

Scientific Advisory Committee on Nutrition

Paper for Discussion:**Review of Research on the Effects of Food Promotion to Children****Agenda Item 5**

Attached is a background note on the above report and the Executive and Management Summary. The full report is on the FSA web-site at: <http://www.food.gov.uk/news/newsarchive/promote>. A hard copy is not available. Note the report is over 200 pages.

The Committee is requested to:

- Note the report
- Comment on the nutrition associated public health risks for children given the reports' findings
- Comment on the link between behaviour and excessive weight gain and obesity in children

The Promotion of Foods to Children : Background

Issue

The Agency is examining whether commercial advertising may have an adverse influence on children's diets, and if so, how the issue might be addressed.

Agency work so far

Views of Stakeholders: The Agency has held two stakeholder meetings on this issue (in December 2001 and February 2002). These meetings revealed a wide range of views on the effect of promotions.

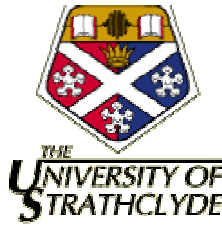
The Agency has since been concentrating on assessing the evidence base on this issue. In October 2001 qualitative consumer research into attitudes to promotional activity was published. The research concluded that although parents regard food packaging and television adverts as the most powerful promotional tools, they believe promotions play only a limited role in influencing which foods they purchase for their children. Parents were more concerned however where foods which they consider to be "unhealthy" are promoted as being "healthy". In March 2003 the Agency commissioned a systematic review of the evidence on the effect of promotional activity on children's eating behaviour. The resulting management summary is attached.

Next Steps

The Agency is developing a range of policy options for assessment and discussion with stakeholders. In assessing the likely impact of individual options on consumers the Agency intends to take into account the potential impact on:

- public health (which might be enhanced if there were associated improvements in children's diets);

- consumer choice (which might for example be reduced if there were an impact on product innovation or availability);
- the quality of children's television programming (which may be affected by a loss of advertising revenue).



REVIEW OF RESEARCH ON THE EFFECTS OF FOOD PROMOTION TO CHILDREN

Final Report (Executive Summary and Management Summary)

Prepared for the Food Standards Agency

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EXECUTIVE SUMMARY

Does Food Promotion Influence Children? A Systematic Review of the Evidence

Background

This review was commissioned by the Food Standards Agency to examine the current research evidence on:

- the extent and nature of food promotion to children
- the effect, if any, that this promotion has on their food knowledge, preferences and behaviour.

Before addressing these aims, two smaller reviews of related literatures were undertaken to provide some context. The first examined what we know about marketing and promotion and the effects it might have on children's consumer behaviour. It shows that promotion is just one part of the complex process of marketing and that measuring its effects on consumer behaviour (and disentangling these from other influences) is notoriously difficult. Nonetheless, advertisers do it all the time and base enormous budgetary decisions on the resulting data. The second small review looked at the field of alcohol and tobacco promotion, showing that hard and fast proof about promotional effects will never emerge; rather, judgements have to be made on the balance of probabilities. It also showed that, in the case of tobacco promotion, these have now been made.

Systematic Review Methods

The two main reviews on the extent and effects of food promotion used 'systematic' procedures. These are borrowed from medical science, where great care is needed to ensure that particular treatments are really safe and effective, and ensure that every possible source of evidence is identified and rigorously evaluated. The precise methods of this search and evaluation process are laid down in a detailed protocol, so that other researchers can replicate the review and check the conclusions it reaches. In short, systematic reviews are both rigorous and transparent. This is the first time that such procedures have been applied to a social phenomenon like food promotion, but it was felt that adopting them would help ensure that the review findings are relevant to and accepted by the many parties with an interest in this issue.

Three methods were used to identify potentially relevant research: an extensive search of electronic databases; searches of the 'grey' (not formally published) literature; and personal contact with key people in the field.

The Extent and Nature of Food Promotion to Children

Children's food promotion is dominated by television advertising, and the great majority of this promotes the so-called 'Big Four' of pre-sugared breakfast cereals, soft-drinks, confectionary and savoury snacks. In the last ten years advertising for fast food outlets has rapidly increased, turning the 'Big Four' into the 'Big Five'. There is some evidence that the dominance of television has recently begun to wane. The importance of strong, global branding reinforces a need for multi-faceted communications combining television with merchandising, 'tie ins' and point of sale activity.

The advertised diet contrasts sharply with that recommended by public health advisors, and themes of fun and fantasy or taste, rather than health and nutrition, are used to promote it to children. Meanwhile, the recommended diet gets little promotional support.

Effects on Children's Food Knowledge, Preferences and Behaviour

There is plenty of evidence that children notice and enjoy food promotion. However, establishing whether this actually influences them is a complex problem. The review tackled it by looking at studies that had examined possible effects on what children know about food, their food preferences, their actual food behaviour (both buying and eating), and their health outcomes (eg. obesity or cholesterol levels). The majority of studies examined food advertising, but a few examined other forms of food promotion.

In terms of nutritional knowledge, food advertising seems to have little influence on children's general perceptions of what constitutes a healthy diet, but, in certain contexts, it does have an effect on more specific types of nutritional knowledge. For example, seeing soft drink and cereal adverts reduced primary aged children's ability to determine correctly whether or not certain products contained real fruit.

The review also found evidence that food promotion influences children's food preferences and their purchase behaviour. A study of primary school children, for instance, found that exposure to advertising influenced which foods they claimed to like; and another showed that labelling and signage on a vending machine had an effect on what was bought by secondary school pupils. A number of studies have also shown that food advertising can influence what children eat. One, for example, showed that advertising influenced a primary class's choice of daily snack at playtime.

The next step, of trying to establish whether or not a link exists between food promotion and diet or obesity, is extremely difficult as it requires research to be done in real world settings. A number of studies have attempted this by using amount of television viewing as a proxy for exposure to television advertising. They have established a clear link between television viewing and diet, obesity, and cholesterol levels. It is impossible to say, however, whether this effect is caused by the advertising, the sedentary nature of television viewing or snacking that might take place whilst viewing. One study resolved this problem by taking a detailed

diary of children's viewing habits. This showed that the more food adverts they saw, the more snacks and calories they consumed.

