Review of Children’s Healthy Eating Interventions

PUBLIC HEALTH NUTRITION
EVIDENCE BASED HEALTH PROMOTION
RESEARCH AND RESOURCE PROJECT

Healthy eating programs for children ages 0-15 years
ACKNOWLEDGEMENTS

We are grateful to Lisa Natoli and Sharon Negri who conducted much of the project work. We would also like to thank the Members of our Expert Advisory Committee for their support. Finally, the information provided by the various stakeholders has been invaluable and we are indebted to them.
# TABLE OF CONTENTS

1. **EXECUTIVE SUMMARY** ................................................................. 5

2. **BACKGROUND** ............................................................................. 10  
   2.1 OVERVIEW ..................................................................................... 10  
   2.2 AIMS OF THE PROJECT ................................................................. 10  
   2.3 DEFINITION OF “CHILDREN” ....................................................... 10

3. **METHODS** ................................................................................... 12  
   3.1 DISCUSSIONS WITH KEY STAKEHOLDERS IN CHILDREN’S HEALTHY EATING... 12  
   3.2 SYSTEMATIC REVIEW OF THE LITERATURE ..................................... 13

4. **RESULTS** ...................................................................................... 19  
   4.1 SUMMARY OF DISCUSSIONS WITH KEY STAKEHOLDERS .................. 19  
   4.2 OVERVIEW OF GREY LITERATURE .............................................. 23  
   4.3 RESULTS OF INTERVENTION PROJECTS IDENTIFIED IN THE LITERATURE REVIEWED ............................................................................................................. 27  
      4.3.1 Peri-natal interventions on mothers ........................................... 28  
      4.3.2 - Interventions on infants and preschoolers .................................. 37  
      4.3.3 - Interventions on primary school children ................................. 40  
      4.3.4 - Interventions on secondary school children ............................ 65  
      4.3.5 - Interventions on families .......................................................... 78  
      4.3.6 - Community-wide interventions .............................................. 83

5. **DISCUSSION** .................................................................................. 87

6. **APPENDICES** ................................................................................ 91  
   APPENDIX 1. STAKEHOLDERS .......................................................... 91  
   APPENDIX 2. STAKEHOLDER INTERVIEW QUESTIONS ......................... 92  
   APPENDIX 3. SEARCH STRATEGY FOR LITERATURE REVIEW ............... 94  
   APPENDIX 4. ORGANISATIONS RESPONDING TO REQUESTS FOR INFORMATION REGARDING GREY LITERATURE .............................................. 101  
   APPENDIX 5. EXPERT ADVISORY GROUP .......................................... 102  
   APPENDIX 6. HEALTHY EATING PROGRAMS FOR CHILDREN: GREY LITERATURE REPORTS ............................................................................................................. 103  
   APPENDIX 7. REVIEWED LITERATURE ............................................... 139

7. **REFERENCES** .................................................................................. 146
### Glossary

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
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<tbody>
<tr>
<td>CALD</td>
<td>Culturally and Linguistically Diverse</td>
</tr>
<tr>
<td>DAA</td>
<td>Dietitians Association of Australia</td>
</tr>
<tr>
<td>DET</td>
<td>Department of Education and Training</td>
</tr>
<tr>
<td>DHS</td>
<td>Department of Human Services</td>
</tr>
<tr>
<td>HEAPS</td>
<td>Health Education and Promotion System</td>
</tr>
<tr>
<td>NGO</td>
<td>Non-government Organisation</td>
</tr>
<tr>
<td>RCT</td>
<td>Randomised Control Trials</td>
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<tr>
<td>SES</td>
<td>Socio-economic Status</td>
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1. EXECUTIVE SUMMARY

Background

In 2001 the Department of Human Services sought tenders to:
• conduct a critical review of the effectiveness of interventions designed to promote healthy eating in children aged 0-15 years,
• consult widely with key stakeholders, and
• develop a research proposal to further our understanding of the influences on children’s eating and nutrition.

Evidence-based practice ensures that practitioners, program planners and funding bodies deliver better health promotion strategies, methods and activities in order to maximise health outcomes. The Victorian Government has recognised the importance of public health nutrition research to ensure that evidence-based practice is applied to specific Victorian conditions and overall public health nutrition knowledge. (Department of Health, 2001). To achieve this, a review was undertaken of strategies and interventions likely to improve the nutrition of families with children aged 0-15 years.

This report provides information on the strategies that have been undertaken in Australia and internationally, and their effectiveness. It also provides a series of suggestions for practitioners in this area.

Aim

The major aim of the project was to identify population based strategies/interventions that are likely to be effective in improving the nutrition of families with children.

Project plan

The project involved:
• Discussions with key stakeholders in children's healthy eating
• A systematic review of the research literature
• Dissemination of the findings
• A planning guide for practitioners

Children aged 0-15 years and their families were the target group because optimal nutrition has benefits for the child, in terms of potential growth and development, as well as reducing the risk of diseases such as Type 2 diabetes, colorectal cancer and obesity. There are also major economic and social benefits associated with optimal nutrition in children such as the reduction of costs to the health care system.
The major findings of the literature review are listed below:

<table>
<thead>
<tr>
<th><strong>Key findings</strong></th>
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<tr>
<td><strong>Lack of conceptual consistency</strong></td>
<td>The research literature is clouded by conceptual confusion about the definition of healthy eating, the measured outcomes of interventions and the theoretical bases of intervention methodologies.</td>
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</tbody>
</table>
| **Gaps in the literature**            | Practitioners’ views differ from the findings of the published intervention literature. Several major gaps in the research literature were identified including:  
  - paucity of studies on children aged 1 to 5 years and adolescents  
  - little investigation of the influence of parents and ways to involve them in the promotion of children’s healthy eating  
  - few investigations of community wide programs |
| **Duration of interventions and their evaluation** | Most interventions have been very short term as have their evaluations. |
| **Success of intervening in eating habits** | There is considerable evidence from most settings that interventions to promote “healthy eating” are effective, especially in primary and secondary school populations in the short term. |
| **Impact of intervention**            | Few reported studies have examined the effects of professionals’ routine teaching activities on children’s eating habits i.e. education and health systems’ impacts on children have rarely been evaluated. |
Specific findings

**Mothers and the new-born**
Many of the reviewed studies attempted to promote the initiation and duration of breastfeeding, particularly randomised controlled trials (RCTs) and cohort studies. There was mixed evidence about the efficacy of hospital-based or pre-term interventions. About half of them were successful. Counselling of mothers appears to promote the incidence and duration of breastfeeding. Further work is required to identify the best strategies for designing and delivering such programs. (See Tables 4.5 and 4.6)

**Infants and preschool children**
Few published intervention studies have been conducted among toddlers, preschoolers and infants. However, some powerful methods have been tested under experimental conditions and are used in practice in many day care centres. Examples of these are adult modelling of food behaviours, positive reinforcement, use of group influence and sensory experience of foods. This is a promising area, which requires more intensive research. Three of the four RCT studies that focused on infants’ food intakes were judged to be effective. The effects of intervention lasted for up to four years. Most of these studies involved education of mothers or care-centre staff. Clearly, interventions aimed at creating healthy food habits in infants can be effective. (See Tables 4.7-4.10)

**Primary school children**
There have been many studies of primary school children. Most were either RCTs or uncontrolled experiments; only one cohort study was found in the literature. Some of the studies had questionable aims by today’s standards (e.g., a heart health project which aimed to reduce intakes of total fat by excluding foods that have other nutritional benefits including meat). Only a few studies examined effects which lasted for more than three months.

More than half of the studies were effective in changing children’s eating behaviours. School-based programs in particular, appear to successfully change children’s eating behaviours. Three studies were still effective after one year and one study reported positive eating behaviours for more than two years. More longitudinal intervention studies are required to evaluate the effect on intakes of foods such as fruits, vegetables and cereal grain products later in life. (See Tables 4.11-4.13)

**Secondary school children**
The dietary behaviours of secondary school students have been successfully altered through educational methods, especially those that involve families. More investigation of the impact of the various approaches is required, e.g. content and pricing of vending machine food, classroom instruction and family involvement. (See Tables 4.14-4.16)

**Community and families**
Only a few studies have focused exclusively on communities or family interventions that focused on a range of dietary outcomes. There were four RCTs conducted on family interventions all of which were effective, two for more than a year. Two community cohort studies had mixed effects. (See Table 4.17)
Given their central role in the promotion of healthy eating for children, it is important that in conducting this work, practitioners:

- **Focus on eating** - most existing studies focus on nutrients or disease risk. There is an urgent need to focus more on dietary patterns, and the taste and enjoyment of food.

- **Focus on people** - it is important to take opportunities to reach children and parents in settings in which they live their lives.

- **Develop and influence policies** - at all levels from kindergarten to government departments.

- **Employ an action research paradigm** - to make small sustainable changes to reach large numbers of children.

- **Evaluate all activities** – there is a desperate need to assess and report innovative approaches not currently addressed by the literature.

- **Influence the social group** - try to influence groups like children’s classes, families, and other sources of social influence.
Recommendations for future action

A food and nutrition policy for children and adolescents should be developed which would establish short and long term goals for children’s healthy eating and physical activity in Victoria. It should be supported by a broad coalition of interest groups including government health and education departments, non-government organisations (eg the Anti-Cancer Council and National Heart Foundation), professional associations (e.g. teachers, nurses and medical associations), community groups and food and agriculture organisations. A small group would oversee the implementation of the policy and regularly monitor the child population’s progress towards the policy objectives.

Areas in which the policy would operate include:

- The promotion of breastfeeding and assistance to new parents, weaning and infant feeding advisory systems;
- The development of award and training systems for professionals and child carers similar to those adopted by Western Australia (Start Right, Eat Right);
- The adoption of the FoodCent$ program among low income groups and in school curricula;
- The reformulation of primary and secondary school curricula to emphasise the acquisition of experiential food skills, physical activity and life skills by all children;
- The development of school food policies, the reform of the school food supply and the marketing of food to children and their families;
- The development of point of sale programs in retail stores and food outlets to help families choose healthy foods;
- The innovation and marketing of novel low energy, nutrient dense foods for children by Victorian food companies;
- The reform of practitioners’ education to enable them to play greater roles in the promotion of healthy eating and physical activity programs;
- The creation of demonstration community development food programs, and the implementation of population monitoring systems to measure progress towards policy goals.

The over riding aims should be to clearly re-orient the education and health service systems towards the promotion of health, disease prevention and the enjoyment of food and physical activity.
2. BACKGROUND

2.1 Overview
Optimal nutrition throughout childhood is associated with major public health, economic and social gains for children, their families and the community.

Health impacts
There is strong evidence that poor nutrition during pregnancy and in childhood is associated with the later onset of cardiovascular disease, Type 2 diabetes and some cancers, all of which places a considerable burden on the public health budget (Boreham, Savage et al. 1993; Wolf and Colditz 1998; Colditz 1999). Although Type 2 diabetes is less of a problem amongst children, it is on the increase (Waters and Baur, 2003).

Risk factors
Some of the major risk factors associated with these diseases include obesity and high blood cholesterol levels, as well as low fruit and vegetable consumption and low levels of daily physical activity (Milligan, Burke et al. 1997; Twisk, Kemper et al. 1997). Many risk factors and associated diseases appear to commence during childhood. For example, overweight children have a greater chance of becoming obese adults (Birch and Fisher 1998; Kemper, Post et al. 1999; von Post-Skagegard, Samuelson et al. 2002). Already about one in four children are either obese or overweight – and the trend is increasing (Magarey, Daniels and Bouton, 2001).

Strategies
Nutrition education and promotion among children is one of the oldest and most prevalent activities in health promotion, dating back to the late nineteenth century. There is an urgent need to closely examine the impact of nutrition interventions among families with children. In part, this need is generated by the increasing output of research publications in both the formal and grey literature, but also by the continually changing states of families and children and by the increasingly stringent rules of evidence based research.

2.2 Aims of the project
The major aim of the project was to identify population based strategies/interventions that are likely to be effective in improving the nutrition of families with children.

In order to achieve this aim, key stakeholders were interviewed, and a systematic review of nutrition interventions was conducted.

2.3 Definition of “children”
Children and their families
For the purposes of this work children were defined as non-diseased individuals aged 0-15 years. The following groups were examined:
- Mothers (and babies) – in relation to promotion of breastfeeding
- Toddlers
- Primary school children
- Secondary school children
- Communities and families
3. METHODS

Three distinct activities were undertaken:

- Discussions with key stakeholders in children's healthy eating
- A systematic review of the research literature
- Dissemination of the findings to practitioners

3.1 Discussions with key stakeholders in children's healthy eating

Aim
To explore stakeholders’ needs and perspectives so that the findings from the study could be disseminated in ways that would facilitate their understanding and practice in the promotion of children’s nutrition, as well as stimulating and sustaining these professionals’ interest in this area.

Objectives
1. Identification of successful promotion projects.
2. Canvassing of stakeholders’ opinions about the needs of the area.
3. Identification of strategies for the promotion of children's healthy eating in Victoria and for the dissemination of the findings among practitioners and other stakeholders.
4. Identification of likely action research projects, along with the sectors that can conduct them.

Project Design
It was imperative that key experts in the community were consulted on their experiences with public health nutrition interventions for children. With the support of the expert advisory group, a list of 40 key stakeholders was developed. These people were mainly from within the state of Victoria, and included school representatives, community dietitians and public health nutritionists, health planners, food industry personnel, and representatives from non government health organisations such as the National Heart Foundation.

They represented both the agencies responsible for the promotion of children's healthy eating and children's feeding as well as experienced practitioners. The list of stakeholders may be found in Appendix 1.

Each of the stakeholders was invited to participate in a face-to-face or telephone interview with the project team. Stakeholders were initially contacted with a letter which outlined the purpose of the project, as well as the list of interview questions. Attempts were made to contact non-respondents on up to three occasions. Of the 40 people contacted, three declined to participate and 8 failed to respond at all; in total 29 stakeholders were involved in this consultative process.

Measurement/instruments
The stakeholders’ interviews were based on a standard list of questions (Appendix 2). Notes were taken by the interviewer. Responses were summarised and are reported in section 4.
3.2 Systematic review of the literature

Aim
To produce an evidence-based, systematic review of population based nutrition interventions to support the public health nutrition sector in selecting and implementing appropriate and effective interventions.

Objectives
The major objectives of the critical review were to:
- Identify the broad range of strategies that are likely to be effective in improving the nutrition of families with young children (birth to school age).
- Assess the impact of interventions designed to promote and support healthy eating in childhood (including intervention characteristics related to both positive and negative outcomes)
- Specify the best practice models/approaches that are effective in improving the nutritional status of families with young children.
- Advise on the types of evaluation appropriate to each of the best practice models identified, including consideration of short and long term evaluation.

Project Design
In order to address these objectives, a key issue that required resolution was the exact definition of the key outcome - healthy eating. This was informed by ‘The Dietary Guidelines for Children and Adolescents’ (National Health and Medical Research Council, 1995), which capture the key elements of current nutrition policy in Victoria, focusing on promoting and supporting healthy eating (see Table 1).

Table 3.1 Dietary Guidelines for Children and Adolescents

| Encourage and support breastfeeding.  
| Children need appropriate food and physical activity for normal growth and development.  
| Enjoy a wide variety of nutritious foods.  
| Eat plenty of breads and cereals, vegetables (including legumes) and fruits.  
| Low fat diets are not suitable for young children. For older children, a diet low in fat and in particular, low in saturated fat, is appropriate.  
| Encourage water as a drink. Alcohol is not recommended for children.  
| Eat only a moderate amount of sugars and foods containing added sugars.  
| Choose low salt foods.  
| Eat foods containing calcium.  
| Eat foods containing iron.  

*These have been recently updated (June 2003) but the new guidelines are similar to these.*
The literature review questions were framed as follows:

For children aged 0-15 years, what is the evidence of the effectiveness of interventions in each of the following areas?
- Breastfeeding
- Healthy growth
- Food variety
- Cereals, fruit and vegetable consumption
- Dietary fat and total energy intake
- Calcium and/iron intakes
- Sugar intakes
- Salt intakes

In considering these questions, it was important to pay particular attention to the identification of best practice models, the most appropriate timing and settings of interventions, and the existing capacity within Victoria to deliver and support interventions.

**General approach to the review**
This review was based on the ‘Proposed Schema for Evaluating Evidence on Public Health Interventions’ (Rychetnik and Frommer, 2000) produced by the Public Health Partnership (2000). Studies of interventions to promote healthy eating in 0-15 year olds were identified and critically assessed in terms of the quality of the research.

**Criteria for considering studies for review**
**Types of studies**
The value and appropriateness of randomised controlled trials (RCTs) in assessing the efficacy of lifestyle and behavioural interventions is a contentious issue, even though there is strong evidence that RCTs provide the least biased estimates of effect size (Stephenson 1998). However, preliminary examination of the literature established that few RCTs have been conducted in this area. Therefore, a range of study designs were reviewed, including:
- RCTs
- Non-randomised trials with concurrent control group
- Controlled trials with no randomisation
- Cohort (prospective) studies with concurrent controls/historical controls
- Well designed cohort (retrospective) studies with concurrent controls
- Case-control (retrospective) studies

Studies were assessed within a hierarchy of evidence paradigm (NHS, 1996. NHS Centre for Reviews and Dissemination, University of York. *Undertaking systematic reviews of research on effectiveness. CRD guidelines for those carrying out or commissioning reviews. CRD Report 4 1996*).

The general literature on behavioural change suggests that in most instances changes are unlikely to be sustained. Measuring behavioural change soon after completion of an intervention is unlikely to reflect the longer-term impacts of the intervention, thus early outcomes of these interventions should be viewed with caution. It would
therefore be ideal to consider only those studies in which participants had been followed for a minimum of one-year post intervention. However, many studies do not meet this criterion and promising strategies may be missed if too strict an inclusion criterion is applied. Given this, studies were included with a minimum three-month post-intervention period of observation. Studies were assessed on the basis of the length of observation, with longer-term studies providing stronger levels of evidence than equivalent shorter-term studies.

**Populations studied**

*Inclusion criteria:*
- All children aged less than 16 years at the commencement of the study
- Mother and babies. Interventions that promote breastfeeding in mothers, where the outcome, eg healthy growth or duration of breastfeeding was measured in their babies.
- Families and community studies which included children.

*Exclusion criteria:*
- Low birth weight (Children involved in disease specific interventions and the critically ill were excluded).
- Interventions targeting pregnant women (eg to improve their iron status).
- Studies related to vitamin supplementation or fortification of foods.
- Studies related to use of infant formula.
- Interventions aimed at treating eating disorders.
- Children with special needs (eg cleft palate, developmental disabilities, neonates in ICU having tube or enteral feeds, babies with eating disorders).
- Interventions targeting low weight birth rate or pre-term babies.
- Studies measuring cognitive performance as an indicator of healthy growth.

**Conceptualism of interventions and outcome measures**
The types of interventions were broadly classified as shown in Table 3.1. The types of outcome measures included in the interventions are summarised in Table 3.2.
Table 3.2 Types of interventions

<table>
<thead>
<tr>
<th>Strategies:</th>
<th>Educational, health promotion, settings-based, psychological, family, behavioural interventions, dietary counselling/management.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Topics:</td>
<td>Diet and nutrition, eating behaviours, nutrition knowledge, attitudes and beliefs, lifestyle and social support, involving children themselves with or without associated family members.</td>
</tr>
<tr>
<td>Settings:</td>
<td>Included community, school, health centres and other settings.</td>
</tr>
<tr>
<td>Delivery:</td>
<td>Given the focus of this project on examining issues related to capacity, there was no restriction on who delivered the interventions. (eg: teachers, health workers).</td>
</tr>
</tbody>
</table>

Table 3.3 Types of outcome measures

| Change in dietary intake: | Changes in nutrients and food contents of diet such as dietary fat, energy, calcium, iron, salt, sugar, cereal, fruit and vegetables. |
|                          | Changes in food variety.                                                                                                           |
| Change in knowledge:     | Diet and nutrition knowledge that impacts on attitudes and beliefs and lifestyle.                                                   |
| Structural changes:      | Changes in food services provision and/or capacity of the workforce.                                                               |
| Secondary outcomes:      | Participants views of the intervention including measures of harm associated with the intervention, measures of self-esteem, health status, well-being and quality of life. Also included are skinfold measures and weight related measures where provided as these are indicators of healthy growth. |
|                         | **Not Included:** Blood pressure, serum cholesterol or other biochemical indices as these were considered to be indirect effects of food intake changes (and other changes such as changes in physical activity). |
| Cost of interventions:  | The costs for individuals, communities and those funding the intervention.                                                           |
The literature search strategy
This section describes the methods and processes undertaken in order to develop the comprehensive endnote libraries (of both electronic and grey literature), upon which the systematic review was based. A range of strategies were employed to optimise our search findings:

1. Searching of electronic databases
2. Hand searching of journals
3. Searching of references cited within references
4. Interviews with key stakeholders
5. Searching for grey literature

Searching of electronic data bases
Databases for inclusion were decided upon following consultation with members of the expert Advisory Group and Deakin University library staff. All searches were limited to English language publications, made between 1980 and July 2001. The following electronic databases were included:

- PUBMED
- PSYCHINFO
- CINALH
- FOOD SCIENCE and TECHNOLOGY
- ABI/PROQUEST
- CAMBRIDGE SCIENTIFIC ABSTRACTS
- ERIC

In addition, it became evident that a number of important literature sources were not catalogued on the searched databases which required searching by hand. These included the following:

- Australian Journal of Nutrition and Dietetics
- Australian and New Zealand Journal of Public Health
- Health Education Research
- Health Promotion Journal of Australia
- ACHPER (Australian Council for Health, Physical Education and Recreation, Inc.) Journals

Full details of the search strategy are shown in Appendix 3.

References cited within references
The bibliographies of references were reviewed for other pertinent literature not previously found during searches of the electronic databases. These were also sourced and included in the final review.

Search for ‘Grey’ Literature
The formal literature search was complemented with a search for grey literature, such as internal reports and unpublished studies. Interviews with the Advisory Group provided leads for this process. Organisations and agencies were contacted (by email,
mail or telephone), informed about the project, and asked if they could respond with any relevant program information, reports or resources. The internet was also searched for sites with relevance to children’s nutrition.

The Health Education and Promotion System (HEAPS) database was also searched at this time. This database primarily provides information on health promotion projects within Australia. Since the database has no linked thesaurus, a variation on the search strategy used for the PUBMED database was utilised.

**Critical appraisal: process**
A standard form to guide appraisal of each reference was developed using Microsoft ACCESS. This template was based on the National Public Health Partnership’s Proposed Schema for Evaluating Evidence on Public Health Interventions, Cochrane Review recommendations and discussions held amongst the Project team. References were reviewed according to the criteria and data were entered, thus producing a separate record for each reference.

**Other resources**
In conducting this review we came across several valuable resources that were not part of our search brief. These included:

- References to psychological processes involved in children's healthy eating such as modelling of food behaviours, positive reinforcement of new healthy eating behaviours and exposure of children to new (healthy) foods.
- References to interventions in Third World countries which are not directly relevant to our study aims but which form an important resource for workers in the Third World.
- Previous reviews of the children's healthy eating area. These are particularly valuable though they do not share the exact outcome criteria of this project. These are available along with the "grey literature" above.

**Dissemination of the project findings**

**Aim**
To develop practical models to apply to the findings from the review and the stakeholder interviews. This will add to the evidence base, and will specifically examine the organisational, capacity and expertise requirements that also need to be considered for implementation in the Victorian context.

**Design**
The stakeholders and meetings with the Advisory Committee made many suggestions for strategies to disseminate the research findings. These discussions showed that the production of a guide for practitioners was considered essential. This is now available (“Promoting healthy eating for children: a planning guide for practitioners”).
4. RESULTS

4.1 Summary of discussions with key stakeholders

In general, responses to the survey were very enthusiastic, though among some groups, such as regional health promotion officers, the subject of children's healthy eating was of low priority. However, long and detailed meetings were held with most respondents. A summary of the findings is presented below, according to our main questions:

Experience and qualifications of respondents
Most of the key informants were dietitians, but several other groups such as community social workers, nurses and industry personnel were also involved. Almost all of them had worked in the area of children's nutrition or healthy eating. A few had had long experience from 15 to 25 years, however the majority had only worked with children's food issues for short periods, some for only a few months.

The community dietitians appeared to have the most "hands on" experience with children's eating problems. Although they had considerable nutritional education, their training had not equipped them to deal with the major social, psychological and family issues that they encountered in their jobs in the community.

Few of the agency representatives catered for specific ethnic or socially disadvantaged groups and very few had worked directly with children's families, although some of the community dietitians worked with children's families in various ethnic and social settings. There was a common theme among most of the key stakeholders that community and family settings were central influences on children's eating that should be addressed "on the ground". One of the main contexts which affects children's eating is disability (of all types) and this is common enough to be considered mainstream.

The main problems in children's nutrition and healthy eating
This question evoked a range of answers. Nutritional issues like obesity and diet-related diseases such as diabetes (Type 2) were mentioned, as were nutritional deficiencies such as iron deficiency and vitamin D deficiency (which may be becoming widespread in some groups). Similarly, restricted food intake such as low fruit and vegetable intakes was mentioned, though more commonly in relation to the incidence of constipation amongst children. However, perhaps the most commonly reported problem was "fussy eating" or "food refusal". This is a problem among young children but also seems to extend to older children and adolescents. Fussy eating seems to lead to a restricted variety of intake, over reliance on fast foods, and narrow taste and texture preferences - foods have to be bland and smooth to be acceptable.

The community dietitians were perhaps the most vocal with regard to this issue. They felt that fussy eating is a problem of parenting. Several mentioned that they spent a lot of time supporting young parents (usually mothers) in dealing with their "cranky" children. The dietitians believed that some parents have little confidence in their role as parents and that some parents have little knowledge of either the nutritional quality
of food or parenting strategies. According to these dietitians, many parents tried to reason with their children with little success. In some families the "locus of power" is with the child, who chooses the food he/she eats as well as the family TV programs and other activities. One dietitian mentioned that at times some mothers have to cook as many as four individual evening meals to suit different members of the family. Various reasons were identified including lack of parental self esteem, ignorance of parenting roles and children, unwillingness to exert authority (perhaps because of an overly authoritarian childhood the parent had experienced), paid work outside the home and associated compensatory food practices (no time to cook meals therefore let the child have a fast food product).

A few dietitians felt this sort of behaviour occurred mainly in poor socio-economic status (SES) groups but others argued that it occurred in all SES groups and in a variety of ethnic groups. Some, however, felt that in some Language Other than English Backgrounds (LOEB) groups the child tended to learn English faster than the parents - from school and TV and was overly influenced by TV advertising; the child in turn influenced the parents to buy fast food products that they had seen advertised on TV. The major differences in the customs of ethnic groups were mentioned, from the high dependence of grandchildren on grandmothers in some Chinese groups, to the independent or laissez faire practices of other groups - usually where both parents are in paid employment.

There was general consensus that parenting practices are central and that parents require more practical help. There was also a theme running through many of the interviews that some marketing practices that target young children are unhelpful or even damaging to healthy eating.

**Proposed strategies to overcome healthy eating problems**

All respondents believed that today's problems will only get worse in future years unless strong prevention initiatives are undertaken in the immediate future. Several strategies were suggested. These can be divided into two groups, perhaps according to their underlying assumptions about the nature of human food behaviours. One group concerns education of the public, the other is about community development, partnership and policies. They are not mutually exclusive and overlap considerably.

**Education of the public**

Some respondents were unable to elaborate very much about educational strategies; they merely recommended more and better food and nutrition education of children. Others, however, had much more detailed views. Whilst there is a need for conventional nutrition education such as "seven a day programs", there is also a need for much more experiential education. Children and parents should learn to enjoy "playing" with food and they should explore its sensory characteristics so that they develop an "educated palate" which will lead them to demand high quality products. It was emphasised that parents as well as children require a broad food education.

First time parents are particularly interested in their infants well being and feel very ignorant about ways to care for them - they are generally regarded as a key "target" of education especially for parenting skills. One dietitian remarked that there was a huge demand for information and skills among young parents that is not being met.
Several informants however, noted that learning about food is only part of a successful educational strategy. Knowledge of what is "common sense" is required as are high levels of self-esteem and self-efficacy. Some informants felt that some parents have not been in a position to learn from their parents about "reasonable ways" to interact with infants and children (e.g. they don't want or know how to be authoritative) nor do they know much about modelling behaviours, reinforcement techniques or the value of repeated exposure to new foods.

Some of our informants felt that current school curricula were not providing relevant life skills education for children, particularly for teenagers. Several felt that the curricula should be reformed so that children have the opportunity to acquire life knowledge and skills at schools. Several valuable examples were cited, particularly the new Queensland home economics curriculum, which is activities and skills based and student-centred.

There was much discussion about the difficulties of "reaching parents". Schools do provide one avenue but most schools are over stretched and run the danger of preaching to the converted. Pre-school centres appear to offer more hope of contact as do the mass media and other settings such as retailers and food markets. Essentially parental education will rely a lot on various forms of community development.

**Community development strategies**

The essence of the community development approach is one of focused effort within a relatively small community or locality. Thus, whilst a program may have a focus on, say, improving pre school children's food consumption, a variety of settings, agencies and groups may be recruited towards this end. Thus, food suppliers, teachers, parents, local council environmental health officers, supermarkets, local media and others may be invited to join in an effort to improve children's food consumption in a sustainable way. One community dietitian noted the importance of developing organisational and community food and nutrition policies that are owned by the various participants. The parents, teachers and children involved make their own sets of rules and strategies (policies) that they abide by. It was claimed that such focused community development has effects which go beyond food and nutrition, food being used as a vehicle for community building (e.g. through the formation of women's groups, cooperatives, and small business development, to foster community tolerance, inclusiveness and self esteem). Several respondents noted the maxim that it is best to focus on communities' strengths rather than their weaknesses.

Footscray markets and Collingwood College were two community development examples that were cited. The former encourages people to try a wide range of ethnic dishes thus widening food preferences and the latter has developed a vegetable garden and cooking classes for children from disadvantaged families. Aboriginal community initiatives such as Flaming Bull restaurant were also cited. Many developments such as these appear to exist but few of them have been documented or evaluated.

Many of the key informants favoured community based strategies as ways of overcoming the various problems in children's eating. Several had been involved in community food programs, which had been oriented towards young children and their parents. Few of these programs had been formally evaluated although several children's nutrition initiatives are in the process of being evaluated.
Whilst marketing campaigns for confectionary and fast food products received a lot of criticism, some key informants felt that they could be a valuable form of community education if diverted to promote healthier foods. In fact one person noted that mass media campaigns when backed up by 'on the ground’ community activities, were highly motivational, "creating tension" among people who otherwise would be satisfied with their current food habits. This experienced community nutritionist observed that community programs alone tended to meet the needs of "the converted" and rarely reached the mass of the population.

The notion of the appointment of community development workers with special expertise in food matters was popular.

**Policy Development for Food and Nutrition**

A few respondents mentioned "policy development" as a strategy. One used the term to apply to policies developed within particular groups but the others meant something larger encompassing the whole State. Several respondents noted that one government policy, that relating to food safety regulations, was having a deleterious effect on the serving of fruit and vegetables in kindergartens. Staff no longer served vegetables or fruit because they thought that it contravened the new food safety regulations.

More positively, the development and promulgation of government policies is likely to be an inexpensive and effective way to improve the healthiness of children's eating. One experienced respondent held the view that where ever children are served food in social institutions like pre-schools, schools, vacation camps and the like, then government policies could recommend the preparation and types of food which could be served.

This is seen most graphically in relation to school canteens. Essentially the provision of foods at school has been privatised. Almost all food products are permissible in school canteens. Thus if a school canteen wants to promote high-energy foods which are highly profitable there is nothing to stop them. One teacher noted that children quickly see the hypocrisy of the current situation in which school lessons advise children to consume fruits and vegetables, and, low fat foods only to be faced with a dearth of the former and an excess of the latter in the school canteen! It was felt that a school canteen policy would help prevent the current divisions between groups of parents and focus attention on the importance of promoting healthy eating for children. Similar policy development was raised with regard to TV food advertising to children by many of the respondents, though no one could elucidate such a policy clearly.

**Professional development**

A fair amount of time was taken up with discussion of ways in which the various children's health professionals could become better equipped to deal with children's healthy eating problems. Suggestions included more relevant undergraduate education, especially the inclusion of social and behavioural science, counselling and community health promotion skills, and continuing education in a range of areas such as project management, report writing and basic nutrition.
Partnerships and Coalitions

Key informants were asked to suggest opportunities for cooperation between children's healthy eating initiatives and other public health programs in Victoria as well as identifying agencies which should take the lead in the facilitation of children's healthy eating.

Several respondents were keen on the idea of coalition building. They felt that community health practitioners, NGOs, industry, DHS and University personnel should form an advocacy coalition that would develop strategies for change in Victoria. For example, strategies for school curriculum reform, school canteen reform, institutional food policies and the regulation of children's food marketing.

The main cooperative agencies suggested were the Department of Education and Training (DE and T) and the Department of Human Services (DHS) in its various regions and branches. Community development funding was also mentioned, for example the support offered by VicHealth to sports organisations. A common view was that healthy eating initiatives should be combined with physical activity programs. A few respondents felt that the food industry could be valuable partners though there were concerns about possible exploitation of programs by some companies.

The question about leadership generally elicited the view that government in the form of the DHS should take the lead in the development of policy and other initiatives and that the government should fund various developments. Some felt that NGOs like the Anti-Cancer Council and the Heart Foundation do valuable work but need to ensure that their activities are broader than disease prevention and that they interface with general food and nutrition promotion programs. One respondent noted that the NGOs are in a powerful position to advocate for the promotion of children’s healthy eating, something that the DHS itself is probably unable to do directly.

Dissemination of the findings

There is a great deal of interest in the reports emanating from the present project and there was general agreement that strategies which work to improve children's eating need widespread circulation among the various interest groups. Many suggestions were made as to the best ways to disseminate the findings and the primary concern was that they should be made relevant to a variety of settings in which health professionals and educators work. In response, a report has been produced: Promoting healthy eating for children: a planning guide for practitioners.

4.2 Overview of Grey Literature

A total of 52 organisations were contacted, including Community Health Centres, Divisions of General Practice (Victoria), Primary Care Partnerships and other organisations that were thought to have an interest in child health and wellbeing (see Appendix 4 for a listing of all organisations contacted).

Table 4.1 shows the proportion of these organisations that responded to requests for copies of any reports, information packs and other literature related to food and nutrition interventions they have been associated with.
Table 4.1 Response to request for reports on interventions

<table>
<thead>
<tr>
<th>Type of organisation</th>
<th>No. contacted</th>
<th>No. who responded</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community Health Centres</td>
<td>41</td>
<td>15</td>
</tr>
<tr>
<td>Divisions of General Practice</td>
<td>31</td>
<td>5</td>
</tr>
<tr>
<td>Primary Care Partnerships</td>
<td>33</td>
<td>12</td>
</tr>
<tr>
<td>Other organisations</td>
<td>37</td>
<td>20</td>
</tr>
</tbody>
</table>

Of the 52 who initially responded, reports were received from 32 organisations.
These were reviewed and the following measures were compared

- Age group
- Setting
- Aims of the intervention
- Description
- Evaluation

Appendix 5 details these intervention reports. Most of the interventions were
predominantly aimed at infants, preschoolers and primary school children. Few of
these interventions appeared to focus upon secondary school children or families in
general. Table 4.2 shows the proportion of interventions that were designed to target
various age groups.

