In [697]:

```
import numpy as np
import sys
import pandas as pd
from scipy.stats import f
import matplotlib.pyplot as plt
%matplotlib inline
import seaborn as sns
import scipy.stats as stats
from scipy.stats import ttest_1samp, ttest_ind
from statsmodels.stats.power import ttest_power
sns.set(color_codes=True)
```

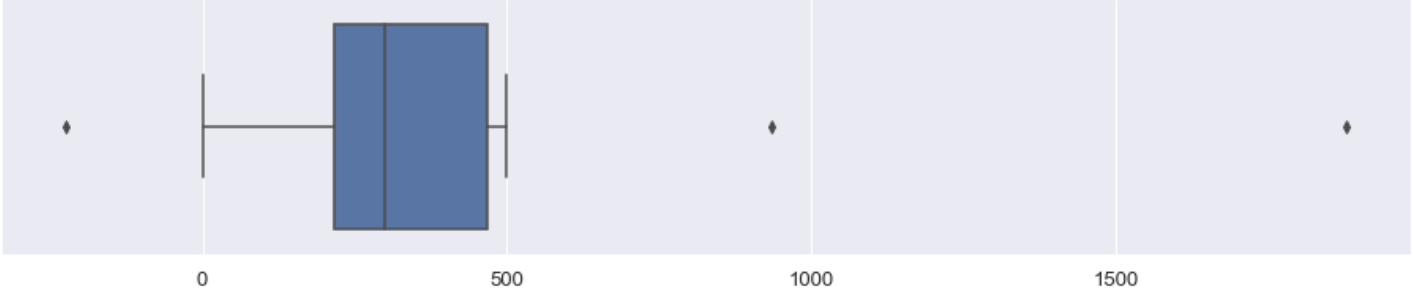
In [698]:

```
df1=pd.read_csv('McDonald.csv')
```

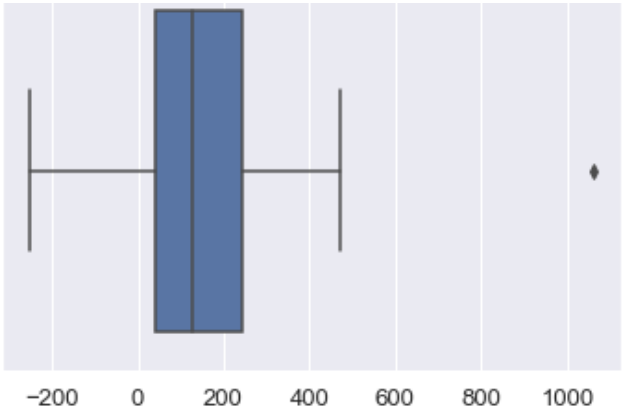
In [727]:

```
#2. Which all variables have an outlier?
df2=df1.describe().T.reset_index()

InterQuartileThreshold=(df2['75%']-df2['25%'])*1.5
df2['Outlierthresholdformax']=df2['75%']+InterQuartileThreshold
df2['Outlierthresholdformin']=df2['25%']-InterQuartileThreshold
# df2[df2['min']<df2['Outlierthresholdformin']]
df3=df2[df2['max']>df2['Outlierthresholdformax']].set_index('index')
if len(df3)>0:
    print('Variables with Outliers on the maximum side')
    print('-'*len('Variables with Outliers above Q3 listed below'))
    plt.figure(figsize=(16,3))
    for i in df3.index:
        print(i)
        sns.boxplot(df3.loc[[i]])
        plt.show()
else:
    print('No variables have outliers with values on the maximum side')

df4=df2[df2['min']<df2['Outlierthresholdformin']].set_index('index')
if len(df4)>0:
    print('Variables with Outliers on the minimum side listed below')
    print('-'*len('Variables with Outliers on the minimum side listed below'))
    plt.figure(figsize=(16,3))
    for i in df3.index:
        print(i)
        sns.boxplot(df4.loc[[i]])
        plt.show()
else:
    print('No variables have outliers with values on the minimum side')
```

