Marketing messages in food and alcohol magazine advertisements, variations across type and nutritional content of promoted products: a content analysis

A. Pitts¹, W. Burke², J. Adams¹

¹Institute of Health & Society, Newcastle University, Baddiley-Clark Building, Richardson Road, Newcastle NE2 1AX, UK
²Public Health Department, North Tyneside Council Offices, Quadrant, Silverlink North, Cobalt Business Park, North Tyneside NE27 0BY, UK
Address correspondence to J. Adams, E-mail: j.m.adams@ncl.ac.uk

ABSTRACT

Background ‘Marketing messages’ are the themes used in advertisements to promote products. We explored the frequency of different marketing messages used in food and alcohol advertisements in UK women’s magazines and associations with the type and nutritional content of products promoted.

Methods All advertisements for food and alcohol in 108 issues of popular UK monthly women’s magazines were identified and text-based marketing messages classified using a bespoke coding framework. This information was linked to existing data on the type (i.e. food group) and nutritional content of advertised products.

Results A total of 2,687 marketing messages were identified in 726 advertisements. Consumer messages such as ‘taste’ and ‘quality’ were most frequently found. Marketing messages used in advertisements for food and alcohol were notably different. The relationship between type and nutritional content of products advertised and marketing messages used was not intuitive from a consumer perspective: advertisements for foods ‘high in fat and/or sugar’ were less likely to use messages related to health, but more likely to use messages emphasizing reduced amounts of specific nutrients.

Conclusions Almost all advertisements included consumer-related marketing messages. Marketing messages used were not always congruent with the type or nutritional content of advertised products. These findings should be considered when developing policy.

Keywords diet, food, marketing, mass media, periodicals

Introduction

The influence of food marketing on children’s dietary preferences and choices has been extensively reviewed and confirmed.¹² In response to these findings, substantial efforts are being made worldwide to reduce exposure of children to food marketing.³⁴ Similar findings have linked exposure to alcohol marketing to initiation and alcohol consumption levels in young people.⁵–⁷ Less interest has focussed on food and alcohol marketing to adults, but there is some evidence that the dietary practises of adults are influenced by food marketing.⁸

Previous research has documented the extent and nature of food and drink advertising targeted at general population groups in a number of spheres, including television,⁹,¹⁰ magazines,¹¹–¹⁸ and outdoors.¹⁹,²⁰ This work has universally concluded that advertised foods are predominantly less healthful. Less work has explored how food and alcohol advertisements promote the products they do. In particular, little is known about the marketing messages used in contemporary food and alcohol advertisements and how these relate to the type and nutritional content of foods advertised.

We use the term ‘marketing messages’ to describe the implicit and explicit themes and concepts that are used in advertisements to promote products via text, images and
audio sound. Better understanding of what marketing messages are commonly used to promote less healthful foods, in particular, could help develop more effective regulation and more effective media training to help combat the negative effects of food and alcohol advertising.

Print media, magazines in particular, are frequently cited as an important source of lay diet-related information.\textsuperscript{14,15} Furthermore, advertising in print media can communicate more detailed information than television advertising due to the potential for longer time spent by the audience viewing advertisements.\textsuperscript{21}

Previous work exploring marketing messages in food advertising in magazines for adults originates in the USA, Canada, Australia and The Netherlands. This suggests that the most common marketing messages used are consumer related (e.g. taste, convenience and quality) and that differences exist in messages used over time, across age groups and between different ethnic audiences.\textsuperscript{14,15,17,18,22}

Overall, previous work on marketing messages used in magazine food and drink advertisements has been restricted in the number of publications studied, with no previous study that we are aware of including more than six different publications.\textsuperscript{15,22,23} Any attempts to explore relationships with the type of food advertised have focussed on broad food groups, rather than detailed nutritional content.\textsuperscript{16,23} There is also a dearth of recent evidence with only one study, that we are aware of, published on this topic in the past decade.\textsuperscript{22}

Our objectives were to document the frequency of different marketing messages used in food and drink advertisements in a wide range of UK monthly magazines and to explore the associations between marketing messages used and the type and nutritional content of foods promoted across advertisements.

