

Nutrition Information in Fast Food Restaurants

Sta199 Project Pipe Dream- Romit, Ananya, Anika, and Tess

Motivation & Research Question

- Fast food is convenient but often high in **calories and sodium**
- Many chains offer “**salads**” as **healthier options**
- But it’s unclear if salads are **actually better**

Research Question:

Do salad items have lower calories and sodium than non-salad items, and does this difference vary by restaurant chain?

Hypothesis:

Salads will have fewer calories and less sodium, but the magnitude of this difference varies by chain.



The Data

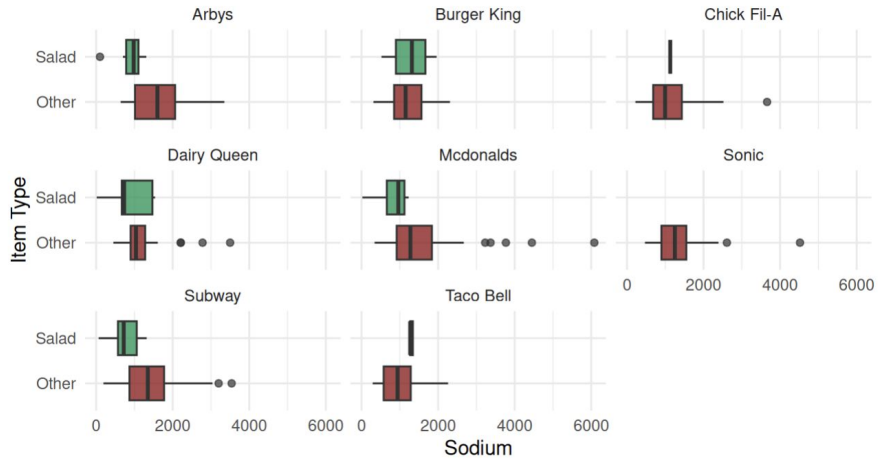
restaurant <chr>	item <chr>	calories <dbl>	sodium <dbl>	salad <chr>
Mcdonalds	Artisan Grilled Chicken Sandwich	380	1110	Other
Mcdonalds	Single Bacon Smokehouse Burger	840	1580	Other
Mcdonalds	Double Bacon Smokehouse Burger	1130	1920	Other
Mcdonalds	Grilled Bacon Smokehouse Chicken Sandwich	750	1940	Other
Mcdonalds	Crispy Bacon Smokehouse Chicken Sandwich	920	1980	Other
Mcdonalds	Big Mac	540	950	Other

- **515** menu items from major fast-food chains and **18** variables
- Key Variables:
 - **restaurant:** (fast food chain)
 - **item**
 - **calories**
 - **sodium**
 - **salad:** (“Salad” vs. “Other”).