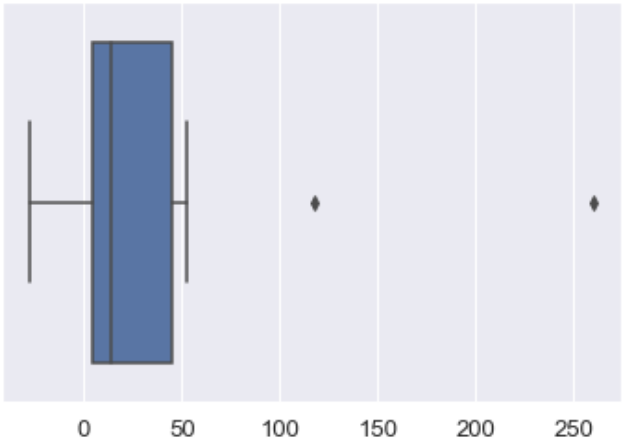
```
Variables with Outliers on the maximum side
-------------------------------------------
Calories
```



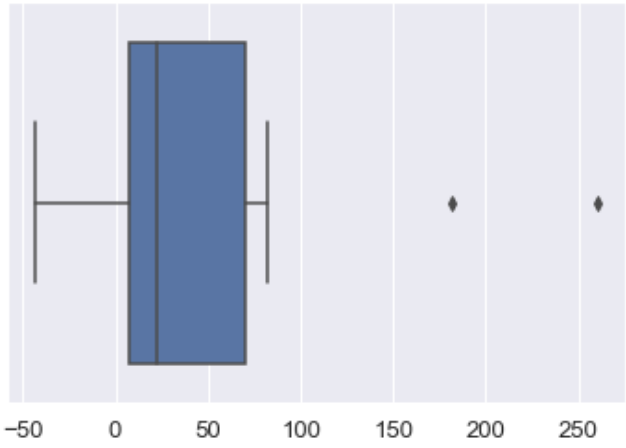

```
Calories from Fat
```



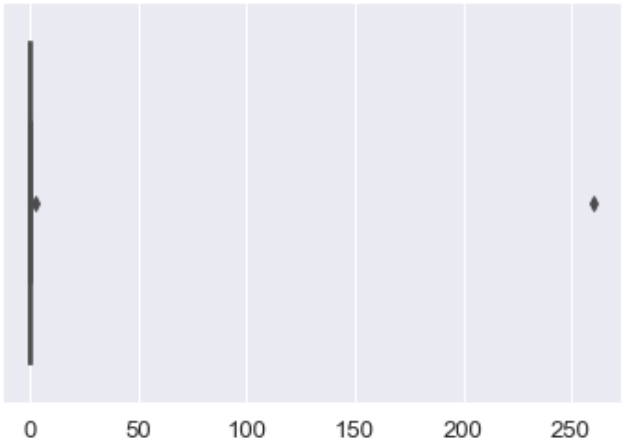
Total Fat



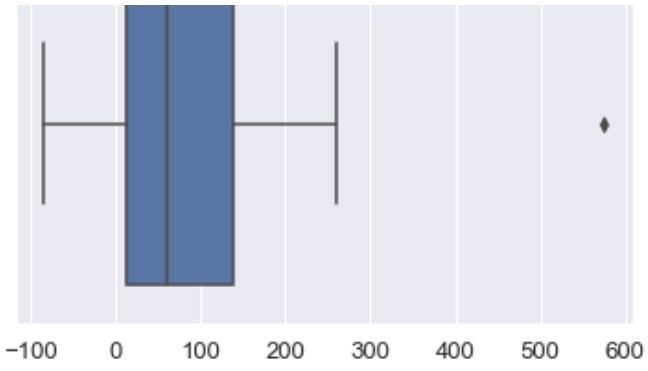
Total Fat (% Daily Value)



