

Final Report

Learning from the past to amplify community vegetable education programs of the future

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Project:

Learning from the past to amplify community vegetable education programs of the future (VG22003)

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Public summary

The vegetable industry has delivered a range of levy funded initiatives seeking to increase consumer demand, which accounted for approximately 16% of total program investment expenditure from 2017-2021 (\$15.2 million). This investment has been motivated by the large share of the Australian population (>90%) who are not consuming the recommended serves of vegetables per day. This 'consumption gap' represents a valuable opportunity for the Australian vegetable industry to realise additional demand and market growth. Despite the broad range of investment activity seeking to increase vegetable consumption (e.g. product development, education, insights, best practice guidelines), population-level changes in actual consumption has not occurred, suggesting that the initiatives have generated a minimal observable impact.

In response to the ongoing opportunity to drive consumer vegetable demand, project VG22003 sought to understand the delivery of previous initiatives seeking to increase vegetable consumption within Australia (levy and non-levy). This was informed by a literature review and stakeholder consultation process, culminating in a framework to guide future investment to increase consumer demand. The project drew on behaviour change theory to guide the evaluation and framework development approach and was delivered in three phases:

1. Literature review and mapping initiatives.
2. Evaluation of levy and non-levy initiatives.
3. Behaviour Change Framework to guide future investment

The literature review identified 100 initiatives that have been delivered (or are currently being delivered) mostly within a domestic setting over the most recent 10 year period covering a range of cohorts and categories. The evaluation process was carried out over a sample of 10 initiatives, representing both levy and non-levy funded initiatives. The key finding from the evaluation was that while initiatives were generally highly relevant to the target cohort and were supported by an appropriate strategic basis, the effectiveness of execution for achieving sustained behaviour change and industry impact was significantly weaker. This was in part due to the absence of an implementation plan, which was required to activate, extend and engage stakeholders post the research and development (R&D) delivery phase with the tools and resources developed.

Informed by the literature review and evaluation, a Behaviour Change Framework was developed to provide a framework to guide future vegetable R&D levy investment across five strategic pillars, in the context of the broader response levers and stakeholders that can complement and leverage levy-funded initiatives.

The Behaviour Change Framework provides Hort Innovation and relevant vegetable industry stakeholders with improved knowledge of the requirements to design and deliver levy investments that increase domestic vegetable demand and industry impact.

Keywords

Behaviour change strategy, evaluation, consumer demand, vegetable consumption, literature review

Introduction

Since 2017 a material share of the vegetable research and development (R&D) levy has been invested in projects with the objective of increasing Australian consumer demand for vegetables. The *Vegetable Strategic Investment Plan 2017-2022 Performance Report* identified that approximately \$15.2 million (16.1% of total) was invested in initiatives such as consumer insights and education to increase domestic demand over the 2017-2021 Vegetable Strategic Investment Plan (SIP). At the same time, a range of Government, not-for profit and community groups have also funded and delivered programs aimed at increasing vegetable consumption across a range of cohorts.

Despite the significant investment and broad range of R&D interventions, the share of the Australian population consuming the recommended 5 serves of vegetables continues to remain low. Results from the latest National Health Survey found that just 6.5% of adults met the recommended daily intake of 5 serves of vegetables in 2022-23, reflecting a declining trend since 2011-12 (where 8.3% of adults met recommended consumption levels)¹. Therefore, a major opportunity exists to leverage ongoing R&D to deliver a tangible contribution to increase vegetable demand and close the 'consumption gap'.

The process of learning from the past to inform future levy funded demand creation initiatives was sought, given that the opportunity to realise Australian vegetable demand creation to the full potential has yet to be realised. This project sought to provide the vegetable industry and Hort Innovation with new knowledge that would contribute to a shared understanding of the most significant and tangible opportunities for the design and delivery of R&D initiatives within a broader behaviour change framework. In addition to the immediate impact for vegetable levy payers through improved market demand, the broader social impact regarding improved health outcomes associated with increased vegetable consumption also underpinned the behaviour change framework as well as the relevant stakeholders anticipated to be involved in this process.

¹ ABS (2023). National Health Survey 2011-12, 2022. Accessed <https://www.abs.gov.au/statistics/health/health-conditions-and-risks/national-health-survey>.

Methodology

The project was delivered by a multidisciplinary team of evaluators and agricultural economists (Ag Econ) and agrifood behaviour change experts (McKINNA *et al.*) between May 2023 and February 2024 across three main phases:

1. Literature review and mapping initiatives.
2. Evaluation of levy and non-levy initiatives.
3. Behaviour Change Framework to guide future investment.

Each phase involved a combination of desktop review and stakeholder engagement to develop the necessary insights. The specific methods utilised for each project phase are described below.

Phase 1: Literature review and mapping initiatives

- A refined and current list of levy-funded and other community initiatives seeking to drive increased vegetable consumption was identified through a literature review process.
- The literature review: (1) consolidated existing research on vegetable consumption barriers and impediments; (2) identified and described the delivery and broad results achieved to-date across 6 categories of community vegetable education initiatives; and (3) identified themes reflecting the legacy of investment delivery, supported by n=24 consultations with thought leaders involved in the delivery of flagship initiatives.
- A total of n=100 initiatives were identified and documented in a database, organised by partner, funding model, target audience, jurisdiction, and program category for future reference by Hort Innovation and industry stakeholders.

Phase 2: Evaluation of levy and non-levy initiatives

- Evaluation Framework. To determine the value of previous program delivery for increasing vegetable consumption, an Evaluation Framework was first developed to establish a systematic process to inform the merit, worth and significance of previous initiatives through a behaviour change lens.
- Evaluation sample. The selection of initiatives for evaluation was guided by the literature review. A broad range of levy-funded (n=5) and non-levy funded (n=5) initiatives were selected to ensure representation across the major intervention categories, consumption impediments and target cohorts.
- Each initiative was reviewed using the criteria and rubric from the Evaluation Framework, through a combination of document review and stakeholder engagement.
- The results of each evaluation were reported and captured in a summary evaluation report.

Phase 3: Behaviour Change Framework

- The Behaviour Change Framework consolidated the learnings and insights from Phase 1 (literature review) and Phase 2 (evaluation) to inform a set of guidelines to inform investment strategy.
- The Behaviour Change Framework draws on the experience of behaviour change experts and was guided by behaviour change principles that have been used in successful campaigns for other social causes.
- The Framework reflects the broad range of stakeholders and influences that provide the collective opportunity for influencing vegetable consumption, as well as the bespoke opportunity for R&D supported by the vegetable industry within this landscape.
- The draft Framework was presented to select industry stakeholders before being finalised.

Results and discussion

Part 1: Literature review (Appendix 1)

The project initially delivered the literature review, which underpinned a database of n=100 current initiatives seeking to drive vegetable consumption. The literature review process was supported by consultation with n=24 thought leaders. The 6 intervention categories identified through the literature review process are described below:

1. Policy – influencing food policy, for example food subsidies, pricing, compulsory and voluntary levies, mandatory guidelines, food labelling regulation, public health and education primarily by non-government organisations and industry associations.
2. Promotion – mass market messaging, ‘edutainment’ and E-health interventions designed to leverage media and communication channels to engage wide audiences.
3. Targeted – bespoke resources and programs directed at specific cohorts, such as primary schools.
4. Environments – creating positive food environments to support and encourage desirable choice where food decision are made, such as retail, away-from home dining, school canteens, workplaces and sporting clubs.
5. Local – community driven initiatives with a focus on building social capital and resilience.
6. Insecurity – addressing access or affordability challenges for disadvantaged populations.

The existing literature focus on impediments and barriers to increased consumption was also consolidated into five main drivers that have continued to impact consumption:

1. *Taste & enjoyment* of due to bad past experiences or lack of inspiration.
2. *Knowledge & skill* of buying, storing and preparing.
3. *Quality & convenience* including freshness and consistency.
4. *Cost & wastage* due to perceptions and poor storage or preparation practices.
5. *Access & affordability* relative to other food options available.

The literature review documented a broad range of insights and learnings. Several insights are extracted below (consult Appendix 1 for full detail).

- Shifting vegetable consumption demands a long-term, intergeneration journey involving small, sequential positive steps linked to a coordinated strategy delivered through collaborative partnerships.
- Much of the community vegetable education effort has been driven by health professionals and researchers with a focus on nutrition and health outcomes. However the more successful programs all share a focus on eating enjoyment and socialisation rather than an overt nutritional message.
- There are multiple examples in the literature of controlled experiments involving various types of interventions that have shown qualified success in lifting vegetable consumption, but which have not delivered sustainable consumption shifts at a macro level beyond trial because they have not been rolled out or scaled up across a wider population.
- Interventions in food environments where consumption decisions are made have been lacking in Australia.
- The large, collective investment over the past few years in community vegetable education in Australia has created a significant asset base of materials and resources that potentially provide solid foundations to advance the cause, but which are grossly under-utilised because of the lack of uptake by the various stakeholder groups.

Part 2: Evaluation of levy and non-levy initiatives (Appendix 2, 3)

The evaluation identified that while the relevance and strategic approach were generally strong across all sampled initiatives, the extent to which initiatives could demonstrate the effectiveness of actual consumer behaviour change that supported industry impact (underpinned by efficient use of resources and a sustained legacy) was significantly weaker.

The results of the performance of each sampled initiative against the performance criteria are summarised in Table 1.

Table 1. Evaluation performance analysis summary

| Evaluation Criteria | Levy Funded | | | | | Non-levy funded | | | | |
|---------------------------------------------------------------------------------------------|------------------|-----------|---------------|------------------|------------------|-----------------|----------------------------|-----------------------|------------------|------------------|
| | Phenom-enom! | VegKIT | Taste & Learn | VegEze | Veggycation | Food Sensations | Steph-Alex. Kitchen Garden | Produce Prescriptions | Live Lighter | VEG Education |
| Relevance <i>“Solving the right problems”</i> | Very good | Excellent | Excellent | Very good | Very good | Excellent | Excellent | Very good | Good | Very good |
| Strategic appropriateness <i>“Strategic approach is suitable to address the problem”</i> | Emerging | Very good | Very good | Emerging | Emerging | Good | Good | Very good | Good | Good |
| Execution effectiveness <i>“Using the right methods that are achieving results”</i> | Good | Good | Good | Emerging | Not yet emerging | Emerging | Emerging | Good | Emerging | Emerging |
| Efficiency <i>“Use of resources”</i> | Emerging | Very good | Emerging | Emerging | Emerging | Emerging | Emerging | Not yet emerging | Emerging | Emerging |
| Legacy <i>“Ongoing utilisation”</i> | Emerging | Good | Emerging | Not yet emerging | Emerging | Good | Very good | Emerging | Good | Not yet emerging |
| Impact and investment return <i>“Realised increased consumption”</i> | Not yet emerging | Emerging | Emerging | Emerging | Not yet emerging | Emerging | Good | Emerging | Not yet emerging | Not yet emerging |

The evaluation of past and current initiatives seeking to increase vegetable consumption through a behaviour change lens generated a range of learnings which inform recommendations for future investment strategy, summarised below.

Balancing short term delivery with long term results

- All initiatives were characterised by a short term delivery timeframe, inherently conflicted by the longer timeframe required to achieve behaviour change.
- While short term change in target attitudes and consumption was achieved, these changes could not be linked to broad and sustained behaviour change.

Recommendation #1: *Prioritise the development of initiatives with a minimum 5 year delivery timeframe to support increased capacity to measure long term results for target cohorts.*

Longevity and legacy

- Initiatives were strengthened when they were delivered continuously over multiple intakes and/or iterations with a consistent program name, brand or association.
- Consistency, stability and a ‘track record’ generates goodwill that encouraged partnerships, and contributed to increased engagement across target cohorts.

Recommendation #2: *Initiatives should include the provision for partnership support to expand the longevity and legacy of delivery beyond the project period to sustain multiple participant intakes and drive broader engagement and goodwill with participants and stakeholders.*

Aligning jurisdictions

- Initiatives with a local or state delivery model faced challenges when trying to scale, while contributing to duplication where similar initiatives were being delivered in different jurisdictions.
- The design of initiatives should occur at a national level, with a flexible platform that enables alignment with individual requirements of lower level jurisdictions to offer a more targeted basis to extend reach and scale delivery.

Recommendation #3: *Initiatives should be designed at the national level to ensure a more accessible basis to extend reach and scale delivery across a range of jurisdictions.*

Scale and leverage

- Initiatives that readily leveraged available resources and supporting initiatives could more successfully scale delivery to reach wider audiences.
- Initiatives that failed to appropriately draw on supporting resources limited capacity to generate momentum and differentiate the delivery from other supporting programs, increasing the risk of duplicating activities and outputs.

Recommendation #4: *Ensure that available resources and supporting initiatives are suitably identified and leveraged in the delivery approach to maximise scale and realise efficiencies, which is best achieved through a program approach.*

Align to behaviour change framework

- Initiatives that explicitly recognised and worked to align delivery with broader behaviour change strategy were more successful at targeting participant response.
- Levy-funded investments have not been linked to a broader behaviour change framework.
- As a result, investment delivery has lacked a common identifier that ensures the R&D is suitably placed to compliment and elevate supporting and related work from other stakeholders.

Recommendation #5: *Develop and align all future levy investments to a behaviour change framework to ensure identified opportunities are designed to complement and integrate with broader initiatives contributing to support sustained long*

term behaviour change.

Implementation plan

- The most common and significant limitation of levy funded initiatives was the lack of an implementation plan to activate, extend and engage stakeholders post R&D delivery.
- This resulted in a 'passive' reliance for material and tools to be utilised, significantly impacting on the overall reach and momentum generated through the R&D phase.
- Without implementation, R&D outputs have no activation pathway, with many of the stakeholders consulted in Volume 1 showing low levels of familiarity with the suite of levy funded initiatives.

Recommendation #6: *All levy funded investment should be supported by an implementation plan to ensure the legacy and impact of initiatives can be sustained beyond the R&D phase with supporting partners.*

Part 3: Behaviour Change Framework

The Behaviour Change Framework identified an approach for a national behaviour change program involving the collective mobilisation of all stakeholders, as well as the specific opportunities for vegetable R&D levy investment to support and reinforce activities more broadly within the Plan. The Behaviour Change Framework proposes the use of an umbrella brand, to articulate the value proposition for increasing vegetable consumption across the entire population and provide a linking mechanism to reduce message clutter.

Delivering against the Framework will require the involvement of a collaboration of multiple stakeholders. The Fruit and Vegetable Consortium (FVC) has been identified as a key stakeholder group that can support and drive the delivery of the behaviour change plan holistically. For that reason, the vision and mission from the FVC has been reflected in the Plan.

Several considerations were identified in the Plan regarding the scope and expectations of R&D levy investment within a broader behaviour change agenda:

1. It is not the core function of the R&D levy to address the national health crisis, but to drive industry growth and development.
2. It is unrealistic to expect that R&D levy investments alone will be sufficient to drive a notable increase in vegetable demand.
3. Investment in more of the same community vegetable education programs is unlikely to generate a paradigm shift in consumption without alignment to a more holistic strategy.
4. Identifying the desired commercial outcomes for growers in every investment is essential.
5. Ultimately, collaboration across all supply chain partners on demand creation will be required to effect real change.

Outputs

The outputs delivered through V22003 are described in Table 2.

Table 2. Output summary

| Output | Description | Detail |
|-----------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Literature review and scoping study (Appendix 1) | Review of initiatives and environment influencing vegetable consumption. | Delivered and communicated to Hort Innovation as the initial project output. Provided the foundation for sampling initiatives to inform the evaluation, and framing the strategic pillars and response levers for the behaviour change strategy. A supporting database of n=100 initiatives was developed. |
| Evaluation Framework (Appendix 2) | Describes the approach for evaluating previous initiatives informed through a behaviour change lens. | Delivered and communicated to Hort Innovation following the completion of the literature review. The Evaluation Framework underpins a systematic process to inform the merit, worth and significance of previous community initiatives delivered to support increased vegetable consumption in a range of settings through a behaviour change lens. |
| Evaluation reports (n=10 sampled initiative; summary evaluation report) (Appendix 3) | Reports the results of the evaluation completed for a selection of levy and non-levied initiatives identified in the literature review. | Prepared for the final report submission. The evaluation process sought to determine the performance of previous initiatives to provide an evidence base to inform and guide the design and delivery of future levy funded initiatives to drive material changes to consumption. |
| Behaviour Change Framework (Appendix 4) | Identifies a strategic framework to guide collective effort and R&D investment to realise behaviour change. | Prepared for the final report submission. The Plan was tested with key industry stakeholders prior to being finalised. The Plan is intended to support Hort Innovation design and deliver R&D investment within a broader framework that recognises the requirements to realise vegetable consumption behaviour change. |

Outcomes

VG22003 aligns with supporting the delivery of Outcome 2 ‘Demand creation’ of the 2022-2026 Vegetable Strategic Investment Plan. The outcomes of VG22003 are described in Table 3.

Table 3. Outcome summary

| Outcome | Alignment to fund outcome, strategy and KPI | Description | Evidence |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Improved knowledge by Hort Innovation and vegetable industry stakeholders regarding the relative merit, delivery and impact of previous initiatives focused on increasing vegetable consumption to inform future investment. | Outcome 2: Demand creation. Strategy 4. Support vegetable product differentiation and initiate stakeholder education initiatives (e.g., health benefits). KPI. Development of stakeholder education programs that impact knowledge, awareness and purchase intent. | Phase 1 (Literature Review) and Phase 2 (Evaluation) identified insights regarding the delivery of previous initiatives, and recommendations to inform future design and delivery. | Feedback from Hort Innovation and industry stakeholders indicating interest in results and improved understanding of the factors driving vegetable consumption. |
| Improved capacity of Hort Innovation and vegetable industry stakeholders to design and deliver R&D investment in support of sustained consumer vegetable consumption behaviour change. | | The Behaviour Change Plan identifies strategic pillars, response levers (including R&D) and guidelines for R&D investment to enable effective investment that is cognisant of broader stakeholders also participating. | Feedback from Hort Innovation and industry stakeholders. |

Monitoring and evaluation

Key Evaluation Questions and performance expectations were not explicitly identified for this project given the underlying focus on delivering evaluation in support of Hort Innovation’s Evaluation Framework.

Recommendations

Six recommendations to inform future R&D investment design and delivery were identified through the evaluation of n=10 previous initiatives (refer appendix 2 for more detail):

1. Balancing short term delivery with long term results. Initiatives should include the provision for partnership support to expand the longevity and legacy of delivery beyond the project period to sustain multiple participant intakes and drive broader engagement and goodwill with participants and stakeholders.
2. Longevity and legacy. Initiatives should include the provision for partnership support to expand the longevity and legacy of delivery beyond the project period to sustain multiple participant intakes and drive broader engagement and goodwill with participants and stakeholders.
3. Aligning jurisdictions. Initiatives should be designed at the national level to ensure a more accessible basis to extend reach and scale delivery across a range of jurisdictions.
4. Scale and leverage. Ensure that available resources and supporting initiatives are suitably identified and leveraged in the delivery approach to maximise scale and realise efficiencies, which is best achieved through a program approach.
5. Align to a behaviour change framework. Develop and align all future levy investments to a behaviour change framework to ensure identified opportunities are designed to complement and integrate with broader initiatives contributing to support sustained long term behaviour change.
6. Implementation plan. All levy funded investment should be supported by an implementation plan to ensure the legacy and impact of initiatives can be sustained beyond the R&D phase with supporting partners.

Beyond the immediate recommendations identified from the evaluation, the following recommendations are proposed to support implementation of the Behaviour Change Framework in order to guide the development of levy-funded initiatives seeking to increase vegetable demand.

1. Ensure the *guidelines for vegetable levy investment checklist* within the Behaviour Change Framework (p.62) are applied to, and satisfied by, all investment recommendations progressed by Hort Innovation and the Vegetable Strategic Investment Advisory Panel and are incorporated into M&E planning processes to ensure alignment to 'best practice' behaviour change principles.
2. Hort Innovation to engage supporting collaborators (Vegetable Industry Bodies, Commercial partners, not-for-profit organisations, health organisations and government) leveraging the content of the Behaviour Change Framework to identify a pathway for securing support and investment model for activating an umbrella brand and linking of supporting initiatives across priority cohorts (e.g. Plus One Serve of Vegetables by 2030 Program).

Refereed scientific publications

None to report.

References

ABS (2012). Australian Health Survey: First Results, 2011-12. Retrieved from: <https://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/4364.0.55.0012011-12?OpenDocument#Publications>.

ABS (2023). National Health Survey, 2022. Retrieved from: <https://www.abs.gov.au/statistics/health/health-conditions-and-risks/national-health-survey/latest-release#data-downloads>.

Intellectual property

No project IP or commercialisation to report.

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Appendices

Appendix 1: Literature Scan and Consultation Findings – September 2023 (McKINNA *et al.*)

Appendix 2: Evaluation Framework – October 2023 (Ag Econ)

Appendix 3: Evaluation of past initiatives (summary report and 10 project specific reports) – February 2024 (Ag Econ)



Hort Innovation

VG 22003 Learning from the past to amplify
community vegetable education programs of the
future

Volume 1: Literature scan and consultation
findings

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Executive summary

Despite large investments in a myriad of community vegetable education programs and other interventions by governments, NGOs and industry, the proportion of the Australian population consuming the recommended daily servings of vegetables required for a healthy lifestyle remains stubbornly low. Only one in ten (8.7%) Australians aged 18 years and over met the vegetable consumption recommendations in the most recent ABS data (ABS 2020-21).

Project VG22003 *'Learning from the past to amplify community vegetable education programs of the future'* aims to extract learnings from past and current community vegetable education in order to inform future vegetable industry levy investments to drive demand. This document presents the first stage research findings (task 2 of the project) that will inform a final report with advice to Hort Innovation. Stage 1 has delivered preliminary stakeholder engagement with a small sample of thought leaders on the subject; a scan of relevant literature focusing on umbrella evaluations of community vegetable education programs; compilation of a database of recent and current programs; plus strategic analysis of the findings.

Stage 1 research highlights the broad range of agencies active in driving increased vegetable consumption, each with a slightly different agenda spanning preventative health, nutrition, education, food insecurity, specific disease management, economic development, social inclusion, skill development, business growth and more. On the basis of that reach alone, the collective investment in community vegetable education has been significant and includes over \$16 million of national vegetable levy funds across the last two industry investment plans (commencing 2016-17).

Globally there have been many categories of community vegetable education programs ranging from broad spectrum, mass marketing programs to those targeting specific cohorts. There are also many interventions in environments where buying and eating decisions are made in order to attempt to influence choices towards vegetable options. In Australia, there is no shortage of information, resources and recipe ideas provided by governments, NGOs and others to encourage more vegetable consumption.

In summary, the literature scan and opinion leader engagement for this project presents the following learnings from the past to inform future investment:

1. The impediments to increased vegetable consumption can be summarised as:
 - **Taste & enjoyment** of vegetables through learning, inspiration and meal solutions
 - **Knowledge & skill** of buying, storing and preparing
 - **Quality & consistency** including freshness and convenience
 - **Cost & wastage** due to perceptions and practices
 - **Access & affordability** relative to other food options available.



2. There have been numerous evaluations and trials of vegetable education programs in Australia. While some have demonstrated objectively that they have been successful in achieving a short-term lift in consumption, in many cases, the projects were not sustained beyond the trial period. The thought leaders consulted to inform this stage of the project suggested that failure is often due to lack of adequate long-term funding supported by an implementation plan and adoption partner.
3. Although mass marketed community vegetable education programs (i.e. health promotions) are successful in raising awareness and are considered cost effective (Eatwell Report, 2013) they need to be sustained because the effect fades post-campaign. There appears to be a strong global shift away from mass market programs with a nutritional message because of the unwillingness of governments to fund them consistently over the long term. The evaluation literature on community vegetable education programs commonly notes that promoting vegetables on the basis of their nutritional qualities (which is the usual approach of such programs), will not lift consumption because consumers already know that vegetables are good for them and that they should eat more for a healthy lifestyle. This awareness is not influencing behaviour change.
4. The programs that had both a strong evidence base and anecdotal support as being most successful in Australia were those that delivered on the objective of eating enjoyment primarily (while also supporting good nutrition) e.g. the Jamie Oliver, Maggie Beer and Stephanie Alexander programs.
5. There is strong consensus among nutritionalists that interventions directed at children (pre-school and primary school age) aiming to establish a taste preference for vegetables are a highly effective path to sustainable, long-term increases in consumption. Taste preferences are learned and can be influenced in a positive environment. Changing taste preferences in adults is far more challenging.
6. There is no shortage of tools, curriculum guides and teaching resources aimed at assisting schools to play a part in vegetable education. The challenge is connecting busy teachers with these resources and influencing school and government policy.
7. There is a plethora of web-based resources targeting specific cohorts with healthy eating and nutrition messaging. These sites include measuring tools, diaries, recipes, fact sheets and more. However, uptake and adoption rates are challenging because of the need to drive people to the sites in the first place and because of the message clutter. Many of these sites focus on nutrition and health messages rather than eating enjoyment and as such, do not address the real need of inspiring Australians to eat more vegetables. The Australian community education programs focused on eating enjoyment of fresh vegetables were more successful.
8. Interventions in food environments that make healthier food more accessible in places like school canteens, workplaces, sporting clubs, community events, aged care facilities, retail and foodservice outlets have been found to be an effective way of driving positive change.



