(Over)Eating Out: An observational study of the energy content of main meals served in major UK restaurant chains

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**What is already known on this topic?**

Eating out of the home is common in the UK.

The poor nutritional quality of ‘fast-food’ has been well documented.

The energy content of traditional ‘full-service’ restaurants has received less attention.

**What this study adds?**

**The average kcal content of main meals served in both fast-food and full-service restaurants in the UK is larger than public health recommendations.**

**The proportion of main meals in UK restaurant chains that meet public health recommendations for kcals is smaller than the proportion of meals that have an excessive number of kcals.**

**Compared to fast-food restaurants, there are more significantly more kcals on average in full-service restaurant meals in the UK.**

**Abstract**

**Objectives: Eating out of the home is common, but the kilocalorie (kcal) content of main meals served by major UK restaurant chains has not been examined. The objectives of this study were to examine the kcal content of main meals served in major UK restaurant chains and compare the kcal content of fast-food and ‘full-service’ restaurant chains.**

**Design: Observational study.**

**Setting: Menu and nutritional information provided by major UK restaurant chains.**

**Method: During April to July 2018, websites were accessed and visits were made to restaurant chains with 50 or more outlets in the UK. Menu items that constituted lunch or evening main meal dishes were identified and the kcal content of these meals was extracted. Beverage kcals were not included.**

**Main outcome measures: The mean kcal content of meals, the proportion of meals meeting public health recommendations for kcal consumption (600kcals or less) and the proportion of meals with an excessive kcal content (1000kcals or more).**

**Results: Main meals from twenty-seven restaurant chains (21 full-service, 6 fast-food) were sampled. The mean kcal content of all eligible restaurant meals (13,396 in total) was 977kcals (95% CIs: 973 to 983), the percentage of all meals that met public health recommendations for kcal content was low (10%) and smaller than the percentage of meals with an excessive kcal content (42%). Compared to fast-food restaurants, full-service restaurants offered significantly more excessive calorific main meals, fewer main meals meeting public health recommendations and on average 268 kcals more (95% Cis: 103 to 433) in main meals.**

**Conclusions: The kcal content of a large number of main meals in major UK restaurant chains is excessive and only a minority meet public health recommendations. Although** **the poor nutritional quality of fast-food meals has been well documented, the kcal content of full-service restaurant meals in the UK tends to be greater and is a cause for concern.**

**Registration: The study protocol and analysis strategy was pre-registered on the Open Science Framework (https://osf.io/w5h8q/).**

**Introduction**

**The prevalence of overweight and obesity has increased markedly across most of the developed world1. Increases in energy intake caused by major changes to the food environment2 have been identified as a key factor explaining population level weight gain3 4. In the UK, meals are consumed out of the home regularly; data collected from 2008-2012 showed that a quarter of UK adults ate out once or more per week5. However, a more recent report from the UK Food Standards Agency in 2016 indicates that eating out of the home may becoming more common, with 39% of UK adults reporting eating out at least once per week6. A number of studies suggest that people who eat out of the home more frequently are at increased risk of weight gain and obesity7. ‘Fast-food’ restaurants in particular have been highlighted as providing meals that are low in nutritional quality8 9. There is also some evidence that a higher geographical density of fast-food restaurants is associated with increased risk of obesity10 11. Because of this there have been public health calls in the UK to limit where fast-food restaurant outlets can operate12 13. However, more traditional ‘full-service’ restaurants also contribute substantially to the out of home dining market in the UK14.**