Table 4.2 Target age group for interventions

<table>
<thead>
<tr>
<th>Age group</th>
<th>No. of Interventions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infants/ pre-schoolers</td>
<td>14</td>
</tr>
<tr>
<td>Infants/ primary school</td>
<td>2</td>
</tr>
<tr>
<td>Primary school</td>
<td>6</td>
</tr>
<tr>
<td>Primary/Secondary</td>
<td>5</td>
</tr>
<tr>
<td>Secondary</td>
<td>0</td>
</tr>
<tr>
<td>Community</td>
<td>5</td>
</tr>
</tbody>
</table>

Most interventions took place in schools (n=11), day care centres (n=9) or in the
community (n=10). Two of the interventions were designed to be used in both day
care centres and primary schools.

The interventions can be grouped into five main categories:

- Food and Nutrition policies and plans
- Education
- Improvements to health
- Increasing consumption of healthy foods
- Improving hygiene and safety of food
Development of food and health policies and plans
Settings for this category encompassed the community, day care and schools. Policies and plans in the community involved developing healthy eating plans for public events.

One program, run by a local authority, aimed to enhance the food and nutrition practices in day care centres in their region and develop food and nutrition guidelines to be used as a model in other child care centres.

Likewise, two of the intervention programs were focussed on the introduction of food and nutrition policies in schools.

Education
Some of the interventions were developed to improve the quality and quantity of nutrition education programs.

Development of education programs for the community included increasing awareness of the need to eat more fruit and vegetables and to develop a series of training modules to cover a range of nutrition topics to address poor nutrition in the Aboriginal and Torres Strait Islander Community.

Education programs for day care centres included improving children’s food knowledge and the development of an educators’ nutrition manual and an early childhood newsletter.

In schools, education interventions included developing an awareness of healthy eating among staff, parents and children participating in the Out of School Hours Care Services; improving children’s food selection skills and knowledge of food in relation to health; and encouraging children to experience a wide variety of food and drink.

Improvements to health
Interventions to improve health included use of the mass media to increase awareness of the importance of fruit and vegetables for health; development of a sustainable community food garden; increasing community acceptance of breastfeeding in public; (Pollard, 2001) improving health of children in Victoria; improving the nutritional status of children by improving the nutritional quality of the food provided; and contributing to a reduction in dental disease among children 0-5 years of age by establishing tooth brushing habits and healthy eating habits among this age group.

Increasing consumption of healthy food
These included projects which aimed to increase the initiation and duration of breastfeeding; provide incentives to improve food service and the nutritional quality of food in child care facilities; increase children’s water intake during the day; increase the proportion of children who regularly consume breakfast; provide access to a range of nutritious and affordable fruit, and to encourage school and community links to provide a supportive environment to make healthy food choices.

Improving hygiene and safety of food
There were two interventions to improve food hygiene in day care and school canteens.
Evaluation of programs
Many (n=23) of the intervention projects were evaluated, although the type of evaluation varied as shown in Table 4.3.

Table 4.3 Proportion of interventions that were evaluated.

<table>
<thead>
<tr>
<th>Type of Evaluation</th>
<th>No. of Interventions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process, impact and outcome</td>
<td>5</td>
</tr>
<tr>
<td>Process and impact</td>
<td>10</td>
</tr>
<tr>
<td>Process only</td>
<td>1</td>
</tr>
<tr>
<td>Impact only</td>
<td>6</td>
</tr>
<tr>
<td>Limited evaluation – type not specified</td>
<td>1</td>
</tr>
<tr>
<td>Not evaluated</td>
<td>7</td>
</tr>
</tbody>
</table>

There was no evaluation for seven of the interventions. One reported that evaluation was planned but had not been conducted up to the interim report being published. Another report suggested that evaluation should be conducted on the intervention in question but did not identify how or when this would take place.

The value of some interventions is not always obvious from the evaluation of the project. One example is a project undertaken by the Health Department of Western Australia, which promoted the consumption of fruit and vegetables with every meal through the use of television advertisements, press advertising, point of sale promotions, information and resource kits as well as community based promotions. At the end of this intervention, there was an 80% awareness of the campaign, and there was an increase in the intake of fruit and vegetables of 30%. Whether this proves to be cost effective in the long term is still to be determined.

Effectiveness of interventions
The effectiveness of each program has been assessed by the organisation responsible using various indicators. Four of these indicators were predominant:
- Awareness of program
- Uptake of program
- Change in behaviour
- Change in knowledge

There were several underlying indicators which were also identified by some organisations. For example, one program highlighted their success in the development of partnerships between organisations, individuals and the community with regard to eating habits of primary school children, which lead to changes in attitudes, knowledge and practices amongst stakeholders (Central Sydney Area Health Service, see Appendix 5, program 1).

However, some indicators of the effectiveness of programs were also perceived as potential barriers to their success such as:
- The perceived usefulness of the program
- The resources provided by the program
- The cost effectiveness of the program
The perceived priority of the issue. For example, the National Heart Foundation’s Food Smart- Primary School Nutrition Education Pilot Project had strong support from the stakeholders. However they raised some concerns, particularly regarding program costs and planning time requirements.

4.3 Results of Intervention projects identified in the literature reviewed

The results of the literature review are summarised in this section.

Several examples from each intervention category are outlined in detail in the text. The examples have been selected to illustrate some of the different types of approaches (such as changes to food service, parental involvement, educational approaches) and well as different types of outcomes and levels of effectiveness.

Brief details of all reviewed interventions are then provided in table form. (A bibliography of studies reviewed appears at the end of this report and is also available in electronic form (Microsoft Access database). Detailed summaries of all studies are also available in the electronic database.) Some information about the interventions has been categorised for presentation in the tables:

- An intervention was classified ‘effective’ if the authors found a significant treatment difference or demonstrated a clear effect.

- An intervention was classified ‘partly effective’ if the treatment was effective in one group (e.g., males) but not others, or at one follow-up time point but not another.

- An intervention was classified ‘not effective’ if the investigators reported no significant differences or were unclear about possible effects.

- For simplicity of reviewing and comparison, the duration and follow-up time of each intervention is shown according to the following categories: 0-3 months, 4-6 months, 7-12 months, 12-24 months, >24 months (rather than the absolute duration or follow-up time that may have been reported by the authors).

- Similarly, program approaches have been categorised as either ‘educational’ (which includes classroom activities, didactic lessons and experiential food learning), ‘counselling’, ‘mixed approaches’, or ‘other’ approaches.

The literature review showed that specific features of interventions are generally poorly described. The impact of different intervention approaches (e.g., family involvement versus classroom education) generally has not been examined in the studies. As comparisons of the impact of specific intervention components have not been made it is not possible to clearly identify the specific features of programs that made them effective.
4.3.1 Peri-natal interventions on mothers

**Randomised Control Trials**
Twenty-two studies were found. Details of the duration follow up and approach/strategy for these studies are shown in Table 4.4. All the interventions (except one) lasted for less than 3 months. Duration of follow up was: 0-3 months (n=10), 4-6 months (n=7), 7-12 months (n=2) and one was 13-24 months. The most popular approach was education and counseling. Other strategies included mass media, the use of incentives and interpersonal contact.

**Uncontrolled Experimental Studies**
None were found.

**Cohort Studies**
There were 16 cohort studies, all of which ran for less than three months. The duration of follow-up was 0-3 months for seven of them, 4-6 months for eight of them, and 7-12 months for one. Four projects used educational strategies, four used counselling, and eight used mixed approaches.

<table>
<thead>
<tr>
<th>Table 4.4 Projects targeting mothers identified in the literature review</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Number of studies</strong></td>
</tr>
<tr>
<td><strong>Number effective (partly effective)</strong></td>
</tr>
<tr>
<td><strong>Duration (months)</strong></td>
</tr>
<tr>
<td>0-3</td>
</tr>
<tr>
<td>Unspecified</td>
</tr>
<tr>
<td><strong>Follow up (months)</strong></td>
</tr>
<tr>
<td>0-3</td>
</tr>
<tr>
<td>4-6</td>
</tr>
<tr>
<td>7-12</td>
</tr>
<tr>
<td>13-24</td>
</tr>
<tr>
<td>Unspecified</td>
</tr>
<tr>
<td><strong>Method employed</strong></td>
</tr>
<tr>
<td>Education</td>
</tr>
<tr>
<td>Counselling</td>
</tr>
<tr>
<td>Mixed approaches/other</td>
</tr>
</tbody>
</table>

**Commentary on effective studies**
Most studies examined the effect of counselling (during pregnancy or immediately postnatally) or other assistance (eg provision of an information pack), on the establishment or duration of breastfeeding. About half of the studies were effective according to their own criteria. Such a “success” rate may be considered remarkable given the brief duration of intervention, however, breastfeeding is influenced by several extra-maternal factors such as the father’s and family’s attitudes, and the post hospital environment. So these studies are for the most part limited to activities that hospitals might be reasonably expected to conduct. The take home message is that counselling and assistance to mothers in hospitals or birth centres is worthwhile. Not surprisingly, medical staff aim for mothers to leave hospital capable of and willing to
breast feed, so there are plenty of studies of how to do this. Unfortunately the cessation of breastfeeding, weaning, is much less studied.

**Examples of effective interventions on mothers**

**Frank et al. (1987) *Pediatrics* 80 (6): 845-854**

This intervention involved a 20-40 minute individual post partum counselling session with a nurse, in addition to, or in place of routine counselling. It also included an intervention discharge pack (which replaced the routine pack), breast pad and educational pamphlets (in English and Spanish) unequivocally advocating breastfeeding.

Intervention counselling resulted in delayed introduction of solid foods but there was no effect on breastfeeding by 4 months postpartum. Women who received the intervention discharge pack were more likely to prolong exclusive breastfeeding and delay the introduction of solid foods. There were lower rates of rehospitalisation of infants whose mothers received both the intervention discharge pack and intervention counselling.

**Taylor et al. (1985) *Acta Paediatr Scan Suppl* 316 15-22**

This study examined the effect of early contact (EC) between mother and infant (beginning approximately half an hour after delivery for an average of 46 minutes). Comparison of EC infants with regular contact (RC) infants (taken from the arms of the mother in recovery room and put in a crib beside her) showed that prolonged breast-feeding was not significantly associated with extra contact. However, suckling during extra early contact was associated with greater incidence of breast-feeding.


This study consisted of three intervention groups: group A (Referral card for call-in breastfeeding consultation), group B (Referral card plus manual providing information about breastfeeding problems common in first two weeks after delivery) and group C (Referral card, manual and bedside teaching session). The bedside teaching session included same information as the Manual, as well as assistance for the mother in putting baby to breast.

Thirty days post intervention the proportion still breastfeeding was significantly greater in group C (67%), than group B (25%) and group A (16%).


Three interventions were implemented in four ‘Women, Infants, Children’ (WIC) program clinics by WIC providers: 1) Control - usual WIC services for women 2) Waiting room video intervention (mainly prenatal) with posters, pamphlets and breastfeeding counselling; 3) Peer counselling before and after delivery 4) Combined 1) and 2).
Women intending to breastfeed were significantly more likely to initiate breastfeeding. Women with less education, vaginal delivery, who had not received infant feeding instructions and who had received artificial milk discharge packs in hospital were significantly less likely to initiate breastfeeding. Hospital practices were important determinants of breastfeeding initiation (decreased by vaginal delivery and by artificial milk discharge packs, increased by infant feeding instruction).


This study involved a mandatory one and a half hour hospital staff in-service education session, followed by an optional written tutorial completed individually over the following month.

Over a seven-month period, the intervention hospital experienced an increase in breastfeeding compliance, greater patient belief in breastfeeding, and increased rates of exclusive breastfeeding (pre-test: 31% versus post-test: 54%), but no change in attitudes (liking/disliking) to breastfeeding. There was no change in the control hospital.

In this pilot study there was a higher frequency of breastfeeding at 3, 6 and 12 weeks among mothers who received a structured program of home visits and breastfeeding advice.


In this study, women who indicated they wanted a trained peer counsellor were contacted by the counsellor (via telephone, letter, or in person at the WIC office) within a few days of delivery, and at 2 weeks, 1 month, 2 months and 3 months after delivery.

Participants who received peer counselling exhibited higher rates of exclusive breastfeeding across three months, and more exclusive breastfeeding was associated with longer duration overall. Mothers’ career plans had the greatest effect on breastfeeding duration. Duration of breastfeeding was associated with attendance at breastfeeding class and knowing someone who had breastfed. Women were discouraged from breastfeeding by returning to work or school and by the perception of a diminished milk supply.
## Table 4. Interventions on Mothers - Randomised Control Trials

<table>
<thead>
<tr>
<th>Study id</th>
<th>Author</th>
<th>Target outcomes/ program approach</th>
<th>Intervention period &amp; sample</th>
<th>Final outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>025</td>
<td>Frank, et al, 1987</td>
<td>Breastfeeding Counselling, Other</td>
<td>Intervention: 0-3 months Follow-up: 0-3 months Sample: 343</td>
<td>EFFECTIVE Counselling delayed onset of first introduction of solid foods but no effect on breastfeeding by 4 months postpartum. Women receiving the intervention pack were more likely to prolong exclusive breastfeeding and to delay onset solid foods. Lower rates rehospitalisation of infants whose mothers received both intervention pack and intervention counselling.</td>
</tr>
<tr>
<td>035</td>
<td>Howard, et al, 2000</td>
<td>Breastfeeding, Other</td>
<td>Intervention: 0-3 months Follow-up: 4-6 months Sample: Commercial pack (235); Research pack (209)</td>
<td>NOT EFFECTIVE (1) In those who chose to breastfeed: Intervention did not affect length of personal goals or likelihood of an uncertain goal, or goal attainment. (2) In sub-group of women with goal of 12 weeks or less or undefined personal goals: mean duration of full breastfeeding was reduced by 20 days, mean duration of exclusive breastfeeding reduced by 11 days.</td>
</tr>
<tr>
<td>037</td>
<td>Neifert, et al, 1988</td>
<td>Length of breast-feeding, Other</td>
<td>Intervention: 0-3 months Follow-up: 0-3 months, or weaning Sample: 60</td>
<td>NOT EFFECTIVE No difference in duration of breast-feeding or age at which formula supplementation begun for two gift-pack groups. Mothers found study pack more useful (included breast pads and pump).</td>
</tr>
<tr>
<td>052</td>
<td>Lynch, et al 1986</td>
<td>Breastfeeding, Counselling</td>
<td>Intervention: 0-3 months Follow-up: 7-12 months Sample: 135 in each group</td>
<td>NOT EFFECTIVE No difference in duration of breastfeeding between groups.</td>
</tr>
<tr>
<td>054</td>
<td>Taylor, et al, 1985</td>
<td>Breastfeeding, Other</td>
<td>Intervention: 0-3 months Follow-up: 13-24 months Sample: EC (39) RC (39) registered for study</td>
<td>NOT EFFECTIVE Prolonged breast-feeding was not significantly associated with extra contact. Suckling during extra early contact associated with greater incidence of breast-feeding for total subjects at two months and trend (3,4,5) months.</td>
</tr>
<tr>
<td>063</td>
<td>Johnson, et al, 1984</td>
<td>Breastfeeding, Educational</td>
<td>Intervention: 0-3 months Follow-up: 0-3 months Sample: On study entry (A=20/B=20/C=20), results shown only for sample size at end (see below)</td>
<td>EFFECTIVE Participants were randomised to one of three groups: group A (Referral card for call-in breastfeeding consultation), group B (Referral card plus manual providing information about breastfeeding problems common in first two weeks after delivery) and group C (Referral card, manual and bedside teaching session): Thirty days after intervention the proportion still breastfeeding was significantly greater in Group C (67%), than Group B (25%) and Group A (16%).</td>
</tr>
<tr>
<td>066</td>
<td>Steyn, et al, 1989</td>
<td>Breastfeeding, Mass media, Other</td>
<td>Intervention: 0-3 months Follow-up: 4-6 months (not given) Sample: Total 400/unknown in 3 groups</td>
<td>NOT EFFECTIVE Findings suggest that a combined mass media and interpersonal program was more successful than the mass media program alone.</td>
</tr>
<tr>
<td>082</td>
<td>Porteous, et al, 2000</td>
<td>Breastfeeding, Counselling</td>
<td>Intervention: 0-3 months Follow-up: 4-6 months Sample: Group I (27) Group C (25)</td>
<td>EFFECTIVE Postpartum care with individualised professional support in hospital and continued support in the community increased the duration of breastfeeding among women who identified themselves as being without breastfeeding support for the first month postpartum.</td>
</tr>
<tr>
<td>094</td>
<td>Curro, et al, 1997</td>
<td>Breastfeeding, Educational</td>
<td>Intervention: 0-3 months Follow-up: 4-6 months Sample: TR=103/CO=97</td>
<td>NOT EFFECTIVE Prevalence of breastfeeding at 6 months of age: no difference between treatment (TR) and control (CO) groups (exclusive breastfeeding: TR=48.5% v CO=43.7% or complementary feeding TR=43.7 v CO=38.8%).</td>
</tr>
<tr>
<td>Study id</td>
<td>Author</td>
<td>Target outcomes/ program approach</td>
<td>Intervention period &amp; sample</td>
<td>Final outcome</td>
</tr>
<tr>
<td>----------</td>
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<td>-----------------------------------</td>
<td>-----------------------------</td>
<td>--------------</td>
</tr>
<tr>
<td>104</td>
<td>Campbell Bliss, et al, 1997</td>
<td>Breastfeeding, Other</td>
<td>Intervention: 0-3 months Follow-up: 4-6 months Sample: 1625</td>
<td>NOT EFFECTIVE</td>
</tr>
<tr>
<td>108</td>
<td>Kafatos, et al, 1991</td>
<td>Breastfeeding, infant growth, use of available medical services, Education</td>
<td>Intervention: 0-3 months Follow-up: 7-12 months Sample: =263; I=296</td>
<td>NOT EFFECTIVE</td>
</tr>
<tr>
<td>112</td>
<td>Evans, et al, 1986</td>
<td>Breastfeeding, Other</td>
<td>Intervention: 0-3 months Follow-up: 0-3 months Sample: 115 consented follow-up 110</td>
<td>NOT EFFECTIVE</td>
</tr>
<tr>
<td>121</td>
<td>Cronenwett, et al, 1992</td>
<td>Breastfeeding, infant temperament</td>
<td>Intervention: 0-3 months Follow-up: 4-6 months Sample: 128 recruited, 121 completed study</td>
<td>NOT EFFECTIVE</td>
</tr>
<tr>
<td>130</td>
<td>Hill, 1985</td>
<td>Breastfeeding, Educational</td>
<td>Intervention: 0-3 months Follow-up: 0-3 months Sample: Total unknown/I=31, C=33</td>
<td>NOT EFFECTIVE</td>
</tr>
<tr>
<td>132</td>
<td>Serafino-Cross, et al, 1992</td>
<td>Breastfeeding, Counselling</td>
<td>Intervention: 0-3 months Follow-up: 0-3 months Sample: 89 approached/80 agreed/ 52/ I=26/C=26</td>
<td>EFFECTIVE</td>
</tr>
<tr>
<td>138</td>
<td>Sciacca, et al, 1995</td>
<td>Breastfeeding, Other</td>
<td>Intervention: 0-3 months Follow-up: 0-3 months Sample: I=34/29; C=34/26</td>
<td>EFFECTIVE</td>
</tr>
<tr>
<td>148</td>
<td>Kaplowitz et al, 1983</td>
<td>Breastfeeding, Other</td>
<td>Intervention: 0-3 months Follow-up: 0-3 months Sample: I=23, C=21</td>
<td>NOT EFFECTIVE</td>
</tr>
<tr>
<td>150</td>
<td>Dungy, et al, 1992</td>
<td>Breastfeeding, Other</td>
<td>Intervention: 0-3 months Follow-up: 0-3 months Sample: Criteria met (270); interviewed (216); breastfeeding (146)</td>
<td>EFFECTIVE</td>
</tr>
<tr>
<td>157</td>
<td>Fitzpatrick, et al, 1997</td>
<td>Multiple variables, of relevance: whole foods, vegetables, fruit, milk</td>
<td>Intervention: not specified Follow-up: 0-3 months</td>
<td>EFFECTIVE</td>
</tr>
</tbody>
</table>

CO=51.5%). The median duration of breastfeeding (weeks) was the same in both groups (exclusive TR=24 v 22, CO=22 and complementary feeding TR=27 v CO=25).

Contents of discharge packs had a negligible effect on feeding method and breastfeeding duration to 6 months. No effect of potential confounding variables found.

Higher proportion of mothers in Group I were willing to breastfeed on demand (61 v 38%). Lack of impact on breastfeeding may be explained by good overall pattern of breastfeeding initiation and duration in this area of rural Greece.

Cessation of breastfeeding by 6-7 weeks post partum: no difference for those who received formula samples; no difference for less education, primiparas, and illness postpartum

Group assignment had no effect on occurrence of breastfeeding problems, mother’s achievement of 90% of their prenatal breastfeeding duration goals, or on weeks to weaning. Breastfeeding was taking place at six months postpartum: PBG=59%, BFG=69%. Infant temperament had no effect on breastfeeding outcomes. Mother’s intention about breastfeeding was the most important factor in predictor of time to weaning.

Breastfeeding duration and perception of breastfeeding success: no difference (trend, but not significant).

Breastfeeding at two months: Higher frequency in intervention group (61.5% v. 34.6%). Reasons for termination of breastfeeding also identified.

Breastfeeding at all intervals to 3 months: Higher frequency in women who were given incentives throughout and who attended a separate education program.

The program appeared to be effective in increasing knowledge, but did not cause the women to form more positive attitudes towards breastfeeding or increase the incidence or duration of breastfeeding.

Duration of exclusive breastfeeding: Longer in women with breast pump (but no formula) than women with formula (mean 4.2 vs. 2.8 weeks).
<table>
<thead>
<tr>
<th>Study id</th>
<th>Author</th>
<th>Target outcomes/ program approach</th>
<th>Intervention period &amp; sample</th>
<th>Final outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>158</td>
<td>Sciacca, et al, 1995</td>
<td>Breastfeeding, Educational</td>
<td>Intervention: 0-3 months</td>
<td>EFFECTIVE</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Follow-up: 0-3 months</td>
<td>Findings suggest that incentives (such as donated prizes) can be used to attract low socio-economic group women and their partners to breast-feeding promotion interventions. Such participation can produce increase in breast-feeding knowledge and positive change in attitudes and support and can have a dramatic effect in promoting breast-feeding.</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>Sample: Total=68/55/I=34/26:</td>
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<td></td>
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<td></td>
<td>C=34/29</td>
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</tr>
<tr>
<td>160</td>
<td>Dungy, et al, 1997</td>
<td>Breastfeeding, Other</td>
<td>Intervention: 0-3 months</td>
<td>NOT EFFECTIVE</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Follow-up: 4-6 months</td>
<td>The content of the hospital discharge pack did not affect whether the mother engaged in partial or exclusive breastfeeding during the 16-week follow-up. Study does not support hypothesis that inclusion of commercial infant formula in hospital discharge packs decreases the duration of breastfeeding.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Sample: 1012/810/763:</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>BP=251/BPIF=255/IF=257</td>
<td></td>
</tr>
<tr>
<td>043</td>
<td>Taddei, et al, 2000</td>
<td>Breastfeeding, Workforce</td>
<td>Intervention: 0-3 months</td>
<td>EFFECTIVE</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Follow-up: 4-6 months</td>
<td>Increase in estimated adj rates for children born in hospitals with trained personnel for exclusive and full breastfeeding but no change for total breastfeeding</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Sample: Drop out before course 19%, after course 16% / Numbers</td>
<td></td>
</tr>
<tr>
<td>Study id</td>
<td>Author</td>
<td>Target outcomes / program approach</td>
<td>Intervention period &amp; sample</td>
<td>Final outcome</td>
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</tr>
<tr>
<td>039</td>
<td>Neyzi, et al, 1991</td>
<td>breastfeeding / educational</td>
<td>Intervention: 0-3 months Follow-up: 4-6 months Sample: (20.9% drop out rate)</td>
<td>EFFECTIVE Frequency of breastfeeding higher in study group for two months post-intervention, but the impact of the intervention was low and short-lived.</td>
</tr>
<tr>
<td>041</td>
<td>Caulfield, et al, 1988</td>
<td>Breastfeeding / counselling, mass media</td>
<td>Intervention: 0-3 months Follow-up: 4-6 months Sample: 674 started</td>
<td>EFFECTIVE Women intending to breastfeed at enrolment as well as at 34 weeks were significantly more likely to initiate breastfeeding. Hospital practices were important determinants of breastfeeding initiation (decreased by vaginal delivery and by artificial milk discharge packs, increased by infant feeding instruction)</td>
</tr>
<tr>
<td>045</td>
<td>Reifsnider, et al, 1997</td>
<td>breastfeeding / educational</td>
<td>Intervention: 0-3 months Follow-up: 4-6 months Sample: Control (24), exclt (23)</td>
<td>EFFECTIVE No difference in breastfeeding initiation between groups. Longer duration of breastfeeding in experimental (mean 76 days) than controls (mean 29.5 days). Higher % of experimental group were breastfeeding at 3 and 4 months compared to controls.</td>
</tr>
<tr>
<td>050</td>
<td>Kistin, et al, 1994</td>
<td>breastfeeding / counselling</td>
<td>Intervention: 0-3 months Follow-up: 4-6 months Sample: Counsellor (59) No counsellor (43)</td>
<td>NOT EFFECTIVE Findings suggest peer counsellors (well-trained and with on-going supervision) can have a positive effect on breastfeeding practices among low income urban women who intend to breastfeed. Mean duration of exclusive breastfeeding (8 weeks v 4 weeks) and of breastfeeding (one or more times daily) (15 weeks v 8 weeks)</td>
</tr>
<tr>
<td>080</td>
<td>Martens, 2000</td>
<td>1) Increase in compliance with BFHI criteria 2) Increase in staff breastfeeding belief and attitude scores and decrease in bottle-feeding belief scores 3) Increase in proportion of mothers exclusively breastfeeding while in hospital Approach: educational</td>
<td>Intervention: 0-3 months Follow-up: 0-3 months Sample: S=20/15staff; C=18/16 staff. S=21/20infants C=20/14 infants</td>
<td>EFFECTIVE Over a 7 month period, intervention hospital experienced an increase in BFHI compliance, breastfeeding beliefs, and exclusive breastfeeding rates (pre-test 31% post-test 54%), but no change in breastfeeding attitudes. The control hospital did not improve in any way.</td>
</tr>
<tr>
<td>084</td>
<td>Skibsted, et al 1990</td>
<td>Influence of place on delivery and place of birth / other</td>
<td>Intervention: 0-3 months Follow-up: 4-6 months Sample: ABC=125; [ABCR=24; O=146]</td>
<td>EFFECTIVE Fourteen weeks after delivery: Higher percent of mothers breastfeeding without supplement (68.4 v 51.8%). Breastfeeding success had a positive correlation (separately) to higher social groups, delivering at an alternative birth clinic (ABC), number of antenatal care visits, increasing maternal age. Birthplace and social group were isolated (together) as factors that could explain the differences in the course of breastfeeding in ABC and the obstetrics ward (O). (ABCR = refused by ABC as there was no place available)</td>
</tr>
<tr>
<td>090</td>
<td>Waldenstrom, et al, 1987</td>
<td>breastfeeding / other</td>
<td>Intervention: 0-3 months Follow-up: 4-6 months</td>
<td>NOT EFFECTIVE No difference between experimental group and control group women in success of breastfeeding from first 14 days after birth. More likely (tendency) for multiparous women to have longer duration of breastfeeding in early discharge group.</td>
</tr>
<tr>
<td>096</td>
<td>Righard, et al, 1992</td>
<td>breastfeeding / other</td>
<td>Intervention: 0-3 months Follow-up: 4-6 months Sample: CS=28, ICS=29, IS=25</td>
<td>NOT EFFECTIVE At 4 month follow-up: Higher proportion of breastfeeding problems and earlier cessation of breastfeeding and more common regular use of pacifier (more than 2 hrs a day) than the other two groups (ICS and CS). (ICS – infants with faulty sucking technique corrected when observed, IS - infants with faulty sucking technique remaining uncorrected, CS – control group with correct sucking technique)</td>
</tr>
<tr>
<td>Study id</td>
<td>Author</td>
<td>Target outcomes / program approach</td>
<td>Intervention period &amp; sample</td>
<td>Final outcome</td>
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<tr>
<td>106</td>
<td>Hauck, et al, 1994</td>
<td>breastfeeding / educational</td>
<td>Intervention: 0-3 months Follow-up: 4-6 months Sample: I=143, C=64</td>
<td>NOT EFFECTIVE No difference for breastfeeding duration between groups. 97% of experimental group found the information book useful.</td>
</tr>
<tr>
<td>110</td>
<td>Schafer, et al, 1998</td>
<td>breastfeeding, dietary intake, knowledge / counselling</td>
<td>Intervention: 0-3 months Follow-up: 0-3 months Sample: E=75/C=75</td>
<td>NOT EFFECTIVE Volunteer peer-counselling program providing role models, accurate information, support and encouragement can increase the duration of breastfeeding.</td>
</tr>
<tr>
<td>123</td>
<td>Jenner, 1988</td>
<td>breastfeeding / other</td>
<td>Intervention: 0-3 months Follow-up: 0-3 months Sample: 38 women (C=19, I=19)</td>
<td>EFFECTIVE Successful breastfeeding (breast milk alone for three months): Higher in Intervention group (68 v 21%).</td>
</tr>
<tr>
<td>128</td>
<td>Kelly, 1983</td>
<td>breastfeeding / counselling</td>
<td>Intervention: 0-3 months Follow-up: 0-3 months Sample: 71/38/ I=19, C=19</td>
<td>PARTLY EFFECTIVE Pilot study only. Breastfeeding at 3,6,12 weeks: Higher frequency in mothers who received structured program of home visits and breastfeeding advice. Not statistically significant but approaching significance at week 12.</td>
</tr>
<tr>
<td>134</td>
<td>Arlotti, et al, 1998</td>
<td>breastfeeding / counselling</td>
<td>Intervention: 0-3 months Follow-up: 0-3 months Sample: 48/36/ I=18, C=18</td>
<td>EFFECTIVE Participants in the peer counsellor group exhibited higher rates of exclusive breastfeeding across three months, and more exclusive breastfeeding was associated with longer duration overall. Mothers’ career plans had the greatest effect on breastfeeding duration. Positive correlation of longer breastfeeding duration with attendance at breastfeeding class and knowing someone who had breastfed. Women were discouraged from breastfeeding by returning to work/school/both and the perception of a diminished milk supply.</td>
</tr>
<tr>
<td>136</td>
<td>Hill, et al, 1997</td>
<td>breastfeeding / other</td>
<td>Intervention: 0-3 months Follow-up: 7-12 months Sample: Phase I (120/105); Phase II (22/3/2009)</td>
<td>EFFECTIVE (negative effect) Early introduction of supplemental bottles of artificial milk was associated with a decrease in the amount of human milk the infant received as well as with early weaning.</td>
</tr>
<tr>
<td>144</td>
<td>Volpe, et al, 2000</td>
<td>breastfeeding / educational</td>
<td>Intervention: 0-3 months Follow-up: 0-3 months Sample: C=48, I=43</td>
<td>EFFECTIVE Initiation of breastfeeding: Higher in adolescents who received specific breastfeeding education (65 vs.15%).</td>
</tr>
<tr>
<td>154</td>
<td>Berry, 1994</td>
<td>breastfeeding / other</td>
<td>Intervention: 0-3 months Follow-up: 0-3 months Sample: 40/I=20; C=20</td>
<td>NOT EFFECTIVE The results of this preliminary study indicate that the feeding practices of postnatal women probably directly influence one another.</td>
</tr>
<tr>
<td>156</td>
<td>Hart, et al, 1980</td>
<td>breastfeeding / counselling</td>
<td>Intervention: 0-3 months Follow-up: 0-3 months Sample: 1974-75 sample (Camden=154, Paddington=85) le I (Camden=66, Paddington=59): C=87</td>
<td>EFFECTIVE There was an increase in the incidence of breastfeeding at all time intervals following the introduction of a program to encourage breastfeeding through increased contact and support by a health visitor and child health clinic antenatally and postnatally.</td>
</tr>
<tr>
<td>056</td>
<td>Schutzman, et al, 1986</td>
<td>Breastfeeding / Other</td>
<td>Intervention: 0-3 months Follow-up: 0-3 months</td>
<td>NOT EFFECTIVE No difference in time of arrival of milk between infants demand fed (mean 54.9 hours) and those demand...</td>
</tr>
<tr>
<td>Study id</td>
<td>Author</td>
<td>Target outcomes / program approach</td>
<td>Intervention period &amp; sample</td>
<td>Final outcome</td>
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</tr>
<tr>
<td>072</td>
<td>Schubiger, et al, 1997</td>
<td>Breastfeeding,/ Other</td>
<td>Intervention: 0-3 months Follow-up: 4-6 months Sample: UNICEF (294), Std (308)</td>
<td>NOT EFFECTIVE Fluid supplements offered by bottle with or without the use of pacifiers during the first 5 days of life were not associated with a lower frequency or shorter duration of breastfeeding during the first 6 months of life.</td>
</tr>
<tr>
<td>076</td>
<td>Martin-Calama, et al, 1997</td>
<td>Infant weight loss (up to 72 hours of life), serum glucose level (up to 48 hours), temperature (first 72 hours), age of introduction of infant formulas, breastfeeding duration, Approach: Other</td>
<td>Intervention: 0-3 months Follow-up: 4-6 months Sample: GW=90; NGW=90</td>
<td>NOT EFFECTIVE Suppression of feedings with glucose water in the first days of life increases the probability of successful breastfeeding. No difference between groups in the percentage of mothers that introduced formula at each interval (after one month and before 5 months).</td>
</tr>
</tbody>
</table>
4.3.2 - Interventions on infants and preschoolers

Randomised Control Trials
There were four RCT studies targeting this age group. The duration of these studies ranged from 0-3 months to more than two years (Table 4.8).

