A REVIEW OF
THE EFFECTIVENESS OF SOCIAL MARKETING
NUTRITION INTERVENTIONS

Undertaken by

ISM Institute for Social Marketing
A collaboration between the University of Stirling and The Open University

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INTRODUCTION – National Social Marketing Centre review work

Dominic McVey and Clive Blair-Stevens

The aim of the Centre:

to help realise the full potential of effective social marketing in contributing to national and local efforts to improve health and reduce health inequalities.

This paper is part of work contributing to the independent National Review of health-related programmes and social marketing campaigns that was first announced as part of the Public Health White Paper ‘Choosing Health’. The work was undertaken by the National Social Marketing Centre and was published in June 2006.

The discussion and consultation that fed into the development of that White Paper had highlighted a number of concerns. Two of particular relevance to this work were:

• A growing realisation that continuing with existing methods and approaches was not going to deliver the type of impact on key health-related behaviours that was needed.

• Other comparable countries appeared to be achieving more positive impacts on behaviours by using and integrating a more dynamic customer-focused social marketing approach into their methods.

As a result, it was agreed that a National Review should be undertaken to examine the potential of social marketing approaches to contribute to both national and local efforts, and to review current understanding and skills in the area among key professional and practitioner groups.

The National Consumer Council was asked to lead this work as they had been key advocates for a more consumer-focused approach. It was also recognised that an independent aspect to the review would be important so that existing practice across the Department of Health could be considered and recommendations developed.

To inform the National Review a range of research methods and approaches were used. The overarching objectives of the research programme were as follows:

<table>
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<th>Research programme – overarching objectives</th>
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<td>1: To review the growing evidence-base for Social Marketing in some key priority areas</td>
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<td>2: To examine current government practice and effectiveness in delivering health-related programmes and campaign interventions.</td>
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<td>3: To better understand stakeholder understanding and perceptions of social marketing</td>
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<td>4: To consider key behavioural trends and progress towards government health-related targets.</td>
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<td>5: To consider and assess the costs to society of preventable ill-health and assess the potential of Social Marketing to contribute to reducing that cost.</td>
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<td>6: To map current national capacity to utilise and deliver Social Marketing approaches.</td>
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<td>7: To map key social and market research sources available to those developing health-related programmes or campaigns.</td>
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While the NSM Centre has a small core team, a larger number of external associates have been actively contributing to developing work. These have included colleagues from a number of research organisations and individual consultants who have been commissioned to assist with developing aspects of the research programme.

This report is one of a range of research and review reports that have informed the National Review.

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<th>Summary of NSM Centre papers – currently being developed</th>
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<tr>
<td>NSMC1 Effectiveness Review: Physical Activity and Social Marketing</td>
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<td>NSMC2 Effectiveness Review: Nutrition and Social Marketing</td>
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<td>NSMC3 Effectiveness Review: Alcohol, Tobacco and Drug misuse &amp; Social Marketing</td>
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<td>NSMC4 Social Marketing Capacity in the UK: Academic Sector – initial selective review</td>
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<td>NSMC5 Social Marketing Capacity in the UK: Commercial Sector – initial selective review</td>
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<td>NSMC6 Social Marketing for Health in the European Union – initial selective review</td>
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<td>NSMC7 National Health-Related Campaigns Review – selective review of 11 campaigns</td>
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<td>NSMC12 Overview of key behavioural trends and targets re: ‘Choosing Health’ priorities</td>
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The research programme is revealing invaluable insights into the use and effectiveness of social marketing related interventions and has provided a robust platform to inform the first National Social Marketing Strategy for Health.

The work however also has a much wider value and interest. Anyone working to elicit positive behavioural effects within different audiences, whatever the focus or topic, should find these reports of interest. It will be of particular relevance to those working on or contributing to health-related programmes and campaigns, whether in public health, health promotion, communications or as dedicated social marketers, at a national or local level.

To encourage debate about Social Marketing we would like to take this opportunity to invite readers to offer their views and feedback on the ways they think health-related programmes and campaigns might be improved, drawing on core social marketing principles.

As other work and material is developed it is being made available via the website on: www.nsmcentre.org.uk. We welcome your comments and ideas which can be emailed to us at: nsmc@ncc.org.uk
Finally, we would like to thank particularly colleagues Ross Gordon, Laura McDermott, Martine Stead, Kathryn Angus and Gerard Hastings, at the Institute for Social Marketing for undertaking this work and contributing to our national review.

Thanks are also due to our other National Social Marketing Centre colleagues and associates who have all helped ensure this work could contribute to the national review.

We look forward to receiving further comments and views.

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1: WHAT IS SOCIAL MARKETING?

The systematic application
of marketing concepts and techniques
to achieve specific behavioural goals
relevant to a social good

In recent years, attention has turned to social marketing as a promising approach for health behaviour change.

It is increasingly being advocated as a core public health strategy, particularly for influencing voluntary lifestyle behaviours such as smoking, drinking, drug use and diet (CDC 2005). The UK Government 2004 White Paper on Public Health recommends that social marketing is used to make behaviour that harms health less attractive, and to encourage behaviour that improves health (Department of Health 2004).

The UK Government 2004 White Paper on Public Health recommends that social marketing is used to make behaviour that harms health less attractive, and to encourage behaviour that improves health (Department of Health 2004). The National Social Marketing Strategy for Health, led by the National Consumer Council and the Department of Health, has been established to “help realise the full potential of effective social marketing in contributing to national and local efforts to improve health and reduce health inequalities” (NCC/DH ‘Realising the Potential of Effective Social Marketing’ 2005).

Although social marketing has been used to inform interventions for around 30 years, there have been few reviews of its effectiveness in general as a health behaviour change approach. One difficulty has been the lack of an easily operationalised definition of a social marketing intervention.

Generic definitions of social marketing are not precise enough to help in deciding whether a specific intervention does or does not qualify as social marketing. One solution to the difficulty is simply to select interventions that are called social marketing programmes by their managers or evaluators.

However, our recent experience of reviewing ‘social marketing nutrition interventions’ demonstrated that relying solely on the label is a problematic approach (McDermott et al 2005a, McDermott et al 2005b). Firstly, it excludes many interventions which are not labelled social marketing but which incorporate social marketing principles. Secondly, it includes interventions which, despite their label, are poor examples of social marketing or not social marketing at all. The resulting evidence base, if a search is restricted only to interventions called ‘Social Marketing’, is likely to be limited and flawed.

In our previous systematic review, we resolved this challenge by searching instead for interventions which met all six benchmark criteria for a social marketing intervention (Andreasen 2001). Eligible interventions had to provide evidence of:
### Andreasen’s Social Marketing Benchmark Criteria

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<th>Benchmark</th>
<th>Explanation</th>
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<td>1. Behaviour Change</td>
<td>Intervention seeks to change behaviour and has specific measurable behavioural objectives</td>
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<td>2. Consumer Research</td>
<td>Formative research is conducted to identify target consumer characteristics and needs. Intervention elements are pre-tested with the target group.</td>
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<tr>
<td>3. Segmentation &amp; Targeting</td>
<td>Different segmentation variables are considered when selecting the intervention target group. Intervention strategy is tailored for the selected segment/s.</td>
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<td>4. Marketing Mix</td>
<td>Intervention consists of promotion (communications) plus at least one other marketing ‘P’ (‘product’, ‘price’, ‘place’). Other Ps might include ‘policy change’ or ‘people’ (eg. training is provided to intervention delivery agents).</td>
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<td>5. Exchange</td>
<td>Intervention considers what will motivate people to engage voluntarily with the intervention and offers them something beneficial in return. The offered benefit may be intangible (eg. personal satisfaction) or tangible (eg. rewards for participating in the programme and making behavioural changes).</td>
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<tr>
<td>6. Competition</td>
<td>Intervention considers the appeal of competing behaviours (including current behaviour). Intervention uses strategies that seek to minimise the competition.</td>
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These same criteria have been applied in this review to identify social marketing substance misuse interventions.
2: REVIEW AIM AND METHODS

The aims of the review are:

1. To review how effective social marketing physical interventions have been in changing the behaviour of individuals, groups, organisations and public policy.
2. To map the diversity of social marketing approaches that have been used to address physical inactivity.
3. To describe what, if any, behavioural models / theories are used by campaigners to develop social marketing physical activity interventions.
4. To describe how social marketing physical activity interventions have been evaluated and make recommendations as to how they should be evaluated in the future, including identification of common indicators of short, medium and long-term effectiveness.

To update the original review (McDermott et al 2005a), 8 electronic databases were revisited and searched for relevant literature from 2003 onwards.

Appendix 1 provides details of these searches (see McDermott et al 2005a for full details of the original search strategy). One reviewer (LM) screened 637 potentially relevant titles and abstracts.

From this, 67 articles were retrieved in full text and examined against social marketing criteria by one reviewer (LM); uncertainties and discrepancies in assessment were resolved through independent assessment by another reviewer (MS).

31 studies met all six SM criteria and were included in this review.

27 of these were included in the earlier review and 4 were new studies.

By ‘a study’, we mean all the published papers reporting on a single evaluation of a specific programme (for example, where a programme was followed up over several years within one evaluation, all the outcome papers are included as one study).

Sometimes the same programme or variants of it are evaluated in different settings with different participants; in this case, each evaluation is counted as a separate study, again each potentially comprising more than one paper. The studies included in the review are listed in Appendix 2.

To assess the quality of included studies, each was independently graded by reviewers on 6 social marketing criteria (see Appendix 1).

Formal statistical synthesis was not possible because of the heterogeneity in interventions, study designs and outcome variables so a qualitative synthesis was used. We weighted our conclusions by study quality, with greater emphasis given to higher quality studies.
3: THE STUDIES

The 31 studies represented a wide range of different types of intervention, and were heterogeneous in approach, target groups and settings, and evaluation design.

3.1: Types of Intervention

They have been grouped into 6 categories:

- 9 were School-based interventions
- 5 were Other youth interventions
- 2 were Family interventions
- 3 were Church-based interventions
- 5 were Multi-component community interventions
- 7 were Interventions in other settings.

I: School-based Interventions

- 9 were school-based interventions
  - These interventions typically comprised theory driven classroom curricula, usually designed to improve children’s understanding of the benefits of eating a healthier diet and provide them with the relevant skills to do so. Classroom education took place alongside activities in other channels such as media/communications campaigns and changes to school food provisions.
  - All 9 targeted some kind of nutritional behaviour (eg. increased consumption of fruit and vegetables, reduced salt intake).
  - An additional 3 interventions aimed to influence nutritional knowledge and seven tried to influence psychosocial outcomes associated with nutrition including, for example, food choice intentions and self efficacy to eat a better diet.
  - 4 interventions targeted physiological changes including BMI (body mass index).

II: Other Youth Interventions

- 5 studies were with undertaken with young people outwith a school setting
  - (Baranowski 2002; Beech 2003; Story 2003; Baranowski 2003; Resnicow 2000).
  - These interventions typically included some kind of educational component instructing children or teenagers about healthy eating. The educational sessions usually involved practical tasks like preparing healthy snacks.
  - All 5 interventions targeted some kind of nutritional behaviour.
  - 2 aimed to influence nutritional knowledge.
  - 3 attempted to change psychosocial variables associated with nutrition including, for example, healthy eating intentions and reported availability of fruit and vegetables.
  - 3 interventions also aimed to influence BMI.
III: Family Interventions

- 2 studies described family interventions
  - (Fitzgibbon 1996; Nader 1989).