**Recent public health recommendations made by Public Health England suggest that adults should aim to consume 600 kilocalories (kcals) or less for their main lunch and dinner meals to avoid excess daily energy intake and maintain a healthy body weight15. This is in part motivated by Public Health England’s estimate that the average adult in the UK is consuming 195 excess kcals per day15. Because the amount of energy a person consumes during a meal is strongly influenced by the energy density and portion size of food served 16-19, meals provided to consumers that are high in kcals promote excess energy intake and are problematic for public health. However, public health action on improving the nutritional quality of food prepared outside of the home has to date focused largely on encouraging the food industry to make reductions to the kcal content of supermarket food20 and has not focused on the restaurant sector. To date, there has been no examination of the number of kcals in main meals served by major UK restaurant chains and it is therefore unclear whether consumers can adhere to public health recommendations for meal kcal consumption when eating in these establishments. Moreover, legislation has been passed which will result in kcal labelling of all food products sold by major chain restaurants becoming mandatory in the US21. Similar legislation is currently being considered by UK government, but mandatory kcal labelling will come at a financial cost to the food industry which may cause challenges to legislation, as was the case in the US22. To address such challenges it will be important to understand the extent to which major UK restaurant chains are contributing to overconsumption by examining the typical kcal content of main meals and the availability of main meals meeting public health recommendations for kcal consumption.**

**In the present study we examined the kcal content of main meals (lunch and dinner) sold by major restaurant chains in the UK. We also compared the kcal content of main meals in fast-food vs. traditional ‘full-service’ restaurant chains. We reasoned that this comparison would be important for a number of reasons. First, although the kcal content of full-service restaurants has received little attention in the UK, a small number of studies of North American dining suggests that kcal content for these restaurant types can be excessive23. Second, we speculate that over time the negative publicity concerning the poor nutritional quality of fast-food may have caused this sector to provide lower kcal meal options on their menus and/or reformulate existing meals24, whereas the full-service restaurant sector has presumably not faced this pressure. Thus, we hypothesised that, somewhat counterintuitively, the kcal content of main meals in full-service restaurant chains would be more excessive than that of fast-food restaurant chains in the UK.**

**Methods**

**The study protocol and analysis strategy was pre-registered on the Open Science Framework (https://osf.io/w5h8q/).**

*Restaurant sampling.*As our aim was to examine major UK restaurant chains we included all chains with 50[[1]](#footnote-1) or more outlets in the UK. To identify major restaurant chains we consulted market reports listing restaurants with the largest number of UK outlets and market research ranking UK restaurant chains by annual turnover, popularity, number of users, and numbers of outlets 14 25-27 . To confirm eligibility, during March-April 2018 one researcher accessed the UK website of each restaurant chain to identify those with ≥50 outlets and this was independently verified by another researcher. If the number of UK outlets was not provided on a restaurant website this information was requested by email. For a full list of all restaurant chains identified with ≥50 outlets and the number of outlets per chain, see online supplementary materials table 1.

*Characterising restaurant types.*To categorise restaurant chains as ‘fast-food’ or ‘full-service’, based on previous research, e.g.28 we used the following definition of fast-food restaurants: *‘Restaurants that primarily provide consumers with largely pre-prepared ‘quick’ meals with little or no table service, with in-store seating and in which take-away orders are likely to account for a significant proportion of orders’*. We did not include coffee shop chains or chains that only provided take-away food (i.e. no physical restaurant). Two researchers independently coded each eligible restaurant as fast-food or full-service and any disagreements were resolved through discussion.

*Data sources.*During April-July 2018 we accessed the UK websites of all eligible restaurant chains and identified current menus and nutritional information. Restaurant chains that did not provide nutritional information on their UK website were contacted by email and this information was requested.

*Public/patient involvement.* There was no public or patient involvement in the design of the study.

