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Running head: Magazine food advertisements

**Socio-economic and gender differences in nutritional content of foods advertised
in popular UK weekly magazines**

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Abstract

Background

Advertising in magazines contributes to nutritional knowledge and social norms and may play a role in food choice and adiposity. In contrast to food advertising on television, that in magazines has received little research attention. We describe the type and nutritional content of foods advertised in popular UK weekly magazines and explore variations in these according to the socio-economic and gender profile of readers.

Method

Four consecutive issues of 30 popular UK weekly magazines were obtained. Food advertisements were categorised into one of eight food groups. Manufacturer's data on the nutritional content of advertised foods was used to determine the nutritional content of advertised foods. Socio-economic and gender profile of magazines was determined from national readership statistics.

Results

443 advertisements for food products were identified. The most common categories of foods advertised were meals, combination foods, soups & sauces (26%) and foods containing fat/sugar (23%). Advertised foods had a lower percentage of energy from carbohydrate (43%), lower fibre density (2g/MJ), but higher percentage of energy from sugars (24%) and higher sodium density (0.5g/MJ) than a diet recommended to avoid disease. There were variations in the type of foods advertised according to the socio-economic profile of readers and in the nutritional content of advertised foods according to the socio-economic and gender profile of readers.

Conclusions

Food advertising reflects, and may reinforce, socio-economic and gender variations in food choice and adiposity. Producers of more healthy food may need help from policy makers and health promoters to effectively market their products.

Keywords

Commercials, media, diet, public health, obesity

Introduction

Recent increases in the prevalence of overweight and obesity in both adults and children have been documented in many countries.[1-4] In developed countries, such as the UK, there are socio-economic and gender inequalities in body weight with less affluent individuals (particularly women) and women tending to have a higher body mass index (BMI) and be more likely to be overweight or obese than more affluent individuals and men.[5]

Food choices have an important influence on body weight and changes in food choices, alongside changes in activity levels, are at the root of the recent rise in obesity. The determinants of food choices are complex, but nutritional knowledge and social norms play a role.[6-9] The editorial and advertising content of print media is one important source of both.[10, 11] Furthermore, by reflecting current social patterns back to readers, often in an embellished and idealised form, the print media reinforces and develops social norms.[12, 13]

Advertisements are an important component of all media with food advertising spend accounting for around 10% all advertising in the UK.[14] Food advertisements in magazines appear to have a strong effect on the consumption habits of readers – increasing purchasing of both the specific product advertised and the category of product advertised.[15] However, whilst substantial recent research has been devoted to describing the content and exploring the impact of television food advertising,[16] food advertising in print media has received much less attention.

The majority of research on the nutritional content of magazine food advertisements to date has focused on the types of foods advertised – generally described in terms of a number of discrete categories.[10, 17-28] Women's magazines from the US are

most often studied[10, 23, 24, 26-28] but magazines aimed at other target groups[18, 19, 21, 22] and published in other countries[17, 19-21] have also being investigated. To date, no work on food advertisements in magazines aimed at UK adults has been published.

Whilst the exact frequency of different categories of food advertised varies from study to study, foods high in fat and sugar; prepared convenience foods such as sauces, soups and ready meals; and alcoholic beverages appear to predominate.[17-19, 21, 26-28] Advertisements for fruit and vegetable are consistently least common.[17, 25, 26] Whilst category based evaluations can provide important information on the type of food advertised, they may hide more subtle variations in the nutrient content of advertised foods. We are not aware of any published information on the detailed nutritional content of foods advertised in magazines.

Variations in the type of foods advertised in magazines aimed at different groups have also been reported. For instance, Pratt & Pratt (1995) found marked differences in food advertisements appearing in US magazines aimed at African American and white women, with advertisements for alcoholic beverages predominating in magazines aimed at African American women and advertisements for fruit and vegetables being more common in magazines aimed at white women.[27] The authors suggest that these differences may contribute to, or reinforce, body weight differences between African American and white women. Other authors have found differences in food advertisements according to the age of readers and the genre of magazine.[20, 26] However, to date, no studies of variations in magazine food advertisements according to the socio-economic or gender profile of readers have been published.