- Both comprised educational sessions involving family groups. The sessions included discussions about healthy foods and provided training in preparing healthy meals.
- Both interventions targeted some kind of nutritional behaviour and nutritional knowledge.
- Only 1 attempted to change any psychosocial variables association with nutrition.
- Both interventions attempted to influence physiological factors including BMI, blood pressure and cholesterol.

IV: Church-based Interventions

- 3 studies were church-based interventions
  - (Campbell 1999; Resnicow 2001; Resnicow 2004).

- These interventions targeted African American church-goers and made attempts to motivate participation through religion, which was especially meaningful to the target audience. All 3 utilised a range of methods including:
  - Educational sessions
  - Counselling
  - Printed materials, and
  - Increasing the range of healthy foods available at church.

- All 3 interventions targeted nutritional behaviour.
- 1 also targeted nutritional knowledge and stage of stage in relation to fruit and vegetable consumption.
- 2 targeted psychosocial factors associated with nutrition, including self efficacy and extrinsic motivation to consume more fruit and vegetables.

V: Multi-component community interventions

- 5 studies described multi-component community-wide interventions

- These interventions comprised various elements including:
  - Promotion/communications
  - Education, and
  - Training for health professionals.

- They also included environmental level changes designed to make it easier for the target audiences to make healthy choices.
- All targeted nutritional behaviour.
- 2 attempted to influence nutritional knowledge and 2 sought to change physiological factors.

VI: Interventions in Other Settings

- 7 interventions were delivered in heterogeneous settings and have been grouped together for the purpose of the review.
Settings included:
- Supermarkets (*Steenhuis 2004*)
- Clinical practices (*Delichatsios 2001*)
- The Workplace of public health employees (*Neiger 2001*).

All 7 sought to influence nutritional behaviour of some kind.
- 1 targeted nutritional knowledge.
- 3 targeted stage of change with respect to fruit and vegetable consumption and fat intake.
- 4 interventions sought to influence psychosocial factors associated with nutrition including dietary self-efficacy, perceived social support for eating a healthy diet, and the perceived importance of barrier to healthy eating.
- 2 interventions also tried to influence physiological factors associated with healthy eating including BMI, blood pressure and cholesterol.
3.2: Theories and Models Used in the Programmes

- The interventions were based on a range of different behaviour change models.

- **Social Cognitive / Social Learning theory** – was the most widely used theory utilised to at least some extent by 14 studies

- **The transtheoretical model (stages of change)** was used by 4 studies
  - (Havas 1998; Havas 2003; Delichatsios 2001; Neiger 2001)

- Other behavioural theories or models that were used include

  - **Organisational change theory**
    - (Luepker 1996)

  - **Family systems theory**
    - (Beech 2003; Story 2003; Baranowski 2003)

  - **Behaviour change theory**
    - (O’Loughlin 1999)

  - **Persuasive communications theory**
    - (Luepker 1994)

  - **The behavioural intention model**
    - (Vartiainen 1995)

  - **Ecological models of change**
    - (Sallis 2003, Campbell 1999; Resnicow 2004)

  - ‘**Social marketing’ techniques or theory**
    - (Thackeray 2002; Wechsler 1998; Smitasiri 1994),

  - ‘**Models for involvement of community leaders and institutions’**
    - (Luepker 1994)

  - **Nutritional anthropology and media advocacy**
    - (Smitasiri 1994).
3.3: Target Groups

- The interventions target a range of different populations.
- Several were undertaken with **school students** and although the majority of these programmes were ‘universal’, that is, designed for the whole student population in specific school years.
- Some school interventions were deliberately tailored for high risk or disadvantaged populations. For example:
  - The New Moves intervention was especially designed for overweight/obese teenage girls  
    - (Neumark-Sztainer 2003)
  - The Pathways intervention was specifically created to improve the dietary habits of American Indian school children  
    - (Caballero 2003).
- 5 other studies were undertaken with groups of children or young people outwith a school setting. The target groups for these interventions were:
  - Boy scouts  
    - (Baranowski 2002)
  - Overweight teenage girls  
    - (Beech 2003; Story 2003; Baranowski 2003; Resnicow 2000)
- 2 interventions targeted family units, including
  - Low-income Hispanics  
    - (Fitzgibbon 1996)
  - Lower-to-middle income Mexican-American and Anglo-American families  
    - (Nader 1989)
- A further 4 interventions were wider community-based projects targeting various segments within selected communities (eg. middle-aged men, individuals at high risk of CVD)
  - (O’Loughlin 1999; Luepker 1994; Smitasiri 1994; Vartiainen 1995)
- The remaining target groups for the interventions were
  - African American church members  
    - (Campbell 1999; Resnicow 2001; Resnicow 2004)
  - Co-habiting couples  
    - (Burke 2002 Study 1)
  - Overweight hypertensives  
    - (Burke 2002 Study 2)
  - Peruvian and Nigerian pregnant women and mothers  
    - (DMD 1989)
  - Adult patients in primary care  
    - (Delichatsios 2001)
  - Supermarket shoppers  
    - (Steenhuis 2004)
  - Low-income women  
    - (Havas 1998; Havas 2003)
  - Public health employees  
    - (Neiger 2001).
3.4: How the Interventions were Evaluated

- The vast majority of the interventions were evaluated using a randomised controlled trial or quasi-experimental design (n=26).

- For the school-based interventions, this typically involved random assignment of classes or schools to an intervention or control condition, while for the multi-component community interventions, intervention sites were typically compared with comparison communities matched on key characteristics.

- The period of follow-up ranged widely in the studies from immediately post-intervention to several years.

- The main outcomes examined in the studies included fruit and vegetable consumption, fat intake, and consumption of other foods including fibre and salt.

- Many studies also took cognitive and attitudinal measures including, for example, nutritional knowledge, self-efficacy to eat a better diet, and the perceived benefits of eating more healthily.
3.5: Social Marketing Characteristics of the Interventions

All included interventions had to show evidence of having met all 6 social marketing criteria. This meant that they had to:

I: Have a specific Behaviour Change goal.
- Behaviour change goals sought by the included interventions included: to increase the consumption of healthy foods such as fruit, vegetables and fibre or decrease the consumption of less healthy foods such as fat, processed meats or salt.

II: Have used Consumer Research to inform the intervention.
- Typical consumer research conducted by the interventions included community needs assessments, focus groups, pre-testing of materials, and pilot tests of intervention activities.

III: Consider different Segmentation variables and Target interventions appropriately.
- Interventions demonstrated segmentation and targeting if, for example, activities were designed to be age-appropriate or particularly appropriate to the setting in which they were delivered, or if they tailored activities and materials to specific groups, such as low income or minority ethnic participants.

IV: Demonstrate use of more than one element of the Marketing Mix.
- We defined the marketing mix as comprising ‘6 Ps’: Product, Price, Place, Promotion/communication, Person and Policy. For example, a school-based intervention might comprise a curriculum element, teacher training, materials and home activities (place, promotion/communication, person).

V: Utilise the ‘exchange’ concept.
- Consider what would motivate people to engage voluntarily with the intervention and offer them something beneficial in return (Exchange). The exchange could be tangible or intangible. Examples include: rewards (such as stickers) or recognition for successfully achieving behavioural goals, or attempts to make the desired behaviour more appealing to the target group (eg. through improving the packing, emphasising the benefits of a healthier diet).

VI: Utilise the ‘competition’ concept.
- Consider the appeal of competing behaviours and use strategies that seek to minimise this Competition. These strategies could address competition at an external or internal level, or both. Examples include altering the environment to remove unhealthy alternatives (eg. displacing high fat for low fat milk, reducing the fat and sodium content of school meals) or teaching the target group ‘skills’ to identify and overcome barriers/threats to change, including self-monitoring, and time and stress management.

More detailed information on the social marketing characteristics and results of each intervention is provided in Appendix 3.
4: RESULTS

31 studies met all the inclusion criteria:
- 19 were randomised controlled trials
- 2 used a randomised cross-over design
- 5 were quasi-experiments
- 2 used both longitudinal cohort surveys and independent sample surveys
- 3 were uncontrolled studies.

Appendix 3 groups the studies by methodological quality and provides information about the intervention title and authors, participants, study design, intervention strategy, social marketing characteristics, outcome measures and key results.

Outcome papers were sought that reported the studies’ key findings particularly in terms of behaviour, knowledge and attitudes.

Where environmental aspects of the intervention are described and evaluated, these are reported too.

Results from the studies are briefly summarised below under eight headings: fruit and vegetable intake, fat intake, other dietary behaviours, dietary knowledge, stage of change, psychosocial variables, physiological outcomes and environmental changes.
4.1: Fruit and Vegetable Intake

- 18 studies examined intervention effects on fruit and vegetable intake.
- 10 of the 18 interventions were effective overall
  - 3 of these 10 were high quality studies (Havas 1998, Havas 2003, Resnicow 2001).
- 6 interventions produced mixed/moderate results.
- 1 produced no change.
- 1 intervention had a counter-productive effect.
- There is strong evidence of an impact on fruit and vegetable intake.

Some examples:

The TEENS school programme (Birnbaum 2002)
- Examined the impact of a multi-component school-based intervention (comprising curriculum education and school food service changes) on the fruit and vegetable consumption of seventh and eighth grade children. At one year follow-up, students who had been recruited as peer leaders for the curriculum intervention reported an increase of nearly one additional serving of fruit and vegetables per day (p<0.05).
- Students who received both the curriculum education and the environmental (ie. food service changes) intervention (but were not peer leaders) reported consuming almost an additional half serving of fruits and vegetables each day (p<0.10). Students who received the school environment component only and those in the control group showed no change. However, similar effects were not seen for fruit and vegetable consumption at two-years.

The Food Dudes school intervention (Lowe 2004)
- Examined the impact of a school rewards-based, peer modelling intervention on the fruit and vegetable consumption of primary school children in England and Wales. Snack time fruit and vegetable consumption significantly increased from around 48% at baseline to around 71% at follow-up (p<0.001). Lunchtime consumption rose from around 27% at baseline to around 71% during the intervention (p<0.001). In addition, reported home consumption of fruits and vegetables was also significantly higher on weekdays during the intervention period (p<0.05).

The Maryland 5-a-Day programme (Havas 1998)
- An education-based intervention study with low-income women in Maryland produced a mean increase in daily fruit and vegetable consumption of 0.56 servings among women in the intervention group. This change was significantly greater than the change seen among control participants (a mean increase of only 0.13 daily servings) (p=0.002).

Worksite intervention (Neiger 2001)
- Another study found that a worksite intervention, comprising both communications and environmental changes, with public health department employees in Utah produced significant improvements in the consumption of fruits and vegetables from pre- to post-test.

PACE+ school programme (Prochaska 2004)
- Prochaska compared the effects of a physical activity and nutrition programme (PAN) with that of a physical activity-only intervention (PA) on the dietary behaviour of
middle school students. Fruit and vegetable consumption actually decreased by an average of 0.38 daily servings among boys in the PAN intervention. However, among boys in the PA intervention and control groups, daily fruit and vegetable consumption increased by an average of 0.18 servings and 0.71 servings respectively.

- Among girls, fruit and vegetable consumption increased by an average of 0.13 daily servings in the PAN group. An increase of 0.09 daily servings was seen in the PA group and a decrease of 0.43 daily servings among girls in the control group. Changes over time among both boys and girls were non-significant, however significant gender differences were observed $F(2,128)=2.44$, $p=0.091$. 

4.2: Fat Intake

- 18 studies examined intervention effects on fat intake.