9. Government policy interventions and support such as food subsidies, pricing interventions, compulsory labelling, education policy, etc., have been found to be effective but require political will to fund the interventions for the long term and enforce guidelines.
10. 'Food is Medicine' and 'Produce Prescription' interventions targeting cohorts at high-risk of preventable diseases have been trialed in both in the US and Australia and are showing promising outcomes, both in terms of improving health and lifestyle as well as lifting vegetable consumption.
11. There is a large amount of qualitative and anecdotal feedback reported in the literature suggesting that local community activities such as community gardens, farmers markets, local food networks, community subsidised agriculture, etc., all lift vegetable consumption. However, there is little objective evidence to support this, plus the benefits to levy payers in supporting such activities are not evaluated. In remote areas, local community gardens are clearly improving access to fresh food and fostering social inclusion.
12. The literature indicates that global programs where there is collaboration across multiple parties, particularly involving industry, are more effective at delivering measurable outcomes.
13. The siloed nature of interventions and the lack of connectedness between community vegetable education programs is diluting the collective effort and resulting in unnecessary cross-over, duplication of effort and message clutter. There is a need for greater aggregation of effort.
14. A key reason given for the limited impact of levy-funded projects in terms of lifting vegetable consumption is that much of the work does not proceed beyond R&D because of the absence of an implementation plan and adoption partner right from the point of project design. There is a need for recognition of the fact that lifting vegetable consumption is a difficult and long-term journey and needs to be approached through a series of interconnected projects, underpinned by a more strategic, long term investment plan.
15. Some of the Hort Innovation program evaluations (e.g. VG16071), the studies referenced in the umbrella evaluations (Noy *et al*, Wolfenden *et al* and Eatwell) and the thought leaders interviewed, tend to assess project success on the core metric of additional 'serves per day of vegetables' consumed. It was observed that evaluations are often made on the binary judgement of this measure, without considering the potential residual and legacy impacts of the R&D (e.g. contribution to a valuable body of knowledge, creation of tools with an ongoing presence, etc.). Most evaluations lacked deeper diagnostic analysis to determine why the interventions were not successful.



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Introduction

This document outlines the research findings for Task 2 ‘Scoping and mapping research and community initiatives’ for the project VG 22003 ‘Learning from the past to amplify community vegetable education programs of the future’. The document is structured in four parts:

- Part A: Literature scan
- Part B: Consultation themes
- Part C: Analysis of current programs
- Part D: Research insights

Objectives

The key purpose of this project is to discover and synthesize previous levy-funded projects and review the vast body of research on community vegetable education programs in order to inform a revised investment approach resulting in improved outcomes.

The objectives of the consultation and independent research has been to inform the answers to four key questions:

1. Who are the key stakeholders investing in projects to lift vegetable consumption?
2. What programs are being implemented and where?
3. What elements of these programs have been successful and why?
4. What are the key lessons that can be applied to future programs?

Methodology

The steps involved in preparing this report supporting the completion of Task 2 of the project included:

1. **Stakeholder Engagement** – interviews with a small sample (n= 24) of thought leaders in the field of community nutrition.
2. **Literature Scan** – a review of recent umbrella evaluations building on the body of knowledge reported in VG17013 ‘*Building the case to grow domestic demand for vegetables*’.
3. **Database Compilation** - database of recent levy-funded projects and current community interventions and education programs.
4. **Key insights summary** – a summary of the research findings and the implications.



Acknowledgements

A list of thought leaders who kindly gave their time to be interviewed for this paper is tabled in the appendix. The authors would particularly like to thank the following individuals for their assistance in delivering this work:

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Context

The issue of low consumption rates of vegetables within the Australian community remains problematic in terms of health and quality of life outcomes as well as associated economic losses. Economic modelling of this situation by Deloitte Access Economics (VG15031, 2016) indicated that a 10% increase in vegetable consumption across the population of Australia would result in an estimated \$123 million of national benefits (\$100 million in reduced health costs to government and \$23 million in increased profits for vegetable growers). Despite the millions of dollars of investment from industry, government, multiple not-for-profit (NFP) organisations and health agencies, there is little evidence of success in terms of sustainable lifts in consumption, as measured by average daily serves. This literature scan confirms that this is also the case in most developed countries around the world.

Hort Innovation has invested more than \$16 million of vegetable levy funds (McKINNA *et al* estimate, 2023) on behalf of industry to drive vegetable consumption over the past two vegetable Strategic Investment Plans (SIPs) with limited measurable, sustainable success against the metric used by nutritionists of ‘average daily serves of vegetables consumed’. Some of the levy funded community education programs have had limited short-term success in lifting awareness levels and changing attitudes but with no evidence of sustained behaviour change. Several levy programs have resulted in modest short-term traction while the program was operating, but this was not enduring once the program ended.

Although this document focuses on the findings from a high-level scan of umbrella evaluation reports of community education programs, it also reports insights from the qualitative stakeholder consultation with opinion leaders in this field and analysis of a database of interventions compiled during the research. In the authors’ opinion, the findings from the consultation have provided the most potent strategic cues for future investment.

The findings from this stage of research will be used to inform Task 3 involving development of an evaluation framework and in Task 4 a subsequent evaluation of a sample of levy funded investments that sought to increase vegetable demand. The results from this evaluation process will culminate in a high-level strategy (Behavioural Framework and Change Plan) to guide future investment for Hort Innovation.

While it is understood that many levy payers hold a strong commitment to community vegetable education programs on the basis of contributing to ‘social good’, this study also aims to view the challenge of increasing vegetable consumption through the commercial lens of increasing domestic market demand for vegetables in order to maintain industry viability, which is a perspective that appears to have been overlooked in previous reports and in other advice to industry on this subject.



Definition of ‘community vegetable education programs’

The intent of this study (i.e. informing future vegetable industry investment in increasing consumer demand for vegetables) dictates that a broad interpretation of the term ‘community vegetable education programs’ is adopted, particularly as the industry has invested in a wide array of projects and needs to better understand their impact.

The health and nutrition communities most often refer to ‘community interventions’ as being projects that influence behavioural change. Noy *et al* in the Hort Innovation project VG 16025 interprets ‘community interventions’ as ‘community-driven food initiatives’ i.e. kitchen gardens, farmers markets, community gardens, local food systems, etc., which are *very* local in their scope and interpretation of ‘community’. This study has taken a broader view to include any activity that has the intent of driving vegetable consumption with a health and nutrition objective underpinning it. It includes health promotion mass marketing but not marketing that is solely focused on selling specific vegetable products e.g. branded product advertising campaigns or commodity specific marketing campaigns like ‘the mighty mushie’ mushroom campaign. Under the terms of the vegetable industry R&D levy, consumer-focused, branded advertising is not permitted. (**Note:** some vegetable industries including sweet potatoes, onions and mushrooms, do have a small marketing levy but the main vegetable fund does not.)

Various attempts have been made in the literature at categorising community vegetable education programs as outlined later in the report. None of the existing categorisations were suited to the purpose of this study, which is to focus on ‘community vegetable education programs’ and to develop a framework for future strategic investment of levy funds in this area. For ease of comprehension, the range of community vegetable education programs has been classified in the following categories:

CATEGORY 1 | POLICY - Influencing food policy

CATEGORY 2 | PROMOTION - Mass market messaging and ‘edutainment’

CATEGORY 3 | TARGETED - Targeted programs and resources

CATEGORY 4 | ENVIRONMENTS - Modifying food environments

CATEGORY 5 | LOCAL - Social and local activity

CATEGORY 6 | INSECURITY - Addressing food insecurity

These categories are described in further detail in Part A, Section 2 of this document.



Part A: Literature Scan



Approach to the literature scan

The intent of the literature scan has been to capture and synthesise key learnings from the enormous body of work that has been published, both in Australia and overseas, on community interventions and education programs to drive vegetable consumption. In Australia alone there have been hundreds of academic literature reviews on the subject. The global body of knowledge has developed to the point where there are agencies that specialise in nutrition program evaluation and global bodies and research institutions that focus on the community vegetable education agenda. To indicate the breadth of research on this subject, a search for ‘community interventions to increase vegetable consumption’ on the open access science publisher PLOS generated over 17,000 results and on Google Scholar over 18,000 reports.

It would be of little value to industry to duplicate this work so the approach taken in this scan has been to synthesise several umbrella evaluation reports (i.e. reviews and analysis of multiple projects which capture metadata), with the specific purpose of delivering the terms of the project brief which is to:

“ . . . identify and critically evaluate the effectiveness of community initiatives and education programs that aim to increase vegetable consumption – seeking to answer the question of what makes a community initiative successful in increasing vegetable consumption.”

The research findings are referenced where possible to the umbrella evaluations but not to the original research because by its nature, metadata involves the aggregation of multiple studies.

This high level scan focuses on three comprehensive umbrella reviews which are widely used and respected among the nutrition community. The first is a levy-funded Australian study by Deakin University (VG16025 Noy *et al*, 2017) which involved a comprehensive review of over 180 peer reviewed articles and 200 grey literature articles to explore existing knowledge of community interventions that promote vegetable consumption and to identify how these may increase consumption. Also referenced are two related studies by Wolfenden *et al* (2021) and Gerritsen *et al* (2021) commissioned for the World Health Organisation (WHO). These reports drew findings from research that screened 3,637 articles on community interventions to improve nutrition, from which the authors synthesised 19 reviews covering 32 interventions over the past 10 years. A further umbrella report is from the Eatwell project (Eatwellproject.eu), which was a comprehensive review of nutrition interventions across the European Union conducted between 2009 to 2013. The Eatwell Project’s intention was to provide an evidence base of which community nutrition programs were most effective in improving health outcomes. Although two of the above umbrella reports may be a little out of date, they are still highly relevant and have provided an efficient basis for this literature scan.

Also captured in this report are relevant learnings from a literature scan on vegetable consumption by McKINNA *et al* in 2018 as part of project VG17013



(Building the business case to grow domestic demand for vegetables) as well as other levy-funded reports and relevant evaluations of Australian programs discovered during compilation of the database.

While the reporting here draws on a robust evidence base, the intent has been to distill the vast body of literature into a digestible, easy-to-read synopsis. This approach has been taken in order to assist levy payers and SIAP members to grasp the fundamentals of community nutrition interventions as context when considering future projects for funding or developing Strategic Investment Plans.



Section 1 | Impediments to vegetable consumption

According to the most recent ABS data, only one in ten (8.7%) Australians aged 18 years and over are meeting the vegetable consumption recommendations (ABS 2020-21)). The Australian Dietary Guidelines state that Australians over 9 years of age require 5 to 6 serves of vegetables per day, depending on age and sex (eatforhealth.gov.au).

Developing effective response strategies to increase vegetable intake firstly requires an understanding of the key impediments and blockers to consumption so that each blocker can be addressed with a targeted program of interventions tailored to different age and social cohorts. This multi-faceted or segmented approach was adopted in the Fruit & Vegetable Consortium's business case to invest in growing Australian vegetable consumption in consultation with Monash University BehaviourWorks (Fruit & Vegetable Consortium Business Case, 2020). The global study by Raaijmakers *et al*, (2018) also found that tailoring of messages in fruit and vegetable consumption campaigns was critical to success.

There are countless summaries in the nutritional literature of the key blockers to vegetable consumption with varying degrees of complexity in their analysis. By way of some examples, VicHealth have a simple and concise list on their website (www.vichealth.vic.gov.au) that captures the headline contributors to unhealthy eating most succinctly as follows:

1. **Cost** – fresh produce is perceived to be more expensive than other foods
2. **Time** – for shopping and cooking is getting harder to find
3. **Housing/Facilities** – not all Australians have access to kitchens or facilities
4. **Neighbourhood design** – distance from fresh food markets
5. **Geographic location** – regional and remote communities have higher food costs and less fresh food options
6. **Marketing** – processed food marketers have large advertising budgets while fresh food producers do not
7. **Social exclusion** – minority communities can lose their connections to healthy food from their cultures
8. **Knowledge** – Nutritional advice is confusing and cooking skills are declining.

There has been a considerable amount of levy funds invested in projects identifying the specific barriers to vegetable consumption over the past decade. These were summarised in VG17013 (McKINNA *et al*, 2018) and included:

1. Less than satisfying eating experience
2. The absence of inspiration and recipe ideas to avoid boredom



3. Lack of skill in buying, storing, preparing and serving
4. Lack of branding and packaging which limits shelf impact
5. Intense competition for the food dollar
6. Lack of convenience relative to other options
7. Perception that vegetables are expensive and poor understanding of seasonality in that regard
8. Fear of wastage and inconvenient unit size relative to household needs
9. Lack of vegetable options in out of home dining
10. The stigma which children hold about vegetables
11. Lack of knowledge of specific health benefits
12. Tendency to eat vegetables at the evening meal only.

Hort Innovation conducted several projects looking at the triggers and barriers to consumption of particular vegetables as part of the long running consumer research studies under 'Project Harvest', which became 'Harvest to Home' (MT17017, MT21004). The vegetable varieties examined in more detail included broccoli, capsicum, cauliflower, Asian greens, green beans and pumpkin (VG12045, VG12069, VG12070, VG12092). To pick one of these studies as an example, the barriers of consumption to cauliflower and green beans (VG12070) were noted as:

1. Low acceptance
2. Children's dislike
3. Limited consumption opportunities
4. Price.

The 2020 business case for the Fruit & Vegetable Consortium (McKINNA *et al*, 2020), captured much of the same research as above and expressed the blockers to consumption as follows:

1. Lack of knowledge about vegetables
2. Vegetable lack appetite appeal and satiety
3. Vegetables are sidelined in meal planning
4. Vegetables lack the convenience factor required in today's busy lifestyles
5. Vegetables are perceived to be expensive
6. Vegetables involve a large amount of waste
7. There is a lack of understanding about seasonality
8. Poor knowledge of the specific health benefits of particular vegetables



9. Strong marketing by snack food and convenience food businesses
10. Growth in away from home dining (where vegetables are not usually the hero of the plate)
11. A perception that 5 serves per day was unachievable.

The recent position statement by the Vegetable Intake Strategic Alliance (VISA) focuses on the blockers to consumption in children and identifies the following six impediments to vegetable consumption in this cohort as follows:

1. Taste and other sensory properties
2. Time and occasion of eating
3. Dietary advice
4. Distribution and access
5. Marketing and promotion
6. Stakeholder coordination.

The commentary below aims to capture the key themes drawn from the above efforts and the literature scan and explain these blockers more fully. The commentary also draws on insights that the authors have drawn from conducting over 30 years of market research with fresh food consumers.

1. The belief that vegetables do not address taste and satiety

The taste and sensory characteristics of vegetables consistently arise in the literature as being a major barrier to consumption, particularly with children, teenagers and young males who complain that vegetables are not enjoyable to eat and that they “*don’t fill me up*”.

For families, meal choice is heavily based around whole family enjoyment with a tendency to avoid foods that one or more family members dislike. Certain vegetables commonly fall into the category of foods that are avoided because they cause disruption at mealtimes by children and teenagers (e.g. leafy green vegetables).

In its position statement, the Vegetable Intake Strategic Alliance highlights the fact that appetite appeal and sensory attributes are the biggest issue inhibiting vegetable consumption by children, because the sensory characteristics of vegetables are not innately liked by children and enjoyment of foods with these tastes may take time to develop. The VegKIT program, the Taste & Learn research, the Coles Supermarket 2023 superhero promotion and others work to address this fact by training children to like vegetables. Sensory acceptance needs to be learned early in life and can influence food choices throughout a lifetime.

Because of the belief that vegetables are not filling, they are commonly viewed as the side dish or a flavoring in a dish where protein or carbohydrate are the hero.



This view appears to be slowly changing as the percentage of vegans and vegetarians in the community increases and a greater diversity of international cuisines are accepted in Australia resulting in the decline of the 'meat and 3 veg' style of meal preparation.

2. Lack of convenience

Vegetables are perceived to be time-consuming to prepare and serve. Time poorness has been a strong driver of category growth in convenience foods including pan-ready, 'heat and serve' ready meals or meal components and home delivery meal boxes. Ready meals are particularly popular with smaller or single person households and while the better quality ones commonly have some element of vegetables in them, many are low in nutritional value. Generally convenience equates to less consumption of vegetables because the easier options of frozen pizza or takeaway prevail.

McKINNA *et al* consumer research suggest that semi-prepared vegetables (*fresh cuts*) and home-delivered meal kits are positive drivers of increased vegetable consumption because they typically include semi-prepared, portioned ingredients with vegetables and garnishes. This convenience and the simple cooking instructions are said to have stimulated increased vegetable usage by removing the 'lack of convenience' blocker but this industry claim is not yet validated in the research.

Consultation with retailers for this project confirmed that 'convenience' also comes up as blocker to purchase of vegetables in their own market research. It was noted that supermarkets overseas have much more innovative packaging solutions and fresh cut options for vegetables than in Australia.

3. Perceived high cost and wastage

Vegetables are perceived by many consumers to be expensive relative to other foods, particularly during the post-pandemic period when the high cost of living has been topical. A big contributor to this perception is the high wastage factor in vegetables due to spoilage in the home and the volume of discarded peelings and trimmings. There is a lack of knowledge about how to store vegetables correctly and most Australians do not have the time or skill to maximise their value by repurposing left over vegetables for soups, stews, stocks, curries or other dishes.

Another concern identified in the levy-funded Harvest to Home consumer research regarding wastage is portion size. Australian households are becoming smaller but portion sizes are not adjusting sufficiently in response, so consumers are more inclined to throw out the excess vegetables that spoil before they can eat them. A further demographic shift is the aging population and McKINNA *et al* consumer research with vegetable shoppers found that older consumers do not buy some vegetable varieties because the portion size is so large that they are too heavy to carry home in the shopping bag.

Another contributing factor to the high cost perception is the poor understanding of the seasonality of vegetables. Consumers now expect to be able to buy all



vegetable varieties all year round at the same price so they form the impression that they are expensive when shopping out of season.

4. Limited cooking skills and knowledge of vegetables

Cooking skills are an impediment to vegetable consumption because vegetables usually require some preparation. Since the demise of home economics education in schools, many young people leave home with few cooking skills and fail to acquire even the most basic ones in adulthood. This age group are more likely to eat takeaway food with low vegetable content. This is the cohort targeted by the University of Newcastle's 'No money, No time' website which provides easy to cook, healthy recipes with minimal equipment and ingredients (<https://nomoneynotime.com.au>).

The lack of knowledge on vegetable preparation in the community extends to even basic knowledge about the vegetable varieties, fitness-for-purpose, selection, storage, seasonality and the nutrient benefits. However, a proportion of consumers are seeking more detailed nutritional information about the foods they buy and now scrutinise labels on packaged foods to seek out the elements they are looking for (e.g. antioxidants) or trying to avoid (e.g. oligosaccharides from onion or garlic). Unfortunately, this information is not as readily presented on vegetables because most are sold loose and unlabeled.

While there are interventions that address the very basic lack of cooking skills among some adults in the community, they do not reach the wider population. The countless websites and programs that provide healthy recipes do not address it either because the cohorts who have no cooking skills at all (and often no cooking equipment in the home) are not receptive and do not seek out the information.

5. Inconsistent quality and freshness of vegetables

Inconsistent quality and freshness is commonly cited in consumer research as a reason for not buying more vegetables, particularly green vegetables that do not always look fresh at the point of purchase. Vegetables are perceived to be expensive so shoppers refuse to pay for product that does not present well on the shelves. There is a growing expectation that vegetables should appear in perfect condition year-round. Supermarkets are hearing this feedback from their customers and constantly improving vegetable supply chains in Australia, putting increased pressure on growers to wear the cost of this. The retailer efforts at marketing 'not quite right' vegetables are continuing but it is only a small segment of the market purchasing this product. Quality and freshness of vegetables is a reason that many farmers markets and fresh market shoppers give for preferring those outlets.

6. Lack of meal planning skills and time

Meal planning is generally based around the centre of plate item, which in most cases is the protein element. Vegetables are commonly an afterthought in meal planning relative to high-value foods such as meat, fish and cheese. Because



vegetables tend to be a low involvement, almost semi-automatic reflex purchase, consumers frequently purchasing the same 3 or 4 familiar varieties each week, leading to boredom as household cooks tend to serve them in the same way. A recent in-depth consumer study commissioned by the Fresh Produce Alliance (Goldring, 2019) reported a persistent perception from Australian households that “vegetables can be boring” and one of the most reported barriers to consumption was the lack of meal inspiration. This study also aligned with other research sources in observing that consumers default to a meal rotation of favourite dishes with the same vegetables each week. One of the retailers consulted noted that recipes are a huge driver of traffic to their stores because they make the decision easier for shoppers by providing the inspiration and shopping solutions in-store or on-line.

7. Competition from other foods

The battle for the food dollar is fiercely competitive with packaged food companies employing sophisticated, highly researched and well-funded marketing strategies backed by very large budgets. Food marketers are exceptionally skilled at exploiting the meal planning space, offering convenient and appealing meal solutions at affordable prices. Packaged foods generally deliver higher profit margins than vegetables and can finance multi-million-dollar marketing budgets. Likewise, fast food and snack food competitors with large multinational brands target younger cohorts with low-cost meal packages and omnipresent snack options focused on strong taste appeal.

The marketing activities and budgets of the vegetable industry pale into insignificance relative to those of packaged, convenience and fast-food companies. By comparison with the processed food industry, the fresh vegetable industry is highly fragmented and the profit margins insufficient to mount a high visibility marketing program at a business level (but this could be possible at an industry level). Because brands are not well-established in vegetables, there is little incentive for businesses to invest in marketing, however, a number of the larger and more progressive growers are now leveraging exclusive vegetable varieties with protectable IP to underpin brand-based marketing efforts.

8. Accessibility and affordability of vegetables

A significant proportion of Australians do not have access to fresh fruit and vegetables because of geographic distribution and/or affordability, which the nutrition literature refers to as ‘food insecurity’. The food insecurity crisis appears to be grossly under-estimated in Australia. Charities such as Foodbank and OzHarvest are struggling to keep up with growing demand. Foodbank estimate that on a typical day, relief agencies provide food for over 306,000 households around Australia and that this effort is meeting only 20% of the food insecurity need (Foodbank Hunger Report, 2022). To more fully illustrate the depth of food insecurity in Australia, it should be noted that the reach of relief agencies represents around one third of the food insecure households and the statistics do not capture the food relief that is being provided by friends and family nor the families that simply go hungry.



9. Growth in away-from-home dining

The foodservice channel, which comprises both institutional and commercial foodservice, is estimated by market research house Food Industry Foresight (2022, fiforesight.com) to account for 49.5% of food expenditure with strong growth.

(**Note:** The authors of this paper consult to a number of leading food processors in Australia who work on the accepted industry estimate of this figure being more like 40%). The Hort Stats Handbook estimates that 19% of fresh vegetable supply (410,707 tonnes), goes to foodservice (2022), which does not take into account the large amount of frozen vegetables used in foodservice, particularly frozen potatoes. This data plus the anecdotal industry feedback indicates that foodservice outlets under-index in terms of vegetable consumption. The quick serve restaurant (QSR) sector, which continues to grow and is popular with children and young adults, has minimal vegetable content across their menus. Commonly full-service restaurants offer vegetables as optional side dishes but the options are usually few and relatively costly. The children's menu options are generally shockingly bereft of vegetable matter.