*Identification of main meal menu options.*We aimed to examine the kcal content of all ‘main meal’ menu options. We defined a main meal as being a menu option that would normally be the primary dish in a lunch or dinner meal and typically be found in the ‘main course’ part of a restaurant menu. Examples of main meal items using this definition include burger and chips, chicken Caesar salad, spaghetti Bolognese, jacket potato with a filling. We did not include individually sold food items (e.g. sides) or sharing menu options (e.g. tapas) as it was unclear what combination of individual items or sharing menu options would constitute a main meal. Starters and dessert menu options were not included as they are not typically consumed as a main meal. We did not include breakfast menu options as during a scoping exercise we found that a large number of eligible restaurants did not offer breakfast menu options. We included main meals that could be purchased by any member of the general public and menu options for specialist consumer groups were ineligible (e.g. pensioners menu, child menu). In order to minimize effects of season, we included main meal options that appeared to be available all year round only. In instances in which a main meal menu option could be customized at the explicit request of the customer (e.g. swap default side dish for a different side dish), we selected the default composition of the meal. In instances in which a meal menu option required a customer to make an explicit choice (e.g. choice of salad or fries) we extracted all possible configurations of the meal and recorded each variant as an individual meal. During May-June 2018 two researchers independently accessed each restaurant menu and identified eligible meal menu options. For more detailed information on coding instructions used by researchers see supplementary materials. Discrepancies were resolved by discussion and if required, a third researcher. If a restaurant only provided individual food item information on their online menu with no information on which combinations of items constituted a meal option in store, two researchers visited a local outlet (Liverpool city centre) of that restaurant and recorded eligible menu meal options.

*Extraction of meal kcal content.* Although nutritional information tends not to be displayed on UK restaurant menus in store, some restaurant chains provide this information on their websites. A researcher accessed online nutritional information for each restaurant and extracted the number of kcals for each eligible meal. A second researcher checked extraction for accuracy. If kcal information was missing from a restaurant’s nutritional information we attempted to locate it from elsewhere on the website and if we were not able to, we used kcal information from a close to identical meal option (e.g. sandwich with brown vs. wholegrain bread), if available. Because drinks were not routinely provided with meals in restaurants, drinks were not included when extracting kcal information for any meal options that included a drink.

*Inter-coder consistency.* We examined percentage agreement (i.e. proportion of restaurants identified by both researchers as fast-food or full-service) as an indicator of inter-coder consistency for classification of restaurant type. We had planned to adopt a similar approach for inter-coder consistency of identification of eligible main meal options, but due to there being a very large number of menu items that were clearly not eligible (e.g. starters, sides, desserts, drinks, children’s menu) coders did not record a classification (eligible vs. not eligible) for every menu item and recorded eligible menu options only. We therefore approximated inter-coder consistency by examining the number of menu options identified that were deemed eligible by both coders independently vs. the number of menu options identified by one of the coders, but not the other.

*Planned analyses.* To estimate the mean number of kcals in meal options we used multi-level modelling, with individual meal options nested within restaurants and restaurants categorised as being fast-food or full-service. We examined model fit by comparing the loglikelihood ratio statistic (loglikelihood of the multilevel model - loglikelihood of a single-level model) to a Chi-squared distribution with 1 degree of freedom. We used bootstrapping (500 samples) as this improves the accuracy of parameter values and reduces bias in parameter estimates.Because any difference in meal kcal content between fast-food vs. full-service restaurants may be in part explained by the two types of restaurant serving different types of meals, we also planned to repeat our analyses for any individual meal types that were provided by the majority of both fast-food and full-service restaurant chains. We identified two meal types (burger and fries/chips meals, salad meals) that met this requirement and used the same multilevel modelling approach described above.

We also examined the proportion of meals that met UK public health guidelines for recommended kcal consumption (≤600kcals) for a main meal15 and the proportion of all meals that were excessively high in kcals. We defined ‘excessive’ as being meals that were ≥1000kcals, as this single meal constitutes 50% and 40% of the recommended total number of daily kcals for women (2000kcals) and men (2500kcals) respectively and also constitutes the majority of the number of kcals that a man or women attempting weight loss is recommended to eat in a day by the UK National Health Service29. To examine whether fast-food vs. full-service restaurants differed in the proportion of main meals that were ≤600kcals and ≥1000kcals we conducted two multilevel logistic regressions. We used 1st order marginal quasi-likelihood models. To examine whether two level models (meals within restaurants) were more appropriate than single level models we examined whether residual variance at the restaurant level was significantly different from 0, by computing the Wald statistic (variance/standard error)2 and comparing this with a Chi-Square distribution with 1 degree of freedom. We planned in the pre-registered protocol to examine the above using only Chi-Squares and for completeness we report these results in the online supplementary material. In all analyses α was set at .05. Multi-level analyses were conducted in MLWiN v.3 (2017). All other analyses were conducted in SPSS 22.