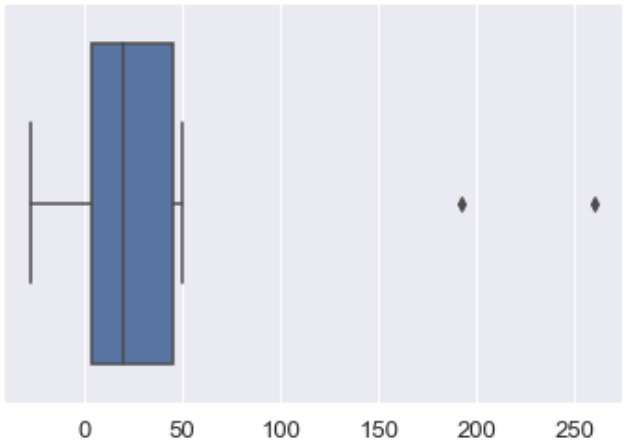
Trans Fat



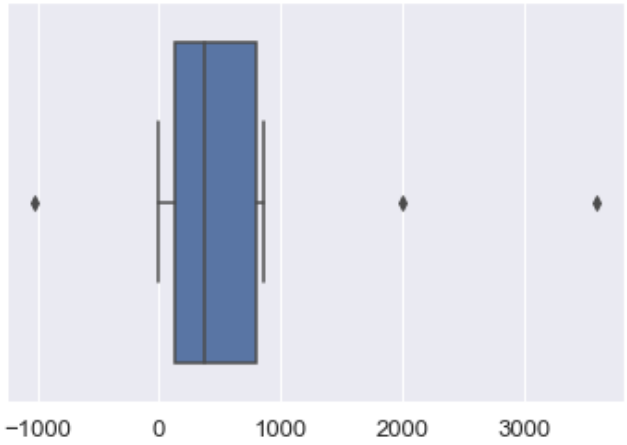
Cholesterol



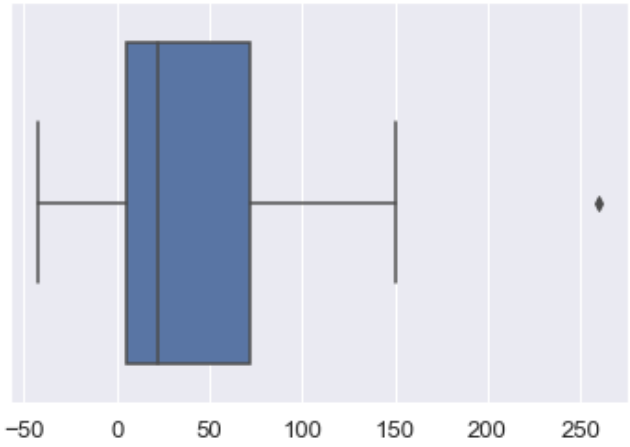
Cholesterol (% Daily Value)



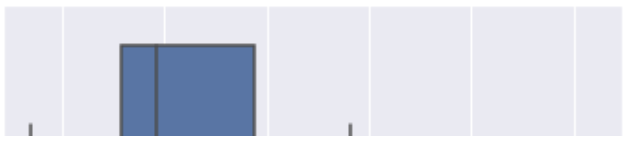
Sodium

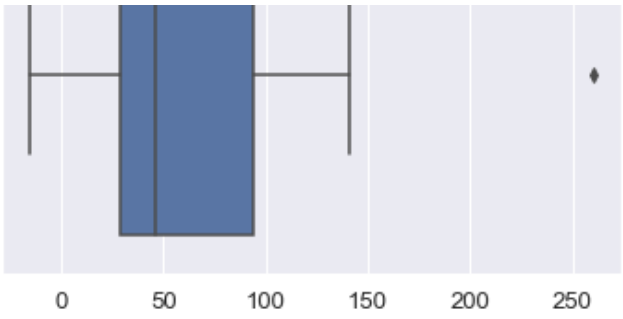


Sodium (% Daily Value)