- 8 of the 18 interventions were effective overall
  - 2 of these 8 were high quality studies (Havas 2003; Luepker 1996).
- 7 had a mixed/moderate effect.
- 3 produced no change.

- There is reasonable evidence of an impact on fat intake.

Some examples:

**The CATCH school programme (Luepker 1996)**
- Implemented in four US states, aimed to lower the fat content of school meals and students’ intake of fats. At two-year follow-up, fat intake significantly reduced from 32.7% to 30.3% of calories among students in intervention schools, compared with a much smaller reduction from 32.6% to 32.2% in control schools (p<0.001). Results from this study also show that the intervention successfully lowered the percentage of calories from total fat in school meals from 14.8% to 12.0% in intervention schools, compared with a change from 15.1% to 13.7% in control schools (p<0.01).

**The Pathways school programme (Caballero 2003)**
- Another school-based programme produced mixed results. ‘Pathways’, a culturally tailored intervention comprising food service changes, classroom curricula and a family component (as well as a physical exercise component), brought about significant reductions in the fat intake of American Indian children. Total daily energy intake and percentage energy from total fat (by 24-hour recall) were significantly lower in intervention schools compared with control schools (p=0.003 and p=0.001 respectively). However, the study did not achieve its primary goal of reducing percentage body fat.

**Body and Soul (Resnicow 2004)**
- The only church-based intervention to investigate fat intake (Body and Soul) examined the impact of a multi-component intervention (based on motivational interviewing) on the fat intake of African American church members. The intervention group showed small but significantly greater changes in the desired direction for percentage calories from fat when compared with individuals in the control condition (p<0.05).

**EatSmart (Delichatsios 2001)**
- Similarly, a preventive nutrition intervention, implemented in a primary care setting, sought to influence the fat intake of adult patients. Intention to treat analysis showed that, when compared with the control group, participants in the intervention condition decreased their saturated fat intake by 0.6% (95%CI = 1.2, 0.0) of energy intake at three-month follow-up.

**Supermarket intervention (Steenhuis 2004)**
- A supermarket intervention in the Netherlands had no impact on the fat intake of supermarket shoppers. At two-month follow-up, mean fat consumption decreased from 20.0 points to 19.6 points in the education-plus-labelling condition, from 20.4 points to 20.0 points in the education-only condition, and from 19.9 points to 19.6
points among the control group. No significant time or group differences were found. Results at six months were fairly similar.
4.3: Other Dietary Behaviours

- 15 studies examined intervention effects on other dietary behaviours including sodium and fibre consumption.

- 6 of the 15 interventions were effective overall, and this included one high quality study
  - (Havas 2003).

- 8 interventions produced mixed/moderate results.

- 1 intervention had no effect on the consumption of other foods.

- There is reasonable evidence of an impact on other dietary behaviours.

Some examples:

**The Minnesota school programme (Luepker 1994)**
- As part of the wider Minnesota Heart Health Program, a school-based intervention embedded in wider community initiatives sought to influence the salting behaviour of school pupils. The study found that girls in the intervention community reported significantly less food salting than girls in the comparison community at all follow-up measurements (p values range from p<0.01 to p<0.03). A similar pattern was observed for boys at all but one follow-up point.

**The Maryland Food for Life programme (Havas 2003)**
- Havas assessed the impact of the Maryland Food For Life programme on the fibre consumption of low-income women. Two months after the intervention, a significant net improvement in fibre consumption among intervention participants (relative to controls) was observed (p=0.001).

**The DMD project (DMD 1989)**
- Another intervention, a community-based social marketing programme, successfully increased trial and use of a nutritionally beneficial weaning food recipe among Peruvian and Nigerian mothers.

**The Cancer Risk Reduction programme (Fitzgibbon 1996)**
- A family intervention produced mixed results. Fitzgibbon found that a 12-week nutrition intervention for families significantly increased the consumption of (healthy) dairy foods among older Hispanic-American children (in grades 4-6) in the intervention group from pre- to post-test $F(2,31)=0.03$, p<0.05. However, when the data for older and younger children were combined, no significant time effects were observed. In addition, differences in consumption among control and intervention children were not significant at post-test.
4.4: Dietary Knowledge

- 9 of the 11 studies which aimed to change nutritional knowledge were effective overall. Nearly half of the effective studies (n=4) were high quality.
- 2 interventions produced mixed/moderate results.
- There is strong evidence of an impact on dietary knowledge.

Some examples:

**The Maryland 5-a-Day programme (Havas 1998)**
- A ‘5-a-Day’ programme, comprising nutrition sessions, printed materials and direct mail, increased knowledge of the recommendation to eat five or more fruits and vegetables a day among low-income women in Maryland (p<0.001).

**Go Girls (Resnicow 2000)**
- Similarly, nutritional sessions undertaken with overweight African American teenage girls significantly increased their understanding of the nutrient content of foods, food labelling and the health effects of fat and fibre (p<0.01).

**Eat for Life (Resnicow 2001)**
- A church-based intervention in North Carolina significantly improved knowledge of the health benefits of fruit and vegetable consumption among African American church members (p<0.005).
### 4.5: Stage of Change

- 4 studies that aimed to improve nutrition-related *stage of change*.
- 3 of the 4 (including 1 high quality study) were effective.
- 1 intervention produced mixed/moderate results.
- There is strong evidence of an impact on stage of change.

Some examples:

**EatSmart* (Delichatsios 2001)**
- A primary care-based intervention in New England used tailored educational materials, physician endorsement and motivational counselling to influence primary care patients’ stage of change for fat intake: 47% of individuals in the intervention group progressed in stage at follow-up, compared with only 29% of the control group *(p=0.002)*.

**The Maryland 5-a-Day programme* (Havas 1998)**
- An educational intervention with low-income women in Maryland produced significantly more movement to higher stages of change among women in the intervention group, compared with controls.

**Black Churches United for Better Health* (Campbell 1999)**
- Similarly, a multi-component church-based intervention study with African Americans in North Carolina showed that a higher percentage of people in the intervention group (26% versus 19%) were in the action or maintenance stages of change at follow-up, compared with the comparison group *(p<0.005)*.

**Worksite intervention* (Neiger 2001)**
- A worksite intervention with public health employees produced mixed results. Although it had a significant positive impact on the distribution of stages of change among female workers (a movement towards action and maintenance from preparation, contemplation and pre-contemplation) *(p<0.05)* similar changes were not observed among men.
4.6: Psycho-social Variables

- 17 studies that attempted to influence nutrition-related *psycho-social variables*.

- 13 of the 17 reported a positive overall effect for at least one variable
  - 3 of these 13 were high quality studies (Caballero 2003, Havas 1998, Luepker 1996).

- There is strong evidence of an impact on psychosocial variables.

Some examples:

Several studies significantly improved self-efficacy in relation to healthy eating.

**Black Churches United for Better Health** *(Campbell 1999)*
- In North Carolina, the Black Churches United for Better Health intervention (comprising educational sessions, increased availability of fruit and vegetables at church functions, and various other church-based activities) brought about significant improvements in self-efficacy for eating five daily portions of fruit and vegetables among church members. At two-year follow-up, 47% of individuals in the intervention group reported a high self-efficacy for eating five daily servings of fruit and vegetables, compared with only 31% of people in the delayed intervention group (*p*<0.005).

**Body and Soul** *(Resnicow 2004)*
- Similarly, the ‘Body & Soul’ church-based intervention used motivational interviewing and other church-based activities to produce significant improvements in self-efficacy to eat fruit and vegetables (*p*<0.05).

**The CATCH school programme** *(Luepker 1996)*
- The Child and Adolescent Trial for Cardiovascular Health (CATCH) intervention with elementary school children in Minnesota, North Dakota and South Dakota significantly improved students’ self-efficacy for consuming a healthier diet (*p*<0.001).

**The 5-a-Day school programme** *(Thackeray 2002)*
- Another school-based intervention, focusing on environmental change, did not have any impact on students’ self-efficacy for healthier eating but resulted in a significant improvement among parents’ self-efficacy to eat three daily servings of fruit and vegetables (*p*<0.025).

A range of other psycho-social outcomes were also successfully influenced.

**The Food Dudes intervention** *(Lowe 2004)*
- A rewards-based peer modelling intervention (Food Dudes) with primary school children (aged 4-11) in England and Wales produced significant improvements in children’s liking for fruit and vegetables. The study found that children’s overall mean ratings (in terms of liking) for both fruits and vegetables increased significantly from baseline over the intervention phase (*p*<0.001). This effect was consistent among both boys and girls, and children of different ages.

**5-a-Day Achievement Badge for Boy Scouts intervention** *(Baranowski 2002)*
- A badge-based intervention with Boy Scouts in Houston, Texas brought about significant improvements in boys’ preferences for fruit, juice and vegetables as well
as their perceptions of positive outcomes associated with healthy eating (p=0.01 for fruit and p=0.0001 for vegetables).

The TEENS school programme *(Birnbaum 2002)*
- However, a multi-component school-based intervention (TEENS) comprising educational sessions and environmental changes, was found to have no significant impact on a wide range of psychosocial variables associated with healthy eating among seventh and eighth grade students. Between-group differences were compared for the following variables: outcome expectations, valuation, barriers, subjective norms, intentions, and assessment of current behaviour.

The New Moves school programme *(Neumark-Sztainer 2003)*
- Another school-based intervention with overweight/obese teenage girls produced only moderate results in terms of the perceived benefits of healthy eating; changes were observed in the hypothesised direction at 3 month follow-up, but differences between intervention and control groups were not significant (p=0.73).
### 4.7: Physiological Outcomes

- 13 studies attempted to influence physiological outcomes
- 3 of the 13 reported a positive overall effect for at least one variable.
- All 3 were medium scoring studies.
- 7 studies examined changes in blood pressure.
  - 2 reported a positive overall effect
  - 2 reported no change
  - 3 reported mixed results.
- 5 studies examined changes in cholesterol.
  - 2 reported a positive overall effect
  - 2 reported no change
  - 1 reported mixed/moderate results.
- 11 studies examined changes in BMI.
  - 4 reported mixed/moderate results
  - 7 had no effect.
- There is weaker evidence of an impact on physiological outcomes.

Some examples:

**The North Kareila project** *(Vartiainen 1995)*
- The North Kareila project was a long-term (25 year) multi-component community intervention designed to reduce CVD rates in a high risk population region. The programme incorporated a media campaign, professional training, organised activities and efforts at policy change. Dietary changes attributed to the programme have been associated with major reductions in the population’s cholesterol and blood pressure levels. The serum cholesterol levels of both men and women decreased by 18% in North Karelia between 1972 and 1997. Cholesterol levels have also decreased markedly in other areas monitored in Finland. Diastolic blood pressure reportedly decreased by 5% in men and 13% in women.

**The CATCH school programme** *(Luepker 1996)*
- The CATCH school study measured changes in blood pressure levels, BMI and cholesterol at three-year follow-up. Although the intervention had been successful in reducing fat intake and increasing self efficacy for eating a healthier diet, no significant changes in blood pressure, BMI and cholesterol were found.

**The Pathways school programme** *(Caballero 2003)*
- Similarly, although the Pathways intervention resulted in some positive improvements in the fat intake of American Indian children, it had no impact on their BMI.
4.8: Environmental Changes

- 13 interventions sought to create environmental changes in relation to nutrition.

- Nearly half of these were school-based interventions that included strategies to make healthy foods more available (and/or unhealthy foods less available) at school, and other efforts to make healthy food choices easier and more appealing to students.

- The remaining interventions were implemented in a range of settings including churches and a workplace.