Non Random Studies
There was one study in this category. It was 24 months long with more than 24 months of follow up and used an educational approach. It was ineffective. (Table 4.9)

Cohort Studies
There were no studies in this category.

| Table 4.7 Projects targeting infants and preschoolers as identified in the literature review |
|---------------------------------|---------------------------------|---------------------------------|
| RCTs                           | Cohort Designs                  | Non-random with control         |
| Number of studies              | 4                               | 0                              | 1                              |
| Effective (+ partly)           | 2                               | 0                              | 0                              |
| Duration:                      |                                 |                                 |                                |
| 0-3 months                     | 1                               | 0                              | 0                              |
| 4-6 months                     | 0                               | 0                              | 0                              |
| 7-12 months                    | 1                               | 0                              | 1                              |
| > 2 years                      | 1                               | 0                              | 0                              |
| Unspecified                    | 1                               | 0                              | 0                              |
| Follow up:                     |                                 |                                 |                                |
| 0-3 months                     | 1                               | 0                              | 0                              |
| 4-6 months                     | 0                               | 0                              | 0                              |
| 7-12 months                    | 0                               | 0                              | 0                              |
| 13-24 months                   | 0                               | 0                              | 1                              |
| Unspecified                    | 3                               | 0                              | 0                              |
| Methods:                       |                                 |                                 |                                |
| Education                      | 2                               | 0                              | 1                              |
| Mixed approaches/ other        | 2                               | 0                              | 0                              |

Commentary on effective studies
Four of the interventions were classified as effective. The published literature is somewhat at odds with the lively work that is being conducted in this age group in various parts of Australia, particularly in Western Australia. The few published studies highlight the lack of evaluation in this area, but do suggest that intervention may be worthwhile. The non-intervention work of work of Leanne Birch and associates (eg Birch and Fisher 1998) has had strong influence in the pre-school sectors, and includes the identification of key change variables such as repeated exposure to novel foods, child and adult modelling of eating, reinforcement strategies and taste exploration. Although there is little evidence, clearly this is an important age group in which parents are strongly connected to their children and so must rank as a priority stage in the establishment of healthy eating habits.
### Table 4. Interventions on infants and preschoolers - Randomised Control Trials

<table>
<thead>
<tr>
<th>Study id</th>
<th>Author</th>
<th>Target outcomes/program approach</th>
<th>Intervention period &amp; sample</th>
<th>Final outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>097</td>
<td>Hammond, et al, 1998</td>
<td>Familiarity with various foods (not discussed for review) and willingness to eat them. Educational</td>
<td>Intervention: 7-12 months Follow-up: Not specified Sample: I=91, C=83</td>
<td>NOT EFFECTIVE No direct impact on students’ willingness to eat the specific foods was observed as a result of exposure to the nutrition program.</td>
</tr>
<tr>
<td>113</td>
<td>Lagstrom, et al, 1997</td>
<td>Dietary intake of: energy (kJ), fat (g), cholesterol (mg), carbohydrate (g), sucrose (g), fibre (g), protein (g), fat as % of energy intake. Educational</td>
<td>Intervention: 24 months+ Follow-up: Not specified 4 years Sample: I=540, C=522 (check this)</td>
<td>EFFECTIVE The intakes of fat and cholesterol, and those of saturated and polyunsaturated fat, differed markedly between children in the intervention and control group (p&lt;.001).</td>
</tr>
<tr>
<td>167</td>
<td>Dixon, L.B., Tershakovec, A.M., McKenzie, J., Shannon, B. (2000)</td>
<td>fat, fruit &amp; veg, sodium, calcium, complex CHO (+ dietary quality) Target group: pre school/primary age Approach: educational, family involvement</td>
<td>Study design: prospective cohort with control Duration of intervention: 0-3 months Follow up: 0-3 months</td>
<td>NOT EFFECTIVE This study evaluated the impact of a nutrition education in promoting lower dietary fat on the overall diet quality in children using a multidimensional index that measures nutrient and food intakes in relation to US dietary recommendations. Before and after measures of diet quality based on 24 hour recall were conducted at baseline and 3 months. Target outcomes were fat, fruit &amp; veg, sodium, calcium, complex CHO and calcium. Before and after measures of diet quality based on 24 hour recall were conducted at baseline and 3 months. Target outcomes were fat, fruit &amp; veg, sodium, calcium, complex CHO (+ dietary quality) Outcomes - 3 months: parent child- n=71; counselling- n=77; at risk control- n=79; not at risk controls- n=76 baseline: pc- 5.6+/- 0.2; c- 6.0+/- 0.2; arc- 5.7+/- 0.2; narc- 5.8+/- 0.2 3 months: pc- 5.2+/- 0.2; c- 5.5+/- 0.2; arc- 6.0+/- 0.2; narc- 5.7+/- 0.2 Simple changes are reported although these appear to be inconsistent with baseline/ final data.</td>
</tr>
<tr>
<td>166</td>
<td>Sangster, et al, 1999</td>
<td>Multiple outcomes: two non meat meals served per fortnight; three serves of dairy food each day; two or more serves of bread/cereal per day; one vegetable served per day; 100% juice served, not fruit juice drink or cordial. Educational, food service, workforce Approach: other</td>
<td>Intervention: not specified Follow-up: Not specified Sample: I=40 long day care centres, C=20 long day care centres.</td>
<td>EFFECTIVE POST TEST: Significant improvements were seen in the nutritional adequacy of intervention centre menus (p&lt;.05), reflected in the type of foods offered; there was a 45% increase in the number of centres with adequate serves of dairy foods on their menu, and a 21% increase in the number of centres with adequate serves of breads or cereals. Control centres showed no significant improvements.</td>
</tr>
<tr>
<td>study id</td>
<td>author</td>
<td>target outcome/program approach</td>
<td>sample size start:total/control/otherarms</td>
<td>Final outcome</td>
</tr>
<tr>
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</tr>
<tr>
<td>161</td>
<td>Heino, T., Kallio, K., Jokinen, E., Lagstrom, H., Seppanen, R., Valimaki, I., Vilkar, J., Ronnemaa, T., Simell, O. (2000)</td>
<td>Outcome of relevense was: Sodium intake mg/d. Approach: educational</td>
<td>Sample size: I=100 / C=100 Study design: non-rand with control Duration of intervention: 24 months Follow up: 24 months</td>
<td>NOT EFFECTIVE The intervention children consumed as much or slightly more sodium than the control children at all ages studied. Sodium intakes of boys &amp; girls was very similar. This approach to nutrition counselling, with its main focus being the quality of fat in the children's diet, had minimal influence on sodium intake.</td>
</tr>
</tbody>
</table>
Examples of effective interventions on infants and preschoolers


This study was part of the STRIP project, a long-term coronary heart disease prevention study. The parents in the intervention group were counselled to reduce their child’s intake of saturated fat and cholesterol, but to ensure adequate energy intake. These children were seen at 1-3 monthly intervals until two years of age and then twice yearly. Dietary issues were discussed with families of children in the control group only briefly according to current practice of ‘Well Baby Clinics’. Children in the control group were seen twice yearly from the beginning of the trial.

At four years of age the intakes of fat, cholesterol, saturated and polyunsaturated fat, differed markedly between children in the intervention and control group (p<.001).


The ‘Good Food for Children’ (GFFC) project was a multi-strategic intervention aimed at improving the nutritional adequacy of food provided in childcare centres. The major strategies of the intervention were: assessment of centres’ menus with individual feedback to each centre; advice on development of policies; workshops for child care staff to improve nutrition knowledge and skills; improvement of training and support for child care cooks; provision of nutrition information for parents; and intersectoral collaboration with government departments responsible for child care to improve legislation and guidelines relating to food in child care centres. Only two of these strategies are discussed in this paper: assessment of menus with feedback and development of workshops for childcare staff.

Significant improvements were seen in the nutritional adequacy of intervention centre menus (p<.05), reflected in the type of foods offered; there was a 45% increase in the number of centres with adequate serves of dairy foods on their menu, and a 21% increase in the number of centres with adequate serves of breads or cereals. Control centres showed no significant improvements.

4.3.3 - Interventions on primary school children

*Randomised Control Trials*

Duration: 10 studies were 0-3 months, six were 4-6 months, four were seven to 12 months, 6 were two years or more. Time lapse prior to follow-up: 17 were 0-3 months, three were 4-6 months, 1 was 7-12 months, one was 13-24 months three were more than two years, and one was not specified. Five studies used educational approaches only, 14 were educational with a family component, two used education and food service approaches, one used food service only, mixed approaches four others used food service and family approaches and used a community and educational approach. Twenty studies were reported to be effective. (Table 4.11)
Non Random Control Studies
Duration (22 studies): five were 0-3 months, three were 4-6 months, six were 7-12 months, three at 13-24 months and four were more than 24 months long, and one was not specified. The durations of follow-up were: 0-3 months (18 studies), 4-6 months (1), 13-24 months (2) and one was more than 24 months. The main program approaches were education only (7), education plus family (8), education and food service (6) and one was food service only. (Table 4.12)

Cohort Studies
One study was a prospective study design.

<p>| Table 4.10 Projects targeting primary school children as identified from literature review |
|--------------------------------------------------|-----------------|-----------------|-----------------|</p>
<table>
<thead>
<tr>
<th><strong>Number of studies</strong></th>
<th><strong>RCTs</strong></th>
<th><strong>Cohort Designs</strong></th>
<th><strong>Uncontrolled Designs</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of studies</td>
<td>22</td>
<td>1</td>
<td>22</td>
</tr>
<tr>
<td>Effective (+ partly)</td>
<td>12 (5)</td>
<td>1</td>
<td>16 (4)</td>
</tr>
<tr>
<td>Duration:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-3 months</td>
<td>8</td>
<td>-</td>
<td>5</td>
</tr>
<tr>
<td>4-6 months</td>
<td>5</td>
<td>-</td>
<td>3</td>
</tr>
<tr>
<td>7-12 months</td>
<td>4</td>
<td>-</td>
<td>6</td>
</tr>
<tr>
<td>13-24 months</td>
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<td>-</td>
<td>4</td>
</tr>
<tr>
<td>&gt; 2 years</td>
<td>5</td>
<td>-</td>
<td>4</td>
</tr>
<tr>
<td>Unspecified</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Not applicable</td>
<td>-</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>Follow up:</td>
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<td>0-3 months</td>
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<td>7-12 months</td>
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<tr>
<td>13-24 months</td>
<td>3</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td>Unspecified</td>
<td>1</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Not applicable</td>
<td>-</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>Methods:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td>5</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>Mixed approaches/other</td>
<td>17</td>
<td>1</td>
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</tbody>
</table>

Commentary on effective studies

Randomised Control Trials
Sixteen studies, the majority of the RCT studies in primary aged children, were effective in altering the food consumption of treatment children. However, most of the interventions were of less than three months duration and most were evaluated soon after the completion of the interventions.

It is difficult to compare the studies as most have different outcomes measured in different ways. It is also difficult to compare the methodologies of the studies. Some were quite complex interventions based on social and behavioural theories (e.g. Whittaker, et al (1994), Perry and Bishop (1998) and Wechsler et al (1998)) whilst
others of seemingly similar efficacy were very simple short-term interventions. In this respect, a study by Kirks and Hughes (1986), which had effects apparently for five years after the intervention, and La Porte et al’s study (165), are noteworthy.

Our conclusion is that there is plenty of evidence that school-based interventions on primary school children work, sometimes in the long term, but that clearer definition of goals and methodologies is required. The importance of local context, staff commitment and quality of management systems needed to be considered. Findings in studies involving primary/secondary age children are quite similar to those from primary aged students in that they are encouraging but not dramatic. The ‘Know Your Body’ program has run for a long time and has been applied successfully in low SES areas. It should be noted that for many of these programs behaviour change was not the only or even the major intended outcome. Other measures included changes in biomedical outcomes such as blood pressure.

Non-random with control
Again, most of these studies were effective, however, most were short interventions and few were evaluated for a long period post intervention. Many materials have been developed in response to local and temporally defined needs (such as the heart health campaigns of the 1980s). Classroom education with or without improved food services and parental involvement can have at least short-term effects on children’s eating behaviours (ref?).

Cohort Studies - There was one prospective cohort study. The study was effective and provides a useful reminder of the importance of foods provided at school – if the menus are healthy, children have a better chance of eating healthy food while at school.

Examples of effective interventions on primary school children

Randomised Control Trials


The intervention consisted of four components:

1. Behavioral curricula. Two curricula were written for the 4th and 5th grades. Each included 16 x 40-45 minute classroom sessions implemented twice a week for 8 weeks. Skill building and problem solving activities were included, as well as snack preparation and taste testing. New role models were introduced via comic books. Students formed teams during both curricula, and a team competition to eat fruit and vegetables during lunch was a central component of each program. Small prizes were awarded on an individual and team basis at the end of each program.

2. Parental education and involvement. The 4th grade program consisted of five information/activity packs for students and parents to complete in the home. The 5th grade program consisted of four snack packs that children took home. These were prepared by the school food service and contained food items (including fruit and vegetables) for the students to prepare for their families at home.
3. **The food service intervention** encouraged selection and consumption of fruit and vegetables at school lunch via four strategies:
   a) point of purchase promotion of fruit and vegetables using characters and messages from the classroom curricula,
   b) enhancing attractiveness of fruit and vegetables served daily at school lunch,
   c) increasing variety and choice of fruit and vegetables available to students,
   d) providing an additional fruit item on days when a baked dessert was served.

4. **Industry involvement** included support from the 72 member Minnesota 5-a-Day Coalition. This included supply of produce for classroom taste testing, home snack packs and school lunches, providing classroom presentations and additional educational and incentive materials.

**POST PROGRAM PERIOD: LUNCHROOM OBSERVATIONS:**

Higher intakes (statistically significant) were observed in the intervention schools compared to the control schools, for all primary variables, except for servings of vegetables. There was however a significant intervention effect for vegetable consumption at lunch for girls.

**24 HR RECALL:** Significant intervention effects were seen for servings of fruit, as well as a significant reduction in the % of calories as fat.

**HEALTH BEHAVIOR QA:** There was a significant increase in the usual daily servings of fruit and vegetables.


This intervention was implemented as part of the Washington Heights-Inwood Healthy Heart Program, a community based cardiovascular disease prevention project. The intervention was designed using the PRECEDE framework, to be highly focused, entertaining and replicable. It featured a number of techniques used in social marketing campaigns, such as product positioning, celebrity endorsements (a charismatic Disney like anthropomorphic cow, Lowfat Lucy), taste tests, "teaser" advertising (eg posters saying "Lucy is coming in 2 weeks" .. "one week".."2 days".."tomorrow"), point of purchase advertising (3D cut outs of Lucy holding low fat milk carton), product related contests with product related prizes and products (tee shirts, magnets and novelty pencils), a slogan and persuasion through entertainment. The intervention targeted behaviour change related to one food item and was based on the belief that dietary change campaigns can be most effective when they target specific foods rather than nutrients or general eating patterns. To provide culturally appropriate role models, people of Latino background delivered all educational activities. Demands made on teachers and administrators were kept to a minimum. The intervention activities did not involve any classroom lessons.

**3-4 MONTHS POST PROGRAM:** Although there were modest declines from the immediate post intervention data, differences remained significant at 3-4 months follow up.

**Walter (1989) Health Education Quarterly 16 (2): 201 - 214**

The ‘Know Your Body’ (KYB) intervention model combined the "population" (all children receive general intervention) and "individual" (high-risk children receive special intervention) strategies, utilized the school (population strategy) and the
medical care system (high-risk strategy) as delivery vehicles, and was targeted primarily at the classroom student (as opposed to parents and the environment). The program consisted of three components:

1. **The teacher delivered implementation of a classroom curriculum:** The curriculum was intended to provide the motivation and capability required for favourable voluntary behaviour change. It focused on diet, physical activity and cigarette smoking prevention, and required approximately two hours per week throughout each school year for complete delivery.

2. **Parent education:** This component also sought (in a more limited way) to provide behavioural motivation and capability to students’ parents. It consisted of four main elements: self assessment of chronic disease behavioural risk status; receipt of newsletters; participation with the student in curriculum activities; and attendance at seminars.

3. **Periodic examination in the school setting of students' risk factor levels:** This provided an opportunity for students to become aware of their personal health status, thereby facilitating goal setting and providing reinforcement for favourable behaviour change.

After five years of program implementation, immediately POST PROGRAM: Rate of change per year, difference in school mean (intervention/control) with 95% CI. Total fat, % total kcal: -3.6 (-7.1 - -0.1), Total carbohydrate, % total kcal: +4.5 (0.1 - 8.9), Sodium/1000kcal (mg), -62 (-317 - 193). The net mean reduction in total fat intake was -3.6% (95% CI -7.1 - -0.1) and the net mean increase in total carbohydrate was 4.5% (95% CI 0.1 - 8.9).

**Baranowski et al. (2000) Health Education & Behaviour 27 (1): 96-111**

GIMME 5 was a theory based multi-component, randomised controlled intervention trial. The intervention was a six week (12 x 45-55 minute session) grade appropriate intervention delivered in January/February 1995 and again in 1996. The curriculum was designed to be fun and participative while targeting behaviour change. GIMME 5 encouraged and assisted 4th and 5th grade students to eat more servings of fruit, juice and vegetables (FJV) by:

- **a) increasing FJV availability-accessibility** at home and at fast food restaurants through role plays and other activities to develop students’ ‘asking’ skills;
- **b) enhancing students' preferences for FJV** by strongly encouraging students to taste the fast, simple, safe and tasty (FaSST) FJV recipes prepared in class;
- **c) training students' in FaSST FJV preparation** to increase their FJV snack and meal preparation skills;
- **d) training students in goal setting** to mobilise skills to increase intake;
- **e) training students in problem solving skills** for cases in which initial goals were not attained.

Students earned points toward a small prize for attaining three dietary change goals in each grade. The 4th grade curriculum targeted vegetable consumption alone whilst
the 5th grade curriculum emphasized F and J, but included V to achieve five FJV servings a day. A range of resources complemented curriculum delivery and included transparencies, handouts, worksheets, posters, teacher and parent newsletters, videotapes, and point of purchase education.

IMMEDIATE POST PROGRAM: Significant group by time effects favouring the treatment group were observed for FJV combined (p=.038) and V alone (p=.004), but not F. The pattern of means revealed that the treatment appeared to mitigate a decline in FJV consumption. In summary, favourable results were observed for consumption of FJV combined and FJV consumed at weekday lunch.


Four one-hour classroom lessons were taught every 6-8 weeks after baseline testing. The message was to decrease dietary fat, cholesterol, sodium and sugar; increase complex carbohydrate and fibre; consume less than 30% of calories from fat, less than 10% calories from saturated fat, and less than 300mg cholesterol. The social learning approach focused on individual, behavioural and environmental factors that influence behaviour. Lessons involved skill building and utilised role models, including peers, parents, teachers, athletes and cartoon characters. Another facet of the model was progression through a series of goals, e.g. the family was asked to switch from whole milk to 2% milk to 1% milk and then to skim milk. Traditional teaching provided information about heart disease and focused on how the heart works, and how healthy eating reduces cardiac risk. There was no reinforcement by role models, hands on skill building activities, or other social learning guided activities.

SPRING 1993: Food Behaviour: The use of high fat foods decreased for both groups (p<.01). The social learning group decreased the intake of high fat foods by 23%, and the traditional group decreased intake by 18% (p<.05). For both groups, the use of high sodium foods decreased by 12% (p<.01), and the use of high sugar foods decreased by 15% (p<.01). The reported use of heart healthy foods did not change in either group. Physical Measures: height, weight and BMI increased similarly for both groups from fall to spring.


In 1979, three schools were matched and randomly assigned to one of three groups; one in which both students and parents received regular nutrition education (SPI), one in which only the students received nutrition education (SI), and one control school. In addition to classroom education for their children, parents of the children in the SPI group received biweekly newsletters with nutrition information, had family menus analysed for nutrient content, and had access to a dietitian five days a week to answer questions regarding food, nutrition and health. The questionnaire used to assess diet in this study was re-sent to the parents of the original sample five years after the original study.

AFTER 5 YEARS: The analyses showed that, in general, the participants in the SPI group were eating a higher quality diet than the participants in either of the other groups. Compared to the other groups, the SPI group were consuming significantly
greater quantities of vegetables and milk/milk products. Cereals were also reported to be consumed in greater variety by this group (p<.05). The values for meat/poultry/fish and juices approached significance. 


‘High 5’ was a multi component intervention incorporating classroom, parent and food service components.

**Classroom component:** Learning methods included modelling, self monitoring, problem solving, reinforcement, taste testing and others. 14 lesson curriculum was delivered on three consecutive days each week, with a 30-45 min lesson presented on the first day, a ‘High 5’ Day (when children were challenged to eat five servings of fruit and vegetables) observed on the second day, and 30-45 min lesson on the third day. A homework section was included to reinforce skills and parents were alerted to the ‘High 5’ Days so they could also encourage increased fruit and vegetable servings.

**Parent component:** Parents were presented with an overview of the program during an evening function at each school. They were asked to encourage and support behaviour change, and to assist with homework assignments.

**Food service component:** Food service managers and staff were trained in purchasing, preparing and promoting fruit and vegetables in a way that met the ‘High 5’ guidelines. Cafeterias were rated monthly by project nutritionists, depending on their completion of 10 intervention activities.

At follow up 1 and follow up 2 children in the intervention group consumed significantly more servings of fruit and vegetables combined than control children, as indicated by 24 hour recall. Differences between conditions were smaller at follow up 2. Children in the intervention group also consumed more servings of fruit and vegetables separately. Intervention effects were not observed in the cafeteria observation data at either follow up period. At follow up 1 and 2, after adjusting for baseline levels, treatment differences were found favouring the intervention group for total fat, saturated fat, carbohydrate and fibre. Total calories consumed (energy) did not differ between conditions. This pattern suggests a program effect for the displacement of fat calories with carbohydrate and other energy sources.

Hopper et al. (1992) *Res Q Exerc Sport* 63 (3): 315-21

This study consisted of three groups: **control** - no additional instruction; **school only** - in class instruction and activities related to developing healthy exercise and nutrition habits; and **school and home** - in class instruction and activities related to developing healthy exercise and nutrition habits. Children's parents were also asked to participate by engaging in specific nutritional and exercise activities at home with their family as a home team.

**Curriculum details:**

PHYSICAL FITNESS EDUCATION. 'School and home' and 'school only' groups received PE instruction for 3 x 40 mins /week for six weeks. Concepts were based on
the Superkids-Superfit program from the ‘Bogalusa Heart Study’ and the ‘Know Your Body Program’.

NUTRITION EDUCATION. Children in the 'school and home' and 'school only' groups received nutrition education in 2 x 30 min sessions/ week for 6 weeks. The main focus of the curriculum was reducing saturated fat in the diet, but the following topics were also included: preparing snacks using fruit and vegetables, preparing heart healthy meals (reducing salt, sugar, saturated fat and cholesterol), reading food labels, and eating high fibre foods, meat alternatives, and high energy foods. Methods included hands on preparation of foods, films, games, group discussions, and role plays. Food choices were designated as 'everyday foods' or 'sometimes foods' using the approach from the Minnesota Heart Project. Students were taught specific concepts relating to nutrition and its influence on cardiovascular disease. They were also taught how to discuss nutritional topics at home with their parents and how eating habits could be improved within the family.

FAMILY EXERCISE and NUTRITION. Each week, children in the 'school and home' group were given take home activity packets about healthy nutrition and exercise habits. Families received directions for preparing healthy foods and completing exercise activities as a family. The packets included guidelines for setting eating and exercise goals and developing healthy nutrition and exercise habits through activities and games. Each week family members completed a scorecard detailing the number of joint activities completed by students and parents. A point goal was given each week for both exercise and nutrition activities. T-shirts, balloons, stickers and certificates were used as incentives.

POST TEST: The groups differed significantly at post test on % calories from fat, with the school and home group and the school only group each showing significantly lower % of calories from fat than the control group (p<.05).


There were six experimental groups in this study: fitness; fitness + school nutrition; school based nutrition; school + home nutrition; home based nutrition; and a control group.

1) The School Based Nutrition Program: a range of teaching resources were utilised in 10 x 1 hour lessons, which aimed to improve knowledge, attitudes and eating habits.

2) The Home Based Nutrition Program presented five nutrition messages using comics delivered through schools. Each comic contained educational material for the child with additional material for the parents, who were encouraged to become involved by assisting with homework exercises such as preparing healthy recipes. Completed homework sheets were returned to the school and efforts were rewarded.

3) The Fitness Education Program included 6 x 30 minute class sessions aimed at providing the children with a rational basis for their activity programs and for exercise in general. In addition, a range of fitness activities were offered, increasing in intensity and duration throughout the intervention. Fitness programs were planned to be carried out for 15 minutes every school day throughout the year.
The intervention was associated with several positive dietary changes which included decreases in the % daily energy derived from sugar, particularly in boys, and significant increases in fibre intake in girls in the fitness group and in both boys and girls in the school + home nutrition group. However, there was a significant negative correlation between intake of sugar and fat. This relation is seen in the fitness, fitness + school nutrition, and school + home nutrition groups for boys in whom increased fat intake was associated with decreased sugar intake, and for girls, in whom decreased fat intake was associated with increased sugar intake in the school + home nutrition and home nutrition groups. Given that a decrease in fat intake is likely to be of greater benefit in terms of cardiovascular risk reduction, the different responses for boys and girls in this respect is considerably important.


This study examined the effects of a cancer nutrition education program on three groups of 6th grade students: Group 1 received nutrition education with parent intervention; group 2 received nutrition education only; and group 3 served as a control group and received no intervention. Instructional meetings were held with students once a week for 5 weeks. All nutrition lessons for the project were adapted from ‘Planning Meals That Lower Cancer Risk’, which provides implementation for the dietary guidelines on nutrition and cancer published by the National Research Council in 1982.

Lesson 1: Introduction.

Lesson 2 identified foods high in fat, the fat content of various fast foods, and the importance of maintaining ideal body weight. Group 1 had a take home letter encouraging parental involvement in activities to rehearse appropriate behaviour.

Lesson 3 focused on the importance of fibre and methods of increasing it in the diet. Students participated in a taste fair featuring high fibre foods and were involved in a poster competition. Group 1 again received take home information for parents.

Lesson 4 focused on increasing dietary intake of foods rich in vitamins A and C. Fruit and vegetables were displayed and students then observed how to make them into edible art creations, and were encouraged to make their own to bring to class the following week for judging. Cross word puzzles were used in class to review lesson content. The parent information for group 1 included pamphlets on proper handling of produce and shopping lists and food guides that focused on recommended foods with low cancer risk.

Lesson 5 focused on the suspected relationship between diet and cancer. The class discussed food selection, alcohol and preparation practices such as charcoal broiling. The five take home materials for group 1 emphasised the risk associated with alcohol and charcoal broiling and suggested recipes to incorporate foods thought to lower cancer risk.

10 WEEKS POST PROGRAM: Students in group 2 (nutrition education only) demonstrated increased frequency of consumption of carrots, and decreased frequency of consumption of butter, margarine, whole milk and cheeses. Parental involvement in addition to the nutrition education did not significantly improve the dietary habits of group 1 participants. Findings for nutrient intake as determined by three-day food record were not significant.
Non-random with control


In this study cardiovascular curriculum was presented to 5th graders in five rural schools in the Southwest of New Mexico. The four sequential units of the curriculum dealt with cardiovascular health, exercise, nutrition and obesity, and tobacco use. These were taught by project staff in approximately 20 classroom hours, usually 2 hours /week. There was an emphasis on student involvement in active learning. Dietary recommendations were summarised in "three rules for a healthy heart": eat less fat and less of the wrong type of fat; eat less salt; eat only as much as you need. Special features of the nutrition unit related to the food patterns and cultural environment of the children. The approach was to encourage healthy eating, traditional food selections such as red and green chilli, modify the preparation of other foods such as refried beans, and reserve some foods such as sopaiillas and fried bread for special occasions. Preparation and tasting of nutritious snacks took place in the classroom. Recommendations for dietary modifications also took into account local food availability and home facilities for food storage and preparation.

The program resulted in significant changes in foods eaten ‘yesterday’ for seven of the 28 foods on the checklist. Five of these represented increased consumption of heart healthy foods (specific results for consumption of specific foods are shown in table 4.12).

Gortmaker et al. (1999) *Archives of Paediatric & Adolescent Medicine* 153 (9): 975-83

The ‘Eat Well and Keep Moving’ Program was taught by classroom teachers, integrating units into math, science, language arts, and social studies classes. Units were implemented over 2 school years, and consisted of 13 x 50 minute lessons for grades 4 and 5. Materials provided links to school food services and families, and provided training and wellness programs for teachers and other staff members. Intervention materials focused on decreasing consumption of foods high in total and saturated fat, increasing fruit and vegetables intake, as well as reducing television viewing and increasing physical activity. To increase the opportunities for students to try the recommended behaviours and build links with families and community, program activities included campaigns that focused on promoting fruit and vegetables, limiting TV viewing time and increasing walking. These campaigns were classroom based but because they included home activities, involved family members as well. A coalition was developed, linking parent liaisons at school with representatives of organisations that provide free or low cost nutrition and physical activity programs to parents. The following data was collected: 1) baseline and follow up data from a longitudinal cohort (n=479) initially in grade 4 at baseline. 2) 24 hour recall measures from a random subsample (n=336) at follow up in 1997. 3) cross sectional survey data from grade 5 students from 1995-97.

SPRING 1997. Analysis of repeated 24 hr recall data indicate that, after controlling for baseline measures, the %total energy from fat was reduced in students in the intervention schools relative to the control schools (- 1.4%, 95% CI -2.8 - -.04, p=.04). There was an increase in consumption of fruit and vegetables (.36 servings per
4184kJ, 95% CI .10-.62, p=.01). This difference in fruit and vegetable consumption is equivalent to an increase of .73 servings per day given a mean total energy intake of 8473kJ. In addition to the primary endpoints, the 24 hr recall data indicated an increase in fibre consumption (.70g per 4184 kJ, 95% CI 0.0 - 1.4, p=.05), and no change in iron or sodium intake. Food frequency measures of dietary intake also indicated a decrease in % total energy form fat (-1.1%, 95% CI -2.0% - -0.2%, p=.02). Analysis of the repeated cross sectional survey data showed reductions in the % total energy from fat (-1.1%, 95% CI -2.0% to -0.15%, p=.02).


The Integrated Nutrition Project is an ongoing comprehensive elementary school-based program focused on increasing consumption of whole grains, fruits, and vegetables in children and establishing nutrition education in the schools through local partnerships. The intervention consisted of:

1) **24 weekly hands on activities** (including food preparation and eating) taught by a resource teacher; parent education consisting of 12 bimonthly, bilingual, low literacy newsletters; nutrition classes taught by existing community nutrition education programs;

2) **Family fun nights** at school, and

3) **Community** nutrition/food resource development. In year 4, six corresponding parent taught school lunchroom activities were included. Classroom activities were designed to reinforce concepts in maths, science, literacy and social studies.

In year 4, plate waste servings indicated that the treatment students consumed significantly more NCI (National Cancer Institute) servings of fruit and vegetables during school lunch at the post test than control students. Compared to the control group, the treatment group ate about 1/5 more servings of fruit, 1/4 more servings of vegetables, and 0.4 more fruit and vegetables in total. Those in the program ate the equivalent of a full NCI serving of fruit and vegetables compared to the 2/3 serving eaten by the comparison group.


During the 1995-96 academic year, interventions were carried out in one community in southeast Arkansas and comparisons made with a control community. Nutrition education not related to this project occurred simultaneously in the two communities. Interventions specific to this project included:

1) **Nutrition curriculum** (one day per week) for all students in grades K-5.
2) ‘5 A Day’ grocery store tour for children in grades 4 and 5.
3) Service of newly designed lunch menus in the school cafeteria.
4) **Nutrition messages in the school cafeteria** including point of purchase messages about the new menu items and posters about good nutrition.
5) **Parent attendance at lunch** on days when new menus were served.
6) Development and dissemination of nutrition messages consistent with the school curriculum, throughout the school (in parent newsletters etc),

7) Community activities including grocery store demonstrations of revised school lunch menus, a project booth at the local water festival, and billboards with project nutrition messages.