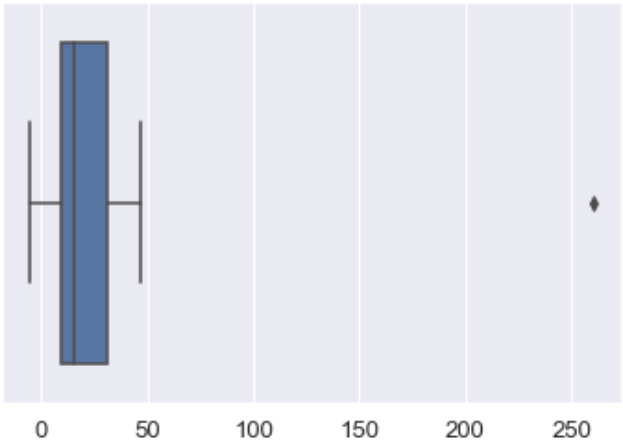


Carbohydrates

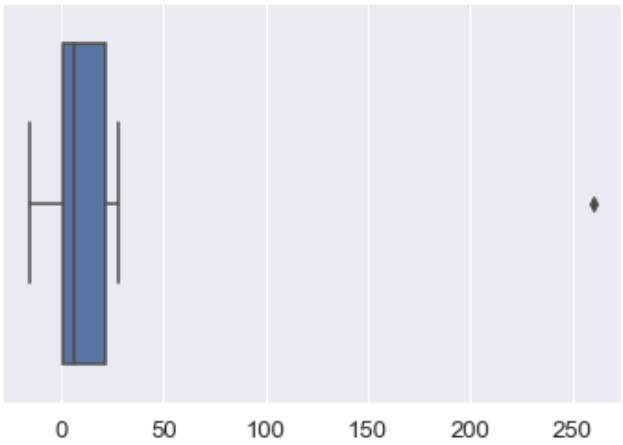




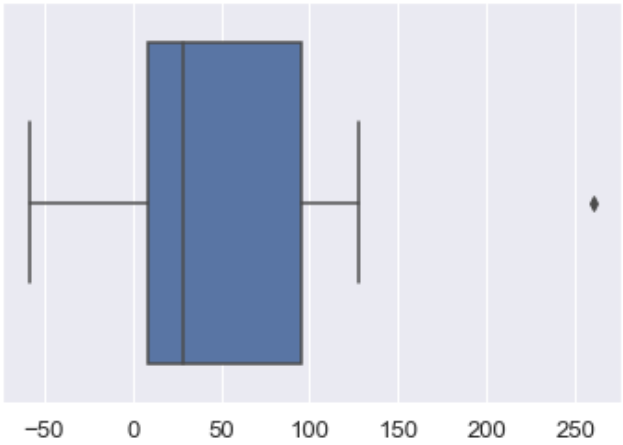
Carbohydrates (% Daily Value)



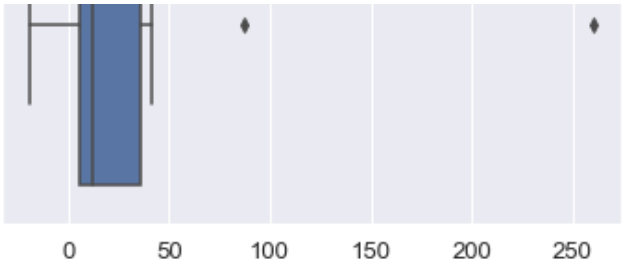
Dietary Fiber (% Daily Value)