Methods

We identified all advertisements for food and both alcoholic and non-alcoholic drinks (henceforth collectively referred to as ‘food’) in a large sample of magazines. An iteratively developed coding framework was used to classify all text-based marketing messages in each food advertisement. This information was then linked to previously collected and reported data on the type and nutritional content of foods advertised.

Magazines

All UK monthly magazines listed in the National Readership Survey\textsuperscript{24} as a women’s magazine with a mean readership of over 500 000 per month during October 2006–September 2007 were considered for inclusion. Six publications were excluded—four supermarket magazines not readily available outside the respective supermarkets (‘Asda Magazine’, ‘Sainsbury’s Magazine’, ‘Somerfield Magazine’ and ‘Waitrose Food Illustrated’) and two magazines aimed at teenagers (‘Bliss’ and ‘Sugar’) that are covered by statutory and voluntary regulations on food advertising to children.\textsuperscript{25} One year subscriptions to the remaining 18 publications were purchased in spring 2008.

Starting with the earliest issue available in the full sample (with a cover month of March, April, May or June 2008), every alternate issue of each magazine title was included in the current study, giving a total of six issues per title and 108 issues overall. Details of the titles and cover months of magazines included in the study, as well as reader demographics for each title are summarized in the Supplementary data.

Food advertisements

All stand-alone advertisements that were physically part of the included magazines were identified. Product placement in editorial content, supplements and loose fliers was excluded. We defined ‘food advertisements’ as those advertisements for branded food and drink products, but excluding dietary supplements and baby food.

Development of coding framework

A convenience sample of 30 advertisements was initially viewed to determine the most common marketing messages used. These were then added to the coding framework used in the most recent work of this type\textsuperscript{15} to produce an adapted framework. This adapted framework was piloted on a further convenience sample of 150 food advertisements by one researcher (A.P) with 10% of advertisements duplicate coded by a second researcher (W.B) to explore inter-rater reliability. This led to further extension of the framework. The final coding framework included 20 marketing messages within four message groups (Table 1).

Application of coding framework

The final coding framework was used to code all text (including any text in pictorial representations of products advertised) present in included food advertisements that could be read with the naked eye. As many codes as necessary were assigned to each advertisement to encapsulate all text-based marketing messages present.

To explore inter-rater reliability of the final coding framework, a random sample of around 20% of all food advertisements, stratified by magazine title ($n = 129$), was independently coded by the second researcher (W.B) after all advertisements had been coded by the first researcher (A.P). Any
advertisements that were not coded exactly the same by both researchers \((n = 74, 57.4\%)\) were discussed and a consensus arrived at for which codes should be applied. We then compared the first researcher’s original coding to the consensus coding. The first researcher coded in agreement with the consensus in 101 cases \((78.3\%)\). In 26 cases \((16.1\%)\), the first researcher identified one more or one fewer marketing message code than the consensus number. Two and three fewer message codes than consensus were identified on one occasion \((0.8\%)\) each.

### Nutritional content of foods advertised

Information on the energy, carbohydrate, sugar, protein, fat, saturated fat, sodium, fibre and alcohol content of advertised foods, collected and described previously,\(^{11}\) was obtained from packaging, manufacturer’s websites, commercial weight loss websites and telephone helplines as far as possible, supplemented with standard food table data.\(^{26}\) Where necessary, we chose to include the first eight of these nutrients as they are those recommended, on a voluntary basis, by the UK government to be included on all food packaging.\(^{27}\) If alcohol