We explored differences in the type and nutritional content of foods advertised in popular UK weekly magazines according to the socio-economic and gender profile of readers.

Methods

Data on readership of weekly women's and general magazines are obtained from the July 2006 – June 2007 edition of the National Readership Survey (NRS).[29] All such magazines with a mean weekly readership of 500 000 or more were considered for inclusion (n=32). Two titles were excluded: *The Big Issue* (which comprises a number of local editions and we were not able to confirm that any one local edition would be representative of all others) and *AutoTrader* (which comprises almost entirely of small advertisements for cars for private sale). Four consecutive issues of the remaining 30 titles sold during November 2007 were obtained and included in the study (for one title, *Best*, only two issues could be obtained).

National Readership Survey data on the social class and gender breakdown of adult readers (aged 15 years and older) was used to calculate metrics indicating the socio-economic and gender profile of each magazine. To give an indication of the socio-economic profile of readers of each magazine, we calculated the ratio of the mean percentage of individuals in social classes C2DE (manual, less affluent social classes) who read the magazine each week to the mean percentage of individuals in social classes ABC1 (non-manual, more affluent social classes) who read the magazine ('C2DE:ABC1 ratio', see Table 1). A similar ratio was calculated to give an indication of the gender balance of readers of each magazine ('women:men ratio' see Table 1). Magazines were also grouped into three affluence tertiles based on the C2DE:ABC1 ratio and into two types based on the categorisation used by the NRS –

women's magazines (n=20) and general magazines (n=10). General magazines all had a women:men ratio of less than 2.

All advertisements published in the magazines of interest were identified and the size of each advertisement and the product being advertised recorded. **All stand alone advertisements were included, but advertorials, money-off coupons and product placements were excluded.** Advertisements for food and drink (referred to as 'food'), but not food supplements (e.g. vitamins and fibre drinks), were grouped into one of eight food categories based on the UK Food Standards Agency's 'Eatwell plate'[30] (see Table 3).

As far as possible, the energy, protein, fat, saturated fat, carbohydrate, total sugar, alcohol, fibre and sodium content (per 100g) of advertised foods were obtained from packaging, manufacturers' websites and telephone helplines. When data from these sources was unavailable, we used data from standard food tables [31-36]. We did not mix data sources for nutritional information within individual foods leading to some missing data when manufacturers reported some, but not all, of the nutrients of interest. When more than one branded product was shown in a single advertisement (e.g. a number of different flavours of a brand of yoghurt), the mean nutritional content of all products pictured was calculated and used in analyses. The percentage of energy obtain from macronutrients, saturated fat, total sugar and alcohol, as well as the fibre and sodium density (in grams per MJ) and energy density (in kJ per 100g), of each food advertised was then calculated.

The unit of analysis was individual advertisements. **Chi-squared tests for linear trend were used to determine if the proportion of food adverts that fell into each food category varied across affluence tertiles.** Chi-squared tests (or Fisher's exact test

where appropriate) were used to determine if the proportion of food adverts that fell into each food category varied across magazine type. Kendall's tau-b rank correlation was used to determine if there were associations between each nutritional metric and either the C2DE:ABC1 or women:men ratio.

Results

Four issues of each of 29 titles and two issues of a further title contained a total of 11 906 pages and 2829 advertisements covering 2765.6 (23.2%) pages. Of these advertisements, 443 (15.7%) were for food. Food advertisements made up 436.7 (3.7%) pages. Table 2 shows the number of (and number of pages devoted to) advertisements and food advertisements across affluence tertiles and magazine types. There was statistical evidence of a trend in the proportion of pages that were advertisements across affluence tertiles with the proportion decreasing as affluence increased. Magazines in the most affluent tertile had the greatest proportion of pages devoted to advertisements in general and food advertisements in particular. In addition, there was a clear, and statistically significant, trend in the proportion of advertising pages that were for food across affluence tertiles with proportion increasing as affluence decreased. There were no statistical trends in the proportion of advertisements, or advertising pages, that were for food across affluence tertiles.

