



Best practice guidelines for increasing children's vegetable intake

Establish an environment that encourages children to learn about, try and eat vegetables every day



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Introduction

Most Australian children are not eating enough vegetables. Only 6% of children aged 2–17 years of age eat the recommended amount [1].

This guide aims to increase children's vegetable intake. It seeks to bridge the gap between the amount of vegetables children are currently eating and the higher recommended intake.

Increasing children's vegetable intake is not the responsibility of just one group. Large-scale improvements can only be achieved when all those who influence children's eating habits are involved, including:

- community settings such as long day care, primary schools and out-of-school hours care
- parents, families and carers
- government and research institutes
- industry and service providers.

Similarly, success depends on multiple approaches and strategies.

There are a number of useful resources to support families, carers and educators in encouraging children to eat more vegetables.

This guide is an important addition to these resources, founded on a robust review of the literature.

The seven best practice guidelines have been developed through analysis of previous programs and initiatives [2]. All the activities suggested in this guide are drawn from programs that have worked in the past.

Research shows that previous initiatives have achieved up to a 30% increase in children's vegetable intake which, based on current consumption patterns, equates to about half a serve per child per day. This is a substantial increase in intake and would be a great result if achieved for all Australian children.

There is an opportunity to combine strategies from different initiatives and to work together to create greater and more sustained increases in children's vegetable intake.

These guidelines are available in setting-specific formats with applicable examples and resources including:

- long day care centres
- primary schools
- out-of-school hours care services
- government
- food industry
- research.

Why increasing vegetable intake needs to be a priority

Better food, better health

Children's eating habits can impact their health in the short and longer term.

Following a healthy diet in childhood is important for normal growth and development and can also reduce the risk of diseases such as diabetes, cardiovascular disease and some cancers later in life [1-7].

While there are many different patterns of eating that are considered healthy, eating plenty of vegetables is central to all of them [8].

Life-long eating habits are established early in life

Establishing good eating behaviours during childhood is essential. Good eating habits can extend through adolescence and into adulthood [6].

Australian recommendations for vegetable intake

The Australian Dietary Guidelines provide recommendations for the amount and variety of foods needed for good health [9]. It is recommended that all Australians eat "plenty of vegetables, including different types and colours and legumes/beans every day". Vegetables provide vitamins, minerals and dietary fibre that are especially important in our diet.

The amount of vegetables children should eat increases as they get older (Table 1).

Table 1: Australian Dietary Guidelines recommendations for children's vegetable intake*

Age group	Boys	Girls
2-3 years	2 ½ serves	2 ½ serves
4-8 years	4 ½ serves	4 ½ serves
9-11 years	5 serves	5 serves
12-13 years	5 ½ serves	5 serves

*One serve is about 75g, equivalent to ½ cup cooked vegetables or legumes, or 1 cup of raw salad vegetables. For more examples see Eat for Health [8].

Why we need best practice guidelines

Determining best practice

These guidelines are for those who wish to update existing initiatives or develop new programs or activities to increase children's vegetable intake.

They come from a robust review of the literature to build on what has been learnt from previous programs and initiatives, including those strategies that have worked and those that have been less successful [10, 11].

Best practice guidelines

From this process it has been possible to identify seven best practice guidelines. Used in combination, these have the potential to form the basis of effective new interventions across a variety of settings.

The guidelines are grouped into three key segments to support behaviour change.

It is recognised that some services may already have nutrition policies and practices in place that support the intake of vegetables. Services are encouraged to review what they are currently doing and decide where they can have the greatest (and perhaps quickest and easiest) impact.



The seven guidelines

The framework for increasing children's vegetable intake is outlined below:

Foundation

- 1 Make vegetables the hero**
Have simple vegetable specific messages with a clear focus.
- 2 Coordinate sustained effort across multiple players**
Coordinate long-term action among key players involved in providing and promoting vegetables to children.
- 3 Grow knowledge and skills to support change**
Identify and act on gaps in knowledge and skills to support children's vegetable intake.
- 4 Minimise barriers to increase success**
Understand and identify ways to address barriers to children's vegetable intake.

Action

- 5 Plan for and commit to success**
Set clear and measurable vegetable-specific goals and commit to a plan of action.
- 6 Create an environment that supports children to eat vegetables**
Make vegetables the easy choice by providing an environment that promotes vegetable familiarisation and intake.

Review

- 7 Monitor and provide feedback on progress**
Monitor progress and achievement against goals and provide feedback at regular intervals.

Foundation

1 Make vegetables the hero

Have simple vegetable-specific messages with a clear focus.

There are many elements to healthy eating, but to be serious about improving children's vegetable intake, it is important to make vegetables more of a focus.

Interventions need to communicate a clear and consistent message about increasing vegetables. This vegetable-specific message needs to be consistent across stakeholders and settings.

2 Coordinate sustained effort across multiple players

Coordinate long-term action among key players involved in providing and promoting vegetables to children.