### Table 1 Final coding framework of marketing messages used in food advertisements in UK monthly women’s magazines

<table>
<thead>
<tr>
<th>Marketing message group</th>
<th>Marketing message code</th>
<th>Example text</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consumer-related benefit</td>
<td>Taste</td>
<td>Pleasant taste, flavour, delicious, yummy, appetising, aroma, divine, gorgeous, irresistible, palate, savour, satisfying, refreshing, thick, creamy, rich, succulent, full-bodied, smooth</td>
</tr>
<tr>
<td>Convenient</td>
<td>Convenient, easy to use, prepare, express, handy</td>
<td></td>
</tr>
<tr>
<td>Quality</td>
<td>Quality, finest, best, perfect, fresh, crafted, best selling, favourite, gourmet, exclusive, made with care/passion/by experts, distinctive, authentic, original, traditional, genuine, made since – homemade, classic, natural, pure, award winning</td>
<td></td>
</tr>
<tr>
<td>Free-range/fair-trade</td>
<td>Fair-trade, free-range, organic, recycled, environmentally minded; helps community; helps others (not family or friends)</td>
<td></td>
</tr>
<tr>
<td>Location</td>
<td>Made in –; protected geographical status; taste of –; mention of country/region</td>
<td></td>
</tr>
<tr>
<td>Endorsed</td>
<td>Named/unnamed celebrity or (not health) professional endorsed; sponsor of –; certified by –; study of customers said –</td>
<td></td>
</tr>
<tr>
<td>New</td>
<td>New; how; improved (e.g. more), introducing, limited edition, only available at</td>
<td></td>
</tr>
<tr>
<td>Extra</td>
<td>Recipes, added benefit, win prize, coupon provided</td>
<td></td>
</tr>
<tr>
<td>Family/friends</td>
<td>Pleases others/family mentioned, Christmas, Easter, cultural event, summertime, mention of season</td>
<td></td>
</tr>
<tr>
<td>Fun</td>
<td>Provides personal pleasure, indulgence, treat, special, heavenly, beautiful, pretty, stylish, cool, sexy, fabulous, creative, adventurous, confident, fun/good times/feelings of happiness/ enjoyment, gives energy/performance enhancing, humour/pun</td>
<td></td>
</tr>
<tr>
<td>Health benefit</td>
<td>Healthy</td>
<td>‘Health food’, giving health, nutritious, makes you fit, prevents illness/diseases, cures disease, relieves symptoms, goodness/good for you, wholesome, takes care of you</td>
</tr>
<tr>
<td>Health professional</td>
<td>Health professional association endorsed, recommends, scientifically tested, proven, claim, unspecified experts recommend</td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>Aids weight loss, slimming, watch weight</td>
<td></td>
</tr>
<tr>
<td>Digestion</td>
<td>Aids digestion, easily digested, keeps you full, fuller for longer, stops hunger, eat less</td>
<td></td>
</tr>
<tr>
<td>5 a day</td>
<td>‘5 a day’, 1 portion of fruit or vegetables</td>
<td></td>
</tr>
<tr>
<td>Specific nutrients or ingredients</td>
<td>Wholegrain/multigrain</td>
<td>Wholegrain, multigrain</td>
</tr>
<tr>
<td>Fruit/vegetable</td>
<td>Contains fruit, contains vegetables, fruity</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>Minerals, vitamins, specific fats, protein, complex carbohydrate, antioxidants, detox</td>
<td></td>
</tr>
<tr>
<td>Minimization/elimination of nutrients</td>
<td>Fat/cholesterol</td>
<td>Reduced fat/low fat, fat free, no hydrogenated fats, Lowers/low/free from cholesterol</td>
</tr>
<tr>
<td>Preservatives</td>
<td>Free from additives, preservatives, colours, sweeteners, flavourings</td>
<td></td>
</tr>
<tr>
<td>Light/lite</td>
<td>Lite, light, in reference to drinks: diet or free</td>
<td></td>
</tr>
<tr>
<td>Reduced</td>
<td>Skinny, mini, in reference to ingredients, calories, fat or sugar: only, little, just, smaller, less, few, fewer, lower</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>Low/reduced/free from salt or sodium, no, zero, reduced/low calorie, low caffeine, low alcohol</td>
<td></td>
</tr>
</tbody>
</table>
was not mentioned on packaging, we assumed no alcohol was present.

These data were used to calculate energy, sodium and fibre density and also percentage of energy derived from carbohydrates, sugars, protein, fat, saturated fat and alcohol of all foods advertised. Where more than one branded product was shown in a food advertisement, the mean nutritional content of all branded products shown was calculated.

