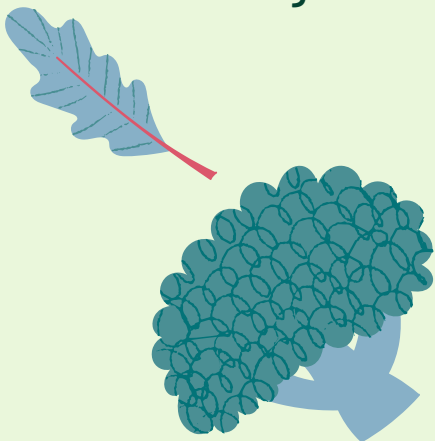




Plus One Serve by 2030

A bold, collaborative and innovative approach to increasing Australia's vegetable consumption.



AUSVEG

+ONE SERVE
OF VEGETABLES

About One Plus Serve

The “Plus One Serve of Vegetables by 2030” program is a bold, collaborative and transformative approach to substantially address the alarmingly low and declining daily per capita consumption of vegetables in Australia. The 6-year R&D program will ‘meet consumers where they are’ with initiatives that nudge Aussies towards eating more vegetables where they live, learn, work, rest and play.

Australians are eating fewer vegetables than ever before, just **1.8 serves per day** against the recommended **5 serves**. This shortfall threatens public health, burdens the healthcare system, weakens farm incomes and increases reliance on imported produce.

Plus One Serve by 2030, led by AUSVEG, is a national behaviour change initiative to increase vegetable consumption, improve health, support growers and strengthen Australia’s food security. Adding just one extra serve (75g) of vegetables per person per day will deliver a powerful triple bottom line of benefits. It will improve the economic, health, social and environmental wellbeing for all Australians:

\$1.4 billion in projected healthcare savings by 2030

\$3.3 billion added to the vegetable supply chain

12,841 new jobs

“Historically low vegetable consumption is not just a health concern, it threatens the long-term viability of Australia’s vegetable industry. Plus One Serve by 2030 offers a clear, evidence-based path forward. This program brings together the collective expertise of health, government, research and industry partners to deliver a solution that is good for growers, good for public health and good for the national economy. AUSVEG is proud to be working on this initiative with Hort Innovation and our collaborators.”



Michael Coote
CEO of AUSVEG

This report summarises the research, insights and recommendations that form the foundation for the Plus One Serve initiative. It is an executive summary of the National Strategy and Baseline Review Final Report. The key elements of the program methodology include:

- **National ‘true’ consumption baseline** mapped from farmgate to retail, home and out of home.
- **Global best practice review** to develop an evidence-base for interventions by setting.
- **Rapid Review of national behaviour change frameworks** and application of logic to vegetable consumption by cohort and by setting.
- **Co-design workshops** with cross sector experts to consider key variables influencing per capita consumption change to inform three investment scenarios (low, moderate, high change).
- **Investment Scenarios converted into costs estimates** (initial six-year program to achieve Plus One Serve by 2030).

Plus One Serve is a transformational program designed to **address Australia’s vegetable consumption crisis**, strengthen our economy and secure the future of Australian horticulture. With coordinated, cross-sector investment and evidence-backed strategies, we can drive change by 2030.

“Plus One Serve is a bold, national program designed to create lasting behaviour change by reconnecting Australians with vegetables. We’ll do this by driving preference, increasing intake, supporting growers and boosting regional economies. This six-year initiative brings together a powerful cross-sector coalition of industry, government, health, research, education, retail and community partners. Together, we are building a movement to make eating more vegetables a simple, valuable choice for all Australians. The National Strategy and Baseline Review has given us the evidence base and strategic framework to enable this and act decisively.”



Justine Coates
Managing Director,
Plus One Serve Program



A national crisis Why vegetable consumption in Australia must change

Vegetables are at the core of a healthy lifestyle, yet Australians are eating fewer than ever before. Despite strong evidence linking higher vegetable intake to better health outcomes and disease prevention, the latest research shows that adults consume just 1.8 serves per day, far below the recommended 5 serves.

This shortfall is not just a major health concern, it has widespread implications for our economy, food security and the long-term viability of Australian vegetable growers.

If we do nothing, we will see more lifestyle-related illnesses, increased pressure on the healthcare system, declining farm incomes, with one in three Australian vegetable growers potentially leaving the industry and greater reliance on imported vegetables which in turn increases costs to consumers.

This is why urgent action is needed, now

The National Strategy and Baseline Review project has been funded by Hort Innovation, using the vegetable research and development levy and contributions from the Australian Government. Hort Innovation is the grower-owned, not-for-profit research and development corporation for Australian horticulture.

**Hort
Innovation**

The Plus One Serve Solution

Plus One Serve of vegetables by 2030 is led by AUSVEG in partnership with government, industry leaders, health organisations and retailers. The objective is clear: **increase vegetable consumption by one extra serve per person per day by 2030.**

This simple yet powerful shift can transform Australia's health system, economy and agricultural sector – a triple bottom line impact that benefits everyone.

Health Benefits

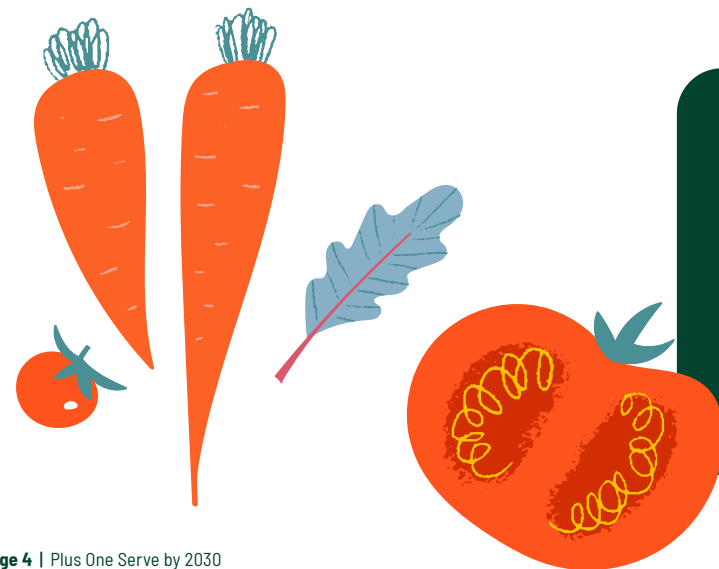
- **Reduce the risk of chronic disease:** Lower rates of heart disease, obesity, type 2 diabetes, stroke and certain cancers.
- **Deliver \$1.4 billion in healthcare savings:** Less disease means lower medical costs and a healthier population.