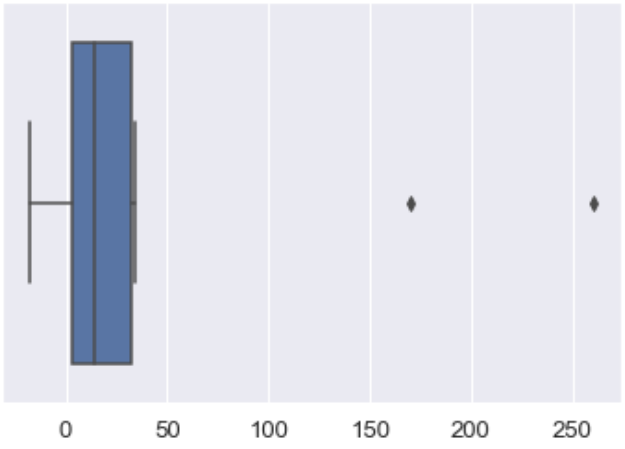
Sugars



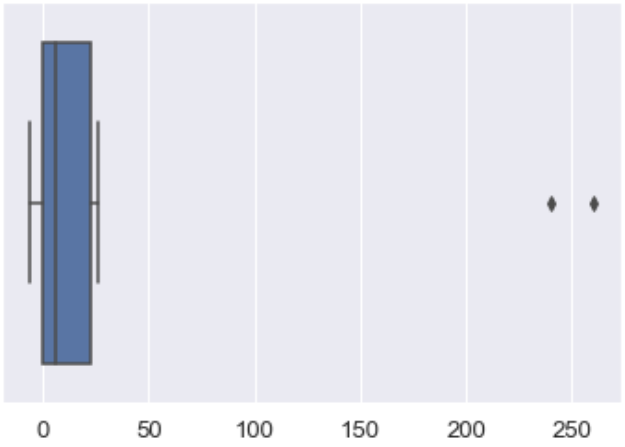
Protein



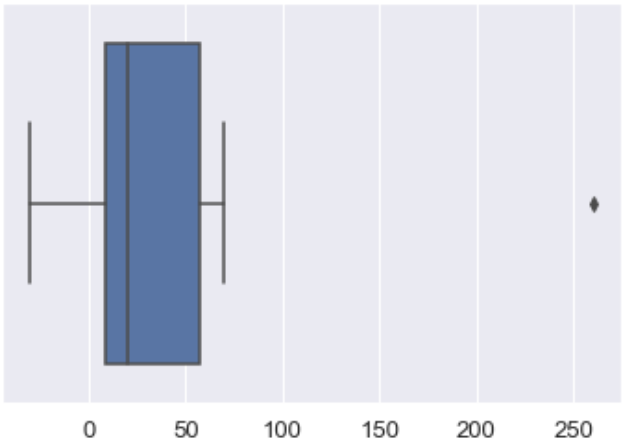
Vitamin A (% Daily Value)



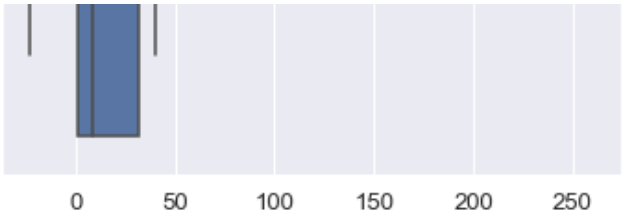
Vitamin C (% Daily Value)



Calcium (% Daily Value)



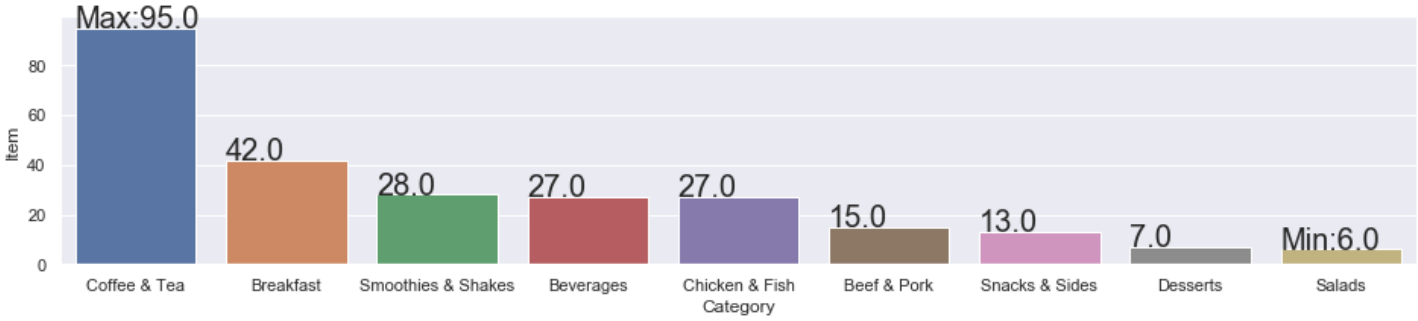
Iron (% Daily Value)