Highlights from EDA

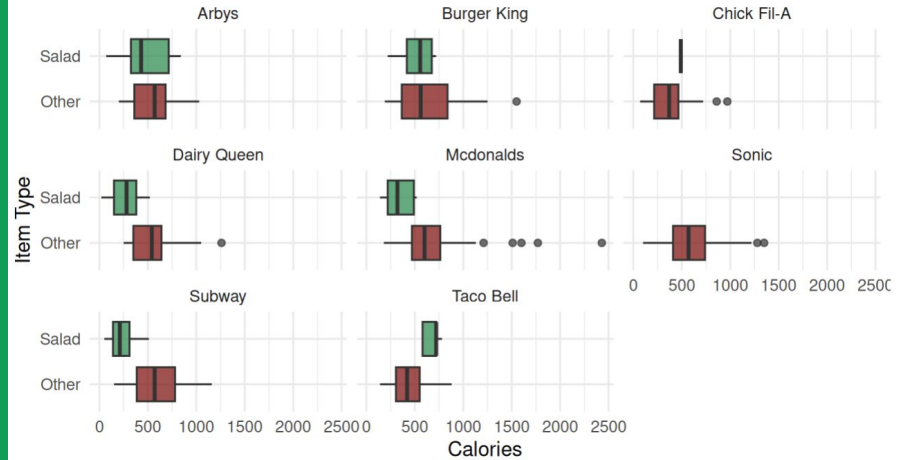
Fast Food Nutrition

Salad vs. Non-Salad Items: Sodium



Fast Food Nutrition

Salad vs. Non-Salad Items: Calories



Highlights from EDA

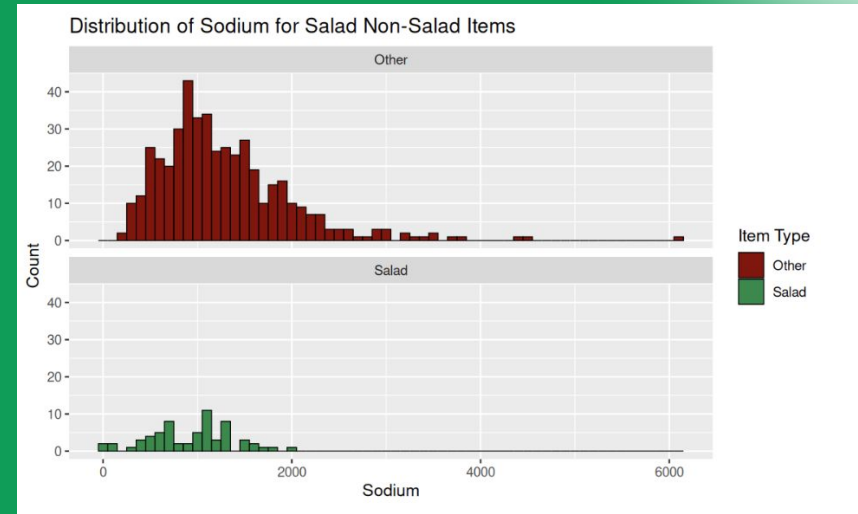
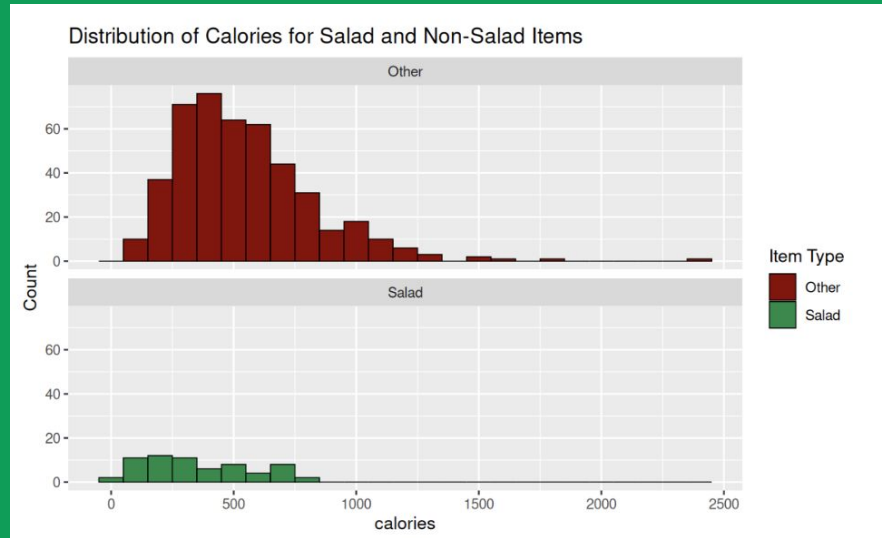
restaurant	salad	mean_calories	median_calories	sd_calories	q25_calories	q75_calories	max_calories	min_calories
<chr>	<chr>	<dbl>	<dbl>	<dbl>	<dbl>	<dbl>	<dbl>	<dbl>
Arbys	Other	539.1667	570	200.91105	360.0	682.5	1030	200
Arbys	Salad	488.5714	430	281.74626	325.0	715.0	840	70
Burger King	Other	627.0690	560	306.46833	365.0	837.5	1550	190
Burger King	Salad	519.1667	555	178.45083	417.5	675.0	720	220
Chick Fil-A	Other	380.3846	370	223.82995	215.0	465.0	970	70
Chick Fil-A	Salad	490.0000	490	NA	490.0	490.0	490	490
Dairy Queen	Other	554.0541	540	250.02733	350.0	640.0	1260	250
Dairy Queen	Salad	270.0000	280	194.67922	150.0	380.0	520	20
Mcdonalds	Other	698.1250	600	419.51672	470.0	762.5	2430	180
Mcdonalds	Salad	332.2222	320	141.04767	220.0	490.0	520	140
Sonic	Other	631.6981	570	300.88163	410.0	740.0	1350	100
Subway	Other	600.1408	570	259.58479	385.0	780.0	1160	150
Subway	Salad	227.2000	210	107.64602	140.0	310.0	510	50
Taco Bell	Other	433.0909	420	180.69055	305.0	550.0	880	140
Taco Bell	Salad	676.0000	720	90.99451	580.0	720.0	780	580

