Prevention and Population Health Branch, Department of Health

Getting children aged 5 to 12 years to eat more fruit and vegetables

An Evidence Summary

February 2010

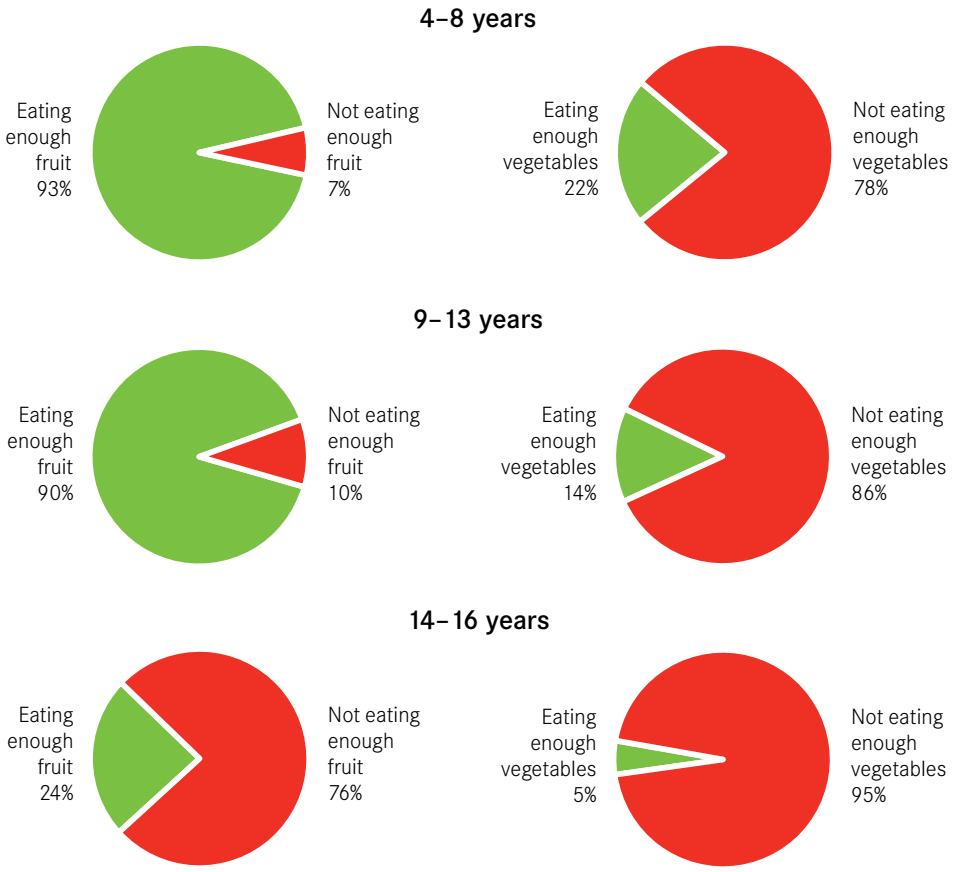
This document summarises current evidence on increasing fruit and vegetable consumption by children aged 5 to 12 years, with implications for policy, practice and research.

1 Why change is needed

- The proportion of children aged from 5 to 12 years eating the recommended amount of fruit and particularly vegetables is currently low and reduces with age. This is of significant concern. (See pie charts.)
- Increasing fruit and vegetable consumption as a part of a healthy diet (combined with physical activity) can contribute to population wide reductions in chronic disease.[3]
- The effects of inadequate fruit and vegetable consumption accounts for 3.3% of the total Victorian disease burden.[4]
- Children meeting recommended fruit and vegetable consumption (as part of a healthy diet) can result in healthy growth and protection from chronic disease later in life.[5]

Are children eating enough fruit and vegetables? Red means no!