The proportion of advertisements that were for food, the proportion of pages that were advertisements, the proportion of pages that were food advertisements and the proportion of advertising pages that were devoted to food were all significantly higher in women's, compared to general, magazines ($p < 0.001$).

The distribution of food advertisements across food categories are shown in Table 3. Overall, the most common categories were meals, combination foods, sauces & soups

(25.5%) and foods containing fat/sugar (23.0%). Foods in the fruit and vegetable category were least common (1.8%). There were statistically significant trends in the proportion of foods that fell into the fruit & vegetables, alcoholic beverages; diet soft drinks and sweeteners; and meal, combination foods, sauces & soups categories across the affluence tertiles. Advertisements for fruit & vegetables and alcoholic beverages were most common in the most affluent tertile, whilst those for meals, combination foods, soups & sauces were least common in the most affluent tertile. Advertisements for diet soft drinks & sweeteners were only present in magazines in the most affluent tertile. There were no differences in the proportion of food advertisements in any of the food categories according to magazine type.

The mean percentage of energy derived from each nutrient, as well as the energy, fibre and sodium density, of advertised foods is shown in Table 4. For comparisons, population intake ranges suggested by the World Health Organisation and Food and Agriculture Organisation (WHO/FAO) in order to prevent diet-related chronic diseases[37] are also shown. The mean percentage of energy derived from protein, fat and saturated fat in advertised foods were either within, or near to the ranges suggested by the WHO/FAO. However, the percentage of energy derived from carbohydrate in advertised foods was substantially less, and the percentage of energy derived from total sugars substantially more, than recommended. The fibre density of advertised foods was substantially lower, and the sodium density substantially higher, than would be required to meet the WHO/FAO recommendations, based on a 8.4MJ/day (2000kcal/day) diet.

Also shown in Table 4 are Kendall's tau-b rank correlations between each nutritional metric and both the C2DE:ABC1 and women:men ratios of the magazine that advertisements appeared in. Greater C2DE:ABC1 and women:men ratios (indicating

a greater proportion of individuals in social classes C2DE, or women, than individuals in social classes ABC1, or men, were readers) were significantly associated with advertised foods having a higher percentage of energy from protein, saturated fat, carbohydrate, and total sugars; higher sodium density; and lower percentage of energy from alcohol. Greater C2DE:ABC1 ratio was additionally associated with advertised food having higher percentage of energy from total fat.

Discussion

Summary

This is the first analysis of food advertisements in UK magazines aimed at adults and the first detailed nutritional analysis of foods advertised in magazines. Food advertisements were common in the magazines studied accounting for 16-20% of advertising space. Almost a quarter of food advertisements fell into the category of 'foods containing fat/sugar' that the UK government recommends should only be eaten "sparingly".[30] Advertisements for fruit and vegetable products were very uncommon. There was evidence of variations in the types of foods advertised according to the socio-economic, but not the gender, profile of readers. Advertised foods were particularly high in total sugars and sodium and low in carbohydrate and fibre compared to international recommendations. There were a number of statistically significant associations between the nutrient content of foods advertised and both the socio-economic profile and gender balance of readers of the magazines that foods were advertised in. Magazines with higher proportions of C2DE and female readers tended to advertise foods with greater protein, saturated fat, carbohydrate and sugar content, greater sodium density, but lower alcohol content.

Strengths and weaknesses

This is the first examination of the detailed nutrient content of foods advertised in magazines, not just the type or category of foods advertised. Furthermore, the number of different magazine titles included was large and wider ranging than most previous research. To our knowledge, this is also the first study that has made a detailed examination of variations in magazine food advertising according to the socio-economic and gender profile of readers.