- Again, environmental strategies sought to influence the availability and accessibility of healthy foods within these settings and to generally create more health focused environments.

A brief summary of the environmental changes implemented within the studies is provided below, together with relevant process or outcome data, where available.

**The Pathways school programme (Caballero 2003)**

- One goal of the Pathways school-based intervention, which sought to reduce the fat intake of American Indian children, was to reduce the amount of fat in school lunches.

- To achieve this goal, training was provided to school food service personnel (e.g. to improve their knowledge and skills in relation to reduced fat options) and the fat content of foods sold at the school cafeterias was subsequently reduced.

- To examine the impact of these environmental changes, the energy and fat content in school lunches was assessed by the research team using menu and recipe analyses and by observing school lunches.

- The menu and recipe analyses revealed a trend towards lower fat intake among students in the intervention group compared to the control group, however there was no difference in energy intake across the two groups (data not shown). Percentage of energy as fat was 28.2% in the intervention school and 32.0% in the control school. The energy content of lunches served at school was 683kcal and 688kcal in the intervention and control groups respectively.

- This trend was supported by the school lunch observation.

**M-SPAN (Sallis 2003)**

- The M-SPAN school-based intervention included strategies designed to change school ‘policies’ and environments to provide more healthful food choices. Key school personnel met with project staff to form committees responsible for selecting relevant ‘policy changes’; each project year they selected between two and four policies to implement.

- Strategies included: providing and marketing low fat foods at school food sources; identifying vendors who could supply healthy foods to schools at reasonable prices; serving only 1% or skim milk (as opposed to whole milk); closing school stores at lunchtime; and substituting low fat for high fat foods.

- Progress on these ‘environmental’ goals was monitored by research staff through meeting reports. In addition, similarly to the Pathways study, changes in school store sales were measured by examining sales records and labels to calculate total and saturated fat grams sold at stores.

- Changes in school cafeteria food sales were measured by examining menus, recipes, and product labels to calculate the total and saturated fat grams sold at the cafeteria. However, no significant differences were found suggesting that the intervention was not effective at reducing total and saturated dietary fat purchased at school.
The TEENS school programme *(Birnbaum 2002)*

- The TEENS school programme included a ‘schoolwide’ component that involved working with district food service directors and local food service managers to increase the availability of and promote fruit and vegetables (and other healthier snacks).
- Again, councils comprising school staff, parents, students and the research team met monthly to try to bring about these changes.
- This component of the intervention was evaluated using ‘food service visits and meeting logs’.
- In addition to successfully providing food service training, project staff made approximately 10 and 26 visits in the 7th and 8th grade intervention years to school food service staff for on-site consultation and extended training and support, and school councils were successfully established.
- No other outcome data on this aspect of the intervention is provided.

The CATCH school programme *(Luepker 1996)*

- The CATCH school intervention combined classroom curricula with a ‘food service modification element’ and other activities.
- The goal of the food service component was to reduce the fat intake of school meals and, like the other studies, this aspect of the intervention was evaluated using menu and recipe analysis to determine the nutrient content of foods served.
- Percentage energy intake from total fat in school meals was significantly reduced in the intervention schools (from 38.7% to 31.9%) compared with the control schools (38.9% to 36.2%) *(p<0.01)*.
- Energy intake from saturated fat and total energy intake were also significantly reduced in intervention schools lunches compared with controls *(p<0.01)*.
- The sodium content of foods rose in both the intervention and control schools, though differences were not significant.
- A significant increase in potassium in school lunches was seen in the intervention schools when compared with control schools *(p<0.01)*.

The 5-a-Day school programme *(Thackeray 2002)*

- Environmental strategies in the ‘5-a-day social marketing’ school programme included efforts to increase the type and variety of fruit and vegetables available in cafeteria and change how they were displayed to make them more appealing to students.
- The study reported non-significant increases in mean score ratings of “presentation of fruit and vegetables in school cafeteria” in the social marketing intervention group, however a significant increase was found among the comparison group.

Low Fat Milk school campaign *(Wechsler 1998)*

- As part of a wider school intervention, one study sought to influence schools to provide only low-fat milk.
- The study does not report any data in terms of how many schools implemented this change but, overall, children's consumption of low-fat milk improved over the course of the study.

Black Churches United for Better Health *(Campbell 1999)*

- One goal of the Black Churches United for Better Health project was to increase the availability of fruit and vegetables at church functions. Attempts were also made to establish ‘community coalitions’ and ‘nutritional action teams’ to plan events and implement activities.
• The study does not report any data reporting directly on the outcomes of these groups and committees, but it did find that frequency of church attendance was associated with greater consumption of fruits and vegetables.
• In addition, 60% of church-goers that were surveyed rated having fruit and vegetables at church functions as influencing them ‘a lot’.

**Body and Soul** *(Resnicow et al 2004)*

• A similar church-based intervention, Body and Soul, included a project co-ordination team, again created to plan nutrition-related events and activities.
• Although no direct outcome data is provided with respect to this team, the study did report that attendance at activities (set up by the team) was fairly high; 75% reportedly attended the kick off event and 63% attended ‘at least one additional activity’.

**The North Karelia Project** *(Vartiainen 1995)*

• In the North Karelia study, the programme sought to bring about ‘social policy’ favouring healthy change. The research team worked with health service providers, business leaders and political decision makers to bring about these changes and also collaborated with the food industry.
• The food industry became heavily involved, encouraged by the potential of new markets for healthier products (eg. unsaturated vegetable oil). During the latter years of the programme, national policy decisions and legislation contributed towards improvements in diet and related outcomes.
• The study’s policy actions are believed to have reinforced changes including the development of low fat spreads, labelling of fat, salt and other food groups, and improvements in the quality of meals within the public sector (eg. schools, the army).
• Reforms were also made that helped ‘neutralise’ the taxation between dairy and vegetable oil fats (previously dairy fats were favoured).
• Finally, the programme also resulted in the creation of national guidelines for dietary changes and the reduction of risk factors.

**Social Marketing Vitamin A-Rich Foods** *(Smitasiri 1994)*

• Smitasiri implemented a nutritional intervention in Thailand that included community training for local health workers and “ivy gourd plant cultivation in schools” (to make the healthy option more easily available and accessible to the target groups).
• The study also reportedly gained “additional project and community manpower” when the district education office organised a meeting of retired teachers to encourage them to participate in promoting better nutrition.

**Worksite intervention** *(Neiger 2001)*

• A worksite intervention with public health employees attempted environmental changes by working with cafeteria staff to improve quality and selection of fruits and vegetables.

**Coeur en Santé St-Henri Heart Health programme** *(O’Loughlin 1999)*

• This community intervention included a menu labelling programme in local restaurants and offering discounts on healthy foods.
• Point-of-sale educational materials were also implemented in local supermarkets.

**The Minnesota Heart Health Programme** *(Luepker 1994)*

• Elements of the Minnesota Heart Health Programme sought to involve health professionals in the intervention and encourage them to serve as role models and opinion leaders.
• The programme also included labelling of healthy options at restaurants and local grocery stores and the schools component often had a food labelling component to help students identify healthy choices.
5: DISCUSSION

All of the interventions included in this review were judged to have adopted social marketing principles in their design and implementation. That is to say, they all had specific behavioural objectives, used consumer research to understand the target audience, the people whose behaviour they were trying to change, considered ways of segmenting the population and tailored the intervention accordingly and appropriately. They all considered what would motivate people to change (‘exchange’), used a combination of the channels and activities that make up ‘the marketing mix’, and addressed competition or barriers to behaviour change.

Overall, the review has found strong evidence that nutrition interventions developed using social marketing principles can be effective. The vast majority (n=24) of the interventions had at least one significant positive effect on some form of nutritional behaviour, whether that be fruit and vegetable consumption, fat intake, or something else. A further three studies reported non-significant trends of improvement. Only three of the 31 studies were essentially ineffective at influencing nutritional behaviour (Prochaska 2004; Sallis 2003; Steenhuis 2004; O’Loughlin 1999).

The interventions included in the review focused on three broad nutritional ‘domains’: fruit and vegetable consumption, fat consumption, and consumption of other foods such as fibre and processed meats. There was evidence that interventions were effective in all three domains. In addition, there was evidence that social marketing interventions were effective in changing behaviour, knowledge, stage of change and psychosocial variables related to nutrition.

There was limited evidence of effects on physiological outcomes, including BMI, blood pressure and cholesterol. This might be expected, as these kinds of outcomes are arguably more difficult to change, and where changes do happen, they may take a much longer time to occur and be detected. In addition, physiological outcomes may also be influenced by factors other than nutrition, including smoking and sedentary lifestyles.

The interventions adopted a range of targeting strategies. Some targeted relatively broadly - for example, a mix of different ethnic groups, all adults in a geographically defined neighbourhood, parents and children - while others targeted a more narrowly defined group such as 8-10 year old overweight African American girls. Both types of intervention could be effective. There was also evidence that social marketing can work in variety of different settings including schools, churches, and within wider community settings.

Furthermore, there is evidence that social marketing can multi-task. We examined whether interventions that targeted behaviours within a single nutritional (eg. fruit and vegetable intake only) were more effective than those that targeted multiple behaviours (eg. fruit and vegetable intake and other dietary behaviours). In fact, we found that interventions which sought to target several domains at once could be just as effective as those concerned with a narrower range of behaviours.

This suggests that social marketing interventions can produce changes across a relatively wide spectrum of behaviours, rather than only working, or working better, when they focus on only one behaviour. This is important given that - unlike in tobacco prevention where there is only one important target of change, giving up smoking - to improve diet properly, there is a need for multi-faceted behavioural changes: increases in consumption of some foods, decreased consumption of others, switching between food categories and so on.
There are also clear cost-effectiveness implications if it is possible to design social marketing interventions which can produce changes in several behaviours and risk factors at once.

The results should be considered in the light of several potential methodological limitations. In many studies, allocation to intervention or comparison group was carried out at the level of the school, city or community, followed by analysis at the level of the individual, which may lead to spurious findings. Differences at baseline between intervention and comparison communities were found in several studies, which may cause differential rates of change in outcomes between groups, and attrition was also a problem in a number of studies, particularly those with long term follow-ups. All these factors mean that results should be treated with caution.

In cases where the interventions comprised a large number of components, in the majority of cases, overall results were reported and the research designs did not allow for the efficacy of different components to be compared (eg. educational sessions, mass media, local events). This makes it difficult to get a sense for what is actually working and what components are responsible for producing the observed effects. This kind of information could be crucial to the planning of future interventions, to ensure that - often limited - resources are concentrated on the most effective aspects of the strategy.

While noting the methodological limitations above, it should be emphasised that the nature of several of the interventions examined in this review precluded the use of a strictly randomised controlled design. In large-scale multi-component and community interventions and mass media programmes, it is impossible to control fully for other factors which might influence outcomes, even where matched comparison cities or communities are used.

It is also difficult, where effects are found, to identify whether these are attributable to particular intervention components, or to the combination of activities, or to other factors such as secular trends.

Furthermore, intervention approaches such as community organisation, direct action and media advocacy do not lend themselves readily to precise statement as independent variables whose effects can be measured (Stead et al 2002). The quasi-experimental design also tends to neglect effects and changes which may in themselves be deemed worthwhile, such as changes in community empowerment or shifts in the policy formation process. These sorts of changes are noted in some of the studies examined in this review, but it is possible that they are omitted, or were not measured, in many others.
REFERENCES


Baranowski T, Cullen KW, Nicklas T, Thompson D, Baranowski J. Are current health behavioural change models helpful in guiding weight gain efforts? Obesity Research 2003;11:23S-43S.