**Results**

*Restaurants.* We identified 52 restaurant chains with 50 or more outlets in the UK. Of these, we were able to access menu and nutritional information for 30 restaurants and requested this from the remaining chains, 1 of which provided information. Four of these 31 restaurants did not have items on their menus that constituted meals and instead only sold individual food items (e.g. individual pieces of chicken, sushi) so were not eligible for inclusion. Inter-coder consistency for classification of eligible restaurants as fast-food vs. full-service was high (96%, 26/27 restaurants) and the one discrepancy (Wimpy) was resolved by discussion between the two coders after accessing the chain’s website. The final number of eligible restaurant chains was 27 (n=6 for fast-food, n=21 for full-service restaurants). See Table 1 for restaurants included.

***Meals.* Of the meals identified by the first coder (13,422 meals) 99% were also identified by the second coder and of the meals identified by the second coder (13,444 meals) 99% were identified by the first coder, indicating consistency between the two coders when identifying eligible meals. After discrepancies between the two coders (i.e. meals identified by one coder only) were resolved, the final number of eligible meals was 13,507. The large number of eligible meals was mainly attributable to the relatively large number of meals contributed by two restaurant chains (Subway, N=2,436 and Nando’s, N = 9,298) due to these restaurants offering meals with multiple variants (e.g. chicken with a choice of any two sides, sandwich meal with a choice of multiple sides). With these restaurant chains removed, inter-coder consistency as described above remained high (90% and 90%).**

***Kcal information.* Of the 13,507 eligible meals identified, we were able to extract kcal information for 13,396 meals (99%) and the remaining meals were treated as missing data and not included in analyses. See Table 1 for number of eligible meals per restaurant and raw kcal data per meal for each restaurant.**

***Mean kcal content of all meals.* Across all meals the average number of kcals per meal was 977 (95% CIs: 973 to 983, Standard error (SE) = 2). A two level model structure (meals within restaurants) was a better fit of the data than a single level structure, χ2(1) = 2918, p < .001, indicating that multi-level modelling was appropriate. The variance partition coefficient; the total residual variance which is attributable to restaurants rather than individual meals was 37%. Type of restaurant (full-service vs. fast-food) was a significant predictor, β = 268, SE = 84 (95% CIs 103 to 433), p < .001, explaining 36 % of variance at the restaurant level. These results indicate that meals from full-service restaurants had 268 kcals more energy than meals from fast-food restaurants, on average.**

***Mean kcal content of specific meal types.* Across burger and fries/chips meals (N = 1,904; 1,010 full-service, 894 fast-food) the average number of kcals was 1171 (SE = 7). The weighted multilevel model demonstrated a two level structure was a better fit than a single level structure, χ2(1) = 411, p < .001, and the variance partition coefficient was 68%. Type of restaurant (full-service vs. fast-food) was a significant predictor, β = 414, SE = 141 (95% CIs 138 to 691), p < .001, explaining 29% of variance at the restaurant level and indicating that burger meals in full-service restaurants had 414kcals more energy than in fast-food restaurants, on average. Across salad meals (N = 304; 92 full-service, 212 fast-food) the average number of kcals was 446 (SE = 10). A two level structure was a better fit than a single level structure, χ2(1) = 885, p < .001, and the variance partition coefficient was 69%. Type of restaurant (full-service vs. fast-food) explained 8% of variance at the restaurant level and full-service restaurant salad meals had on average 142kcals more than fast-food meals, although restaurant type was not a statistically significant predictor in the model, β = 142, SE = 99 (95% CIs: -52 to 336), p = .076. See Table 2 for average kcals for burger and salad meals by restaurant.**

**Because there was an unexpectedly large amount of variability in the number of meals that individual restaurants contributed to the analyses for ‘all meals’ and ‘specific meal types’ we also conducted weighted multi-level analyses (see online supplementary materials).**