The institutional foodservice channel comprises a diverse array of government and non-government sites including hospitals, aged care, the military, prisons, mining sites, canteens, airline catering and much more. In general, the institutional sector also under-indexes on vegetable content although the situation appears to be improving. Most government managed facilities (hospitals, school canteens, prison, the military) have healthy eating guidelines, some of which are monitored. Workplace canteens are increasingly open to offering healthier options as they recognise the benefits in terms of employee wellbeing.

10. The belief that 5 serves per day is unachievable

Several studies reviewing the five-a-day campaign and others (as cited in McKINNA *et al*, 2018) indicated that many consumers perceive this target of five serves to be too difficult a goal to aim for and they had difficulty in estimating what 75 grams of each type of vegetable might look like and how they would portion it for family members. A Deakin University qualitative study (Livingstone, 2020) in Victoria suggested that respondents thought it would be difficult to physically eat that many vegetables.

The possibility exists that because the goal of five serves per day is perceived as being too difficult and there is no comprehension of what an extra serve per day actually looks like, consumers 'tune out' to the message. The Canadian program 'Half your plate' addresses this issue very simply in its brand and messaging.



Impediments to vegetable consumption summary

The above comprehensive analysis can be distilled into five major themes that impact vegetable consumption, as summarised below. Each theme is interlinked:

- **Taste & enjoyment** of vegetables through learning, inspiration and meal solutions
- **Knowledge & skill** of buying, storing and preparing
- **Quality & consistency** including freshness and convenience
- **Cost & wastage** due to perceptions and practices
- **Access & affordability** relative to other food options available.

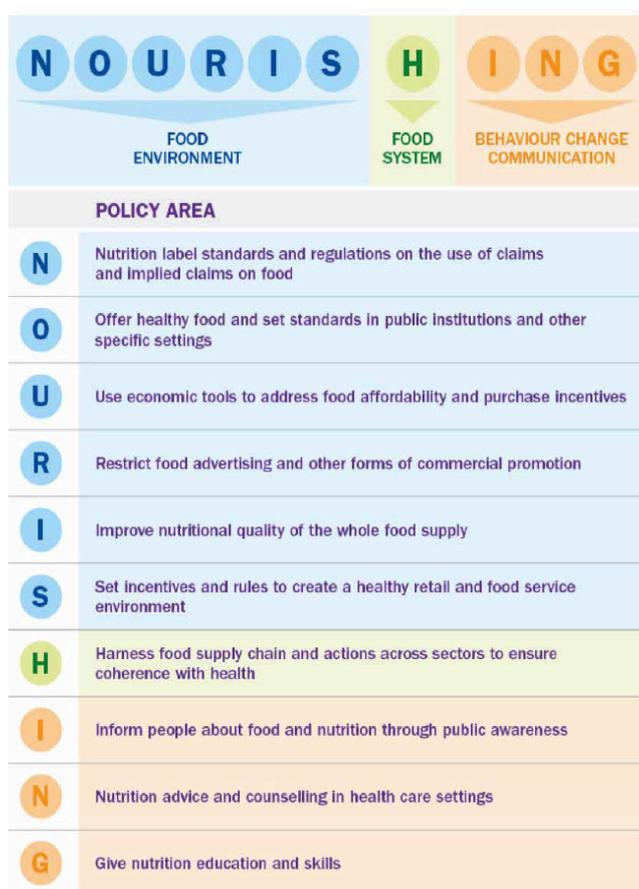


Section 2 | Categories of community vegetable education programs and their impacts

Community vegetable education programs have been the focus of activities to change behaviours around increasing vegetable consumption in Australia. Low vegetable intake is a global challenge and as a result, researchers, health authorities, governments, not-for-profit organisations and local communities around the world have developed multiple iterations of community education programs and interventions, which have been difficult to categorise, monitor and evaluate due to their proliferation, varied scope and operational diversity.

Commonly used classification frameworks for nutrition interventions include The World Cancer Council classification built around the acronym NOURISHING which identifies 10 policy and program intervention areas (see Figure 1). A second model frequently drawn on in health programs is Ashfin *et al*, (2014), (see Figure 2). The Ashfin *et al* model was adapted by CSIRO as part of the VegKIT project. Others exists such as the Nutrition Accountability Framework developed by Micha *et al* (2022) which is structured around actions such as ‘Enabling Actions’, ‘Policy Actions’ or ‘Impact Actions’.

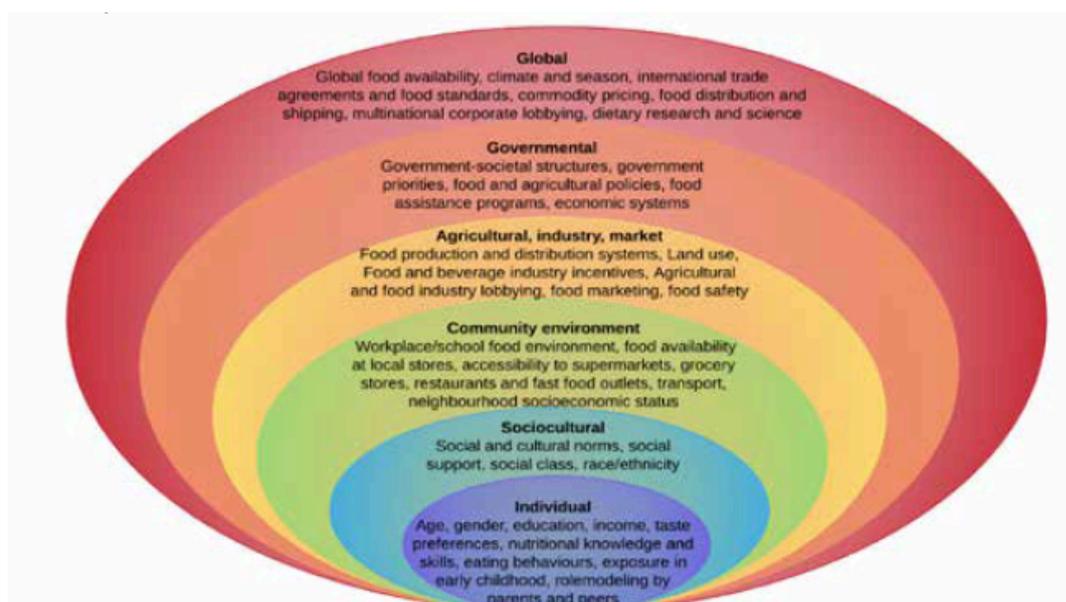
Figure 1: NOURISHING intervention classification framework



Source:
Gerritsen *et al*, WHO, 2021, adapted from
Hawkes, Jewell and Allen, 2013.



Figure 2: Adaption of Ashfin *et al* intervention classification framework



Source: Gerritsen *et al*, 2021, adapted from Ashfin *et al*, 2014

After reviewing existing options, the authors propose that a simple framework is more suited for the purpose of this project as outlined below. It should be noted that the lines between each classification are somewhat blurred as many of the interventions have elements that cross over between categories. In classifying the database, the authors have chosen to classify each program under a single category, choosing that which is most closely aligned from one of the following:

CATEGORY 1 | POLICY - Influencing food policy

CATEGORY 2 | PROMOTION - Mass market messaging and 'edutainment'

CATEGORY 3 | TARGETED - Targeted programs and resources

CATEGORY 4 | ENVIRONMENTS - Modifying food environments

CATEGORY 5 | LOCAL - Social and local activity

CATEGORY 6 | INSECURITY - Addressing food insecurity

These categories are described in the following pages.



CATEGORY 1 | POLICY - Influencing food policy

The European Commission Eatwell Project (2013) was actioned expressly to reform the European Union's food policy, in recognition of the impact government holds on community health outcomes. The report classifies food policy areas as:

- a) **Measures supporting informed choice** (e.g. advertising to children, nutritional labeling, public information campaigns)
- b) **Measures changing the market environment** (e.g. food taxes, nutrition standards).

Food policy crosses multiple jurisdictions of government (agriculture, business, health, education) impacting policy on food subsidies, pricing, compulsory and voluntary levies, mandatory guidelines, food labelling regulation, public health education and much more. The 'influencing food policy' category does not include situations where government purely provides program funding without policy intervention.

Although funds from vegetable industry levies are unable to be used for advocacy or to lobby government under the terms of the agricultural levy system, the industry does have a role to play in investing in research to inform government policy around supply chain issues that impact national health. The low rates of vegetable consumption nationally is one such issue. The Fruit & Vegetable Consortium is the most prominent cross-sector collaborative advocacy body attempting to stimulate action via policy change and government investment in increasing vegetable consumption and the vegetable industry is a member of this group.

The peak body AUSVEG can play an active role in advocating for policy change e.g. advocating for monitoring of healthy eating guidelines in all canteens, sporting venues and workplaces; or supporting initiatives such as Produce Prescriptions and food insecurity more broadly.

Most of the health and wellbeing NGOs are active in influencing government policy at both Commonwealth and State level. There are other national bodies advocating in special interest areas such as the Healthy Kids Association who campaign for policy action around school and day care food environments.

CATEGORY 2 | PROMOTION - Mass market messaging and 'edutainment'

This category of community vegetable education covers advertising with healthy eating messages and other communication activities including social media, interactive video games and television shows that have an element of nutritional education as well as entertainment.

Mass marketing

Mass marketing has been a tool employed from time to time by state governments in the effort to drive vegetable consumption through health



promotion messaging. Globally, there have been many behavioural change programs that have had an aspect of mass marketing as part of their health promotion strategy. However, most mass marketing campaigns have been aimed at healthy eating more generally, rather than vegetable consumption specifically.

A recent example of mass marketing to drive vegetable consumption comes from The Outdoor Media Association (OMA), the industry body representing Australian outdoor advertising companies who manage advertising on billboards, buses, trains and TV screens in places like retail stores and health clinics. The association has been running a four-week national public good advertising campaign promoting vegetables over the past three years. The 2023 campaign ran from January to February covering 1,850 sites and had an estimated commercial value of \$8 million. The campaign content was endorsed by Nutrition Australia and Health & Wellbeing Queensland. OMA estimate that the campaign achieved 12 million views and measured its performance with a 1,000 household survey reporting the following results from those respondents who had seen and recalled the campaign:

| | |
|------------------------------------------|-----|
| Encouraged to eat more vegetables | 81% |
| Made more conscious of eating vegetables | 82% |
| Encouraged to lead a healthier lifestyle | 84% |
| Talked to someone about the campaign | 41% |
| Visited the website | 70% |

Source *Buy in season for healthy returns, Campaign Report, 2023*

Mass marketing campaigns include multiple media formats: conventional advertising, social media, websites and outdoor media. In recent years, State governments, in particular, have shifted away from broad based health promotion campaigns to more strategic and targeted community messaging in their mass marketing health promotion e.g. reduction in sugary drinks, exercise for girls, etc.

The experience globally is that mass marketing campaigns only appear to have meaningful impact on vegetable consumption while they are running. The notable global campaigns include Canada's 'Half your plate'; Denmark's '6 A Day' and the British More Peas Please campaign, all of which have had positive results. Australia's only mass marketing vegetable campaign (which excluded Victoria) 'Go for 2 & 5', ran only for 9 months but resulted in a measured increase in vegetable intake increase of approx. 0.6 serves per day. Once the campaign ceased, intake levels reverted to previous levels (as cited in McKINNA *et al*, 2020).

The synthesis of multiple primary studies of mass media strategies targeting nutrition behaviours by Wolfenden *et al* (2021) suggested that the potential effectiveness of mass marketing as a stand-alone approach in improving the



consumption of fruits and vegetables in adults and young people was beneficial. The Noy *et al* study (2017) concluded that, although mass media had potential to lift vegetable consumption, the researchers could find no absolute evidence of effectiveness. This is at odds with the official evaluation of the Go for 2 & 5 campaign in 2009. Notably, the comprehensive Eatwell study in the EU strongly recommended public health campaigns as being one of the most cost-effective tools for driving behavioural change, with the proviso that they need to be long-term and that they work best when supported by other interventions.

Edutainment

'Edutainment' refers to entertainment programs with an element of embedded education (e.g. TV programs, video games, interactive apps). High rating television food shows do have the potential to educate and change behaviours, although not always in a favourable way as their focus is usually on eating enjoyment and are often sponsored by companies that market unhealthy food. Various studies have found such TV shows to have a short-term impact on lifting consumption, but which was not sustainable. Rekhy *et al* (Rekhy, 2016) examined the impact of celebrity cooking show content on consumer intentions and behaviour regarding vegetable consumption. The results indicated some positive impacts on consumer intention related to vegetable consumption, however, this did not translate into higher vegetable consumption one week post intervention. Likewise, overseas studies have not found an increase in vegetable consumption among viewers of cooking programs.

The levy funded Phenomenom children's video programs and podcasts were primarily educative in their intent but presented the learnings in an entertaining format. The evaluation of this work in the Horticulture Impact Assessment Program (MT18011) indicated that Phenomenom delivered a cost/benefit return of 3.3 times the investment.

E Health

The Wolfenden *et al* (2021) umbrella study noted that E-health interventions (i.e. interventions using apps or advice delivered on-line or by telephone) were effective in improving fruit and vegetable intake in adults and children and a sub-group analysis indicated positive effects for computer-based, SMS and internet-based intervention strategies, but not for those delivered via mobile apps or video games. The study describes an intervention in New Zealand using smart phones to provide regular prompts to target a cohort of educated, low fruit and vegetable consuming young adults. The study notes that it increased consumption by more than one serve per day. Another example of this type of intervention was the levy-funded VegEze pilot, which did not proceed to full launch, but a small sample of participants in a 21 day challenge achieved an average increase of 0.5 serves per day (VG16017).



CATEGORY 3 | TARGETED - Targeted programs and resources

This category captures community vegetable education programs that are targeted at specific demographic or behavioural cohorts.

Analysis of the database would suggest that the majority of vegetable education programs in Australia fall into this category (60%). Over 40% of the database programs were targeted at primary school aged children and their families. This is also the case globally – the Eatwell study found that 31 of the 35 public information campaigns on nutrition that were active in the EU at that time were targeted at children.

The database analysis suggests that education programs in Australia are commonly segmented around the following cohorts:

- *Pre-school*
- *Primary school*
- *Busy families*
- *Food insecure families*
- *Youth*
- *Seniors in aged care*
- *Indigenous communities*
- *Migrant communities.*

One literature scan indicated that there were fewer programs targeting the very needy sectors of seniors at home and single men (Noy *et al*, 2017) and the database analysis suggests that families are over-represented, compared to single person households.

While many of the cohort-specific interventions are targeted at segments of the community, there are also resources available that are targeted to the individual including virtual coaching, tele-health or in-person classes. According to the umbrella evaluation studies, these approaches have shown the most promising results in improving diets. An Australian example is the Victorian Life! program targeting pre-diabetics, which conducts small group workshops and individual tele-health training. The equivalent NSW program 'Get Healthy Information and Coaching Service' was formally evaluated several times and while there was improvement in exercise rates and some reduction in weight of participants, the most recent evaluation indicated that serves of vegetables increased only marginally at less than one serve per day, but this was considered a positive outcome (Bradley *et al*, 2021).

Jamie Oliver's Ministry of Food program was a model noted by Noy *et al* (2017) as the most promising in terms of increased fruit and vegetable consumption, but this successful UK program no longer appears to be active in Australia. Along with improved cooking skills, increased vegetable eating was sustained at 6 months after participation in the Jamie Oliver program. The increase differed by State but again, was less than one serve per day (Victoria 0.81 serves and Queensland 0.52 serves).



Across Australia, every state has community education interventions tailored for indigenous communities. Some of these are indigenous versions of the mainstream program and others are cater to remote locations where access to fresh vegetables is they key blocker so communities need to grow their own vegetables or redevelop lost foraging skills. The WA FOODcents program for indigenous communities was an adaptation of the Health Department's successful FOODcents program that helped families to achieve a healthy diet while saving money on grocery shopping. FOODcents is no longer active. State government programs targeted at indigenous communities include Health & Wellbeing Queensland's Deadly Choices and the New South Wales Government's Aboriginal knockout health challenge. The Northern Territory Government offers downloadable resources like Kukumbat gudwan daga: really cooking good food to influence healthy eating for large gatherings and the Flour Drum Stove cookbook.

Pre-school and primary school interventions

There has been a strong shift in recent times to early childhood vegetable education interventions. Governments in Australia and overseas have adopted the evidence-based recommendations of researchers that forming good eating habits at an early age carries through life. Taste and sensory characteristics of vegetables are a major barrier to children as they naturally prefer sweet foods, hence the reason why fruit consumption is higher than vegetables. Various trials reported in the literature have shown that children can be trained to like vegetables through the introduction to specific varieties in small servings, delivered in positive settings (so-called 'nudge strategies'). The VegKIT research proves that children can be trained to like vegetables and the program increased trial of vegetables and long-term adoption when it was active.

Other examples of this approach are the school garden programs like Stephanie Alexander Kitchen Gardens (SAKG) program (national), 24 Carrots (TAS) and Pick of the Crop (QLD) where children are involved in growing, preparing and eating vegetables. These programs have been evaluated at length indicating a positive long-term impact on consumption. Evaluations of the SAGK program in 2009 and 2012 indicated that it successfully increased children's willingness to try new foods; improved knowledge of fresh foods; and that cooking skills were transferred to the home (Block *et al*, 2019). A subsequent study in 2019 aimed at evaluating long term impacts surveyed a sample of 18 to 24 year-olds who had been through the program in childhood and these respondents noted the following:

- 76% indicated that it had contributed to their cooking skills
- 65% indicated it had influenced their cooking behaviours
- 53% noted its impact on their food choices.

In the qualitative part of this long term impacts review, respondents commented that the program had certainly influenced their current diets to include a wide



range of vegetables. Other programs where trial is linked to reward have shown some promise. For example, Coles are currently running a *Superhero Builders* promotion using collectable sticker tokens of vegetable characters with a wall chart for children to indicate which ones they have tried.

While there has been much levy investment in developing and providing curriculum and other tools to support children's programs, discussions with nutrition thought leaders during the consultation step of this study suggested that it was difficult to get schools to take up these free programs and adopt the supplied teaching tools and resources unless there was a particular teacher at the school who had a passion for healthy eating and vegetables and was willing to champion the project.

The QLD Government 'Pick of the crop' program, which was piloted in 35 primary schools involved raising awareness of vegetables with children including options such as farm visits and school vegetable gardens. The program was evaluated by Institute for Social Science Research and The University of Queensland (2021) whose researchers did not measure the increase in vegetable consumption but noted that there were multiple positive outcomes including some success in shifting student attitudes and encouraging them to try new vegetables but noted that on-going investment and additional resources such as a regional coordinator were required to make the program sustainable. Barriers to the uptake of the programs were:

- Limited time and capacity of teachers
- Crowded curriculum
- Fast food culture in the school community.

Policy intervention in school curriculums would address this problem but this would need to be achieved in every state.

CATEGORY 4 | ENVIRONMENTS - Modifying food environments

In recent times there has been a shift in emphasis towards environmental interventions, which are based around creating positive situations that support healthier eating in various environments where food purchase and consumption decisions are made, including retail outlets, away-from-home dining outlets, school canteens, workplaces, sporting clubs, etc. The rationale is to create situations which support Australians making positive choices at the point of purchase or consumption. The South Australian government have aligned their most recent healthy eating strategy around environmental modifications and Health & Wellbeing Queensland have a focus on food environments in their program called 'A better choice'.

Some of the literature uses the term 'choice architecture' to describe environmental interventions such as food signage in retail outlets, changes to food descriptions, locations, presentation and usage of verbal prompts in



cafeterias. The umbrella studies indicate that there was no conclusive evidence of the long-term effects of choice architecture or so-called ‘nudge’ intervention strategies. However, one study noted that this conclusion did not apply to on-pack nutritional labelling. The Noy *et al* study concluded that there was no demonstrable lift in consumption levels from choice architecture. However, limited supportive evidence exists to prove that fruit and vegetable sales were improved by information-based cues in supermarket settings.

Learning environments

The database of community education programs prepared for this project suggests that most interventions in Australian learning environments occur in pre-schools, outside school hours care and primary schools.

Both NSW and WA Governments run the Crunch & Sip programs in primary schools which aims to encourage students to snack on vegetables during an allocated period in class each day. One of the program challenges in NSW was that many children did not have a vegetable snack to bring to school. A trial in disadvantaged areas offering free fruit and vegetables so all children could participate in Crunch & Sip (Hector *et al*, 2017) reported in increased participation in the program from 46% to 92% and more children began bringing their own fruit and vegetables to school over time. The increase in consumption was not measured in this study.

Improving school canteens has been an area with multiple interventions over the past few decades and the canteen associations are still pushing for further improvements. Successful initiatives include banning sugary drinks and confectionary and work to improve menu options and sourcing continues. Hort Innovation currently has a school canteen project in progress to introduce more vegetable items into menus.

State governments have also invested in multiple resources to assist day care and after school care facilities to improve their snack and meal options, these include menu guides, fact sheets and recipe ideas.

Retailer programs

Supermarkets around the world are placing greater emphasis on healthy eating in response to market research with their customers that indicates the positive impact on their brand from such investment and the fact that consumers are demanding healthier options in all departments of the store. Various strategies have been adopted by supermarkets both in Australia and overseas to increase fruit and vegetable consumption including in-store demonstrations, free fruit for children and provision of nutritional information in retailer magazines and websites. In Australia the two major supermarkets are both investing heavily in lifting fruit and vegetable consumption with a particular focus of targeting families with young children. They are also working with suppliers to improve vegetable content in ready meals and processed foods.



The Wolfenden *et al* study concluded that potentially supermarkets could have a negative impact on vegetable consumption because they offer wide choice of alternative foods, although other fresh food markets, including mobile markets had the potential to lift consumption of vegetables.

In Australia, the independent fruit and vegetable retailers use a collective campaign called 'Better Choice' which is a multi-faceted campaign and includes in-store messaging, sales promotions and web-based resources such as recipes to drive fruit and vegetable sales. Supported by the wholesale markets around the country, this program has been running for some years. Evaluations from this marketing activity are not on the public record but a representative from the organisation stated that the aim of increasing consumption is working and suggest that shoppers at independent fruit and vegetable retailers who are supporting the Better Choice campaign purchase 61% more fruit and vegetables than at supermarkets (source: interview, 2023).

Foodservice

Foodservice outlets, which includes all food consumed away from home provide a massive education opportunity to improve diet and increase vegetable consumption. As noted already, the foodservice channel accounts for around 40 to 49% of all food consumption (*ibid*) and this is split across commercial and institutional segments.

Foodservice - Commercial

The commercial foodservice channel comprises QSR (quick service restaurants e.g. McDonalds), full-service restaurants, clubs and pubs, airline and event catering and much more. There is a paucity of literature on vegetable consumption interventions within the foodservice channel and the database search indicated that there are few interventions beyond community venues and workplace canteens in Australia.

McKINNA *et al* consumer research for various commercial clients indicates that when dining out, consumers are seeking indulgent eating experiences. Vegetables are not always prominent in menu choices and increasing relegated to a side dish. Most menus now offer a vegetarian meal option (even vegetarian menu options can offer few vegetables). Interventions like Victoria's Life! program do have training modules to help clients navigate restaurant menus when dining out, but the literature search did not identify any evaluations of foodservice interventions specifically in Australia.

Lessons could be learnt from the UK Food Foundation, which is very active in influencing this channel with restaurant tool kits and nutrition information for chefs and restaurant managers as well as sample healthy children's menus. Its program evaluation maintains that their interventions increased vegetable spend by 15 to 20% in the first year of the intervention and by 2020, the spend on vegetables was up by 25% (foodfoundation.org.uk).



Food cost, preparation time and kitchen skills are key considerations for foodservice operators, so interventions need to address these challenges with solutions that include vegetables.

The Wolfenden *et al* umbrella study reported that targeting workplace cafeterias (with or without nutrition education) resulted in consistent improvement in fruit and vegetable intake post-intervention; however, evidence of the lasting effect at longer-term follow-up was equivocal. Other studies have reported stronger successes in workplace based interventions. The Eatwell report suggests that there is evidence of success in influencing healthy workplace meals in Europe if the programs expand rather than restrict food choices. It notes that Finland has subsidised healthy workplace meals since the 1970s.