Thackeray R. Comparison of a 5-a-day social marketing intervention and school-based curriculum. *American Journal of Health Studies* 2002; Winter.


APPENDIX 1

Nutrition Review
Record of Electronic Searches

ERIC: Electronic Research
Limits: 2004-2005, English language
Search Fields: Title and abstract, title

(food OR diet OR obesity OR nutrition) AND (intervention OR communication OR campaign OR promotion) AND (behavior* OR outcome OR policy) AND (behavior* OR audience OR consumer OR pre-testing OR segment* OR target* OR exchange OR communication)
Results = 10

Limits: 2004-2005, English language
Search Fields: Keywords

(food OR diet OR obesity OR nutrition) AND (intervention OR communication OR campaign OR promotion) AND (behavior* OR outcome OR policy) AND (behavior* OR audience OR consumer OR pre-testing OR segment* OR target* OR exchange OR communication)
Results = 1

SOCIOLOGICAL ABSTRACTS
Limits: 2004 to present, English language
Search Fields: Keywords

(food OR diet OR obesity OR nutrition) AND (intervention OR communication OR campaign OR promotion) AND (behavior* OR outcome OR policy) AND (behavior* OR audience OR consumer OR pre-testing OR segment* OR target* OR exchange OR communication)
Results = 68

IBSS
Limits: 2004-2005, English language
Search Fields: Abstract, Title, Descriptors

(food OR diet OR obesity OR nutrition) AND (intervention OR communication OR campaign OR promotion) AND (behavior* OR outcome OR policy) AND (behavior* OR audience OR consumer OR pre-testing OR segment* OR target* OR exchange OR communication)
Results = 7

INGENTA ONLINE
Limits: 2004-2005
Search Fields: Title, Keywords, Abstract

(food OR diet OR obesity OR nutrition) AND (intervention OR communication OR campaign OR promotion) AND (behavior OR behaviour OR outcome OR policy) AND (behavior OR behaviour OR audience OR consumer OR pre-testing OR segmentation)
Results: 87

(food OR diet OR obesity OR nutrition) AND (intervention OR communication OR campaign OR promotion) AND (behavior OR behaviour OR outcome OR policy) AND (targeting OR exchange OR communication)
Results: 46

INGENTA FAX/ARIEL
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Results: 7

(food OR diet OR obesity OR nutrition) AND (intervention OR communication OR campaign OR promotion) AND (behavior OR behaviour OR outcome OR policy) AND (targeting OR exchange OR communication)

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PSYCINFO
Limits: 2004-2005, English language, Human
Search Fields: Title, Abstract, Descriptors

(food OR diet OR obesity OR nutrition) AND (intervention OR communication OR campaign OR promotion) AND (behavior OR behaviour OR outcome OR policy) AND (behavior OR behaviour OR audience OR consumer OR pre-testing OR segmentation)

Results: 84

ISI WEB OF SCIENCE
Limits: Year to date
Search Fields: Topic

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Results: 255

MEDLINE
Limits: Social Sciences, 2004-2006
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Results: 71

Quality Rating Procedures

To assess the quality of included studies, each was independently graded by reviewers on a scale from 1-5 (where 1=poor and 5=good) on the following six criteria: quality of research design, quality of measurement, quality of sampling, quality of data collection, quality of data analysis and quality of link back to social marketing theory or hypotheses set up. Using these scores, an overall quality rating was calculated for each study. On the basis of this rating, studies were then labelled as either 'high', 'medium', or 'low' quality (Appendix 3 groups studies according to quality). Appendix 3 groups the included studies according to their quality rating.
APPENDIX 2

Nutrition Review
List of Studies Included in the Review

Baranowski 2002

Baranowski 2003

Beech 2003

Birnbaum 2002


Burke et al 2002


Caballero 2003

Campbell 1999

DMD 1989

Fitzgibbon 1996

Havas 1998

Havas 2003

Luepker 1994


Lowe 2004

Luepker 1996


Nader 1989


Neiger 2001

Neumark-Sztainer 2003

O’Loughlin 1999
Prochaska 2004

Resnicow 2001


Resnicow 2004

Sallis 2003

Resnicow 2001


Sallis 2003

Smitasiri 1994

Steenhuis 2004

Story 2003

Thackeray 2002
Thackeray R. Comparison of a 5-a-day social marketing intervention and school-based curriculum. *American Journal of Health Studies* 2002;Winter.


Vartiainen et al 1995


Wechsler 1998
## SUMMARY

### HIGH QUALITY

- **TEENS**
  - Pathways
  - Maryland WIC 5-a-day Promotion Program
  - Maryland WIC Food for Life Program
  - Physical Activity and Nutrition Among Adolescents (PACE+)
  - Eat For Life
  - CATCH
  - ‘5-a-day’ School Intervention

- **Medium Quality**
  - ‘5-a-day’ Achievement Badge for Urban Boy Scouts
  - GEMS Pilot Study Memphis
  - GEMS Pilot Study Minnesota
  - GEMS Pilot Study Texas
  - Black Churches United for Better Health Project
  - EatSmart
  - Minnesota Heart Health Programme (MHHP)
  - San Diego Family Health Project
  - Social Marketing for Public Health Employees
  - Coeur en Santé St-Henri Heart Health Programme
  - Body & Soul
  - Middle-School Physical Activity and Nutrition Study (M-SPAN)
  - Social Marketing Vitamin A-Rich Foods
  - Environmental and Educational Nutrition Programmes in the Netherlands
  - Low Fat Milk Campaign
  - North Karelia
  - New Moves
  - Health Promotion Programme for Couples
  - Health Promotion Programme for Overweight Hypertensives

### LOW QUALITY

- Dietary Management of Diarrhea (DMD) Project
- Cancer Risk Reduction Programme
- Food Dudes
- Go Girls!

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**Nutrition Review**

**Overview of included Studies**

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<th>Study / Program</th>
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### Nutrition interventions – Overview of Study Characteristics and Results

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<th>SM Characteristics</th>
<th>Outcome Measures &amp; Results</th>
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| Caballero et al 2003        | American Indian school children | Randomised controlled trial. | School-based intervention comprising food service changes, classroom curricula and a family component. Intervention utilises elements of social learning theory. | 1. Behaviour change goal: Intervention sought to reduce dietary fat intake through, for example, reducing the amount of fat in school meals. Specific aims were described.  
2. Consumer research: The study included a 3-year feasibility phase during which intervention components were developed and tested. In addition, formative research was undertaken using both qualitative and quantitative methods.  
3. Segmentation and targeting: American Indian children. The cultural heritage of the children was considered during the development of the programme.  
4. Marketing mix: Intervention comprised food service changes, classroom curriculum, a family component (and a physical activity programme).  
5. Exchange: The intervention included the use of a ‘chip jar’ to record the times that proposed guidelines were successfully implemented.  
6. Competition: Risk behaviours (e.g. eating high fat foods) were identified in formative research. The intervention strategy sought to target such behaviours (e.g. the removal of high fat foods from the service line). | High Quality Fat intake: mixed/moderate effect Food choice intentions and self efficacy to eat healthy foods: positive effect BMI: no change |
### Nutrition interventions – Overview of Study Characteristics and Results

<table>
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<tr>
<th>Intervention name &amp; authors</th>
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| **Havas 1998** *Maryland WIC 5-a-day Promotion Program* | Low-income women | Randomised controlled trial. | 5-a-Day programme comprising nutrition sessions, printed materials and direct mail. The intervention is based on the Stages of Change model. | 1. Behaviour change goal: Intervention sought to increase fruit and vegetable consumption by at least one half serving.  
2. Consumer research: Formative research (including focus groups & central intercept interviews) were undertaken. A pilot study was also undertaken.  
3. Segmentation and targeting: Women enrolled in the WIC programme. Intervention components were ‘culturally sensitive’.  
4. Marketing mix: The 5-a-day promotion programme comprised three components: (1) nutrition sessions by peer educators who had previously received training; (2) printed material & visual reminders; and, (3) direct mail.  
5. Exchange: Participants were provided with stickers to attach to calendars each day they reached their goals.  
6. Competition: Intervention included a specific session on identifying and overcoming barriers to behaviour change. Child care was also provided to allow women to attend the sessions. | High Quality  
F&V intake: positive effect  
F&V knowledge: positive effect  
F&V stage of change: positive effect  
Self efficacy for F&V: positive effect |
# Nutrition interventions – Overview of Study Characteristics and Results