***Meals ≤600kcals and ≥1000kcals.*Of the 13,396 possible meals identified, 1,226 (10%) met UK public health recommendations of ≤600kcals. The total number of meals which contained ≥1000kcals was 6,251 (47%).** See Table 1. Logistic models examining proportion of meals < 600kcals demonstrated significant variance at the restaurant level (Wald Test Statistic = 9.0, p = .002) suggesting a two level model was appropriate. The odds ratio for restaurant type was OR = 3.2 (95% CIs 1.4 to 7.4, p = .003), suggesting that fast-food restaurants were approximately three times more likely to offer meals < 600kcals than full-service restaurants. For proportion of meals >1000kcals there was significant variance at the restaurant level (Wald Test Statistic = 6.0, p = .014), suggesting a two level model was appropriate. The odds ratio for restaurant type was OR = 5.1 (95% CIs 1.7 to 15.0, p = .002), suggesting full-service restaurants were approximately five times more likely to offer meals ≥1000kcals than fast-food restaurants

**Discussion**

***Statement of principal findings***

**Across the major UK chain restaurant meals included, the mean number of kcals in main meals was 977kcals, a sizeable proportion (42%) were ‘excessive’ in kcal content (≥1000kcals) and only a small minority (10%) were in line with public health recommendations for main meal kcal consumption (≤600kcals). On average, the number of kcal in main meals served by full-service restaurants was 268kcals larger than main meals served by fast-food restaurants. Full-service restaurants also tended to serve more highly calorific main meals and provide fewer main meals meeting public health recommendations for kcal consumption.**

***Strengths and weakness of the study***

**We were able to sample a large number of restaurant chains and main meals. However, our analyses were limited to restaurants that provided nutritional information and sold products consistent with our inclusion criteria (27/52 identified chains.) This is a weakness of the study, as it is possible that main meals in restaurants not providing online nutritional information differ in kcal content to those that do. Reliance on self-reported kcal information from restaurant chains is a weakness of the study and objectively calculated kcal content (using laboratory methods) would have been preferable, but was not feasible. However, it is important to note that previous research suggests that commercially provided nutritional information tends to be accurate30, but may underestimate kcal content of some products31. Our findings are therefore more likely to underestimate than overestimate kcal content of main meals and this means that the kcal content of UK restaurant food may be more problematic than our data suggest. Our focus here was on the energy content of main meals. Although energy intake is of most relevance to population-level body weight and obesity, other aspects of diet (e.g. salt, saturated fat) also shape health and disease. For example, the amount of salt in most UK supermarket ready meal products does not meet nutritional guidelines32 and the salt content of UK restaurant main meals may be similarly high. In the present study we did not include larger main meal items that are typically shared by consumers due to uncertainty over what would constitute one portion. In addition, we examined the number of kcals served and this does not permit us to make conclusions about consumption. Although consumers will not always finish all of a meal served, ‘plate clearing’ is a fairly common behaviour 33 34. Because some customers will order a main meal as well as a drink, starter and/or dessert, we assume that on average the number of kcals consumed in both full-service and fast-food restaurants will be larger still.**

*Strengths and weaknesses in relation to other studies*

**Although research has examined the nutritional quality of restaurant food, this has tended to be conducted in North America23 35. This is the first study we are aware of to characterise the kcal content of main meals served in UK chain restaurants. A limitation of our study was that we did not examine smaller chains or independent restaurants, although both chain and non-chain US restaurants serve excess amounts of energy35. Previous studies examining nutritional quality of other food products (e.g. supermarket food) have made use of WHO guidelines to examine the proportion of products meeting specific nutrient recommendations (e.g. energy from saturated fat)32. There are no international guidelines concerning kcal consumption per meal. We therefore examined the proportion of main meals meeting Public Health England’s recommendation of 600 kcals or less per meal (lunch and dinner). We also quantified the proportion of main meals that not only failed to meet this recommendation but could be considered as ‘excessive’ in kcals. Given there is no consensus on what is an excessive number of kcals w**e defined this as main meals that were 1000 kcals or more, as in a single course this would constitute 50% and 40% of the recommended total number of daily kcals for women and men respectively, or viewed in another way; the majority of kcals that a man or women attempting weight loss is recommended to eat in a day. Although it is important to note that the amount of energy that any person requires to maintain a healthy body weight varies, few people are likely to require more than 1000 kcals from a single main meal in order to maintain a healthy body weight. By using 1000kcals or more as a threshold for an excessive number of main meal kcals in the present study we are not suggesting this should become a default threshold used by other researchers, but we believe it is useful for descriptive purposes here given that there were more main meals that were ‘excessive’ in kcal content than adhered to the public health recommendation of 600kcals.