No variables have outliers with values on the minimum side

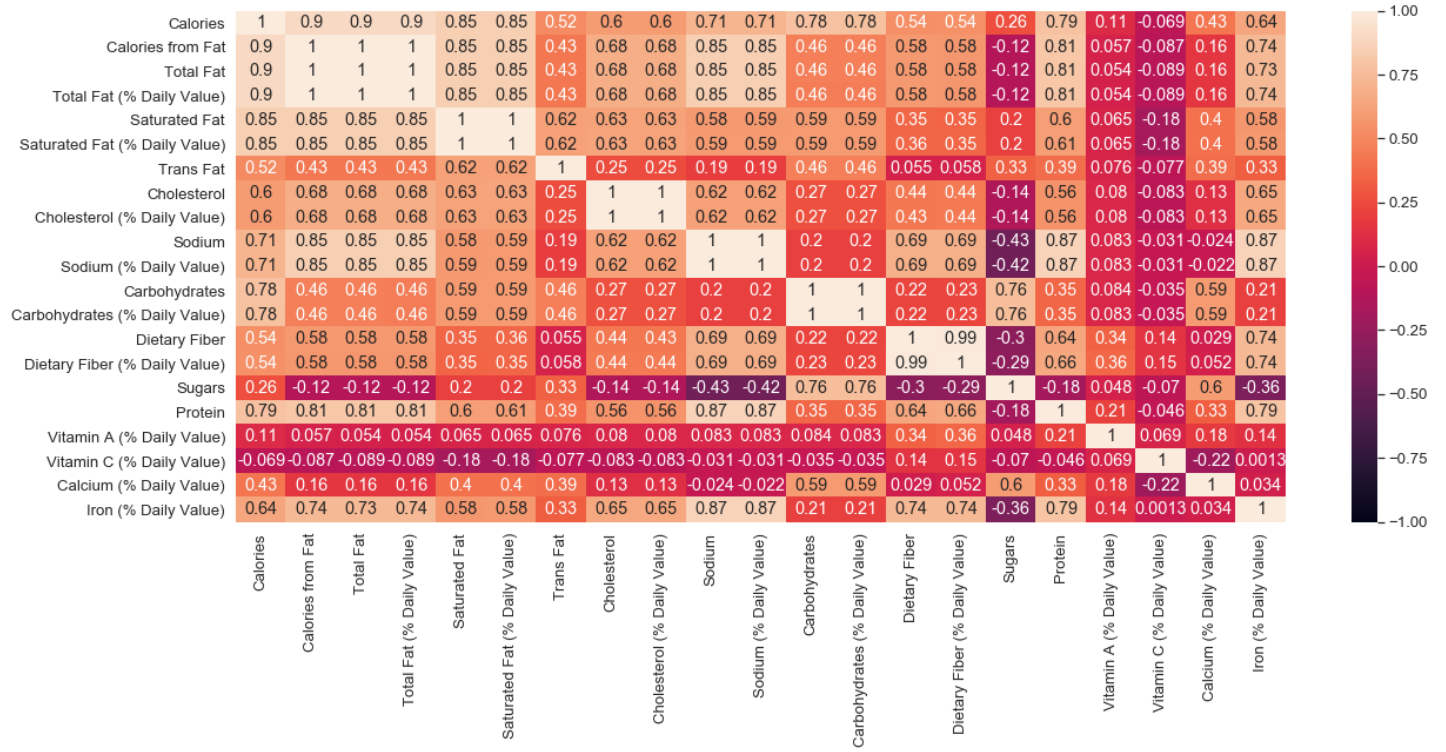
In [700]:

```
#1. Plot graphically which food categories have highest and lowest varieties?
df2=df1[['Category','Item']].groupby('Category').count().reset_index()
df2=df2.sort_values(by='Item',ascending=False)
plt.figure(figsize=(16,3))
# ptplot=sns.pointplot(df2['Category'],df2['Item'])
cplot=sns.barplot(df2['Category'],df2['Item'])
length=df2['Item'].size-1
ctr=0
for p in cplot.patches:
    if ctr==0:
        display_value='Max:'+str(p.get_height())
    elif ctr==length:
        display_value='Min:'+str(p.get_height())
    else:
        display_value=p.get_height()
    cplot.annotate(format(display_value),(p.get_x(),p.get_height()),fontsize=20)
    ctr=ctr+1
```