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| Havas 2003                  | Low-income women       | Randomised controlled trial. | Programme comprising monthly-led educational sessions, direct mail and telephone calls by trained peer educators. The intervention is based on the Stages of Change model and Social Learning Theory. | 1. Behaviour change goal: Intervention sought to increase fruit and vegetable consumption and fibre consumption, and decrease fat consumption. Specific targets were set.  
2. Consumer research: Formative research (focus groups & central intercept interviews) were undertaken.  
3. Segmentation and targeting: Women enrolled in the WIC programme. Intervention components were ‘culturally sensitive’ and tailored to Stage of Change.  
4. Marketing mix: Intervention comprised monthly peer-led educational sessions for six month intervention. Peer educators made reminder telephone calls & mailed out educational pamphlets. It also included a ‘kickoff fair’ focussing on eating behaviour eg. blind tasting.  
5. Exchange: ‘Behaviour reinforcing incentives’ were used. Key reasons to attend sessions emphasised in personalised mail-outs.  
6. Competition: Intervention strategy considered barriers to health eating among this low income target group. Mail-outs included special advice on how to reduce fat in the diet. | High Quality  
F&V intake: positive effect  
Fat intake: positive effect  
Fibre intake: positive effect |
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| **Luepker 1996**            | Elementary school children | Randomised controlled trial. | School-based intervention comprising both classroom curricula and food service changes. Constructs from organisational change and social cognitive theory guided the intervention. | 1. Behaviour change goal: Intervention sought to reduce total fat, saturated fat and sodium content of food served in school cafeterias. Specific targets were set.  
2. Consumer research: Overall programme was ‘developed from a body of research that tested theory-based methods’. Limited empirical data influenced the design of the intervention. Food service instruments were pre-tested with staff.  
3. Segmentation and targeting: Multi-ethnic, Caucasian, African American and Hispanic school children. The curricula was developed to suit children at different ages.  
4. Marketing mix: Intervention comprised both classroom curricula & school environment components. The school curricula component comprised several programmes for different age groups (eg. Adventures of Hearty Heart, Go for Health and FACTS for Five). Teachers were also provided with training in implementing these lessons. The school environment component (‘Eat Smart’) included actual changes in meal preparation & composition, taste tests for children and training for food service staff.  
5. Exchange: In terms of motivation, the programme targeted anticipated outcomes of changing behaviour. Rewards, prizes & incentives are also mentioned.  
6. Competition: Intervention addressed self-regulatory processes including self-monitoring as part of the education programme. Children also received training in perceptions of ‘threats’ & coping response processes. | High Quality  
Fat intake: positive effect  
Nutritional knowledge: positive effect  
Dietary intentions and perceived social support for healthy eating: positive effect  
Blood pressure, BMI, cholesterol: no change |
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| Prochaska 2004              | Middle schools students | Randomised controlled trial. | School-based intervention comprising an interactive computer programme and a session with a health professional. Intervention was informed by TTM, SCT and the Relapse Prevention Model. | 1. Behaviour change goal: Intervention sought to encourage healthy nutrition (fruit and vegetable consumption) plus physical activity.  
2. Consumer research: Prototypes of the programme were tested for usability. Focus group interviews were also undertaken with teenagers and other potential audiences.  
3. Segmentation and targeting: Teenagers. The programme also used individual tailoring.  
4. Marketing mix: Intervention comprised an interactive computer program which was completed before an encounter with a health professional.  
5. Exchange: Action plans identified the benefits to be gained from making changes. Participants were asked 'what is important to you?'  
6. Competition: Intervention included relapse-prevention plans which included strategies for reducing barriers identified as likely to impede behaviour change. | High Quality  
F&V intake: no change |
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| Resnicow 2001 Eat For Life   | African American church members | Randomised controlled trial. | Church-based intervention comprising a video, cookbook, printed education materials, ‘5-a-Day’ promotional items and motivational interviewing. Counselling is based on motivational interviewing but no specific behaviour change models are mentioned. | 1. Behaviour change goal: Intervention sought to increase fruit and vegetable consumption.  
2. Consumer research: Focus groups were undertaken with target audience, plus interviews with researchers & practitioners. Pre-testing of materials (eg. video) undertaken with experts & target group.  
3. Segmentation and targeting: African Americans, church-goers. Intervention materials were designed to be ‘culturally sensitive’.  
4. Marketing mix: Intervention comprised an 18 minute video, a project cookbook, printed health education material, motivational interviewing, & several ‘cues’ with the 5 A Day message.  
5. Exchange: Target group were contacted directly by the pastor to encourage involvement, & intervention was designed to motivate participation through religion which was very meaningful to the target group (eg. eating healthily seen as ‘spiritually beneficial’).  
6. Competition: Motivational interviewing addressed barriers to fruit & vegetable consumption & tried to identify solutions. | High Quality F&V intake: positive effect |
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| **Thackeray 2002**          | Inner-city school children and their parents | Quasi-experiment | School-based intervention comprising school-wide events, communications and food service changes. Intervention is based on the “SMART” model (Social Marketing and Response Tool). No other behaviour change models or theories are mentioned. | 1. Behaviour change goal: Intervention sought to increase fruit and vegetable consumption.  
2. Consumer research: Campaign was based on formative research needs assessment (100 individual interviews & six focus groups). Interventions were pre-tested with the target audience.  
4. Marketing mix: Eight week intervention comprised school-wide events (eg. assembly, contests), communications (eg. posters) & food service modifications in the cafeteria. It also included a parent component comprising cooking classes, newsletters & parent-teacher conference (with recipes & food samples).  
5. Exchange: Intervention included a contest at the end of programme & a ‘cafeteria celebration’. The programme emphasised the benefits of eating fruit & vegetables & the presentation of fruit & vegetables in the cafeteria was improved to make them more appealing.  
6. Competition: Formative research identified barriers to fruit & vegetable consumption (eg. students chose pizza line in cafeteria because it was faster) which were addressed through the social marketing strategy. | High Quality F&V intake: mixed/moderate effect  
F&V knowledge: positive effect  
Self efficacy and choice of fruit and vegetables: mixed/moderate effect |
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<tr>
<td>Baranowski 2002</td>
<td>African American Boy Scouts aged 9-18 years</td>
<td>Randomised controlled trial</td>
<td>Troop-based educational sessions and additional camping sessions to train Scouts in self-control and food preparation. No specific behaviour change models or theories are mentioned.</td>
<td>1. Behaviour change goal: Intervention sought to increase consumption of fruit, 100% juice and vegetables. 2. Consumer research: Focus group research was undertaken with scouts and their parents to inform the design of the intervention. 3. Segmentation and targeting: African American boy scouts. Printed materials were designed to cope with low literacy. 4. Marketing mix: Intervention comprised eight weekly troop sessions &amp; two camping sessions. Scouts were trained in ‘asking activities’, self-control, &amp; recipes, plus a series of badge-activities (eg. food preparation). 5. Exchange: Intervention sought to increase preferences for fruit, juice and vegetables by associating them with ‘fun’. Boys received an achievement badge if they achieved all their dietary change goals. ‘Door prizes’ were provided to encourage parent participation. 6. Competition: Formative research identified environmental factors that limit fruit &amp; vegetable consumption. The intervention included self-control activities such as self-monitoring.</td>
<td>Medium Quality  F&amp;V intake: positive effect  Various psychosocial for F&amp;V (preferences, asking behaviour, availability and accessibility): positive effect</td>
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<tr>
<td><strong>Beech 2003</strong>&lt;br&gt;<strong>GEMS Pilot Study Memphis</strong></td>
<td>Overweight African American girls aged 8-10 years</td>
<td>Randomised controlled trial.</td>
<td>Interactive educational sessions focussing on knowledge and behaviour change skills. Interventions was guided by social cognitive theory, family systems theory and “theoretical and empirical evidence supporting the use of a family-based approach to obesity prevention in children”.</td>
<td>1. Behaviour change goal: Intervention sought to tackle obesity by promoting healthy eating (eg. reducing consumption of sweetened beverages, increasing fruit and vegetable consumption).&lt;br&gt;2. Consumer research: GEMS programmes were developed based on ‘extensive formative assessments’ (eg. focus groups).&lt;br&gt;3. Segmentation and targeting: Pre-teen African American girls &amp; their families. The programmes were culturally relevant/tailored.&lt;br&gt;4. Marketing mix: Intervention components varied across the three sites but generally consisted of child targeted programmes (group sessions and activities) &amp; parent programmes plus events (including taste-testing). One programme included a summer camp.&lt;br&gt;5. Exchange: Intervention used incentives/small gifts.&lt;br&gt;6. Competition: Recognised potential influence of family members &amp; peers on diet. Programmes also included messages about food moderation &amp; sought to displace the consumption of high fat foods.</td>
<td><strong>Medium Quality</strong>&lt;br&gt;F&amp;V intake: mixed/moderate effect&lt;br&gt;Fat intake: mixed/moderate effect&lt;br&gt;Consumption of ‘unhealthy’ foods: mixed/moderate effect&lt;br&gt;Nutritional knowledge: positive effect&lt;br&gt;High and low fat food practices/reported availability: no change&lt;br&gt;BMI: no change</td>
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| Story 2003                  | Overweight African American girls aged 8-10 years | Randomised controlled trial. | Interactive educational sessions focusing on knowledge and behaviour change skills. Interventions was guided by social cognitive theory, family systems theory and “theoretical and empirical evidence supporting the use of a family-based approach to obesity prevention in children”. | 1. Behaviour change goal: Intervention sought to tackle obesity by promoting healthy eating (eg. reducing consumption of sweetened beverages, increasing fruit and vegetable consumption). 
2. Consumer research: GEMS programmes were developed based on ‘extensive formative assessments’ (eg. focus groups). 
3. Segmentation and targeting: Pre-teen African American girls & their families. The programmes were culturally relevant/tailored. 
4. Marketing mix: Intervention components varied across the three sites but generally consisted of child targeted programmes (group sessions and activities) & parent programmes plus events (including taste-testing). One programme included a summer camp. 
5. Exchange: Intervention used incentives/small gifts. 
6. Competition: Recognised potential influence of family members & peers on diet. Programmes also included messages about food moderation & sought to displace the consumption of high fat foods. | Medium Quality 
F&V intake: negative effect 
Fat intake: mixed/moderate effect 
Consumption of ‘unhealthy’ foods: mixed/moderate effect 
Healthy eating intentions: positive effect 
Parental encouragement: no change 
Reported availability of high fat foods: positive effect 
BMI: no change |
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| Baranowski 2003 GEMS Pilot Study Texas | Overweight African American girls aged 8-10 years | Randomised controlled trial. | Interactive educational sessions focussing on knowledge and behaviour change skills. Intervention was guided by social cognitive theory, family systems theory and “theoretical and empirical evidence supporting the use of a family-based approached to obesity prevention in children”. | 1. Behaviour change goal: Intervention sought to tackle obesity by promoting healthy eating (eg. reducing consumption of sweetened beverages, increasing fruit and vegetable consumption).  
2. Consumer research: GEMS programmes were developed based on ‘extensive formative assessments’ (eg. focus groups).  
3 Segmentation and targeting: Pre-teen African American girls & their families. The programmes were culturally relevant/tailored.  
4. Marketing mix: Intervention components varied across the three sites but generally consisted of child targeted programmes (group sessions and activities) & parent programmes plus events (including taste-testing). One programme included a summer camp.  
5. Exchange: Intervention used incentives/small gifts.  
6. Competition: Recognised potential influence of family members & peers on diet. Programmes also included messages about food moderation & sought to displace the consumption of high fat foods. | Medium Quality  
F&V intake: mixed/moderate effect  
Fat intake: mixed/moderate effect  
Consumption of ‘unhealthy’ foods: mixed/moderate effect  
BMI: mixed/moderate effect |
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<td><strong>Campbell 1999</strong>&lt;br&gt;Black Churches United for Better Health Project</td>
<td>African American church members</td>
<td>Randomised controlled trial.</td>
<td>Church-based intervention based on an ecological model of change including tailored bulletins, printed materials, educational sessions, increased availability of fruit and vegetables at church functions. The intervention is based on an ecological model of change.</td>