**Types of food advertised**

Food advertisements were also categorized into one of the six food groups using the UK Food Standard’s Agency’s ‘EatWell Plate’ plus an additional category of alcoholic drinks. Where more than one branded product was shown in an advertisement, categorization was based on the most prominently displayed product. Our previous work indicated that ‘foods high in fat and/or sugar’ made up the single largest of these groups. To facilitate analyses, the six original food groups were collapsed into three: ‘foods high in fat and/or sugar’, alcoholic drinks and all other foods and drinks.

**Analysis**

The frequency of different marketing messages was determined in the whole sample of advertisements and separately for advertisements in each of the three food groups. Differences in the distribution of marketing messages across food groups were explored using the \( \chi^2 \) statistic.

The median value (and inter-quartile range) of each nutritional metric was calculated for the whole sample of advertised foods, and separately for each of the four message groups. Kruskal–Wallis tests were used to compare the nutritional content of foods advertised with and without marketing messages in each of the message groups.

Given the high number of statistical tests performed, to reduce the risk of type 1 statistical error, a \( P \)-value of <0.01 was taken as indicating statistical significance throughout.

**Results**

A total of 726 advertisements were identified in 108 magazine issues. Table 2 shows the number of food advertisements, marketing message codes and codes per food advertisements overall and by food group. At least one marketing message code was assigned to all food advertisements and the median number of codes per advertisement was 4 (25–75th centile: 3–5).

The distributions of marketing message codes and message groups, both overall and separately for each food group, are shown in Table 3. The most commonly assigned message group was ‘consumer related benefit’, with 96.1% of advertisements being assigned at least one code within this group. Messages in the ‘health benefit’ group were least frequently used, being assigned to 20.4% of advertisements. In terms of individual marketing message codes, ‘taste’ was the most frequently assigned, in 56.9% of food advertisements, closely followed by ‘quality’ in 55.8%.

There was no significant difference in the proportion of food advertisements that were assigned at least one marketing message code in the ‘consumer-related benefit’ message group across food groups (\( P = 0.098 \)). However, there were significant differences in relation to the other three message groups. No advertisements for alcoholic drinks were assigned a code in the ‘health benefit’ message group, compared with 20.0–23.7% in the other food groups (\( P < 0.001 \)). Advertisements for alcoholic drinks were less likely than foods in other groups to be assigned a code in the ‘specific nutrients or ingredients’ or ‘minimization or elimination of nutritional components’ message groups (\( P < 0.001 \)).

There were also significant differences in the distribution of many individual marketing message codes across food groups. In many cases, advertisements for ‘alcoholic drinks’ appeared to be different from other food advertisements, being less likely to use many of the marketing messages in the framework, except for ‘taste’ and ‘location’. Other noticeable differences were that, compared with ‘other food and drinks’, advertisements for ‘foods high in fat and/or sugar’ were much less likely to be assigned the ‘endorsed’, ‘wholegrain/multigrain’ or ‘minimization or elimination of nutritional components group—other’ codes; but much more likely to be assigned the ‘light/lite’ or ‘reduced’ codes.

Table 4 shows the overall nutritional content of advertised foods. In addition, the median nutritional content of foods...
advertised with and without marketing messages in each of the four message groups is shown and compared. Foods advertised using marketing messages in the ‘consumer related benefit’ message group tended to have a higher energy density, but lower percentage of energy derived from sugar than those advertised without these messages.

When messages in the ‘health benefit’ group were used, advertised foods tended to have a higher percentage of energy derived from carbohydrate and lower percentage of energy derived from alcohol. When messages in the ‘specific nutrients or ingredients’ group were used, advertised foods tended to derive a higher percentage of energy from carbohydrate and sugars and have a higher fibre density; derive a lower percentage of energy from fat, saturated fat and alcohol and have a lower sodium density.

When foods were advertised using messages from the ‘minimization/elimination of nutritional components’ group, they tended to have a lower energy density, derive a higher percentage of energy from sugars and a lower percentage of energy from alcohol and have a higher sodium density.

**Discussion**

**Main findings of this study**

This is the first study to document the frequency of different marketing messages used in food and drink advertisements in the UK and the first worldwide to compare marketing messages to the detailed nutritional content of advertised products.