Thus the literature does suggest food promotion is influencing children's diet in a number of ways. This does not amount to proof; as noted above with this kind of research, incontrovertible proof simply isn't attainable. Nor do all studies point to this conclusion; several have not found an effect. In addition, very few studies have attempted to measure how strong these effects are *relative* to other factors influencing children's food choices.

Nonetheless, many studies have found clear effects and they have used sophisticated methodologies that make it possible to determine that i) these effects are not just due to chance; ii) they are independent of other factors that may influence diet, such as parents' eating habits or attitudes; and iii) they occur at a brand and category level.

Furthermore, two factors suggest that these findings actually understate the effect that food promotion has on children. First, the literature focuses principally on television advertising; the cumulative effect of this combined with other forms of promotion and marketing is likely to be significantly greater. Second, the studies have looked at *direct* effects on individual children, and understate *indirect* influences. For example, promotion for fast food outlets may not only influence the child, but also encourage parents to take them for meals and reinforce the idea that this is a normal and desirable behaviour.

Conclusions

This first UK systematic review of the research literature shows that:

1. There is a lot of food advertising to children.
2. The advertised diet is less healthy than the recommended one.
3. Children enjoy and engage with food promotion.
4. Food promotion is having an effect, particularly on children's preferences, purchase behaviour and consumption.
5. This effect is independent of other factors and operates at both a brand and category level.

This does not amount to proof of an effect, but in our view does provide sufficient evidence to conclude that an effect exists. The debate should now shift to what action is needed, and specifically to how the power of commercial marketing can be used to bring about improvements in young people's eating.

MANAGEMENT SUMMARY

Background

The Food Standards Agency commissioned this review to examine what, if any, research evidence there is that food promotion can influence the food-related knowledge, preferences and behaviour of children. This is an extremely contentious issue and as a consequence great care has been taken to adopt rigorous objective and replicable procedures. Specifically, for the key review questions a 'systematic' approach was adopted.

The review is structured in two parts. Part 1 sets the context by examining the nature of advertising and promotion and the effects it can have. It also briefly examines the promotion to children of two non-food products, tobacco and alcohol, that have been the subject of equivalent debates about cause and effect. Part 2 contains the main and systematic components of the review, the first examining the extent and nature of food promotion to children, and the second the evidence on whether or not this affects their food knowledge, preferences and behaviour.

Part 1: Narrative Reviews

Marketing, Promotion and Consumer Behaviour

Marketing is a complex mechanism for influencing consumer behaviour, and advertising and promotion form an important part of it. It is clear that consumers are actively involved in the consumption of advertising and cannot be characterised as passive or easily manipulated. Nonetheless, the effects of advertising are multiple and include knowledge, attitude and behaviour change by consumers themselves, stakeholders and significant others. Measuring the effect of promotion is very difficult but essential for marketers who need to assess the performance of their communications for future planning: consumer studies, econometrics and experiments are all used.

It is also clear that children are becoming more important to marketers, and that marketers are becoming increasingly sophisticated in their efforts to reach and influence them. Children become more adept at consuming advertising as they grow older, matching their cognitive and social development. Conversely, younger children may be particularly susceptible to the persuasive influences of promotion.

The Promotion of Tobacco and Alcohol to Young People

Evidence that tobacco advertising has an influence on children's smoking is dominated by consumer surveys. These have consistently shown that young smokers are more aware, familiar and appreciative of tobacco advertising and the imagery it promotes than their non-smoking peers. Furthermore, longitudinal studies have

shown that this heightened knowledge and awareness of tobacco advertising predicts the onset of smoking. This suggests (but does not prove) that tobacco advertising plays a role in both the onset and continuance of smoking by young people.

The literature on the effects of alcohol promotion on young people is less well developed although findings from consumer studies do provide some evidence of a link between alcohol promotion and young people's drinking.

This part of the review provides three important lessons. First, disentangling the influences on complex human behaviours is extremely difficult. There will never be any such thing as certainty or final proof. Evidence has to be collected and conclusions drawn on the basis of a balance of probabilities. In the case of tobacco, policy makers have decided that the case is strong enough and taken appropriate policy decisions; in the case of alcohol the evidence is much less clear and the policy options are therefore less apparent. Second, looking for evidence of promotional effects with population sub-groups like children requires consumer studies, as econometric, population based approaches do not provide a sufficient degree of disaggregation. Third, it shows that researchers tend to focus on advertising but that other promotional activity, and the cumulative effects of this, also needs to be considered.

Part 2: Systematic Reviews

Systematic Review Methods

Three main methods were used to identify potentially relevant research: an extensive search of electronic databases; searches of the 'grey' literature; and personal contact with key people in the field. The reference list of the original Ministry of Agriculture Fisheries and Food (MAFF) review (Young et al 1996) was also examined and an 'in-house' search for relevant literature undertaken at the Centre for Social Marketing (CSM). These search methods yielded 29946 potentially relevant titles and abstracts that underwent an initial stage of relevance assessment. From this, a total of 201 articles were considered relevant: 79 met the initial criteria for the systematic review of the extent and nature of food promotion to children, 109 met the initial criteria for the systematic review of the effects of food promotion on children's food knowledge, preferences and behaviour, and a further 13 articles met the initial criteria for both systematic reviews.

Each of these 201 articles was then assessed against more stringent relevance and quality criteria. Sixty five articles describing 50 studies passed these criteria for the systematic review of the extent and nature of food promotion to children and 55 articles describing 51 studies passed these criteria for the systematic review of the effects of food promotion on children's knowledge, preferences and behaviour. Finally, the included studies were subject to a final quality rating to gauge their relative quality; this was used to help assess which studies' findings should be given more weight in drawing conclusions from the evidence. Studies were categorised, on the basis of their rating scores, as higher, medium or lower scoring.

Systematic Review 1: Review of the Extent and Nature of Food Promotion to Children

Fifty studies provided evidence of the extent and nature of food promotion to children and were of sufficient methodological quality to include in the review. Forty two involved the collection of original data, and the remaining eight were review articles. The following questions were examined:

- i) What promotional channels are being used to target children? What is the relative spend in each of these promotional channels? What are the time trend changes?
- ii) What food items are being promoted to children? What are the time trend changes?
- iii) What are the principal creative strategies used to target children? To what extent are these different creative strategies being used? What are the time trend changes?

Q1: (1) What promotional channels are being used to target children?