IMMEDIATE POST PROGRAM: In the Intervention school (I) in grades 2 and 3, the difference between pre and post intervention scores for behavioural intent and food choice behaviour were not significant. However in 4th and 5th grades a significant improvement (p<.001) was seen for both measures. In the control (C) school there was no significant difference in the behavioural intent in the younger grades, but there was a significant improvement in food choice behaviours during the year (p<.001), perhaps related to non program nutrition education occurring in school and out of school youth groups. For students in the 4th and 5th grades at the C school, pre and post behavioural intent scores differed significantly (p<.05), but in a negative direction. No change was seen in behaviour. Comparing the intervention and control schools, no significant difference was seen in the lower grades for differences between pre and post behavioural intent scores. A significant difference was seen in the lower grades between the I and C schools for gain in the food choice behaviour scores. However, an increased gain was seen in the C school (p<.001). In the upper grades, the I school had gains in behavioural intent and behaviour that were significantly greater (p<.001) than those in the C school.
<table>
<thead>
<tr>
<th>Study id</th>
<th>Author</th>
<th>Target outcomes/ program approach</th>
<th>Intervention period &amp; sample</th>
<th>Final outcome</th>
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<tbody>
<tr>
<td>005</td>
<td>Domel, et al., 1993</td>
<td>1. F and V consumption. (2. F and V preferences and knowledge). Educational, family involvement</td>
<td>Intervention: 0-3 months Follow-up: 0-3 months Sample: 214 I / 132 C</td>
<td>PARTLY EFFECTIVE There was no significant difference in total F and V daily servings. There was a significant increase in F daily servings in the intervention school compared to the control school. IMMEDIATELY POST PROGRAM. Intervention school: n=195. Total F and V 2.95 (1.21) Difference: .29 (1.23), Fruits .90 (.58) Difference: .30 (.61), Juices .38 (.52) Difference .04 (.50), Vegetables 1.55 (.70) Difference -.00 (.70), Legumes .12 (.16) Difference -05 (23), Control school: n=106. Total F and V 2.35 (1.32) Difference .30 (.99), Fruits .48 (.54) Difference .06 (.50), Juices .46 (.56) Difference .07 (.49), Vegetables 1.36 (67) Difference .20 (.68), Legumes .06 (.10) Difference -03 (.15). Total F and V F= .01 p=. 913, fruits F=. 12.03 p=. 001, juices F=. 39 p=. 531, vegetables F=.562 p=. 018, legumes F=. 48 P=. 491</td>
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<td>008</td>
<td>Whitaker, et al, 1994</td>
<td>Selection of low fat entree from school lunch menus. (A secondary outcome of the proportion of enrolled students participating in school lunch was also measured). Food service, family involvement.</td>
<td>Intervention: 4-6 months Follow-up: 0-3 months Sample: 16 elementary schools</td>
<td>PARTIALLY EFFECTIVE There was a modest increase in the selection of low fat entrees in the intervention group Students selecting low fat entrees. CONTROL SCHOOLS. Intervention period: 32.2% Change: + 1.4%. INTERVENTION SCHOOLS. Intervention period: 35.5% Change: + 4% (p=.03 for comparison between groups).</td>
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<td>009</td>
<td>Perry, et al, 1998</td>
<td>F and V servings, F servings, V servings. Total fat % of kcal, Iron mg, calcium mg, fibre g. Servings of F, F juices, or V eaten each day. Educational, family involvement, food service</td>
<td>Intervention: 7-12 months Follow-up: 0-3 months Sample: 1612 completed health behaviour QA. 657 randomly selected for dietary measurement (652 observed at lunchtime. 580 returned food records next day, of whom 536 completed the 24 hr food recall).</td>
<td>EFFECTIVE OBSERVATIONS: Higher intakes (statistically significant) were observed in the intervention schools compared to the control schools, for F servings but not vegetables, except for girls. 24 HR RECALL: Significant intervention effects were seen for servings of fruit, as well as a significant reduction in the % of calories as fat. HEALTH BEHAVIOR QA: There was a significant increase in the usual daily servings of F and V.</td>
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<td>010</td>
<td>Wechsler, et al, 1998</td>
<td>Low fat milk consumption: the mean value over 5 days at each school, of the proportion of all milk cartons discarded that contained low fat milk. Food service</td>
<td>Intervention: 0-3 months Follow-up: 4-6 months Sample: 6 schools: 3I / 3C</td>
<td>EFFECTIVE 3-4 MONTHS POST PROGRAM: Although there were modest declines from the immediate post intervention data, differences remained significant at 3-4 months follow up.</td>
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<tr>
<td>012</td>
<td>Resnicow, et al, 1998</td>
<td>Outcomes were measured in teachers and children. For children, outcomes included dietary intake of fruit, vegetables, and total fruit/vegetable consumption.</td>
<td>Intervention: 24 months+ Follow-up: 0-3 months Sample: Baseline data was obtained from 1780 of the 2708 (66%) 3rd graders.</td>
<td>NOT EFFECTIVE AT PROGRAM COMPLETION: There was no significant difference between control and intervention groups for F and V consumption.</td>
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<tr>
<td>Study id</td>
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<td>014</td>
<td>Walter, 1989</td>
<td>Total fat, total CHO and sodium/1000 kcal (mg). Educational, family involvement</td>
<td>Intervention: 24 months+ Follow-up: 0-3 months Sample: Of the 1105 eligible subjects (485 I / 620 C) in the 15 Westchester County Schools, 911 (82.4%) participated in baseline observations (447 I, 92.1% / 464 C, 74.9%)</td>
<td>EFFECTIVE After 5 years of program implementation, immediately POST PROGRAM: Rate of change per year, difference in school mean (intervention/control) with 95% CI. Total fat, % total kcal: -3.6 (-7.1 - - 0.1), Total CHO, % total kcal: +4.5 (0.1 - 8.9), Sodium/1000kcal (mg), -62 (-317 - 193). The net mean reduction in total fat intake was -3.6% (95% CI -7.1 - -0.1) and the net mean increase in total CHO consumption was 4.5% (95%CI 0.1 - 8.9).</td>
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<td>015</td>
<td>Bush, et al, 1989</td>
<td>Target outcome of relevance to review was % kcal from total fat, and triceps skinfold (mm). Educational, family involvement</td>
<td>Intervention: 24 months+ Follow-up: Not specified Sample: Of 1234 students eligible at baseline, 1041 (84.4%) participated in baseline data collection.</td>
<td>NOT EFFECTIVE AFTER 4 YEARS: (n=160) %kcal from total fat. CONTROL: 37.1 (SD 9.1), INTERVENTION: 36.7 (SD 8.4) p=.80 YEAR 5 - Adjusted net differences between intervention/control groups for triceps skinfold, presented as mean change, (S.E) and p value. Triceps skinfold -0.95 (.81), p=.237.</td>
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<td>016</td>
<td>Hovell, et al, 1988</td>
<td>Two separate measures of the effect of teaching were obtained - a nutrition knowledge and snack food selection. Laboratory</td>
<td>Intervention: 0-3 months Follow-up: 0-3 months Sample: 91 total. 3 classes, N= 28, 30 and 33.</td>
<td>EFFECTIVE 6-WEEK FOLLOW UP: modest declines in performance for the Conventional Nutrition Education Group and the Teacher Controlled Behaviour modification group. The Self Controlled Behaviour modification group was the exception, with continued improvement at follow up.</td>
</tr>
<tr>
<td>017</td>
<td>Baranowski, et al, 2000</td>
<td>FJV consumption and a range of psychosocial variables (not discussed within purpose of this review), Educational, family involvement, community.</td>
<td>Intervention: 0-3 months Follow-up: 0-3 months Sample: 1732 completed food record year1, 1864 in year 2 and 1946 in year 3. Breakdown of I/C groups not given.</td>
<td>EFFECTIVE IMMEDIATE POST PROGRAM: Significant group by time effects favouring the treatment group were observed for FJV combined (p=. 038) and V alone (p=.004), but not F. … seems to be contradicted by this statement... The pattern of means revealed that the treatment appeared to mitigate a decline in FJV consumption. In summary, favourable results were observed for consumption of FJV combined and FJV consumed at weekday lunch.</td>
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<td>019</td>
<td>Stewart, et al, 1997</td>
<td>The primary variables were knowledge about how lifestyle affects health; changes in the use of FAT, SODIUM and SUGAR; total cholesterol, blood pressure and FATNESS. Educational</td>
<td>Intervention: 4-6 months Follow-up: 0-3 months Sample: 742 eligible at baseline. Behavioural instruments administered to all children; consent for physical assessment obtained from 514 students (69%).</td>
<td>EFFECTIVE SPRING 1993: Food Behaviour; The use of high fat foods decreased for both groups (p&lt;.01). The social learning group decreased the intake of high fat foods by 23%, and the traditional group decreased intake by 16% (p&lt;.05). For both groups, the use of high sodium foods decreased by 12% (p&lt;.01), and the use of high sugar foods decreased by 15% (p&lt;.01). The reported use of heart healthy foods did not change in either group. Physical Measures; Height, weight and BMI increased similarly for both groups from fall to spring.</td>
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<td>023</td>
<td>Chang, et al, 1997</td>
<td>Frequency of intake of specific high fat foods, Educational</td>
<td>Intervention: 4-6 months Follow-up: 4-6 months Sample: 262</td>
<td>NOT EFFECTIVE 6 MONTHS POST INTERVENTION: No significant difference between conditions was seen on the Food Frequency Scale.</td>
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<td>047</td>
<td>Perry, et al, 1998</td>
<td>number of servings of Fand V derived from 24 hour recalls. Educational</td>
<td>Intervention: 24 months+ Follow-up: 24 months+</td>
<td>PARTLY EFFECTIVE There was no significant overall difference between intervention and control conditions in fruit and vegetable consumption at follow-up, however there was a significant difference between intervention and control conditions in fruit and vegetable consumption.</td>
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<td>059</td>
<td>Cullen, et al, 1997</td>
<td>Increase fruit and vegetable intake, Educational</td>
<td>Intervention: 0-3 months</td>
<td>PARTLY EFFECTIVE</td>
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<td>Follow-up: 0-3 months</td>
<td>Significant increases in fruit and vegetable intake, knowledge and F&amp;V preferences were found for intervention girl scout troops compared to the control girl scout troops. However, F&amp;V intake returned to pretest levels 3 months later.</td>
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<td>Sample: Baseline 259: 133: 126</td>
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<td>Follow-up: 24 months+</td>
<td>AFTER 5 YEARS: The analyses showed that, in general, the participants in the SPI group were eating a higher quality diet than the participants in either of the other groups. In looking at the number of vegetables, milk/milk products that each group was consuming, compared to the other groups, the SPI group were consuming significantly (p&lt;.01) greater quantities of these foods. Cereals were also reported to be consumed in greater variety by this group (p&lt;.05). The values for meat/poultry/fish as well as juices approached significance similar to the aforementioned two groups.</td>
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<td>Sample: SPI=51; SI=50; C=50</td>
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<td>116</td>
<td>Reynolds, et al, 2000</td>
<td>Multiple outcomes, of relevance to review: servings of fruit, vegetables and fruit/vegetables combined. From these, energy, % calories from fat, % calories from saturated fat, % calories from CHO and fibre (g) were determined. Educational, food service, family involvement</td>
<td>Intervention: 7-12 months</td>
<td>EFFECTIVE</td>
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<td>Follow-up: 13-24 months</td>
<td>At Follow up 1 and Follow Up 2 the intervention children consumed significantly more servings of F and V combined than control children, as indicated by the 24 recall. Differences between conditions were smaller at Follow Up 2. Intervention children also consumed more servings of F and V separately. Intervention effects were not observed in the cafeteria observation data at either follow up period. At Follow Up 1 and 2, after adjusting for baseline levels, treatment differences were found favouring the intervention group for total fat, saturated fat, CHO and fibre. Total calories consumed (energy) did not differ between conditions. This pattern suggests a program effect for the displacement of fat calories with Cho, perhaps due to the increased consumption of F and V.</td>
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<td>Sample: From 2457 eligible families, 1698 participated.</td>
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<td>135</td>
<td>Burke, et al, 1998</td>
<td>Multiple outcomes, of interest, dietary intake of fat (% energy), salt (g/day), fibre (g/day), anthropometric measures - height, weight, BMI, WHA (weight for height for age), % body fat from skinfold measures. Educational, family involvement</td>
<td>Intervention: 4-6 months</td>
<td>NOT EFFECTIVE</td>
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<td>Follow-up: 4-6 months</td>
<td>APROX 6 MONTHS POST PROGRAM: Change in WHA and BMI did not differ significantly between groups for boys or girls. The increase in height was significantly less in girls from the control group (p=.0001). There were no significant differences in the change from baseline in subscapular or triceps skinfolds in boys related program group or risk group membership. In girls, those in the standard program schools had a significantly greater decrease in subscapular skinfolds than those in the enrichment or control groups (p=.0273), but showed no significant program or risk group related changes in triceps skinfolds. As expected, BMI increased in all groups after the end of the intervention. For other measured of body size and body fat, variables tended to return toward baseline values after the end of intervention. Dietary Intake: There were no significant changes in any nutrient, and sodium intake showed a return to ward baseline values.</td>
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<td>Sample: of the 983 children invited to participate, 804 (81.3%) consented to do so. Baseline data was collected from 800 children.</td>
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<tr>
<td>141</td>
<td>Nader, et al, 1996</td>
<td>Multiple. Of relevance, health behaviour (usual food choices), dietary recall (% calories from fat and sodium intake per 1000 calories), Educational, food service, family involvement</td>
<td>Intervention: 24 months+</td>
<td>NOT EFFECTIVE</td>
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<td>Follow-up: 0-3 months</td>
<td>POST PROGRAM: There was no dose effect (level of family participation) on the behaviours of the students.</td>
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<td>Sample: 3663 students attended a CATCH plus family school during the 3 years of the study. Of these students, 46.7% (n=1711) attended a CATCH family school for the entire 3 year period. Analysis was limited to</td>
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consumption at one of the four study sites (Texas)
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<tr>
<td>143</td>
<td>Petchers, et al, 1987</td>
<td>Multiple measures, of relevance, simulated shopping for heart healthy/non heart healthy foods. Educational, family involvement</td>
<td>Intervention: 7-12 months Follow-up: 0-3 months Sample: Not specified</td>
<td>PARTLY EFFECTIVE POST PROGRAM: Whilst the student curriculum was shown to affect several of the outcomes under investigation (for shopping behaviour, CO and PP groups demonstrated significant improvement in healthier food selection, p&lt;.05), the parent participation component did not contribute to this impact. Students whose parents participated did not demonstrate superior performance to those whose parents did not participate (ie. Curriculum only groups).</td>
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<td>147</td>
<td>Hopper, et al, 1992</td>
<td>Multiple variables, of relevance: height, weight, sum of skinfolds (subscapular, triceps, calf), dietary intake and % total calories from CHO (g) and total fat (g). Educational, family involvement.</td>
<td>Intervention: 0-3 months Follow-up: 0-3 months Sample: School and Home, n=45. School only, n=43. Control, n=44.</td>
<td>EFFECTIVE POST TEST: The groups differed significantly at post test on % calories from fat, with the school and home group and the school only group each showing significantly lower % of calories from fat than the control group (p&lt;.05).</td>
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<td>153</td>
<td>Perry, et al, 1988</td>
<td>Those of relevance included: height, weight, skin folds thickness, self reported intake of CHO and fat, heart healthy foods in family pantries. Educational, family involvement.</td>
<td>Intervention: 0-3 months Follow-up: 0-3 months Sample: HH (School-based program) =387 HT (home-based program) = 512 HH-HT=506 C (control) =422</td>
<td>EFFECTIVE POST INTERVENTION: The self reported food selections, 24 hr dietary recall data for fat and complex CHO consumption, and the food shelf inventory for 'encouraged' foods were all more positive for children and homes involved in the Home Team program.</td>
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<td>155</td>
<td>Vandongen, et al, 1995</td>
<td>Multiple outcomes, of relevance, sugar (% energy), total fat (% energy), fibre (g/day), sodium (g/day), energy (MJ/day), % body fat, BMI. Educational, family involvement</td>
<td>Intervention: 7-12 months Follow-up: 0-3 months Sample: Fitness=75 / Fitness + School Nutrition=72 / School Nutrition=73 / School + home nutrition=54 / Home Nutrition=86 / Control =63</td>
<td>EFFECTIVE The intervention was associated with several positive dietary changes which included decreases in the % daily energy derived from sugar, particularly in boys, and significant increases in fibre intake was seen in girls in the fitness group and in both boys and girls in the school + home nutrition group. However, there was a significant negative correlation between intake of sugar and fat. This relation is seen in the fitness, fitness + school nutrition, and school + home nutrition groups for boys in whom increased fat intake was associated with decreased sugar intake, and for girls, in whom decreased fat intake was associated with increased sugar intake in the school + home nutrition and home nutrition groups. Given that a decrease in fat intake is likely to be of greater benefit in terms of cardiovascular risk reduction, the different responses for boys and girls in this respect assumes considerable importance.</td>
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<td>165</td>
<td>La Porte, et al, 1989</td>
<td>Of relevance: Weekly food frequency of fruits; vegetables, butter/margarine; whole milk;</td>
<td>Intervention: 0-3 months Follow-up: 0-3 months Sample: Approx. 100 students at middle</td>
<td>EFFECTIVE 10 WEEKS POST PROGRAM: Students in Group 2 (nutrition education only) demonstrated increased frequency of consumption of carrots, and decreased...</td>
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<td>cheeses; whole grain/bran products; beef; fish/chicken; hot dogs/lunch meats. Educational, family involvement.</td>
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<td>school A were randomly assigned to one of two groups (1 and 2). 55 students at middle school B formed the control group. 20 students in Group 1 and 17 students in Group 2 completed baseline data. Of those designated to form the control group, 13 provided baseline data.</td>
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<td>frequency of consumption of butter, margarine, whole milk and cheeses. Parental involvement in addition to the nutrition education did not significantly improve the dietary habits of Group 1 participants. Findings for nutrient intake as determined by 3-day food record were not significant.</td>
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<td>026</td>
<td>Mc Bride, S., Browne, J. (1993)</td>
<td>Mean consumption of selected nutrients: fibre, sodium, sugar &amp; the % of energy derived from fat, Program approach: food service</td>
<td>Intervention: NA Follow-up: NA Sample size: 185 (breakdown of groups not given)</td>
<td>EFFECTIVE Schools were categorised into three groups based on the nutritional value of school food: Group HE (Healthy school menus), Group CO (control), Group CH (change schools, which indicated an intention to make healthy changes to their menus). 5 MONTHS POST: The mean % energy obtained from fat was significantly lower for the HE group than it was for groups CH &amp; CO (p&lt;.001). Group HE students also consumed significantly more fibre than those in groups CH &amp; CO (p&lt;.001). A significant difference (p&lt;.05) was also found between the HE group and the other two groups for sodium consumption, with that of the HE group being significantly lower. Sugar consumption for the HE group was also significantly lower than that of the CO group (p&lt;.05). The CH group mean fell between the two. Students with access to canteens with a healthy menu consumed less fat, less salt &amp; more fibre whilst at school compared with students in schools where the menu was nutritionally inferior.</td>
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<td>002</td>
<td>Perry, et al, 1985</td>
<td>1. Consumption of 12 targeted foods; potato chips, sugared cereal, candy, soft drinks, green veg, fruits, fried foods, legumes, meat, fish, chicken, added salt. 2. Behaviour &amp; (knowledge/preference) related to 18 food pairs, either fat, salt or complex CHO. (3. Process indicators re curriculum were also measured.) Approach: educational, family involvement</td>
<td>Intervention: 0-3 months Follow-up: 0-3 months Sample: 172 I / 199 C</td>
<td>EFFECTIVE Following Week 10 of curriculum. 24 hr food recall, significant changes in reported intake of 5 of 12 targeted food items, of note, more dark green veg. $X^2=5.35$, $p&lt;.02$, more fruit ($X^2=7.7$, $p&lt;.02$), less fried foods ($X^2=8.1$, $p&lt;.005$). Mean post test scores, treatment vs control for ‘eat most often’ section of KPB questionnaire. Fat: $F=29.89$, $p&lt;.0001$, Complex CHO: $F=7.95$, $p=.0062$</td>
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<td>003</td>
<td>Seaman, et al, 1995</td>
<td>Frequency of intake of high starch foods and high fat foods. Approach: educational</td>
<td>Intervention: 0-3 months Follow-up: 0-3 months Sample: 249 I / 60 C</td>
<td>EFFECTIVE ONE MONTH POST INTERVENTION: Intervention School, frequency of food consumption of starch rich foods. N=249 Foods eaten at home yesterday: chips/fried potatoes, 60 (24%), $p&lt;.001$. Boiled rice, 56 (22%), $p&lt;.001$. Boiled potatoes 57 (23%), $p&lt;.01$. Pasta 45 (18%). Foods eaten at school yesterday: chips/fried potatoes, 31 (12%) Boiled rice,33 (13%) Boiled potatoes 32 (13%). Pasta 26 (10%). Foods eaten at home last week: chips/fried potatoes, 160 (64%) Boiled rice, 97 (39%) Boiled potatoes 138 (55%) Pasta 88 (34%). Foods eaten at school last week: chips/fried potatoes, 82 (33%) Boiled rice, 55 (22%) Boiled potatoes 51 (20%) Pasta 33 (13%) Reported consumption of chips/fried potatoes decreased significantly in the month post intervention ($p&lt;.001$). This change was accompanied by a significant increase in the reported consumption of rice &amp; potatoes ($p&lt;.001$), but the effects on the consumption of pasta are less clear. For CONTROL SCHOOLS, data gathered showed no statistically significant differences in outcome variables.</td>
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<td>004</td>
<td>Friel, et al, 1999</td>
<td>1. (Knowledge-preference) &amp; behaviour related to healthy/unhealthy food choices. 2. Frequency of consumption of different food groups: meat, fish or alternatives; dairy products, fruit and vegetables; cereals including bread &amp; potatoes. Consumption of salty &amp; high sugar snacks &amp; drinks was also included. Approach: educational, family involvement</td>
<td>Intervention: 0-3 months Follow-up: 0-3 months Sample: 453 I / 368 C</td>
<td>EFFECTIVE IMMEDIATE POST INTERVENTION. BEHAVIOR SECTION of questionnaire: INTERVENTION group: post test n = 336, Mean=24.2, SD=3.7 ($p&lt;.01$) CONTROL group; post test n= 274, Mean=26.8, SD=3.5 Following the programme the intervention group demonstrated significant changes in reported behavior. Findings from FOOD DIARIES. INTERVENTION group, post test, n=133, No. servings per day. Meat &lt;1= 27, 1=54, 2=10, &gt;2=9 Dairy Products &lt;1=16, 1=38, 2=30, 3=5, more than/=3 =13 Cereals &lt;3=4, 3-4=15, 5-6=29, 7-8=39, &gt;8=13 F &amp; V &lt;1=48, 1=34, 2=12, 3=4, more than/=4 =2 Frequency in last 5 days Chips never=29, once=22, 2-3 times=54, more than/=4 times =15 Orange juice never=95, &lt;3 times=16, 1/day=14, 1/day=11 salty snacks &lt;1/day=89, 2-3/day=18, more than/=4 per day =14 High sugar snacks &lt;2/day=35, 3-4/day=23, 1/day=28, &gt;1/day=20 High sugar drink &lt;2/day=51, 3-4/day=23, 1/day=16, &gt;1/day=10 CONTROL group, post test, n=54, No. servings per day. Meat &lt;1=33, 1=56, 2=9, &gt;2=2 Dairy Products &lt;1=35, 1=37, 2=18, 3=2, more than/=3 =7 Cereals &lt;3=2, 3-4=33, 5-6=30, 7-8=33, &gt;8=2 F &amp; V &lt;1=74, 1=22, 2=2, 3=2, more than/=4 =0 Frequency in last 5 days Chips never=30, once=17, 2-3</td>
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<td>006</td>
<td>Simons-Morton, et al, 1991</td>
<td>Energy/fat/sodium consumption (as well as nutrient content of school lunches &amp; physical activity) Approach: educational, food service</td>
<td>Intervention: 7-12 months Follow-up: 0-3 months Sample</td>
<td>EFFECTIVE POST PROGRAMME: Selected nutrients from bag or tray lunch based on 24 hour diet recall. CONTROL GROUP: Total day (n=68), Energy (kcal). Mean 2135.3, 95% CI 1978.3 - 2292.3 / Total Fat (g). Mean 90, 95% CI 80.8 - 99.1 / Sodium (mg). Mean 3377.6, 95% CI 3044.1 - 3711 Tray lunch (n=49). Energy (kcal). Mean 806.9, 95% CI 730.7 - 883, Total day avg (%) 37.8 SE 1.8 / Total Fat (g). Mean 34.80, 95% CI 30.8 - 38.8 Total day avg (%) 40.1 / Sodium (mg). Mean 1283.4, 95% CI 1137.2 - 1429.6, Total day avg (%) 39.7, SE 2.3 / Bag lunch (n=19). Energy (kcal). Mean 681.4, 95% CI 588.8 - 794.1, Total day avg (%) 35.7 SE 2.6 / Total Fat (g). Mean 27.3, 95% CI 21.5 - 33 Total day avg (%) 34.4, SE 2.7 / Sodium (mg). Mean 986, 95% CI 794.8 - 1137.3, Total day avg (%) 33.4, SE 2 / INTERVENTION GROUP Total day (n=67), Energy (kcal). Mean 2094.5, 95% CI 1922.6 - 2266.5 / Total Fat (g). Mean 78.6, 95% CI 70 - 87.2 / Sodium (mg). Mean 2872.6, 95% CI 2554.2 - 3190.7 Tray lunch (n=48). Energy (kcal). Mean 790.2, 95% CI 676.9 - 903.4, Total day avg (%) 36.5 SE 1.9 / Total Fat (g). Mean 29.7, 95% CI 25.6 - 33.8 Total day avg (%) 38.6 / Sodium (mg) Mean 909.1, 95% CI 756.6 - 1052.7, Total day avg (%) 32.5, SE 2 / Bag lunch (n=19). Energy (kcal). Mean 657.7, 95% CI 516.8 - 798.6, Total day avg (%) 36.1 SE 2.7 / Total Fat (g). Mean 25.1, 95% CI 18.8 - 31.3 Total day avg (%) 37.2, SE 2.8 / Sodium (mg). Mean 789.5, 95% CI 645.5 - 933.5, Total day avg (%) 31.3, SE 2.4 The 24 hr dietary recall data indicated that the changes in nutrients served in school lunch contributed to improvements in total daily dietary intake of calories, total fat &amp; sodium.</td>
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<td>007</td>
<td>Koehler, et al, 1988</td>
<td>(Knowledge &amp; behaviour change). In relation to nutrition, the outcome was consumption of 28 food items: meat, milk (regular), regular soda pop, oven bread (including tortillas), fruit, cheese, potato chips (including doritos), other vegetables, candy, koolaid with sugar, cookies (cake, pie), cereal with sugar, eggs, fried foods, fried bread, beans, peanut butter, honey (including jam &amp; jelly), chicken or turkey, nachos, bread or butter, cereal without</td>
<td>Intervention: 13-24 months Follow-up: 0-3 months Sample</td>
<td>PARTLY EFFECTIVE POST PROGRAMME: Intervention Schools B, C &amp; E (first 2 parts of eating behavior instrument administered pre &amp; post test). Number of students reporting using margarine increased from 25% to 36%, t(134)=2.45, p&lt;.05, whilst those using lard increased from 16% to 33 %, t(134) = 4.11, p&lt;.001. No other significant changes in use of fat or salt. There were significant changes in foods eaten yesterday for 7 of the 28 foods on the checklist. Five of these represented increased consumption of heart healthy foods. Sig. Pre/post test changes in foods eaten yesterday, n=135. Oven bread, tortillas (pre 48%, post 61%, p&lt;.05). Beans (pre 32%, post 44%, p&lt;.05). Other vegetables (pre 41%, post 54%, p&lt;.01). Fruit (pre 41%, post 69%, p&lt;.001). Chicken or turkey (pre 24%, post 36%), p&lt;.05. Potato chips (pre 38%, post 52%, p&lt;.01). Cereal without sugar (pre 21%, post 11%, p&lt;.01).</td>
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<td>018</td>
<td>Gortmaker, et al, 1999</td>
<td>Dietary intake &amp; physical activity (not discussed for purposes of this review). For dietary intake, primary endpoints of relevance were: % total energy from fat &amp; number of F &amp; V per 4184kJ. Additional dietary variables of relevance were total energy intake kJ/day, fiber g/4184kJ, iron mg/4184kJ and sodium mg/4184kJ. Approach: educational, family involvement</td>
<td>Intervention: 24 months+ Follow-up: 0-3 months Sample: Cohort subjects; n=479, I=190 &amp; C=289. / Random sub sample of n=336, I=173 &amp; C=162. / Cross sectional group: I=129 &amp; C=180</td>
<td>EFFECTIVE SPRING 1997. Analysis of repeated 24 hr recall data indicate that, after controlling for baseline measures, the %total energy from fat was reduced in students in the intervention schools relative to the control schools (-1.4%, 95% CI -2.8 - -.04, p=.04). There was an increase in consumption of F &amp; V (.36 servings per 4184kJ, 95% CI 10- .62, p=.01). This difference in F &amp; V consumption is equivalent to an increase of .73 servings per day given a mean total energy intake of 8473kJ. In addition to the primary endpoints, the 24 hr recall data indicated an increase in fiber consumption (.70g per 4184kJ, 95% CI 0.0 - 1.4, p=.05), &amp; no change in iron or sodium intake. Food frequency measures of dietary intake also indicated a decrease in % total energy form fat (-1.1%, 95% CI -2.0% to -0.2%, p=.02). Analysis of the repeated cross sectional survey data showed reductions in the % total energy from fat (-1.1%, 95% CI -.20% to -.01%, p=.02).</td>
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<td>020</td>
<td>Resnicow, et al, 1993</td>
<td>Outcome variables of relevance for purpose of review were: height &amp; weight (BMI), consumption of &quot;high fat&quot; &amp; &quot;heart healthy&quot; foods. Approach: educational, family involvement</td>
<td>Intervention: 7-12 months Follow-up: 13-24 months Sample: At baseline, 2686 (95%; 1850 I &amp; 836 C) of the 2830 (1944 I &amp; 886 C) eligible students completed baseline questionnaire. Of the total 1944 students eligible in the intervention schools, 1735 (89%) participated in the first screening.</td>
<td>EFFECTIVE IMMEDIATE POST PROGRAM. 1) Questionnaire: Students in the intervention group reported significantly lower consumption of high fat foods than those in the comparison group. 2) Physiologic measures from screening activity not presented.</td>
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<td>022</td>
<td>Smolak, et al, 1998</td>
<td>F &amp; V consumption Approach: educational, family involvement</td>
<td>Intervention: 0-3 months Follow-up: 0-3 months Sample: 253 (not separated into I &amp; C groups)</td>
<td>PARTLY EFFECTIVE POST TEST, between 1-4 months post intervention: No significant pre-post, curriculum or gender effects or any significant interactions in terms of fruit consumption. Vegetable consumption also showed no main effects. However, the pre-post by gender interaction was significant, F(1,214)=4.25, p&lt;.05, as was the gender by curriculum by pre-post interaction, F(1,214)=612, p&lt;.01. The boys in the non curricula classrooms showed substantial increases in vegetable consumption whereas the girls in control classes decreased markedly from pre-post testing.</td>
</tr>
<tr>
<td>024</td>
<td>Marcus, et al 1987</td>
<td>Multiple variables assessing knowledge, attitudes &amp; behaviour. Of particular relevance were : 1. DAIRY; Self reported consumption of whole milk &amp; several other dairy products. 2. CHOLESTEROL; multiple average serving size cholesterol content be self reported intake of</td>
<td>Intervention: 7-12 months Follow-up: 0-3 months Sample: (C+S: N=688, S: N=333, C: N=253, CNT: N=234.) Of the 2753 children eligible at baseline, 80% completed the baseline questionnaire.</td>
<td>NOT EFFECTIVE IMMEDIATE POST PROGRAM: No consistent differences in self reported behaviors pertaining to consumption of dairy products &amp; high cholesterol foods.</td>
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<td>Study id</td>
<td>Author</td>
<td>Target outcomes / Program approach</td>
<td>Intervention period &amp; sample</td>
<td>Final outcome</td>
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<tr>
<td>030</td>
<td>Parcel, et al, 1987</td>
<td>Multiple outcomes measured. Of relevance: 1. Food purchasing patterns. 2. Student school lunch consumption. 3. Self reported frequency of consumption of certain foods (4 days). Approach: educational</td>
<td>Intervention: 7-12 months Follow-up: 13-24 months Sample: Not detailed: 3rd &amp; 4th graders from 2 I &amp; 2 C schools.</td>
<td>EFFECTIVE Data only reported for Diet Self Report. SALT: T tests indicated that significant declines (p&lt;.05) in average daily frequency of salting occurred from baseline to post test 2 (spring 1987, 12 months after program implementation) in one intervention school &amp; baseline to post test 1 (Spring 1986, just after program implementation) in one control school. The overall decline in sel reported salt use was largely accounted for by one school. GO FOOD SELECTION: T tests indicated that there was a significant increase (p&lt;.05) in the % of F &amp; V selected from baseline to post test 1 in one intervention school &amp; one control school. A significant decline (p&lt;.05) in the average % of F &amp; V selected occurred in one control school from post test 1 to post test 2. No overall effect was found for Go Food selection, because the small improvements that occurred in one school were offset by improvements in one control school.</td>
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<tr>
<td>034</td>
<td>Shannon, et al, 1988</td>
<td>(Nutrition knowledge, attitudes) &amp; self reported eating behaviour. Foods were divided into low nutrient density (cookies, cupcakes, cocoa, ice cream, jello, milkshake, popsicles, potato chips, popcorn, pudding &amp; soda pop) &amp; high nutrient density (apples, bananas, broccoli, carrots, noodles, orange juice, rice, rolls &amp; strawberries) &amp; milk. Approach: educational</td>
<td>Intervention: 7-12 months Follow-up: 0-3 months Sample: Approximately: I=879, C=828</td>
<td>EFFECTIVE ON the one eating behavior assessment where the treatment &amp; control groups differed (the low nutrient density foods), those children exposed to the program either moved more rapidly toward a reduced level of reported intake than did controls, or if their reported intake was already in the desirable range (ie low), the treatment group maintained that intake level better than controls.</td>
</tr>
<tr>
<td>101</td>
<td>Auld, et al, 1998</td>
<td>increased consumption of whole grains, fruits &amp; vegetables. Approach: educational, family involvement</td>
<td>Intervention: 4-6 months Follow-up: 4-6 months Sample: I=456, C=395</td>
<td>EFFECTIVE In year 4, plate waste servings indicated that the treatment students consumed significantly more NCI (National Cancer Institute) servings of F &amp; V during school lunch at the post test than did the comparison students. Compared to the control group, the treatment group ate about 1/5 more servings of fruit, 1/4 more servings of vegetables, and 0.4 more F &amp; V in total. Those in the program ate the equivalent of a full NCI serving of F &amp; V compared to the 2/3 serving eaten by the comparison group.</td>
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<tr>
<td>103</td>
<td>Liquori, et al, 1998</td>
<td>consumption of: sweet potatoes; broccoli; cauliflower; spinach; collard greens; squash; salad; beans; rice; pita, rye &amp; pumpernickel breads, whole wheats. Approach: educational, food service, family involvement</td>
<td>Intervention: 4-6 months Follow-up: 0-3 months Sample:</td>
<td>EFFECTIVE 2 WEEKS POST PROGRAM: For the younger classes that received the CS program, behavioral intention scores were higher than for the classes that did not receive it; this was true for both the food intention subscale &amp; the paired choice subscale (p&lt;.01). Main effects were found for both the CS intervention for both the younger (p&lt;.01) and older children (p&lt;.01). There were not many effects for FEL for either age group.</td>
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<tr>
<td>Study id</td>
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<td>Children exposed to the curriculum reported greater consumption of fruits &amp; vegetables &amp; sources of protein &amp; Vitamin A, in comparison to those in the control group (p&lt;.01). Findings for children in the lower socio economic group for Vitamin C consumption and the &quot;balance&quot; score significantly exceeded those in the control group. In addition, at the p&lt;.05 level, children in the test group reported a greater number of portions of milk, total dairy foods, calcium scores &amp; riboflavin sources.</td>
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<td>Students in the intervention group reported significantly higher consumption of fruit &amp; vegetables, protein &amp; riboflavin in comparison to the control group (p&lt;.01). From the list of 40 common foods, children in the control group reported eating a broader variety of foods in the meat-fish-poultry-eggs food group. Nonetheless, based on 24 hour recall data, the control group's protein consumption was significantly lower than that of the test group, &amp; there was no difference in meat-fish-poultry-eggs portion counts. Thus, there was not a positive relationship between the variety index &amp; the food group portions or protein portions reported on the 24 hr recall. Only black children exposed to the nutrition curriculum exhibited significantly higher consumption of dairy foods, milk &amp; calcium (p&lt;.01). All other races displayed no significant effect of the test curriculum on dairy products &amp; milk; in the case of calcium, children in the control group reported greater consumption.</td>
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<tr>
<td>109</td>
<td>Shannon, et al, 1982</td>
<td>Consumption of green beans, corn, mashed potatoes, stewed potatoes, fresh spinach salad, cooked broccoli, wheat bread, milk, banana cake, yellow cake. Snacks: peanuts &amp; raisins, raw carrot/broccoli sticks, pumpkin bread, wheat bread &amp; cheese, apple boats (apple quarter with peanut butter &amp; pineapple cube). Parents were also surveyed to find out their children's request for more or less of certain foods, but this outcome has not been included in findings. Approach: educational</td>
<td>Intervention: 0-3 months Follow-up: 0-3 months Sample: not specified</td>
<td>PARTLY EFFECTIVE</td>
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<td>The effect of the program on food consumption was mixed. For the 5 snacks offered to the kindergarten age children, the experimental group had significantly higher post consumption of one (broccoli/carrot sticks), &amp; controls of another (wheat bread with cheese); there was no difference for the other 3 items. Of the 8 menu items examined at the grade 1-6 level, experimental pupils had significantly greater post consumption of 2 items (stewed tomatoes &amp; wheat bread), &amp; controls of 1 item (wheat bread); consumption of 2 other items (green beans &amp; corn) were influenced only at certain grade levels. Of these later items, green beans were consumed in greater amount by experimental pupils in grades 4-6, &amp; corn by control pupils in grades 1 &amp; 2.</td>
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<tr>
<td>111</td>
<td>Goldberg, et al, 1980</td>
<td>Amongst other physiologic variables, outcomes of relevance were height, weight &amp; skinfold thickness. Approach: educational, food service, family involvement.</td>
<td>Intervention: not specified Follow-up: 24 months Sample: I group: From 246 eligible children, 224 provided consent. C group: There were 2 control groups, one in the same interventions school (where new</td>
<td>NOT EFFECTIVE</td>
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<td>% height, weight &amp; skinfold thickness were statistically similar for all groups for all periods.</td>
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<td>Intervention period &amp; sample</td>
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<td>127</td>
<td>Manios, et al, 1999</td>
<td>Amongst other outcomes, energy (kcal), total fat (g), carbohydrate (g). Approach: educational, food service, family involvement.</td>
<td>Intervention: 24 months+ Follow-up: 0-3 months Sample: I=602 / C=444</td>
<td>EFFECTIVE IMMEDIATELY POST PROGRAM: The daily energy intake (p&lt;.05) as well as the intake of monounsaturated (p&lt;.05), polyunsaturated (p&lt;.005), &amp; saturated fat (p&lt;.01) were increasingly significantly more in the control group compared to the intervention group.</td>
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<tr>
<td>129</td>
<td>Manios, et al, 1999</td>
<td>Amongst other outcomes; anthropometric measures - height, weight, BMI, sum of skinfolds. Dietary measures: daily nutrient intake of energy (kcal), total fat (g), carbohydrate (g), &amp; fibre (g). Approach: educational, family involvement.</td>
<td>Intervention: 24 months+ Follow-up: 0-3 months Sample: of 1281 eligible pupils at baseline, 1046 (81.7%) participated in baseline assessments.</td>
<td>EFFECTIVE IMMEDIATE POST PROGRAM: children from the intervention group were found to have had a significantly higher average gain of height over the 3 year period, compared to the control group (p=.009). Control group pupils had a significantly higher change in BMI than intervention group pupils (p=.001) &amp; suprailiac skin fold (p&lt;.05) when adjusting for the change in height, sex, parental education &amp; baseline values. With reference to the dietary data, there were no significant differences between the intervention &amp; control groups.</td>
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<td>133</td>
<td>Dollahite, et al, 1998</td>
<td>Multiple outcomes, of relevance, children’s food choice intention &amp; behaviour (10 items, not defined). Approach: educational, food service, family involvement, community</td>
<td>Intervention: 4-6 months Follow-up: 0-3 months Sample: I=548, from which 88% consented to participate, &amp; 99% of these completed pre intervention surveys. C=382, from which 82% consented to participate &amp; 100% completed pre intervention surveys</td>
<td>PARTLY EFFECTIVE IMMEDIATE POST PROGRAM: In the 1 school in grades 2 &amp; 3, the difference between pre &amp; post intervention scores for behavioral intent &amp; food choice behavior were not significant. However in 4th &amp; 5th grades a significant improvement (p&lt;.001) was seen for both measures. In the C school there was no significant difference in the behavioral intent in the younger grades, but there was a significant improvement in food choice behaviors during the year (p&lt;.001), perhaps related to non program nutrition education occurring in school &amp; out of school youth groups. In the 4th &amp; 5th grades, students at the C school, pre &amp; post behavioral intent scores differed significantly (p&lt;.05), but in a negative direction. No change was seen in behavior. Comparing the I &amp; C schools, no significant difference was seen in the lower grades for differences between pre &amp; post behavioral intent scores. A significant difference was seen in the lower grades between the I &amp; C schools for gain in the food choice behavior scores, however, with an increased gain seen in the C school (p&lt;.001). In the upper grades, the I school had gains in behavioral intent &amp; behavior that were significantly greater (p&lt;.001) than those in the C school.</td>
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<td>139</td>
<td>Resnicow, et al, 1992</td>
<td>Multiple variables, of relevance: height/weight, BMI. Food frequency of dairy (milk &amp; whole milk products), meat (red meats &amp; fried chicken), fruit, vegetable, high fat (cakes, cookies, candy, ice cream), &amp; heart healthy (low fat milk, whole wheat bread,</td>
<td>Intervention: 24 months+ Follow-up: 0-3 months Sample: Of 3423 eligible students, baseline data was collected from 2973 (87%)</td>
<td>EFFECTIVE FINAL FOLLOW UP (post program): Post test values for BMI or dietary indices did not differ significantly between groups. When the 3 intervention groups (low, moderate &amp; high exposure based on teacher implementation) were combined, the combined intervention group reported significantly lower intake of dairy products (p&lt;.01) &amp; desserts (p=.006). For the year 3 post test only cohort, students with high teacher implementation reported significantly greater consumption of vegetables &amp; heart healthy foods &amp; significantly lower consumption of meats &amp; desserts. When the 3 year</td>
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<td>Study id</td>
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<td>Target outcomes / Program approach</td>
<td>Intervention period &amp; sample</td>
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<td>breakfast cereal with fibre, broiled fish, popcorn without butter) Approach: educational, food service</td>
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<td>intervention groups (level of teacher implementation) were combined, the group reported significantly lower intake of desserts (p=.021), &amp; greater intake of vegetables (p&lt;.01) &amp; heart healthy foods (p=.007) compared to the control group.</td>
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</table>
At 2 YEARS: Intervention school menus were significantly lower for energy, sodium & fat compared to the control school. From analysis of plate waste, children from both schools consumed approximately 25% less energy than served (p<.05). Consumption of fat as a % of total energy & consumption of sodium was significantly less for the intervention compared to the control school. Compensation for the lower fat meals by the intervention school children (eating greater portions of high fat items) was not evident as the % of energy from fat consumed was only 1.3% greater than the % which was served. |
### 4.3.4 - Interventions on secondary school children