We found that almost all food and alcohol advertisements used consumer-related marketing messages. Advertisements for alcoholic drinks stood out as using markedly different combinations of marketing messages than advertisements for other food and drinks. The relationship between food groups and marketing messages used was not always intuitive from a
Table 4  Nutritional content of foods advertised using different marketing messages in UK monthly women's magazines

<table>
<thead>
<tr>
<th>Marketing message group</th>
<th>Energy density (kJ/100 g)</th>
<th>% energy from carbohydrate</th>
<th>% energy from sugars</th>
<th>% energy from protein</th>
<th>% energy from fat</th>
<th>% energy from sat. fat</th>
<th>% energy from alcohol</th>
<th>Sodium density (g/MJ)</th>
<th>Fibre density (g/MJ)</th>
</tr>
</thead>
<tbody>
<tr>
<td>All food advertisements</td>
<td>Median (25–75th centile)</td>
<td>9.3 (3.4–15.9)</td>
<td>47.9 (12.8–75.0)</td>
<td>14.7 (0.6–43.0)</td>
<td>7.2 (1.5–18.4)</td>
<td>23.1 (1.7–50.8)</td>
<td>4.2 (0–19.6)</td>
<td>0 (0–0)</td>
<td>0.1 (0–0.4)</td>
</tr>
<tr>
<td>Consumer-related benefit group</td>
<td>Present, median (25–75th centile)</td>
<td>9.3 (3.5–15.9)</td>
<td>47.9 (10.4–75.2)</td>
<td>14.2 (0.4–43.0)</td>
<td>7.1 (1.1–17.7)</td>
<td>23.1 (1.1–51.1)</td>
<td>4.2 (0–20.3)</td>
<td>0 (0–0)</td>
<td>0.1 (0–0.4)</td>
</tr>
<tr>
<td></td>
<td>Absent, median (25–75th centile)</td>
<td>2.7 (2.2–3.0)</td>
<td>62.3 (45.3–62.6)</td>
<td>30.8 (27.2–39.7)</td>
<td>13.1 (3.4–26.6)</td>
<td>32.1 (5.0–37.0)</td>
<td>1.7 (1.5–6.2)</td>
<td>0 (0–0)</td>
<td>0.3 (0.1–3.7)</td>
</tr>
<tr>
<td></td>
<td>$\chi^2$ (d.f. = 1)* (P-value)</td>
<td>13.0 (&lt;0.001)</td>
<td>2.3 (0.130)</td>
<td>9.6 (0.002)</td>
<td>6.1 (0.014)</td>
<td>0.01 (0.926)</td>
<td>2.4 (0.123)</td>
<td>2.8 (0.027)</td>
<td>4.9 (0.027)</td>
</tr>
<tr>
<td>Health benefit group</td>
<td>Present, median (25–75th centile)</td>
<td>9.9 (2.4–15.2)</td>
<td>64.9 (36.0–82.0)</td>
<td>14.4 (1.1–48.5)</td>
<td>11.2 (0.3–21.0)</td>
<td>16.3 (3.2–32.1)</td>
<td>2.6 (1.3–15.2)</td>
<td>0 (0–0)</td>