Studies of television advertising dominate the published literature on food promotions to children. Only three studies did *not* examine television advertising (Consumers Union 1995, Hawkes 2002, Longman 2002), with only another two focusing on other forms of promotion as well as television advertising (Horgen et al 2001, Longman 2000). However, the heterogeneity of television was reflected in the variety of approaches used to research this medium.

Thirteen studies examined the differences between types of television output by examining both national broadcast networks and local independent terrestrial television channels, both national broadcast networks with cable networks/satellite channels, and national broadcast networks, local independent terrestrial television channels *and* cable networks/satellite. Food commercials were found to be more prevalent in advertising broadcast on the major national networks, while toy adverts were relatively more common on other forms of television (Barcus 1981, Consumers International 1999, Kunkel & Gantz 1992, Solomon et al 1982).

Eleven studies examined food advertising and food related public service announcements, six studies looked at product-programme tie-ins and two studies described aspects of the actual food content of television shows that were transmitted between the commercial breaks monitored.

Twenty four studies focused on either or both of the two children's time-slots: Saturday/Sunday morning television ('SMTV') and the mid-week, after-school 'children's hour' (the 'C' hour). Prime-time television where both adults and children were expected to be exposed to advertising together was examined in one study, 10 studies compared prime-time television with children's television, and three of these studies also examined 'post-watershed' television (aimed solely at adults), comparing this with prime-time, SMTV and the 'C' hour advertising.

Beyond television advertising, below-the-line promotional techniques such as sponsorship, in-school marketing, point-of-sale, free samples of food items, free gifts/tokens (premiums) with food items, loyalty/clubs, inter-active food, novel packaging, tie-ins with movies, tie-ins with computer software and other forms of wider brand building were examined.

Overall, the review identified a preponderance of television studies, most of which investigate output during children's time-slots.

Q1: (2) What is the relative spend in each of these promotional channels?

Only two studies considered spend when quantifying the extent of food promotion to children (Dibb 1993, Horgen et al 2001). Original data was therefore obtained from AC Nielsen which provided figures for advertising spend in the UK of all food brands (in total and for each individual brand), broken down by promotional channel for the years 1994, 1998 and 2002. Both studies and AC Nielsen data confirmed that television was the primary medium used for advertising food to children: making up at least 75% of all advertising spend in the UK in recent years. Furthermore the most heavily advertised food brands were for products identified in this review as those most often promoted to children (ie. breakfast cereals, confectionary, soft-drinks, savoury-snacks and fast-food restaurants).

Other research strategies were employed by a further 25 studies in order to gauge the extent of food promotions to children. Six studies compared the relative extent of food promotion to children with the extent of food promotion to adults and showed that food makes up a far greater proportion of promotions aimed at children than it does with adults. Seventeen studies investigated the extent of food promotion to children by comparing it to other products also aimed at children. These show that only toys threaten the pre-eminence of food in terms of advertising, and then only in the run up to Christmas.

Overall, the review found that television is the principal channel used by food marketers to reach children, and that food products dominate children's advertising.

Q1: (3) What are the time trend changes?

Only one study considered time trends in food promotion by spend (Horgen et al 2001). Both this and data obtained from AC Nielsen indicate that television has been by far the dominant promotional channel throughout the past decade, although spend appeared to be decreasing slightly in both relative and absolute terms by 2002.

The relative change in the amount of food promotion to children was also addressed by studies which compared the length of commercial breaks during children's television programs. Allowing for changes in advert length, frequency and any restrictions imposed on advertising, the extent of television commercials in general, of which half or more tend to be for food products, is increasing. Given the proliferation of channels and formats over time, the potential extent of exposure to food promotions seems likely to increase, even if the proportion of food adverts falls.

The review also identified an ongoing trend towards more branded rather than generic food products; one study looked at potential future trends in food promotion to children including below-the-line marketing activities such as branding, packaging and the advent of new 'fun' food.

Overall, the time trends show that the tendency for television to dominate food promotion, and food children's advertising, are long term phenomena.

Q2: (1) What food items are being promoted to children?

Forty one studies conducted content analyses of children's food commercials to determine which sorts of products were being promoted. Recorded data were then subdivided (eg. by product, health status or nutritional content) by judges or raters. The resulting data were reported in mainly descriptive terms, and only rarely used inferential statistics. Sixteen studies looked at the relative amounts of advertising for specific foods, 21 attempted to estimate their actual nutritional content, while eight studies made comparisons between the 'advertised diet' and an acknowledged recommended diet.

Televised children's food promotions were found to be dominated by a 'big four' food items: breakfast cereals, confectionary, savoury-snacks and soft-drinks by virtually every relevant study. Adverts for fast-food outlets were also found to have "significantly" increased their share of children's adverts in recent years.

Overall, the food items which predominate in children's advertising were considered to be, or classified as, unhealthy and the advertised diet contrasts with that recommended by public health. The relative absence of advertising in support of the recommended diet is also noted.

Q2: (2) What are the time trend changes?

Thirteen studies in this review looked at time trends in the type of food being promoted to children. These show that the dominance of the 'big four' has been apparent since the 1950's, with these being joined in recent years by a fifth - advertising for fast-food restaurants. Advertising spend on fast food brands in the UK has been increasing in both relative and absolute terms over the past decade, mirroring trends found in the USA, with an increase in fast-food promotions being both relative to and replacing those for breakfast cereals as the most promoted product.

Overall, the literature presents a clear picture of time-trends in the extent to which different food items are promoted to children: promotions for staples and fresh foods have reduced to be replaced by promotion for the 'big four' items ('pre-sugared' breakfast cereals, soft-drinks, confectionary and savoury snacks) and fast-food outlets.

Q3: (1) What are the principal creative strategies used target children?

Thirty four of the studies included in this review addressed the issue of the nature of food promotions to children. A broad range of creative strategies were examined including the format of adverts (eg. characterisation, animation and tone), the theme of adverts (eg. whether it uses a storyline and if the tone is humorous or serious), the theme appeals of adverts (ie. what messages are used to attract the customer) and the use of disclaimers by adverts (ie. what information is provided about the product). The main method employed was again content analysis.

There was little agreement across studies over classification of the creative strategies to be analysed, coupled with the much greater potential for subjectivity by raters/judges. To account for this some studies used some kind of standardised rating scales or statistical validation of their coding systems and judges' ratings of creative strategies. Data was typically reported in descriptive terms; only nine studies used inferential statistics to describe relationships between creative strategies.