<td>1. Behaviour change goal: Intervention sought to increase fruit and vegetable consumption by at least 0.5 daily servings. &lt;br&gt;2. Consumer research: Focus groups, pastor interviews and ongoing feedback from church members were used to inform the design of the programme and messages. &lt;br&gt;3. Segmentation and targeting: Rural African American church members. Individualised feedback to motivate behaviour change. &lt;br&gt;4. Marketing mix: Multi-component intervention, based on an ecological model of change, comprised tailored bulletins, printed materials, gardening activities, educational sessions, the provision of cookbooks and recipe tasting, serving more fruit and vegetables at church functions, involvement of lay health advisors, the establishment of community coalitions, pastor support, grocer-vendor involvement &amp; church-initiated activities. &lt;br&gt;5. Exchange: Churches were given funding plus a ‘small discretionary amount’ for their participation. Intervention was designed around spiritual themes &amp; coupons were distributed through vendors. &lt;br&gt;6. Competition: Several activities designed to help people overcome barriers to behaviour change (eg. the educational sessions and cooking classes all addressed enabling factors).</td>
<td>Medium Quality&lt;br&gt;F&amp;V intake: positive effect&lt;br&gt;F&amp;V knowledge: positive effect&lt;br&gt;F&amp;V stage of change: positive effect&lt;br&gt;F&amp;V self-efficacy: positive effect</td>
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| Delichatsios 2001 EatSmart   | Adult primary care patients | Randomised controlled trial. | Primary care-based intervention tailored educational materials, physician endorsement and motivational counselling. Motivational counselling and TTM. | 1. Behaviour change goal: Intervention sought to increase fruit and vegetable consumption, decrease red and processed meat consumption, and replace whole-fat dairy products with low-fat products. Specific targets were set.  
2. Consumer research: Initial dietary assessment was by a survey used to develop tailored educational materials.  
3. Segmentation and targeting: Adult primary care patients. The intervention was individually tailored (matched to Stage of Change).  
4. Marketing mix: Multi-faceted preventive nutrition intervention that included tailored educational materials, a low-intensity physician endorsement (incl. triaging) and motivational counselling by telephone.  
5. Exchange: Interview style was designed to enhance motivation for change and encouraged participants to set goals.  
6. Competition: Intervention sought to encourage individuals to reduce their consumption of processed foods and substitute whole-fat with low-fat products. It also sought to address people's ambivalence about behaviour change. | Medium Quality  
F&V intake: positive effect  
F&V stage of change: no change  
Fat intake: positive effect  
Fat stage of change: positive effect  
Intake of healthy and unhealthy foods: mixed/moderate effect |
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<td>Luepker 1994</td>
<td>Selected groups within three mid-west US communities</td>
<td>Quasi-experiment.</td>
<td>Community-based intervention comprising mass communications, direct education through primary care settings, professional education, school-based programmes and other community activities.</td>
<td>1. Behaviour change goal: Intervention sought to reduce the risk of cardiovascular disease (CVD) by improving eating, smoking and exercise behaviours. In terms of nutrition, specific goals were set out relating to fat intake and fruit and vegetable consumption. 2. Consumer research: Intervention components were based on different formative work (e.g., telephone survey of parents, needs assessment surveys with students). 3. Segmentation and targeting: Different community sub-segments were targeted including school students &amp; health professionals. 4. Marketing mix: Community-wide intervention programme comprised educational programmes for different community sub-segments. It also included a general awareness campaign, CVD screening, nutrition labelling at supermarkets, training for teachers &amp; the involvement of retailers and restaurateurs. 5. Exchange: Intervention included 'economic incentives' &amp; the school programme employed goal setting with 'direct reinforcement'. Participants were provided with participation points &amp; 'score cards'. 6. Competition: Schools programmes included teaching students the skills to resist pressures, to engage in 'healthy compromising behaviours', &amp; involved analysing barriers to healthy eating that exist within the school environment.</td>
<td>Medium Quality  Salting behaviour: positive effect  Blood pressure, BMI, cholesterol: no change</td>
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<tr>
<td>Kelder et al 1995</td>
<td>Minnesota Heart Health Programme (MHHHP)</td>
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| Nader 1989                  | Lower-to-middle income Mexican American and Anglo American families | Randomised controlled trial. | Family-based intervention comprising culturally tailored, interactive educational sessions. The intervention was based on Social Learning Theory and principles of self-management. | 1. Behaviour change goal: Intervention sought to reduce cardiovascular risk through improving eating habits (eg. decreasing consumption of high salt and high fat foods).  
2. Consumer research: Formative research was undertaken.  
3. Segmentation and targeting: Mexican American & Anglo-American families. The intervention was culturally sensitive (eg. use of bilingual speakers).  
4. Marketing mix: Nutrition intervention comprised an educational programme based on social learning theory. Group sessions were located at nearby schools, & training was provided for the graduate students who ran the intervention.  
6. Competition: Programme sought to decrease consumption of high salt, high fat foods, & addressed issues such as identifying high fat foods, recognising the salt content of foods, & fat substitution. | Medium Quality  
Fat intake: mixed/moderate effect  
Intake of unhealthy foods: mixed/moderate effect  
Nutritional knowledge: mixed/moderate effect  
Blood pressure: mixed/moderate effect  
Cholesterol: mixed/moderate effect |
| Nader et al 1992            | San Diego Family Health Project | Family-based intervention comprising culturally tailored, interactive educational sessions. The intervention was based on Social Learning Theory and principles of self-management. | 1. Behaviour change goal: Intervention sought to reduce cardiovascular risk through improving eating habits (eg. decreasing consumption of high salt and high fat foods).  
2. Consumer research: Formative research was undertaken.  
3. Segmentation and targeting: Mexican American & Anglo-American families. The intervention was culturally sensitive (eg. use of bilingual speakers).  
4. Marketing mix: Nutrition intervention comprised an educational programme based on social learning theory. Group sessions were located at nearby schools, & training was provided for the graduate students who ran the intervention.  
6. Competition: Programme sought to decrease consumption of high salt, high fat foods, & addressed issues such as identifying high fat foods, recognising the salt content of foods, & fat substitution. | Medium Quality  
Fat intake: mixed/moderate effect  
Intake of unhealthy foods: mixed/moderate effect  
Nutritional knowledge: mixed/moderate effect  
Blood pressure: mixed/moderate effect  
Cholesterol: mixed/moderate effect |
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<td>Neiger 2001 Social Marketing for Public Health Employees</td>
<td>Public health employees</td>
<td>Quasi-experiment.</td>
<td>Worksites intervention comprising communications, environmental changes including improvements in the availability of healthy foods at work, and other activities. Intervention is based on the Stages of Change model.</td>
<td>1. Behaviour change goal: The intervention sought to increase fruit and vegetable consumption (and physical activity levels). 2. Consumer research: Comprehensive formative research was undertaken, including an interest survey, focus groups, in-depth interviews. Activities &amp; messages were pre-tested with employees. 3. Segmentation and targeting: Public health employees (in preparation stage). 4. Marketing mix: The intervention comprised: (1) communications and promotions, including posters, public announcements &amp; emails; (2) environmental changes including improvements in the range of fruit &amp; vegetables available; (3) ongoing activities including a challenge; &amp; (4) onetime events including a recipe tasting contest, picnic, etc. 5. Exchange: Winners of the challenge (to increase fruit and vegetable consumption) won one hour of administrative leave. Recipe contests with prizes, ‘pat on the back’ closing ceremony which recognised ‘success stories’. 6. Competition: Formative research was used to identify perceived barriers &amp; threats related to fruit &amp; vegetable consumption (eg. lack of social support and interaction). Activities were developed to increase self-efficacy &amp; decrease barriers.</td>
<td>Medium Quality  F&amp;V intake: positive effect  F&amp;V stage of change: mixed/moderate effect  Self efficacy for eating more F&amp;V: positive effect  Perceived social support for healthy lifestyles: positive effect</td>
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| O’Loughlin 1999 *Coeûr en Santé St-Henri Heart Health Programme* | Residents of a low-income, inner city neighbourhood aged 18-65 years | Community trial using both longitudinal cohort and independent sample surveys. | Community-based intervention including nutrition education, recipe contests, a grocery store campaign and cholesterol and blood pressure screening events. Intervention is based on social learning theory and behaviour change theory. | 1. Behaviour change goal: Intervention targeted cardiovascular disease (CVD) behavioural risk factors including consumption of a high-fat diet.  
2. Consumer research: Formative evaluation (including focus groups) is used to test acceptability to & comprehension by the target audience.  
3. Segmentation and targeting: Low-income, low education community. Women are more heavily targeted than men. Educational materials adapted to suit a low income clientele.  
4. Marketing mix: Programme comprised a broad range of interventions. Nutrition related interventions include recipe contests, nutrition course, a grocery store campaign, menus in restaurants, cholesterol & blood pressure screening events, videos & newspaper coverage of activities.  
5. Exchange: Interventions included a workshop activity (using a motivational approach) and a recipe contest.  
6. Competition: During workshops, participants were trained to recognise risk factors & engage in self monitoring. The intervention strategy also sought to make low-cost foods available. | Medium Quality  
Fat intake: no change |
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| Resnicow 2004 *Body & Soul*| African American church members | Randomised controlled trial. | Church-based intervention comprising policy changes, taste-testing, distribution of ‘self-help’ materials, motivational interviewing and training for lay church members. The intervention was based on an earlier programme that used an “ecological model”. | 1. Behaviour change goal: Intervention sought to increase fruit and vegetable consumption.  
2. Consumer research: This intervention is comprehensively based on ‘Eat for Life’ & ‘United for Better Health’ (interventions undertaken by the same author) in which the intervention components had been ‘rigorously tested’.  
4. Marketing mix: The intervention comprised church-wide activities (which included establishing a project, making policy changes, taste-testing, distribution of self-help materials, training for lay church members & motivational interviewing).  
5. Exchange: The motivational interviewing was client-centred, & explored the benefits of behaviour change and ‘potential untapped sources of motivation’.  
6. Competition: The motivational interviewing aspect of the intervention sought to solve barriers to behaviour change & help individuals recognise the positives & negatives of current behaviour. | Medium Quality  
F&V intake: positive effect  
Self efficacy and intrinsic and extrinsic motivation to eat F&V: positive effect  
Fat intake: positive effect |
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| Sallis 2003 Middle-School Physical Activity and Nutrition Study (M-SPAN) | Middle school children and their parents | Randomised cross-over design. | School-based intervention comprising media and changes to school food service and policies. The intervention is based on an ecological model of health behaviour. | 1. Behaviour change goal: Intervention was designed to reduce the fat intake of school children.  
2. Consumer research: Baseline data was used to inform the development of the intervention strategy.  
4. Marketing mix: Nutrition intervention component targeted: (1) the availability of protective or harmful products (eg. reducing store operating hours, reducing fat content of school meals); (2) physical structures or characteristics of products (eg. packaging of low fat foods); and, (3) school structures and policies (eg. establishment of a policy group, newsletters and contests). Media and cultural messages were also distributed through posters and signs, etc.  
5. Exchange: Contests and raffle tickets were part of the nutrition intervention.  
6. Competition: Strategy sought to reduce the availability of less healthy food products through, for example, reducing school store operating hours, reducing the fat content of school meals, encouraging students to substitute high fat for low fat lunches, etc. | Medium Quality  
Fat intake: no change  
Parental avoidance of fat in family meals: no change  
BMI: mixed/moderate effect |
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| Smitasiri 1994             | Pregnant and lactating women and mothers with pre-school age children. | Quasi-experiment. | Community-based intervention comprising a food resource plan (eg. an agricultural promotional programme), a health service plan and an educational/communications plan. The intervention utilises four overall frameworks: behaviour analysis combined with nutritional anthropology, media advocacy and social marketing. Social marketing is described as the programme’s main operational approach. | 1. Behaviour change goal: Intervention sought to improve vitamin A-related knowledge, attitudes & behaviours (including dietary intake of vitamin A rich foods).  
2. Consumer research: Fairly comprehensive formative research (comprising in-depth interviews and focus groups) & pre-testing were undertaken.  
3. Segmentation and targeting: Population segments with low vitamin A intakes. Four different target groups were defined.  
4. Marketing mix: Intervention comprised nutrition education/communication, PR with key organisations, the distribution of vitamin-A foods, training, counselling & cooking demonstrations  
5. Exchange: Strategy considered how to motivate people & create demand based on perceived needs. The theoretical basis of the intervention emphasised importance of stressing the perceived benefits.  