<td>0.1 (0–0.3)</td>
</tr>
<tr>
<td></td>
<td>Absent, median (25–75th centile)</td>
<td>9.3 (3.5–16.0)</td>
<td>46.3 (12.8–69.3)</td>
<td>16.8 (0.1–39.5)</td>
<td>6.2 (1.5–17.1)</td>
<td>24.6 (0.2–51.2)</td>
<td>5.1 (0–19.7)</td>
<td>0 (0–0)</td>
<td>0.1 (0–0.4)</td>
</tr>
<tr>
<td></td>
<td>$\chi^2$ (d.f. = 1)* (P-value)</td>
<td>0.1 (0.730)</td>
<td>16.0 (&lt;0.001)</td>
<td>2.1 (0.147)</td>
<td>3.0 (0.085)</td>
<td>0.8 (0.375)</td>
<td>2.2 (0.136)</td>
<td>17.6 (&lt;0.001)</td>
<td>0.01 (0.925)</td>
</tr>
<tr>
<td>Specific nutrients or ingredients group</td>
<td>Present, median (25–75th centile)</td>
<td>6.1 (3.1–15.8)</td>
<td>65.6 (44.3–81.8)</td>
<td>30.8 (6.8–53.6)</td>
<td>7.6 (0.7–12.2)</td>
<td>12.9 (1.5–32.2)</td>
<td>2.6 (0–10.2)</td>
<td>0 (0–0)</td>
<td>0.1 (0–0.3)</td>
</tr>
<tr>
<td></td>
<td>Absent, median (25–75th centile)</td>
<td>9.4 (3.5–16.2)</td>
<td>34.0 (2.9–60.5)</td>
<td>5.6 (0–32.2)</td>
<td>6.1 (1.7–22.2)</td>
<td>37.0 (2.3–56.9)</td>
<td>5.2 (0–27.3)</td>
<td>0 (0–0)</td>
<td>0.2 (0–0.4)</td>
</tr>
<tr>
<td></td>
<td>$\chi^2$ (d.f. = 1)* (P-value)</td>
<td>3.1 (0.077)</td>
<td>106.6 (&lt;0.001)</td>
<td>69.4 (&lt;0.001)</td>
<td>3.7 (0.053)</td>
<td>26.8 (&lt;0.001)</td>
<td>13.1 (&lt;0.001)</td>
<td>17.0 (&lt;0.001)</td>
<td>6.9 (0.008)</td>
</tr>
<tr>
<td>Minimization or elimination of nutritional components group</td>
<td>Present, median (25–75th centile)</td>
<td>4.6 (2.5–14.9)</td>
<td>49.6 (35.9–72.3)</td>
<td>27.2 (2.6–55.9)</td>
<td>7.8 (3.4–21.3)</td>
<td>24.6 (1.9–51.1)</td>
<td>5.2 (0–20.3)</td>
<td>0 (0–0)</td>
<td>0.2 (0–0.7)</td>
</tr>
<tr>
<td></td>
<td>Absent, median (25–75th centile)</td>
<td>9.4 (3.5–16.2)</td>
<td>46.4 (6.4–75.0)</td>
<td>14.4 (0.1–35.6)</td>
<td>6.9 (0.7–16.3)</td>
<td>21.8 (0.4–50.8)</td>
<td>3.0 (0–19.6)</td>
<td>0 (0–0)</td>
<td>0.1 (0–0.3)</td>
</tr>
<tr>
<td></td>
<td>$\chi^2$ (d.f. = 1)* (P-value)</td>
<td>9.8 (0.002)</td>
<td>4.6 (0.032)</td>
<td>14.0 (&lt;0.001)</td>
<td>3.9 (0.048)</td>
<td>0.3 (0.562)</td>
<td>1.2 (0.268)</td>
<td>21.8 (&lt;0.001)</td>
<td>23.5 (&lt;0.001)</td>
</tr>
</tbody>
</table>