The characteristics of children's food promotions were examined in different ways. Sixteen studies looked at the characterisation in food adverts aimed at children and examined whether the advert was live action or featured cartoon characters, who speaks for the food product, actors or off-screen announcers, those who appear in the adverts, and if they are portrayed using the product being promoted (ie. eating).

Children's food advertising was characterised by off-screen male announcers and on screen male characters; other adults who appeared on-screen in food adverts tended to be portrayed as either comic-book heroes or villains. In terms of on-screen consumption of foods, one study reported that food advertising reports a "mixed-message" (Byrd-Bredbenner & Grasso 2000b) as actors observed consuming foods were reportedly slim and healthy, despite the majority of the food consumed being rated as of "low nutrient density".

The use of animation techniques in television food adverts was found to be particularly strongly associated with children's food adverts in comparison to non-food adverts aimed at children and adult-oriented food adverts (Atkin 1975/Atkin & Heald 1977, Barcus 1975a/1975b/Barcus & Wolkin 1977, Barcus 1981, Lewis & Hill 1998, Morton 1990). The use of animation or mixed formats was seen as being an indicator of the "light" or "humorous" tone of children's food adverts; much less humour was observed in both adult-oriented adverts and non-food adverts aimed at children (Atkin 1975/Atkin & Heald 1977, Doolittle & Pepper 1975, Lewis & Hill 1998, Morton 1990).

Theme appeals in children's adverts were examined in 15 studies, and food appeals identified included: appeals based on the food product's taste (such as sweetness), nutritional/health properties, physical appearance/texture, fantasy/adventure themes, fun/humour, enablement/capability, price, novelty/modernity and social aspects of the product (there is little consensus about the definition of these themes, so comparisons between studies are difficult). The most popular appeals used in the promotion of foods to children were hedonistic, including taste, humour, action-adventure and fun.

Of the food products identified as most commonly advertised to children, breakfast cereals were uniquely identified as those most likely to utilise nutritional or health claims as a theme appeal selling point (Barcus 1971a/1971b, Barcus

1975a/1975b/Barcus & Wolkin 1977, Consumers Union 1995, Hammond et al 1997a, Hill & Radimer 1997, Kotz & Story 1994, Reece et al 1999, Stern & Harmon 1984, Winick et al 1973).

Eleven studies examined the nature of disclaimers. Other products advertised to children, such as toys, were much more likely to use disclaimers than were food items and services, although the chief exception to this pattern was breakfast cereals. Intrinsic disclaimers/disclosures (referring to the product) were said to be used to sell food, except fast-food restaurants which were thought to use extrinsic disclaimers (referring to the product's effect) to sell the brand. Toys, breakfast cereals and candy/gum tended to use informative disclaimers (referring to what the product does do), while fast-food restaurants tended to use restrictive disclaimers (referring to what the product does not do) (Muehling & Kolbe 1998).

Adverts designed to promote food to children were said to utilise 'pester-power' or 'purchase-influence-attempts' (PIA). A commonplace creative strategy said to employ pester-power was the use of premiums or competition prizes offering collectibles (eg. toys), and the use of celebrity was observed (although only limited cases). Six studies examining program-commercial tie-ins found the boundary between television shows and advert breaks to be less than clear cut. The food products which tended to sponsor shows, and utilise tie-ins, tended to be those categorised as pre-sugared or of low nutritional value, with the same food items or services (eg. fast-food outlets) being present. In-school marketing was also identified as an inappropriate channel for promoting foods to children (Consumers International 1999, Consumers Union 1995, Horgen et al 2001, Longman 2002) and, even in comparison to television, this type of promotion was felt to be particularly effective at reaching children.

Overall, the creative appeals in children's food advertising were found to concentrate on 'fun' and 'taste', rather than on health or nutrition (true both in comparison to other food promotions (aimed at adults) and other promotions aimed at children). The dominance of animation as a creative device was thought to illustrate this tendency. Fast-food advertising, which has become more prominent in recent years, tends not to describe the product advertised and focuses on the experience of the meal and the brand.

Q3: (2) To what extent are these different creative strategies being used?

Seventeen studies measured the relative extent to which these creative strategies are used to target children. Despite diverse ratings procedures, it was universally concluded that the food is promoted to children using themes such as taste rather than nutrition and fun or fantasy rather than health. Breakfast cereal adverts alone were found to regularly use nutritional appeals, regardless of whether or not these appeals were deemed to be misleading or disclaimers.

Seven studies compared the relative extent of different creative strategies by examining the creative strategies used to promote toys. Toy adverts were reported to take a more serious tone, use quite different theme appeals, display a much greater level of portrayal of the product in use, make greater use of disclaimers and consist of

straightforward live action formats. Five studies compared creative strategies in children's food promotion with those used in the promotion of adult foods. Adult food adverts were found to take a more serious tone and use different theme appeals (ie. with nutrition, price, convenience, quality and health being more common and fantasy-adventure and fun less so).

Overall, despite some methodological weakness, key differences have been identified between children's food promotions and other types of promotion. Children's food adverts appeared to be more likely to use hedonistic themes such as fun and fantasy. The 'advertised diet' was universally found to differ from the recommended diet and was viewed as unhealthy by comparison.

Q3: (3) What are the time trend changes?

Nine studies explored time trends in the development of the creative strategies used to promote food to children. The basic creative strategies used to promote food to children are beginning to change. The rise of new media is giving rise to a host of new potential creative strategies, and the evolution of brand-stretching and 'globalisation' is allowing promotional messages to cut across many different media and also allowing increased tie-ins with below-the-line marketing activities.

Systematic Review 2: Review of the Effects of Food Promotion on Children's Food Knowledge, Preferences and Behaviour

Fifty one studies provided evidence of how children respond to food promotion and were of sufficient methodological quality to include in the review. Thirty three of these studies were judged to be capable of providing evidence of a potentially causal relationship between food promotion and children's food-related knowledge, preferences and/or behaviour. The remaining eighteen studies were not capable of providing evidence of a potentially causal relationship between food promotion and effects on children, but did illustrate ways in which children respond to food promotion (for example, recall and enjoyment of adverts).

The review examined four questions:

- i) How do children respond to food promotion?
- ii) Is there a causal link between food promotion and children's food knowledge, preferences and behaviour?
- iii) If food promotion is shown to have an effect on children's food knowledge, preferences and behaviour, what is the extent of this influence relative to other factors?
- iv) In the studies which demonstrate an effect of food promotion on children's food knowledge, preferences and behaviour, does this affect total category sales, brand switching or both?