**Randomised Control Trials**

Eight studies are included in this category. For five studies the duration of intervention was 0-3 months, 4-6 months for one, 7-12 months for one, and one was not shown (36). Follow-up occurred at 0-3 months for three studies, 4-6 months for two studies, 7-12 months for one study and one was not shown (36). Program approaches included: education only (3), education and family (4) and food service (1). Almost all were reported to be effective. (Table 4.14)

**Non Random Control Studies**

There were eight uncontrolled experimental studies. The duration of intervention was 0-3 months for three studies, 4-6 months for one, 7-12 months for another and exactly 24 months for the remaining three. Duration of follow-up was 0-3 months for 6 studies and 7-12 months for the other two studies. The program approach was educational for five studies, education and family for two studies and a food service approach for one study. (Table 4.15) All were reportedly effective.

**Cohort Studies**

There were three cohort studies. For two the duration of intervention was less than three months and for one the intervention lasted for more than two years. For all of them the duration of follow-up was less than three months. One used an educational approach, education plus for another (study 75) and policy and regulation for the third (Table 4.16).

<table>
<thead>
<tr>
<th>Table 4.14 Projects targeting secondary school children identified from literature review</th>
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<tbody>
<tr>
<td>RCTs</td>
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<tr>
<td>Number of studies 8</td>
</tr>
<tr>
<td>Effective (+ partly) 6(2)</td>
</tr>
<tr>
<td>Duration 0-3 months 5</td>
</tr>
<tr>
<td>4-6 months 1</td>
</tr>
<tr>
<td>7-12 months 1</td>
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<tr>
<td>13-24 months -</td>
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<tr>
<td>&gt; 2 years 1</td>
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<tr>
<td>Follow up 0-3 months 3</td>
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<tr>
<td>4-6 months 2</td>
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<tr>
<td>7-12 months 1</td>
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<tr>
<td>13-24 months 1</td>
</tr>
<tr>
<td>&gt; 2 years 1</td>
</tr>
<tr>
<td>Unspecified 0</td>
</tr>
<tr>
<td>Methods: Educational 3</td>
</tr>
<tr>
<td>Mixed approaches/other 5</td>
</tr>
</tbody>
</table>
Commentary on effective studies

The healthy eating interventions that have been conducted strongly suggest that adolescents may be most receptive to proposals for dietary change. In this set of reports, most were effective in bringing about change. They include excellent examples of the use of classroom education, school food service change and family involvement. These findings suggest that we should make special efforts to promote healthy eating among high school students.

Eight RCT studies were identified and all eight demonstrated some level of effectiveness. Three studies showed effects, which lasted for more than one year, indeed the effects of Nicklas and Johnson’s (1998) promotion of fruit and vegetables, lasted over two years. The emphasis in all studies (except Nicklas and Johnson, 1998) was on the promotion of lower fat foods. Seven of the studies used education methods such as classroom instruction but four also used family involvement (Nicklas and Johnson 1998; Coates et al 1985; Walker et al 1992; King et al 1988); and one (French et al 2001) used price cuts in vended foods.

The conclusion here is that secondary school students’ dietary behaviours can be altered through educational methods, especially those that involve families. French et al’s study (2001) shows that price incentive can have marked effects on vending machine foods in the short term. More work is required to identify in a systematic manner the impact of various approaches such as the effects of vending machines.

Examples of effective interventions on secondary school children


Interventions included:
1) **School wide media marketing campaign:** The campaign goal was to provide appealing messages and activities relevant to teenagers that would increase awareness, reinforce concepts, and promote positive attitudes toward consumption of fruit and vegetables. Materials and activities included in monthly promotions included marketing stations, taste-testing, point of service signs, posters, table tents, public service announcements, faculty fruit and vegetable baskets, faculty tip sheets and student contests.

2) **Classroom Activities:** 5 x 55 min workshops, providing students with learning opportunities to develop additional knowledge, positive attitudes, and skills necessary to increase fruit and vegetable consumption. Supplementary subject activities were also provided. These activities built fruit and vegetables into the existing curriculum, aiming to increase and maintain awareness by teachers and students during the first year of intervention (each teacher of the 9th grade cohort was requested to present at least one supplementary subject activity in their subject area each semester during the year).

3) **School Meal Modification:** The goal of "Fresh Choices" was to increase the availability, variety, and taste of fruit and vegetables meeting 5-A-Day serving size and nutrient criteria in the school cafeteria. The component included four objectives: a) to increase student consumption of fruit and vegetables by increasing availability and portion size. b) increase the variety of fruit and vegetables served. c) increase
4) **Parent Involvement:** The goal of the parent component, "Raising Teens", was to provide education, stimulate awareness, and elicit parental support for the ‘Gimme 5’ program. The objective was to encourage increased availability and variety of fruit and vegetables in the home. ‘Gimme 5’ staff conducted taste testing of ‘Gimme 5’ recipes, media displays, and activities at parent teacher organisation meetings and at family related functions. Colourful brochures featuring pictures of individual fruit and vegetables with recipes were distributed to parents with school mailings at least once a semester.

The reported consumption of daily servings of fruit and vegetables was significantly higher in the intervention schools than in the control schools in 1995 and 1996 (p<.05), but this difference was not sustained at follow up in 1997. From 1994-96, a significant linear increase in the reported daily consumption of servings of fruit and vegetables was observed in the intervention group, compared to no significant linear trend in the control group (p<.001). The intervention group reported a 14% increase in consumption of fruit and vegetables after 2 years of intervention, from 2.63 servings at baseline (1994) to 3 servings in 1996. This linear increase was not observed in the control group from 1994-96. At follow up (1997), reported consumption remained stable among the intervention group, concomitant with increased consumption in the control group. Therefore, no significant difference existed between groups at final follow up.


A 10-session peer led program for 9th and 10th grade students: Session 1. Introduction to Fitness-peer leader and videotape introduction to program. Session 2. Consequences of fitness (or lack of)-healthy and unhealthy behaviors and their effects over the lifespan. Session 3. Taking it personally-food records and personal goals.  
Session 4. Cardiorespiratory fitness and exercise-recommended frequency, intensity, duration, and type of exercise for cardiorespiratory fitness. Session 5. The will to be heart healthy-characteristics of a heart health diet. Session 6. "you are what you eat" - heart health alternatives to high fat, high sodium foods. Session 7. Environmental influences- Group projects assessing schools, grocery stores, restaurants, community resources and media. Session 8. Weight control- criteria for a sensible approach to weight control. Session 9. Environmental Influence reports and summary-recommendations for reducing negative environmental influences on eating and exercise habits. Session 10. Social influences on eating and exercise habits-videotapes presenting situations involving social influences and methods for resisting these influences. The peer leaders were included as a way to have direct impact on the social environment in the classes, to provide positive role models and to help change norms regarding eating and physical activity. They also provided factual information by leading small group discussions that followed the videotapes, and by organising several small group projects.

Students were given a series of food choices concerning their usual snack, breakfast and restaurant menu selections, the females in the intervention group reported a significant increase in their choice of heart health (low in fat, salt and sugar) food items compared to the control group (from 3.3 food items to 3.9 versus 3.6 to 3.4 , p<.05). When given specific food pairs, the females in the intervention group again
reported a significant increase in heart health choices compared to the control group (4.5 out of 18 healthy food choices to 8.4 versus 4.3 to 6.7, p=.001). There was no significant difference between the increase that occurred for males in the two groups.

**Killen et al. (1989) Health Education Quarterly 16 (2): 263-83**

The education program consisted of 20 x 50 min classroom sessions, occurring during regularly scheduled PE class time. The first session began with the concept of 'healthy lifestyles', including a short discussion on the major CVD risk factors. It was followed by a video drama "Choices", produced specifically for the intervention and involving high school actors; the setting of proximal and distal goals, demonstrated attainment of temporary failure to attain goals and the resulting consequences of different personal choices were presented in the drama. The next 12 sessions were divided into four separate modules: physical activity, nutrition, cigarette smoking and stress. To raise the perceived incentive value of making changes in lifestyle, these modules emphasized information on the important immediate effects on life quality as well as the potential long term health consequences of adopting healthful behaviours. The modules also introduced self-regulatory skills specific to each area. These included the setting of specific, proximal change goals; methods of monitoring progress toward proximal goals, problem-solving skills, and application of self managed incentives. Educational methods utilised within each module included discussion oriented information sessions, slide and music slide presentations, videotaped vignettes modelling peers learning to use skills successfully, guided role playing simulations to aid in invention of coping strategies for managing high risk situations, and performance based exercises. The four informational modules were followed by a two session quiz game, reviewing the information and skills introduced in the prior four modules. The final module (five sessions) was devoted to training in problem solving and the development of personal action plans for behaviour change.

**FOLLOW UP (two months post completion of intervention): Nutrition/Diet; Students in the treatment group were more likely to report that they would chose heart healthy snack items than their control group counterparts. The mean increase in selection of heart healthy food alternatives for boys and girls in the treatment group was 2.1 and 2.3 respectively. Reported selection for boys and girls in the control group actually decreased (p<.0001). Anthropometry: Significant effects in the treatment group were seen for BMI (p=.05, with impact more evident amongst girls than boys), triceps skinfold thickness (p=.004) and subscapular skinfold thickness (p=.01).**


Low fat snacks were added to 55 vending machines in a convenience sample of 12 secondary schools and 12 worksites. Four pricing levels (equal price, 10% reduction, 25% reduction, 50% reduction) and 3 promotional conditions (none, low fat label, low fat label plus promotional sign) were crossed in a Latin square design. Sales of low fat vending snacks were measured continuously for the 12 month intervention.

Price reductions of 10%, 25% and 50% on low fat snacks were associated with significant increases in low fat snack sales; percentages of low fat snack sales increased by 9%, 39% and 93% respectively. Promotional signage was independently
but significantly associated with increases in low fat snack sales. Reducing relative prices on low fat snacks was effective in promoting lower fat snack purchases from vending machines in both adult and adolescent populations. (it is important to note that when prices were reduced by 25% or 50%, the absolute number of low fat snacks sold increased, as did the total sales volume in the 50% price reduction condition; this finding suggest that customers may have been increasing the number of snacks purchased. If this was the case, overall energy from vending machine snacks might be higher than if a single, higher fat vending snack had been purchased, an undesirable outcome from a public health perspective.)


The Great Sensations Program was a nutrition education project developed for high school students. It was delivered in six 45-minute lessons during regular health education classes. The sequence of classes and topics was as follows: Lesson 1, Week 1: Introduction. Lesson 2, Week 1: Problem solving - Barriers to nutrition behaviour change such as food availability, taste and convenience were discussed. Lesson 3, Week 2: Peer, media and family pressure. Lesson 4, Week 3: Salt and Cardiovascular Health. Lesson 5, Week 3: Reading labels, developing skills to ranks high and low salt foods. Lesson 6, Week 4: Review. Goal setting for food substitution was the final activity. The overall program and each class lesson were designed to incorporate five strategies to encourage behaviour change: models of desired behaviour, behaviour rehearsal, goal specification, feedback of results, and reinforcement for behaviour change. A parental involvement program consisted of mailers and telephone calls to parents to teach them to encourage changes in student snacking habits. A school wide media program was designed to provide out of class peer support for student modifications in salty snack foods.

SALTY SNACKS: Differences between Intervention (I) and Control (C) schools were significant at post assessment (p<.01), and the differences between class and no class intervention within the I school were significant at Follow Up 1 (p<.05). The program was effective in producing immediate significant reduction in salty snack food consumption at post assessment in students in the I school. However, the % salty snack food consumed continued to decline only among students receiving the classroom instruction. Students not receiving the instruction program returned to baseline values by Follow Up 1. The school wide program produced an acute effect among all students, but the effect was sustained until the end of the year, only for those students who received the classroom instruction. By Follow Up 2, those students receiving the class instruction had also returned to baseline values.

TARGET SNACKS: At post test there were significant class and school effects. Students in the I school showed a significant increase while students in the C school showed a decrease in reported consumption of target snack foods (p<.05). There was also a significant classroom instruction effect. Students not receiving the class instruction remained at baseline levels. Instruction effects were maintained at both follow up assessments. Again, acute changes were produced by the overall school program, but changes persisted only with classroom instruction (p<.05). Students in the parent involvement group reported eating significantly fewer target snack foods at Follow Up 2 than did students not in the parent involvement component.
OTHER SNACK FOODS: There was a significant difference between the parent involvement and no parent involvement group at baseline. There was a significant classroom instruction effect at post-test. Those receiving the class instruction decreased their consumption of other snacks, whilst those not receiving class instructions increased these other foods. Although there were no significant differences in absolute levels of other snacks consumed at Follow up, students in the parent involvement group changed significantly more than students not in the parent involvement group from Follow Up 1 to Follow Up 2.

*Non-random with control*


This was a 7th grade social norms and skills based educational program developed and implemented in collaboration with local home economics teachers. Students were given the opportunity to prepare their "favourite foods", but with healthier recipes. They also completed a three-day food record, and performed their own computer analysis for nutrient content. In order to provide a positive setting for parents (previously informed about the objectives of the program) and students to communicate about food, students, as part of their homework, were asked to plan and prepare dinners for their families. In addition to having impact on foods available at home, groups of students analysed food items in local grocery stores, fast food outlets, community youth organisations and at school; they were then asked to prepare recommendations for how to improve the local food availability. In order to address students' social environment, peer leaders were selected and trained to help implement small group activities. Finally, activities aimed at increasing students' knowledge of and changing their attitudes toward eating patterns were designed so that students could share their own knowledge and discuss the issues.

Females in the intervention group reported significantly healthier eating behaviour than did females in the control group at both follow up (immediate post and then plus 8 months) surveys. Males in the intervention group reported significantly healthier eating behaviour than did males in the control group at the first follow up survey, but there was no difference between the two groups at the final follow up.

**Winett et al. (1999) Journal of Gender, Culture and Health 4 (3): 239-54**

The Eat4Life Program was a linear series of five 90 min internet based modules that focuses on changing health behaviours and serves as an adjunct to health curricula. The modules involve text, graphics, and pictures with considerable interactions and use a number of established behaviour change tactics such as personalization of content through frequent assessments, prescriptive strategies, and personalized goals and feedback.

PRE and POST ASSESSMENST were performed in four cohorts (an experimental and control group within each year level, Grade 9 and 10). Analyses indicated that that within the experimental group, there were significant differences between pre and
post assessments for increasing meals (p<.001), increasing fruit and vegetables (p<.001), increasing fibre (p<.001), and decreasing regular sodas (p<.05). There were no significant changes for high fat dairy or snack. The changes for fruit and vegetables and cereal equate to about one serving per day. Comparison of experimental and control classes indicated significant differences in consumption of regular meals and fruit and vegetables favouring the experimental group, in all four cohorts; significant differences for fibre were found in three cohorts and for regular soda in two cohorts. Pre and post fast food data was collected on one experimental cohort only. Girls initially reported consuming 1047 cal in their last fast food meal compared to 786 cal later; this difference was significant (p<.001), likewise, fat grams were reduced from 44.4 to 30.2 (p<.001).


The North Karelia Youth Project was a 2 year educational intervention carried out among children initially 13 years of age (7th graders) in the county of North Karelia, Eastern Finland. The intervention was carried out for 2 years (autumn 1978-autumn 1980) on two levels: a) an intensive direct intervention, and b) a general country wide intervention (these groups were compared with a non intervention control group). Major emphasis was placed on a) prevention of smoking and b) introduction of dietary changes influencing serum cholesterol and BP (reduction in saturated fat, partial substitution of saturated fat by polyunsaturated fats, increase in vegetable consumption, and reduction in sodium intake). The study protocol was designed within the framework of the WHO protocol and the international "Know Your Body" (KYB) Program. Physical activity, reduction or prevention of overweight, and some other principles of healthy diet (ie sugar reduction) were also promoted, although with smaller intensity. The intervention was based on a comprehensive approach emphasizing several educational activities. The aim was to involve, in addition to the children themselves, their homes, teachers, and the rest of the community as much as possible. Practical preventive services by the health personnel were combined with broad ranged educational and behavioural modifying activities. Although increase in health knowledge was also a goal, major emphasis was also put on teaching practical skills and on promoting an environment supportive of the behavioural objectives.

At COMPLETION OF 2 YEARS OF INTERVENTION: Anthropometry; Average changes in height, weight, skinfold thickness and BMI were similar across the different school groups. However, boys from the intensive intervention school had no decrease in skinfold thickness, and girls of the county-wide intervention schools had less weight increase than others (p<.05). Diet; In the intensive intervention schools 8% of the boys changed from fattier types of milk to the medium type (3%), and 12% of the girls changed to skim milk. Bots use of fat from milk and butter decreased from baseline level 17% (8g) in the intensive-intervention schools; there was no change in the other community wide intervention schools, and an increase of 6% (3g) in the control schools. Among girls this reduction was 46% (16g) in the intensive intervention schools, 6% (2g) in the community wide intervention schools, and 13% (5g) in the control schools. Reported use of vegetable oil and low sodium salt at home increased among all groups and use of extra salted butter or margarine decreased, especially among intervention school children. Approximately 10% of the mothers felt that their children had reduced their salt intake, and approximately half the
mothers felt that their children had reduced their fat consumption during follow up; there was a greater difference between the three school pairs for the latter variable.

**Moberg and Piper (1990)** *Health Education Quarterly* 17 (1):37-51

Project Model Health (PMH) is an integrated, multifaceted health promotion program for middle school students. It consists of 32 hours of classroom instruction, with activities provided in 64 sessions over the course of a semester. The program was taught on a daily basis during a 30 min period. Seven major strategies were used to attain the behavioural objectives for each unit. These are: 1) The use of instructors who are positive, high status role models for the students. 2) Focus on understanding and interpreting media messages about the targeted behaviours. 3) Practice of peer refusal skills. 4) Use of information on peer norms for the targeted health risk behaviours. 5) Emphasis on short term effects rather than effects in some indeterminant future. 6) Use of the students' public commitment to change their behaviour. 7) Students advocating healthy behaviours in their school and community.

BASELINE compared to FOLLOW UP (post 1 year) Group means for the nutrition index reflected increasingly positive food choices among the PMH subjects and the reverse among the comparison students (p<.001). Examining the nutritional data more closely, the Nutrition Index effect was likely due to an overall decline in healthy food choices among comparison school students, combined with a small increase for PMH students. It may be that the PMH forestalled an otherwise to be expected deterioration in healthy food choices.
<table>
<thead>
<tr>
<th>Study id</th>
<th>Author</th>
<th>Target outcomes/ program approach</th>
<th>Intervention period &amp; sample</th>
<th>Final outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>036</td>
<td>Nicklas, et al, 1998</td>
<td>Daily consumption of F and V, E. Educational, family involvement.</td>
<td>Intervention: Follow-up: 24 months+ Sample: 2213 students, 51 % in I group and 49% in C group.</td>
<td>EFFECTIVE F and V up 14% from 1994-96 (2.63 to 3.0 serves) in intervention schools From 1994-96, a significant linear increase in daily F and V intake in intervention group, none in control group (p&lt;.001). By 1997 controls had increased to intervention intake level</td>
</tr>
<tr>
<td>040</td>
<td>Perry, et al, 1987</td>
<td>Intakes of fat, salt and sugar, Educational.</td>
<td>Intervention: 0-3 months Follow-up: 13-24 months Sample: 270; I=173, C=97</td>
<td>PARTLY EFFECTIVE Females in the intervention group increased choices of heart health (low in fat, salt and sugar) food items compared to the control group (from 3.3 food items to 3.9 versus 3.6 to 3.4 , p&lt;.05). In food pair choice tests, females in the intervention group chose more heart healthy foods compared to the control group (4.5 out of 18 healthy food choices to 8.4 versus 4.3 to 6.7, p=.001). No changes observed among males.</td>
</tr>
<tr>
<td>055</td>
<td>Killen, et al, 1989</td>
<td>Self reported diet behaviour, Height/weight body fat (skinfolds,) Educational</td>
<td>Intervention: 0-3 months Follow-up: 0-3 months 2 months post completion Sample: 1447 students at baseline</td>
<td>EFFECTIVE Nutrition/Diet treatment group intended to choose heart healthy snack items than control group. (From 2.1 to 2.3 choices) . Control choices decreased (p&lt;.0001). Drop in tr grp BMI (p=.05) especially in girls., triceps skinfold thickness (p=.004) and subscapular skinfold thickness (p=.01).</td>
</tr>
<tr>
<td>062</td>
<td>French, et al, 2001</td>
<td>Sales of low fat vending snacks; low fat chips, low fat candy, low fat pastry, low fat snacks and low fat cookies. Food service.</td>
<td>Intervention: 7-12 months Follow-up: 0-3 months Sample: 55 vending machines</td>
<td>EFFECTIVE Price reductions of 10%, 25% and 50% on low fat snacks were associated with significant increases in low fat snack sales; percentages of low fat snack sales increased by 9%, 39% and 93% respectively. Promotional signage significantly associated with increases in low fat snack sales. Price reductions of 25% and 50% increased sales of low fat snacks (may have increased fat intake)</td>
</tr>
<tr>
<td>077</td>
<td>Coates, et al, 1985</td>
<td>Consumption of: Healthy Snacks; Salted snacks Unhealthy snacks. Educational, family involvement</td>
<td>Intervention: 0-3 months Follow-up: 4-6 months Sample: 284 students; I=154 students, C=130 students</td>
<td>EFFECTIVE SALTY SNACKS: effective with class instruction HEALTHY SNACKS: effective with class instruction UNHEALTHY SNACKS: effective with class instruction</td>
</tr>
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Table 4.15 Interventions on secondary school children – Randomised Control Trials
<table>
<thead>
<tr>
<th>Study id</th>
<th>Author</th>
<th>Target outcomes/ program approach</th>
<th>Intervention period &amp; sample</th>
<th>Final outcome</th>
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<tbody>
<tr>
<td>083</td>
<td>Walker, et al, 1992</td>
<td>BMI, % of energy intake derived from fat (self reported), % of energy intake from saturated fat (self reported). Educational, family involvement</td>
<td>Intervention: 4-6 months Follow-up: 4-6 months 12 months Sample: Early I: n=80; Late I: n=64; C: n=76</td>
<td>EFFECTIVE AFTER 12 MONTHS; Effective early intervention Early intervention group decreased their self reported intakes of total and saturated fat compared to the late intervention group (p&lt;.05).</td>
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<tr>
<td>044</td>
<td>King, et al, 1988</td>
<td>Consumption of complex CHO, saturated fat, sugar and salt. Educational, family involvement</td>
<td>Intervention: 0-3 months Follow-up: 7-12 months Sample: Self Report Behaviour; C=148; I=70 Snack Choice: C=34; I=16</td>
<td>PARTLY EFFECTIVE Effective at 3 months Not effective at 12 months 1 YEAR FOLLOW UP: The significant differences seen between I and control groups at post intervention were not maintained at 1 year follow up.</td>
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</tbody>
</table>
### Table 4.16 Interventions on secondary school children – Cohort studies

<table>
<thead>
<tr>
<th>Study id</th>
<th>Author</th>
<th>Target outcomes/ program approach</th>
<th>Intervention period &amp; sample</th>
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<tr>
<td>067</td>
<td>Cade, J. and Lambert, H., 1991</td>
<td>Food intake throughout the previous school day. Measures included: bread/toast, marmalade/jam/honey, breakfast cereal, fresh fruit or juice, chocolate, other sweets, eggs, bacon or other meat, cheese, coffee or tea, milk or milky drink, fizzy drink or squash, nothing to eat or drink. Approach: policy &amp; regulation</td>
<td>Intervention: 0-3 months Follow-up: 0-3 months All children who were entitled to a Family Income Supplement (FIS) free school meal at the time of base line data collection were included in the study. This group (n=50) was compared with an age &amp; sex matched group of children entitled to a Supplementary Benefit (SB) free school meal (n=49) &amp; a control group (n=100) of children.</td>
<td>PARTLY EFFECTIVE Four secondary schools in Southampton were chosen to study the effects of Social Security changes. A self completed questionnaire asking about food intake throughout the previous school day was given to each child by the form teacher on 2 occasions, both before &amp; after benefit changes. SUMMARY: The removal of the free school meal for children whose families were receiving FIS led to changes in the foods consumed by these children, particularly at the lunchtime meal, their pattern of food intake becoming more like that of children in the control group. Fewer of the FIS children had a school lunch &amp; more ate at home or had a packed lunch. Reflecting these changes there was a reduction in the numbers consuming fatty foods commonly served at school canteens, such as chips &amp; burgers, with an increase in the numbers eating sandwiches, fruit &amp; crisps at lunchtime. Against this, there was also an increase in the number of FIS children eating crisps &amp; chocolate at morning &amp; afternoon break times.</td>
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<tr>
<td>075</td>
<td>Baxter et al, 1997</td>
<td>Multiple variables, of relevance: wholemeal bread consumption, low fat spread consumption, &amp; low fat milk consumption. Approach: educational, community</td>
<td>Intervention: 24+ months Follow-up: 0-3 months There were 5 schools &amp; 2 year levels within each school, with data collected in 1991 &amp;94. Response rates for the various schools and year levels were between 84-95%.</td>
<td>PARTLY EFFECTIVE DIFFERENCE OVER 3 YEAR PERIOD (data collected at baseline in 1991 &amp; then again at conclusion of intervention, 1994). Wholemeal bread consumption: There was evidence that wholemeal bread consumption was higher in intervention schools, for both age groups (p&lt;.01). Low Fat Spread Consumption: There was no reliable evidence of any difference between intervention &amp; control schools over the three year period. Consumption of Low Fat Milk: There was an approximate doubling in the odds of using low fat milk over the three years, in both intervention &amp; control schools for 11 yr olds; for 14 yr olds this increase was only seen in intervention schools but not in control schools.</td>
</tr>
<tr>
<td>118</td>
<td>Kelder et al, 1995</td>
<td>Fat, salt &amp; CHO consumption (other outcomes also measured, but not relevant for review) Approach: educational, community, mass media</td>
<td>Intervention: 24+ months Follow-up: 13-24 months</td>
<td>PARTLY EFFECTIVE Females in the intervention community reported significantly healthier food choices as compared to females in the reference community at all but the final follow up point. Males in the intervention community reported significantly healthier food choice scores at all but the 11th &amp; 12th grade follow up points. An upward trend in healthier food choices is seen for both genders, particularly for females. For the salt outcome, females reported significantly less food salting in the intervention group at all follow up measurements, &amp; for males, at all but the 12th grade time point (p&lt;.07).</td>
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<tr>
<td>Study id</td>
<td>Author</td>
<td>Target outcomes / Program approach</td>
<td>Intervention period &amp; sample</td>
<td>Final outcome</td>
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<td>042</td>
<td>Klepp, et al 1993</td>
<td>Healthy eating behaviour score, reflecting consumption of food items low in fat &amp; sugar, or high in fat &amp; sugar. Approach: educational, family involvement</td>
<td>Intervention: 4-6 months Follow-up: 7-12 months Sample: 447 from 517 eligible students (94%) participated at baseline.</td>
<td>EFFECTIVE Females in the intervention group reported significantly healthier eating behaviour than did females in the control group at both follow up (immediate post &amp; then plus 8 months) surveys. Males in the intervention group reported significantly healthier eating behaviour than did males in the control group at the first follow up survey, but there was no difference between the two groups at the final follow up.</td>
</tr>
<tr>
<td>046</td>
<td>Byrd-Bredbenner, et al, 1984</td>
<td>Food frequency (together with other outcomes not relevant to review). 7 food groups observed were dairy products, animal protein foods, plant protein foods, vitamin c rich fruits &amp; juices, vitamin A/folic acid rich vegetables, other F &amp; V, &amp; breads &amp; cereals. Approach: educational</td>
<td>Intervention: 0-3 months Follow-up: 0-3 months Sample: Not specified. For students completing knowledge instrument sample sizes were: Junior High; I=236, C=133. Senior High; I=265, C=114</td>
<td>NOT EFFECTIVE At both grade levels, adjusted mean dietary post scores of experimental &amp; control groups did not differ significantly.</td>
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<tr>
<td>051</td>
<td>Winett, et al, 1999</td>
<td>Six targeted nutrition areas: increasing regular meals, increasing servings of F &amp; V, increasing servings of breads &amp; cereals for fibre, decreasing high fat snacks, decreasing high fat dairy, decreasing regular sodas. Approach: educational</td>
<td>Intervention: 0-3 months Follow-up: 0-3 months Sample: I=103, C=77</td>
<td>EFFECTIVE PRE &amp; POST ASSESSMENT were performed in 4 cohorts (an experimental &amp; control group within each year level, Grade 9 &amp; 10). Analyses indicate that that within the experimental group, there were significant differences between pre &amp; post assessments for increasing meals (p&lt;.001), increasing F &amp; V (p&lt;.001), increasing fibre (p&lt;.001), and decreasing regular sodas (p&lt;.05). There were no significant changes for high fat dairy or snack. The changes for F &amp; V &amp; cereal equate to about 1 serving per day. Comparison of experimental and control classes indicated significant differences in consumption of regular meals &amp; F &amp; V favouring the experimental group, in all four cohorts; significant differences for fibre were found in three cohorts &amp; for regular soda in two cohorts. Pre &amp; post fast food data was collected on one experimental cohort only. Girls initially reported consuming 1047 cal in their last fast food meal compared to 786 cal later; this difference was significant (p&lt;0.01), likewise, fat grams were reduced from 44.4 to 30.2 (p&lt;0.001).</td>
</tr>
<tr>
<td>053</td>
<td>Hern, et al, 1998</td>
<td>Outcome of relevance for review purposes was dietary fat intake. (cholesterol and exercise also measured) Approach: educational</td>
<td>Intervention: 7-12 months Follow-up: 0-3 months Sample: I=13, C=10</td>
<td>NOT EFFECTIVE 24 hour self reported dietary recalls were analysed on 3 different occasions. No significant differences were found between the two biology classes (intervention &amp; control) in relation to the% of fat in the total calories consumed. Students in both classes reported eating high fat foods, a behavior characteristic of this developmental age group.</td>
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<tr>
<td>057</td>
<td>Puska, et al, 1982</td>
<td>Outcome variables of relevance to review included: Anthropometry; height, weight. BMI &amp; skinfold thickness. Self Reported Diet; fat (milk &amp; butter), salt &amp; bread. Approach: educational, family involvement,</td>
<td>Intervention: 24 months+ Follow-up: 0-3 months Sample: Baseline sample was 966 students, representing a 99.3 % participation rate.</td>
<td>PARTLY EFFECTIVE At COMPLETION OF 2 YEARS OF INTERVENTION: Anthropometry; Average changes in height, weight, skinfold thickness &amp; BMI were similar across the different school groups. However, boys from the intensive intervention school had no decrease in skinfold thickness, and girls of the</td>
</tr>
<tr>
<td>Study id</td>
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<td>Intervention period &amp; sample</td>
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<tr>
<td>064</td>
<td>Ellison, et al, 1989</td>
<td>community, mass media, food service</td>
<td>Intervention: 24 months+ Follow-up: 0-3 months Sample: For Phase 1: I= 340, C=334</td>
<td>EFFECTIVE The intervention resulted in a mean decrease in sodium intake of approximately 15-20%. Differences between the changes during the year at control &amp; intervention schools for measures of sodium intake were all statistically significant. Interventions produced large effects on the total intake of saturated &amp; polyunsaturated fats (preliminary results only). There was a 20% reduction in saturated fat intake, &amp; an increase in the P/S ratio from .46 to .84 among students.</td>
</tr>
<tr>
<td>087</td>
<td>Lewis, et al, 1988</td>
<td>from 3 day food record: number of servings from selected food categories (milk, meat, F/V, grain, low nutrient foods, low calorie soft drinks). Approach: educational</td>
<td>Intervention: 24 months+ Follow-up: 0-3 months Sample: C=223, I=506</td>
<td>NOT EFFECTIVE In YEAR 3: Data from 3 day food records showed treatment group students’ mean food intakes were generally more positive than those of the control group students, with the treatment group reporting that they ate more high nutrient foods &amp; fewer foods &amp; drinks low in nutrients. However, differences between groups were not statistically significant.</td>
</tr>
<tr>
<td>091</td>
<td>Moberg, et al 1990</td>
<td>A nutrition index based on consumption of less salt, sugar, &amp; fat, &amp; increased consumption of fibre &amp; calcium in their diets. Approach: educational</td>
<td>Intervention: 0-3 months Follow-up: 7-12 months Sample: I=115, C=82</td>
<td>EFFECTIVE BASELINE compared to FOLLOW UP (post 1 year) Group means for the nutrition index reflected increasingly positive food choices among the PMH subjects &amp; the reverse among the comparison students (p&lt;.001). Examining the nutritional data more closely, the Nutrition Index effect was likely due to an overall decline in healthy food choices among comparison school students, combined with a small increase for PMH students. It may be that the PMH forestalled an otherwise to be expected deterioration in healthy food choices.</td>
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</table>
4.3.5 - Interventions on families

**Randomised Control Trials**
Four studies were identified in this category, three were of three months in duration, and the other was 7-12 months long. The duration of follow-up was 0-3 months for two studies, and 7-12 months for the other two. One study used an educational approach (De Bourdeaudhuij and Brug 2000) and the remaining three were educational and family involvement. (Table 4.16) Three studies were effective and one was possibly effective.