Economic Impact

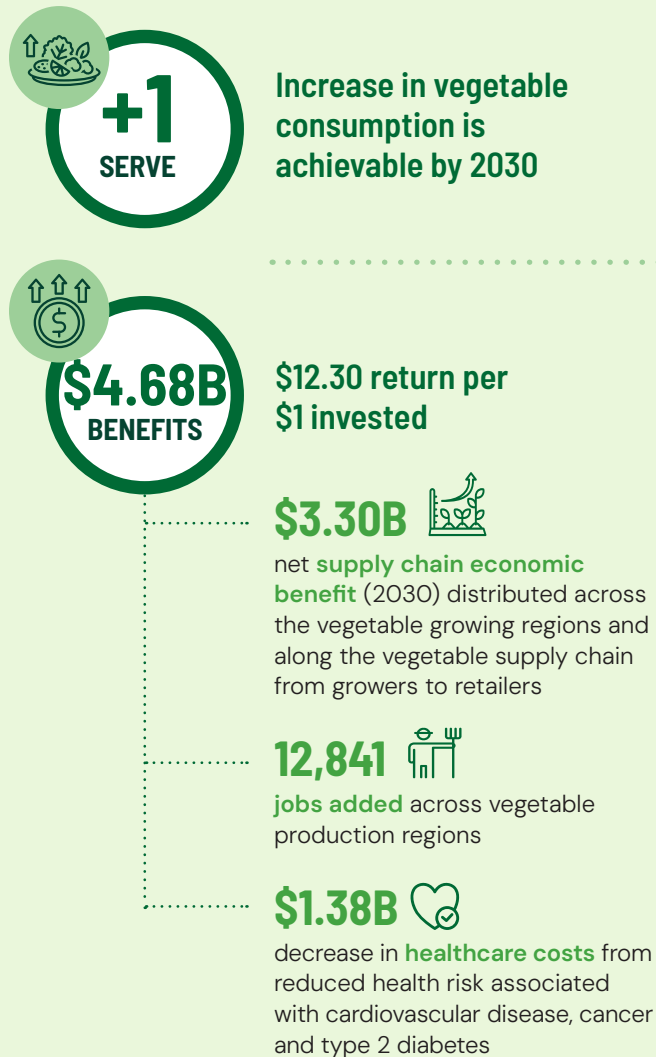
- **\$3.3 billion added to the vegetable supply chain:** Increased demand for fresh vegetables means higher revenue for farmers, processors and retailers.
- **12,841 new jobs created:** Growth in agriculture, retail and food services will drive employment opportunities nationwide.
- **12.3:1 return on investment:** Every dollar invested in Plus One Serve generates \$12.30 in economic benefits.
- Overall, Plus One Serve will deliver **\$4.68 billion in economic value by 2030.**

Support for Australian Growers

- **1 in 3 vegetable growers are considering exiting the industry** due to the rising costs and falling demand.²
- **Higher vegetable consumption will stabilise the sector,** ensuring ongoing access to fresh, locally grown produce.
- **Stronger food security will reduce reliance on imports** and create greater resilience in the face of global supply chain disruptions.



Triple Bottom Line of benefits by 2030:



This document provides a summary of the research, insights and recommendations that underpin the creation and value of the Plus One Serve by 2030 program.

Introduction

This study examined the urgent need to increase vegetable consumption in Australia. While the National Health and Medical Research Council recommends 5 serves per day³, on average Australians have actually been consuming much less than that⁴. This shortfall poses risks to public health and impacts the sustainability of vegetable growers.

Funded by Hort Innovation and led by AUSVEG, this research underpins the Plus One Serve by 2030 initiative, a six-year program designed to boost vegetable consumption using a data-driven approach. The study provides a foundation for a national strategy by reviewing past interventions, updating baseline consumption data, testing investment scenarios and assessing potential economic and health benefits.

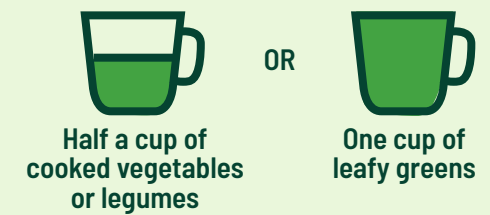
The study objectives were to:

- Review global best practices for increasing vegetable consumption.
- Update and refine the National Vegetable Consumption Baseline, identifying data gaps.
- Test different investment and intervention scenarios to determine if an extra serve per person per day is achievable by 2030.
- Model the impact and benefits of successful scenarios.
- Provide an evidence base for industry, government and stakeholders to drive meaningful change.

What is a “serve” of vegetables?

Not everyone may be familiar with what a “serve” of vegetables means, so it’s important to define it clearly for this report and the Plus One Serve program. A serve is a standard measurement used to help track vegetable intake and ensure consistency in dietary recommendations.

A serve of vegetables is:
Approximately 75 grams of vegetables or legumes which equates to:



Vegetables include fresh, canned and frozen varieties, as well as starchy vegetables like potatoes and legumes. However, potato chips and crisps are considered “discretionary foods” and do not count as a vegetable serve.

Discretionary foods are those that are not needed to meet nutrient requirements and do not fit into the 5 core food groups.