Food knowledge was defined as including general perceptions of what foods are 'good' and 'bad' to eat, perceptions and understanding of what constitutes a balanced diet, perceptions and knowledge of the nutritional value of different food products,

ability to understand the composition of processed foods, and understanding of nutritional concepts.

Food preferences were defined as including both liking for specific foods and preferences between different foods.

Food behaviour was defined broadly, as including purchasing and purchase-related behaviour, consumption behaviour, and diet and health status. Purchasing included both individual and household purchasing, while purchase-related behaviour referred to behaviour designed to influence parents to buy particular products. Consumption behaviour was defined as including one-off consumption (such as the amount of food eaten on one occasion), short-term consumption (such as daily selection of foods for consumption over a short period of time), and self-reported regular patterns of consumption behaviour (such as reported frequency of eating sweets). Studies which measured children's diet and nutrient intake, and health-related variables such as obesity and cholesterol, were also examined under behaviour.

Q1. How do children respond to food promotion?

Eighteen studies investigated children's responses to food promotion. These were primarily simple surveys with relatively small, usually non-randomly selected samples. Three of the studies were conducted in the UK. Seven different types of response were examined: recall of food advertising, liking for and attitudes towards food advertising, communication about food advertising, purchase-related behaviour perceived to be triggered by food promotion, responses to free gifts and packaging, desire for promoted foods, and qualitative insights into children's interaction with food promotion.

The studies indicated that children recalled food adverts (Hitchings & Moynihan 1998, Yavas & Abdul-Gader 1993, Radkar & Mundlay 2001, Barry & Hansen 1973) and that food adverts tended to be among their favourites (Yavas & Abdul-Gader 1993, Ward et al 1972, Donohue 1975, Lam 1978). Two studies found that children discussed food promotion with peers and families (Carruth et al 1991, Yavas & Abdul-Gader 1993). In three studies, children reported asking their parents to buy food they had seen advertised (Del Toro & Greenberg 1989, Yavas & Abdul-Gader 1993, Lam 1978), while four studies found that parents perceived that their children were influenced by food promotion to request specific foods and that they themselves responded to these requests (Taras et al 2000, Donkin et al 1992 & 1993, Hitchings & Moynihan 1998, Radkar & Mundlay 2001). Three studies indicated that free gifts and packaging attributes appeared to attract children's attention and stimulate demand for products (Carruth et al 2000, Atkin 1975a & 1978, Donohue 1975). Those studies which made statistical comparisons between different groups indicated that there were some gender (Del Toro & Greenberg 1989, Yavas & Abdul-Gader 1993), age (Del Toro & Greenberg 1989) and racial (Barry & Hansen 1973) differences in how children responded to food promotion.

Overall, the studies indicated that food promotion is noticed and enjoyed by children, and seems to influence their communication and shopping behaviour. This suggests that the creative strategies examined in Systematic Review One have persuasive

power. The studies examined in this section were not capable of establishing any causal link between food promotion and food knowledge, attitudes and behaviour. For this, more complex research designs are needed.

Q2. Is there a causal link between food promotion and children's food knowledge, preferences and behaviour?

Thirty three studies investigated whether there was a causal link between exposure to food promotion and children's food knowledge, preferences and behaviour. They comprised 22 experimental studies, one observational study, one quasi-experiment, and nine cross-sectional studies.

Q2: (1) Does food promotion influence children's nutritional knowledge?

Eight studies investigated the influence of food promotion on children's nutritional knowledge. Five were experiments deploying a randomised controlled design and three were cross-sectional surveys examining the association between exposure to food advertising and nutritional knowledge. In terms of quality, two studies were higher scoring and six were medium scoring. All but one were conducted with North American samples in the 1970s and 1980s.

The eight studies reviewed provide modest evidence of an effect on children's nutritional knowledge. Four studies found that food promotion had an effect on or was associated with differences in nutritional knowledge. Three of these four studies provided evidence that exposure to food promotion for 'low nutrition' foods was associated with poorer nutritional knowledge. Of these, one was an experiment providing causal evidence (Ross et al 1980 & 1981) and the other two (Wiman & Newman 1989, Gracey et al 1996) were cross-sectional studies. The fourth study, an experiment (Peterson et al 1984), found that exposure to adverts for foods "high in nutritional value" increased nutritional knowledge, although it was impossible to separate out the effects of the adverts from other nutritional messages in this study.

Three studies found that exposure to food promotion had no impact on, or was not associated with changes in, children's perceptions of the healthiness of different foods or what constitutes a healthy diet. Two were experimental (Goldberg et al 1978a & 1978b Study 1, Goldberg et al 1978a and 1978b Study 2) and one was cross-sectional (Atkin 1975b). The eighth study produced inconclusive results (Galst 1980).

The evidence is modest rather than strong. In two of the studies (one of which showed an effect and one where the results were inconclusive) it was difficult to separate out the effects of advertising from other exposure variables (Peterson et al 1984, Galst 1980); furthermore, studies which found effects tended to take more detailed knowledge measures than did the studies which did not find effects: the studies were not measuring the same effect.

Overall, the weight of evidence suggests that food promotion may have little influence on children's general perceptions of what constitutes a healthy diet, but that

it can, in certain contexts, have an effect on more specific types of nutritional knowledge.

Q2: (2) Does food promotion influence children's food preferences?

Fourteen studies investigated the influence of food promotion on children's food preferences. Thirteen were experiments, and one was a cross-sectional study. The studies covered a wide age range, 2-18 years. The majority of the studies were conducted in north America in the 1980s. In terms of quality, four were higher scoring, five were medium scoring, and three were lower scoring.

The fourteen studies reviewed provided reasonably strong evidence of an effect on children's food preferences. Of the twelve studies that reported results (two did not), seven found that exposure to food promotion had an impact on, or was associated with significant changes in, children's food preferences (Goldberg et al 1978a & 1978b Study 1, Gorn & Goldberg 1980a, Stoneman & Brody 1981, Kaufman & Sandman 1983, Borzekowski & Robinson 2001, Heslop & Ryans 1980, Norton et al 2000). Three of these were good quality experimental studies (Goldberg et al 1978a & 1978b Study 1, Stoneman & Brody 1981, Kaufman & Sandman 1983); they found that children were significantly more likely to prefer high fat, salt or sugar foods over lower fat, salt or sugar alternatives after exposure to food adverts. Three studies found that children were more likely to choose the advertised brand than a non-advertised brand of the same product type after exposure to food adverts (Borzekowski & Robinson 2001, Gorn & Goldberg 1980a, Heslop & Ryans 1980). One cross-sectional study found a weak association between television advertising and preferences for specific foods (Norton et al 2000).