**Uncontrolled Experimental Studies**
None were found.

**Cohort Studies**
None were found.

<table>
<thead>
<tr>
<th>Table 4.18 Projects targeting families identified in the literature review</th>
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<tbody>
<tr>
<td>RCTs</td>
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<tr>
<td>Number of studies</td>
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<tr>
<td>Effective (+ partly)</td>
</tr>
<tr>
<td>Duration</td>
</tr>
<tr>
<td>0-3 months</td>
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<tr>
<td>4-6 months</td>
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<td>7-12 months</td>
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<tr>
<td>13-24 months</td>
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<tr>
<td>&gt;2 years</td>
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<tr>
<td>Follow up</td>
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<tr>
<td>0-3 months</td>
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<td>4-6 months</td>
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<td>7-12 months</td>
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<td>13-24 months</td>
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<tr>
<td>Unspecified</td>
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<tr>
<td>Methods:</td>
</tr>
<tr>
<td>Educational</td>
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<tr>
<td>Mixed approaches/other</td>
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**Commentary on effective studies**
There are few published studies that report family-focused interventions. The findings, such as they are, suggest that involvement of parents is a useful approach. We know from our stakeholders study that parents of young children often have problems about feeding their children and require help. Again, the studies are largely incomparable, Nader et al, (1989) for example had brief interventions yet found long term effects as did (Sunseri et al 1984) who used a much more complex, intense, long term intervention. Major action research opportunities remain in this area.
All four family RCT studies demonstrated effectiveness in meeting their goals. Again the emphasis was on low fat foods and on heart healthy, though Wagner et al (1992) also included increased fruit, vegetables and cereal intakes. De Bourdeaudhuij and Brug (2000) showed the superiority of a tailoring approach among mothers over and above family involvement (the provision of information which matches the specific behavioural characteristics of individuals). Nader et al (1999) and Suneri et al (1994) studies show the complexity of findings when working in multiethnic communities. These two studies are impressive in that they both demonstrate effectiveness lasting for around one year post-intervention. These findings suggest that family involvement is an important way to influence children’s food consumption.

Examples of effective interventions on families


The Nutrition for a Lifetime System (NLS) is a public access, interactive information system that was located in a supermarket and designed to help shoppers alter their purchases to meet National Cancer Institute (NCI) guidelines. The system includes a computer, videodisc player, colour touch screen monitor and printer housed in a custom designed kiosk. In addition it contains specifically signed software and a series of weekly video programs. The educational videodisc programs followed a linear format (ie each subsequent program added one new idea) and were 2-8 minutes in length. The series promoted gradual dietary change through a variety of purchases and meals: Program 1; brief introduction. Program 2; More information and suggestion of one simple change and commitment (eg buy more pieces of fruit this week) Programs 3 and 4; stressed additional commitments to decrease purchases of items and the preparation of meals that were high in fat, and to increase purchases of items and the preparation of meals that were high in complex CHO and fibre. Program 5; focussed on strategies to overcome common problems (eg meal preparation for children), whilst still expanding food purchases and meal variety. Program 6; focussed on maintenance of strategies and long-term commitment to change. The NLS monitors the user's purchases, presents specific food purchase goals (reducing fat and increasing fibre in supermarket purchases and subsequent meal preparation), and provides individualised feedback (eg suggested substitutes for high fat and low fibre items and praise of new purchases of low fat or high fibre products) on progress.

4 WEEKS POST INTERVENTION: Family participants significantly increased their purchases of high fibre cereals and grains (intended), compared with the control condition. In addition, decreases in high fat purchases (intended) favoured the experimental group, but were not significant. The CST results indicated that for the snack category, children and parents in the experimental group increased their scores (more low fat, high fibre choices and less high fat, low fibre choices), for behaviour (also preference and knowledge), whist participants in the control group decreased their scores; for children, this difference in behaviour trended towards significance (p<.10). Findings were similar for the entrée category for behaviour in the children (p<.10). However, some of these differences could be attributed to decrease in scores by control participants. Results of the Food History QA indicated no statistically
significant findings, but trends toward significance (for children) were observed for the low fat dairy category.


The intervention was mainly targeted at reducing fat intake. Subjects in the experimental group received a feedback letter including messages based on their answers to the screening questions. The feedback messages about fat intake included respondents' actual fat consumption expressed in % of energy from fat, a comparison of this with the Flemish recommendations (preferably 30% and not more than 35% energy from fat), and with the mean scores of the other adolescents, mothers or fathers participating in the study. The messages also included the comparison between the actual consumption and the way in which participants rated their own consumption. A figure was included to visualise personal fat intake levels as compared to the recommendation as well as to the mean fat intake of comparable others (adolescents, mothers or fathers). Further messages were included which addressed different important dietary fat sources in the Flemish diet, for which low fat alternatives to high fat choices were suggested. Further for respondents with low self-efficacy, suggestions were given on how to deal with 'high risk' situations. Finally, all subjects who reported a positive intention to reduce their fat intake were advised to convert these plans into direct action in the weeks to come, preferably in the next week. No attempts were made to stimulate positive family influence, eg, by including recommendations to share the results with other family members. Subjects in the control group received a general nutrition education letter. This letter included information about the importance of a healthy diet, and gave general information about dietary fat reduction, the health risks of a high fat diet were stressed, the mean population intake (40% energy) was compared with the recommendations (30% energy), and further information was given about reducing fat in milk and dairy products, butter, meat, sauce, snacks, sweets and chocolate.

The data showed that the tailored intervention was more effective than the non-tailored intervention in reducing total and saturated fat intake when all family members were included in the analysis. However, follow up analysis of individual family members revealed that only mothers benefit from the tailored intervention. For fathers and adolescents, both the tailored and non-tailored intervention resulted in a significant reduction in total and saturated fat scores.

**Nader et al. (1989) Health Education Quarterly 16 (2): 229-44**

This project, whilst school based, requires little or no curriculum time. Intervention families received 3 months of intensive weekly intervention, followed by nine months of monthly or bimonthly maintenance sessions (6 sessions total). Families were grouped for ethnic homogeneity, and 6-7 families usually attended a group meeting, which lasted up to one and a half hours in the early evening, and were held at the local school. (Session content, Social Learning Theory principles, skills and expected outcomes are described in detail in the paper). The structure was designed to facilitate intra and inter-family interaction and support, with all learning activities designed to be experiential or learning through games and discussion. Music aided an introductory
exercise portion with warm up, cool down, and gradually increasingly vigorous aerobic activity. Next, children and adults each had their own education segment that featured learning games for the children. This was followed by families meeting together to review progress, engage in group problem solving, set behaviour change and support goals, and mutually encourage progress in health habit changes. Finally, a social time (often with music) was held. Families took turns bringing a healthy snack (often a new recipe) for others to try.

ONE-YEAR POST PROGRAM: Both Mexican American and Anglo American individuals in the experimental groups reported significant dietary improvement as indicated by the food frequency index. Anglo subjects reported significantly lower total fat and sodium intake on both 24-hour recalls and three day food records. Analysis was also performed on the family unit, but results were not dramatically different.


The Chicago Heart Health Curriculum Program (CHHCP) was a yearlong comprehensive risk reduction program, specially designed for a multiracial population of 6th grade students and their families. Based on effective education principles, program materials stressed responsible decision making, knowledge of the consequences of various choices and the interrelationships among the acquisition of knowledge, personal feelings, family and peer influences and heart healthy behaviours. The nutrition module focused on the relationship between atherosclerosis and dietary factors as well as the principles of proper nutrition. Strategies to encourage the selection of low fat foods were included throughout the various lesson plans. Eg, each student completed a 24-hour food record, and then classified the foods listed on the record into low fat or high fat categories. After a classroom discussion of their categories records, the students were asked to plan 7 follow a low fat diet; a second 24 hr food record was then completed and analysed to allow students to assess changes in their eating patterns. Students whose family members chose to participate took family materials home each week. The program was taught over five consecutive weeks.

FOLLOW UP (about 10 months post intervention): Nutrition Behaviour; on both post test and follow up, white students reported significantly more heart healthy eating practices than black students. There was however a significant interaction with time (p<.05), indicating a significant decline in white students' eating behaviour form post test to follow up, while black students' behaviour was virtually unchanged. Simulation of Adult Grocery Shopping; Both Hispanic and white students evidenced significantly more heart healthy shopping than black students on both post test and follow up. There was also a significant decrease over time (p<.001), with the smallest decrease among the Hispanics. There were also increases over time in the purchase of non heart healthy foods by both blacks and whites, the accumulation of which was significant (p<.01). Hispanic students showed the least change in heart healthy selections and no change in their non heart healthy purchases over time, with the result that they had the most heart healthy behaviour at follow up.

There were no non-random control or cohort studies.
<table>
<thead>
<tr>
<th>Study id</th>
<th>Author</th>
<th>Target outcomes/ program approach</th>
<th>Intervention period &amp; sample</th>
<th>Final outcome</th>
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<tbody>
<tr>
<td>071</td>
<td>Wagner, et al, 1992.</td>
<td>Self reported consumption of: fruit, low fat meat, low fat fish/poultry, low fat vegetables, low fat dairy, high fibre grains, high fat meat, high fat fish/poultry, high fat vegetables, high fat dairy, low fibre grains. Educational, family involvement.</td>
<td>Intervention: 0-3 months Follow-up: 0-3 months 4 weeks Sample: 24 families (24 children)</td>
<td>PARTLY EFFECTIVE</td>
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<td></td>
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<td>Family participants significantly increased their purchases of high fibre cereals and grains (intended), compared with the control condition. Intended high fat purchases also increased but were not significant. Children and parents in the experimental group made more low fat, high fibre choices and less high fat, low fibre choices), whilst the control group decreased their scores; for children (p&lt;.10)</td>
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<td>081</td>
<td>De Bourdeaudhuij, et al, 2000</td>
<td>% Energy from fat - total fat, saturated fat, monounsaturated fat and polyunsaturated fat. Educational.</td>
<td>Intervention: 0-3 months Follow-up: 0-3 months Sample: Response rate for inclusion very low (10%) b/c 4 members of each family had to participate. 40 families (n=160) agreed to participate.</td>
<td>EFFECTIVE</td>
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<td></td>
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<td>The tailored intervention was more effective than the non-tailored intervention in reducing total and saturated fat intake when all family members were included in the analysis. Follow up analysis showed only mothers benefited from the tailored intervention. For fathers and adolescents, both the tailored and non-tailored intervention resulted in a significant reduction in total and saturated fat scores.</td>
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<tr>
<td>122</td>
<td>Nader, et al, 1989</td>
<td>Intakes of high fat and high salt foods. Educational, family involvement.</td>
<td>Intervention: 7-12 months Follow-up: 7-12 months 12 months Sample: 206 families (623 individuals)</td>
<td>EFFECTIVE</td>
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<td></td>
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<td>Mexican American and Anglo American individuals in the experimental groups reported significant dietary improvement as indicated by the food frequency index. Anglo subjects reported significantly lower total fat and sodium intake on both 24-hour recalls and 3-day food records. Analysis was also performed on the family unit, but results were not dramatically different.</td>
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<tr>
<td>137</td>
<td>Sunseri, et al, 1984</td>
<td>Multiple outcomes: Nutrition behaviour /consumption, items not described. Simulation of adult grocery shopping of heart healthy/non heart healthy items. Educational, family involvement.</td>
<td>Intervention: 0-3 months Follow-up: 7-12 months 10 months Sample: Control group = 144 / Curriculum only group (E) =350 / curriculum + family group (E/F)=649. The E/F group was subdivided for analysis into those students whose families participated in the adult program (E/P, n=359) and those who chose not to participate (E/NP, n=290). The study population for this paper was limited to the E/P group.</td>
<td>EFFECTIVE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>On both post test and follow up, white students reported significantly more heart healthy eating practices than black students. There was significant decline in white students' eating behaviour from post-test to follow up, while black students' behaviour was virtually unchanged (p&lt;0.05). Hispanic and white students evidenced significantly more heart healthy shopping than black students on both post test and follow up. There was also a significant decrease in heart healthy shopping choices over time (p&lt;.001), with the smallest decrease among the Hispanics. There were also increases over time in the purchase of non-heart healthy foods by both blacks and whites (p&lt;.01). Hispanic students showed the least change in heart healthy selections and no change in their non-heart healthy purchases over time, with the result that they had the most heart healthy behaviour at follow up.</td>
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4.3.6 - Community-wide interventions

*Randomised Control*
None were found.

*Uncontrolled Experimental Designs*
Only two studies were identified in this category. The duration of intervention was 0-3 months for one and 4-6 months for the other. The duration of follow-up was 0-3 months for one and 0-4 months for the other. One involved a mass media approach and the other used education combined with mass media.

*Cohort Designs*
None were found.

| Table 4.20  Community-wide interventions identified in the literature review |
|--------------------------------------------------|-----------------|-----------------|
|                                             | RCTs | Cohort Designs | Non Random Control studies |
| Number of studies                          | -    | -              | 2                           |
| Effective (+ partly)                        | -    | -              | 1(1)                        |
| Duration                                    | -    | -              | -                           |
| 0-3 months                                  | -    | -              | 1                           |
| 4-6 months                                  | -    | -              | 1                           |
| 7-12 months                                 | -    | -              | -                           |
| 13-24 months                                | -    | -              | -                           |
| > 2 years                                   | -    | -              | -                           |
| Follow up                                   | -    | -              | -                           |
| 0-3 months                                  | -    | -              | 1                           |
| 4-6 months                                  | -    | -              | 1                           |
| 7-12 months                                 | -    | -              | -                           |
| 13-24 months                                | -    | -              | -                           |
| Unspecified                                 | -    | -              | -                           |
| Methods:                                    | -    | -              | -                           |
| Educational                                 | -    | -              | -                           |
| Mixed approaches/other                      | -    | -              | 2                           |

*Commentary*

Our search of this set of approaches was disappointing. The only evaluated studies we found are the two below that do not have a strong explicit children’s focus. Nevertheless they illustrate the marketing approaches. “Community development” approaches have been used to promote children’s healthy eating (see list of Australia Community Nutrition projects below) but they remain to be evaluated and reported. Clearly, they are major opportunities to design and evaluate community development approaches to supporting children’s healthy eating. Some of the Healthy Promoting schools projects in Australia and elsewhere may fall into this category.
Examples of community-wide interventions


The Wheeling “1% or Less” campaign, was conducted for six weeks in Feb-Mar of 1996. The campaign messages, advertisements and public relation strategies were as follows. 1) Paid Advertisements: The intervention used paid advertisements on TV, radio and in newspapers. The advertisements used a health message appeal and encouraged a switch from whole or 2% milk to 1% or fat free milk as an easy way to cut saturated fat intake and reduce the risk of heart disease. A professional agency developed and placed the ads. 2) Public Relations: PR events were used to generate news coverage of the campaign message. In the intervention city, news directors and other media gatekeepers were approached to encourage them to cover the campaign. Events were as follows - a) a kick off press conference, b) a mid campaign press conference that featured prominent local physicians, c) a press release announcing the mid campaign results, d) two milk taste test events that stressed that low fat milk tastes good, and e) a press conference at the end of the campaign. A campaign advisory board of 25 community leaders and local health professionals was formed to provide credibility for the campaign and guide implementation.

6 MONTH FOLLOW UP: Milk Sales: market share for low fat milk constituted 42 % of overall milk sales at the 6 month follow up. Volume sales of low fat milk averaged 3383, 5182 and 4380 gallons per supermarket per month for the months before, after and 6 months after the campaign (p<.003). In contrast, no significant variation was observed in the sales of low fat milk between these periods in the comparison city. The market share for high fat milk in the intervention community was 58% at the 6 month follow up. Volume sales of high fat milk decreased significantly in the intervention community from an average of 8135 gallons/supermarket before the campaign, to 6224 and 6156 gallons in the month after and the month 6 months after the campaign (p<.003). No significant reduction in volume sales of high fat milk in comparison community. Telephone survey: Like the milk sales data, the survey results revealed a significant shift from high fat to low fat milk in the Intervention city compared to the Control city. In the I city, 34.1% of high fat milk users switched to low fat milk, compared with 3.6% in the C city (p<.0001). Most of the change occurred among respondents who were drinking 2% milk; 43.6% of 2% milk drinkers in the I city reported switching to low fat milk compared with 3.2% of the C respondents (p<.0001). There was no significant difference between the number of whole milk drinkers who switched to 1% or fat free milk in the I city compared to the C city.


The 1% Or Less campaign is a health education intervention focused on a simple but important dietary change to help reduce saturated fat consumption and the risk of heart disease: the campaign encourages a switch from high fat milk to low fat milk for adults and for children over the age of 2 years. Campaign activities included paid advertisements, public relation efforts, and educational programs at supermarkets,
schools and worksites. Paid Advertisements: included newspaper, TV and radio advertisements. The ads encouraged consumers to switch from whole or 2% milk to 1% or skim milk as an easy way to reduce their intake of saturated fat and risk of heart disease. Public Relations Events: Press conferences, invitations of the press to educational programs and flooding of newspapers with photos and stories etc was maintained throughout the campaign. Taste Tests: Trained campaign volunteers conducted blind taste tests at supermarkets, schools and worksites. Supermarket Programs: In addition to hosting taste tests, supermarkets displayed signs in their dairy cases that encouraged the switch to 1% or skim milk. School-Based Educational Programs: The primary goal of the school based programs was to communicate the campaign message to children and their parents, with the secondary goal of holding events that would interest the news media. Activities included competitions, special assemblies, and math lessons involving caloric calculations, and poetry and essay writing about healthy eating. Other Community Education Programs: local health professionals were trained to give short presentations about nutrition that emphasised the importance of drinking low fat milk; these were conducted at worksites and meetings of civic organisations.

6 MONTH FOLLOW UP: Low Fat Milk Sales: The largest shift in milk sales in the Intervention cities was for 1% milk. Sales of 1% milk were four times as high at the six month follow up than at baseline (p<.05). Skim milk sales increased >70% at the six month follow up, although this difference was of borderline statistical significance. Sales of 1/2% milk increased from 1% to 3% of overall sales. High Fat Milk Sales: The average volume of high fat milk sold in the Intervention (I) cities was 6403 gallons/supermarket/month. In the Control (C) city, the average volume of high fat milk sold was 6489 gallons/supermarket/month, compared to 7233 gallons/supermarket/month at baseline. Sales of high fat milk in the cities decreased from 82% of overall milk sales at baseline to 59% in the month following the campaign, and then increased to 65% at the 6 month follow up. In the C cities, sales of high fat milk were 72% of the overall milk sales at baseline, 67% in the month following the campaign, and 68% at the 6 month follow up. Telephone survey: In all, 36.4% of whole milk drinkers in the I group reported switching to a milk with a lower fat content after the campaign, compared with 15.6% in the C group (p<.05).
<table>
<thead>
<tr>
<th>Study id</th>
<th>Author</th>
<th>Target outcomes/ program approach</th>
<th>Intervention period &amp; sample</th>
<th>Final outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>149</td>
<td>Reger et al., 1999</td>
<td>Milk consumption: whole, 2%, 1%, &amp; fat free. Approach: mass media</td>
<td>Intervention: 0-3 months, Follow-up: 4-6 months for telephone survey (start): I=368 / C=374; telephone survey (end): I=285 / C=258, response rate 73% of those called at baseline.</td>
<td>PARTLY EFFECTIVE&lt;br&gt;6 MONTH FOLLOW UP: Milk Sales: market share for low fat milk constituted 42% of overall milk sales at the 6 month follow up. Volume sales of low fat milk averaged 3383, 5182 &amp; 4380 gallons per supermarket per month for the months before, after &amp; 6 months after the campaign (p&lt;.003). In contrast, no significant variation was observed in the sales of low fat milk between these periods in the comparison city. The market share for high fat milk in the intervention community was 56% at the 6 month follow up. Volume sales of high fat milk decreased significantly in the intervention community from an average of 8135 gallons/supermarket before the campaign, to 6224 &amp; 6156 gallons in the month after &amp; the month 6 months after the campaign (p&lt;.003). No significant reduction in volume sales of high fat milk in comparison community. Telephone survey: Like the milk sales data, the survey results reveal a significant shift from high fat to low fat milk in the I city compared to the C city. In the I city, 34.1% of high fat milk users switched to low fat milk, compared with 3.6% in the C city (p&lt;.0001). Most of the change occurred among respondents who were drinking 2% milk; 43.6% of 2% milk drinkers in the I city reported switching to low fat milk compared with 3.2% of the C respondents (p&lt;.0001). There was no significant difference between the number of whole milk drinkers who switched to 1% or fat free milk in the I city compared to the C city.</td>
</tr>
<tr>
<td>151</td>
<td>Reger et al., 1998</td>
<td>Consumption of whole, 2%, 1%, 1/2% &amp; skim milk. Approach: educational, mass media, food service</td>
<td>Intervention: 4-6 months, Follow-up: 0-3 months for telephone survey (start): I=370 / C=362; telephone survey (end): I=257 / C=248, attrition 69%.</td>
<td>EFFECTIVE&lt;br&gt;6 MONTH FOLLOW UP: Low Fat Milk Sales: The largest shift in milk sales in the I cities was for 1% milk. Sales of 1% milk were 4 times as high at the 6 month follow up than at baseline (p&lt;.05). Skim milk sales increased &gt; 70% at the 6 month follow up, although this difference was of borderline statistical significance. Sales of 1/2 % milk increased from 1% to 3% of overall sales. High Fat Milk Sales: The average vol. Of high fat milk sold in the I cities was 6403 gallons/supermarket/month. In the C city, the average vol. Of high fat milk sold 6489 gallons/ supermarket/month, compared to 7233 gallons/supermarket/month at baseline. Sales of high fat milk in the I cities decreased from 82% of overall milk sales at baseline to 59% in the month following the campaign, &amp; then increased to 65% at the 6 month follow up. In the C cities, sales of high fat milk were 72% of the overall milk sales at baseline, 67% in the month following the campaign, &amp; 66% at the 6 month follow up. Telephone survey: In all 36.4% of whole milk drinkers in the I group reported switching to a milk with a lower fat content after the campaign, compared with 15.6% in the C group (p&lt;.05).</td>
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</table>
5. DISCUSSION

The review of the literature identified several areas which require further research. These are:

- targets and settings
- intervention approaches and strategies
- methodology

Targets and Settings
There was a dearth of well-designed studies of preschoolers, teenagers, and communities. Apart from schools and hospitals there has been little research in other settings.

Intervention approaches and strategies
Many studies have centred on multiple approaches to promote children’s healthy eating. However these were mostly poorly described in the literature and their individual impact is difficult to assess. For example, it is usually impossible to distinguish the separate impacts of family involvement and educational programs. Therefore, future studies should endeavour to examine and compare the impact of individual approaches as well as any combined effects. This will require well-designed randomised control trials.

Methodology
Many of the studies reviewed focused on biomedical outcomes rather than healthy eating per se. Most interventions were of short duration and involved short term follow up. Therefore, in addition to more stringent design outcomes relevant to children’s eating practices longer periods of evaluation are required.

The stakeholders' views represent those of a group of workers who are close to children's and families' eating problems. Perhaps as a result they are quite divergent from the findings of the systematic review of the children's healthy eating intervention literature. In the main, the intervention literature concerns the imposition of externally designed and implemented education programs on schools and other children's institutions. In contrast, the stakeholders are involved in community institutions and groups. Essentially they want more of their current community building activities to be carried out in Victoria. The pseudo-controlled trial designs of the intervention literature are far removed from the action research paradigms of community health promotion. However, the intervention literature does give ground for optimism since their weak designs and interventions tend to be associated with beneficial behavioural outcomes.

Need for multi-level interventions
The stakeholders have drawn attention to the target groups with which they deal. The needs of young children of young parents appear paramount, as is parenting throughout the 0-15 year period. However, there are many other target groups that require attention and support. For example, CALD families, low income families,
Aboriginal families, adolescents and parents themselves. Many of these people could be reached through a variety of local community interventions. However, there is no doubt that children and their families are influenced by many settings such as maternal and child health services, pre-schools, primary school curricula and secondary school curricula. School canteens, out of school care programs, sports clubs, TV programs and advertising, food retailers and food service outlets are among others. Some of these will have more influence on children and their families at some times during their lives than others.

**Potential areas for promotion of CHE**

There are many opportunities for the promotion of children’s healthy eating in various settings.

**Mothers and breastfeeding:**
It is particularly important to improve feeding environments and enable fathers to help. The literature clearly shows that counselling of mothers prenatally is effective in increasing rates of breastfeeding initiation and sometimes duration. However, much more support is required for mothers at initiation and afterwards. Education of fathers and other adult family members is important, as is education of the general community. For example, education of transport and food service owners and workers is needed, so that breastfeeding mothers feel free to feed their children whenever needed (i.e. frequently) in congenial public places.

More Victorian maternity hospitals birthing centres should join in the Baby Friendly Hospital initiative, and more promotion of this initiative is required. Such initiatives will provide models of breastfeeding mothers which will help overcome anti-breastfeeding norms in society and therefore make breastfeeding more acceptable to more people, especially young adults.

It is important that education about breastfeeding is provided to boys as well as girls in school curricula, and via mass media messages.

**Low SES parents:**
A frequent complaint is that health promotion activities tend to be more acceptable to high socio-economic (SES) groups but rejected by low SES groups (people who generally are most exposed to disease risk). The Western Australian FoodCent$ scheme is highly unusual in that it is one of the few programs that is successful with low SES groups. It should be noted that much of the healthy eating literature has been relatively unconcerned with SES differences. These schemes should be adopted in Victoria as part of a low SES community development initiative, and further should be incorporated into school curricula. It is a most unusual program in that it targets the motivations of low SES groups (ie reducing household expenditure as opposed to broad nutrition benefits). Such a needs based approach could be adopted widely for the purposes of promoting healthy eating. For example, the healthy eating pyramid (used in FoodCent$) could be used to emphasise the ecological benefits of fruits, vegetables and cereal grains. This would be popular with secondary school students.

**Help for new parents and families:**
Stakeholders were clear that new parents need a lot of help and advice. This might be in the form of courses and books for new parents, telephone advice lines, internet
programs for parents, parents' associations, and sessions provided in community
health centres by children’s nurses. Research is needed to find feasible, effective ways
to help parents. There are opportunities to extend current maternal and child health
programs.

**Preschool setup:**
The WA ‘Start Right Eat Right’ program appears to have been successful in training a
large number of childcare workers in the principles of healthy eating and related
nutrition issues. Anecdotal reports suggest that trained workers are able to advise
parents about feeding their children. More research is needed to examine the
effectiveness of this type of program if used in different (age group) settings in
Victoria (et al Pollard, 2002).

**Primary schools**
Socio-behavioural principles should be used to develop and expand children's food
preferences. Healthy eating programs should be accompanied by the promotion of
physical activity in schools. At present, there is no knowledge about the child
population’s taste and food preferences or their food skills and knowledge.

**Secondary schools**
Again almost nothing is known about the eating habits of secondary students or their
acquisition of food knowledge and skills. Since food and health skills are valuable for
all citizens it is important that any curricula that are developed are taken by all
secondary students. The limited literature strongly suggest that secondary school is an
ideal setting for the promotion of healthy eating. For example, there may be
opportunity to influence the school food supply and thus children’s eating. Food
skills based curricular are required to prepare secondary students for adulthood.

**Community development interventions:**
These interventions should focus on: giving low SES populations access to high
quality food and food preparation skills; the introduction of CALD groups to healthy
Australian foods; children's experiences of community food production and sale (e.g.
ethnic community markets); development of community gardens that link food to
children’s concerns about the environment and animal welfare – which many children
and adolescents value highly. Collingwood College is a useful example of a school
which is embedded within its local community.

**Population monitoring systems:**
It is important to establish systems to monitor children’s eating and physical activity.
This could include:
- The views, perceived problems and knowledge of parents - do they realise the
  problems involved with their children, do they want help; what is the best way to
  provide services for them?
- The views and knowledge and food practices and preferences of children at
  various ages - what do they eat, do they have regular meals, what needs and wants do
  they have?
- Health status indices of children (and their parents) year by year e.g. BMI, WHR,
  stress levels, dietary assessments, fitness assessments, biomedical risk factors,
  attitudes to food, eating and physical activity.
Monitoring of the child population (and their families) should be done in a regular timely manner on random population samples (and perhaps at sentinel sites; e.g. the US Paediatric Nutrition surveillance system uses height and weight data from children's hospitals to determine prevalence of stunting). There is no need for massive cumbersome surveys. Instead a variety of small scale monitoring systems using for the most part health and education system staff and CATI systems should suffice to allow monitoring of the ‘Children's Food and Nutrition Policy's’ progression towards its goals.
6. APPENDICES

Appendix 1. Stakeholders

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<th>ORGANISATION</th>
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<tr>
<td>Anti-Cancer Council of Victoria</td>
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<td>Australian Breastfeeding Association</td>
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<td>Australian Dairy Corporation</td>
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<td>Australian Department of Health and Aged Care- Vic</td>
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<tr>
<td>Collingwood College</td>
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<tr>
<td>DAA- Paediatric (SIG)</td>
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<tr>
<td>DAA- Public Health and Community Nutrition (SIG)</td>
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<tr>
<td>DEET- Health, Physical and Sport Education Centre</td>
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<td>DHS- Public Health Nutrition</td>
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<td>DHS- Barwon-South Western</td>
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<td>DHS- Specialist Children's Services</td>
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<td>DHS- Disability Services</td>
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<td>DHS- Grampians</td>
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<td>DHS- Loddon Mallee Region</td>
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<td>DHS- Northern</td>
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<td>DHS- Southern</td>
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<td>DHS- Western</td>
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<td>Eat Well SA- Women's and Children's Hospital</td>
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<td>Family Day Care Victoria Resource Unit</td>
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<td>Flinders University</td>
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<td>Food Bank Victoria</td>
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<td>Goodman Fielder</td>
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<td>HealthWest (WA Health Dept)</td>
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<td>NSW School Canteen Association Inc</td>
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<td>Queensland Health</td>
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<td>Royal Australasian College of Physicians, Division of Paediatrics</td>
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<td>Royal Children's Hospital</td>
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<td>Tasmanian Department of Health and Human Services</td>
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<td>The Family Day Care Council of Australia</td>
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<td>VicHealth</td>
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<td>Victorian Aboriginal Health Service</td>
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<td>Victorian Home Economics and Textiles Teachers’ Association (VHETTA)</td>
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Appendix 2. Stakeholder interview questions

The stakeholders were asked their opinion on the following questions:

You and your organisation
- How long have you worked in the area of children’s health/nutrition?
- What are your qualifications?
- What is the nature of your/your organisation’s service/activity?
- What age groups (children) do you work with?
- What age groups (children) does your organisation work with?
- Are there specific social/ethnic groups you and your organisation work with?
- If so, what are they?
- Does your organisation work directly with the children’s families?

Eating and nutrition-related problems
- Do you believe there are any eating or nutrition-related problems in the children you deal with?
- If yes, what are they?
- Do you have any favoured strategies for overcoming them?
- What do you see as the emerging problems we will have to address in the coming years?

Promoting children’s nutrition
- Has your or your organisation tried any strategies to promote healthy eating in children?
- If yes, what where the strategies and what where their outcomes?
- What do you believe are the most effective strategies for promoting healthy eating in children, and why?
- What do you think are the best settings in which we can influence children’s healthy eating, and why?
- What opportunities are there to link up with other public health initiatives, services or agencies in Victoria (e.g. sport, mental health, etc.)?
- What opportunities are there to involve families and parents in the promotion of healthy eating in children?
- Which agencies do you think would be in the best position to take the lead in promoting healthy eating for children?
- Hypothetically, if only one initiative could be taken to promote healthy eating in children, what would it be, and why?
- What resources would be required?
- What do you consider to be the major barriers?