In [701]:

```
#3. Which variables have highest co releation? Plot them and find the value

df_cor=df1.corr()
plt.figure(figsize=(20,8))
sns.set(font_scale=1.2)
sns.heatmap(df_cor,annot=True,vmin=-1,vmax=1)
plt.show()


df_cor_positively_better_corelated=df_cor[df_cor.loc[:,:]>0.7][df_cor.loc[:,:]<1]
df_cor_negatively_better_corelated=df_cor[df_cor.loc[:,:]<-0.7][df_cor.loc[:,:]>-1]

# print(df_cor[df_cor_positively_better_corelated.iloc[:,1].notnull()].iloc[:,1].count())
for i in df_cor.columns:
    cnt=df_cor[df_cor_positively_better_corelated.loc[:,i].notnull()].loc[:,i].count()
    if cnt > 1:
        a='Printing better positive corelations for column: '+i
        print('\n'+a)
        print('-'*len(a))
        print(df_cor[df_cor_positively_better_corelated.loc[:,i].notnull()].loc[:,i])

for i in df_cor.columns:
    cnt=df_cor[df_cor_negatively_better_corelated.loc[:,i].notnull()].loc[:,i].count()
    if cnt > 1:
        a='Printing better negative corelations for column: '+i
        print('\n'+a)
        print('-'*len(a))
        print(df_cor[df_cor_negatively_better_corelated.loc[:,i].notnull()].loc[:,i])
```




```
Printing better positive corelations for column: Calories
----------------------------------------------------------
Calories from Fat                 0.904588
Total Fat                         0.904409
Total Fat (% Daily Value)         0.904123
Saturated Fat                     0.845564
Saturated Fat (% Daily Value)     0.847631
Sodium                            0.712309
Sodium (% Daily Value)            0.713415
Carbohydrates                     0.781539
Carbohydrates (% Daily Value)     0.781242
Protein                           0.787847
Name: Calories, dtype: float64

Printing better positive corelations for column: Calories from Fat
------------------------------------------------------------------
Calories                          0.904588
Total Fat                         0.999663
Total Fat (% Daily Value)         0.999725
Saturated Fat                     0.847008
Saturated Fat (% Daily Value)     0.849592
Sodium                            0.846624
Sodium (% Daily Value)            0.847276
Protein                           0.807913
Iron (% Daily Value)              0.735894
Name: Calories from Fat, dtype: float64

Printing better positive corelations for column: Total Fat
----------------------------------------------------------
Calories                          0.904409
Calories from Fat                 0.999663
Total Fat (% Daily Value)         0.999765
Saturated Fat                     0.846707
Saturated Fat (% Daily Value)     0.849293
Sodium                            0.846158
Sodium (% Daily Value)            0.846780
Protein                           0.807773
Iron (% Daily Value)              0.734685
Name: Total Fat, dtype: float64

Printing better positive corelations for column: Total Fat (% Daily Value)
--------------------------------------------------------------------------
Calories                          0.904123
Calories from Fat                 0.999725
Total Fat                         0.999765
Saturated Fat                     0.847379
```

```
Saturated Fat (% Daily Value)    0.849973
Sodium                           0.846728
Sodium (% Daily Value)           0.847368
Protein                          0.807922
Iron (% Daily Value)             0.735478
Name: Total Fat (% Daily Value), dtype: float64

Printing better positive corelations for column: Saturated Fat
--------------------------------------------------------------
Calories                         0.845564
Calories from Fat                0.847008
Total Fat                        0.846707
Total Fat (% Daily Value)        0.847379
Saturated Fat (% Daily Value)    0.999279
Name: Saturated Fat, dtype: float64

Printing better positive corelations for column: Saturated Fat (% Daily Value)
-----------------------------------------------------------------------------
Calories                      0.847631
Calories from Fat             0.849592
Total Fat                     0.849293
Total Fat (% Daily Value)     0.849973
Saturated Fat                 0.999279
Name: Saturated Fat (% Daily Value), dtype: float64

Printing better positive corelations for column: Sodium
-------------------------------------------------------
Calories                      0.712309
Calories from Fat             0.846624
Total Fat                     0.846158
Total Fat (% Daily Value)     0.846728
Sodium (% Daily Value)        0.999929
Protein                       0.869802
Iron (% Daily Value)          0.871593
Name: Sodium, dtype: float64

Printing better positive corelations for column: Sodium (% Daily Value)
-----------------------------------------------------------------------
Calories                      0.713415
Calories from Fat             0.847276
Total Fat                     0.846780
Total Fat (% Daily Value)     0.847368
Sodium                        0.999929
Protein                       0.869870
Iron (% Daily Value)          0.870742
Name: Sodium (% Daily Value), dtype: float64

Printing better positive corelations for column: Carbohydrates
--------------------------------------------------------------
Calories                         0.781539
Carbohydrates (% Daily Value)    0.999620
Sugars                           0.762362
Name: Carbohydrates, dtype: float64

Printing better positive corelations for column: Carbohydrates (% Daily Value)
------------------------------------------------------------------------------
Calories         0.781242
Carbohydrates    0.999620
Sugars           0.762282
Name: Carbohydrates (% Daily Value), dtype: float64

Printing better positive corelations for column: Dietary Fiber
--------------------------------------------------------------
Dietary Fiber (% Daily Value)    0.986350
Iron (% Daily Value)             0.740411
Name: Dietary Fiber, dtype: float64

Printing better positive corelations for column: Dietary Fiber (% Daily Value)
------------------------------------------------------------------------------
Dietary Fiber           0.986350
Iron (% Daily Value)    0.737814
Name: Dietary Fiber (% Daily Value), dtype: float64
```

```
Printing better positive corelations for column: Sugars
--------------------------------------------------------
Carbohydrates                    0.762362
Carbohydrates (% Daily Value)    0.762282
Name: Sugars, dtype: float64

Printing better positive corelations for column: Protein
--------------------------------------------------------
Calories                       0.787847
Calories from Fat              0.807913
Total Fat                      0.807773
Total Fat (% Daily Value)      0.807922
Sodium                         0.869802
Sodium (% Daily Value)         0.869870
Iron (% Daily Value)           0.792719
Name: Protein, dtype: float64

Printing better positive corelations for column: Iron (% Daily Value)
--------------------------------------------------------------------------
Calories from Fat                  0.735894
Total Fat                          0.734685
Total Fat (% Daily Value)          0.735478
Sodium                             0.871593
Sodium (% Daily Value)             0.870742
Dietary Fiber                      0.740411
Dietary Fiber (% Daily Value)      0.737814
Protein                            0.792719
Name: Iron (% Daily Value), dtype: float64
```