One study found non-significant results in the direction of an effect (Goldberg et al 1978a & 1978b Study 2), and four (three experiments and one cross-sectional study) found no significant effects or associations (Peterson et al 1984, Clarke 1984, Ritchey & Olson 1983, Gorn & Florsheim 1985).

Overall, the stronger studies were generally more likely to find effects and the less strong studies were not, suggesting that there is reasonably robust evidence that food promotion influences food preferences.

Q2: (3) Does food promotion influence children's food purchasing and purchase-related behaviour?

Seven studies examined the impact of food promotion on children's food purchasing and purchase-related behaviour. Purchase-related behaviour was defined as behaviour intended to influence parents' food purchasing selections. Three were randomized controlled experimental studies, one was a natural quasi-experiment, one was an observational study, and two were cross-sectional surveys. In terms of quality, four were higher scoring, two were medium scoring, and one was lower scoring.

All seven studies found that exposure to food promotion had an influence on, or was significantly associated with, the specific purchase or purchase-related behaviour

measured in each study. One experimental study (French et al 2001) found that promotional signage on vending machines significantly increased sales of low fat snacks in secondary schools independently of pricing variables. This was the only study in the review to provide robust evidence of a causal link between promotion and actual purchasing behaviour by children. One study involving a natural experiment (Goldberg 1990) compared the household purchase of cereals among English- and French-speaking children in Montreal. At the time of the study, English-speaking children in Quebec were exposed to and mostly watched American television, while French-speaking children were also potentially exposed to American television but tended to watch more Quebec television, which banned children's advertising in 1980; they were therefore less likely to be exposed to advertising for children's cereals. Regression analysis indicated that exposure to American television significantly increased household purchase of advertised cereals independently of income or language, suggesting that the difference could not be solely attributable to cultural differences between high and low cereal purchasing households.

Two experimental studies found that exposure to food promotion increased children's purchase influence behaviour observed in a natural setting (supermarket shopping with parents) (Stoneman & Brody 1982, Galst & White 1976). The latter study also found that the more attentive a child was to television advertising, as opposed to television programmes, the greater the number of attempts to influence parental shopping purchases he or she made at the supermarket. One observational study (Reeves & Atkin 1979) and one cross-sectional study (Atkin 1975b) also found significant associations between amount of Saturday morning television viewed and frequency of making food purchase requests to parents, with 'heavy' viewers in both studies making more requests than 'light' viewers. The second cross-sectional study (Taras et al 1989) found a weak association between television watching in general and food purchase requests to mothers.

Overall, the studies provide strong evidence that food promotion influences children's food purchase-related behaviour. Both the methodologically stronger and less strong studies found evidence of effects. In all except one study, the effect was in the direction of increasing purchase requests for foods high in fat, sugar or salt; in the remaining study, the effect was in the direction of increasing low fat snack sales, in line with the promotional stimulus examined in the study.

Q2: (4) Does food promotion influence children's food consumption behaviour?

Eleven studies investigated the effects of exposure to food promotion on children's food consumption behaviour. Consumption behaviour was defined as including consumption of food on a single occasion, daily selection of foods for consumption over a short period of time, and self-reported patterns of consumption behaviour. Eight studies used randomized experimental designs and three were cross-sectional studies. In terms of quality, two studies were higher scoring, eight were medium scoring, and one was lower scoring. All the studies were North American.

The studies provided modest evidence of an effect on consumption behaviour. Two experimental studies found that exposure to food promotion had a significant effect on children's consumption behaviour: in one, it reduced their likelihood of selecting fruit

or orange juice, compared to a sweet, for a daily snack (Gorn & Goldberg 1982/Gorn & Goldberg 1980b), and in one it increased boys' calorific consumption from a tray of snack foods (Jeffrey et al 1982 Study 2/Fox 1981). Three cross-sectional studies (Atkin 1975b, Ritchey & Olson 1983, Bolton 1983) found small associations, of varying degrees of strength, between exposure to television food advertising (as measured using television viewing) and frequency of snacking or consumption of specific foods, although the studies were of varying quality.

Two studies found variations in consumption behaviour, according to exposure to food promotion, but the results were not statistically significant and, therefore, no effect could be concluded (Dawson et al 1988, Jeffrey et al 1982 Study 1).

Four studies produced results which were inconclusive: Galst (1980) appeared to indicate that exposure to food promotion had a *positive* effect on consumption behaviour (ie. it reduced children's selection of sugared snacks), whereas Peterson et al (1984) found that exposure to food promotion had no effect on children's consumption behaviour, but it was not possible in either study to disentangle the effects of food promotion from other experimental stimuli examined at the same time. Two studies found that exposure to food promotion under certain conditions had an effect on consumption behaviour but that under other conditions it did not: in Cantor (1981) the effect was to *increase* consumption of sweet foods, while in Gorn & Goldberg (1980a) the effect was to *reduce* consumption of ice cream.

Overall, the studies provide modest evidence of an effect of food promotion on consumption behaviour. Effects were sometimes inconsistent and were not found in all the studies, but were found in sufficient studies to suggest that food promotion can, in some contexts, influence children's food consumption behaviour.

Q2: (5) Does food promotion influence children's diet and health-related variables?

Six cross-sectional studies addressed this question. Four investigated the relationship between television viewing and children's diet (Bolton 1983, Coon et al 2001, Gracey et al 1996, Taras et al 1989). The other two studies examined health-related variables: one examined the relationship between television viewing and obesity (Dietz & Gortmaker 1985) and one (Wong et al 1992) examined the relationship between television and video viewing and cholesterol levels. One of the studies was higher scoring in terms of quality, four were medium scoring and one was lower scoring.

All four dietary studies found significant associations, of varying strength, between television viewing and dietary intake. Bolton (1983), a strong study, found that food advertising exposure as calculated from children's television viewing diaries was significantly related with children's snacking frequency, calorific intake and nutrient efficiency. Coon et al (2001) found a significant association between television being on during meals and children's diet. Taras et al (1989) and Gracey et al (1996) found weak evidence of a relationship between television watching and food purchase requests (in the first study) and fat intake (in both studies). The other two studies found significant relationships between television viewing and obesity (Dietz & Gortmaker 1985), and between television viewing/video game playing and high cholesterol (Wong et al 1992).