Many FIFO workplaces in Australia are now implementing healthy work canteen policies on the rationale that poor diet represents an OH&S risk. Driven by the growing pressures of 'duty of care' responsibilities on employers, there is increasing focus on healthy eating in the workplace. More recently with the push by organisations to get their employees back into the office after the COVID19 'work from home' (WFH) trend, many organisations are offering food as an incentive, with a strong focus on healthy options. For example, Melbourne office of wealth management company JB Were is offering a subsidised wholesome 2 course lunch to employees on Friday's for just \$15, to encourage them to come into the office and socialise with each other.

Foodservice - Institutional

Institutional foodservice (e.g. hospitals, prisons, etc.) are increasingly focused on improving nutrition and lifting vegetable consumption because of the imperative of improving health outcomes of clients in these environments. Most of the government controlled institutional outlets have dietary guidelines, which in some States are audited and enforced.

The foodservice offer in aged care in Australia has been in the spotlight since a Royal Commission following the pandemic. The Maggie Beer Foundation received long term funding to address the poor standard of food in aged care in Australia and is reporting success based on a 'train the trainer' model of upskilling chefs, cooks and procurement managers. An increase in the portions of fresh food, including vegetables have been achieved but vegetable consumption has not been measured specifically.

Indigenous and remote communities

In remote areas, access to fresh vegetables at an affordable price through retail channels is a challenge and this was extreme during the pandemic. Remote indigenous communities are active in trying to address the poor offering at stores in their townships and elders are encouraging a return to foraging skills. Horticultural training is occurring in some communities to assist communities to grow their own vegetables.



Some remote farming townships in regional Australia established their first community vegetable garden during the pandemic, simply to ensure local access to vegetables when supply chains broke down.

Ensuring food security in these remote environments is an ongoing challenge for State governments and indigenous health authorities.

CATEGORY 5 | LOCAL - Social & local activity

Community interventions that are local and driven by the community e.g. local food networks, farmers markets and community gardens were identified in a number of studies as being key influencers of vegetable consumption. These were specifically mentioned in the project RFP as an area of interest.

Noy *et al* (2017) examined these community education programs in detail, both in Australia and overseas and concluded that there was scope to leverage these interventions further, however, linking this activity to increased returns to commercial vegetable growers is difficult to assess as they are primarily designed to build social capital and improve nutritional outcomes and were evaluated as such.

Community gardens

According to Noy *et al*, in 2017 Australia had more than 550 community gardens in a range of settings including local council land, schools and urban, rural, and indigenous communities. This evaluation of community-driven programs suggests that belonging to a community garden is associated with increased consumption of fruit and vegetables because of the positive associations, but the research is largely anecdotal. Evaluation of community gardens in Australia and overseas has found positive influences on food-related behaviours such as increased ability to identify different fruit and vegetables, greater interest in cooking and increased accessibility to fresh produce. The benefits of local community gardens went beyond access to fresh produce during the pandemic when regional communities were not able to travel – they also offered an important social connection.

Kitchen gardens

Kitchen gardens attached to community organisations like day care, schools, clubs and aged care facilities prompts the the desire to eat fresh, locally produced food and to engage with others socially. There are also several migrant communities that have formed community vegetable gardens as a means of social connection and to grow vegetable and herb varieties familiar to their culture that are not readily available in stores. Kitchen gardens also save money, improve health and address concerns for environmental impacts of modern food systems.

Kitchen gardens are increasingly common in primary schools where many schools link food production, cooking and social eating to the classroom curriculum. The Stephanie Alexander Kitchen Garden Foundation program



(SAKGP) is the most well known in Australia and encourages student involvement in all aspects of kitchen gardens from planting and harvesting to food preparation. The program can be integrated into the school curriculum to enhance its positive impact. According to Noy et al (2017), the holistic approach, exemplified by the SAKG program, tends to be more successful than programs that only involve one aspect i.e. only gardening or only cooking. The Maggie Beer program also encourages kitchen gardens in aged care facilities as part of its activities.

The umbrella studies reviewed in this literature scan and long term evaluations of the SAKG program (Block *et al*, 2019) have shown that participation in kitchen gardens resulted in positive changes in cooking skills, food related behaviors, impacted vegetable consumption into adulthood, improved attitude and knowledge, and increased confidence in cooking and food preparation skills. They have been found to have other positive impacts such as increased willingness to attend school and increased confidence levels.

Agritourism and farm tourism

There is significant public appetite for food tourism and activity that increases community connection to primary production. This social shift provides an opportunity for smaller growers to add other revenue sources to their business. Agritourism, farm or food tourism involves activities such as farm gate sales, 'pick your own' sales, food produce trails, farm tours, farm experiences and demonstration farms. The agritourism sector grew exponentially in Australia with the introduction of on-line short stay accommodation websites such as Air BNB with the number of tourists visiting farms (including farm gate) in Australia growing significantly. The key motivations for visitation include the desire for fresh and local foods and to learn more about the provenance of food.

Although agritourism was included in the terms of this project's brief, there is limited research about the impact of this activity on vegetable consumption. Anecdotally, there is a view that engagement with food and the rural environment increases consumers' interest in local, fresh produce but the literature scan provided no conclusive evidence linking this to increased vegetable consumption.

Farmers markets

The umbrella evaluations referenced in this report provide evidence that shopping at farmers markets leads to an increased vegetable intake. US studies report that where government subsidies (i.e. discount vouchers) were available, there was an increase of 1.4 servings of fruit and vegetables which was sustained at a six-month test. The Noy *et al* report stated that a study in WA indicated that 71% of consumers who shopped at farmers markets estimated that they now purchased more fruit and vegetables since doing so. A feature of farmers markets is the opportunity for personal connections that create mutual benefits for local farmers, shoppers and communities and provide educational opportunities to learn about unfamiliar and seasonal local food.



Wolfenden *et al* found that the introduction of farmers markets into lower income communities had mixed effects, some positive and others no impact.

Local food systems

The term 'local food systems', food networks or food hubs applies to local and regional community food enterprises as well as short food supply chains. Commonly, they are associated with 'direct from farm' purchases including weekly food boxes, farm gate sales or local delivery systems. There is a focus on organic and pesticide-free foods. The Noy *et al* report estimated that there were 746 local food networks in Victoria alone in 2017. The study reported on a body of evidence from the US supporting positive impact on vegetable consumption of participation in food hubs, farmers' markets and kitchen gardens.

CATEGORY 6 | INSECURITY - Addressing food insecurity

Food security programs describe a group of community education interventions aimed at cohorts whose vegetable consumption is below recommended guidelines due to accessibility or affordability issues. Such interventions range from emergency food relief (including natural disaster relief) to government subsidies for healthy foods for underprivileged cohorts, produce prescription programs, medically tailored food packages and meal programs.

The most prominent organisations in Australia that address food insecurity are Foodbank, OzHarvest and Second Bite but there are many others. These agencies are finding increasing demand for fresh foods which they are having trouble satisfying. Most relief agencies also have comprehensive community education programs in which vegetables are high profile. These include cooking classes, chef training, nutrition advice, community networking and a great deal of web-based information. The vegetable industry's relationship with Foodbank is well established. Because food charities traditionally focused on being first responders to food insecurity, the nutritional aspects of the food distributed were not always ideal. The main Australian organisations are now supporting very well organized and strategic nutritional education programs.

The concepts of 'food security' and 'health equity' are about ensuring consistent access to affordable foods that promote wellbeing and prevent health issues. The UN FAO has updated its reports and recommendations that encompass nutrition to include metrics on affordability of healthy, nourishing foods. Nutrition security is a high-profile concept in the USA where most would assume access to healthy food was a given and the EU where the Eatwell study noted the presence of many 'food deserts' across developed nations within their member states. The conclusion is that access to healthy foods in developed nations is no longer considered a personal choice but is now impacted by where a person lives and works and their financial circumstances (Mozaffarian, *et al*, 2022).



Food is Medicine and Produce Prescriptions

Food is Medicine community interventions have evolved from a program of research at Tufts University in Boston, USA by Mozaffarian *et al* (2022). The concept recommends a hierarchy of interventions from medically tailored meals (also called therapeutic meals) for the chronically ill, to medically tailored food packages (sometimes known as 'food pharmacies') for patients living at home with acute conditions. The next tier of intervention is the 'produce prescription' for pre-diabetics and others at risk or suffering from nutrition insecurity. The produce prescriptions are delivered in the form of food boxes, often with recipes provided and coaching offered. The interventions are typically directed by clinicians through the healthcare system, provided at no or very low cost to the patient and funded by healthcare, government or philanthropy.

The intent of produce prescriptions is to prevent 'at risk' individuals from becoming dependent on medication and reducing their quality of life. The logic is that investment in reducing the incidences of type 2 diabetes and other preventable illnesses will deflect the cost to health systems of ongoing medication and future health complications. Its potential to reduce the public health burden by a greater amount than the cost of the intervention has been substantiated in the studies (Wang *et al*, 2023). The Wang *et al* study in the USA proved that over a period of 5 to 10 years, the program would be revenue positive to the public purse by reducing cardiovascular disease, saving health care costs, increasing productivity and improving quality of life. It would also reduce the insurance burden for insurance companies. The results were similar across all age and race cohorts.

In Australia, Professor Jason Wu at The George Institute is trialing the first studies of produce prescriptions indicating positive results in fat reduction and lowered blood sugar (Wu *et al*, 2022). The George Institute trials are ongoing and are compiling evidence of the reduced cost to the health system. The completed trial in Australia had a sample of 50 households with a type II diabetes patient, which involved participants receiving a weekly prescribed food delivery for 2 meals per day for the whole household over a 12 week period, delivered by Harris Farm with financial support of the International Fresh Produce Association and Harris Farm. The Australian trial indicated significantly improved blood chemistry results and an average increase of 0.57 serves per day of vegetables (*ibid*, 2022) but the paper indicated that other trials have achieved an increase of 0.8 serves of vegetables per day. There was a high level of patient satisfaction with the outcomes.

The produce prescription intervention is emerging as a new global trend based on successes in the USA. Downer *et al* (2020) claim that there is now a compelling body of evidence indicating that preventative interventions such as Produce Prescriptions are resulting in reduced health services usage and costs and present the case for increased government investment in this area.

The first comprehensive literature review and meta-analysis on produce prescriptions by Bhat *et al* (2021) involving leading public health universities from



Australia, UK and USA, presents compelling evidence of the tangible success of such interventions globally, even at this early stage. Of the 13 studies evaluated, 6 reported an increase in fruit and/or vegetable intake because of the produce prescription intervention. When results were pooled across the 13 studies, healthy food prescription programs increased daily combined fruit and vegetable intake by 22%. There was a trend towards an increase in vegetable consumption of 0.8 servings per day.

Food pricing programs

The review by Wolfenden *et al* included two fiscal interventions involving price subsidies and increases in lower income communities. One review quoted in the umbrella evaluation pooled data from nine pricing interventions and found that a 10% price reduction resulted in a 14% to 17% increase in fruit and vegetable consumption, whereas a similar study where prices were artificially increased by 10% resulted in reductions in consumption ranging from 5.3% to 7.2%. In similar trials price increases in unhealthy foods such as sweets had only a marginal positive impact. This adds credence to the view that cost of vegetables is a significant barrier to consumption, particularly in lower socioeconomic families and that vegetables have a significant elasticity of demand. The qualitative research for this project indicates that the perception of vegetables being high cost is becoming more entrenched in the community.



Section 3 | Key principles of community interventions to drive vegetable consumption

Drawing from the learnings in this scan, the following represent a synopsis of the collective view of what works and does not work in community interventions to drive increased vegetable consumption:

1. Interventions with children are extremely powerful because they can improve educational outcomes and train children to love vegetables, resulting in improved eating habits over their entire lifetime.
2. Health promotion campaigns with nutritional messages have minimal impact because people already know that vegetables are good for them.
3. Interventions that focus on discovering the eating enjoyment of vegetables through improved cooking and /or gardening skills and include social interaction have been very successful in Australia across multiple age groups.
4. Behavioural change is a long-term investment requiring many generations to embed behaviours, therefore ongoing program funding is imperative.
5. There are multiple blockers to the consumption of vegetables and, as such, interventions require a holistic, multi-pronged strategy with interventions tailored to every cohort in the community.
6. Given the magnitude of the challenge and the need for programs across all intervention categories, collaboration is required to deliver the holistic strategy required for success.
7. Marrying the science and program design with an implementation and adoption partner at the project planning stage is critical to leveraging value from levy funded programs.

The predominance of interventions with children in Australia is founded on sound research that this is where investment has had real and lasting impact. One of the key outputs of the VegKIT project was to identify best practice guidelines for increasing children's vegetable consumption based on analysis of previous projects and activities that have worked in the past. A recent statement that was led by a group of concerned researchers called the Vegetable Intake Strategic Alliance (VISA) indicated that previous initiatives have achieved up to a 30% increase in children's vegetable intake which equates to about half a serve per child per day. 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.

The strong focus on children's nutrition education by state governments is based on the rationale that establishing good eating behaviours in childhood extends through life. The VegKIT work identifies seven best practice guidelines for increasing children's vegetable consumption:

1. Make vegetables the hero - simple messages with clear focus
2. Coordinate sustained effort across multiple layers
3. Grow knowledge and skills to support change
4. Minimise barriers to success
5. Plan and commit for success
6. Create an environment that supports children to eat vegetables
7. Monitor and provide feedback on progress.

Many of the above principles are applicable to community interventions more broadly.



Part B: Consultation themes



Consultation themes

A short stage of consultation (n=24) was conducted with thought leaders in the field of community vegetable education and others active the vegetable supply chain. The interviews were open ended and exploratory in nature, drawing on the opinions and insights of the participants. The following themes were identified:

1. The industry levy investments have created a valuable body of knowledge

The body of knowledge generated by the industry and other funders of community vegetable education programs has benefited all stakeholders including State governments, health agencies, health and wellbeing NGOs, researchers and the community at large. This collective investment will have residual impact for years to come. The research knowledge that these projects have contributed to is being transferred through the nutrition and science community and provide a solid foundation for future work.

2. The residual value in the tools created to date is not being maximised

Projects such as Phenomenom and VegKIT have resulted in tools which still have much residual value such as teaching plans, videos and web resources. Unfortunately, respondents reported that many stakeholders were unaware of the existence of these tools. It was surprising to learn during the consultation of the low level of awareness, despite the fact that the programs and their tools are known within the nutrition community. Although all levy-funded programs have a component of communication, the message is not getting to where it is needed. Organisations like Nuts for Life and the Grains and Legumes Nutrition Council were repeatedly cited in the consultation as the exemplars of distributing knowledge acquired in from R&D investment and that these are the industries who are leveraging the most value from the research investments.

3. Evaluations of levy-funded projects often lack strategic diagnostics

Commonly levy-funded projects are evaluated against the terms of the RFP in a binary manner against the main KPI of shifts in average serves of vegetables per day consumed. The evaluations often do not consider the potentially valuable residual or legacy impacts as noted above, nor the positive lag effects.

Many community vegetable education programs, particularly interventions involving children, are long-term in nature and needs to be measured over life stages through longitudinal studies. The application of the binary yardstick of 'increase in average serves per day' is resulting in projects being terminated before they had a chance to demonstrate their potential and causing dissatisfaction among levy payers and delivery partners. Some also believe that



this measurement methodology is too insensitive to pick up on smaller, but important shifts.

There is a common view among opinion leaders that achieving the average 5 serves per day in any cohort is a formidable challenge that will require a long and coordinated journey to achieve should industry wish to play an ongoing part in this effort.

Another point regarding evaluations of levy-funded projects is that most lack any diagnostic analysis, and do not dig more deeply into why projects succeeded or failed and what could be learned to benefit future investments. (This project aims to do just that, but it is a retrospective umbrella examination rather than at the end of every project.) Some projects cited in the literature were successful at increasing consumption rates during the trial but had no residual impact beyond the life of the trial. It would be highly valuable to find out why and how this could be addressed in future interventions.

It was also observed that many of these programs did not have a strong focus on returns to growers nor were they realistic about the potential for industry to adopt or respond to the research findings.

4. Many of the programs that have shown promise have not gone beyond the development phase because they lacked implementation plans, partners and budgets.

A common view among the opinion leaders consulted is that potentially successful levy-funded vegetable projects have never gone further than the research and development stage because of the lack of an implementation plan and adoption partner. The literature confirms that there is a much higher success rate with projects that are aligned with a partner who can fund and implement the program.

The vegetable industry does not appear to have sufficiently taken up the opportunities to drive the research findings into tangible outcomes either at a peak body or individual business level. The fact that many of the reports are presented in an academic style with a focus on nutrition rather than commercial outcomes may have been a blocker to knowledge transfer.

The absence of a marketing levy for vegetables is a contributing factor here as well. A marketing levy would provide a means to integrate the implementation element of the R&D. It was noted that the Nuts for Life model draws on a voluntary supply chain levy where a component of the activity is matched for R&D and the remainder used for disseminating the research findings, promoting the category's nutritional benefits and implementing education programs. On a smaller scale, the mushroom and onion industries have been able to attempt this because they have a marketing levy, but as single vegetable varieties with limited marketing budgets they have no real cut through and reach in their messaging compared to what the whole vegetable industry could achieve. The consumption challenge is a category story rather than individual vegetable variety story. The



marketing levy and dedicated nutritionalists on staff enables these other industries to extract the maximum value from the R&D investment.

5. *The lack of alignment between programs and parties is resulting in fragmented effort and significant wastage!*

The lack of a shared view, alignment and interconnection between parties in the goal of increasing national vegetable consumption means that much of the large collective investment is diluted. It is also resulting in consumer confusion and message clutter.

The belief is that most of the building blocks for 'shifting the dial' in vegetable consumption are in place, but the collective effort falls short because of the lack of collaboration. Addressing this duplication of effort remains the intent of the Fruit and Vegetable Consortium but not all industry actors are members.

A major contributing factor in the lack of collaboration is that the parties operate in silos based around jurisdictional, professional and commercial boundaries which exist within and across government agencies, NGOs, professional bodies, researchers and commercial businesses. Even some of the NGOs themselves have become fragmented across state lines. Furthermore, researchers and NGOs are wary of being too closely involved with commercial businesses because of concern that it could compromise their professional standards and independence.

The feedback from the consultation suggested that State government health agencies have been reluctant to participate in a national program because they have established their own programs aligned with the messaging from the government of the day. State governments do have a clear mandate to invest in nutrition as a preventative measure in order to reduce public health costs, but they are in most cases, unwilling to take on a program developed by another state because they have invested in and are wedded to their own brands and because of the political realities (there is some schools program collaboration occurring between NSW and WA governments, with both states running the Crunch & Sip program). The discussions in the consultation for this project would indicate that State governments are unlikely to relinquish their hold on school, pre-school indigenous and general healthy living interventions that have their own branding. (Note: not all State Health agencies were consulted for this project). This situation results in duplication of effort and wasted public funds. Often there are also issues with ownership of the intellectual property associated with the programs.

Similarly, supermarkets are seeking a point of competitive advantage founded on the popular nutrition agenda but there is the opportunity for national retailers to collaborate in community vegetable education programs on a pre-competitive basis.

If progress is to be made on the challenge of increasing vegetable consumption, it is critical that these silos can be broken down and the vegetable industry itself has



a role to play in this. The starting point will be to develop the strategies and collateral for pre-competitive programs to stimulate collaboration.

6. *Despite the many resources available, limited cooking skills and lack of inspiration with vegetables in meal preparation remains a blocker*

Although there is a wide range of active community vegetable education programs and their various interventions, many stakeholders have called out that the decline of basic cooking skills of Australians remains unaddressed and is impacting vegetable consumption. There is an abundance of healthy vegetable recipes available, but when cooking skills and equipment are not available, consumers do not seek them out. Predominantly, consumers are driven by simplicity, convenience and taste. The popularity of ready meals and takeaway foods is thought to be increasing because younger generations have not developed kitchen or home economics skills, hence providing vegetable recipes alone does not address this. The University of Newcastle's 'No Money, No Time' program was prompted by addressing this generational failure but has found that the issue extends across the wider population. The Stephanie Alexander Kitchen Garden program, 24 Carrots, Foodbank, Jamie Oliver and others are trying to rectify this fundamental societal failure with future generations.

The growth in home delivered meal boxes and 'ready to assemble' meal kits is one means of addressing this issue. These boxes are frequently marketed based on reducing vegetable waste which offers added appeal to those consumers who can afford them and who live within reach of a delivery service.

7. *Industry investment in this pillar to date has been on individual projects rather than a, holistic long term strategy to address low consumption*

It was observed in the interviews that vegetable levy investment and other industry funding for community vegetable education programs appeared to be decided on a project-by-project basis rather than as part of a holistic program connected to the SIP. Those consulted suggested that investment appeared to be in self-standing projects, rather than as part of a cohesive, connected program linked to a long-term objective and aligned with other industry activity (e.g. AUSVEG's contribution to Foodbank). Many of the research projects funded through multi-industry streams, other RDCs or foundations were felt to be initiated by researchers rather than addressing the commercial needs of levy payers or supply chain partners or the industry strategic directions.

A common view across the nutrition community is that this is a generational journey that needs to be built around a carefully structured plan with small, interlinking, progressive steps. There is a strong sense that for this reason, most projects do not have any impact beyond the life of the project, leading growers to believe that it is research just for the sake of investing the funds somewhere.



Part C: Analysis of current programs



Learnings from the database compilation

About the database

During the research for this project, a database of 100 community vegetable education programs was compiled to attempt to log and track the recent levy funded projects and those community interventions that are active in Australia. A small sample of notable international programs have been included for comparison.

As outlined in the project RFP the intent has been to develop a representative database. Attempting to build an exhaustive database capturing every single initiative in Australia and even a small sample from the English-speaking world would be unrealistic due to the vast number of interventions and their transitory nature. Where possible, a link has been provided in the database to a website or evaluation report for further information (see separate database document).

While the database lists all the community vegetable education projects that were funded by the vegetable levy fund during the previous and current SIP periods, this does not include all of the projects completed in the SIP's Demand Creation outcome as many of those were market research studies or research reports that addressed other consumption issues (e.g. food safety). The consumer insight projects, such as those supported through Harvest to Home, were not included in the database as these cannot be considered community education programs, although it is evident from the consultation that they have informed the design of many programs and their learnings have clearly been absorbed by many in the nutrition community. Because the target was finding community programs, also avoided were the programs providing nutritional advice to patients of specific diseases e.g. kidney disease, heart disease, etc. although type 2 diabetes appears in many of the community programs.

The challenges in compiling this database were:

- The overwhelming number of programs at a state and local level
- Not all programs were specific to vegetables (in fact, most are oriented towards healthy eating and wellbeing generally) but with the ultimate outcome of increasing vegetable consumption, even if this was not explicitly stated. It was hard to pinpoint programs with a 'community intervention' aspect rather than just straight health promotion. In many cases the intervention is simply the provision of information and resources via a website.
- Commonly, the state government program brands appear to come and go between government cycles, but their websites are still on the internet, so it is difficult to ascertain which are now redundant.
- The multiplicity of stakeholders in most projects creates confusion about who is leading and funding the initiative.



- The names of many of the programs are very similar and in some cases identical, adding to the 'noise' in nutritional messaging and emphasising the need for rationalisation of programs in Australia
- Categorising the initiatives was challenging when many of the programs are multi-faceted. The most obvious categorisation has been chosen in that circumstance
- Activity in these community education programs is highly dynamic so the information is transient and was current as at September 2023.

Key observations

The key observations and learnings that have come out of the database analysis include the following:

- **The duplication of effort in community nutrition education programs in Australia is astounding!** There are countless websites with similar measurement tools, diet trackers, tips, recipes and nutrition advice and numerous programs, many with similar sounding names. It is likely that millions of dollars could be saved through a collaborative national effort across stakeholders. The wasted public funds through duplication of effort should be of concern to those who work in this domain.
- Most community education programs are state-based programs targeted to specific cohorts with a strong focus on children, mitigation of preventable diseases like diabetes and general lifestyle advice. Most states have at least one program tailored to indigenous communities.
- While the classifications in this database are very general and open to interpretation, they provide an overview of the activity. The database analysis confirms that the vast majority of interventions in Australia are likely to be targeted at specific cohorts rather than the community as a whole (60%). The true proportion of targeted programs is even higher, as many of the programs classified as 'insecurity' are also targeted programs. This result is unsurprising as the literature confirms that targeted approaches have been more effective than generic health promotion.
- 41% of all the programs in the database were targeted at pre-school, primary school students and their families. A factor that was surprising in this analysis is that within the targeted programs, very few has a primary focus on some of the highly problematic cohorts for vegetable consumption i.e. single men and elderly at home. The 'No time, no money' website appears to be the main program targeted at young adults with limited cooking skills, outside of the relief agencies, which are also running youth and adult programs.