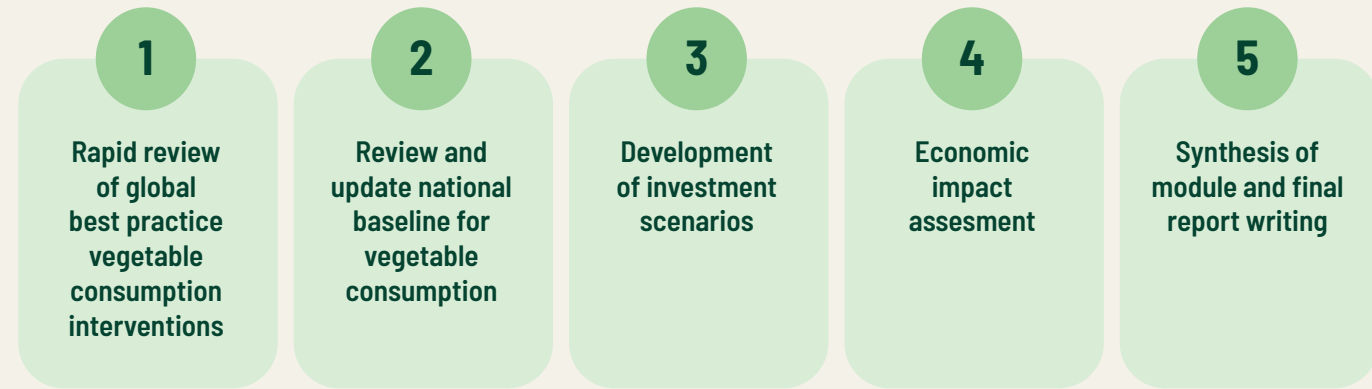
Adequate daily vegetable intake is defined by whether a person meets or exceeds the minimum recommended servings outlined in the dietary guidelines.



Project methodology

Understanding how to successfully increase vegetable consumption in Australia requires a structured, evidence-based approach. 5 steps were taken to assess feasibility, define interventions and develop a practical roadmap for achieving the Plus One Serve by 2030 goal.

The project methodology was broken into five key stages



Rapid review of best practice interventions

A literature review, conducted using Cochrane guidelines, assessed the effectiveness of interventions to boost vegetable consumption across key settings including early childhood, schools, homes, workplaces, aged care, retail, food service, and food relief programs.

Twenty systematic reviews, encompassing 819 primary studies (274 focused on vegetable intake), were analysed. Most evidence came from school, home, or mixed settings, with limited data available for retail, food service, and food relief environments. **On average, interventions led to a modest increase of +0.12 serves of vegetables per day, with some school and home-based strategies achieving up to +0.4 serves.**

Key Recommendations

- Expand evaluation of interventions in schools and homes.
- Increase research in retail settings, especially supermarkets.
- Address evidence gaps in under-researched environments.

Achieving the Plus One Serve by 2030 goal will require coordinated, multi-setting strategies supported by stronger research and targeted investment.

A review and update of the national baseline for vegetable consumption

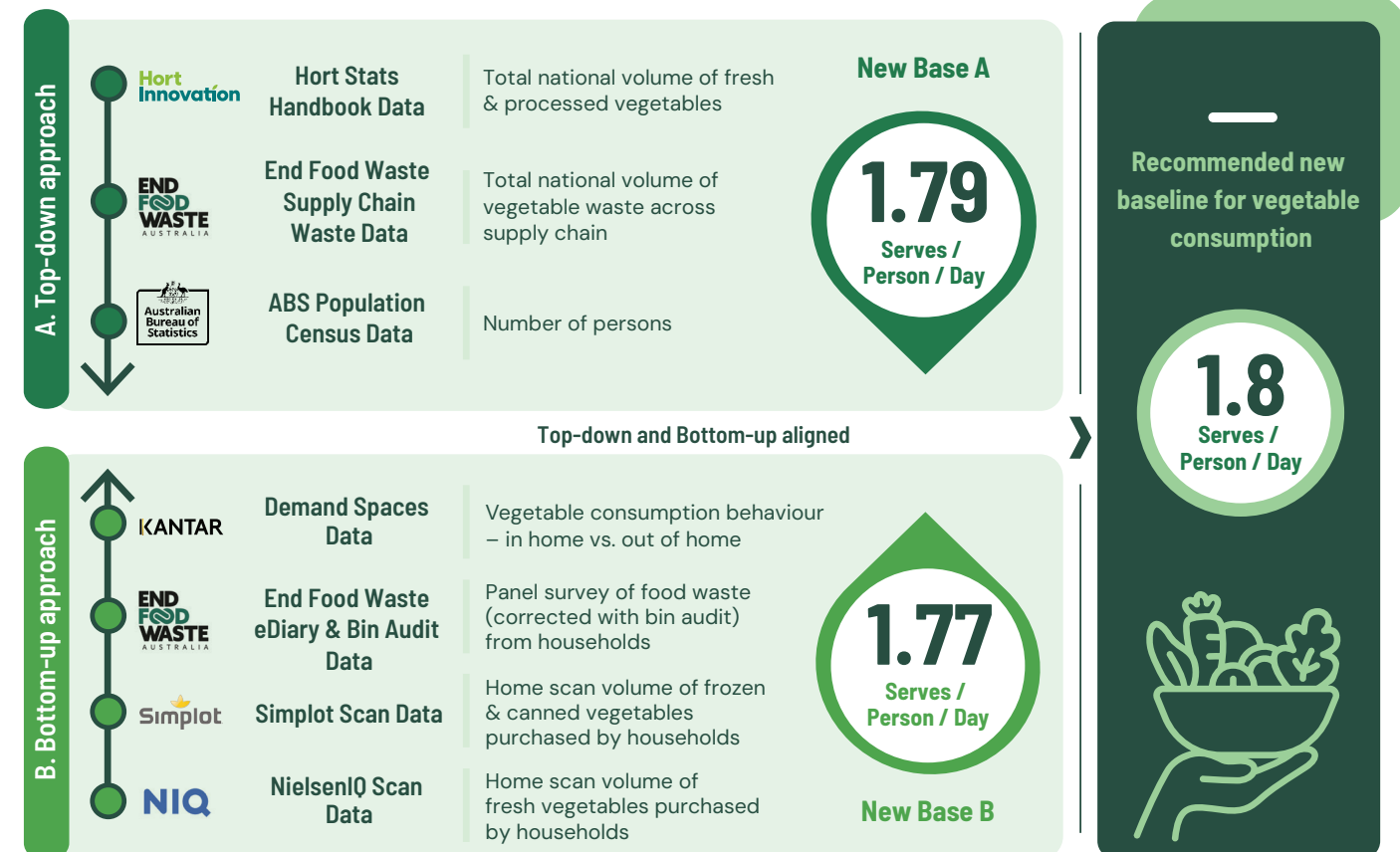
According to recent data, average vegetable consumption in Australia remains well below the recommended 5 serves per day. Adults consume an average of 2.4 serves daily⁴, dropping to 2.3 when children are included.⁵