Overall, there was evidence of small but significant associations between television viewing and diet (four studies), television viewing and obesity (one study) and television viewing and cholesterol (one study). In five of the studies, the potential effect of food advertising on this relationship could not be disentangled from the general effect of television viewing. The effects may have been attributable to the impact of the advertising seen while watching television, the impact of other messages seen while watching television, such as programme content, or to the sedentary nature of the activity itself (Dietz & Gortmaker 1985). Alternatively, it is possible that a high level of television viewing acts as a marker for a complex set of attitudes and behaviours within the family which taken together lead to observed associations between television and children's food-related behaviour and diets (Coon et al 2001). One study, however, (Bolton 1983), measured the specific contribution of food advertising. The use of detailed television viewing diaries enabled a calculation of the extent to which each subject was exposed specifically to food advertising rather than simply the amount of time the subject spent watching television in general. The study found that the greater a child's food advertising exposure, the more frequent his or her snacking and the lower his or her nutrient efficiency.

Q2: (6) Other effects of food promotion

Finally, two experimental studies examined other attitudinal effects of food promotion. One experimental study (Lewis & Hill 1998) found that overweight children's self-perceptions and attitudes towards eating confectionery were affected both negatively and positively by exposure to food promotion. Another study (Gorn & Goldberg 1982)/Gorn & Goldberg 1980b) found that exposure to either confectionery adverts, fruit adverts or dietary public service announcements (PSAs) had no impact, either positive or negative, on children's attitudes towards snack food consumption.

Q3. If food promotion is shown to have an effect on children's food knowledge, preferences and behaviour, what is the extent of this influence relative to other factors?

Eight studies investigated the relative influence of food promotion or television viewing on children's food behaviour, diet or health-related variables compared to one or more other factors known to influence children's food behaviour and diet. Seven were cross-sectional (Norton et al 2000, Coon et al 2001, Bolton 1983, Gracey et al 1996, Dietz & Gortmaker 1985, Wong et al 1992, Ritchey & Olson 1983) and one was experimental (French et al 2001). Two were higher scoring in terms of quality, four were medium scoring and two were lower scoring.

Overall, all eight studies provided evidence, of varying strength, that food promotion or television viewing have an influence on children's food behaviour and diet independent of at least one other factor. However, not all the studies examined, or had data that could easily be used to investigate, either the strength of the association between behaviour and food promotion relative to associations with other influences, or the relative magnitudes of the corresponding sizes of effects. More weight should

be attached to the findings of the two stronger studies (Bolton 1983, French et al 2001).

One experimental study (French et al 2001) found that substantial (25-50%) price changes appeared to have a stronger influence than promotional signage on low fat snack sales from vending machines in secondary schools. However, promotion significantly increased low fat snack sales independently of pricing strategies.

One study (Bolton 1983) found that food advertising exposure had a small but significant impact on children's snacking frequency, nutrient efficiency, and, indirectly, calorific intake. The effect occurred independently of parental snacking frequency, child's age, parental diet supervision and child's missed meals. Food advertising exposure would seem to explain less of the variance in children's snacking frequency than parents' snacking frequency.

One study (Ritchey & Olson 1983) compared the influence of television watching on children's consumption of sweets with the influence of parents' frequency of consumption of sweet foods and parents' attitudes towards sweet foods. Television watching made a significant independent contribution to children's consumption of sweets, although to a lesser degree than parents' frequency of consumption.

One study (Wong et al 1992) found that time spent watching television and playing video games was a significant and independent predictor of raised cholesterol in children.

One study (Dietz & Gortmaker 1985) indicated that television viewing was predictive, at marginally significant levels, of obesity and prior obesity in three to four years time, and that this effect occurred independently of prior obesity and family socioeconomic characteristics.

One study (Coon et al 2001) found that television being on during meals had a significant and independent influence on children's diet. It was not possible, from the results presented, to judge the strength of influence of presence of television during meals relative to the other influences examined.

Norton et al (2000) found that television advertising was significantly associated with preferences for a small number of foods, and that this occurred independently of other motivational factors influencing food preferences. It was not possible, from the results presented, to judge the strength of influence of advertising relative to the other influences examined. The remaining study, Gracey et al (1996), provided weak evidence that television watching had a small, marginally significant, independent influence on fat intake, but it did not assess the relative strength of the influence of television watching.

Overall, then, there is evidence from both methodologically stronger and less strong studies that food promotion or television viewing significantly influences children's food behaviour and diet independently of other factors known to influence children's food behaviour and diet. However, there is little evidence to show whether the influence of food promotion on children's food behaviour and diet is greater or lesser than that of other factors. In the one study (French et al 2001) which compared the

size of the effect (as opposed to the strength of the association), the effect was small relative to substantial price changes.

Q4. In the studies which demonstrate an effect of food promotion on children's food knowledge, preferences and behaviour, does this affect total category sales, brand switching or both?

Only one study (French et al 2001) measured sales to children, but it did not examine and compare brand and category effects. For a study to be able to answer this question directly, it would need to examine purchasing by children across both different brands within the same category and across different categories, and to be able to relate this purchasing to exposure to food promotion.

However, thirteen studies examined the impact of food promotion on brand preferences (five studies) or category preferences and behaviour (eight studies) independently of each other. The latter looked specifically at whether food promotion caused children to prefer or consume more foods in a 'less healthy' category than foods in a 'more healthy' category. All the studies were North American. Five were higher scoring in terms of quality, seven were medium scoring, and one was lower scoring.

Two of the brand preference studies (Borzekowski & Robinson 2001, Gorn & Goldberg 1980a) found that exposure to food promotion significantly increased children's likelihood of selecting the advertised food over a non-advertised food. Two studies found that it had no effect on brand preferences (Clarke 1984, Gorn & Florsheim 1985), and one found only very modest effects in favour of the advertised brand (Heslop & Ryans 1980). The studies therefore provided modest evidence that food promotion influences children's brand preferences.