(Based on minimum recommended consumption). Adapted from the Australian National Children's Nutrition and Physical Activity Survey 2007.[2]



A Victorian Government initiative

Victoria The Place To Be

2 The evidence

The evidence from systematic reviews indicates that fruit and vegetable consumption by children (including the 5 to 12 years age group) can be increased and that positive outcomes can be achieved using a variety of interventions.[6–8]

There are, however, significant gaps in the research findings and it's difficult to provide detailed analysis or identify any one type of intervention as the *most effective.*[8] The evidence is limited to describing key themes and approaches with successful outcomes, as described below.

2.1 Home

- For most children the majority of food (by energy intake) is consumed at home.[9]
- Levels of fruit and vegetable consumption by children are higher when parents regularly eat fruit and vegetables and they are available and accessible at home.[10–12]
- Television viewing and exposure to television advertisements are associated with lower intakes of fruit and vegetables.[10]

2.2 Schools

Evidence indicates that *multi-component approaches* at schools are more likely to be successful.[6, 8, 10] Single-component interventions (for example, classroom activities or single-session interventions) are not effective.[13, 14]

Multi-component approaches can include:

- school policy
- curriculum activities
- classroom practices (for example fruit and vegetable breaks)
- canteen services

- media activities
- parent resources
- mailings[15-17]

To increase the chance of success, school-based interventions should:

a Increase availability of fruit and vegetables.[7, 8, 10, 14, 17]

Fruit and vegetables can be made available in the school environment in a variety of ways, including fruit and vegetable breaks (to eat fruit and vegetables provided from home), school gardening activities, cooking or tasting programs, free or subsidised programs and through the canteen.

Student participation in food preparation and taste testing contributes to increased skills, acceptance and taste preferences.[11, 13, 17] Interventions such as taste testing games or fruit and vegetable schemes in schools can also improve availability of fruit and vegetables in schools.[11]

Free fruit and vegetable programs for consumption in school have been shown to increase intake *while the free fruit and vegetables were provided.*[7] However, no benefit was reported at one year after cessation of the free fruit and vegetable supply.[18]

One program that offered free fruit for a period to supplement participation in a paid fruit and vegetable scheme showed sustained benefit at one year associated with ongoing access to the paid scheme.[19]

b Give clear messages on fruit and vegetable intake and include behavioural goals.[8]

Children should be taught specific *behaviour changes* (for example increase fruit and vegetable intake) rather than *nutritional knowledge.*[14, 20]

c Actively involve parents in primary school interventions.[8]

Parents setting a good example (by word and deed) are consistently and positively associated with children's fruit and vegetable consumption.[12]

Home-based activities should aim at increasing availability and accessibility of fruit and vegetables at home.[10]

School programs should include parental involvement and link to activities at home.[7]

Parents should be asked to participate in cooperation with teachers and health promotion practitioners.[13]

Successful programs use newsletters and other resources to maximise parental understanding of the fruit and vegetable program.[6]

d Provide longer and more intense interventions.

Interventions that are run over longer periods of time are more likely to be successful.

Higher intensity interventions (involving components at classroom, school and community levels) achieved the greatest increase in fruit and vegetable consumption.[21]

Reviews provided varying recommendations for program duration, ranging from at least eight to ten weeks[14] to greater than 12 months.[17]

2.3 Listening to children

Interventions that consider children's views and experiences can achieve greater effect.[13] The systematic review found that:

- Children do not see it as their role to be interested in health.
- Children do not see messages about future health as personally relevant or credible.
- Fruit, vegetables and confectionery have very different meanings for children than they do for adults.
- Children actively seek ways to exercise their own food choices.
- Children value eating as a social occasion.
- Children see the contradiction between what is promoted in theory and what adults provide in practice.

