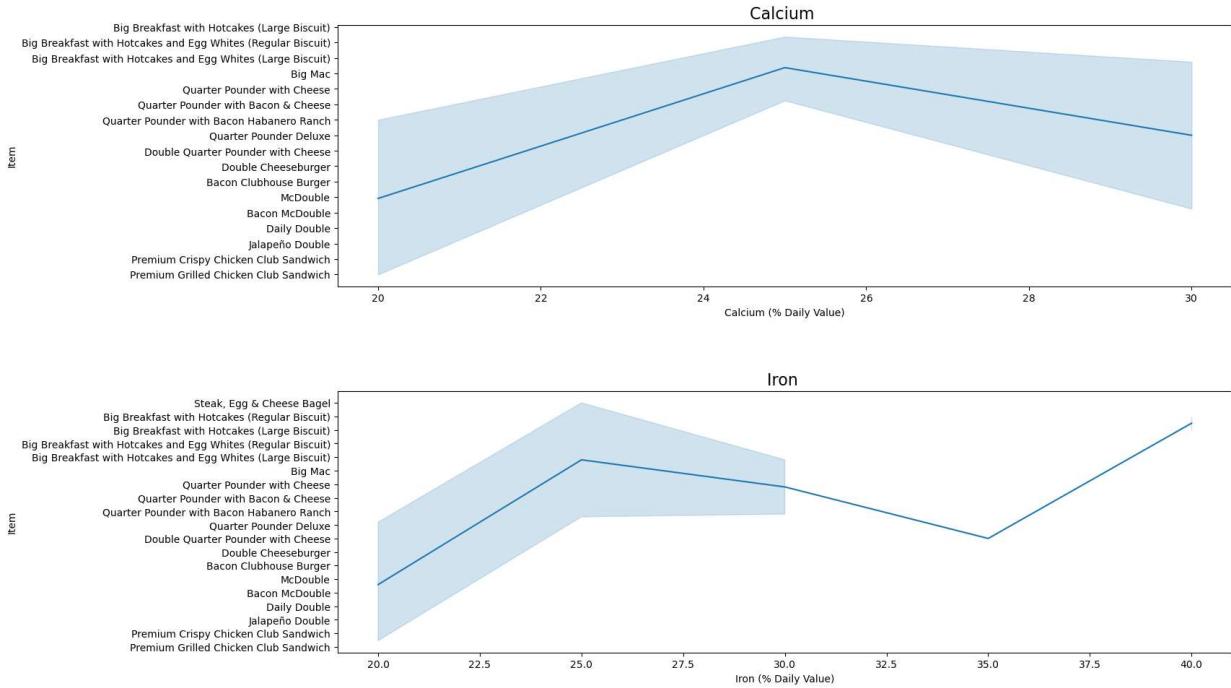
So,

--> Smoothies & Shakes , Coffee & Tea ,Beef & pork categories have better calcium levels.

--> Beef & Pork ,Breakfast and Chicken & Fish categories have better Iron levels.

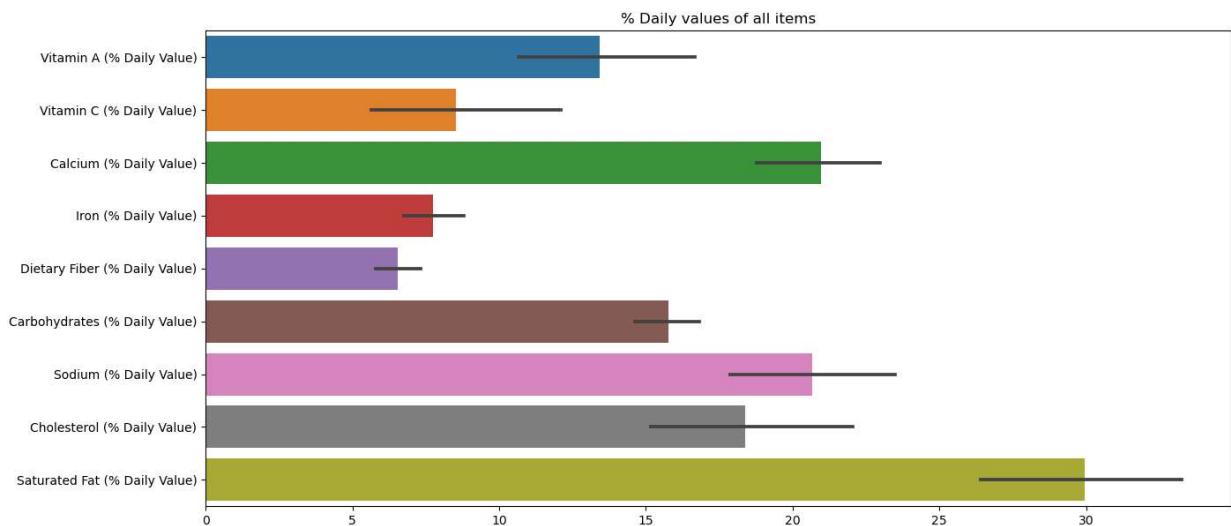
Food items with good calcium and iron content

```
In [59]: x=nutrition[(nutrition["Calcium (% Daily Value)"]>=20) & (nutrition["Iron (% Daily Va"]
plt.figure(figsize=(16,11))
plt.subplots_adjust(wspace=0.4, hspace=0.4, top=0.9)
plt.subplot(2,1,1)
g=sns.lineplot(y="Item",x="Calcium (% Daily Value)",data=x)
g.set_title("Calcium ",fontsize=16)
plt.subplot(2,1,2)
g1=sns.lineplot(y="Item",x="Iron (% Daily Value)",data=x)
g1.set_title("Iron ",fontsize=16)
plt.show()
```



14. Comparing all % Daily values of all nutrients of all food items.

```
In [54]: df1=nutrition[["Vitamin A (% Daily Value)", "Vitamin C (% Daily Value)", "Calcium (% Daily Value)", "Iron (% Daily Value)", "Dietary Fiber (% Daily Value)", "Carbohydrates (% Daily Value)", "Sodium (% Daily Value)", "Cholesterol (% Daily Value)", "Saturated Fat (% Daily Value)"]]
df1
plt.figure(figsize=(15,7))
sns.barplot(data=df1,orient="h")
plt.title("% Daily values of all items")
plt.show()
```



From above we can observe that

In McDonald's food items:

--> Saturated fats are high and dietary fibers are low so there is chance of gaining weight

which leads to obesity

--> Cholesterol levels are also high it leads to heart diseases

--> Sodium levels are high which leads to brain related diseases.

--> Vitamin C and iron levels are very low this can cause the blood to become toxic and also leads to poor skin health.

--> Carbohydrates are high so we can more energy from these foods.

--> Calcium levels are high which are good for bones

.

```
In [63]: sns.pairplot(data=nutrition)
```

```
Out[63]: <seaborn.axisgrid.PairGrid at 0x1a351bacf70>
```