***Meaning of the study***

There was a sizeable proportion of fast-food and full-service main meals that were excessive in kcals and we note that there tended to be little or no information provided on menus that would allow consumers to identify menu options that were high in calories vs. those that were lower. Consumers tend to underestimate the number of kcals in large meals36 37 and this in combination with the present findings make recent calls to mandate kcal labelling of restaurant food in the UK appropriate. Although kcal labelling is not common in UK restaurants, the best available evidence suggests that kcal labelling is only likely to have a modest impact on consumer behaviour38, so other public health measures to address energy intake out of the home will be required. **Because portion sizes of many food products have increased over time39 40 and reductions made to the portion size and energy density of food products are unlikely to be compensated for by consumers41 42, policy levers that result in the food industry reducing the number of kcals being sold to consumers are needed. This proposition is in line with the observation that changes to the food environment have played a key role in the emergence of the obesity problem and measures are now required to ‘renormalize’ the food environment (e.g. downsizing food product portions)43.**

***Unanswered questions and future research***

**The reason why full-service restaurant main meals tended to be higher in kcals than fast-food restaurant meals in the present study is unclear, but likely to be caused by multiple factors, including the type of food sold. However, when we isolated our analyses to meal types that were routinely sold by both fast-food and full-service restaurants we found that full-service restaurant main meals still tended to be markedly higher in kcals. Although these analyses were reduced in sample size, there was a statistically significant larger number of kcals in burger and chips main meals served in full-service than fast-food restaurants (414kcal difference, p < .001) and more kcals in salad meals (146kcal difference, p = .08), but the latter was not statistically significantly. Thus, decisions regarding portion size, energy density of ingredients and cooking methods are also likely to explain differences in meal kcal content between full-service and fast-food restaurants. A further explanation is that because the fast-food sector has received negative press because of poor nutritional quality of products44, this may have caused restaurant chains in this sector to offer more lower kcal meal options and/or reformulate existing products to reduce kcal content24, whereas similar pressures do not appear to have been experienced by the full-service restaurant sector. There was also marked variability between individual restaurants for kcal content of main meals and identifying why will be informative. In addition to the type of cuisine sold, it is possible that individual restaurant market positioning and price range are associated with kcal content. The present study may be of use to future research efforts that examine whether major UK restaurant chains respond to public health calls to reduce the number of kcals in their products. Likewise, if legislation is passed, the results of the present study can be used to assess whether the introduction of kcal labelling results in restaurant chains reformulating the nutritional content of meals, as appears to have been the case in the US45. In this vein it will be important to characterise the nutritional quality of other parts of the UK food environment, as the present study did not examine nutritional quality of other market sectors (e.g. coffee shops, online food ordering). Online services that allow consumers to have restaurant food delivered to their home are a recent development in the UK and will likely be increasing the number of meals consumed that are prepared out of the home.**

***Conclusions***

**The kcal content of a large number of main meals in major UK restaurant chains is excessive and only a minority meet public health recommendations. Although the poor nutritional quality of fast-food restaurant meals has been well documented, the kcal content of full-service restaurant meals in the UK tends to be greater and is a cause for concern.**

**Data Sharing**

**The final data sets containing restaurant meal descriptions and number of kcals for each restaurant used in analyses are available online at https://osf.io/cd597/**

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**Competing interests**

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All authors designed the study. All authors contributed to data collection. AJ and ER were responsible for data analysis. ER was responsible for initial drafting of the paper and all authors approved the manuscript and had full access to the data. We would like to thank Lizhi Zhang for research assistance.