- Another surprising learning is that most of the burden of food insecurity is being addressed by charitable relief agencies . More intervention from government in food insecurity would be expected given the growing magnitude of the problem.

Database analysis – programs by category

| | |
|---------------------------|-----|
| CATEGORY 1 POLICY | 8% |
| CATEGORY 2 PROMOTION | 10% |
| CATEGORY 3 TARGETED | 60% |
| CATEGORY 4 ENVIRONMENTS | 13% |
| CATEGORY 4 LOCAL | 2% |
| CATEGORY 5 INSECURITY | 7% |

- Activity in the higher profile international programs suggests that programs that have input from multiple actors within the fresh food supply chain have a lot to offer. In Canada, the USA and UK, the collaborative programs are very well resourced and appear professionally managed with a high calibre of marketing and promotion collateral. In Canada and the US, the fresh produce associations have taken an active role in initiating community vegetable education programs.
- A further anecdotal observation from the authors is that the programs managed outside of government appear to have greater longevity, for example the Stephanie Alexander and Jamie Oliver projects run by independent foundations.



Part D: Research insights



Key insights

The following is a summary of the key insights that have been drawn from the literature scan, thought-leader consultation and analysis of the database:

1. Moving the dial on average serves of vegetables is an extremely challenging task. There continues to be a large collective investment by a range of stakeholders who have tried many interventions with limited success in terms of sustainable shifts in average daily serves of vegetables.
2. Shifting vegetable consumption demands a long-term, intergeneration journey involving small, sequential positive steps linked to a coordinated strategy delivered through collaborative partnerships.
3. There has never been a significant national, long term mass marketing campaign in Australia to drive increased vegetable consumption equivalent to campaigns like Slip, Slop, Slap, Quit or Life. Be in it. The success factors of these campaigns have been broad reach, adequate funding over a sustained period (Slip Slop Slap has been active for 40 years), professional marketing, together with the fact that the advertising elements have been underpinned by a range of integrated interventions delivered through public and commercial partners with consistent messaging. In recent years, State governments and their health and wellbeing agencies have focused on targeted interventions rather than general health promotion.
4. Much of the community vegetable education effort has been being driven by health professionals and researchers with a focus on nutrition and health outcomes. The research suggests that this type of messaging is not effective at driving behavioral change. This is because most people are already aware that they should eat more vegetables and even though they have good intentions to do so, have not changed behaviours because the fundamentals of eating enjoyment, convenience and other blockers have not been addressed. Increased serves per day should be treated as 'the outcome' rather than 'the change driver' in the future strategies. Nutrition and wellbeing should be a secondary endorsement message, rather than the focus of the message. It is notable that the research programs that are consistently mentioned as being the most successful, all share a focus on eating enjoyment and socialisation (e.g. Stephanie Alexander, Jamie Oliver, Maggie Beer), rather than messages delivered with an overt nutritional message.
5. While the nutrition community tend to refer to the measure of 'increased serves per day' as the benchmark of program success, a number of the levy-funded projects measure program success on the basis of metrics such as 'uptake', 'building awareness of the nutritional benefit of vegetables' and 'creating more positive attitudes' about vegetables. One of the consistent themes from this research is that 'awareness' and 'attitude' measures in their own right, do not necessarily translate into increased vegetable consumption and sales of more vegetables.
6. To date there has not been a systematic, holistic focus on addressing the key impediments to vegetable consumption, although these are now well understood and summarised below:



- **Taste & enjoyment** of vegetables through learning, inspiration and meal solutions
- **Knowledge & skill** of buying, storing and preparing
- **Quality & consistency** including freshness and convenience
- **Cost & wastage** due to perceptions and practices
- **Access & affordability** relative to other food options available.

While some of these blockers are being partially addressed through various *ad hoc* programs, there does not appear to be a systematic, collaborative approach. Because the current programs fall under a range of jurisdictions, there is a need for an integrated program involving industry, government and NGOs. This is the role that the Fruit & Vegetable Consortium are seeking to perform with their proposed national behavioural change program. Hort Innovation needs to determine where industry can invest for maximum impact within the limits of the R&D investment framework and which priorities will cut through most quickly. The final report of this project will make recommendations to Hort Innovation in that regard.

7. There are multiple examples in the literature of controlled experiments involving various types of interventions that have shown qualified success in lifting consumption of fruit and vegetables, but which have not delivered sustainable consumption shifts at a macro level beyond this trial, as measured by the accepted average daily serves metric, because they have not been rolled out or scaled up across a wider population. This is largely due to the lack of on-going funding streams and the lack of an implementation program with adoption partners.
8. There is a growing view that targeting children in vegetable education interventions has been effective in driving long-term sustainable increases in consumption. However, the Australian government programs are already heavily weighted towards children and families, arguably at the expense of other cohorts, notably young males, elderly living at home and single person households, which are shown to be cohorts requiring attention.
9. Interventions in food environments where consumption decisions are made have been lacking in Australia, given that over 40% of food is consumed away from home. The foodservice menu offering in Australia is a major contributor to low vegetable consumption. To date the focus has largely been on school canteens and hospitals and aged care settings but the commercial foodservice sector seems to be underrepresented relative to its importance. Hort Innovation has invested in a number of small foodservice events and market research for other levy funds such as mushrooms and onions and some cross-industry research (VN18000, VN20002, MU20003, MU12006, MT21011 and MT18002), but there were few active or impactful vegetable education interventions in commercial foodservice discovered in the research. With some Australians eating almost all meals from foodservice outlets, this would appear to be a glaring gap in community interventions.
10. The significance of food insecurity, affordability and accessibility as impediment to consumption appears greatly understated and under serviced.



11. The large, collective investment over the past few years in community vegetable education in Australia has created a significant asset base of materials and resources that potentially provide solid foundations to advance the cause, but which are grossly under-utilised because of the lack of uptake by the various stakeholder groups. This is largely because there has not been an implementation plan to recruit adoption partners at the outset. As a consequence, funding has not been continued and these resources are not being kept up to date.
12. The absence of a marketing levy for most vegetable categories is a major limitation in the drive to increase consumption because it prevents industry from extending the research learnings into activity that engages directly with consumers as the Nuts for Life program does for nuts.
13. Not enough has been done to communicate the knowledge generated by levy-funded projects to the broader stakeholder population and stimulate uptake. It was reported in the consultation that many stakeholders are not aware of the existence of much of this material.
14. Much of the published material and final reports produced from levy-funded projects are written or presented in an academic format and style, which is not user-friendly for the largely lay audience who are funding this research and making decisions about future investments.
15. The sheer scale of community vegetable education reviews, evaluations and umbrella studies has resulted in much confusion about what has and has not worked in shifting behaviour. The metadata is prone to lead to conclusions that a certain type of intervention does not work because a number of studies reported so. These sweeping assumptions fail to examine the nuances of success and failure e.g. was the marketing simply poorly executed. The research in many respects is inconclusive and there are many contradictions in the findings.
16. A critical task in the later stage of this project will be to determine where Hort Innovation can invest for maximum benefit with the terms of the R&D funding guidelines.



Next steps

The next steps in project VG22003 include:

- Task 3: Evaluation framework development
- Task 4: Sample initiatives
- Task 5: Evaluation and behavioural change analysis
- Task 6: Behavioural framework
- Task 7: Behaviour change plan
- Task 8: Reporting.



Appendix



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| | |
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| Coles | Belinda Anderson, Jason Colosimo, Kim Tekellis |
| CSIRO | David Cox, Gilly Hendrie, Astrid Poleman |
| Eatwell Tasmania | Carl Saunder |
| Fresh Markets Australia | James Patrick |
| Foodbank | Sarah Pennell |
| Health & Wellbeing QLD | Mathew Dick |
| Healthy Kids Association | Shadia Djakovic |
| Maggie Beer Foundation | Lesley Wood |
| Newcastle University | Illyse Jones |
| NSW Ministry of Health | Lisa Yates |
| Nutrition Australia | Michelle Lausen, Lucinda Hancock, Amber Kelaart, |
| Outdoor Media Association | Jessie Nguyen |
| OzHarvest | Tony Ashmore |
| Queensland Fruit & Vegetable Growers | Angela Seng-Williams |
| Wellbeing SA | Juliet Bociulis, Amanda Wilson-Tran |
| Woolworths | Stevie Wring, Matt Dwyer |
| The George Institute | Jason Wu |





Appendix 2: Evaluation Framework

*Learning from the past to amplify community vegetable education
programs of the future (VG22003)*

February 2024

Why an Evaluation Framework?

The Evaluation Framework underpins a systematic process to inform the merit, worth and significance of previous community initiatives delivered to support increased vegetable consumption in a range of settings through a behaviour change lens. The McKINNA *et al.* literature scan extensively identified previous initiatives (n=100) delivered to address five major consumption barriers (taste & enjoyment; knowledge & skill; quality & consistency; cost & wastage; access & affordability). Identified initiatives were delivered through the vegetable R&D levy, and other Government and not-for profit organisations. Initiatives were classified across 6 simplified categories, reflecting broad pathways used to influence consumption.

The literature scan and supporting consultation identified learnings regarding the environment and delivery models of initiatives, highlighting that segmentation and duplication of effort across stakeholders has impacted success. To support the development of a strategic framework informing vegetable R&D investment to increase vegetable consumption, an evaluation of past initiatives through a common framework is required. This will inform an understanding of the merit of delivery modalities, and provide an evidence base to guide the development of an investment strategy that addresses opportunities for measurable and sustained consumption increases.

Evaluation Framework overview

Given that the community initiatives identified and classified through the literature review have already been scoped and commenced (or concluded) delivery, an Evaluation Framework that goes beyond individual initiative-specific delivery mechanics is required. Therefore, the Evaluation Framework is framed to enable a broad review of previous initiatives, in a consistent and standardised manner that considers the merit of delivery for supporting the outcome of increased vegetable consumption informed by available data and evidence.

The Evaluation Framework consists of four components:

1. Evaluation criteria
2. Performance standards
3. Rubric
4. Judgement and synthesis.

The process of systematic evaluation supported by a framework serves as an evidence base to improve the design of future initiatives by drawing on the learnings from previous initiatives.

1. Evaluation criteria

Evaluation criteria identify “*what matters?*”, and are used to inform value judgements of the performance of community initiatives intended to support increased vegetable consumption.

The criteria themes align and build on Hort Innovation’s Evaluation Framework. Each criteria is supported by *Key Evaluation Questions*, which guide inquiry into the performance of initiatives focused on increasing vegetable consumption, aligned to behaviour change theory.

Evaluation criteria are informed by the stakeholders who deliver or respond to community initiatives. A range of stakeholder perspectives captured through MCKINNA *et al.* literature review consultation are reflected in the criteria. The evaluation criteria are also aligned to behaviour change theory (MCKINNA *et al.*), which reflects the role of stimulating new beliefs to drive sustained and lasting consumption patterns. The behaviour change model that informs the evaluation criteria is presented in Figure 1. This model is based on that developed for the Fruit & Vegetable Consortium’s business case to invest in driving vegetable consumption by Monash University’s Behaviour Works research institute.

Figure 1: Behaviour change model (Source: MCKINNA *et al.*)

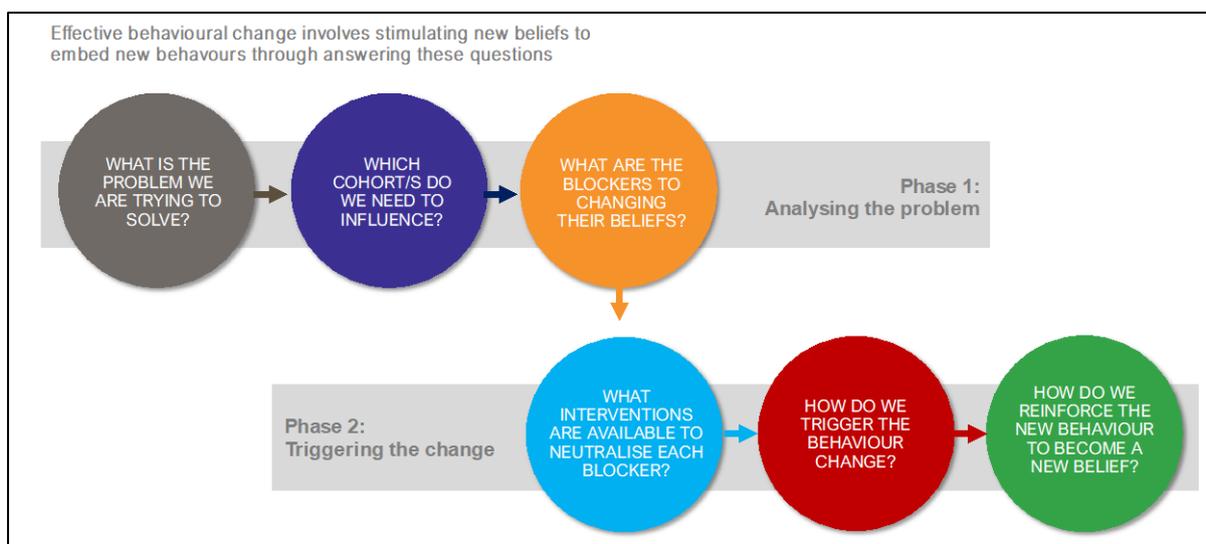


Table 1 presents the criteria to inform an evaluation of the previous vegetable community initiatives.

Table 1: Vegetable community initiative evaluation criteria

| Criteria Theme | Behavioural change model | Key Evaluation Question |
|-----------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Relevance “Solving the right problems” | <ul style="list-style-type: none"> • What is the problem we are trying to solve? • Which cohort/s do we need to influence? • What are the blockers to changing their beliefs? | <ol style="list-style-type: none"> 1. Was the initiative targeted to a high priority issue? 2. To what extent did the initiative target one or more consumption barrier(s)? 3. Was the intervention targeting a prime prospect cohort? |
| Strategic appropriateness “Strategic approach and methods suitable to address the problem” | <ul style="list-style-type: none"> • What interventions are available to neutralise each blocker? | <ol style="list-style-type: none"> 1. Was the strategy appropriate to the problem being addressed? 2. To what extent were the right tools, delivery and implementation model used in addressing the consumption barriers? 3. Was there a call to action trigger element? |
| Execution effectiveness “Execution of the right methods that are achieving results” | <ul style="list-style-type: none"> • How do we trigger the behaviour change? | <ol style="list-style-type: none"> 1. To what extent did the creative execution and delivery address behavioural drivers or barriers for the target cohorts? 2. Was the creative execution effective at changing attitudes and consumption intent to drive behaviour change? 3. Was the program effectively implemented to drive behaviour change? |
| Efficiency “Use of resources” | <i>Applies to Phase 1 & Phase 2</i> | <ol style="list-style-type: none"> 1. How were resources used to achieve increased consumption? |
| Impact and investment return “Realised increased consumption” | <i>Applies to Phase 2</i> | <ol style="list-style-type: none"> 1. Did the intervention increase consumption leading to improved industry (economic) and social benefits? 2. Did the investment deliver value for money for levy payers and funding bodies? 3. Overall, was the initiative worthwhile? |
| Legacy “Ongoing utilisation” | <ul style="list-style-type: none"> • How do we reinforce the new behaviour to become a belief? | <ol style="list-style-type: none"> 1. Has the initiative influenced/complemented/leveraged other programs to increasing consumption? 2. To what extent will the initiative have an on-going residual/lagged effect? |

2. Performance standards

Performance standards define the extent to which the criteria have been supported through the initiative. The characteristics of performance are identified using a descriptive scale. This allows the performance of respective initiatives to be aligned to a particular level of performance for each criteria.

Table 2 identifies the generic performance standards that underpin the Evaluation Framework.

Table 2: General performance standards

| Performance standard | Description |
|---------------------------------------|-----------------------------------------------------------------------------------------|
| Excellent (Always) | Excellent performance on all aspects with no weaknesses. |
| Very good (Almost always) | Very good on all aspects, no weaknesses of any real consequence. |
| Good (Mostly, with some exceptions) | Reasonably good performance overall, with a few slight weaknesses of minor consequence. |
| Emerging (Sometimes, with exceptions) | Fair performance, some potentially significant weaknesses on a few aspects. |
| Not yet emerging (Barely) | No clear evidence has emerged that performance has taken effect. |
| Poor (Never) | Clear evidence of unsatisfactory functioning, serious weaknesses on crucial aspects. |

3. Rubric

The rubric combines a description of each performance standard for each of the criteria into a single matrix. This supports an analysis of performance across multiple criteria. While the possible performance standards are aligned to those from Table 2, the respective conditions reflect unique requirements for that criterion to be supported. Table 3 details the rubric which can supports holistic assessment across the various the individual initiatives.

Table 3: Analytical rubric—Vegetable consumption initiatives

| Criteria | Performance Standard | | | | | |
|---------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| | Poor | Not yet emerging | Emerging | Good | Very good | Excellent |
| Relevance <i>“Solving the right problems” (Consumption barriers)</i> | It was not possible to define the population or consumption barriers through the intervention design. | No consumption barriers for any cohorts were defined. | Consumption barriers were of partially defined for cohorts in the intervention. | Consumption barrier opportunities across at least one target cohort were defined. | Consumption barrier opportunities were clearly defined for one or more cohorts were defined. | Multiple consumption barrier opportunities were clearly defined for cohorts. |
| Strategic appropriateness <i>“Strategic approach is suitable to address the problem”</i> | No strategic intent in delivery was evident. | Limited strategic intent in delivery with weak execution and limited influence. | Isolated aspects of strategic delivery with limited influence including consumption barriers, call to action and/or implementation. | Reasonable strategic intent through some coordination across consumption barriers, call to action and implementation. | Strong strategic intent through clear coordinated efforts across consumption barriers, call to action and implementation. | Comprehensive strategic intent through clear coordinated efforts involving consumption barriers, call to action and implementation. |
| Execution effectiveness <i>“Using the right methods that are achieving results”</i> | Methods focused on behaviour change were not used, with no results produced. | Limited coverage of an isolated components of behaviour change strategy with unclear or weak results | Fair coverage of isolated components of behaviour change strategy were facilitated achieving some results. | Reasonable coverage of more than one component of behaviour change strategy was supported with intended results. | Strong coverage of multiple components of behaviour change strategy were supported through achieving integrated results. | Comprehensive coverage of all components of behaviour change strategy were supported through integrated delivery exceeding result expectations. |
| Efficiency <i>“Use of resources”</i> | Isolated with no capacity to leverage supporting or connected initiatives and stakeholders. | Resources were not leveraged with supporting initiatives and/or stakeholders. | Some limited integration with complimentary initiatives and partners. | Reasonable integration with complimentary initiatives and partners supporting scale and reach. | Strong integration with complimentary initiatives and stakeholder groups enabling synergies and learnings. | Comprehensive integration with complimentary initiatives that directly realizes connection with stakeholders. |
| Impact and investment return <i>“Realised increased consumption”</i> | There was no evidence available to inform the initiatives industry and social impacts considering attitudes, intent and consumption. | Attitudes, intent and consumption were not impacted, associated with poor value. | Attitudes, intent and consumption resulted in limited industry and social impact, associated with some low value. | Attitudes, intent and consumption supported moderate industry and social impacts, associated with some value. | Attitudes, intent and consumption supported material industry and social impacts with strong value and clear investment return. | Attitudes, intent and consumption supported significant industry and social impacts, associated with excellent value and unmatched investment return. |
| Legacy <i>“Ongoing utilisation”</i> | No ongoing avenue for supporting work. | Opportunities for continuity were not realised. | Initial continuity potential was identified but limited evidence of this being supported | Reasonable legacy (e.g. learnings influencing a new program iteration) | Strong legacy has been supported realised through program continuity, or a new sustainable funding model. | Outstanding legacy supports ongoing program utilisation beyond its immediate funding term.(e.g. messaging, call to action). |

4. Judgement and synthesis

The merit of each of the vegetable consumption initiatives will be judged against the respective criteria and performance standards using available evidence collected through delivery (desktop) and stakeholder consultation. The results of this process will be synthesised into a set of performance judgements that can be used to inform the strategy design and delivery of future community initiatives, including the role of R&D investment.

The key questions that will be addressed include the following:

- What have been the successful elements of the projects?
- What factors have supported sustained impact on vegetable consumption?
- What were the challenges, shortfalls and weak points in the program?
- In hindsight what could have been done differently?
- Where can Hort Innovation invest to deliver the maximum benefit amidst the other actors and their key leverage mechanisms?
- How could Hort Innovation improve project construct and management?
- What are the key lessons that Hort Innovation can embrace to inform future investments?
- How can Hort Innovation be catalyst in this space within the limits of the R&D levy?

The performance judgements will provide a clear and transparent evidence base for informing the behaviour change strategy.



Appendix 3:
Evaluation of past initiatives
Summary report

*Learning from the past to amplify community vegetable education
programs of the future (VG22003)*

February 2024

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Executive Summary

The vegetable industry has invested a material share of available R&D levy into initiatives seeking to increase the consumer demand for vegetables in Australia over the last 10 years. Investment has been motivated by the significant potential impact of increased consumption for industry growth and returns, given that just 6.5% of Australian adults and 4.3% of children consume the recommended number of vegetable serves each day.

Despite the delivery of a variety of levy and non-levy funded initiatives seeking to drive demand creation for the vegetable industry, material changes in consumption have not been realised. To inform the design and delivery of future investment in realising this ongoing opportunity, an evaluation of n=10 previous initiatives was undertaken. An evaluation framework guided the approach, which identified a range of evaluation criteria aligned to a behaviour change model. The evaluation was informed through a combination of document review and outreach with key stakeholders.

Summary of evaluation findings

The evaluation process identified that across both levy and non-levy initiatives, the underlying relevance and strategic approach was generally well defined, responding to a genuine knowledge or capability gap based on a strategic approach with potential to address the opportunity. However the extent to which each initiative was effective in achieving overall impact for long term vegetable consumption behaviour change was significantly weaker.

The major factors contributing to limited delivery effectiveness and impact across both levy and non-levy funded initiatives were short term delivery timeframes and participation windows limiting the capacity to measure and inform long term behaviour change; and challenges in scaling to reach large audience groups. An additional factor unique to levy funded initiatives was the absence of any implementation effort, resulting in lost momentum, awareness and capacity to maintain active participant engagement following the delivery. Initiatives that demonstrated the capacity to scale through the support of partnerships, leverage multiple behavioural drivers, and that were delivered over the long term were more likely to deliver a stronger platform for impacting behaviour change in target cohorts.

The Evaluation identified the following learnings, implications and recommendations to consider when designing future iterations of R&D levy investment in vegetable demand creation initiatives.

Balancing short term delivery with long term results

- All initiatives were characterised by a short term delivery timeframe, inherently conflicted by the longer timeframe required to achieve behaviour change.
- Whilst short term change in target attitudes and consumption was achieved, these changes could not be linked to broad and sustained behaviour change.

Recommendation #1: *Prioritise the development of initiatives with a minimum 5 year delivery timeframe to support increased capacity to measure long term results for target cohorts.*

Longevity and legacy

- Initiatives were strengthened when they were delivered continuously over multiple intakes and/or iterations with a consistent program name, brand or association.
- Consistency, stability and a 'track record' generates goodwill that encouraged partnerships, and contributed to increased engagement across target cohorts.

Recommendation #2: Initiatives should include the provision for partnership support to expand the longevity and legacy of delivery beyond the project period to sustain multiple participant intakes and drive broader engagement and goodwill with participants and stakeholders.

Aligning jurisdictions

- Initiatives with a local or state delivery model faced challenges when trying to scale, while contributing to duplication where similar initiatives were being delivered in different jurisdictions.
- The design of initiatives should occur at a national level, with a flexible platform that enables alignment with individual requirements of lower level jurisdictions to offer a more targeted basis to extend reach and scale delivery.