Other work in the field
- Do you know of any other projects in Victoria or elsewhere that are relevant to ours?
- Who else do you think we should consult with?

Format/Dissemination
- What would be the most useful format/process to make the outcomes of this project available to practitioners?
• How do you think practitioners would use this resource?
• What do practitioners need to engage best practice in this area?
Appendix 3. Search strategy for literature review

A) Data Bases and Search Strategies

Data bases to be included were decided upon following consultation with members of the expert Advisory Group and the Deakin University library staff. All searches were limited to included English publications, made between 1980 and July 2001. The following electronic data bases were included:

(i) PUBMED

This was the largest database available, and in order to optimise search outcomes, MESH terms were used wherever possible. Essentially we sought references that described or evaluated interventions, whose impact was assessed via any of the outcome measures detailed in the Dietary Guidelines for Children and Adolescents. Whilst the target age range was 0-15yrs, there were some exceptions. References relating to maternal interventions for example were included in the search findings, since the outcomes were measurable in their children. In accordance with the protocol, the search was limited to the “normal” population, seeking to exclude interventions directed toward disease-specific problems or disorders. Despite this, numerous references in relation to eating disorders or low birth weight babies etc were discovered in the initial findings.

The first search strategy was as follows:


A total of 6695 references were found.

Unfortunately after running this search it was realised that a number of key references were not being detected. In order to try and understand why, each of these key references were found through a single citation search, and their MESH terms compared with the search strategy above to see if they would ‘fit in’. For a descriptive example of this process see Table 1 below.
Table 1. MESH terms of key references compared to MESH terms of search strategy

<table>
<thead>
<tr>
<th>Examples of MESH terms used in search strategy</th>
<th>Key references</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>‘health education’ AND</td>
<td>✓</td>
</tr>
<tr>
<td>‘child’ AND</td>
<td>✓</td>
</tr>
<tr>
<td>‘vegetables’ AND</td>
<td>✓</td>
</tr>
<tr>
<td>‘child nutrition’ AND NOT</td>
<td>✓</td>
</tr>
<tr>
<td>‘disease category’</td>
<td>X</td>
</tr>
<tr>
<td>Fits search strategy?</td>
<td>no</td>
</tr>
</tbody>
</table>

✓ = reference where MESH term matches those in search strategy  
X = reference where MESH term does not match that in search strategy

It became apparent that using the format of searching for the combination of (‘an intervention’ AND ‘an age group’ AND ‘an outcome’ AND ‘child nutrition’ AND NOT ‘diseases category’) was too limiting. Furthermore, excluding all ‘disease categories’ meant that a number of references relating to healthy eating (aiming to reduce potential for cardiovascular disease) were also failing to show in the search.

So, a number of changes were made. The ‘outcome’ terms were joined with the ‘intervention’ terms and the number of terms used reduced one by one, checking for effect by looking through the references lost. This was done until relevant references started to ‘drop off’. The strategy of searching for (‘Interventions and outcomes’ AND ‘age group’ AND ‘not diseases, except for cardiovascular disease’) was successful.

The final search strategy was:

Search ("Health Education" {MESH} OR "health promotion"{MESH} OR ("Child Nutrition"{MESH} NOT ("diet" [MESH]) OR "Vegetables"{MESH} OR fruit*[MESH] OR bread*[MESH] OR "Cereals"{MESH} OR "dietary fiber"{MESH} OR “dietary carbohydrate” [MESH] OR “sodium, dietary” [MESH] OR "food preferences"{MESH} OR "food habits"{MESH}))) AND ("Adolescence"{MESH} OR "child" {MESH} OR "Child, Preschool"{MESH} OR ("Infant"{MESH} NOT "Infant, Newborn"{MESH})) NOT ("Animal Diseases"{MESH} OR "Bacterial Infections and Mycoses"{MESH} OR "Digestive System Diseases"{MESH} OR "Disorders of Environmental Origin"{MESH} OR "Endocrine Diseases"{MESH} OR "Eye Diseases"{MESH} OR "Female Genital Diseases and Pregnancy Complications"{MESH} OR "Hemic and Lymphatic Diseases"{MESH} OR "Immunologic Diseases"{MESH} OR "Musculoskeletal Diseases"{MESH} OR "Neonatal Diseases and Abnormalities"{MESH} OR Neoplasms{MESH} OR "Nervous System Diseases"{MESH} OR "Nutritional and Metabolic Diseases"{MESH} OR "Otorhinolaryngologic Diseases"{MESH} OR "Parasitic Diseases"{MESH} OR "Pathological Conditions, Signs and Symptoms"{MESH} OR "Respiratory Tract Diseases"{MESH} OR "Skin and Connective Tissue Diseases"{MESH} OR "Stomatognathic Diseases"{MESH} OR "Urologic and Male Genital"
Diseases"[MESH] OR "Virus Diseases"[MESH]) Limits: Publication Date from 1980 to 2001, English, Human

A total of 9593 references were found.

(ii) **PSYCHINFO**

Data base-specific terms were entered into the online thesaurus to be as specific as possible, and to find references of the nature detailed in the PUBMED search.

The strategy here was (‘intervention or outcome’ AND ‘age group’) NOT (‘disease/disorder’) AND (‘nutrition’). It was necessary to limit the search to not include ‘disease’ and to include ‘nutrition’, otherwise the search was in excess of 30,000 references.

The final search strategy was:

(((health education or school* or health promotion or nutrition or program* or educat* or evaluat* or effect* or chang* or assess* or policy or child care or early childhood development or adolescent development or early intervention* or treatment outcomes or program evaluation or social change or social services or kindergarten or food or food intake or feeding practices or food preferences or breastfeeding or weaning or calcium or iron or sugar* or sodium) and (NEONATAL or INFANCY or PRESCHOOL-AGE or CHILDHOOD or SCHOOL-AGE or ADOLESCENCE)) not (disease or illness or disorder)) and (nutrition)) and (LA=ENGLISH) and (PY=1980-2001) and (PO=HUMAN)

A total of 206 references were found.

(iii) **CINAHL**

Data base specific terms were entered into the online thesaurus to be as specific as possible, and to find references of the nature detailed in the PUBMED search. However, again due to the large number of findings and the realisation that many were previously included in the PUBMED search, it was decided to limit the search by seeking the inclusion of some key words in the abstract.

The search strategy was as follows:

#2 #1 and ((health education or health promotion or nutrition education or intervention* or program* or educat* or promot* or campaign* or evaluat* or effect* or effic* or chang* or assess* or result* or impact* or adher* or community service* or peer or child care or child day care or nurser* or school* or kindergarten or creche or school health service* or initiative or vegetable* or fruit* or bread* or cereal* or fat* or energy* or calcium* or iron* or dietary sucrose or sodium chloride, dietary or food* or fibre* or infant food or eat* or breastfeeding or weaning or food or food habit* or food variety or diet* or intake*) in AB) and (LA=ENGLISH) (1297 records)

#1 (((health education or health promotion or nutrition education or intervention* or program* or educat* or promot* or campaign* or evaluat* or effect* or effic* or chang* or assess* or result* or impact* or adher* or community service* or peer or...
child care or child day care or nursery* or school* or kindergarten or creche or school health service* or initiative or vegetable* or fruit* or bread* or cereal* or fat* or energy* or calcium* or iron* or dietary sucrose or sodium chloride, dietary or food* or fibre* or infant food or eat* or breastfeeding or weaning or food or food habit* or food variety or diet* or intake*) and (infant* or neonatal or Preschool or school-age or child or adolescence) and(nutrition)) not (disease or illness or disorder)) and (LA=ENGLISH) (2597 records)

A total of 1297 references found.

(iv) FST (Food Science and Technology)

This data base has no linked thesaurus, so a variation on the search strategy used for the PUBMED database was utilised.

The search strategy was as follows:

(((health education or health promotion or nutrition education or intervention* or initiative* or program* or educat* or promot* or campaign* or evaluat* or effect* or effic* or chang* or assess* or result* or impact* or adher* or maternal-child-health-service or child-care-centres or school* or playgroup* or creche or school health service* or vegetable* or fruit* or bread* or cereal* or fat* or energy* or calcium* or iron* or fibre* or sugar* or sodium or salt or eat* or breastfeeding or weaning or food or food habit* or food variety or diet* or intake*) and (infant* or neonatal or childhood or Pre-school or school-age or child or adolescence) and (nutrition)) not (disease or illness or disorder)) and (LA=ENGLISH) and (PY=1980-2001)

A total of 904 references were found.

The EndNote import filter for this data base was not working, so rather than copy/paste all references, an initial cull was done before downloading to EndNote. There were a lot of irrelevant references in this search (much about infant formulas and fortification; complementary/supplementary feeding in developing communities; comparative analyses of breastmilk/formulas; toxins in food; food consumption surveys; nutrition surveys; surveys of dietary intake and nutritional deficiencies; science about different components, eg fatty acids; content and production of weaning foods; food safety).

Following removal of these references from the original 904, the final number included to an EndNote file was 53.

There was some concern that the depth of the search strategy failed to identify the expected references, and a smaller search was performed via an EndNote ‘connection file’.

Using the search strategy (intervention and nutrition and children), 9 out of 46 findings were included. Using a further variation (education and nutrition and children), 19 from 140 findings were included. These two searches were added to the earlier FSTA findings. Whilst there were some duplicates there were also some other very good references not found in the first search, and it was felt to be important that they were included.
Therefore, the total references saved from FSTA database was 81.

(v) ABI/PROQUEST

Data base specific terms were entered into the online thesaurus to be as specific as possible, and to find references of the nature detailed in the PUBMED search. However, the search capacity of this data base was found to be quite limited, requiring it to be restricted to a few key terms.

The search strategy was as follows:

((early intervention or health education or nutrition education or wellness programs or food) in AB) AND (children or youth) AND (nutrition) AND NOT (illnesses or disease)

A total of 1821 references were found. In detail: 29 records between 1980-85, 1220 records between 1986-98 and 572 records between 1999-2001.

The EndNote ‘connection file’ and ‘import filter’ for this data base was not working, so rather than copy/paste all references, an initial cull was done before downloading to EndNote. Following this process, the number of relevant findings was reduced to: 266 records were included.

(vi) CAMBRIDGE SCIENTIFIC ABSTRACTS (including e-psyche, social services abstracts, sociological abstracts, ERIC and web resources related to social sciences/humanities)

Data base specific terms were entered into the online thesaurus to be as specific as possible, and to find references of the nature detailed in the PUBMED search. However, the search capacity of this data base was found to be quite limited, requiring it to be restricted to a few key terms.

The search strategy was as follows:

((health education or nutrition or intervention or program evaluation or education or evaluation or effects or change or child care services) and (breastfeeding or food or nutrition) and (childhood or children) not (illness))

Total references found was 689. Specifically: e-psyche: 209; social services abstracts: 183; sociological abstracts: 270; web resources related to social sciences/humanities: 27

In the case of the ERIC database, the search strategy had to be further refined, because the database would only display a maximum of 1000 records. The search was re run using the following:

(((health education or health promotion or intervention or evaluation) and (breastfeeding or food or nutrition)) not (illness))
821 references were found, but again these had to be culled because only a maximum of 500 could be saved. Following this process the number of relevant references was found to be 181.

B) Transfer of electronic search findings into a common Endnote library

Search findings from each of the electronic databases were downloaded into a common Endnote library, which included 12,366 references; duplicates were removed, reducing this number to 12,126. This library was reviewed over a period of 10 days, initially culling references by title, if it was clear that they had no relation to nutrition and children. The remaining library abstracts were then reviewed in a more detailed 2nd round of exclusion, which was performed by two reviewers. Articles were rejected on review of title and abstract if they did not address an intervention lying within the objectives of the review, or if they violated the inclusion/exclusion criteria defined in the protocol. In addition, if a reference could not be rejected with certainty, they were kept in the database for full text review. Prior to this second round of exclusion, an Expert Advisory Group meeting was held to discuss in more detail the inclusion/exclusion criteria defined in the protocol. From these discussions several important issues were raised. It was agreed that the following groups of subjects/studies should not be included.

- studies related to vitamin supplementation or fortification of foods,
- studies related to use of infant formula,
- interventions aimed at treating eating disorders,
- children with special needs (eg cleft palate, developmental disabilities, neonates in ICU having tube or enteral feeds, babies with eating disorders)
- interventions targeting LBW or pre-termers,
- studies measuring cognitive performance as an indicator of healthy growth

On the other hand, several of the inclusion criteria were further refined, and it was decided to include:

- interventions to promote breastfeeding in mothers, where the outcome (eg healthy growth or duration of breastfeeding) was measured in their babies. All other interventions targeting pregnant women (eg to improve iron status) would not be included.
- relevant family targeted interventions.

Following this process we were left with an Endnote library of 1142 references. This was subdivided into a smaller library including only breastfeeding/weaning references (303) for ease of management. Reference titles/authors/sources were downloaded into a tabulated word document (see below) to allow tracking during the retrieval and then review process.

A third round of review was then performed in order to rank references in order of priority for attainment. References were ranked as either a “1” or “2”; those ranking as “1” being most important, and those as “2” being of interest but less importance for the purposes of the project.
Priority references were then searched from within the Deakin libraries. If they were not held at these libraries they were ordered from other libraries within Australia or from overseas. So as to meet the project deadline, an arbitrary timeframe was placed on this process; it was agreed that ordered references failing to be delivered within a two month period would not be included in the final review. Of those references rated as priority “1”, we managed to source 115 to be included in the review process.
Appendix 4. Organisations responding to requests for information regarding Grey Literature

<table>
<thead>
<tr>
<th>ORGANISATION</th>
</tr>
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<tbody>
<tr>
<td>Canned Food Information Service (BHP)</td>
</tr>
<tr>
<td>Central Sydney Area Health Service</td>
</tr>
<tr>
<td>Child Care Centres Association of Victoria</td>
</tr>
<tr>
<td>Coles/ Myer</td>
</tr>
<tr>
<td>Australian Department of Health and Aged Care</td>
</tr>
<tr>
<td>NSW Health Department</td>
</tr>
<tr>
<td>Territory Health Services</td>
</tr>
<tr>
<td>Queensland Health</td>
</tr>
<tr>
<td>Department of Health and Human Services Tasmania</td>
</tr>
<tr>
<td>Health Promotion Unit South Eastern Sydney Area Health Service</td>
</tr>
<tr>
<td>Kellogg’s Australia</td>
</tr>
<tr>
<td>National Childcare Accreditation Council</td>
</tr>
<tr>
<td>National Health and Medical Research Council</td>
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<tr>
<td>National Heart Foundation</td>
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<tr>
<td>Nutnet</td>
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<tr>
<td>Nutrition Australia</td>
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<tr>
<td>PHA Child Health (SIG)</td>
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<tr>
<td>PHA Food and Nutrition (SIG)</td>
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<tr>
<td>Sanitarium</td>
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<tr>
<td>SIGNAL</td>
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</tbody>
</table>
### Appendix 5. Expert Advisory Group

<table>
<thead>
<tr>
<th>Name</th>
<th>Organization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rowland Watson</td>
<td>Department of Human Services, Public Health Division</td>
</tr>
<tr>
<td>Allison Hodge</td>
<td>Anti-Cancer Council of Victoria</td>
</tr>
<tr>
<td>Cathy Cooper</td>
<td>National Heart Foundation, Victorian Division</td>
</tr>
<tr>
<td>Ernestine Van Herwerden</td>
<td>National Heart Foundation, Victorian Division</td>
</tr>
<tr>
<td>Kay Gibbons</td>
<td>Department of Nutrition &amp; Food Services, Royal Children’s Hospital</td>
</tr>
<tr>
<td>Carol Warren</td>
<td>Victorian Home Economics &amp; Textiles Teachers Association (VHETTA)</td>
</tr>
<tr>
<td>Kellie Ann Jolly</td>
<td>Victorian Health Promotion Foundation</td>
</tr>
<tr>
<td>Gayle Savige</td>
<td>FAO Centre of Excellence, Monash University</td>
</tr>
<tr>
<td>Anne Netherway</td>
<td>Manningham Community Health Service</td>
</tr>
</tbody>
</table>
### 1. Baxter Better Health Good Health Care Award Submission

**Title:** H²O That’s The Way To Go!

**Age Group:** Primary

**Setting:** School

**Aim:** To increase the percentage of children consuming water during the school day. Specifically, to increase from 29 to 39% the Canterbury primary school children who drink water from when they wake in the morning to the end of the school day.

**Description of Intervention:**
- Advocate for the inclusion of water in the Life Education Van curriculum
- Develop and distribute a school water teaching resource
- Develop and distribute information sheets for culturally and linguistically diverse communities to address water issues raised in ethnic health worker consultations
- Develop and distribute a press release
- Schools participate in the launch of the water teaching resource

**Evaluation:** Strategies were evaluated for process and impact evaluation and intermediate outcomes.

**Findings:** Five of the six types of intermediate outcomes were achieved. These outcomes were:
- Behaviours and environments- school allowed children to keep water bottles on school desks
- Strengthening interest and awareness- water teaching resource, “H2O That’s The Way To Go” launched and publicised; press stories
- Healthier products- published, distributed and promoted copies of resource
- Developing partnerships with organisations- working party of 5 schools, 4 NGOs and 3 health services; student performances at launch; students designed cover of resource and slogan for project; staff developed and reviewed resource
- Changing attitudes, knowledge and practice- results presented to parent focus groups, media articles and NSW DAA Conference 1999
<table>
<thead>
<tr>
<th>GENERAL COMMENTS:</th>
<th></th>
</tr>
</thead>
</table>

2. **SOURCE:** Central Bayside Community Health Services  
**TITLE:** Healthy Eating and Habits for Healthy Futures  
**AGE GROUP:** Infants/ Toddlers  
**SETTING:** Day Care  
**AIM:** To reinforce basic knowledge about food groups and personal hygiene to children in age group 3-5 years at Child Care Centres. To encourage development of appropriate eating habits and to promote preventive habits in a season when illness may be more common.  
**DESCRIPTION OF INTERVENTION:** Demonstration sessions using puppets, food models, and posters. Project kits and take home information packages.  
**EVALUATION:** Only a very basic evaluation was completed- two evaluation forms sited.  
**FINDINGS:** Limited evaluation shows support for the project with objectives being achieved.  
**GENERAL COMMENTS:** Good idea but not well evaluated.

3. **SOURCE:** Central Sydney Area Health Service Division of Population Health  
**TITLE:** Caring for Infants: Food and Nutrition for 0 to 1-year olds in Long Day Care Centres  
**AGE GROUP:** Infants/ Toddlers  
**SETTING:** Day Care  
**AIM:** Improve daily nutrition for infants in LDCC
### DESCRIPTION OF INTERVENTION:

Those centres that agreed to participate in the project were surveyed on infant nutrition knowledge and feeding practices before and after an education based intervention. Half of the centres (32) were offered the education intervention - with the remaining centres (32) acting as controls. The intervention combined a resource book on infant nutrition developed especially for LDCC with a complimentary workshop to educate child care staff.

### EVALUATION:

Process evaluation of workshops; impact evaluation of intervention

### FINDINGS:

The intervention was successful in improving some infant feeding practices (particularly those requiring minimal changes):

- The storage of formula and breastmilk in the correct place in the refrigerator
- Centres giving advice to parents about safe transport of bottles to the centre
- The decrease in the availability of honey to infants
- The correct storage of meals while an infant sleeps;

But had minimal effect on others:

- To encourage more centres to include breastfeeding sections in nutrition policies
- To label bottles with the contents and date of preparation

The evaluation showed that the resource book and workshops have the potential to improve staff knowledge of infant nutrition and infant feeding practices in LDCC.

### GENERAL COMMENTS:

4.

### SOURCE:

Central Sydney Area Health Service Division of Population Health

### TITLE:

School Canteen Food Hygiene Workshops

### AGE GROUP:

Primary/Secondary

### SETTING:

School

### AIM:

Create a more health promoting school environment in terms of school ethos by increasing the percentage of schools following food hygiene practices

### DESCRIPTION OF INTERVENTION:

Food hygiene workshops for school canteen managers and volunteers

### EVALUATION:

Process, impact and outcome evaluation completed
<table>
<thead>
<tr>
<th>FINDINGS:</th>
<th>No results given</th>
</tr>
</thead>
<tbody>
<tr>
<td>GENERAL COMMENTS:</td>
<td>Very brief report provided</td>
</tr>
</tbody>
</table>

5.
| SOURCE:           | Centre for Ecoliteracy |
| TITLE:            | The Edible Schoolyard |
| AGE GROUP:        | Primary/ Secondary |
| SETTING:          | School |
| AIM:              | To create and sustain an organic garden and landscape which is wholly integrated into the school’s curriculum and lunch program. It involves the students in all aspects of farming the garden - along with preparing, serving and eating the food - as a means of awakening their senses and encouraging awareness and appreciation of the transformative values of nourishment, community and stewardship of the land. |
| DESCRIPTION OF INTERVENTION: | Development of a school garden and kitchen. Making it part of the curriculum - gardening, cooking, environmental issues, etc. |
| EVALUATION:       | No official evaluation was completed. |
| FINDINGS:         | Teachers, parents, students and community all supportive of project. Seems to be quite successful with ideas for new developments, ie. dining commons, being planned. |
| GENERAL COMMENTS: | Good resource although quite narrative. |

6.
| SOURCE:           | City of Greater Shepparton |
| TITLE:            | Fruit to Schools & Fruit for Kids |
| AGE GROUP:        | Toddler/ Preschool/ Primary |
| SETTING:          | Day Care/ School |
| AIM:              | To enhance the health status and eating habits of Victorian pre school and school aged children by providing access to a range of nutritious and affordable fruit |
### DESCRIPTION OF INTERVENTION:
The local horticultural industry has a sizeable quantity of ‘downgraded’ apples and pears that the domestic market does not accept. A pilot program has been established to determine the level of community support for the project and ascertain consumer fruit preferences and eating habits. Fresh fruit is to be supplied on a seasonal basis, once per week, ideally to school canteens or ‘in house’ coordinators at day care centres.

### EVALUATION:
No evaluation as yet

### FINDINGS:
No findings as yet

### GENERAL COMMENTS:
Pilot program yet to be completed

7.

### SOURCE:
Community Health Bendigo

### TITLE:
Sustainable Nutrition Intervention Project

### AGE GROUP:
Community

### SETTING:
Community (day care/ preschool/ school)

### AIM:
Encouraging target groups to develop or adopt healthy eating guidelines and strategies at a local level, in accordance with National and State Nutrition Policy Recommendations.
- To develop a Healthy Eating Policy for the City of Greater Bendigo
- To obtain signatories from ‘peak’ bodies and organisations in support of the policy
- To provide leadership, co-ordination and collaboration to increase the provision of healthy food choices in public food outlets and at public events in the City of Greater Bendigo
**DESCRIPTION OF INTERVENTION:**

The process involved consulting with organisations and assisting them to make realistic changes to increase healthy food choices where possible.

The process for this project involved the following general stages:

- a) Contacting a key member of the relevant organisation/event committee;
- b) Meeting with the key person/committee or relevant individuals to outline the aims of the project;
- c) Discussing and documenting what the organisation is currently doing in relation to healthy food choices;
- d) Establishing needs and identifying ways in which the organisation could participate in the project and increase healthy food choices;
- e) Project worker providing resources, training, educational materials or other support mechanisms, or acting as a consultant to increase the availability of healthy foods within the organisation/event/venue;
- f) Benchmarking the increased provision of healthy food choices;
- g) Conducting process and impact evaluation where possible;
- h) Working with the organisation to produce a Nutrition Policy or Healthy Eating Charter where applicable.

Due to the diverse nature of the different groups involved in the project, this process was more or less structured according to the needs of the group.

---

**EVALUATION:**

Both process and impact evaluation were used throughout the project; process evaluation was used to measure the suitability of particular project strategies and approaches, and impact evaluation was used to examine health promotion outcomes resulting from participation in the project.

---

**FINDINGS:**

Raised awareness and increased provision of healthy food choices within various settings, along with the development of structural support mechanisms such as Health Promotion policies and Healthy Eating Charters through consultative and collaborative processes. The underlying intent of all project initiatives was to develop sustainable outcomes that would live beyond the direct involvement of the project.

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**GENERAL COMMENTS:**

Large project covering lots of different community groups. Findings not very detailed.

---

8.

**SOURCE:**

Darebin Community Health

**TITLE:**

Health Promoting Schools Project

**AGE GROUP:**

Primary/Secondary

**SETTING:**

School
**AIM:** The aims of the project were to:
- Use the Health Promoting Schools (HPS) approach to support a small number of local primary and secondary schools to develop plans and policies to complement nutrition education through the curriculum;
- Create a network linking primary and secondary schools with each other and with community resources to support the implementation of school food and health policies and plans;
- Develop a more planned and strategic approach to intersectoral collaboration between the organisations within the North East Health Promotion Centre and local primary and secondary schools to support development, implementation and ongoing review of school food and health policies and plans.

**DESCRIPTION OF INTERVENTION:** Five main areas of intervention:
1) Forums-Health Promoting Schools, Gorgeous Girls Project, Working Together: Schools and Community agencies; & Mental Health in Schools: Gatehouse Project;
2) Health Promoting Schools (HPS) Working Group
3) Healthy Eating in Schools Project Advisory Group
4) Healthy Eating In Schools Project Team Workshops
5) Resources

**EVALUATION:** No official evaluation performed

**FINDINGS:** Three areas where school achievements were examined:
1) Curriculum eg. Increased funds allocated to nutrition in school budget
2) Environment eg. Daily Breakfast Club established
3) Linkages and partnerships eg. Food tips developed by dietitian and health promotion officer included in regular school newsletters and bulletins for parents

Significant project achievements included:
- Networks/ linkages
- Increased understanding across range of agencies around HPS framework
- Changes in policy and practice around HPS
- Broadened understanding of relationship between food and mental health and positive well-being

**GENERAL COMMENTS:** Two pages of school achievements listed

9.

**SOURCE:** Health Department of Western Australia

**TITLE:** Fruit ‘n’ Veg with every meal (phase II & III)
### Start Right-Eat Right Award Scheme: Implementing food and nutrition policy in child care centres

- **AGE GROUP:** Infant/Toddler
- **SETTING:** Day Care
- **AIM:** To provide the incentive to bring about improvement in food service in line with government policy and regulations in the child care industry.

**DESCRIPTION OF INTERVENTION:**
- Five 15 second television advertisements;
- Press advertising
- Point of sale promotions in supermarkets and fresh produce stores eg. Cooking demonstrations/ cookbook
- Information/ resource kits available to consumers/ schools/ health professionals
- Community based promotions organised by local health professionals and teachers

**EVALUATION:** Impact evaluation-feedback from consumers

**FINDINGS:**
- Campaign awareness high (80%)
- Increase intake of fruit & vegetables (30%)
- Change in knowledge (more in females than males)

**GENERAL COMMENTS:**

---

**Source:** Health Department of Western Australia
1) Theories of organisational change were used to identify processes and strategies to support the industry in translating policy into practice.
2) Eight LDC were involved in the development of award criteria, training and resources
   -use of existing resources
   -workshops piloted- resulted in short course and Structured Menu Assessment and Planning Guide
   -production of the Good Food for Childcare video
   -use of existing training programs eg. FoodSafe certificate
3) Implementation of Start Right- Eat Right Media launch- presentation of awards/ brochure
4) Process evaluation

**EVALUATION:** Process and impact evaluation completed

**FINDINGS:** 40% of centres had registered in the scheme 2 years post launch. Most centres registered for the award had to change their menus to meet the award standards.

**GENERAL COMMENTS:**

<table>
<thead>
<tr>
<th>11.</th>
<th>SOURCE:</th>
<th>Health Department of Western Australia</th>
</tr>
</thead>
<tbody>
<tr>
<td>TITLE:</td>
<td>Be creative with fruit ‘n’ veg</td>
<td></td>
</tr>
<tr>
<td>AGE GROUP:</td>
<td>Primary/ Secondary</td>
<td></td>
</tr>
<tr>
<td>SETTING:</td>
<td>School</td>
<td></td>
</tr>
</tbody>
</table>
| AIM: | Increase positive attitudes towards fruit and vegetables
Encourage increased consumption of fruit and vegetables |

**DESCRIPTION OF INTERVENTION:**

**Phase 1:**
Two 30 second television advertisements; one 15 second television advertisement; press advertising; cookbook- “Kids in the Kitchen”; information pamphlets; community activities.

**Phase 2:**
One 30 second television advertisement; four 10 second television advertisements; strategies and resources developed to assist schools and canteens- promotional kit; Supercent$ tours- local supermarkets; cookbook; advertising competition-artwork

**EVALUATION:** Impact evaluation for both phases
### FINDINGS:

<table>
<thead>
<tr>
<th>Phase 1:</th>
<th>77% of target group was aware of campaign</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>9000 cookbooks sold in first 2 months</td>
</tr>
<tr>
<td>Phase 2:</td>
<td>93% aware of television advertisement</td>
</tr>
<tr>
<td></td>
<td>96% aware of fruit and vegetable characters</td>
</tr>
<tr>
<td></td>
<td>48% took some action to eat more fruit and vegetables</td>
</tr>
</tbody>
</table>

### GENERAL COMMENTS:

12.

<table>
<thead>
<tr>
<th>SOURCE:</th>
<th>Health Promotion Service South East Health, Community Health Central Sydney Area Health Service, Bankstown Health Service South Western Sydney Area Health Service</th>
</tr>
</thead>
<tbody>
<tr>
<td>TITLE:</td>
<td>Good Food in Family Day Care Project</td>
</tr>
<tr>
<td>AGE GROUP:</td>
<td>Infant/ Toddler</td>
</tr>
<tr>
<td>SETTING:</td>
<td>Day Care</td>
</tr>
<tr>
<td>AIM:</td>
<td>To improve the safety and nutritional quality of food provided to 0-5 year old children attending family day care</td>
</tr>
<tr>
<td>DESCRIPTION OF INTERVENTION:</td>
<td>Three phases:</td>
</tr>
<tr>
<td></td>
<td>1) Planning- working party advisory committee;</td>
</tr>
<tr>
<td></td>
<td>2) Baseline Research- needs assessment, nutrition policy survey, knowledge survey, food history survey, &amp; parents survey;</td>
</tr>
<tr>
<td></td>
<td>3) Intervention- planning, implementation a) feedback baseline research results, b) workshops, c) nutrition resource kit, &amp; d) communication strategy.</td>
</tr>
<tr>
<td>EVALUATION:</td>
<td>Interim report only- no evaluation specified</td>
</tr>
<tr>
<td>FINDINGS:</td>
<td>Interim report only- findings not mentioned</td>
</tr>
<tr>
<td>GENERAL COMMENTS:</td>
<td>Incomplete report</td>
</tr>
</tbody>
</table>

13.

<table>
<thead>
<tr>
<th>SOURCE:</th>
<th>South Eastern Sydney Area Health Service Health Promotion Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>TITLE:</td>
<td>Good Food for Children 0-5</td>
</tr>
<tr>
<td>AGE GROUP:</td>
<td>Infant/ Toddler/ Preschool</td>
</tr>
<tr>
<td>SETTING:</td>
<td>Day Care</td>
</tr>
</tbody>
</table>
**AIM:** To improve the nutritional status of children by improving the nutritional quality of food available to children attending long day care centres in the South Eastern Sydney Area Health Service.

**DESCRIPTION OF INTERVENTION:** A multi-strategic approach was developed. Strategies were directed at:
- Changing policy, legislation and guidelines relating to nutrition in LDCCs,
- Increasing public interest and parental awareness of children’s nutritional needs,
- Assessing the use of nutrition education resources in LDCCs,
- Influencing the nutrition knowledge, skills and attitudes of LDCC staff through workshops, feedback on centre menus, policies and practices and cooks’ networks.

Both control and intervention centres completed a centre survey, observation checklist, menu checklist, and policy checklist. Intervention centres were invited to attend nutrition and food handling workshops and were also given feedback on their results from the above surveys/checklists. Control centres were not.

**EVALUATION:** The project was evaluated using a pre-post quasi-experimental design. Process, impact and outcome evaluation completed.

**FINDINGS:** Significant improvements were seen in intervention centre menus, policies and food service practices, compared to control centres.

**GENERAL COMMENTS:**

14.

**SOURCE:** Lowson, S. & Cullerton, K.

**TITLE:** Healthy Jarjums make Healthy Food Choices

**AGE GROUP:** Preschool/ Primary

**SETTING:** School/ Home

**AIM:** Not specified

**DESCRIPTION OF INTERVENTION:** Resource- Educator’s Manual including lesson plans

**EVALUATION:** Impact evaluation suggested

**FINDINGS:** Still being determined
<table>
<thead>
<tr>
<th>GENERAL COMMENTS:</th>
<th>Article only</th>
</tr>
</thead>
</table>

15.

**SOURCE:** National Heart Foundation of Australia

**TITLE:** Out of School Hours Care Nutrition Project

**AGE GROUP:** Primary

**SETTING:** School

**AIM:** To increase awareness of healthy eating among:
- Staff from Victorian Out of School Hours Care Services, and
- Parents and children using the Out of School Hours Care Services

**DESCRIPTION OF INTERVENTION:**

Four parts:

1) *Increase capacity of and activity among OSH centre staff to enhance selection and provision of healthy food choices*-
   Develop a resource kit, consultation and piloting of the kit, provide support and nutrition content expertise into training programs and resources provided by relevant training bodies, promote the program, special mail out, & investigate feasibility of website.

2) *Increase healthy food skills of children using OSHC centres*-
   Develop and promote a set of food activities and information, & provide children with a copy of recipe sheets to take home.

3) *Increase parents’ understanding of children’s food needs and ideas for simple meals*-
   Kit to include parent information sheets, send home copies of popular meals/food ideas, & encourage sponsor organisations.

4) *Increase knowledge of program within Victoria and nationally*-
   Promote availability of resources within Victoria, develop resource for national distribution, write a final report, write and present papers & media and public relations.

**EVALUATION:**

Three phases:

1) Testing of the draft OSHC resource for the OSHC workers, and testing of parent/guardian information
2) Involves collection of baseline data about the sector from a random sample of services within Vic and NSW
3) Tracking dissemination of the resource, its use, and any issues that may arise with the resource
### FINDINGS:

<table>
<thead>
<tr>
<th>Summary of results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Only part 1 of intervention and phase 1 of evaluation complete</td>
</tr>
<tr>
<td>- all services piloting the resource (13) found the information in the introduction useful</td>
</tr>
<tr>
<td>- all services felt the nutrition issues were covered adequately in Part 2</td>
</tr>
<tr>
<td>- most services found the food safety information useful</td>
</tr>
<tr>
<td>- 28 of the 32 afternoon tea recipes were tested by one or more services</td>
</tr>
<tr>
<td>- all services found the breakfast information useful</td>
</tr>
<tr>
<td>- 24 of the 28 cooking activities recipes were tested by one or more services</td>
</tr>
<tr>
<td>- 24 of the 37 food and nutrition activities were tested by one or more services</td>
</tr>
<tr>
<td>- all the services that participated in the pilot felt that physical activity issues were covered adequately in Part 3</td>
</tr>
<tr>
<td>- all the services that tested the resource found the background nutrition information useful</td>
</tr>
<tr>
<td>- all services that participated in the pilot found the “For more information” section useful</td>
</tr>
<tr>
<td>- all services that participated in the pilot found the appendices useful</td>
</tr>
<tr>
<td>- all services reported that staff enjoyed using the resource</td>
</tr>
<tr>
<td>- all services reported the resource was easy to follow and use</td>
</tr>
</tbody>
</table>

### GENERAL COMMENTS:

| 13 pages of results |

16.