We have relied, for the most part, on manufacturers' data on the nutrient content of advertised foods. This is the most product specific data currently available but, as there are no legal requirements in the UK to print nutritional information on packaged food, such information was not always available or complete. This led to some use of less accurate standard food tables and missing data in places. As we only studied magazines available for sale in November 2007, we are unable to exclude the possibility that seasonal variations in food advertising, or the presence of particular campaigns, played a role in the pattern of results seen. It is possible that magazines published during other seasons may have a different balance of food advertisements and further work will be required to investigate this.

We used individual instances of advertisements as the unit of analysis. This assumes that all advertisements have equal impact. Advertisements of different size, in different places within a publication **with regard to other features**, and that use different creative techniques may have different impact and this may vary according to the affluence or gender of readers. **Furthermore, our strategy means that all advertisements contributed equally to the nutritional analysis, irrespective of the**

volume of the food promoted that may be eaten. Further investigators may wish to explore the impact of this approach on the results found.

Interpretation

As with previous research, we found that foods advertised in magazines were dominated by foods that were high in fat and sugar and prepared, combination foods, and that advertisements for fruit and vegetable products were rare.[17-19, 21, 25, 27, 28] The same pattern has also been found in studies of television food advertising.[16] This suggests a universal pattern amongst food advertising for promotions of less healthy food types to dominate over more healthy ones. Some commentators have argued that this is because more healthy food products, such as fruit and vegetables, are less likely to be packaged and branded than processed foods, that are commonly high in fat and sugar, making it harder to market the former group of products.[25] If policy makers accept the influence of food marketing on diet, as appears to increasingly be the case,[37-39] they may find it useful to consider helping producers of healthier foods to effectively market their products.

Our detailed nutrient analysis revealed that, compared to the recommended diet,[37] foods advertised in magazines derived a lower percentage of energy from carbohydrate, a higher percentage of energy from sugar and have a lower fibre density and higher sodium density. Whilst we are not aware of other detailed nutrient analyses of magazine food advertisements, the nutrient content of the foods studied here is very similar to that of foods advertised on US children's TV.[40] The only exception to this is that the foods advertised in our sample of magazines had a substantially higher fibre density (1.9g/MJ, compared to 1.1g/MJ) than those on US children's TV.[40] **As the percentage of energy from carbohydrate was lower than**

recommended and the percentage of energy from sugars higher than recommended, the percentage of energy derived from complex carbohydrates in the advertised foods is likely to be lower than the WHO/FAO recommendations imply (although a recommendation for complex carbohydrates is not explicitly stated in the WHO/FAO recommendations).

Whilst 'foods containing fat/sugar' were common in the analysis based on food groups, our detailed nutrient analysis revealed that advertised foods were not much higher in fat than recommended diets.[37] This finding highlights why a detailed analysis of the nutrient composition of advertised foods may be preferable to the more broad-brush category based approach taken previously which may be insensitive to variations in individual nutrients. Furthermore, the nutritional content of advertised foods did not fit the traditional 'high fat, salt and sugar' label. A more accurate description may be 'high salt and sugar, low fibre'.

Many of the differences in food advertisement type and nutritional content seen according to the socio-economic profile of readers reflect known differences in dietary practices. The higher prevalence of advertisements for alcoholic beverages in the group of magazines with the most affluent readers reflects higher alcohol intake in more affluent groups[5]. Lower frequency of advertisements for meals, combination foods, soups & sauces and higher frequency of advertisements for diet soft drinks & sweeteners in the group of magazines with the most affluent readership may reflect greater nutritional knowledge and cooking skills seen in more affluent groups.[8] Magazines with less affluent readerships included advertisements for foods with higher protein, fat, saturated fat, carbohydrate and sugar content and higher sodium density than those with more affluent readerships. Although dietary intake of a number of micronutrients show strong socio-economic gradients, the evidence of

socio-economic gradients in macronutrient and mineral intake is much less consistent.[41] It would be interesting to extend the analyses here to micronutrients, but this was not possible here as such information is not currently routinely displayed on food packaging in the UK.