To gain a clearer understanding of actual intake, Plus One Serve developed a new methodology combining production and purchasing data, adjusted for waste. This dual approach—top-down (production minus waste) and bottom-up (purchasing minus waste) – yielded consistent results and provided a more accurate baseline as illustrated in Figure 1. The new methodology accounts for edible and inedible vegetable waste. This moves the methodology closer to a mass balance approach where inputs and outputs can mostly be accounted for.

Key Finding

- Actual vegetable consumption is just **1.8 serves per person per day**, significantly lower than previous estimates.
- Updating the baseline requires annual update of all datasets used in the top-down bottom-up modelling approach.

Figure 1: Methodology for finding new baseline for vegetable consumption

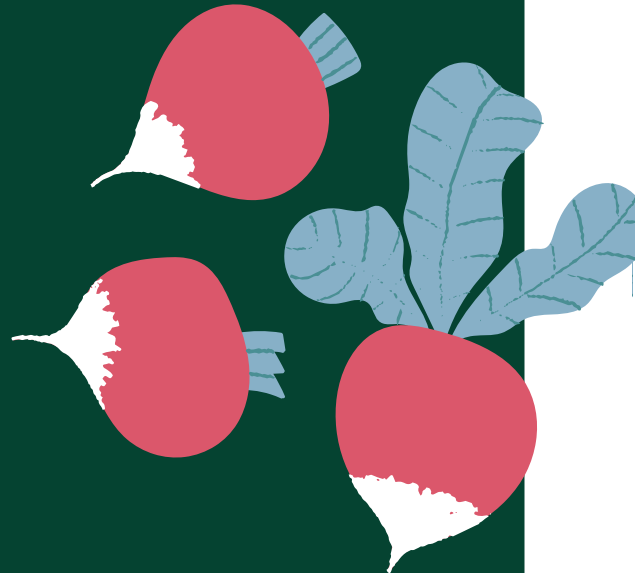


Development of investment scenarios

This section of the report includes two key components:

PART A - The development of the Plus One Serve Behavioural Intervention Framework.

PART B - Development of the financial estimates that represent the future investment scenarios for Plus One Serve.



Part A Behavioural intervention framework

The **Plus One Serve Behavioural Intervention Framework** is a national strategy to increase vegetable consumption by one extra serve per person per day by 2030. It provides a structured, evidence-based approach for designing interventions across five key settings:

- **Early learning and care (ELEC)**
- **Primary schools and out-of-school care (OSHC)**
- **Secondary and tertiary education**
- **Home**
- **Retail**

The framework also considers audience segments such as low socioeconomic (SES) groups, culturally and linguistically diverse (CALD) communities, and regional or remote populations. It factors in consumption patterns by meal or snack occasion.

Key Features

- Focuses on both overcoming barriers and leveraging emerging motivators (e.g. sustainability, mental health via gut health).
- Highlights home and retail settings as critical, with 90% of uptake expected from these areas by 2027.
- Draws on successful multi-setting interventions (e.g. Freshsnap, Stephanie Alexander Kitchen Garden).
- Developed with input from 49 experts across academia, retail, manufacturing, behavioural science, and marketing.

A CSIRO Rapid Review⁶ supports the potential home-based interventions as the most impactful.

Plus One Serve will integrate the framework into its future governance, strategic planning, and operations to drive long-term national change in vegetable consumption.



Figure 2: Plus One Serve Intervention Framework

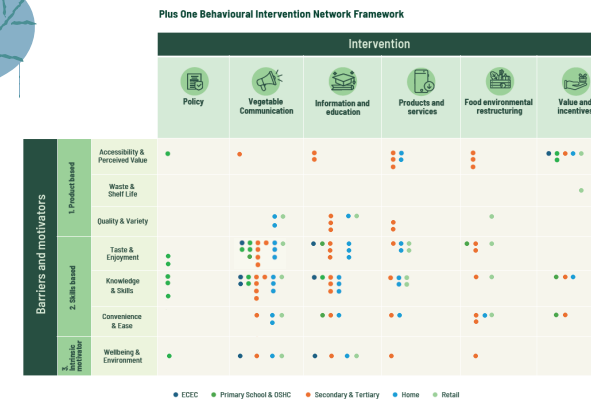
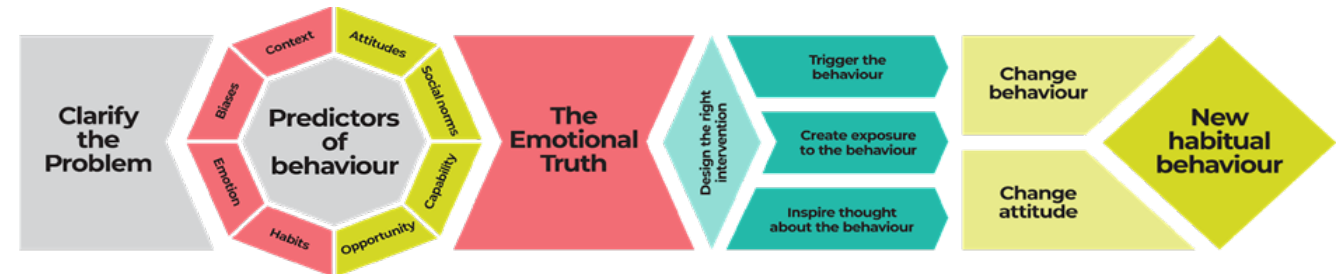