*aComparing the nutritional content of food advertisements that did and did not use a marketing message in this group, using the Kruskal–Wallis test.
consumer perspective. For instance, advertisements for food identified as ‘high in fat and/or sugar’ were more likely to use messages emphasizing that they contained reduced amounts of specific nutrients.

There were some differences in the nutritional content of advertised foods according to groups of marketing messages used. These were, again, not always intuitive from the consumer perspective. For example, the only significantly ‘healthier’ aspect of foods advertised using messages related to health benefits were that they contained less alcohol.

**What is already known on this topic**

Food advertising is common in women’s magazines and previous work has confirmed that products advertised tend to be less healthy.\(^{11-18}\) Previous work on marketing messages used in magazine food advertisements has used magazines published in the USA, Canada, Australia and The Netherlands. Although one previous study has explored food marketing in UK children’s magazines,\(^29\) we are not aware of any previous work focussing UK magazines aimed at adults.

As was found here, previous work found that the most common marketing messages used are consumer related (e.g. taste, convenience and quality). Food advertisements in Canadian and US magazines became increasingly likely to make nutritional claims between the 1920s and 1990s,\(^{14,17}\) and similar trends were seen in The Netherlands over a shorter period.\(^22\) We found that around a third of advertisements used messages in each of the ‘health benefits’, ‘specific nutrients or ingredients’ and ‘minimization/elimination of nutrients’ groups.

This emphasis on nutritional and health information appears to vary across target audiences. Food advertisements in Australian women’s magazines with younger audiences were less likely to emphasize nutritional or health information than those with older audiences.\(^15\) Similarly, food advertisements in US magazines aimed at African-American women were less likely to mention nutritional information than those aimed at Caucasian women.\(^18,30\) We did not explore differences by ethnicity or age of readers.

**What this study adds**

Our results highlight the sometimes incongruent association between marketing messages used to promote foods and the nutritional content of food promoted. Previous research indicates that consumers tend to generalize nutritional claims, interpreting a low fat or low calorie claim as indicating that the food is healthier overall—\(^31\) —the, so-called, ‘halo effect’. Whilst it is quite possible that a food can be high in one particular less healthy nutrient and low in another, consumers do not necessarily recognize these nuances. Our results suggest that manufacturers and marketers may be exploiting these nuances and the ‘halo effect’ to their own, rather than consumers’, advantage. This is particularly worrying given the greater tendency we found for ‘foods high in fat and/or sugar’ to be marketed using ‘light’ and ‘reduced’ marketing messages. Such messages may encourage consumers to believe that these products are healthier, despite them falling in to a food group that current UK recommendations suggest should only be consumed in ‘small amounts’.\(^28\)

Nutritional and health claims on food packaging and in food marketing in the UK are currently governed by European legislation.\(^32\) This provides clear guidance on the conditions under which specific nutritional and health claims can be made. But the guidance is nutrient-specific. As such, it does not take into account the ‘halo effect’.\(^31\) Development of these regulations, based on how consumers interact with marketing messages, may be required.

**Limitations and strengths of this study**

Our sample of magazines covers a much broader range of titles than previous research in this area, with a total of 18 titles included, compared with the previous maximum of six.\(^14,15,17,18,22\) In addition, by specifically choosing magazines based on high readership figures available at the time of publication, we have ensured clear public health relevance. However, monthly women’s magazines are not necessarily representative of all UK magazines. They tend to be more expensive than weekly magazines, with more affluent readers.\(^11\) It would be interesting to determine whether the patterns we found are replicated in magazines aimed at different target groups. Similarly, food advertisements in women’s magazines are not necessarily representative of all food advertisements. In particular, on-line food marketing is now becoming more common and offers the potential to make use of a wider range of marketing messages and strategies than traditional print media.\(^33\)

The sample of magazines included is now around 5 years old. Although marketing is a fast-moving area and specific advertisements are likely to have changed in the intervening 5 years, we do not have any reason to believe that marketing messages used have also changed over this timescale.

We spent considerable time iteratively developing our coding framework. The final framework had good inter-rater reliability. However, we found both developing and applying the framework difficult. Initially, we spent considerable time attempting to ‘interpret’ advertisements as a whole, before concluding that this was unreliable. Our final approach, of coding only written text using the literal meanings of this text,
was reliable, but is unlikely to have captured all the implicit messages used in the advertisements.

We based our methods of determining the type and nutritional content of advertised foods on current UK policy—specifically, the food groups used in the EatWell Plate, and the nutrients recommended for inclusion on all food packaging. This increases the UK policy relevance of our findings, but other food group categorizations are available and the nutrients we studied were not exhaustive. More comprehensive analyses could reveal further interesting trends.

**Conclusions**

Advertisements for food and both alcoholic and non-alcoholic drinks in a range of popular UK monthly women’s magazines most frequently used consumer-related marketing messages such as taste or quality. Advertisements for alcoholic drinks tended to use different marketing messages from advertisements for other food and drink. Marketing messages used were not always congruent, from a consumer-perspective, with the type or nutritional content of food advertised. Those developing regulations on nutritional and health claims in food marketing should take these findings into account.

**Supplementary data**

Supplementary data are available at the Journal of Public Health online.

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