A coordinated and sustained effort across multiple players is most effective in increasing children's vegetable intake and includes:

- Involvement across multiple settings.

Example: Interventions that are designed and delivered to target children in the home and long day care or school. Resources such as newsletters, family homework and recipes are provided to families.

- Consistent action within a single setting.

Example: In long day care, the director, educators and cooks provide consistent vegetable-focused policy, messaging, curricula and meals.

- Extended initiatives focusing on vegetable intake.

Example: Schools deliver a minimum six-week program, with exposure to the program at least once a week. This might involve weekly vegetable-focused lessons for a term, with newsletters to inform families about the material provided in class. Healthy Eating Advisory Service has [strategies](#) to support a whole-school approach.

Interventions should be at least six-weeks long with exposure to the program at least once a week.

3 Grow knowledge and skills to support change

Identify and act on gaps in knowledge and skills to support children's vegetable intake.

Being aware of your current knowledge and skills can help identify areas for improvement.

- Find out what you do and don't know. Identify what you can learn.

Example: Understand why higher vegetable intake is important.

Example: Understand why children's vegetable intake is low and what helps them eat more vegetables.

Example: Learn what the children and families you work with understand about vegetable intake and what children are actually eating.

- Build the skills to make change.

Example: Undertake and provide training to staff and on how to prepare snacks that contain vegetables and are convenient and tasty.

Example: Support families to prepare vegetable-rich meals and snacks.

One serve of vegetables

75g = 1 cup raw vegetables or 1/2 cup cooked vegetables or legumes



4 Minimise barriers to increase success

Understand and identify ways to address barriers to children's vegetable intake.

Identifying and minimising barriers to children's intake of vegetables is a key component in increasing their vegetable intake.

Barriers are likely to vary between settings and require different solutions.

Barriers are often complex and may overlap:

- Environmental, regulatory and health factors: policy restrictions relating to food storage and preparation; safety risks such as allergies, and choking hazards with some hard, crunchy vegetables; competing priorities within curriculum requirements.
- Economic considerations: the cost of vegetables; wastage of fresh produce; additional staff time required to prepare vegetable snacks.
- Knowledge and skills: lack of relevant cooking skills; limited knowledge of vegetable-based meal and serving ideas.
- Social influences: lack of positive role models enjoying vegetables; peer, sibling or parental dislike of vegetables; availability of other foods; distractions that create barriers to eating vegetables.
- Child development: developmental stages that create resistance to vegetables such as neophobia (the fear of something new), growth in independence or temperamental change.

Once barriers are identified they can be addressed.

Example: Buying in-season vegetables can help to reduce costs and allow you to buy more within the same budget. Vegetables may also taste better if they are in season.



Action

5 Plan for and commit to success

Set clear and measurable vegetable-specific goals and commit to a plan of action.

1. Identify a clear and specific goal

Be specific.

Most initiatives have a general aim like “increase children’s vegetable intake”. Being clear about exactly what you want to do to increase vegetable intake is essential.

A target behaviour is the key thing you want to change. Behaviours can be divided into three simple types:

Increasing serves

Increasing the portion or amount of vegetables eaten at each meal.

Increasing frequency

Increasing the number of times vegetables are eaten each day.

Increasing variety

Increasing the number of different types of vegetables eaten each day.

Make your goal easy and achievable. In the first instance, it may be best to choose just one behaviour. When deciding which behaviour you want to change, you might ask yourself the following:

- What is the easiest behaviour to change?
- What is the most acceptable behaviour to change?

2. Choose a practical, simple approach

Keep it simple.

Once you know what behaviour you want to change – increasing serves, frequency or variety of vegetables – identify the best, simplest and most practical way for you to achieve that goal. To help you decide, you can ask:

- What is the most practical option?
- What is affordable and what do I have the resources to achieve?
- What will deliver the best outcomes for the children in my care?

Table 2 provides examples for each of the three approaches.

Table 2: Examples of target behaviours to raise vegetable intake: increasing serves, frequency and variety

Approaches	Increasing serves	Increasing frequency	Increasing variety
Target behaviour examples	Provide one serve (75g) of vegetables per child in lunch.	Present a side platter of vegetables with children's dinner.	Include two different types of vegetables in the lunch main meal.
	Include ½ serve (38g) of vegetables per child at snack times.	Ensure one snack per day contains vegetables.	Vary the preparation and presentation of vegetables within meals and snacks.

Example of increasing serves: Australian children currently eat most of their vegetables at dinner time (54-65% of daily vegetable intake), so increasing intake at this meal can have instant results. It only requires adding extra quantities of vegetables to the dinner plate.

Example of increasing frequency: Add vegetables to breakfast and between-meal snacks. Children most commonly eat unhealthy foods for snacks, so substituting these choices with vegetables has the double value of increasing vegetable intake while decreasing the consumption of less healthy foods.