Figure 3: Com b model



Figure 4: Behaviour change model



Part B Future investment scenarios for Plus One Serve

A national investment model has been developed to identify the funding and strategies needed to achieve the Plus One Serve by 2030 goal. Informed by expert analysis and successful national programs, the model incorporates insights from government, industry, retailers, NGOs and growers.

Key Components

- CSIRO Rapid Review⁶ supports the potential home-based interventions as the most impactful.
- Three investment scenarios (low, moderate, high) were created to guide strategic planning.
- International examples and cost estimates informed scaling of successful pilot programs, especially in retail and consumer environments.
- A strong focus is placed on changing consumer perceptions of cost, waste and preparation through better value messaging and education.

Investment Timeline

- **2025–2030:** Initial six-year program, beginning with research and development funded through Hort Innovation's Frontiers Fund (60% from partners, 40% from Hort Innovation).
- **2031–2040:** Forward estimates for long-term implementation, completing a 16-year investment strategy.

Funding Sources (illustrated in figure 5)

- Commonwealth and State/Territory Governments
- Health agencies
- Vegetable growers
- Grocery retailers
- NGOs and not-for-profits
- Businesses in the health and horticulture sectors

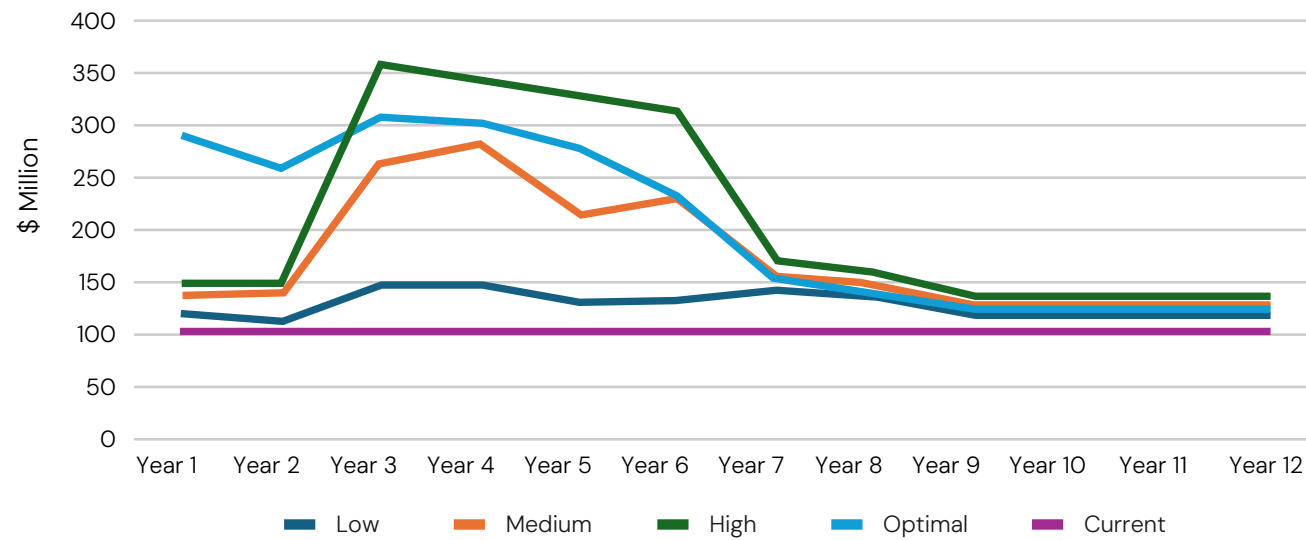
This coordinated investment model aims to deliver scalable, evidence-based interventions to sustainably lift national vegetable intake.

Figure 5: Funding sources in forward estimates across five priority settings

Funding Organisation	Estimated investment %				
	ELEC	Primary Schools & OSCH	Secondary & Tertiary Education	Home	Retail
State & Territory Governments incl. health promotion and public health agencies	40%	50%	50%	20%	10%
Commonwealth Government	10%	10%	10%	10%	5%
Hort Innovation/ AUSVEG	5%	5%	5%	5%	5%
Other commercial investors	15%	0%	0%	0%	0%
Corporate vegetable growers	5%	10%	10%	10%	20%
Grocery retailers	10%	10%	10%	25%	50%
Corporate Early Learning Businesses	15%	15%	15%	30%	10%

A “hockey stick” investment model is proposed, with funding increasing as research-backed interventions are ready for large-scale rollout. A coordinated, multi-stakeholder approach will ensure ongoing R&D, continuous testing and refinement of interventions.

Figure 6: Investment dollars per year per scenario above the current baseline spend (\$Million), excluding project co-ordination and national behaviour change campaign



Reaching the Plus One Serve goal by 2030, raising average vegetable intake from 1.8 to 2.8 serves per day, will require a **274% increase in investment**, totalling an additional **\$1.168 billion over six years** as illustrated in figure 6.

The most effective approach is to **prioritise interventions in retail and home settings**, which reach 90–95% of Australians, complemented by **expanded education initiatives**.