**Ethical Approval**

As the study involved no human or animal participants and made use of publicly available information ethical approval was not required

**Transparency**

ER acts as the guarantor for this work and confirms that the manuscript is an accurate, transparent and honest account of the study, that no important aspects of the study have been omitted and that any discrepancies from the study as planned have been explained.

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Table 1. Kilocalorie content of meals from eligible restaurant chains included in analyses

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Restaurant chainname | Restaurant type | Number of meals  | Mean (SD) kcal per meal | Number and % meals ≤ 600kcals | Number and % meals ≥ 1000kcals |
|  |  |  |  |  |  |
| Burger King | Fast-food | 50 | 711 (214) | 17 (34%) | 4 (8%) |
| KFC | Fast-food | 106 | 987 (273) | 5 (5%) | 53 (50%) |
| Leon | Fast-food | 14 | 597 (86) | 8 (57%) | 0 (0%) |
| Mcdonalds | Fast-food | 127 | 726 (242) | 35 (28%) | 14 (11%) |
| Subwaya | Fast-food | 2436 | 763 (252) | 760 (31%) | 490 (20%) |
| Wimpy | Fast-food | 64 | 721 (221) | 17 (27%) | 6 (9%) |
|  |  |  |  |  |  |
| Fast-food restaurants (N=6)b  | 751 (128) | 30% (17%) | 16% (18%) |
|  |  |  |  |  |  |
| All Bar One | Full-service | 33 | 871 (263) | 5 (15%) | 11 (33%) |
| Ask | Full-service | 44 | 790 (184) | 7 (16%) | 7 (16%) |
| Bills | Full-service | 16 | 966 (310) | 2 (13%) | 7 (44%) |
| Chef and Brewer | Full-service | 95 | 1177 (390) | 6 (6%) | 63 (66%) |
| Ember Inns | Full-service | 75 | 1085 (334) | 5 (7%) | 45 (60%) |
| Flaming Grill | Full-service | 52 | 1232 (496) | 6 (12%) | 36 (69%) |
| Harvester | Full-service | 62 | 1166 (370) | 5 (8%) | 43 (69%) |
| Hungry Horse | Full-service | 333 | 1358 (472) | 19 (6%) | 261 (78%) |
| JD Weatherspoons | Full-service | 114 | 1119 (428) | 16 (14%) | 72 (63%) |
| Nando’sa | Full-service | 9293 | 1019 (231) | 282 (3%) | 4911 (53%) |
| Old English Inns | Full-service | 67 | 1125 (392) | 6 (9%) | 45 (67%) |
| Pizza Express | Full-service | 34 | 854 (234) | 6 (18%) | 7 (21%) |
| Pizza Hut | Full-service | 33 | 975 (238) | 4 (12%) | 19 (58%) |
| Sizzling Pubs | Full-service | 87 | 1269 (575) | 7 (8%) | 56 (64%) |
| Slug and Lettuce | Full-service | 37 | 963 (243) | 2 (5%) | 15 (41%) |
| Stone House | Full-service | 23 | 1275 (323) | 0 (0%) | 18 (78%) |
| Table Table | Full-service | 57 | 869 (273) | 9 (16%) | 17 (30%) |
| Toby Carvery | Full-service | 20 | 942 (166) | 1 (5%) | 8 (40%) |
| Vintage Inns | Full-service | 40 | 1064 (414) | 6 (15%) | 21 (53%) |
| Wagamama | Full-service | 40 | 836 (259) | 7 (18%) | 12 (30%) |
| Zizzi | Full-service | 44 | 735 (337) | 23 (52%) | 10 (23%) |
|  |  |  |  |  |  |
| Full-service restaurants (N=21)b  | 1033 (175) | 12% (11%) | 50% (19%) |

a The relatively large number of eligible meals identified in some restaurant chains was due to there being a large number of meal variants (e.g. chicken with a choice of any two sides, sandwich meal with a choice of bread type, size, and sides) in these restaurants.

b For descriptive purposes, values in this row represent the mean (SD) of individual restaurant values for mean kcals per meal, % of ≤ 600kcal meals and % of ≥ 1000kcals meals.