In [702]:

```
# 4. Which  category contributes to the % of maxiumum Cholesterol (% Daily Value)?
df2=df1[['Category','Cholesterol (% Daily Value)']].groupby('Category').max().sort_values
(by='Cholesterol (% Daily Value)',ascending=False).reset_index().iloc[0:1]
a="".join(df2.iloc[[0],[0]].iloc[0].values)
# print("".join(str(df2.iloc[[0],[1]].iloc[0].values)))
for i in df2.iloc[[0],[1]].iloc[0].values:
    b=i
print(a+" contributes to the  % of maxiumum Cholesterol (% Daily Value) intake upto "+st
r(b))
```

```
Breakfast contributes to the  % of maxiumum Cholesterol (% Daily Value) intake upto 192
```

In [703]:

```
# 5. Which item contributes to maximum Sodium intake?
# df1[['Category','Sodium']].groupby('Category').max().sort_values(by='Sodium',ascending=
False)[0:1].iloc[0:1]
df2=df1[['Category','Sodium']].groupby('Category').max().sort_values(by='Sodium',ascendin
g=False)[0:1].reset_index().iloc[0:1]
a="".join(df2.iloc[[0],[0]].iloc[0].values)
for i in df2.iloc[[0],[1]].iloc[0].values:
    b=i
print(a+" contributes to the maximum Sodium intake of upto "+str(b))
```

```
Chicken & Fish contributes to the maximum Sodium intake of upto 3600
```

In [695]:

```
#6. Which 4 food items contains most amount of saturated fat?

df2=df1[['Item','Saturated Fat']].groupby('Item').max().sort_values(by='Saturated Fat',a
scending=False).reset_index().iloc[0:4]

topic="4 food items with most amount of saturated food are:"
print(topic)
print('-'*len(topic))
for i in range(4):
    a="".join(df2.iloc[[i],[0]].iloc[0].values)
    for j in df2.iloc[[i],[1]].iloc[0].values:
```

```
        b=j
        print(str(i+1)+". "+'{0: <44}'.format(a)+" contains "+str(b))
```

```
4 food items with most amount of saturated food are:
-----------------------------------------------------
1. McFlurry with M&M’s Candies (Medium)          contains 20.0
2. Big Breakfast with Hotcakes (Large Biscuit)   contains 20.0
3. Chicken McNuggets (40 piece)                  contains 20.0
4. Frappé Chocolate Chip (Large)                 contains 20.0
```