Figure 7: Funding quantum by setting over next six years (Low vs. Optimal scenarios)

Scenario	Setting	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Total
Total incremental investment by setting - Low (\$million)	ELEC	1.75	1.75	4.5	4.5	4.5	4.5	21.5
	Primary	2.5	1.25	6	6	6	6	27.8
	Second/Tertiary	1.5	1.25	4.5	4.5	4.5	4.5	20.8
	Home	5	2.5	15	15	7.5	7.5	52.5
	Retail	5	2.5	15	15	7.5	7.5	52.5
	National Behaviour Change Campaign	6.67	6.67	6.67	6.67	6.67	6.67	40.0
	Total (Low)		24.1	17.6	53.4	53.4	38.4	38.4
Total incremental investment by setting - Optimal (\$million)	ELEC	31.3	35.2	17.1	16.7	16.8	11.2	128.2
	Primary	37.5	22.7	34.2	33.3	16.8	22.4	166.9
	Second/Tertiary	18.8	11.4	17.1	16.7	8.4	5.6	77.9
	Home	50.0	45.5	68.3	66.7	67.1	44.8	342.4
	Retail	50.0	45.5	68.3	66.7	67.1	44.8	342.4
	Plus One Serve project coordination	1.7	1.7	1.7	1.7	1.7	1.7	10.2
	National Behaviour Change Campaign	16.7	16.7	16.7	16.7	16.7	16.7	100.0
Total (Optimal)		205.9	178.6	223.4	218.4	194.6	147.1	1,168.0

Long-term success depends on generational change, starting in the home and reinforced through schools to build lifelong habits. Structural interventions, such as improving value perception in retail, will be combined with behavioural change strategies in a cross-sector national program.

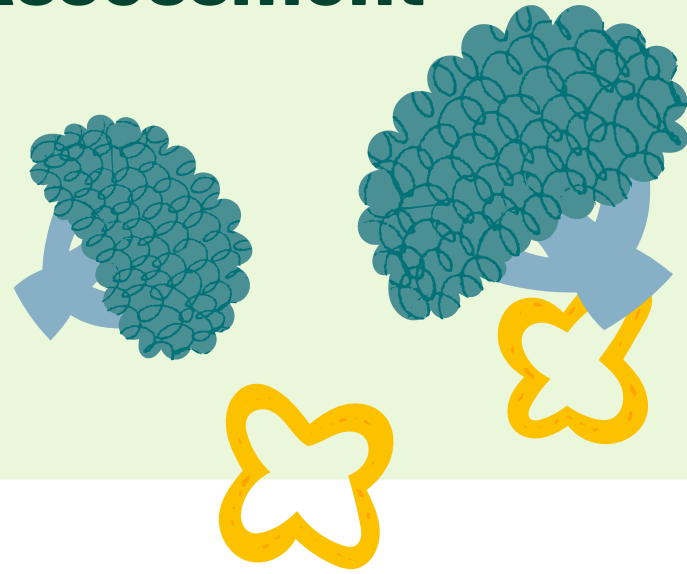
While the investment is significant, it is spread across multiple sectors and designed to deliver strong returns for industry, businesses and communities. Retail and home settings will be the focus in the first three years to drive early impact.

A multi-sector, coordinated effort is essential to achieving Plus One Serve by 2030, ensuring a long-term shift in Australia’s vegetable consumption habits.



Economic Impact Assessment

The Plus One Serve economic modelling assesses the long-term benefits of increasing vegetable consumption by one additional serve per person per day by 2030. It provides robust evidence to guide investment, inform delivery strategy, and demonstrate the value of this national initiative across health, industry and employment.



Part 1 Consumption Change Modelling

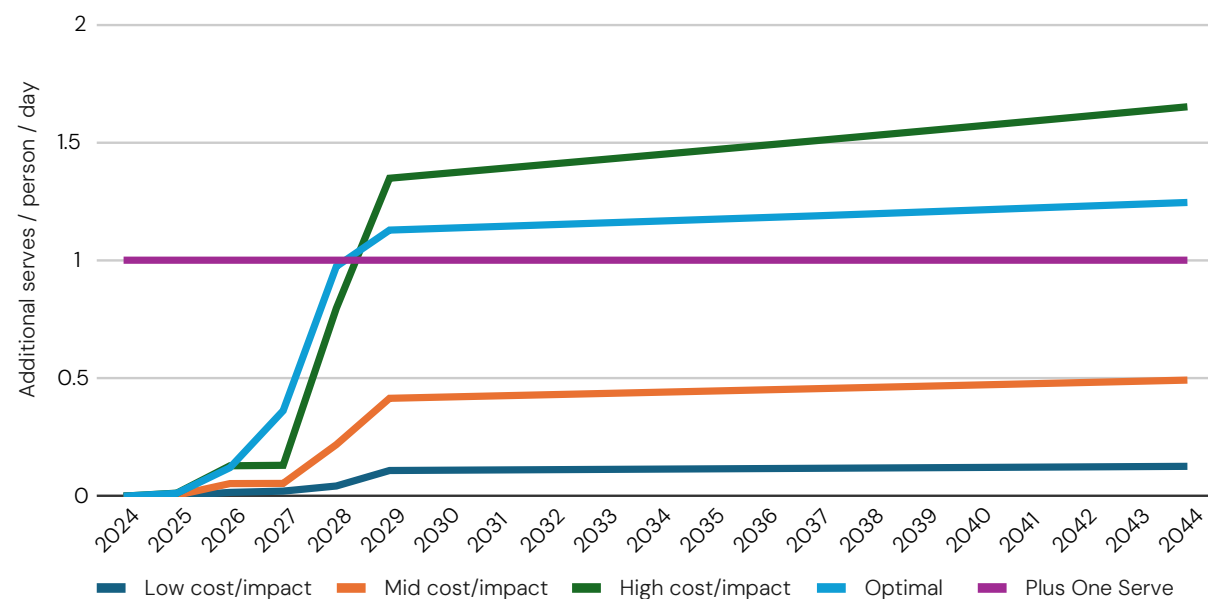
A predictive impact model was developed to simulate national vegetable intake across a 20-year period (2024–2044), accounting for factors such as population growth, intervention reach, behaviour change timelines and cumulative program effects across five key settings (early learning, schools, home, retail and food service).