2.4 Supportive environments

Achieving substantive changes to nutritional outcomes requires population-wide action supported with state and national policy and environmental approaches.[22]

It is important that supportive environments for fruit and vegetable consumption are generated for children.[17]

Community wide activities have been shown to enhance the outcomes of school based programs.[23]

A large scale, community wide campaign including mass media, public relation events, information and community activities has been shown to be effective in increasing adult fruit and vegetable consumption.[24]

3 Policy and practice

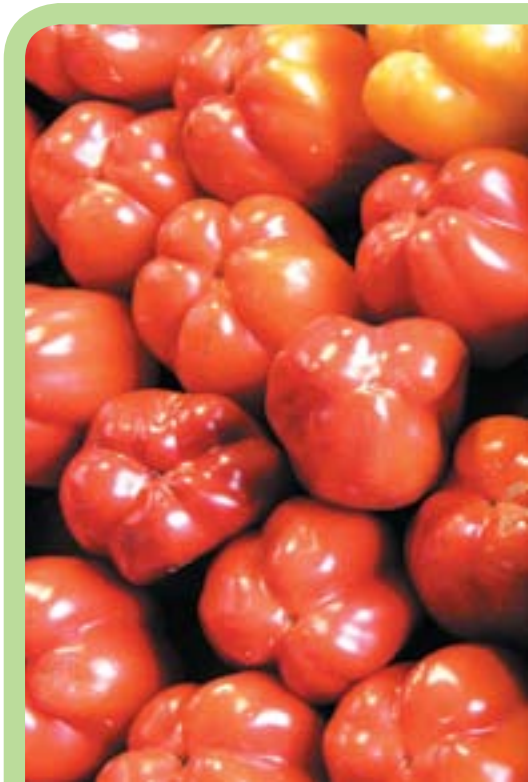
Healthy eating programs for children aged 5 to 12 years need to incorporate *increasing fruit and vegetable consumption.*

Programs to increase fruit and vegetable consumption for children aged 5 to 12 years need to be multi-dimensional and include:

- promotion of both vegetables and fruit
- a whole-school service approach with healthy messages that are clear and consistent across all activities
- links to overall healthy eating and nutrition policy in schools, including out-of-school care program policy (examples in Victoria are Kids 'Go for your life' with partner programs including the Fruit and Veg Program)
- curriculum or classroom activities (such as fruit and vegetable breaks, school garden activities and cooking)
- access to and practical hands-on experiences with both fruit and vegetables with clear, consistent messages about 'how to' and 'how much'
- parent involvement and provision of family, home and community-based activities
- evaluation to guide future investment (including process, impact and outcomes and impact on health inequalities).

State-wide policies and actions need to:

- adopt a comprehensive healthy eating strategy that incorporates fruit and vegetable promotion and provides for:
  - access to healthy foods
  - a secure and sustainable supply of healthy foods
  - a culture that supports the consumption of healthy foods
- provide evidence-based resources, training and support for schools, health promotion services and other organisations (examples in Victoria are Kids 'Go for your life' with partner programs including the Fruit and Veg Program)
- encourage schools, health promotion services and other organisations to explore broader ways of reaching parents and carers
- examine the impact of fruit and vegetable programs on health inequalities and ensure that findings are reflected in ongoing program development
- prioritise funding to schools and communities in areas of greatest disadvantage or at increased risk of low fruit and vegetable consumption
- monitor fruit and vegetable consumption
- evaluate all fruit and vegetable programs.



4 Case studies

4.1 Fresh Kids

The Fresh Kids program adopted a whole-of-school, multifaceted approach to promote healthy eating and reduce the risk factors associated with childhood obesity. The evaluation study was an interrupted time series design without control groups. This program achieved increases of 25–50% in the proportion of children bringing fresh fruit for up to two years after the initial implementation of the Fresh Kids program.[25]

School policy, curriculum initiatives and strategies to engage parents were used. Three key messages were promoted:

- Enjoy fruit and vegetables every day.
- Drink water instead of sweet drinks.
- Be active every day.