### SOURCE:

National Heart Foundation

### TITLE:

Food Smart- Primary School Nutrition Education Pilot Project

### AGE GROUP:

Primary

### SETTING:

School

### AIM:

Phase 1:
To develop a nutrition intervention program designed to improve the nutrition knowledge and skills of Grade 5 and 6 primary school aged children in the Western metropolitan Region of Melbourne. The program was designed to include: a) nutrition education as it relates to health, particularly heart health, b) development of healthy food selection skills, & c) development of healthy food preparation skills.

Phase 2: To determine teacher’s own perception of their ability to implement the Food Smart nutrition education program within their own school context by providing teachers with a Food Smart Manual and an inservice education program that support the use of the Food Smart Manual. To investigate teachers’ opinions regarding the most effective means of marketing the Food Smart program.
### Description of Intervention:

**Phase 1:**
- Appointment of a consultant Home Economist to write and teach a draft set of lessons, six western region metropolitan schools, and one eastern region metropolitan school recruited as pilot schools, appointment of a FoodSmart manual writing group, appointment and training of two part-time demonstrators, design of phase 1 evaluation, & teaching of the eight nutrition education lessons by demonstrators to Grade 5 and 6 classes.

**Phase 2:**
- Food Smart Working Group reconvened, redraft of manual based on recommendations from the phase 1 evaluation, development of the inservice education program, five inservices conducted, food smart supervisor appointed, food smart co-ordinator/contact at each school, meetings with contact person, implementation of food smart program, evaluation instruments designed, journals investigated, focus groups conducted with data transcribed, questionnaires sent to teachers and data collated, supervisor interviewed by writer.

### Evaluation:

**Phase 1:**
- Impact and Process evaluation

**Phase 2:**
- Focused on three key elements- a) the inservice education program-process evaluation, focus groups & questionnaires,
- b) Food Smart program implementation- focus groups, questionnaires, journals & observation, and
- c) Food Smart promotion and marketing strategies- questionnaires & focus groups.
| FINDINGS: | Phase 1:  
Students- Impact evaluation indicated a positive trend in terms of the students’ knowledge and reported eating behaviours. Process evaluation indicated that students generally found the food yummy and the lessons fun, interesting and exciting.  
Teachers- strong support for the program and inservice education, curriculum relevant to personal development/health education component, but little parental support.  
Principals- similar responses to teachers.  
Parents- few responses but those that did were supportive.  
Demonstrators- concept endorsed by all demonstrators, practical problems outlined.  
Phase 2:  
a) Inservice Education Program- strong support for the concept of an inservice education program, process evaluation revealed that the content was adequate, the questionnaire on program length showed no preference, cost question showed little response, location again showed no preference.  
b) Food Smart program implementation-  
i) program- strengths: strong support for program and the educational method, the construction of the program was widely praised; weakness: no outstanding weaknesses but there were some general concerns such as program cost, planning time requirements, worksheet quality and recipes.  
ii) manual presentation- generally well received.  
iii) program sustainability-factors affecting this were found to be parental support, maintaining the interest of the students, costs and funding, & teacher and school support  
c) Promotional strategies- newsletters, flyers, newspapers, personal contact, & word of mouth were recommended. |
| GENERAL COMMENTS: |  |
| SOURCE: | National Heart Foundation |
| TITLE: | Eat Smart for Heart |
| AGE GROUP: | Primary |
| SETTING: | School |
**AIM:**
To encourage children to learn about and enjoy the experience of eating from a wide variety of food and drink and to develop and maintain skills that contribute to healthy eating patterns.
To promote awareness of the importance of a supportive environment for making healthy food and drink choices including from the school canteen/ tuckshop.
To encourage school & community links in the provision of and education about healthy food and drink choices.
The program encompasses the Health Promoting School concept addressing the formal curriculum, the school environment and partnerships with the family and local community.

| DESCRIPTION OF INTERVENTION: | 1. Preparation  
• The school registers for Eat Smart For Heart with the National Heart Foundation  
• The school receives the Eat Smart For Heart materials  
2. Introduction (weeks 1-2)  
• The school community is introduced to the program via the Eat Smart For Heart brochure and the school newsletter  
• Students are introduced to the Eat Smart For Heart learning process, goal-setting and journal writing  
• The canteen/ tuckshop is prepared for the program  
3. Implementation (weeks 3-6)  
• The learning process, goal-setting and journal writing are incorporated into nutrition lessons  
• Students make healthy food and drink choices  
• Unit outlines and student worksheets are used in nutrition lessons  
• The canteen/ tuckshop promotion and sales support the program  
• The school community is encouraged to be involved in the program  
4. Conclusion  
• The school community celebrates with a healthy breakfast or lunch  
• The school community plans for continuing support of healthy eating in the school  
• A thank you note is sent home to parents/ carers for their support  
• The school provides feedback about the program to the heart Foundation  
• The Heart Foundation acknowledges the school’s participation in the program |

**EVALUATION:**
Process and impact evaluation through questionnaires.
**FINDINGS:**
The Eat Smart For Heart Trial was successfully conducted in 13 schools in 5 states and territories. Principals indicated that there was a general acceptance of the program throughout the school community. Teachers indicated appreciation and acceptance of the program in relation to programming, support for student learning, canteen/tuckshop support of healthy food and drink choices and encouragement of home/school communication. Canteen/tuckshop management indicated appreciation of the program in relation to the provision and promotion of healthy food and drink choices and the important role of the school canteen/tuckshop in nutrition education. Parents/carers indicated acceptance and appreciation of the program in relation to healthy eating and the complementary role that the home and school can play in this. Students indicated acceptance and enjoyment of the program as an opportunity to learn about nutrition in an interactive way. Others, including education curriculum officers, health and physical education advisors and health promotion officers in other agencies indicated support of the program as a worthwhile curriculum resource to facilitate learning in nutrition education. The trial as summarised in this report confirms that the implementation of Eat Smart For Heart in Primary schools can be an effective and valuable teaching and learning tool in nutrition within the context of a health promoting school.

<table>
<thead>
<tr>
<th><strong>GENERAL COMMENTS:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Trial Report only</td>
</tr>
</tbody>
</table>

18.

**SOURCE:** National Heart Foundation- Queensland

**TITLE:** Queensland School Breakfast Project

**AGE GROUP:** Primary

**SETTING:** School

**AIM:** To increase the proportion of Qld primary school children who regularly consume breakfast
**DESCRIPTION OF INTERVENTION:**

**Timeline:**

**First 6 months of 2001**
- Formation of working party and advisory group
- Literature review and program review
- Develop promotional tools and recruit schools for focus groups
- Development of focus group tool and subsequent data collection in 12 metropolitan, rural and remote schools

**Second 6 months of 2001**
- Written survey developed (guided by focus group findings) and piloted
- Media coverage of breakfast skipping and project
- Recruit 9 control and 9 intervention metropolitan, rural and remote schools
- Investigate breakfast venues
- Summarise and report on findings (to schools, funding body and organisations)

**2002**
- Data collection (baseline) with written survey in 9 intervention and 9 control schools and quantitative analysis
- Develop and pilot a range of school-specific intervention strategies to improve breakfast consumption
- Evaluate intervention strategies using pre- and post- data
- Develop and disseminate findings and recommendations

**EVALUATION:** Not specifically outlined

**FINDINGS:**

Outcomes to date (Oct 2001)

Literature review- concluded that breakfast consumption is a critical issue for health and nutritional status of school children. Although the evidence is not conclusive, breakfast consumption is also likely to have beneficial effects on learning and behaviour at school. Data from the 1995 National Nutrition Survey indicate that the rate of breakfast skipping in Australian School Children is of sufficient magnitude to be considered a public health issue.

Review of Australian Breakfast Programs- a national review of breakfast programs found that breakfast programs varied in how they were run, whether food was donated and the level of volunteer commitment. Some program providers cited positive social interaction between children as a positive side effect of programs.

Focus Group Research- 35 focus groups with school-aged children (separated genders) were conducted to explore the enablers and barriers to breakfast consumption as well as current breakfast consumption behaviour.

Recruitment of Schools- schools were assessed by accessibility, and representation of different socio-economic status. For recruitment of the control and intervention schools a selection process was set up and media coverage was gained to entice schools to enquire further.

Written questionnaire-the questionnaire is in its final draft stage and is due to be piloted in the next few months.
| GENERAL COMMENTS: |  |
| 19. |  |
| **SOURCE:** | New South Wales School Canteen Association Inc |
| **TITLE:** | Evaluation Report of the Healthy School Canteen Award Accreditation Program |
| **AGE GROUP:** | Primary |
| **SETTING:** | School |
| **AIM:** | To provide an incentive program for schools that are wanting to develop a healthier canteen, including providing healthier food choices. |
| **DESCRIPTION OF INTERVENTION:** | To provide an incentive program for all school canteens to provide healthy menus and other standards. To provide guidance on menu development via the publication of the Healthy Kids Buyers Guide To provide support services for schools wanting to develop a healthier canteen |
| **EVALUATION:** | Award Program Evaluation by Schools- to review the current Award Program by surveying four different groups of schools (four different surveys). Group 1- Schools that have never requested an Award kit Group 2- Schools that requested an Award kit, but did not apply Group 3- Schools that received an Award in previous year(s), but did not re-apply in 2000 Group 4- Schools that received an Award in 2001 |
**FINDINGS:**

<table>
<thead>
<tr>
<th>Group 1:</th>
<th>Group 2:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Too time consuming/ little benefit</td>
<td>Too time consuming/ too much paperwork</td>
</tr>
<tr>
<td>Doing well without an award</td>
<td>Staff changes</td>
</tr>
<tr>
<td>New Canteen Manager</td>
<td>Needed a break</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Group 3:</th>
<th>Group 4:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Changing staff</td>
<td>To be awarded and recognised</td>
</tr>
<tr>
<td>Too time consuming</td>
<td>For health of school community</td>
</tr>
<tr>
<td>Applying again next year</td>
<td>To know we are “on track”</td>
</tr>
</tbody>
</table>

**GENERAL COMMENTS:**

Poor response rate- so results are not accurate

---

**SOURCE:** Paino, R., Wellington, A. & Keane, J.

**TITLE:** Who owns the community food garden?

**AGE GROUP:** Community

**SETTING:** Community

**AIM:** To develop with the community a sustainable community food garden

**DESCRIPTION OF INTERVENTION:**

- Strategies used included:
  - Community development- networks/ partnerships
  - Development of personal skills and education
  - Creating supportive environments

**EVALUATION:** No official evaluation

**FINDINGS:**

- Program benefits:
  - New skills, free food, gardens and trees, improved diet, better resource equity, improved access to resources and vegetables, and more control over their diet and environment

---

**SOURCE:** Queensland Health
### Title:
Nutrition or Indigenous Maternal and Child Health: An Evaluation and Final Report of In-service Training Workshops

### Age Group:
Infant/ Toddler

### Setting:
Community

### Aim:
The workshops were held to train staff on methods and strategies to address poor nutrition in the Aboriginal and Torres Strait Islander community. The aims of the in-service training project were to:
- Develop a series of training modules to cover a range of nutrition topics
- Conduct maternal and child nutrition in-service training and Aboriginal and Torres Strait Islander nutrition planning workshops in each of the three public health zones of Queensland

Each workshop was evaluated at its completion. However, as part of the overall implementation strategy an outcome evaluation was planned 6 months after the workshops had been completed.

Performance indicators for the outcome evaluation were defined as:
- The percentage of participants reporting a sense of direction and commitment to and confidence in working together
- The percentage of participants reporting utilisation of skills 6 months after the program

### Description of Intervention:
An in-service training project on Indigenous maternal and child nutrition was planned.

The Nutrition Program of the University of Queensland was commissioned to develop the series of training modules in consultation with Public Health Nutritionists and Health Workers. The Nutrition Program was also retained to conduct the in-service workshops with the support of the zonal Public Health Nutritionists (Indigenous Health) and contributions from other health workers or project officers with expertise in key program areas.

Four workshops were held, one in each of the regions of Queensland, Cairns, Townsville, Rockhampton and Brisbane.

Approximately 6 months after the workshops a covering letter and an outcome evaluation survey was distributed to all the zonal Public Health Nutritionists involved in the in-service training. These nutritionists distributed the survey, with the letter, to all participants who attended the workshop in their area.

### Evaluation:
Outcome evaluation
### FINDINGS:
- 58% of participants responded to the questionnaire
- Approximately 68% of respondents indicated they had made a plan of action following attendance at the MCH Nutrition Workshop
- Respondents were generally successful in being able to implement their plans to some extent
- Insufficient time, lack of accessible funds, and lack or poor access to training resources were the key reasons given for not being able to carry out plans that had been made
- 50% of respondents reported that the workshop had changed the way they worked with mothers and children
- 70% of respondents indicated that they had referred to the training manual since the workshop
- Comments were also provided which are particularly useful when planning further in-service workshops
- Results of the survey indicate that the in-service workshop was very positive when measured against the outcome indicators established at the onset to the project

### GENERAL COMMENTS:

22.

**SOURCE:** Queensland Health

**TITLE:** Happy Teeth Happy Child Resource Evaluation

**AGE GROUP:** Infant/ Toddler/ Preschool

**SETTING:** Preschool/ Day Care

**AIM:**
- To contribute to a reduction in dental disease among children 0-5 years of age
- To help establish tooth brushing habits in children 0-5 years of age
- To help develop healthy eating habits in children 0-5 years of age
- To provide oral health resources to early childhood educators and parents to support their role as oral health promoters
**DESCRIPTION OF INTERVENTION:**

The project involved the following activities:
- The design and implementation of an oral health education resource targeting early childhood settings
- The training or oral health staff in the implementation of Happy Teeth Happy child
- The training of centre staff in Happy Teeth Happy child, in particular daily tooth brushing
- The implementation of a daily tooth brushing program in early childhood settings
- Ongoing support to centres for the implementation of Happy Teeth Happy Child
- Providing support for the development of centre nutrition policies
- Providing easy to use oral health information to centres to provide to parents (pamphlets, newsletter articles and displays)

**EVALUATION:**

The first 11 early childhood centres in which the program was trailed were used for the evaluation. Process and impact evaluation results. Outcome measures were not included.
The evaluation consisted of four components:
- A pre and post interview with a centre staff member, at six months to gauge changes in oral Health policies and practices within centres
- A post intervention education resource evaluation (at six months) to assess the appropriateness of the Happy Teeth Happy Child teaching resources
- A pre intervention parent interview to assess knowledge of Oral Health issues and current Oral Health practices relating to children 0-5 years, post intervention parent interview at six months to look at changes in knowledge of centre Oral Health policy/practices and receipt of Oral Health information
- A post program implementation review with Oral Health staff. This is based on a diary kept by the Oral Health coordinator and other staff involved in the implementing the program and a discussion with senior staff

**FINDINGS:**

The evaluation results indicate that the program was well accepted and the resources well targeted.
The frequency of oral health lessons increased in all centres.
Oral health support provided to centres also increased by 50%.
Information provided by centres to parents about oral health also increased, as did the range of methods used.
All participants described the resource kit as either extremely useful or useful.
Oral Health Services found the program relatively simple to implement.

**GENERAL COMMENTS:**
<table>
<thead>
<tr>
<th><strong>SOURCE:</strong></th>
<th>Queensland Health</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TITLE:</strong></td>
<td>Better Food Better Care: Statewide Child Care Nutrition Project</td>
</tr>
<tr>
<td><strong>AGE GROUP:</strong></td>
<td>Infant/ Toddler</td>
</tr>
<tr>
<td><strong>SETTING:</strong></td>
<td>Day Care</td>
</tr>
<tr>
<td><strong>AIM:</strong></td>
<td>To improve nutrition intake, food safety and food knowledge of children attending formal child care settings in Queensland</td>
</tr>
<tr>
<td>DESCRIPTION OF INTERVENTION:</td>
<td>Phase 1</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>---------</td>
</tr>
<tr>
<td></td>
<td>• A review of current literature on nutrition in child care settings</td>
</tr>
<tr>
<td></td>
<td>• The collection and analysis of representative data from childcare centres and family day care schemes on current food service arrangements, nutrition policies, food provided by centres and parents, nutrition training of childcare providers and parental participation in childcare settings</td>
</tr>
<tr>
<td></td>
<td>• The development of a draft position paper on nutrition recommendations for Queensland child care settings to be used as a basis for future nutrition initiatives and for reviewing state child care legislation</td>
</tr>
<tr>
<td></td>
<td>• The assessment of interstate projects, training initiatives and other child care activities relating to nutrition and food safety</td>
</tr>
<tr>
<td>Phase 2</td>
<td>• A workshop with key partners where objectives and strategies were formulated for implementation using the data collected during Phase 1</td>
</tr>
<tr>
<td>Phase 3</td>
<td>• Work with Nutrition Australia, Queensland Health and Environmental Health to ensure sustainability of food safety and nutrition training for staff from early childhood settings. Two training packages were developed</td>
</tr>
<tr>
<td></td>
<td>• Work with TAFE and private training providers regarding potential inclusions of food and nutrition issues in several units to meet the competencies for Children’s Services courses for early childhood staff</td>
</tr>
<tr>
<td></td>
<td>• Piloting of a Cooks’ Network in QEII Hospital Health Services District</td>
</tr>
<tr>
<td></td>
<td>• Development of ‘What is better food?’ – a food and nutrition information resource for parents and directors</td>
</tr>
<tr>
<td></td>
<td>• Development, distribution and support for the documents Your Child Care Centre’s Food and Nutrition Policy and Your Family Day Care Scheme food and Nutrition Policy in collaboration with Queensland Dairy Authority</td>
</tr>
<tr>
<td></td>
<td>• Working closely with the Department of Families to raise the profile of nutrition and food safety in early childhood services</td>
</tr>
<tr>
<td></td>
<td>• Investigation of the potential role of Child Health in health promotion and nutrition education in early childhood services</td>
</tr>
</tbody>
</table>

| EVALUATION:                | Process evaluation- the performance indicators of the process strategies of this project have been met |
|                           | Impact & outcome evaluation- Evaluation of the effect of the impact and outcomes of this project on the nutritional status of young children in child care centres and family day care in Queensland, needs to be conducted after a time lapse of at least twelve months to allow time for the strategies to be implemented in services (June 2002). |
**FINDINGS:**

Better food Better care addressed the food and nutrition needs of the child care sector that were identified by the Statewide Childcare Nutrition project.

The major achievements of the project were:

- To raise the profile of food and nutrition issues with key stakeholders of early childhood services
- The development of What is better food? – a flexible resource to provide information for early childhood staff and suggestions and ideas for parents as well as food learning ideas for children
- In conjunction with Queensland Dairy authority, the development, distribution and referrals to Your Child Care Centre Food and Nutrition Policy and Your Family Day Care Scheme Food and Nutrition Policy to assist child care centres and family day care schemes develop and use policies effectively
- The development of an accredited food and nutrition course for Children’s Services.

**GENERAL COMMENTS:**

Implementation Phase- Draft Report only

24.

**SOURCE:**

Swan Hill District Hospital Primary Care Division

**TITLE:**

Healthy Eating- Healthy School Project

**AGE GROUP:**

Primary/ Secondary

**SETTING:**

School

**AIM:**

Phase 1-2: To continue to improve the effectiveness of school based nutrition through the development of food and nutrition policies for all local schools. A food and nutrition policy for each school will provide a baseline for the school in all elements of the “Health Promoting School” approach that is formal curriculum, school ethos and school-home-community interface.

Phase 3: To support the implementation of the food and nutrition policy within schools, and to assist those schools who have not yet developed a policy.
| DESCRIPTION OF INTERVENTION: | Strategies used in phase 1 & 2 were:  
• Inviting schools to participate  
• Project Workshop  
• Networking meeting  
• Policy submission  
Phase 3 strategies included:  
• Provide professional development activities to members of the school community  
• Provide current nutrition information to the school community via Swan Hill District Hospital web-page and the provision of a nutrition newsletter  
• Develop a shared resource facility for school communities  
• Evaluate the effectiveness of the project in enhancing nutrition policy implementation within schools |
| EVALUATION: | Planned but not completed.  
The primary purpose of the evaluation will be to:  
- check the extent and quality of the program’s implementation  
- provide feedback to key stakeholders  
- identify ways the program could be improved  
- to establish the effectiveness of a particular program  
- to decide whether the program should be continued  
Intermediate and short term outcomes to be measured. |
| FINDINGS: | Phase 1 & 2:  
Development of a user-friendly workbook based on the Health promoting School framework.  
Establishment of a networking group which enhanced co-ordination and communication; support and acknowledgment for what already exists; current information about regional/ local resources; best practice; avoidance of duplication; increased sharing of resources, and a whole school approach.  
Two secondary and five primary schools submitted their comprehensive Food and Nutrition Policies.  
Phase 3:  
• Seven out of twelve schools have policies that are current and being implemented  
• 23 people attended the seminars, 39 people received the newsletter  
• all seven schools with Food and Nutrition Policies, participated in an audit interview in Oct 2000  
• the five schools that have not developed a policy were contacted and all were keen to develop their policy next year  
• one school that did not participate in the project last year has promoted healthy eating within the school with activities involving Dietetics. Policy development was encouraged. |
| GENERAL COMMENTS: | Confusing report- i.e. Phase 1, 2 & 3 |
**SOURCE:** Tasmanian Breastfeeding Support Coalition

**TITLE:** It’s OK to Breastfeed…Anywhere!

**AGE GROUP:** Infant

**SETTING:** Community

**AIM:** To increase community acceptance of breastfeeding in public

| DESCRIPTION OF INTERVENTION: | Strategies:
1. Coalition Development—an invitation to attend an initial discussion group meeting was issued to all known breastfeeding promotion stakeholders. The group was established initially as a breastfeeding promotion working group and was named the Tasmanian Breastfeeding Support Coalition.
2. Medium Selection and Feasibility—internal bus advertising was agreed upon.
3. Formative Research and Evaluation—a pre-intervention community survey (face-to-face interview questionnaire) was completed.
4. Intervention Planning—questionnaire design and poster development. The poster was displayed for a two month period.
5. Intervention Evaluation—a post intervention questionnaire was developed based on the formative questionnaire. |

**EVALUATION:** Impact evaluation completed.

**FINDINGS:** Internal bus advertising performed well as a medium for health promotion related awareness raising:
- Recall of exposure to the poster was achieved in almost half of those surveyed
- Message recall was good, indicating that exposure had led to internalisation of the message
- Message exposure was repeated for most passengers, with a quarter indicating that they had seen the poster in excess of 10 times over the 2 month intervention period
- Opportunistic media coverage of the campaign was achieved to help promote the issue and the intervention

Despite being successful in increasing public awareness the intervention had a limited effect on changing community attitudes to breastfeeding in public.
| GENERAL COMMENTS: | See also (in resource file): Tasmanian Department of Community and Health Services- Evaluation of a social marketing strategy to promote community acceptance of breastfeeding in public, & Tasmanian Department of Community and Health Services- The Tasmanian Breastfeeding Support Coalition: Building organisational and community capacity to promote breastfeeding in Tasmania. |

| SOURCE: | Tasmanian Breastfeeding Support Coalition |

| TITLE: | Tasmanian Businesses and Workplaces Supporting Breastfeeding Report |

| AGE GROUP: | Infant |

| SETTING: | Community |

| AIM: | To increase breastfeeding initiation and duration by creating a social and built environment that is more supportive of breastfeeding mothers. |

| DESCRIPTION OF INTERVENTION: | • Establish accreditation criteria.  
• Promote the benefits of accreditation widely amongst businesses.  
• Consult with, assess and facilitate accreditation of businesses. To include assistance with how to reach accreditation standards.  
• Consult with, assess and facilitate accreditation of workplaces. To include assistance with how to reach accreditation standards.  
• Develop shop front marketing aids to promote as breastfeeding supporters at the point of sales/ service.  
• Collate business details for directory during consultation/accreditation.  
• Publish ‘business supporting breastfeeding’ directory.  
• Distribute directory via maternity unit’s infant package.  
• Mobilise ongoing business support for the directory to ensure post project sustainability.  
• In consultation with participating businesses develop staff education materials and facilitate staff training re: breastfeeding awareness support and accreditation responsibilities/ benefits.  
• Utilise opportunistic media coverage to promote the project, the directory and the Businesses supporting breastfeeding. |

| EVALUATION: | Process, Impact and Outcome Evaluations were completed |
### FINDINGS:

**Distributors:**
- there is a demand for the directories, and for the inclusion of more business listings
- directory is extremely beneficial for new mothers

**Mothers:**
- one third had a copy of the directory
- only just over half were aware of the directory and its availability

**Non-participating businesses:**
- a large proportion did not recall being contacted, but were very supportive of breastfeeding and were interested in participating

**Participating businesses:**
- were generally very satisfied with the project and wanted to continue but identified the need for greater incentives

### GENERAL COMMENTS:

See also (in resource file):
Tasmanian Breastfeeding Support Coalition- Tasmanian Businesses Supporting Breastfeeding Evaluation Report

27.

**SOURCE:**
Tasmania Department of Community and Health Sciences

**TITLE:**
Tuckertalk Project- Follow Up Evaluation Report

**AGE GROUP:**
Community

**SETTING:**
Community

**AIM:**
To improve the quality and quantity of nutrition education practices addressing nutrition in the young, amongst primary health care practitioners in the Southern Region

**DESCRIPTION OF INTERVENTION:**
- Development of the Tuckertalk nutrition education manuals
- Developed, conducted and evaluated professional development workshops

**EVALUATION:**
Evaluation completed of the manual 9 months after the Tuckertalk training workshops at which participants were given their manual

**FINDINGS:**
-63% response rate
- most respondents found the Tuckertalk manual easy to use
- most respondents demonstrated a high level of satisfaction and relevance of the manual
- just under half the respondents reported using the manual frequently
- the most commonly used sections included the Educational Handouts and the Infants and Children section
- there is significant interest in Tuckertalk training from those who did not participate
### GENERAL COMMENTS:
See also (in resource file):
Tasmania Department of Community and Health Services- Tuckertalk Project: Nutrition Training Needs Assessment, & Tasmania Department of Community and Health Services- Tucker Talk: Results from a nutrition training needs assessment in the North West Region

28.

**SOURCE:** Tasmania Department of Health and Human Services

**TITLE:** Long Day Care Food and Nutrition Pilot Project

**AGE GROUP:** Infant/ Toddler

**SETTING:** Day Care

**AIM:**
- Support the Centre to enhance their food and nutrition programs and practices so as to provide optimal nutrition care for children and their families
- Develop practical food and nutrition guidelines that could be used as a model for other child care services

**DESCRIPTION OF INTERVENTION:**
The project involved staff from Alexander Beetle House and Wisteria Lane Child Care Centres:
- Establishing a working group representing director, carers, cook and parents
- Completing pre- and post project assessment (questionnaire + strategy checklist)
- Recording current food and nutrition practices, and identifying those that work well and those where additional work is required
- Inviting parent and carer input (eg. via newsletter, display, informal discussions, staff meetings)
- Documenting the strategies and processes that the centres undertook to enhance and review their food and nutrition program
- Gaining feedback from the centres on the “Draft Checklist for Centres Providing Food” and the “Draft Checklist for Centres Where Food is Bought from Home”

**EVALUATION:** Process and impact evaluation completed
FINDINGS:
- Participation in the project was found to be very useful/useful
- 2 major barriers preventing optimal participation were identified; i) limited financial resources and ii) other pressing needs/issues within the centre
- Staff rated their policy as being more useful in improving the food and nutrition program in the centre
- After the program, staff and parents identified food and nutrition policy as having increased importance; in addition parents also saw the value of food related activities for children and staff are now more aware of hygiene issues
- Staff confidence in the following areas improved: food requirements of children, food and nutrition policy, creating a positive mealtime environment, dealing with eating problems and educating parents on food and nutrition issues
- Staff rated the following areas as having improved: food preparation, educating parents on food provision and nutrition, food and nutrition policy, food related activities with children, mealtime environment and dealing with eating problems/fussy eaters; while parents rated food and nutrition policy and dealing with eating problems/fussy eaters as the main areas of improvement
- Staff perceived parent education on food provision and nutrition issues and planning time for cooks as still needing significant improvement after the project
- As a result of the project both centres updated their Food and Nutrition Policy
- Processes to review and update food and nutrition policies annually are in place

GENERAL COMMENTS:

29.

SOURCE: Tasmania Department of Health and Human Services

TITLE: The “Family Feud Food” Video

AGE GROUP: Toddler/Preschool

SETTING: Community

AIM: To establish healthy eating habits and attitudes in toddlers and preschool children
**DESCRIPTION OF INTERVENTION:**
To produce and market an educational video and material for parents, carers, child careers and family child and youth health nurses.
- A steering group was established
- Search of scientific literature
- Sponsorship proposals forwarded
- Children and parents from range of community settings were involved in the making of the video
- A team of dietitians developed the content of the video
- A local production company was engaged to produce the video
- A peer reviewed education package was produced
- Popular Australian children’s group “The Wiggles” gave approval to use 2 of their songs in the production of the video
- The Tasmanian Nutrition Promotion Taskforce provided links to industry groups

**EVALUATION:**
Formative and process evaluation completed. Impact evaluation not yet finalised.

**FINDINGS:**
The evaluation confirmed that the video has fulfilled a need for specific educational resources about food refusal and fussy eating in children. The response to the various attributes of the video was very positive, the most common response being “excellent” and “great”. The video was used most frequently in group sessions. Many comments were made about video access highlighting problems associated obtaining access to the video.

**GENERAL COMMENTS:**

30.
**SOURCE:**
Tasmanian Breastfeeding Support Coalition and NMAA

**TITLE:**
Breastfeeding! Breaking Down the Barriers

**AGE GROUP:**
Infant

**SETTING:**
Community

**AIM:**
To increase breastfeeding rates, both initiation and duration in Tasmania

**DESCRIPTION OF INTERVENTION:**
Stage 1:
Conduct a series of focus groups with 100 adolescent girls and young women, 50% from rural and isolated areas and 50% from urban areas within Tasmania
Stage 2:
Conduct a statewide media campaign which addresses key issues/barriers to breastfeeding identified by young women during focus groups
### EVALUATION:

<table>
<thead>
<tr>
<th>Stage 1:</th>
<th>Process and impact evaluation completed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage 2:</td>
<td>Process and preliminary impact evaluation completed</td>
</tr>
<tr>
<td></td>
<td>preliminary impact- looking to record indicators of impact and immediate responses to the campaign by showing it in various focus group situations</td>
</tr>
<tr>
<td></td>
<td>process- looked at the effectiveness of mediums in reaching the target audience</td>
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<tr>
<td></td>
<td>future evaluation is also necessary</td>
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</tbody>
</table>

### FINDINGS:

| Stage 1:                      | -Key themes were consistent across the sample. |
|------------------------------| Most respondents were at least open to the possibility of breastfeeding future children. |
|                              | Although interviewees acknowledged some nutrition advantages of breast milk over commercial formula they did not see the gap as significant and it was not an important factor in their decision |
|                              | Respondents felt strongly that the decision of whether to breastfeed, or not, must be a freely taken personal choice |
|                              | The Tasmanian study also confirmed previous research which found that positive exposure to breastfeeding did appear to reduce perceptions of the difficulties of breastfeeding |
|                              | Breastfeeding in public was recognised by most as a contentious issue within their communities, with most feeling it was generally acceptable if done discretely |
|                              | It was recognised that women have usually made their decision whether to breastfeed or not well prior to becoming pregnant |
| Stage 2:                     | The results of the focus groups suggested that the advertisement on TV had received excellent coverage as approx. 80% of respondents had seen it in the first two weeks of screening. |
|                              | The written responses from participants demonstrate an understanding of the campaign message and general appeal of campaign |
|                              | Many respondents were surprised that breastfeeding in public was still a problem in the community, however, they agreed that if it is still an issue, it needs to be addressed |
|                              | Many of the respondents did not have a problem with women who breastfeed in public, or they did not feel comfortable talking about it if they did |

### GENERAL COMMENTS:

31.

### SOURCE:

Territory Health Services

### TITLE:

Growth Assessment and Action- Guidelines and Strategic Plan 1998-2003
### AGE GROUP: Community

### SETTING: Community

### AIM: To improve the growth and health of children in the Northern Territory

#### DESCRIPTION OF INTERVENTION:
- **Objective 1:** Undertake timely and accurate assessment of the nutritional status of individual children
- **Objective 2:** Ensure an appropriate and timely response is made when growth faltering occurs in individual children
- **Objective 3:** Provide regular information to communities, district and Territory level service providers, and planners on the nutrition status of children in accordance with THS Information Privacy Code of Conduct

#### EVALUATION:
Process and Impact Evaluation planned

#### FINDINGS:
Evaluation not completed as yet

#### GENERAL COMMENTS:
Guidelines and Strategic Plan only - no evaluation/ findings received as yet

### 32.

#### SOURCE:
The South Australian Child Care Nutrition Partnership

#### TITLE:
Food Matters

### AGE GROUP: Infant/ Toddler/ Preschool

### SETTING: Day Care

### AIM: To develop an early childhood nutrition newsletter

#### DESCRIPTION OF INTERVENTION:
The newsletter is a 6 page, 2 colour, quarterly publication with a 1 page, double sided parent insert which may be photocopied and distributed to parents for education and information. The newsletter contributes to the nutrition education and training needs of cooks, directors and workers in the early childhood sector in addition to parents and caregivers of preschool children. The newsletter is distributed to all child care centres, family day care providers, DETE officials, and preschools in the state.

#### EVALUATION:
Self-administered evaluation questionnaires were distributed as an insert to the third issue of Food Matters- Impact Evaluation
### FINDINGS:

Results indicate that:
- over 96% of participants read the newsletter
- the vast majority of participants found the newsletter to be relevant or very relevant to their work
- the format of the newsletter, including layout, length and readability, was rated as good or very good overall
- the main method for making the parent insert available to families was via the display board
- some participants were not aware of the purpose of the parent insert
- photocopying inserts for each parent was considered to costly and time consuming
- the newsletter has quite broad readership

The results reveal Food Matters to be a highly valued nutrition resource by carers of children under five. It is recommended that the production of Food Matters continues, and the concerns regarding availability of the parent insert to families be addressed.

### GENERAL COMMENTS:
Appendix 7. Reviewed literature


7. REFERENCES.


Kemper, H. C., G. B. Post, et al. (1999). "Lifestyle and obesity in adolescence and young adulthood: results from the Amsterdam Growth And Health Longitudinal Study (AGAHLs)." International journal of obesity and related
metabolic disorders journal of the International Association for the Study of Obesity.