The model acknowledges that individuals may be exposed to multiple interventions across life stages and settings (e.g. school and home), and that these combined exposures reinforce long-term behavioural change.

Projected outcomes by 2030 under different scenarios

- **No intervention:** Intake falls slightly to 1.78 serves/day
- **Low-impact:** 1.89 serves/day
- **Mid-impact:** 2.20 serves/day
- **High-impact:** 3.15 serves/day
- **Plus One Serve:** 2.78 serves/day
- **Optimal scenario:** 2.92 serves/day with sustained growth to 3.01 by 2044 (Illustrated in figure 8 below).

Figure 8: Additional serves per person per day



Part 2 Healthcare Cost Savings

A six-step model estimated the reduction in disease burden from increased vegetable consumption. Chronic illnesses with strong dietary links – such as cardiovascular disease, cancer, coronary heart disease, stroke, and type 2 diabetes – were analysed in relation to projected cost savings as illustrated in Figure 9.

Most savings come from reduced cardiovascular disease (56–57%) and cancer (31–32%). These findings highlight the significant potential for reducing healthcare costs through targeted interventions that increase vegetable consumption, reinforcing the value of a national strategy to promote healthier eating habits.

Estimated savings by scenario

- **Low-impact:** \$3.0 billion (2024–2044)
- **Mid-impact:** \$11.3 billion
- **High-impact:** \$34.4 billion
- **Optimal scenario:** \$28.6 billion total savings
 - \$1.38 billion by 2030
 - \$2.00 billion by 2044

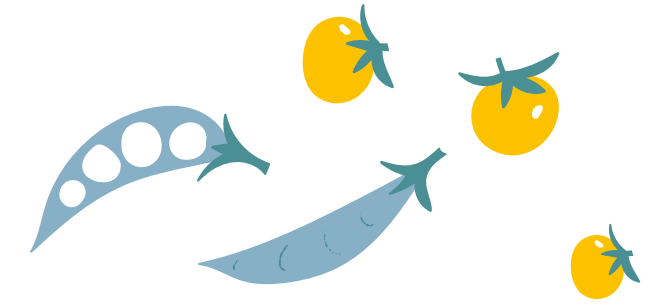
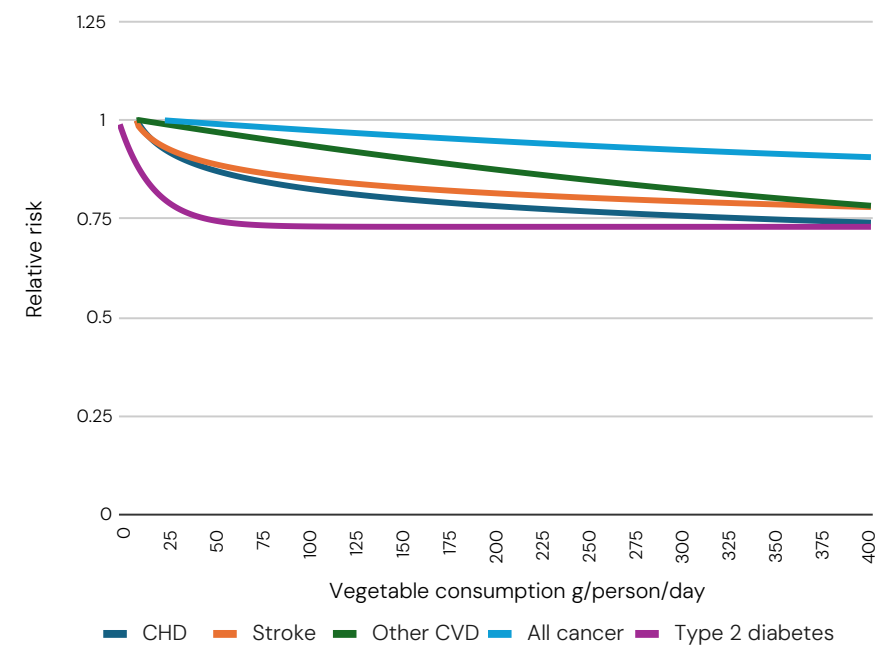


Figure 9: Disease relative risk with changing levels of vegetable consumption



Part 3 Economic Benefits to the Vegetable Industry

A supply chain model estimated the economic uplift from increased vegetable demand, adjusting for waste and production constraints. Impacts were assessed across farming, processing, transport, wholesale and retail sectors.

Under the optimal scenario in 2030

- **Total vegetable sales:** \$7.91 billion.
- **Value added to economy:** \$3.30 billion.
- **Farm & processing sector:** \$3.54 billion in sales (45% of total), generating \$2.73 billion in value-added (83%).
- **Retail & food service:** \$3.34 billion in sales (42%), with \$0.49 billion in value-added.

Job creation

- 12,841 full-time equivalent (FTE) jobs in farm and processing sectors.
- Indirect employment and GDP impacts expected to be even higher, with multipliers of 1.23 (jobs) and 1.29 (GDP).

Farmer profits

- Estimated average increase of \$160,000 per farm by 2030, based on stable farm numbers.

Short-term challenges may include supply constraints (land, labour), but these are expected to ease as demand and investment grow.