Recommendation #3: Initiatives should be designed at the national level to ensure a more accessible basis to extend reach and scale delivery across a range of jurisdictions.

Scale and leverage

- Initiatives that readily leveraged available resources and supporting initiatives could more successfully scale delivery to reach wider audiences.
- Initiatives that failed to appropriately draw on supporting resources limited capacity to generate momentum and differentiate the delivery from other supporting programs, increasing the risk of duplicating activities and outputs.

Recommendation #4: Ensure that available resources and supporting initiatives are suitably identified and leveraged in the delivery approach to maximise scale and realise efficiencies, which is best achieved through a program approach.

Align to behaviour change framework

- Initiatives that explicitly recognised and worked to align delivery with broader behaviour change strategy were more successful at targeting participant response.
- Levy-funded investments have not been linked to a broader behaviour change framework.
- As a result, investment delivery has lacked a common identifier that ensures the R&D is suitably placed to compliment and elevate supporting and related work from other stakeholders.

Recommendation #5: Develop and align all future levy investments to a behaviour change framework to ensure identified opportunities are designed to complement and integrate with broader initiatives contributing to support sustained long term behaviour change.

Implementation plan

- The most common and significant limitation of levy funded initiatives was the lack of an implementation plan to activate, extend and engage stakeholders post R&D delivery.
- This resulted in a 'passive' reliance for material and tools to be utilised, significantly impacting on the overall reach and momentum generated through the R&D phase.
- Without implementation, R&D outputs have no activation pathway, with many of the stakeholders consulted in Volume 1 showing low levels of familiarity with the suite of levy funded initiatives.

Recommendation #6: All levy funded investment should be supported by an implementation plan to ensure the legacy and impact of initiatives can be sustained beyond the R&D phase with supporting partners.

Introduction

Since 2017 a material share of the vegetable R&D levy has been invested in projects with the objective of increasing Australian consumer demand for vegetables. The *Vegetable Strategic Investment Plan 2017-2022 Performance Report* identified that approximately \$15.2 million (16.1% of total) was invested in initiatives such as consumer insights and education to increase demand over the 2017-2021 Vegetable Strategic Investment Plan (SIP). At the same time, a range of Government, not-for profit and community groups have also funded and delivered programs aimed at increasing vegetable consumption.

Despite the significant investment and broad range of interventions, the share of the Australian population consuming the recommended 5 serves of vegetables continues to remain low. Results from the latest National Health Survey found that just 6.5% of adults met the recommended daily intake of 5 serves of vegetables in 2022-23, reflecting a declining trend since 2011-12 (where 8.3% of adults met recommended consumption levels)¹. Therefore despite the significant investment, there has been minimal observable impact on vegetable consumption across the Australian population.

As increasing domestic demand for vegetables continues to remain a priority for the Australian vegetable industry (as well as for Government and health agencies) evaluation of the merit, worth and significance of previous initiatives is required to inform the development of a strategic framework to guide effective and impactful investment into the future. The *Literature scan and consultation findings* (Volume 1) identified that fundamental shifts in underlying consumer behaviours are required through addressing consumption blockers, given that current consumption levels fall well below recommended targets. The extent to which previous initiatives have aligned with behaviour change principles therefore underpins the focus of the evaluation approach.

About the evaluation

To guide the design and delivery of future levy funded initiatives to drive material changes to consumption informed through a strategic framework, a sample of n=10 initiatives from the literature scan (Volume 1) were evaluated.

To inform the evaluation of these initiatives, an Evaluation Framework was developed. The Evaluation Framework underpins a systematic process to inform the merit, worth and significance of previous community initiatives delivered to support increased vegetable consumption in a range of settings through a behaviour change lens.

The Evaluation Framework consists of four components:

1. Evaluation criteria
2. Performance standards
3. Rubric
4. Judgement and synthesis.

The process of systematic evaluation supported by a Framework serves as an evidence base to inform the improved design of future initiatives by drawing on the learnings and insights from previous initiatives.

¹ ABS (2023). National Health Survey 2011-12, 2022. Accessed <https://www.abs.gov.au/statistics/health/health-conditions-and-risks/national-health-survey>.

Evaluation sample

The selection of initiatives for evaluation was guided by Volume 1 *Literature scan and consultation findings* which identified over n=100 recent initiatives, organised across 6 intervention categories. This literature scan distilled the major impediments to consumption from existing research and literature and served as the basis for selecting 10 initiatives, in discussion with Hort Innovation and industry stakeholders. A broad range of levy-funded (n=5) and non-levy funded (n=5) initiatives were selected to ensure representation across the major intervention categories, consumption impediments and target cohorts.

Table 1 summarises the initiatives sampled for evaluation.

Table 1: Sample of initiatives for evaluation

| Initiative | Intervention category | Target consumption impediment | Target cohort | Jurisdiction | Investment (\$) |
|--------------------------------------------|--------------------------|-----------------------------------------------------------------------------------------------------------------|------------------------------------------------------|-------------------|--------------------------|
| Phenomenom! (VG16018) | Targeted | Taste & enjoyment | Primary School | National | \$1.3M (total)* |
| VegKIT (VG16064) | Targeted | Taste & enjoyment Knowledge & Skill Access & affordability | Early childcare Primary school | National | \$4.6M (total) |
| Taste & Learn (VG15067) | Targeted | Knowledge & skill Taste & enjoyment | Early childcare Primary school | National | \$1.1M (total) |
| VegEze (VG16071) | Mass Market | Knowledge & skill | All adults | National | \$949,028 (total) |
| Veggycation (VG12042 & VG16080) | Mass market | Knowledge & skill | Children and adults | National | \$889,358 (total) |
| Nom! Food sensations | Environment / Insecurity | Taste & enjoyment Knowledge & skill Access & affordability Cost & wastage | Adults with low food literacy | Western Australia | \$639,600 (annual) |
| Stephanie Alexander Kitchen Garden Program | Targeted / Local | Taste & enjoyment Knowledge & skill | Childcare, primary, & secondary schools | National | \$4.7M (annual) |
| Produce Prescription | Targeted / Policy | Quality & convenience Access & affordability Cost & wastage Knowledge & skill Quality & convenience | Adults with type 2 diabetes (focus on food insecure) | NSW | \$7.50 per meal |
| Live Lighter | Mass Market | Knowledge & Skill | All adults | Western Australia | \$3M (annual) |
| Veg Education Schools Farm Gate Program | Targeted | Knowledge & Skill Taste & enjoyment | Primary and secondary schools | Victoria | \$2,000 per school visit |

* Not all costs were able to be captured.

About the report

This report summarises the evaluation and findings for each of the sampled n=10 initiatives. The performance of each initiative is considered against the standards defined within the Evaluation Framework. Learnings and recommendations for the future investment of vegetable levy funds are then provided.

The full results of the n=10 sample evaluations are supplied as attachments to this summary report. Each evaluation report provides a background to the initiative, the extent to which the evaluation criteria have been supported and an overall assessment of performance using a rubric approach. The implications and learnings from the evaluation of each initiative concludes these reports.

Section 1: Evaluation method

Desktop review of project documentation, prior evaluations of initiatives and qualitative consultation methods were used to evaluate the delivery and impact of the sampled initiatives seeking to increase consumer vegetable demand. The performance of initiatives for driving behaviour change were assessed using a rubric that combined the evaluation criteria and performance standards. This section provides further detail on the evaluation methods used.

Evaluation criteria, performance standards and rubric

The Evaluation Framework identified criteria, performance standards and a rubric to guide the evaluation (submitted in MS102). The evaluation criteria “*what matters?*” consider the extent to which 15 Key Evaluation Questions (KEQs) were addressed within the delivery of each sampled initiative. The KEQs were defined in the Evaluation Framework and align to the MCKINNA *et al.* behaviour change model (Figure 1).

Table 2 presents the evaluation criteria and KEQ which guide the evaluation of the previous vegetable community initiatives and the supporting alignment to the behaviour change model.

Figure 1: Behaviour change model (Source: MCKINNA *et al.*)

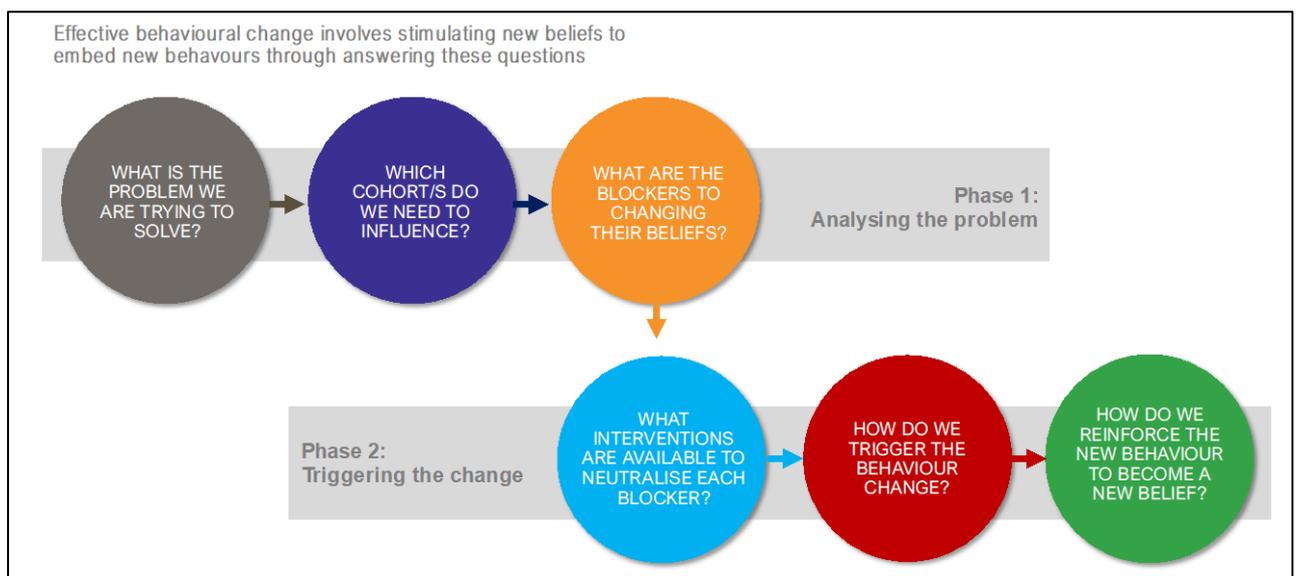


Table 2: Evaluation criteria and Key Evaluation Questions

| Criteria Theme | Behavioural change model | Key Evaluation Question (answered where relevant) |
|-----------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Relevance “Solving the right problems” | <ul style="list-style-type: none"> • What is the problem we are trying to solve? • Which cohort/s do we need to influence? • What are the blockers to changing their beliefs? | <ol style="list-style-type: none"> 1. Was the initiative targeted to a high priority issue? 2. To what extent did the initiative target one or more consumption barrier(s)? 3. Was the intervention targeting a prime prospect cohort? |
| Strategic appropriateness “Strategic approach and methods suitable to address the problem” | <ul style="list-style-type: none"> • What interventions are available to neutralise each blocker? | <ol style="list-style-type: none"> 1. Was the strategy appropriate to the problem being addressed? 2. To what extent were the right tools, delivery and implementation model used in addressing the consumption barriers? 3. Was there a call to action trigger element? |
| Execution effectiveness “Execution of the right methods that are achieving results” | <ul style="list-style-type: none"> • How do we trigger the behaviour change? | <ol style="list-style-type: none"> 1. To what extent did the creative execution and delivery address behavioural drivers or barriers for the target cohorts? 2. Was the creative execution effective at changing attitudes and consumption intent to drive behaviour change? 3. Was the program effectively implemented to drive behaviour change? |
| Efficiency “Use of resources” | <i>Applies to Phase 1 & Phase 2</i> | <ol style="list-style-type: none"> 1. How were resources used to achieve increased consumption? 2. Has the initiative influenced/complemented/leveraged other programs to increase consumption? |
| Legacy “Ongoing utilisation” | How do we reinforce the new behaviour to become a belief? | <ol style="list-style-type: none"> 1. To what extent will the initiative have an on-going residual/lagged effect? |
| Impact and investment return “Realised increased consumption” | <i>Applies to Phase 2</i> | <ol style="list-style-type: none"> 1. Did the intervention increase consumption leading to improved industry (economic) and social benefits? 2. Did the investment deliver value for money for levy payers and funding bodies? 3. Overall, was the initiative worthwhile? |

Evaluation standards were defined to determine achievement against the evaluation criteria. Combined with criteria, standards determine “was it [initiative delivery, outcomes and impact] good?”. Performance standards addressing delivery and impact of each initiative were scoped on a qualitative scale from poor (never) to excellent (always). A rubric was used to summarise performance across all criteria. The evaluation criteria, standards and rubric, combined with the data collection processes (described below) were used to inform evaluative judgements regarding the delivery and impact of sampled initiative for driving behaviour change, and evidence-based recommendations for future investment approaches.

Data collection processes

Data was collected to inform the performance of the sampled initiatives using both desktop review and stakeholder consultation methods.

The project team reviewed all relevant reports, outputs and project management documentation as part of the desktop review process. In a number of cases, existing academic evaluations into the performance of sampled initiatives were available, which provided valuable insights that could be extended to understand the extent to which behaviour change principles were satisfied.

To compliment the document review, a broad range of industry stakeholders were consulted where required, via email and phone to elicit further qualitative feedback regarding the delivery and impact of the initiatives. The focus and content of the consultation undertaken varied by project, stakeholder and information requirement.

Section 2: Findings summary

This section summarises the results of the evaluation, informed by the performance of each initiative and the key themes aligned to the evaluation criteria and KEQs.

Performance Analysis

A summary of the performance of each initiative considered against the evaluation criteria is presented in Table 3, using the performance standards defined in the Evaluation Framework.

These results show that while the relevance and strategic approach were generally strong across all initiatives, the extent to which initiatives could demonstrate the effectiveness of actual consumer behaviour change that supported industry impact (underpinned by efficient use of resources and a sustained legacy) was significantly weaker. Further discussion on the overall performance for each evaluation criteria is provided below Table 3.

Table 3: Evaluation performance analysis summary

| Criteria | Levy Funded | | | | | Non-levy funded | | | | |
|--------------------------------------------------------------------------------------------------------|---------------------|-----------|---------------|---------------------|---------------------|--------------------|----------------------------------|--------------------------|---------------------|---------------------|
| | Phenom- enom! | VegKIT | Taste & Learn | VegEze | Veggycation | Food Sensations | Steph-Alex. Kitchen Garden | Produce Prescriptions | Live Lighter | VEG Education |
| Relevance <i>"Solving the right problems"</i> | Very good | Excellent | Excellent | Very good | Very good | Excellent | Excellent | Very good | Good | Very good |
| Strategic appropriateness <i>"Strategic approach is suitable to address the problem"</i> | Emerging | Very good | Very good | Emerging | Emerging | Good | Good | Very good | Good | Good |
| Execution effectiveness <i>"Using the right methods that are achieving results"</i> | Good | Good | Good | Emerging | Not yet emerging | Emerging | Emerging | Good | Emerging | Emerging |
| Efficiency <i>"Use of resources"</i> | Emerging | Very good | Emerging | Emerging | Emerging | Emerging | Emerging | Not yet emerging | Emerging | Emerging |
| Legacy <i>"Ongoing utilisation"</i> | Emerging | Good | Emerging | Not yet emerging | Emerging | Good | Very good | Emerging | Good | Not yet emerging |
| Impact and investment return <i>"Realised increased consumption"</i> | Not yet emerging | Emerging | Emerging | Emerging | Not yet emerging | Emerging | Good | Emerging | Not yet emerging | Not yet emerging |

Evaluation criteria

Relevance – *solving the right problems*

The benefits of consuming vegetables for supporting optimal health outcomes are well understood, especially in reducing the risk and severity of many non-communicable diseases, including obesity, heart disease and Type 2 Diabetes. However, vegetable consumption remains low for most population cohorts, with just 6.5% of adults and 4.3% of children meeting intake recommendations.

While all initiatives seeking to increase vegetable consumption for any cohort through any consumption barrier could broadly be considered ‘high priority’, the sampled initiatives demonstrated mostly very good or excellent relevance to specific opportunity being targeted.

Was the initiative targeted to a high priority issue?

A range of issues and opportunities were targeted, with a focus on addressing knowledge gaps, capabilities and/or intervention pathways to increasing vegetable consumption. Examples include:

- Low food literacy impacts diet quality, including vegetable consumption (Food Sensations, Veggycation).
- Vegetable diversity is associated with increased vegetable consumption (VegEze).
- Lifestyle markers (including diet rich in vegetables) are an important determinant of chronic disease (Live Lighter, Produce Prescriptions).

To what extent did the initiative target one or more consumption barrier(s)?

All initiatives targeted at least one consumption barrier. The most common consumption barrier supported was *Knowledge & skill* which was addressed by n=9 initiatives, followed by *Taste & enjoyment* (n=6) and *Cost & wastage* (n=2), *Access & affordability* (n=2), and *Quality & convenience* (n=1).

Was the intervention targeting a prime prospect cohort?

A range of cohorts were targeted, influenced by the overarching objective and strategy of the initiative. Several initiatives were broadly targeted to all adults (Veggycation, VegEze, Live Lighter), or student cohorts (Phenomenom!, , SAKGP). Other initiatives targeted a specific cohort with a more focused opportunity set, such as adults with Type 2 Diabetes (Produce Prescriptions) and adults with low food literacy (Food Sensations). Select initiatives such as VegKIT targeted several specific cohorts, including primary school students, long day care and maternity.

A trade-off was identified in pursuing targeted or open recruitment for programs and initiatives seeking to drive vegetable consumption. Targeted programs offer the opportunity to strategically focus on smaller ‘at risk’ cohorts, while broadly targeted programs offer the potential to reach a wider audience but may have less overall appeal on an individual basis.

Strategic appropriateness – *approach and methods suitable to address the problem*

The evaluation identified a range of strategic approaches that underpinned initiative design. Strategic appropriateness was strengthened when the initiative supported more than one behavioural driver. A general weakness of strategic approaches utilised was the lack of an implementation plan, especially for levy-funded initiatives. As a result, despite the design of levy funded initiatives being informed by behavioural theory (e.g. VegEze, Taste & Learn) and utilising multi-faceted approaches (e.g. VegKIT), the potential of the strategy to be integrated beyond the R&D phase was limited.

Was the strategy appropriate to the problem being addressed?

All initiatives utilised the design of strategic approaches that were appropriate to the target problem. The majority of initiatives utilised evidence from previous study iterations (e.g. Taste & Learn, Live Lighter, VegEze) to inform the strategic design. Initiatives that addressed a single consumption blocker were less appropriate for driving overall behaviour change.

Initiatives with clear and appropriate strategies for driving behaviour change included:

- VegKIT: centralise all vegetable consumption initiatives to support improved coordination and synergies by potential partners.
- Produce Prescriptions: Provision of healthy food to food insecure populations.

Initiatives with weaker strategies for driving behaviour change included:

- Veggycation: Single 'health' focus limited strategic depth for behaviour change.

To what extent were the right tools, delivery and implementation model used in addressing the consumption barriers?

The initiatives were generally supported by suitable tools and mechanisms to ensure delivery of objectives. Several initiatives leveraged face to face settings, which provided a suitable approach to ensure strong participant engagement. Initiatives supported by qualified experts (Food Sensations, Veg Education) were generally more consistent in delivery patterns and capacity compared to those where delivery leveraged volunteers (SAKGP). The design of interventions that featured a pilot design phase (Taste & Learn) and alignment to existing behavioural frameworks (VegKIT, VegEze) strengthened the appropriateness of the methods and approach.

A weakness in the strategic approach of some initiatives was the absence of stakeholder outreach and engagement beyond the initial launch (VegEze, Veggycation). Programs with ongoing stakeholder outreach featuring within the strategic design were more common in non-levy initiatives (e.g. Food Sensations, SAKGP). Ongoing strategic engagement was proven to support the capacity for interventions to be successfully delivered over a longer period.

A final common weakness was the limited reconciliation between the short-term delivery timeframes with broader intent to drive behaviour change which is only achieved over the longer term. Mapping short term contributions of initiatives to target behaviour change will improve confidence in the strategic approach and the extent to which changes can be attributed to the initiative compared with external factors.

Was there a call to action trigger element?

A clear 'call to action' element was not featured in most initiatives. Some initiatives developed phrases or associations, for example "*spreading the vegetable love*" (Veggycation) or "*Pleasurable Food Education*" (SAKGP), however these were not action orientated. The Live Lighter initiative did include action orientated triggers "*Reduce the Junk. Reduce your Cancer Risk*", although were not explicitly focused on vegetables.

Execution effectiveness – Execution of the right methods that are achieving results

The execution of initiatives were typically associated with the achievement of short term results to target attitudes, sentiment and occasionally consumption. However it was rare for initiatives to demonstrate long term consumption behaviour change. In most cases this resulted from the underlying strategy generally focused on short term 'proof of concept'. Furthermore some initiatives

didn't actively include any provision for the measurement of results (Veggycation), or were too early in delivery for meaningful results to be obtained (Produce Prescriptions, Veg Education).

To what extent did the creative execution and delivery address behavioural drivers or barriers for the target cohorts?

The effectiveness of the creative execution was strengthened when multiple behavioural drivers were targeted (Produce Prescriptions, FSA, SAKGP) as this provided a wider base for triggering participant response. The evaluation highlighted how a narrow behavioural driver focus can impact the translation of strong creative execution into clear behaviour change (Veggycation).

Delivery that was sustained over a longer time frame with consistent creative messaging (Live Lighter) or credible brand association (SAKGP) were also associated with stronger capacity to drive behaviours. Programs that had not sustained engagement throughout the initiative (VegEze) failed to convert the full potential of the underlying creative execution.

Was the creative execution effective at changing attitudes and consumption intent to drive behaviour change?

Positive change in attitudes and consumption intent was commonly impacted during or immediately after the delivery of the initiative (Phenomenom!, VegKIT, Taste & Learn, VegEze, FSA, SAKGP, Live Lighter). However none of the initiatives (with the exception of SAKGP) have attempted (Live Lighter, FSA), or were in the position (Produce Prescriptions, VEG Education) to demonstrate contribution to longer term behaviour change. As a result, the mechanism to convert short term changes in attitudes to sustained behaviour change across the initiatives remained unclear, representing an ongoing challenge for initiative design and execution.

Was the program effectively implemented to drive behaviour change?

The most common limitation to effective implementation of initiatives was the absence of developing linkages with other third-party services or programs that could compliment or enhance delivery opportunities and scale (for example, SAGKP has not leveraged other school resources such as canteen or school experiences like the Veg Education Farm Gate Program). Another challenge was the consistency of program implementation where initiatives were dependent on accessing resources from host sites, potentially impacting participant experience (SAKGP).

The integration of broader behavioural or environmental factors impacting behaviours (e.g. skills, provision, resources) into implementation was an additional limitation. This was identified through several programs (FSA, Produce Prescriptions) where program implementation did not recognise important external influences, potentially impacting the extent to which behaviour change could be supported for participants.

In the case of R&D funded initiatives, the absence of an implementation plan following delivery resulted in all programs 'stalling' and not being carried forward by other parties for wide scale adoption. This further impacted the extent to which longer term behaviour change could be demonstrated.

Efficiency – Use of resources

The initiatives used available resources in a variety of ways to support delivery. While the majority of initiatives were informed by previous work or evidence, a challenge in striking an efficient use of resources was identified in balancing direct delivery (more resource intensive, less overall participation, more direct influence on change), with open access delivery approaches (less resource

intensive, wider potential for participation, less direct influence on change). Levy funded initiatives were generally 'open access', while non-levy initiatives more commonly used a direct delivery model.

How were resources used to achieve increased consumption?

Several initiatives relied on online or media platforms to extend materials and resources developed to a wide audience base (Phenomenom!, VegKIT, Taste & Learn, VegEze, Veggycation, Live Lighter). While this supported accessibility and enhanced the capacity to reach a wide audience, it was more common for the resources to only be passively promoted without provision for direct or ongoing engagement. Full uptake and utilisation was seldom realised as a result, impacting the resource efficiency.