The program was implemented by the Western Region Health Service (Melbourne) commencing 2005. Further information is available at: http://www.goforyourlife.vic.gov.au/hav/articles.nsf/pracpages/Fresh_Kids?OpenDocument

4.2 California Children's 5 a Day—Power Play! Campaign

The 5 a Day–Power Play! Campaign helps communities motivate and empower children to eat fruit and vegetables and be physically active. It is designed to change individual behaviour as well as social norms, the environment and policy, through:

- school classrooms and cafeterias
- community youth organisations, including after-school and summer programs, farmers' markets, supermarkets and restaurants
- the media, through advertisements and public relations.

The 5 a Day–Power Play! Campaign commenced in 1993 and was successfully evaluated in 1995[23] showing that:

- When implemented through schools alone, it positively influenced children's knowledge and attitudes, and increased fruit and vegetable consumption by 7 percent.
- When a multi-setting, community-wide approach supplemented the school activities, fruit and vegetable consumption increased 14 percent.
- The control site showed a 12 percent decrease in consumption over the study period.

The current Children's Power Play! Campaign is based upon the multi-setting, community-level approach proven successful through the study. Please see:

www.cdph.ca.gov/programs/cpns/Pages/PowerPlayResources.aspx

www.cdph.ca.gov/programs/cpns/Pages/PowerPlayResearchEvaluation.aspx

5 Research gaps

Evaluation of the research indicates that:

- There is a lack of well-evaluated interventions, resulting in a limited evidence base for the most effective interventions for fruit and vegetable promotion for children aged 5 to 12 years. Further research on interventions with adequate duration and consistent methodology and outcome reporting is required.
- More research on effective home and family-based interventions is needed. Research identifies that parental fruit and vegetable consumption is a significant predictor of child intake, yet interventions to change behaviour more often target the school environment and have limited parental involvement.
- No detailed evidence on the cost-effectiveness of fruit and vegetable interventions in 5 to 12 year-olds was identified. Cost-effectiveness data is required, as well as other evaluation outcomes, to inform the ongoing allocation of funding for programs.
- Limited or no evidence was identified regarding the needs of high-risk groups, including low socio-economic groups and Indigenous people.
- No detailed evidence on the relationship between intervention outcomes and health inequalities was identified. Health promotion interventions have the potential to increase or decrease health inequalities so additional evidence is required to inform ongoing planning and delivery.
- More research is needed to understand how the social determinants of health (addressing food supply, access and availability and culture) impact on fruit and vegetable consumption in this age group.

6 Methods

Department of Health evidence summaries use the best available evidence of intervention effectiveness. Full details of the methods are given in the 'Guideline for evidence summaries for health promotion and disease prevention interventions' available at http://www.health.vic.gov.au/healthpromotion/evidence_evaluation/cdp_tools.htm.

The specific methods for this report are listed below.

Inclusion criteria for studies

Population:	Children aged 5 to 12 years
Interventions:	Interventions to promote fruit and vegetable consumption
Comparisons:	No intervention or usual practice
Outcomes:	Fruit and vegetable consumption had to be reported, including that by children aged 5 to 12 years
Study types:	Systematic reviews of all relevant controlled trials Economic evaluations (including cost-effectiveness and cost-utility analyses)

Search strategy

Resources identified in the 'How to search for evidence of intervention effectiveness and cost-effectiveness' were searched using the terms 'fruit' and 'vegetable'. This document is available at http://www.health.vic.gov.au/healthpromotion/evidence_evaluation/cdp_tools.htm.

In addition, *PubMed* and *Google Scholar* were searched using the terms 'fruit', 'vegetable', 'children' and 'systematic review'. Bibliographies of identified studies were examined.

These searches are current as at June 2009.

7 Results

Twelve systematic reviews were identified and used for this summary.[7, 8, 10–17, 20, 22] No economic evaluations were found.

Recommended fruit and vegetable consumption[1]

Age	fruit (servings/day)	vegetables (servings/day)
4–7	1–2	2–4
8–11	1–2	3–5
12–18	3–4	4–9

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This summary along with others in the series are available electronically at: http://www.health.vic.gov.au/healthpromotion/evidence_evaluation/index.htm