6. Competition: Considered Rothschild’s factors which may cause a social marketing campaign to fail. | Medium Quality  
Fat intake: mixed/moderate effect  
Intake of healthy foods: positive effect  
Knowledge of and attitudes towards vitamin-A rich foods: positive effect |
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| Steenhuis 2004              | Supermarket shoppers   | Randomised controlled trial. | Supermarket-based intervention comprising labelling of healthy foods, increasing the range of healthy foods available, brochures and a ‘self-help’ manual. No specific behaviour change models were mentioned. | 1. Behaviour change goal: Intervention sought to reduce fat intake and increase fruit and vegetable intake.  
2. Consumer research: Programmes were based on the outcomes of a pilot study which involved semi-structured interviews with worksite & supermarket representatives. The programme materials were pre-tested.  
4. Marketing mix: The education programme comprised the following (some were optional for supermarkets): posters, brochures, recipe cards, self-help manuals, badges). The labelling programme comprised: drawing attention to low fat products & increasing the range of healthy foods at worksites.  
5. Exchange: The nutrition education programmes could include a contest with questions about healthy nutrition. Recognises need to build support from social network, family etc.  
6. Competition: The environmental intervention addressed self-efficacy for eating more F&V & consuming less fat, as well as ‘personal awareness of consumption levels’. Discussion of environmental strategies mentioned reducing barriers/increasing opportunities & mentions that this might involve prohibiting/limiting less healthy options. | Medium Quality  
Fat intake: no change  
Self efficacy to reduce fat intake: no change |
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<td><strong>Wechsler 1998</strong>&lt;br&gt;Low Fat Milk Campaign</td>
<td>Latino elementary school children</td>
<td>Quasi-experiment.</td>
<td>School-based intervention including communications, taste-testing, product trials, and sales promotions and incentives. Intervention is based on a number of techniques used in social marketing campaigns.</td>
<td>1. Behaviour change goal: Intervention sought to increase consumption of low-fat milk.&lt;br&gt;2. Consumer research: Counselling, questions at educational sessions and informal discussions with residents provided insights to develop campaign materials. Print campaign materials were pre-tested with the target group.&lt;br&gt;3. Segmentation and targeting: Latina mothers of children between the ages of 2 and 12 years. Materials were culturally appropriate (eg. activities were delivered by Latinos) and produced in both Spanish and English&lt;br&gt;4. Marketing mix: Community-wide intervention comprised communications (posters, flyers, radio, press releases, PSAs, etc) plus presentations, taste tests, media publicity, distribution of discount coupons for supermarkets. School intervention was described as a multi-faceted social marketing campaign featuring product positioning, celebrity endorsements (‘Lowfat Lucy’), product trials (taste tests), ‘teaser’ advertising, point-of-sale advertising, sales promotion incentives and products (eg. fridge magnets), a slogan, and persuasion through entertainment.&lt;br&gt;5. Exchange: Community campaign included contest to collect low fat milk labels. The school intervention included a ‘Lowfat Lucy Puzzle Contest’ with t-shirts for prizes.&lt;br&gt;6. Competition: Intervention involved convincing institutions (including schools) to offer only low fat milk.</td>
<td>Medium Quality&lt;br&gt;Intake of healthy foods: positive effect</td>
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| Vartiainen 1995 | Population of North Karelia, Finland. | Repeated independent surveys of large representative population samples in NK and the reference area. | Comprehensive community-based project comprising many elements including media, health education, health services, community organisation and environmental and policy activities. The programme draws on several behavioural change theories including social learning theory and the behavioural intention model. | 1. Behaviour change goal: Intermediate outcomes included changes in dietary habits.  
2. Consumer research: Research was undertaken with the general public and health professionals to establish how they saw the problems and how they felt about the possibilities of solving them. Some elements of the programme were pilot tested for feasibility in one small community before rollout to the rest of the county.  
3. Segmentation and targeting: Target group was chosen using available epidemiological knowledge on risk factors and information on their occurrence in the local population. (North Karelia). Special emphasis was provided to middle-ages men, worksites, school, and family. Efforts were made to match the intervention to local culture.  
4. Marketing mix: Programme is a comprehensive community based project comprising several different elements including: media, health services, community organisation and environmental and policy activities.  
5. Exchange: Programme emphasised incentives other than long-term health. Some elements of the programme involved “positive reinforcement” and overall, it aimed to gain people’s support for change rather than imposing it upon them.  
6. Competition: Messages were designed to anticipate the counter arguments. Collaborations with the food industry sought to modify the health content of foods (eg. manufacturers were asked to reduce the salt content of products supplied to schools). | Medium Quality  
F&V intake: positive effect  
Fat intake: positive effect  
Cholesterol: positive effect  
Blood pressure: positive effect  
BMI: mixed/moderate effect |
<p>| Puska 1995 |  |  |  |  |  |
| Puska 2003 |  |  |  |  |  |
| North Karelia |  |  |  |  |  |</p>
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| Neumark-Sztainer 2003       | Adolescent girls in aged 14-16 (with a focus on overweight/obese girls and those "at risk" of becoming overweight) | Randomised controlled trial | Intervention is based on social cognitive theory. | 1. Behaviour change goal: Intervention sought to influence eating behaviours.  
2. Consumer research: Intervention based on comprehensive needs assessment including in depth interviews, focus groups and a survey.  
4. Marketing mix: Nutritional ‘guidance’ (including curricula and practical activities like preparing healthy snacks & role play exercises, etc).  
5. Exchange: Role play used to create ‘assertiveness’ and the programme included discussions about ‘positive female role models’.  
6. Competition: Programme held out of school hours to overcome difficulties in attending. Also sought to address and overcome “barriers” to healthy eating (eg. discussions about ‘what to do in a fast food restaurant’). | Medium Quality  
F&V intake: mixed/moderate effect  
Fast food intake: no change  
Perceived benefits of healthful eating: mixed/moderate effect  
BMI: no change |
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| **Burke 2002 Study 1**     | Couples who have co-habited for less than 2 years. | Randomised controlled trial. | Programme comprised interactive group counselling sessions, or nutrition information by mail. It is based on Social Cognitive Theory, the Health Belief model & the Theory of Reasoned Action. | 1. Behaviour change goal: Sought to decrease intake of energy & total and saturated fat.  
2. Consumer research: Programme piloted was piloted. Focus group research resulted in ‘modifications’ being made to programme.  
4. Marketing mix: Programme comprised interactive group sessions or information by mail.  
6. Competition: Programmes highlighted costs & benefits of behaviour change & addressed ‘barriers to change’ (eg. time and stress management). | Medium Quality  
Fat intake: positive effect  
Fibre intake: mixed/moderate effect  
Sodium intake: no change  
Perceived importance of barriers to dietary change: positive effect  
Dietary self efficacy: positive effect  
BMI: mixed/moderate effect  
Blood pressure: mixed/moderate effect  
Total cholesterol: positive effect |
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| **Burke 2002 Study 2**     | Overweight, treated hypertensives aged 40-70 years. | Randomised controlled trial. | Programme comprised group or individual counselling sessions, or nutrition information by mail. It is based on Social Cognitive Theory, the Health Belief model & the Theory of Reasoned Action. | 1. Behaviour change goal: Sought to decrease intake of energy & total and saturated fat.  
2. Consumer research: Programme piloted was piloted. Focus group research resulted in ‘modifications’ being made to programme.  
3. Segmentation and targeting: Overweight, treated hypertensives. The programme was specifically tailored to individuals with weight problems.  
4. Marketing mix: Programme comprised interactive group sessions or individual counselling sessions.  
6. Competition: Programmes highlighted costs & benefits of behaviour change & addressed ‘barriers to change’ (eg. time and stress management). | Medium Quality  
Fat intake: positive effect  
Fibre intake: mixed/moderate effect  
Sodium intake: mixed/moderate effect  
Blood pressure: positive effect |
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<td><strong>DMD 1989</strong>&lt;br&gt; <em>Dietary Management of Diarrhea (DMD) Project</em></td>
<td>Peruvian and Nigerian mothers with children under the age of three. Does not appear to be based on any behaviour change theories/models.</td>
<td>Post-intervention survey.</td>
<td>Community-based intervention comprising local cooking demonstrations, communications and training and involvement of health professionals.</td>
<td>1. Behaviour change goal: Intervention encouraged changes in feeding practices, through the trial and adoption of a new weaning food recipe.&lt;br&gt;2. Consumer research: In Peru, a preliminary general assessment of feeding practices, &amp; the availability &amp; price of local foods was undertaken. Educational materials were also pre-tested. In Nigeria, extensive interviews were undertaken with key informants.&lt;br&gt;3. Segmentation and targeting: Mothers with children under the age of 3 years.&lt;br&gt;4. Marketing mix: Interventions generally comprised the distribution &amp; promotion of nutritionally enhanced weaning foods. In Peru, multiple channels of communication were used. In Nigeria, various forms of promotion were used but not mass media.&lt;br&gt;5. Exchange: Mothers were provided with free samples. In the development of the product, ‘perceived quality’ was considered &amp; oil was added to increase its acceptability to young children.&lt;br&gt;6. Competition: Intervention strategy accounts for possible barriers to behaviour change including accessibility, cost &amp; cultural beliefs (eg. low cost food sources were identified for individual nutrients to be included in the final recipes).</td>
<td>Low Quality Use of weaning food recipe: positive effect Knowledge of the recipe: positive effect</td>
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<td><strong>Fitzgibbon 1996</strong>&lt;br&gt;Cancer Risk Reduction Programme</td>
<td>Inner-city, low income, Hispanic American families</td>
<td>Randomised controlled trial.</td>
<td>Family-based curriculum interventions comprising discussion and other nutrition-related activities (eg. food preparation).&lt;br&gt;No behaviour change models are mentioned.</td>
<td>1. Behaviour change goal: Intervention sought to reduce fat intake, increase fibre intake, increase nutrition knowledge and increase parental support for healthy eating.&lt;br&gt;2. Consumer research: Intervention development was based on a needs assessment undertaken with a similar population.&lt;br&gt;3. Segmentation and targeting: Low-literacy, low-income Hispanics. The programme is culturally-specific.&lt;br&gt;4. Marketing mix: Twelve week family-based curriculum intervention which included discussion and activities (eg. food preparation).&lt;br&gt;5. Exchange: Intervention sought to make low-fat foods ‘more enticing’ to children.&lt;br&gt;6. Competition: Intervention addressed children’s resistance to eating healthy foods.</td>
<td>Low Quality: F&amp;V intake: mixed/moderate effect&lt;br&gt;Fat intake: positive effect&lt;br&gt;Intake of healthy foods and unhealthy foods: mixed/moderate effect&lt;br&gt;Nutritional knowledge: mixed/moderate effect&lt;br&gt;Parental support and role modelling for healthy eating: positive effect&lt;br&gt;Blood pressure: mixed/moderate effect&lt;br&gt;BMI: no change</td>
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| Lowe 2004 Food Dudes       | Primary school children aged 4-11 years | Uncontrolled before and after intervention study. | School-based intervention comprising a peer modelling video and rewards. The intervention uses peer modelling. No other behavioural models or theories are mentioned. | 1. Behaviour change goal: Intervention sought to increase fruit and vegetable consumption among children.  
2. Consumer research: Rewards were pilot tested in other schools.  
3. Segmentation and targeting: Primary school children aged 4-11 years.  
5. Exchange: Children provided with rewards including stickers, pencil cases, etc. Letters were also issued to children to provide them with praise and encouragement. Also included in the intervention was a ‘food dude’ prize and stickers cards relating to F&V consumption.  
6. Competition: Intervention addressed children’s aversions, & poor social norms, to fruit & vegetables. | Low Quality F&V intake: positive effect  
Liking for F&V: positive |
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| Resnicow 2000 Go Girls      | Low-income, overweight African American girls ages 11-17 years | Uncontrolled before and after intervention study | Intervention based on social cognitive theory comprising educational sessions. | 1. Behaviour change goal: Intervention sought to increase fruit & vegetable consumption, decrease fat intake, decrease fast food intake (& decrease television viewing & increase physical activity).  
2. Consumer research: Focus group discussions undertaken the target group (plus discussions with researchers & practitioners about other interventions).  
4. Marketing mix: Intervention comprised sessions containing the following: (1) interactive educational/behavioural activity (2) 30-60 mins of physical activity, & (3) preparation and tasting of meals.  
5. Exchange: Incentives used to encourage participation (including t-shirts and cash) & a points system was used to reinforce attendance (points could be exchanged for items including hats and pens). Some also participated in a visit to a state park.  
6. Competition: Participants taught strategies including substitution, moderation & abstinence. | Low Quality  
Fat intake: mixed/moderate effect  
Low fat food practices: positive effect  
Nutritional knowledge: positive effect  
Perceptions of dietary changes, social support, outcome expectancies: mixed/moderate effect |