Other interventions relied on more direct methods of participation (FSA, SAKGP, Veg Education, Produce Prescriptions). However the resource intensive nature of engagement resulted in a relatively low level of participation across eligible populations, although with a higher potential to influence attitudes and behaviours due to the direct (not passive) nature of engagement. Some initiatives relied on access to underlying material and resources such as volunteers (SAKGP) and teaching infrastructure (FSA, Veg Education), which has impacted capacity to scale or deliver a consistent experience for participants with the available resources.

Has the initiative influenced/ complemented/leveraged other programs to increase consumption?

While the majority of initiatives (including all levy funded initiatives) were informed by evidence from previous research and/or program delivery, the extent to which the initiatives have supported or influenced the evolution or contribution to related or supporting programs was mixed. While some initiatives did support and shape renewed programs (FSA) or underpin extended delivery through licensing (Live Lighter), other programs have not sparked complimentary activities or partnerships despite potential opportunities (VegEze, Veggycation). Further, the development of Phenomenom! and Taste & Learn school resources occurred concurrently without any integration, despite strong potential for complimenting each other.

Legacy

The ongoing refinement and evolution of a continuous initiative was noted as underpinning sustained engagement and participation. Initiatives delivered over the long term hold greater potential to continue to enable change beyond immediate participation in the initiative, or through the delivery of the initiative itself by having an 'always on' capacity to influence and engage across a broad range of stakeholders.

To what extent will the initiative have an on-going residual/lagged effect?

Several non-levy funded initiatives demonstrated ongoing legacy through directly influencing and supporting ongoing programs (FSA) and evolution in delivery models and coverage with repeat participation (SAKGP). Programs that offer a single engagement opportunity (e.g. Veg Education) were also identified as having reduced potential for a sustained legacy compared to initiatives that offered repeat exposure over time (SAKGP, Phenomenom!)

Several levy funded initiatives that focused on the development of resource and material have the potential to create lasting legacy, however sustained engagement is required to activate resources. This is potentially emerging through efforts to extend the VegKIT best practice guidelines by engaging with professionals working in health care and child-based settings (VG22005), albeit only for a 12 month period. The siloed nature of delivery of several levy funded initiatives was also identified as impacting legacy. This presented a missed opportunity to explore how the various strategies

delivered could be integrated more strategically through a behaviour change lens focused on increasing vegetable consumption.

Impact and investment return – Realised increased consumption

While most of the initiatives were able to demonstrate either a positive response to target knowledge and attitudes areas regarding vegetable consumption, or short term increases in vegetable consumption, wide-reaching, long-term changes in behaviour were not evident across initiatives. This was generally a result of: (1) interventions delivered over a short period of time, impacting the capacity to demonstrate long term behaviour change; (2) challenges in sustaining appropriate attribution between the delivery model and target behaviour change and; (3) limitations in data reported throughout and following the delivery of the intervention.

Therefore most initiatives established a weak basis for achieving impact and investment return.

Did the intervention increase consumption leading to improved industry (economic) and social benefits?

Two initiatives were associated with short term increases in consumption by participants of approximately 0.5 serves which were sustained over a 90 day period (VegEze, FSA) The Taste & Learn program demonstrated short term changes, however these declined after 3 months following participation in the program. SAKGP was the only initiative where a longer term measure was available (10 years). While the initiative was associated with sustained positive attitudes towards consumption and improved cooking skills in childhood, increases in vegetable consumption compared to control (non-participants) was not statistically significant.

The extent to which the changes in consumption realised through these initiatives would achieve overall industry benefits were limited, given the relatively small share of participants compared to the eligible population. As such, these initiatives have not resulted in material changes in demand that have stimulated increased industry returns.

Several initiatives did not capture sufficient data for consumption changes to be determined (Phenomenon!, Taste & Learn, Veggycation), were still under active delivery with measurement yet to occur (Produce Prescriptions, Veg Education), or where headline results could not be attributed to change in vegetable consumption (Live Lighter).

Did the investment deliver value for money for levy payers and funding bodies?

Determining a suitable value for money measure was challenging for initiatives where changes in consumption were not measured. For investments where consumption change had been stimulated, the absence of wider implementation has resulted in the full value for money potential not being realised for levy payers. Calculations of social return on investment (FSA) and additional investment that was amplified to support program delivery (SAGKP) were available, however these did not align with a value for money measure.

Overall, was the initiative worthwhile?

Most levy funded initiatives were associated with a positive response from stakeholders regarding proof of concept results, however the overall worth of the initiative for driving vegetable demand was significantly compromised by the absence of an implementation plan to extend and scale delivery beyond the immediate funding period.

Non-levy funded initiatives were generally associated with longer term delivery models (FSA, SAKGP, Live Lighter) that enabled broad participation, goodwill and the development of partnerships. While

being 'worthwhile' in their own right, the extent to which the full potential of these initiatives were realised was limited by the absence of broader linkages established between these partnerships. For example, the SAKGP did not demonstrate any utilisation of levy-funded schools focused resources (e.g. Taste and learn), nor engagement with the full range of State Government schools programs (e.g. NSW Healthy Schools Canteens).

The absence of an overall behavioural strategic plan appears to be a significant limitation in supporting the design and delivery of initiatives for realising their full impact potential for the vegetable industry.

Section 3: Learnings and recommendations

The evaluation of past and current initiatives seeking to increase vegetable consumption through a behaviour change lens has generated a range of learnings which inform recommendations for future investment strategy. The sampled initiatives highlight the broad range of approaches that have attempted to address low vegetable consumption among a range of cohorts. While underpinned by compelling opportunities to address a clear consumption barrier(s), it was uncommon for initiatives to demonstrate how delivery has contributed to sustained vegetable consumption behaviour change. Limitations in evidence collected, the short term nature of participation and integration with supporting programs/institutions were the common reasons why impact was not sustained.

The key learnings and associated recommendations for future levy investment strategic design and delivery opportunities following the evaluation process are identified and discussed below.

Balancing short term delivery with long term results

All initiatives were characterised by a short-term delivery timeframe (ranging between 2 hours and less than 1 year) which is inherently conflicted with the long term timeframe that is required to demonstrate behaviour change. Whilst some initiatives were able to demonstrate changes in target attitudes and consumption over the short term, these changes could not be linked to broad and sustained behaviour change.

Recommendation #1: Prioritise the development of initiatives with a minimum 5 year delivery timeframe to support increased capacity to measure long term results for target cohorts.

Longevity and legacy

Initiatives were strengthened when they were delivered continuously over multiple intakes and/or iterations with a consistent program name, brand or association. This consistency, stability and associated 'track record' for initiative delivery generated goodwill that encouraged partnerships, and served contributed to increased engagement across target cohorts. The longevity of initiatives was generally made possible by partnerships and cross sector support.

Recommendation #2: Initiatives should include the provision for partnership support to expand the longevity and legacy of delivery to sustain multiple participant intakes and drive broader engagement and goodwill with participants and stakeholders.

Aligning jurisdictions

Initiatives can be established and delivered on a local, state or national basis. The evaluation highlighted how those initiatives with a local or state delivery model faced challenges when trying to scale, while contributing to duplication where similar initiatives were being delivered in different jurisdictions. This was commonly observed in school programs, where education curriculum is guided by the state, impacting the extent to which programs such as Veg Education or SAKGP could be adapted to other states.

Where possible the design of initiatives should occur at a national level, with a flexible platform that enables alignment with individual requirements of lower level jurisdictions. For example a staged model that is founded on broad national messaging with the support of lower-level targeted messaging more closely targeting the needs of specific sub cohorts could ensure relevance is maintained across jurisdictions in a connected and integrated manner.

This offers a more accessible basis to extend reach and scale delivery, compared to adjusting an existing local/state program to other jurisdiction requirements.

Recommendation #3: Initiatives should be designed at the national level to ensure a more accessible basis to extend reach and scale delivery across a range of jurisdictions.

Scale and leverage

Initiatives that readily leveraged available resources and supporting initiatives could more successfully scale delivery to reach wider audiences. In contrast, several initiatives failed to appropriately draw on supporting resources which limited capacity to generate momentum and differentiate the program from other supporting services. Identifying avenues to scale and leverage available resources will strengthen delivery and the potential for long term impact.

Recommendation #4: Ensure that available resources and supporting initiatives are suitably identified and leveraged into the delivery approach to maximise scale and realise efficiencies.

Align to behaviour change framework

The evaluation process demonstrated how those initiatives which leveraged an integrated approach that addressed several consumption blockers were more successful in achieving their goals and objectives. Initiatives that explicitly recognised and worked to align delivery with broader behaviour change strategy were more successful at targeting participant response.

While levy-funded investments to date have been focused on relevant and strategically important opportunities, they have not been linked to a broader behaviour change framework. As a result, investment delivery has lacked a common identifier that ensures the R&D is suitably placed to compliment and elevate supporting and related work from other stakeholders.

Future levy investment should be aligned to a behavioural change framework which will inform the scope of the approach in contributing to the target behaviour change. Alignment to a behaviour change framework will also ensure opportunities for support from affiliated stakeholder groups (e.g. healthcare, retail etc.) can be clearly identified to ensure that the initiative maintains a realistic and grounded perspective of the attributable change and impact.

Recommendation #5: Develop and align all future levy investments to a behaviour change framework to ensure identified opportunities are designed to complement and integrate with broader initiatives contributing to support sustained long term behaviour change.

Implementation plan

The most common and significant limitation of levy funded initiatives was the lack of an implementation plan to activate, extend and engage stakeholders post the R&D delivery phase. This resulted in a 'passive' reliance for material and tools to be utilised, significantly impacting on the overall reach and momentum generated through the R&D phase. In contrast, several non-levy funded programs were supported by active implementation, underpinned by an annual delivery cycle which ensures that participation and engagement can be sustained.

Future R&D investment that is focused on building knowledge, tools and proof of concept approaches for increasing vegetable consumption must be supported by an implementation plan that identifies and engages partners during the R&D phase to ensure the transition to self-sustaining delivery. Implementation will be supported when investments are delivered through a program approach that is underpinned by a long term behaviour change framework, in turn improving the value proposition for implementation partners. Without implementation, R&D outputs have no activation pathway, with many of the stakeholders consulted in Volume 1 showing low levels of familiarity with the suite of levy funded initiative.

Recommendation #6: All levy funded investment should be supported by an implementation plan to ensure the legacy and impact of initiatives can be sustained beyond the R&D phase with supporting partners.

Attachments

The results of the evaluation for each of the initiatives are captured as the following attachments to this summary report.

Attachment 1: Phenomenom!

Attachment 2: Veg Kit

Attachment 3: Taste& Learn

Attachment 4: VegEze

Attachment 5: Veggycation

Attachment 6: Food Sensations for Adults

Attachment 7: Stephanie Alexander Kitchen Garden Program

Attachment 8: Produce Pres

Attachment 9: LiveLighter

Attachment 10: Veg Education Schools Farmgate Program



VG22003: Evaluation report

Attachment 1

Phenomenom

February 2024

Initiative background

The Vegetable industry strategic investment plan (SIP) 2012 (VG10115) had recommended an increased focus of R&D levy investments into Consumer Alignment (Demand Creation), with a key performance metric of increased Vegetable Consumption beyond domestic population growth. This strategic need was further identified through the CSIRO led projects: VG13090 A Strategy to Address Consumption of Vegetables in Children and VG15005 Implementation Plan for Increasing Children's Vegetable Intake.

From 2016 to 2018, Horticulture Innovation Australia (Hort Innovation) engaged Alice Zaslavsky through Edible Adventures Productions (EAP) to deliver *Educational opportunities around perceptions of, and aversions to, vegetables through digital media* (VG16018). VG16018 aimed to better understand and test opportunities for digital education initiatives to improve attitudes towards vegetables among children aged 8-12, their teachers, parents and caregivers. The program ultimately delivered [Phenomenom](#) – an online resource with videos, lesson plans and activities to help teachers deliver food literacy and nutrition education, that can also be used by families.

VG16018 was funded through vegetable industry research and development (R&D) levies with contributions from the Australian Government.

Table A1.1 summarises the Phenomenom Program, with each element described in further detail below.

Table A1.1: Phenomenom initiative overview

| Program element | Description |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Funding model | Funded through Hort Innovation using vegetable R&D levies, contributions from the Australian Government. |
| Duration | VG16018 ran for 2 years from 2016-2018. |
| Coverage | The program focussed on changing the vegetable consumption behaviour of children aged 8-12 through their teachers, parents and caregivers. |
| Objective | To positively shape children's and their influencers' behaviour and attitudes towards consuming vegetables. |
| Delivery | Delivery was divided into three parts: 1) Research 2) Development and 3) Implementation. The project culminated in the delivery of the Phenomenom online resource, with 25 webisodes (videos), linked to lesson plans and activities to help teachers deliver food literacy and nutrition education and one long-form summary episode. |

Funding model

VG16018 was funded through Hort Innovation using vegetable R&D levies, contributions from the Australian Government. VG16018 was contracted in three distinct parts, *Part 1 – Research* was, *Part 2 – Development*, and *Part 3 – Implementation*. While the cost of *Part 1 – Research* was not obtained from Hort Innovation, the average annual cost of *Part 2 – Development* and *Part 3 – Implementation* was approximately \$1.5 million (2022-23 dollars) over five years.

Duration

VG16018 was delivered from 2016 to 2018, *Part 1 – Research* was delivered from 2016-2017, *Part 2 – Development* was delivered in 2017, and *Part 3 – Implementation* was delivered from 2017 to 2018.

Coverage

VG16018 had a national focus targeting school children aged 8–12 years through their educators, parents, and caregivers.

Objective

The objective of VG16018, which established the Phenomenom initiative, was to understand the perceptions of school-aged children (ages 8 to 12 years) regarding vegetables, and to develop digital food education resources to achieve attitudinal change among children and their parents, caregivers, and educators. VG16018 sought to achieve this by sparking children’s curiosity regarding vegetables rather than focusing on what and why to eat.

Delivery

VG16018 was conceived as an engaging web series, delivering an informative documentary style resource to complement existing primary school resources, and to be appealing to parents and caregivers. VG16018 was delivered in three distinct parts. In *Part 1 — Research* Colmar Brunton conducted market research and workshops to identify the most common barriers to vegetable consumption among the target audience. In *Part 2 — Development* the findings of Part 1 were used to develop a 25-part web series for online streaming, and one long form documentary episode for free to air television or online streaming, and supporting resources for educators. In *Part 3 — Implementation* the web series and associated material was produced and distributed, with a dedicated website www.phenomenom.com.au to house the resources. Additional resources were developed through subsequent investments some of which were outside of the vegetable levy fund (see *Legacy* below).

Evaluation process

VG16018, as part of the broader Phenomenom investment, was evaluated using six evaluation criteria developed for VG22003. The evaluation criteria focus on the extent to which the campaign supported, and has the potential to further support, increased vegetable consumption. Performance against the evaluation criteria was rated on a six-point scale ranging from poor to excellent (see the VG22003 Evaluation Framework for detail on the evaluation criteria and analytical rubric). The ratings were informed through a review of key material captured across project delivery with a particular focus on project milestone reports. These resources provided suitable evidence to evaluate the initiative against the Evaluation Framework developed for VG22003.

The key material consulted to inform the evaluation as part of VG22003 are summarised in table A1.2 below.

Table A1.2: Resources informing the evaluation of the VG16018 Phenomenom project

| Resource | Relevance |
|------------------------------------------------------------------------------------------|------------------------------------------------------------------------|
| VG16018 contracts (and variations) for Parts 2–3 (contract for Part 1 was not available) | Identifies agreed inputs (funding), activities, outputs, and outcomes. |
| VG16018 Final Report | Identifies actual activities, outputs, and outcomes. |
| VG18005 Clear Horizon M&E report (located as an appendix to ST19041) | Achievement of outcomes in line with the project M&E Plan |
| VG16018 Long Form Video extension | Legacy of VG16018 |
| MT18015 Phenomenom extension project | Legacy of VG16018 |
| MT19000 Phenomenom phase two launch and professional development series | Legacy of VG16018 |
| ST19041 Phenomenom - The Good Mood Food Module | Legacy of VG16018 |

Evaluation findings

This section outlines the evidence collected against each of the six evaluation criteria informed by a detailed review of the material identified in Table A1.2, followed by the assessed performance standard against each criteria, and discussion of the findings.

Evaluation Criteria

The extent to which the Evaluation Framework criteria and underlying key evaluation questions (KEQs) have been supported is summarised below, drawing from the broad range of evidence and feedback collected.

Relevance

Was the initiative targeted to a high priority issue?

- The *Vegetable industry strategic investment plan (SIP) 2012 (VG10115)* had recommended an increased focus of R&D levy investments into Consumer Alignment (Demand Creation), with a key performance metric of increased Vegetable Consumption beyond domestic population growth. This was identified as a high priority issue as increasing vegetable demand supports higher farmgate prices and production. Beyond the vegetable industry, increased vegetable consumption is also linked with positive health outcomes with benefits for individuals (wellbeing) and society at large (healthcare costs and productivity).
- This strategic need was further developed through the CSIRO led projects: *VG13090 A Strategy to Address Consumption of Vegetables in Children* and *VG15005 Implementation Plan for Increasing Children's Vegetable Intake*.
- VG16018 sought to address this strategic need, and contribute to the strategy developed through VG13090.

Was the intervention targeting a prime prospect cohort?

- *VG13090 (strategy) and VG15005 (Implementation Plan)* highlighted children as a priority cohort due to:
 - National nutrition surveys from 1995 to 2013² consistently showing that children were consuming vegetables well below than recommended intakes.
 - Research³ identifying that setting good eating behaviours as a child is essential as it forms the basis for future eating behaviours and relationships with food for the remainder of life.
- VG16018 targeted school aged children in line with the above findings of VG13090 and VG15005. VG16018 had an initial focus on children aged 6–14 years, but this was adjusted to ages 8-12 years following Colmar Brunton research (VG16018 Part 1) identifying the significant differences in viewing preferences across the original age-range. The project primarily sought to engage children in the classroom (thereby requiring teacher engagement as a precedent) and also through parents and caregivers.

² [4364.0.55.012 - Australian Health Survey: Consumption of Food Groups from the Australian Dietary Guidelines, 2011-12](#); and [4364.0.55.007 - Australian Health Survey: Nutrition First Results - Foods and Nutrients, 2011-23](#)

³ Birch, L.L. (1998). Development of food acceptance patterns in the first years of life. *Proceedings of the Nutrition Society*, 57, 617–624; Köster, E.P. & Mojet, J. (2007). Theories of food choice development. In: Frewer, L. & Van Trijp, H. C. M. (eds.): *Understanding consumers of food products*, Abbingdon, Cambridge UK, Woodhead; Friedl, K.E., et al. (2014). Report of an EU-US symposium on understanding nutrition-related consumer behaviour: strategies to promote a lifetime of healthy food choices. *Journal of Nutrition Education and Behavior*, 46(5), 445-450.

To what extent did the initiative target one or more consumption barrier(s)?

- As part of *Part 1 — Research*, Colmar Brunton were engaged to ‘undertake research to help gain an in-depth understanding of target market needs, desires, motivations and limitations of utilising food education programs.’ Colmar Brunton conducted a knowledge audit, focus groups, and in-depth interviews to identify the most common barriers to vegetable consumption among the target audience and also the barriers to success for behaviour change interventions.
- Key barriers to consumption identified included a dislike of sensory characteristics, unfamiliarity and a general preference for less healthy foods.
- In terms of the five consumption blockers identified in the VG22003, the Phenomenom initiative primarily focussed on addressing *Taste and Enjoyment* (primarily enjoyment being an online resource).

Strategic appropriateness

Was the strategy appropriate to the problem being addressed?

- While there had historically been an array of teaching resources on promoting better attitudes to food currently available for use in Australia, the messages taught were heavily focused on ensuring children understand the need to eat a healthy and balanced diet it had been identified that children aged 8-12 are not encouraged to increase their consumption of foods through long-term health messaging (Project Harvest VG12078). VG16018 took these findings on board, and sought to deliberately frame the Phenomenom program differently by sparking children’s curiosity regarding vegetables rather than focusing on what and why to eat.

To what extent were the right tools, delivery and implementation model used in addressing the consumption barriers?

- In developing the intervention approach, VG16018 referenced the Strategy (VG13090) and Implementation Plan (VG15005) to address consumption of vegetables in children, which identified the need for novel approaches for interventions, and also that children’s vegetable intake and preferences are dictated by parents, caregivers, and peers. Consequently, it was seen as imperative to create widely available resources aimed at achieving cut-through with these audiences. However, beyond the preliminary strategic positioning against VG13090 and VG15005, there did not appear to be any plan to integrate or coordinate the Phenomenom initiative with other vegetable consumption initiatives to achieve a layered and multi-faceted approach driving behaviour change.
- Within the project itself, there was a methodical approach to identifying and targeting barriers to consumption through resource development and project delivery.
 - Through *Part 1 — Research*, VG16018 focussed on identifying appropriate tools and delivery model to address the identified barriers. The research phase provided an in-depth understanding of the target market and the most appropriate topics and delivery mechanisms.
 - Key findings from the Research phase were the opportunity to take advantage of technological advances with easy to access (online) videos and supporting content, and the need to focus on simple messages, live-action, animation, characters, humour and music, in snackable segments, and with the presence/involvement of similar aged children and role models including sports and television. These were all incorporated into *Part 2 — Development* and *Part 3 — Implementation*.

- In the end-of project review, the project stakeholders commented that the market research phase, helped to maximise the effectiveness of the project in addressing the consumption barriers.
- The resources were also closely aligned with the National Curriculum to appeal to allow for ease of integration into existing teaching programs while the length of the video materials and the range of presenters were refined to maximise appeal to children.

Was there a call to action trigger element?

- The resources reviewed in the evaluation did not present a specific call to action for primary adopters (pre-schools, schools, teachers) beyond identifying the pre-established need to increase vegetable consumption for health and wellbeing reasons. However, this is possibly reflecting of the deliberate approach of VG16018 to frame the Phenomenom program differently to previous education resources by sparking children's curiosity regarding vegetables rather than focusing on what and why to eat. That being said, the resources included underlying/implicit "call to action" themes including health and physical education and sustainability.

Execution effectiveness

Was the program effectively implemented to change attitudes and consumption intent to drive behaviour change?

- A 2019 survey conducted by Colmar Brunton (at the conclusion of follow on project ST19041) found that:
 - 35% of educators (n=21) and 46% of students (n=40) had prior knowledge of Phenomenom indicating successful extension and uptake within 1 year materials were developed.
 - 85% of students (n=74) stated that viewing the Phenomenom resources had increased their interest in learning more about food and nutrition, and 71% (n=62) wanted to try more vegetables after exposure to the resources.
 - 79% of students (n=47) found the Phenomenom resources interesting, 71% found the resources enjoyable, 66% found the resources cool, and 64% found the resources fun to watch. In contrast, 31% found the resources confusing, 15% found the resources boring, and 13% found the resources (or their content) yuck/gross.
 - 71% of students (n=62) wanted to try more vegetables after exposure to the resources.
 - Parents (n=unspecified) stated that viewing the Phenomenom resources had led to them converting actions from intended to actual behaviour, including looking up new recipes (98%), cooking or preparing a new dish at home (80%), and talking to children about vegetables in general (70%).
 - Parents (n=unspecified) increased their purchase of vegetables featured in the resources, including sweet potato (30% of parents), chillies (9%), brussels sprouts (5%), silver beat (5%), pumpkins (5%) beetroot (4–8%), green peas (4–5%), % of students (n=74) stated that viewing the Phenomenom resources had increased their interest in learning more about food and nutrition.
- This data indicates the successful implementation of the initiative in engaging the target audiences and generating likely behaviour change. However, the statistical significance of the results was not made clear, and the lack of actual behaviour change measurement (change in consumption g/day, change in purchase kg/week, etc), or measurement over time

(immediately and follow up behavioural change), all of which reduce confidence in the results in demonstrating behavioural change effectiveness.

Efficiency

How were resources used to achieve increased consumption?