Few differences in the type of foods advertised were seen according to magazine type and the gender composition of readers. This is likely to be due to the very small number of food advertisements (n=41) in general magazines – an interesting finding in itself. However, a number of significant associations between women:men ratio and nutritional content of advertised food were seen. The inverse association between the proportion of women reading a particular magazine and percentage of energy derived from alcohol in advertised foods reflects known gender differences in alcohol consumption.[5] Trends for foods advertised in magazines with higher female readerships to have higher saturated fat, sugar and sodium content may reflect higher rates of obesity amongst women compared to men.[5] However, they are not in line with current trends for women to eat ‘healthier’ diets than men.[5]

Conclusions

Our analysis of food advertisements in popular UK weekly magazines has revealed that food advertisements are common in such magazines. Almost one quarter of foods advertised could be categorised as ‘foods containing fat/sugar’ that the UK government advises should be eaten only “sparingly”. A detailed nutritional analysis revealed that, compared to recommended dietary intake, advertised foods were particularly high in sugars and sodium and low in fibre. There were differences in both the nutritional contents of foods advertised according to the socio-economic and gender profile of readers that generally reflect known differences in dietary intake,

knowledge and behaviour. However, as the analyses performed here were entirely cross-sectional, no direction of causation can be established. In particular, it remains unclear whether food advertising reflects variations in dietary behaviour seen in target audiences, or moulds these. Both may be possible – by reflecting society’s norms back at itself, food advertising may reinforce the status quo and so contribute to socio-economic and gender inequalities in body weight and the prevalence of overweight and obesity. Alongside lobbying for increased regulation of food advertising, policy makers and health promoters may find it effective to aid producers of more healthy products to advertise their products more widely.

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Conflicts of interests

None declared

Keypoints

- Food advertisements are common in popular UK weekly magazines aimed at adults
- Almost one quarter of foods advertised were categorised as ‘foods containing fat/sugar’
- Advertised foods were particularly high in sugars and sodium and low in fibre
- There were significant variations in the nutritional content of foods advertised according to the socio-economic and gender profile of readers

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Table 1 – Magazines included in the sample

Magazine title	Total readership (1000s)*	% of population who read magazine*					C2DE:ABC 1 ratio [†]	Affluence tertile [‡]	Women:men ratio [§]	Magazine type [¶]
		All	ABC1	C2DE	Men	Women				
Bella	1087	2.2	1.7	3.0	0.5	3.9	1.8	Middle	7.8	Women's
Best	788	1.6	1.2	2.2	0.3	2.9	1.8	Least	9.7	Women's
Chat	1385	2.9	1.8	4.2	0.5	5.1	2.3	Least	10.2	Women's
Closer	1525	3.1	3.1	3.2	0.5	5.7	1.0	Most	11.4	Women's
Grazia	546	1.1	1.6	0.6	0.3	2.0	0.4	Most	6.7	Women's
Heat	2106	4.3	4.6	4.0	1.6	7.0	0.9	Most	4.4	Women's
Hello!	2074	4.3	4.7	3.7	1.3	7.1	0.8	Most	5.5	Women's
Inside Soap	707	1.5	1.1	1.9	0.3	2.5	1.7	Middle	8.3	Women's
Kerrang!	508	1.0	1.0	1.1	1.4	0.7	1.1	Most	0.5	General
Love It	645	1.3	0.8	2.0	0.2	2.4	2.5	Least	12.0	Women's
New	549	1.1	1.0	1.3	0.2	2.0	1.3	Most	10.0	Women's
Now	1112	2.3	2.4	2.1	0.5	4.0	0.9	Most	8.0	Women's

Table 1 cont.