salad	mean_calories	median_calories	sd_calories	q25_calories
<chr>	<dbl>	<dbl>	<dbl>	<dbl>
Other	554.0576	510	283.5837	350
Salad	367.8125	315	213.3963	200
salad	q75_calories	max_calories	min_calories	
<chr>	<dbl>	<dbl>	<dbl>	
Other	705.0	2430	70	
Salad	522.5	840	20	

restaurant	salad	mean_sodium	median_sodium	sd_sodium	q25_sodium	q75_sodium	max_sodium	min_sodium
<chr>	<chr>	<dbl>	<dbl>	<dbl>	<dbl>	<dbl>	<dbl>	<dbl>
Arbys	Other	1607.7083	1600	645.81876	1015.0	2062.5	3350	640
Arbys	Salad	881.4286	980	399.80948	785.0	1105.0	1310	100
Burger King	Other	1215.6897	1150	500.74020	850.0	1565.0	2310	310
Burger King	Salad	1261.6667	1315	515.99565	897.5	1667.5	1960	520
Chick Fil-A	Other	1152.3077	995	741.30322	685.0	1432.5	3660	220
Chick Fil-A	Salad	1130.0000	1130	NA	1130.0	1130.0	1130	1130
Dairy Queen	Other	1221.8919	1040	604.49170	900.0	1280.0	3500	450
Dairy Queen	Salad	885.0000	730	632.13923	670.0	1470.0	1540	15
Mcdonalds	Other	1552.9167	1275	1080.76206	917.5	1837.5	6080	340
Mcdonalds	Salad	824.4444	960	388.01131	660.0	1120.0	1230	20
Sonic	Other	1350.7547	1250	665.13402	900.0	1550.0	4520	470
Subway	Other	1448.1690	1350	769.32681	870.0	1775.0	3540	190
Subway	Salad	775.4000	720	337.58308	570.0	1060.0	1320	65
Taco Bell	Other	1001.0909	940	480.79129	577.5	1285.0	2260	290
Taco Bell	Salad	1296.0000	1270	40.37326	1270.0	1340.0	1340	1260

salad	mean_sodium	median_sodium	sd_sodium	q25_sodium
<chr>	<dbl>	<dbl>	<dbl>	<dbl>
Other	1290.2882	1140	708.0795	830.0
Salad	939.8438	990	439.7032	647.5
salad	q75_sodium	max_sodium	min_sodium	
<chr>	<dbl>	<dbl>	<dbl>	
Other	1605.0	6080	190	
Salad	1252.5	1960	15	

Highlights from EDA



Conclusions/Discussion/Critique

Conclusions

- Salad items at most fast food chains are lower in calorie count and sodium content than non-salad items, but restaurant choice makes a difference
- Highest calorie and sodium items (most unhealthy outliers) are almost always non-salad items
- Salads are more consistent and predictable in calorie and sodium values

Critiques

1. Oversimplification of nutritional differences by classifying items as just “salad” or “non-salad”
2. Analysis only focuses on 2 nutritional variables: calories and sodium
3. Unequal group sizes: greater number of “non-salad” items than “salad” items

Discussion

- Salads were healthier on average with generally lower calories and sodium, but the advantage was not consistent across all fast-food chains.
- Non-salad items were much less consistent, with bigger spreads in both calories and sodium.
- Non-salad items also had the most extreme outliers, especially for sodium, so some non-salad items were far worse than the rest.