Figure 10: Time series of total supply chain economic impact

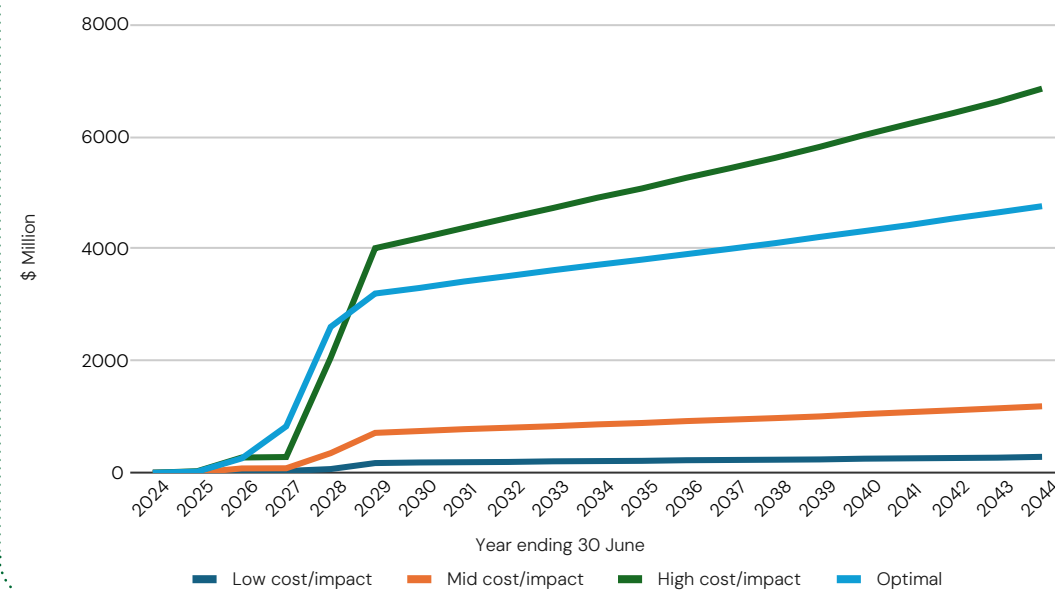
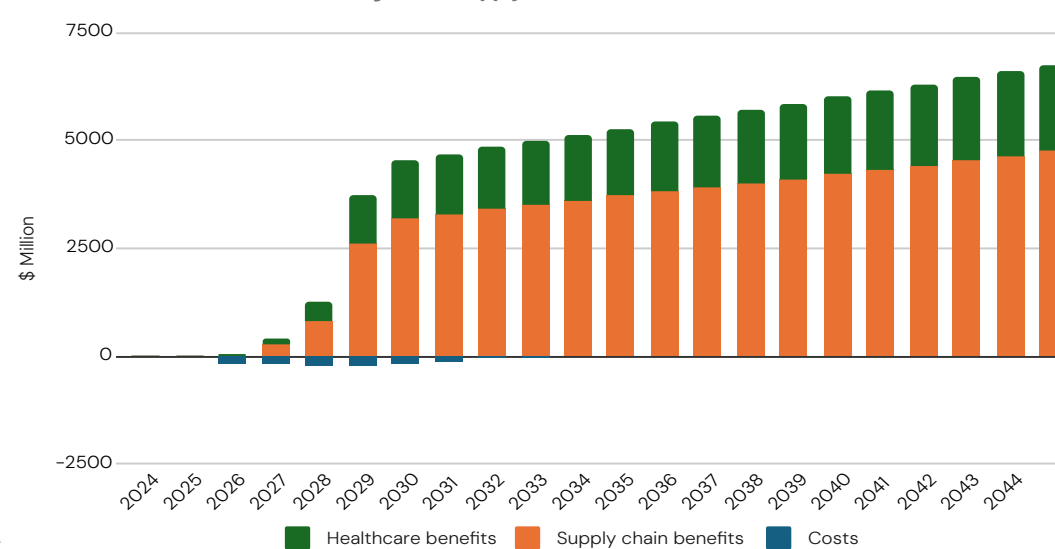


Figure 11: Supply chain and healthcare benefits



Part 4 Summary & Conclusions

The Plus One Serve initiative delivers strong, quantifiable returns

Healthcare savings: \$1.38 billion by 2030

Net Present Value: \$10.2 billion

Industry value uplift: \$3.30 billion in added economic value

Benefit-Cost Ratio: 12.3:1

Job creation: Over 12,841 direct FTE jobs

Coordinated investment in vegetable consumption delivers high-impact, long-term benefits to public health and the economy.

Part 5 Recommendations for Future Modelling

To refine future impact evaluations and validate program effectiveness

- Monitor broader dietary changes resulting from vegetable intake.
- Evaluate outcomes from coordinated, multi-setting programs versus isolated interventions.
- Track long-term changes in behaviour and consumption.
- Explore emerging benefits of vegetable consumption, such as improved mental health and reduced environmental impact.

Enhanced data collection and ongoing research will improve accuracy and strengthen the case for sustained national investment.

In closing

The National Strategy and Baseline Review has laid the critical foundation for a national, coordinated behaviour change program aimed at reversing Australia's persistently low vegetable consumption. Through comprehensive analysis and strategic alignment, this review has identified the key levers, gaps, and opportunities necessary to support a population-wide shift. It establishes a bold yet achievable target: increasing average vegetable intake by one additional serve per person, per day by 2030.

This work now serves as the authoritative launch pad for unified national action, guiding research, policy industry, and community efforts to secure Australia's long-term health, agricultural viability, and food system resilience.



Levy funds – R&D projects

This project has been funded by Hort Innovation, using the Vegetable research and development levy and contributions from the Australian Government. Hort Innovation is the grower-owned, not-for-profit research and development corporation for Australian horticulture.



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Contributors and Acknowledgements

The insights and collaborative efforts of various stakeholders and experts have been instrumental in the development of this report, aimed at addressing the imperative of increasing vegetable consumption in alignment with the 'Plus One Serve by 2030' initiative. Their collective expertise and dedication have shaped a comprehensive analysis and strategic roadmap to promote healthier dietary habits across Australia, emphasising the pivotal role of vegetables in enhancing public health and agricultural sustainability.

Special gratitude is extended to the following organisations for their invaluable contributions to this endeavour:



CVA
Corporate Value Associates



AgEcon
AGRICULTURE • DEVELOPMENT & EXTENSION SERVICES



Shannon
Behaviour Change

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