Magazine title	Total readership (1000s)*	% of population who read magazine*					C2DE:ABC 1 ratio [†]	Affluence tertile [‡]	Women:men ratio [§]	Magazine type [¶]
		All	ABC1	C2DE	Men	Women				
Nuts	1242	2.6	2.2	3.1	4.6	0.6	1.4	Middle	0.1	General
OK!	2437	5.0	5.2	4.8	1.6	8.2	0.9	Most	5.1	Women's
People's Friend	667	1.4	0.9	1.9	0.4	2.3	2.1	Least	5.8	Women's
Pick Me Up	1080	2.2	1.3	3.4	0.4	3.9	2.6	Least	9.8	Women's
Radio Times	2841	5.9	7.9	3.3	5.8	6.0	0.4	Most	1.0	General
Reveal	726	1.5	1.3	1.7	0.2	2.7	1.3	Middle	13.5	Women's
Take a Break	3132	6.5	4.3	9.2	1.8	10.9	2.1	Least	6.1	Women's
That's Life!	983	2.0	1.2	3.1	0.4	3.5	2.6	Least	8.8	Women's
Total TV Guide	716	1.5	1.2	1.9	1.2	1.7	1.6	Middle	1.4	General
TV Choice	1719	3.5	2.4	4.9	2.6	4.5	2.0	Least	1.7	General
TV Easy	595	1.2	0.9	1.7	0.9	1.5	1.9	Least	1.7	General
TV Quick	1221	2.5	1.9	3.3	1.9	3.1	1.7	Middle	1.6	General
TV Times	1750	3.6	3.1	4.2	3.3	3.9	1.4	Middle	1.2	General

Table 1 cont.

Magazine title	Total readership (1000s) [*]	% of population who read magazine [*]					C2DE:ABC 1 ratio [†]	Affluence tertile [‡]	Women:men ratio [§]	Magazine type [¶]
		All	ABC1	C2DE	Men	Women				
What's on TV	3756	7.8	5.6	10.4	5.8	9.6	1.7	Least	1.7	General
Woman	897	1.9	1.5	2.3	0.3	3.3	1.5	Middle	11.0	Women's
Woman's Own	1186	2.4	1.9	3.1	0.4	4.4	1.6	Middle	11.0	Women's
Woman's Weekly	881	1.8	1.6	2.1	0.4	3.2	1.3	Middle	8.0	Women's
Zoo	904	1.9	1.7	2.1	3.4	0.4	1.2	Most	0.1	General

^{*}Data obtained from National Readership Survey, July 2006 – June 2007,[29] restricted to adults aged 15 years or older; [†]Ratio of percentage of population in social class C2DE who read magazine:percentage of population in social class ABC1 who read magazine; [‡]Most=most affluent tertile, Middle=middle affluence tertile, Least=least affluent tertile; [§]Ratio of percentage of women who read magazine:percentage of men who read magazine; [¶]as defined by the National Readership Survey

Table 2 – Number of advertisements and food advertisements in magazines

Group	N titles	N issues	N adverts*	N (%) of adverts for food	N pages	N (%) pages adverts	N (%) pages food adverts	% of advert pages for food
All magazines	30	118	2829	443 (15.7)	11 906	2765.6 (23.2)	436.7 (3.7)	15.8
Affluence tertile								
Most	10	40	1544	225 (14.6)	5230	1503.2 (28.7)	220.4 (4.2)	14.7
Middle	10	40	616	100 (16.2)	3624	631.0 (17.4)	100.0 (2.8)	15.8
Least	10	38	669	118 (17.6)	3052	631.4 (20.7)	116.3 (3.8)	18.4
χ^2 for linear trend (df=1), (p-value)	--	--	--	3.5 (0.061)	--	95.4 (<0.001)	2.1 (0.146)	4.5 (0.033)
Magazine type								
Women's	20	78	1995	402 (20.2)	7658	2004.3 (26.2)	395.7 (5.2)	19.7
General	10	40	834	41 (4.9)	4248	761.3 (17.9)	41.0 (1.0)	5.4
χ^2 (df=1), (p-value)	--	--	--	103.4 (<0.001)	--	104.4 (<0.001)	136.7 (<0.001)	85.7 (<0.001)