Example of increasing variety: Aim for a rainbow of different coloured vegetables across the day or week. People who meet their vegetable recommendations enjoy three different types of vegetables at dinner.

3. Plan for and commit to change

Make a plan.

There are lots of ways to make a plan. A tried and true way to start is by bringing your team or colleagues together and brainstorming the following:

*Why are we doing this and why is it important?
What is the overall goal and what steps need to be undertaken?
When do we put these steps in place?
Where should the initiative and steps take place?
Who is responsible and who is the target audience?
How do we measure our progress and how can we improve?*

You should also consider what barriers will make it hard to achieve your goal and what knowledge and skills gaps exist. Addressing these is important for success.

It is important to include as many people as possible in your setting.

Remember to commit to the change and, where appropriate, make it part of your overall work plan. Steps like reporting on progress at staff meetings, undertaking regular reviews, or reporting to families can help you keep on track.

6 Create an environment that supports children to eat vegetables

Make vegetables readily available and support their intake.

Help children become familiar with vegetables by letting them interact with them on multiple occasions and in different ways.

Ensure vegetables are always at hand. Make them part of everyday life, including by modelling your own good vegetable intake. Reduce the availability of other foods with low nutritional value to avoid competition.

Example: Provide children with regular opportunities to interact with vegetables in different ways, such as playing, cooking, shopping, growing, looking, touching, or drawing.

Example: Offer vegetables throughout the day in multiple meals and snacks. For children getting their own snacks, make vegetables easily accessible.

Review

7 Monitor and provide feedback on progress

Monitor progress and achievement against goals and provide feedback at regular intervals.

Monitoring and providing feedback are essential components of any initiative. They are undertaken at regular times during the initiative as well as at the end.

Monitoring has a number of benefits. It keeps you on track. It allows you improve what you are doing as you go – as well as helping you design better initiatives in the future. And it helps you communicate with staff and families along the way. Giving feedback keeps everyone motivated and keeps you accountable.

An important part of your evaluation will be to measure any change in the amount of vegetables eaten by children during the initiative. To do this, you will need to use a well-developed measurement tool to ensure accuracy and reliability.

If you start a new initiative with second behaviour you want to change, incorporate those things you have already learned.

Example: Track the process and initiatives you undertake and evaluate the change in children's eating habits, knowledge, understanding and attitudes.



To see these best practice guidelines demonstrated in research and initiatives, visit the VegKIT online [registry](#).

References

1. Australian Institute of Health and Welfare. Australia's health 2018. 2018 04.03.2019]; Available from: www.aihw.gov.au/reports/australias-health/australias-health-2018/contents/indicators-of-australias-health/fruit-and-vegetable-intake.
2. Lynch, C., et al., Fruit and vegetable consumption in a sample of 11-year-old children in ten European countries - The PRO GREENS cross-sectional survey. Vol. 17. 2014. 1-9.
3. Organisation for Economic Co-operation and Development, Health at a Glance: Europe 2016. Health at a Glance. 2016, Paris: Organisation for Economic Co-operation and Development.
4. National Cancer Institute. Usual Dietary Intakes: Food Intakes, U.S. Population, 2007-10. 2018 04.03.2019]; Available from: <https://epi.grants.cancer.gov/diet/usualintakes/>.
5. Maynard, M., et al., Fruit, vegetables, and antioxidants in childhood and risk of adult cancer: the Boyd Orr cohort. Journal of Epidemiology and Community Health, 2003. 57(3): p. 218.
6. Maynard, M., et al., What influences diet in early old age? Prospective and cross-sectional analyses of the Boyd Orr cohort. The European Journal of Public Health, 2006. 16(3): p. 315-323.
7. Kaikkonen, J.E., et al., Does childhood nutrition influence adult cardiovascular disease risk?—Insights from the Young Finns Study. Annals of Medicine, 2013. 45(2): p. 120-128.
8. World Health Organisation. Increasing fruit and vegetable consumption to reduce the risk of noncommunicable diseases. 2019 [cited 2019 9th October 2019]; Available from: https://www.who.int/elena/titles/fruit_vegetables_ncds/en/.
9. Eat for health. Recommended number of serves for children, adolescents and toddlers. 2015 08.03.2019]; Available from: <https://www.eatforhealth.gov.au/food-essentials/how-much-do-we-need-each-day/recommended-number-serves-children-adolescents-and>.
10. Hendrie, G.A., et al., Strategies to increase children's vegetable intake in home and community settings: a systematic review of literature. Maternal & Child Nutrition, 2017. 13(1): p. e12276.
11. Hendrie, G.A., et al., Best practice guidelines for increasing children's vegetable consumption: A comprehensive report of the development of best practice guidelines to inform interventions aiming to increase children's consumption of vegetables. . unpublished findings, CSIRO, Flinders University, Nutrition Australia (VIC).