The category studies provided reasonably strong evidence that food promotion influences children's preferences. Of the eight studies which compared children's preferences or behaviour in relation to foods in higher fat, sugar or salt categories versus foods in lower fat, sugar or salt categories, four found that they were more likely to select higher fat, sugar or salt products in a one-off preferences test (Goldberg et al 1978a & 1978b Study 1, Stoneman & Brody 1981, Kaufman & Sandman 1983) or for a daily snack (Gorn & Goldberg 1982/Gorn & Goldberg 1980b). The fifth study (Goldberg et al 1978a & 1978b Study 2) found no significant effects on category preferences, while the remaining three studies produced results which were for various reasons inconclusive. In Galst (1980) and Peterson et al (1984), it was difficult to separate out the effects of food promotion from other elements of the experimental stimulus. Cantor (1981) found that exposure to food promotion under certain conditions increased children's tendency to consume more dessert foods from a 'sweet' category rather than fruit, but that under other conditions it did not have this effect. In addition, two of the five brand preference studies also took basic measures of effects on preferences for products in different categories (Gorn & Florsheim 1985, Gorn & Goldberg 1980a). The former found no effects on product preferences and the latter a modest effect.

Overall, there is evidence that food promotion causes both brand switching *and* category effects, with stronger support for the latter effect. Although no study provides a thorough comparison of the strength of both types of effect, both types of effect have been examined independently, and there is reasonably strong evidence that both occur. In other words, the effects of food promotion are not limited to brand switching.

Conclusions and Recommendations for Future Research

Conclusions

The first Narrative Review shows that promotion is just one part of the complex process of marketing, and that measuring its effects is notoriously difficult. Nonetheless, advertisers do it all the time and base enormous budgetary decisions on the resulting data. The second Narrative Review looks at the field of alcohol and tobacco promotion, showing that hard and fast proof about promotional effects will never emerge; rather, judgements have to be made on the balance of probabilities.

Systematic Review 1 indicates that children's food promotion is dominated by television advertising, and that the majority of this promotes pre-sugared breakfast cereals, confectionery, savoury snacks, soft drinks and, latterly, fast-food outlets. There is some evidence that the dominance of television has begun to wane in recent years. This review also shows that the advertised diet varies greatly from the recommended one, and that themes of fun and fantasy or taste, rather than health and nutrition, are used to promote this to children. Meanwhile, the recommended diet gets little promotional support.

Systematic Review 2 addresses the central question of whether this promotion actually has an effect on children. There are gaps in the evidence base, as discussed below. It is also impossible, as already noted, to provide incontrovertible proof of such effects. In our judgement, however, the review provides sufficient evidence to show that food promotion *can* have and *is* having an effect on children, particularly in the areas of food preferences, purchase behaviour and consumption. It is also clear that these effects are significant, independent of other influences and operate at both brand and category level.

Furthermore, two factors suggest that these findings actually understate the effect that food promotion has on children. First, the literature focuses principally on television advertising; as discussed below, the cumulative effect of this combined with other forms of promotion and marketing is likely to be significantly greater. Second, the studies have looked at direct effects on individual children, and understate indirect influences. For example, promotion for fast food outlets may not only influence the child, but may also encourage parents to take them for meals and reinforce the idea that this is a normal and desirable behaviour.

Most studies that uncover an effect conclude that this will be a harmful one. This is supported by the findings of the first systematic review showing a discrepancy between the recommended and advertised diets. However there is also evidence that promotion can have a beneficial effect, as in the vending machine study (French et al 2001) where promotion was shown to encourage a shift to lower fat options.

Furthermore, there is no prima facie reason to assume that promotion will undermine children's dietary health; it can influence it, but this influence could just as easily be positive as negative.

It is this potential for benign influence that should form the focus of future research.

Recommendations for Future Research

The gaps in the literature confirm this need for a forward-looking research agenda:

- Research on the extent and content of children's food promotion comprises mainly content analysis studies. These tell us little about the advertisers' motives and objectives, or the audiences' response. Given that Narrative Review 1 clearly shows that both are actively involved in the communication process, future research should examine these two groups.
- The literature in both Systematic Reviews is dominated by television advertising studies. Other media and channels of communication are neglected, and the cumulative effect of modern brand-building 'integrated marketing communications' largely ignored. The even wider field of food *marketing* to children – which adds pricing, distribution and product design variables to the mix - is still less well explored. There is an urgent need for public health to learn more about such activities and particularly how they could be harnessed to encourage healthy food choices.
- The evidence on relative effects needs strengthening. In order to answer this question properly, different variables have to be monitored over time, and only one study did this. It showed that substantial reductions in the price of a snack item had a bigger impact on sales than did promotion. But even here the link between the two variables is difficult to separate out. Broader, longitudinal research is needed to put more of this jigsaw together.
- Systematic Review 2 revealed a need for more precision and realism. Precision concerns measurement and analysis tools: for example, studies seeking to examine the relationship between exposure to television food advertising and diet should take more precise measures of exposure than aggregate hours of television viewing per week and should conduct appropriate analysis to enable the independence and relative strength of each influence to be judged. Realism, on the other hand, is a function of research design. There is a clear need for more real world longitudinal experiments; they combine the rigour of experimental design with naturalistic measures of behavioural effect.

Filling these gaps will require a multi-faceted research programme along the lines of a full test market. This will involve selecting one or more television areas and manipulating or removing agreed promotional and marketing variables whilst monitoring children's dietary knowledge, preferences and behaviour. This is new territory for public health, but, as discussed in Narrative Review 1, is a text book exercise for commercial marketers. It will take time and money, and perhaps most

challengingly of all, will depend on full cooperation between the food industry and public health. Long term success will also need to recognise market forces, by incentivising the healthy and disincentivising the unhealthy.

However it does seem a logical next step. If a commercial marketer were trying to decide whether advertising is an effective way of promoting food products to young people, and were presented with the level of evidence in this review, one logical option would be to proceed to a full test market.

It would also bring enormous benefits, providing:

- coherent, comprehensive data on the capacity for a range of marketing techniques and strategies to influence children's eating in the real world, recognising that this influence can be both positive and negative.
- escape from the blame culture that pervades this issue, with interest groups on the one hand characterising food promotion as the villain of the piece, and the industry trying to vindicate it on the other.
- the opportunity to learn how marketers' proven skills in influencing food-related behaviour can be focussed on beneficial outcomes.
- an effective way forward for policy makers along with regular feedback on progress.

Most fundamentally of all, it will provide an innovative lead to the rest of the world in a field that is as contentious as it is important.