*Adverts = advertisements

Table 3 – Distribution of food advertisements across food categories

Food category	N (%)	Affluence tertiles				Magazine type*		
		Most, n(%)	Middle, n(%)	Least, n(%)	χ^2 for linear trend (df=1), (p-value) [†]	Women's, n(%)	General, n(%)	χ^2 (df=1), (p-value) [‡]
Bread, other cereals & potatoes	37 (8.4)	16 (7.1)	9 (9.0)	12 (10.2)	1.0 (0.317)	30 (7.5)	7 (17.1)	FET (0.068)
Fruit & vegetables	8 (1.8)	7 (3.1)	1 (1.0)	0	4.6 (0.032)	8 (2.0)	0	FET (1.00)
Meat, fish & alternatives	39 (8.8)	22 (9.8)	6 (6.0)	11 (9.3)	1.0 (0.754)	36 (9.0)	3 (7.3)	FET (1.00)
Milk & diary foods	80 (18.1)	37 (16.4)	21 (21.0)	22 (18.6)	0.4 (0.529)	76 (18.9)	4 (9.8)	2.1 (0.145)
Foods containing fat/sugar	102 (23.0)	53 (23.6)	19 (19.0)	30 (25.4)	0.1 (0.827)	91 (22.6)	11 (26.8)	0.4 (0.544)
Alcoholic beverages	41 (9.3)	32 (14.2)	7 (7.0)	2 (1.7)	15.1 (<0.001)	34 (8.5)	7 (17.1)	FET (0.089)
Diet soft drinks & sweeteners	23 (5.2)	23 (10.2)	0	0	19.4 (<0.001)	23 (5.7)	0	FET (0.152)
Meals, combo foods, sauces & soups	113 (25.5)	35 (15.6)	37 (37.0)	41 (34.8)	18.4 (<0.001)	104 (25.9)	9 (22.0)	0.3 (0.584)
Total	443 (100)	225 (100)	100 (100)	118 (100)		402 (100)	41 (100)	

*as defined by the National Readership Survey; †Comparing the number of advertisements that fell into each category across socio-economic tertiles with the number that did not; ‡Comparing the number of advertisements that fell into each category across magazine types with the number that did not; FET = Fisher's exact test

Table 4 – Nutritional content of foods advertised

Nutritional measure	N (%) of food advertisements with available data	Mean (SD)	WHO/FAO ranges[37]	Kendall's tau-b* (p-value)	
				C2DE:ABC1 ratio	Women:men ratio
Energy density kJ/100g	443 (100)	968.3 (782.5)	--	0.01 (0.732)	0.01 (0.723)
% energy derived from protein	443 (100)	11.3 (12.6)	10-15	0.11 (<0.001)	0.08 (0.017)
% energy derived from total fat	443 (100)	31.9 (25.8)	15-30	0.07 (0.032)	0.05 (0.101)
% energy derived from saturated fat	403 (91.0)	11.6 (12.6)	<10	0.11 (0.001)	0.10 (0.005)
% energy derived from carbohydrate	441 (99.5)	43.2 (28.6)	55-75	0.19 (<0.001)	0.09 (0.009)
% energy derived from total sugars	396 (89.4)	23.5 (25.5)	<10	0.19 (<0.001)	0.14 (<0.001)
% energy derived from alcohol	443 (100)	7.4 (23.3)	--	-0.18 (<0.001)	-0.13 (<0.001)
Fibre density g/MJ	399 (90.1)	1.9 (2.9)	>3.0 [†]	0.06 (0.101)	0.03 (0.374)
Sodium density g/MJ	390 (88.0)	0.5 (0.7)	<0.2 [‡]	0.15 (<0.001)	0.08 (0.034)

*Kendall's tau-b correlation between C2DE:ABC1 or women:men ratio and nutritional metric; [†]Based on a 8.4MJ/day (2000kcal/day) diet and a recommended daily fibre intake of more than 25g per day; [‡]Based on a 8.4MJ/day (2000kcal/day) diet and a recommended daily sodium intake of less than 2g per day