Table 2. Kilocalorie content of burger and fries/chips meals and salad meals from eligible restaurant chains included in analyses

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Restaurant chainname | Restaurant type | Number of salad meals | Mean kcal (SD) of salad meals | Number of burger meals | Mean kcal (SD) of burger meals |
|  |  |  |  |  |  |
| Burger King | Fast-food | 1 | 210 (-) | 24 | 843 (214) |
| KFC | Fast-food | 3 | 663 (121) | 14 | 1220 (322) |
| Leon | Fast-food | 4 | 555 (40) | - | - |
| Mcdonalds | Fast-food | 8 | 248 (77) | 24 | 907 (141) |
| Subwaya | Fast-food | 192 | 416 (124) | - | - |
| Wimpy | Fast-food | 4 | 372 (68) | 22 | 898 (138) |
|  |  |  |  |  |  |
| Fast-food restaurantsb | 411 (175), N=6 |  | 967 (171), N=4 |
|  |  |  |  |  |  |
| All Bar One | Full-service | 4 | 606 (295) | 6 | 1055 (247) |
| Ask | Full-service | 4 | 650 (268) | - | - |
| Bills | Full-service | 1 | 902 (-) | 3 | 1206 (148) |
| Chef and Brewer | Full-service | 7 | 558 (191) | 8 | 1459 (188) |
| Ember Inns | Full-service | 3 | 575 (175) | 7 | 1295 (294) |
| Flaming Grill | Full-service | 1 | 325 (-) | 8 | 1431 (225) |
| Harvester | Full-service | 4 | 552 (13) | 7 | 1414 (149) |
| Hungry Horse | Full-service | 4 | 394 (296) | 14 | 1966 (771) |
| JD Weatherspoons | Full-service | 5 | 494 (139) | 14 | 1565 (318) |
| Nando’sa | Full-service | 30 | 428 (150) | 912 | 1161 (154) |
| Old English Inns | Full-service | 1 | 247 (-) | 6 | 1543 (213) |
| Pizza Express | Full-service | 4 | 886 (296) | - | - |
| Pizza Hut | Full-service | - | - | - | - |
| Sizzling Pubs | Full-service | 2 | 280 (103) | 10 | 1521 (401) |
| Slug and Lettuce | Full-service | 4 | 736 (215) | 5 | 1280 (149) |
| Stone House | Full-service | 2 | 1353 (158) | - | - |
| Table Table | Full-service | 3 | 329 (88) | 6 | 1105 (166) |
| Toby Carvery | Full-service | 2 | 614 (100) | - | - |
| Vintage Inns | Full-service | 3 | 380 (335) | 2 | 1069 (195) |
| Wagamama | Full-service | 4 | 414 (48) | - | - |
| Zizzi | Full-service | 4 | 467 (213) | - | - |
|  |  |  |  |  |  |
| Full-service restaurantsb | 559 (261), N=20 |  | 1362 (249), N=14 |

a The relatively large number of eligible meals identified in some restaurant chains was due to there being a large number of meal variants (e.g. chicken with a choice of any two sides, sandwich meal with a choice of bread type) in these restaurants.

b For descriptive purposes, values in this row represent the mean (SD) of individual restaurant values for mean salad meal kcals and mean burger meal kcals

- indicates absence of salad or burger meal from restaurant chain menu

**(-) indicates absence of SD as only one eligible meal from restaurant**

1. We were aware of no formal classification of what determines a ‘major’ restaurant chain. We chose 50 outlets or more as this criteria resulted in us being able to include all restaurant chains that were consistently high in annual turnover and popularity according to market reports we accessed. Our scoping research also indicated that chains with fewer than 50 outlets were less likely to provide online nutrition information for menu items. [↑](#footnote-ref-1)