- The resources developed through VG16018 were made freely available on the Phenomenom website.
- The Final Evaluation noted that by removing the typical barriers of cost and time associated with lesson-planning and with its high-quality production values to maximise engagement with students, the research-led design of the program was seen as a key asset to achieving widespread uptake from teachers.
- A target audience was identified as 37,000 teachers (from the Part 2 Contract) and later 20,000 teachers (from the Final Report) and 230,000 parents (from the Part 2 Contract). No data was identified to confirm the success of the program in reaching the target 20,000 teachers, or the number of students and frequency of resource use in classrooms that did adopt the resources.
- The Final Evaluation also identified a limitation in the delivery. While it was identified that direct digital marketing would be a useful factor in enhancing uptake, the strict limitation of the R&D levy investments (with no marketing) excluded this approach. While the project still sought to maximise uptake within this limitation through mainstream, educational and parenting media; social media (unpaid); search engine optimisation; conference presentations and partnerships with individuals and organisations with shared goals; it was recognised that it would take longer for the materials to disseminate to teachers compared to a direct marketing approach.
- Follow up research with participants would need to be undertaken to determine the scale and duration of change both with regards to both uptake as a teaching resource, and also in changing the vegetable consumption behaviour of children; however, the success of this would be hindered by a lack of baseline data, requiring participants to reflect on change rather than measuring change itself.

Has the initiative complemented/leveraged other programs to increasing consumption?

- To avoid duplication of research, as well as to ensure consistency in messaging and build on existing networks, the Phenomenom project drew on and engaged with other Hort Innovation projects including the School Lunches project (HN15003), the CSIRO Strategy (VG13090) and Implementation Plan (VG15005) for increasing children's vegetable intake, and Veggycation (VG12034, VG13087, VG14027, VG16080).
- In 2019, the initial Phenomenom resource (VG16018) was expanded to include onions and mushrooms (which have their own R&D levies) through *Phenomenom extension project* (MT18015). This was followed by *Phenomenom phase two launch and professional development series* (MT19000) which included two pilot interactive professional development workshops to help upskill and educate teachers about the Phenomenom resource. In 2020, additional material was added through *The Good Mood Food Module* (ST19041), providing crossover with [The Good Mood Food campaign](#).
- The VG16018 Final Report noted that "teachers are not currently using resources specifically aimed at teaching children about vegetables or encouraging vegetable usage"; however, vegetable education resources (*Taste and Learn*) had also been developed through *Development of a Vegetable Education Kit (Stage 1 VG13089, and Stage 2 VG15067)* for

integration into the primary school curriculum (like VG16018). In addition, towards the end of the VG16018 another primary school focussed intervention was being developed through VG16064 (VegKIT). As such, both Taste and Learn and the VegKIT would appear to have provided some parallels and synergies to be leveraged by Phenomenom; however, there was no mention of these in any VG16018 (or later Phenomenom) project documents or resources. The Phenomenom resource was identified as one of many resources in the best practice guidelines developed through VG16064 (VegKIT), although industry surveys indicate that there has been limited awareness and use of these best practice guides to date (see Appendix 2 of VG22003 for an evaluation of the VegKIT initiative).

- In general, the Phenomenom resources appear to have been developed as a successful, but relatively stand-alone initiative. While there has been some integration with other initiatives, this appears to have been ad-hoc/opportunistic, with no clear plan to integrate and leverage other initiatives as part of a larger strategic program approach.

Legacy

To what extent will the initiative have an on-going residual/lagged effect?

- Phenomenom developed a wide range of resources that are still available through the website.
- As identified previously, no data was identified to demonstrate the ongoing adoption of the material within the target settings (primary schools), nor the long-term consumption effects of children who have previously been exposed to the Phenomenom resources.

Impact and investment return

Did the intervention increase consumption leading to improved industry (economic) and social benefits?

- Project data as identified above indicated an intent to increase vegetable consumption among children, and showed an increase in vegetable purchases among parents; however, the detail in this data collection was insufficient to demonstrate the actual scale and duration of any consumption change.
- As such, while economic (increased demand supporting increased prices and industry expansion) and social (improved health outcomes) benefits of increased vegetable consumption are well documented, the success of VG16018 in achieving these impacts cannot be confirmed or credibly estimated from the identified project data.

Did the investment deliver value for money for levy payers and funding bodies?

- In the second-round assessment of *Ex-post impact assessment (MT18011)*, the foundational Phenomenom project was assessed and found to have generated an effective, widely adopted program that will increase the consumption of vegetables by children aged 8 to 12 years with a benefit-cost ratio of 3.30:1.
- However due to the lack of data collected through the project (as noted above) the impact assessment was based on unsubstantiated assumptions relating to adoption, and findings from general surveys (MT16008) relating to behaviour change. While only providing part of the behaviour change picture, the project data on changes in parental vegetable purchases was not included in the impact assessment but may not have been available at the time of the MT18011 impact assessment. Given the reliance on assumptions, the VG16018 impact assessment conducted through MT18011 does not provide a robust estimate of the Phenomenom program impact (and associated “value for money”). To confidently quantify

value for money, an impact assessment would need to be supported by Phenomenom specific data relating to adoption and behaviour change over time.

Performance summary (using rubric)

The performance of VG16018 is summarised in Table A2.3 against the evaluation criteria developed for VG22003 considering the evidence compiled to address each KEQ reported on above.

Table A2.3: Performance summary

| Criteria | Performance | Rationale |
|---------------------------------------------------------------------------------------------|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Relevance <i>"Solving the right problems"</i> | Very good | Phenomenom focussed on a single consumption barrier, vegetables fun and interesting, which was identified as a key barrier for the target cohort of primary school children 6–14 years (later narrowed to 8–12). The online video resource approach appears to have been identified prior to any market research, but was validated through the research process. |
| Strategic appropriateness <i>"Strategic approach is suitable to address the problem"</i> | Emerging | Within the Phenomenom initiative itself, there was a clear strategy to identify consumption barriers through market research, and using the insights to develop an appropriate intervention approach. The project was effectively a pilot intervention trial, with no intent for an explicit call to action. The initiative highlighted its goal in addressing the findings and recommendations from VG13090 and VG15005 that identified vegetable consumption barriers among children, barriers to behavioural change, and recommendations to address these. However, beyond this preliminary strategic positioning, there did not appear to be any plan to integrate or coordinate the Phenomenom initiative with other vegetable consumption initiatives to achieve a layered and multi-faceted approach driving behaviour change. While additional funding was provided to update the resources, there was no specific plan for long term implementation. |
| Execution effectiveness <i>"Using the right methods that are achieving results"</i> | Good | The three stage approach (research, development, implementation) helped to ensure that the tools were effectively targeted at the identified behavioural change barriers. Phenomenom M&E identified positive feedback from the target audiences relating to adoption and consumption behaviour metrics including educator intent to use the resources in the classroom, child enjoyment of the resources and intent to adjust vegetable perceptions and consumption, and changes in vegetable purchases. However, weaknesses in the evaluation design relating to a lack of statistical significance, a lack of specific consumption change metrics (e.g. change in consumption g/day), and no measurement over time (immediately and follow up behavioural change), all reduced confidence in the results in demonstrating behavioural change effectiveness. |
| Efficiency <i>"Use of resources"</i> | Emerging | To avoid duplication of research, as well as to ensure consistency in messaging and build on existing networks, the Phenomenom project identified several other Hort Innovation projects that were drawn upon by VG16018; however, beyond this identification there was no evidence that the Phenomenom resources were integrated in any way with existing resources. One pre-existing and concurrent classroom based intervention (Taste and Learn VG13089/VG15067) and one concurrent primary school canteen intervention (VegKit VG15064) were notable in their absence from any VG16018 reporting or resources, indicating potential missed opportunities for synergies. |
| Legacy <i>"Ongoing utilisation"</i> | Emerging | The actual uptake and ongoing use of the Phenomenom resources was not identified, nor the extent to which the program continued to align to teachers classroom/curriculum needs and would be supported by necessary funding through Hort Innovation or otherwise to ensure program continuity and legacy. In general, the Phenomenom resources appear to have been developed as a successful, but relatively stand-alone initiative. While there has been some integration with other initiatives, this appears to have been ad-hoc/opportunistic, with no clear plan to integrate and leverage other initiatives as part of a larger strategic program approach. The project delivery also highlighted a limitation of demand creation RD&E in achieving effective long-term uptake among the target audiences due to the inability to undertake direct digital marketing. |
| Impact and investment return <i>"Realised increased consumption"</i> | Not yet emerging | While behavioural metrics indicated the potential for a positive impact, no metrics were identified relating to actual changes in vegetable consumption over time as a result of viewing the resources, or the actual reach of the resources (number of schools and students, and frequency of use). Without further research to collect this data to estimate resource adoption and vegetable consumption change over time, impact metrics such as economic and social impact and value for money cannot not be quantified. |

Discussion

Overall this evaluation assessed VG16018 performance as being “Very good” to “Not yet emerging” across the six criteria.

Strengths. The performance was strongest for relevance and execution effectiveness, which were supported by the three stage approach (research, development, implementation) to clearly identify the priority behavioural barriers, and ensure that the tools were effectively targeted at the identified behavioural change barriers; however, the evaluation design demonstrated weaknesses in measuring actual behaviour change.

Weaknesses. The performance was weakest strategic appropriateness, efficiency, impact, and legacy. While VG16015 demonstrated some links with previous, concurrent and follow on projects (including extension projects for the Phenomenom program up to 2019) these appeared to be opportunistic/ad hoc in nature, and there were notable omissions in linkages to related children vegetable consumption initiatives (Taste and Learn and VegKIT). Overall, this indicated a lack of strategic integration of the Phenomenom initiative within a broader long-term demand creation program which potentially detracted from delivery efficiency (use of resources) and long-term effectiveness (change in vegetable consumption). A lack of detail in project data collection relating to the adoption of resources and actual consumption change over time, and a lack of information regarding resource ownership and funding for resource maintenance, also reduced the performance rating of the Phenomenom initiative against the impact and legacy criteria.

Conclusion. The Phenomenom program delivered a novel and engaging platform to spark children’s curiosity regarding vegetables, which has resulted in some preliminary changes in attitudes and potential consumption behaviours for setting that were studied. The extent to which the broader adoption and legacy of Phenomenom unclear. Phenomenom resources appear to have been developed as a successful, but relatively stand-alone initiative. While there has been some integration with other initiatives, this appears to have been ad-hoc/opportunistic, with no clear plan to integrate and leverage other initiatives as part of a larger strategic program approach.

Implications and learnings for future investment

This section outlines the key implications and learnings for informing future vegetable R&D levy funded programs to increase vegetable consumption.

Cross-initiative linkages

- Greater integration with projects undertaking related primary school interventions including with a classroom curriculum focus (Taste and Learn VG13089/VG15067) and canteen focus (VegKIT) would likely enhance stakeholder buy-in and adoption (i.e. teacher uptake), improve behaviour change outcomes (consumption) by providing a greater number of coordinated behaviour change touch-points, and improve the efficiency of managing and updating the resources in the future.

Longevity and legacy

- The legacy of the program would be supported by a clear overarching strategy with regards to resource ownership and funding to ensure the resources are reviewed and refreshed as needed to remain relevant to the target audience. For example remaining appealing to teachers and easy to integrate into existing nation-wide lessons/curricula, and critically, remaining appealing to the target cohort of children.
- Any long term strategy would be greatly enhanced by a monitoring and evaluation framework that clearly aligns data collection with desired behavioural change and consumption outcomes, and thereby enhances the ability to evaluate progress success (including through economic impact assessment) and also adjust program delivery over time as necessary.



VG22003: Evaluation report

Attachment 2

VegKIT

February 2024

Initiative background

The Vegetable industry strategic investment plan (SIP) 2012 (VG10115) had recommended an increased focus of R&D levy investments into Consumer Alignment (Demand Creation), with a key performance metric of increased Vegetable Consumption beyond domestic population growth. This strategic need was further identified through the CSIRO led projects: VG13090 A Strategy to Address Consumption of Vegetables in Children and VG15005 Implementation Plan for Increasing Children's Vegetable Intake.

In 2017 to 2022, Horticulture Innovation Australia (Hort Innovation) engaged the Commonwealth Scientific and Industrial Research Organisation (CSIRO) to progress the findings and recommendations of VG13090 and VG15005 and deliver the project *Tools and interventions for increasing children's vegetable knowledge VG16064* (VegKIT). The project aimed to support an integrated program of R&D activities targeted at influencing vegetable consumption behaviour across multiple settings.

VegKIT was funded through vegetable industry research and development (R&D) levies with contributions from the Australian Government.

Table A2.1 summarises the VegKIT program, with each element described in further detail below.

Table A2.1: VegKIT initiative overview

| Program element | Description |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Funding model | Funded through Hort Innovation using vegetable R&D levies, contributions from the Australian Government, and in-kind contributions from research partners CSIRO, Flinders University, and Nutrition Australia (Vic Division). |
| Duration | VG16064 ran for five years from 2017-2022, building on previous investments delivering school based interventions that had commenced in 2013. |
| Coverage | Long day-care and primary school aged children. |
| Objective | To deliver an integrated program of research and development activities to increase children's intakes and acceptance of vegetables, with the long term planned impact of increasing children's intake by more than half a serve of vegetables per day. |
| Delivery | The project delivered <ul style="list-style-type: none"> • Best practice guidelines to increase vegetable intake, • A national on-line registry of initiatives to increase vegetable intake and VegKIT website • A Vegetable Intake Strategic Alliance (VISA) of cross-sector stakeholders. • Dietary advice for maternal, infant and early years. • Community initiatives for long day-care settings. • Supply chain initiatives including industry innovations and initiatives for early primary school settings. |

Funding model

The VegKIT campaign was funded through Hort Innovation using vegetable R&D levies, contributions from the Australian Government, and in-kind contributions from research partners CSIRO, Flinders University, and Nutrition Australia (Vic Division). The annual cost of campaign delivery was approximately \$0.92 million (2022-23 dollars) over five years, including overheads for delivery partners, but excluding project management costs for Hort Innovation.

Duration

The VegKIT program (VG16064) was contracted on the 4th December 2017 with a five year duration to 30th November 2022.

Coverage

Overall, VegKIT sought to increase children's vegetable consumption by targeting maternal, long day care (ages 2–5 years) and primary school aged children (ages 5–12). The target audience to achieve this included school and long day care staff, parents (including maternal), canteen managers, researchers, government, health-care professionals and industry. Overall the program had a national focus, with the school canteen initiative trailed at 16 canteens in NSW primary schools.

Objective

The VegKIT project's objective was to deliver an integrated program of R&D activities to increase children's intakes and acceptance of vegetables, with the long term planned impact of increasing children's intake by more than half a serve of vegetables per day.

Delivery

As part of the integrated program of R&D, the VegKIT project included six activities. All project resources were published at www.vegkit.com.au.

1. Development of best-practice guidelines to increase vegetable consumption.
2. Creation of a national online register of initiatives to increase vegetable consumption.
3. Development and coordination of the Vegetable Intake Strategic Alliance (VISA).
4. Update of current dietary advice for maternal, infant and early years, using evidence-based knowledge of flavour exposure and food preference development, to improve vegetable acceptance.
5. Execution of initiatives in the community (for long day-care settings) .
6. Development of supply chain initiatives (industry innovations) and interventions in early Primary school settings.

Evaluation process

VG16064, as part of the broader investment that contributed to VegKIT, was evaluated using six evaluation criteria developed for VG22003 (Task 3). The evaluation criteria focus on the extent to which the campaign supported, and has the potential to further support, increased vegetable consumption. Performance against the evaluation criteria was rated on a six-point scale ranging from poor to excellent (see the VG22004 Evaluation Framework for detail on the evaluation criteria and analytical rubric). The ratings were informed through a review of key material captured across project delivery with a particular focus on project milestone reports. These resources in conjunction with consultation with VegKIT stateholders (CSIRO, Nutrition Australia, and Healthy Kids Association) provided suitable evidence to evaluate the initiative against the Evaluation Framework developed for VG22003.

The key material consulted to inform the evaluation as part of VG22003 are summarised in table A2.2 below.

Table A2.2: Resources informing the evaluation of the VegKIT project

| Resource | Relevance |
|------------------------------------------------------------------|------------------------------------------------------------------------|
| VG16064 Research Agreement (2017) and Variation Agreement (2022) | Identifies agreed inputs (funding), activities, outputs, and outcomes. |
| VG16064 Final Report and 36 appendices | Identifies actual activities, outputs, and outcomes. |
| VG13090 Research Agreement and Final Report | Identifies outputs and outcomes of previous work leveraged by VG15067 |
| VG15005 Research Agreement and Final Report | Identifies outputs and outcomes of previous work leveraged by VG15067 |
| VG22005 Research Agreement | Legacy of VG16064 |
| MT22006 Research Agreement | Legacy of VG16064 |

Evaluation findings

This section outlines the evidence collected against each of the six evaluation criteria informed by a detailed review of the material identified in Table A2.2, followed by the assessed performance standard against each criteria, and discussion of the findings.

Evaluation Criteria

The extent to which the Evaluation Framework criteria and underlying key evaluation questions (KEQs) have been supported is summarised below, drawing from the broad range of evidence and feedback collected.

Relevance

Was the initiative targeted to a high priority issue?

- The *Vegetable industry strategic investment plan (SIP) 2012 (VG10115)* had recommended an increased focus of R&D levy investments into Consumer Alignment (Demand Creation), with a key performance metric of increased Vegetable Consumption beyond domestic population growth. Beyond the vegetable industry, increased vegetable consumption is also linked with positive health outcomes with benefits for individuals (wellbeing) and society at large (healthcare costs and productivity).
- This strategic need was further developed through the CSIRO led projects: *VG13090 A Strategy to Address Consumption of Vegetables in Children* and *VG15005 Implementation Plan for Increasing Children's Vegetable Intake*.
- VG16064 was a direct continuation of the strategy and plan developed through VG13090 and VG15005 to increase vegetable consumption in Australia.

Was the intervention targeting a prime prospect cohort?

- *VG13090 (strategy) and VG15005 (Implementation Plan)* highlighted children as a priority cohort due to:
 - National nutrition surveys from 1995 to 2013⁴ consistently showing that children were consuming vegetables well below than recommended intakes.
 - Research⁵ identifying that setting good eating behaviours as a child is essential as it forms the basis for future eating behaviours and relationships with food for the remainder of life.
- VG16064 had a target cohort of children aged two to eight years old.

To what extent did the initiative target one or more consumption barrier(s)?

- Drawing on the *VG13090 (strategy) and VG15005 (implementation plan)*, VG16064 sought to address key barriers that were found to have limited children's vegetable consumption and also limited the success of previous interventions (Final report Appendix 5):
 - Negative perceptions around taste and other sensory properties.
 - Insufficient number of eating occasions to facilitate familiarity, exposure, quantity and variety of consumption.

⁴ [4364.0.55.012 - Australian Health Survey: Consumption of Food Groups from the Australian Dietary Guidelines, 2011-12](#); and [4364.0.55.007 - Australian Health Survey: Nutrition First Results - Foods and Nutrients, 2011-23](#)

⁵ Birch, L.L. (1998). Development of food acceptance patterns in the first years of life. *Proceedings of the Nutrition Society*, 57, 617–624; Köster, E.P. & Mojet, J. (2007). Theories of food choice development. In: Frewer, L. & Van Trijp, H. C. M. (eds.): *Understanding consumers of food products*, Abingdon, Cambridge UK, Woodhead; Friedl, K.E., et al. (2014). Report of an EU-US symposium on understanding nutrition-related consumer behaviour: strategies to promote a lifetime of healthy food choices. *Journal of Nutrition Education and Behavior*, 46(5), 445-450.

- Broad dietary advice that insufficiently focusses on vegetable specific attributes.
- Distribution and access challenges getting a regular supply of vegetables into early education centres and schools.
- Marketing and promotion imbalance relative to less healthy snacking options.
- Lack of stakeholder coordination.
- The Best Practice Guidelines provided additional detail on barriers to consumption, including: policy restrictions relating to food storage, preparation and safety and competing priorities within curriculum requirements; budget considerations, a lack of knowledge and skills; social influences; and the availability of competing food choices; and child development challenges such as neophobia. The Guidelines highlighted activities and resources to help stakeholders, but these weren't specifically linked to individual barriers.
- In terms of the five consumption blockers identified in the VG22003, the VegKIT best-practice guides incorporated a range of innovations that primarily focussed on addressing *Taste and Enjoyment, Knowledge and Skill, and Access and affordability*.

Strategic appropriateness

Was the strategy appropriate to the problem being addressed?

- The strategic framework was largely informed by the previous CSIRO led project VG13090, which was further refined through VG15005.
- VG13090 was based on a systematic review of worldwide initiatives to identifying initiatives that have been shown to be effective at increasing vegetable consumption in children 2-12 years, and also to identify gaps and opportunities for new initiatives. This was then refined in an Australian context through consultation with 31 stakeholders, including identifying opportunities for stakeholder collaboration.
- VG13090 provided strategic guidance to inform future investment, all of which was integrated into the VG16064 VegKIT investment. This included, establishing an alliance to enable more effective collaboration across stakeholders, and then targeting interventions at younger children (aged 2-6 years), targeting existing community groups and integrating elements of the home environment, promoting vegetables within the context of healthy eating and/or lifestyle, having contact with participants on a weekly basis, and incorporating support for broader social and policy change.

To what extent were the right tools, delivery and implementation model used in addressing the consumption barriers?

- The extensive background work of VG13090 (*Strategy*) and VG15005 (*Implementation plan*) laid the framework VG16064 to address the identified consumption barriers (see *Relevance*) through the delivery of six research areas. These were refined throughout VG16064 through consultation with all identified stakeholders as part of the project reference group (PRG) and the VISA (once established).
 1. Develop best-practice guidelines to increase vegetable consumption.
 2. Create a national online register of initiatives to increase vegetable consumption.
 3. Develop and coordinate the VISA.
 4. Update current dietary advice for maternal, infant and early years, using evidence-based knowledge of flavour exposure and food preference development, to improve vegetable acceptance.
 5. Execute initiatives in the community (for long day-care settings) .

6. Develop supply chain initiatives (industry innovations) and interventions in early primary school settings.
- Development of this broad program of work (particularly research areas 1-5) was informed by the COM-B model that suggests that behaviour (B) is the result of capability (C), opportunity (O) and motivation (M) (Final report Appendix 3). Behavioural change techniques were reviewed for their effectiveness to inform their suitability in an Australian context. Through the behavioural change analysis, it was identified that effective interventions:
 - Were able to increase vegetable consumption by 34.1% immediately post intervention, and about a 30% increase was achieved at the end of follow up.
 - Targeted younger children (aged 2-8 years) in the preschool or primary school setting.
 - Had more than one target for delivery. These interventions aimed messages at parents and children; or parents, children and teachers.
 - Used multiple behavioural change techniques, with the most common (in a primary school setting) being shaping knowledge, such as social and environmental restructuring, and Repetition and Substitution.
 - The *Guidelines* developed in VG16064 focussed on best practice interventions for subsequent adoption in a wide range of Australian settings. They included the identification of behavioural change barriers for the relevant cohort, and provided resources (including other Hort Innovation and external resources) to support stakeholders (parents, carers, cooks, educators).
 - It was noted that most of the participating schools in the canteen trial already had existing initiatives and programs to support children's vegetable intake including school vegetable gardens, and Crunch & Sip (Final report Appendix 2). VG16064 does not explore the crossover (synergies or duplication) between these existing initiatives and VegKIT.
 - Based on a review of the key properties that influence children's acceptance of vegetables, CSIRO developed a sensory model that can be used in the creation of vegetable-based products for children. Using this model, CSIRO developed a set of new 'vegetable based product concepts' built around the sensory properties that are regarded as 'desirable' for children. The concepts were made freely available for commercial adoption. Two concepts (rainbow dippers, and vegetable based ice blocks) were developed into prototypes. These demonstrated appeal when tested with 105 children (Final report Appendix 9).

Was there a call to action trigger element?

- There was no explicit call to action identified for VegKIT, beyond the established gap in recommended and actual vegetable intake, and associated health implications.
- This is potentially reflective of the broad nature of the VegKIT program, covering a range of stakeholders and settings to influence children's vegetable consumption. However, individual resources did integrate broad call to action messaging for specific target audiences by framing the resources around topics: What is the issue, how is this being addressed by VG16064, what are the roles of specific stakeholders, and what advice does VG16064 have for specific stakeholders.

Execution effectiveness

Was the program effectively implemented to change attitudes and consumption intent to drive behaviour change?

- Best practice guidelines. These consolidated research into global approaches to behavioural change for specific settings (maternal, long day-care, primary school, out of school hours care) including links to resources developed through other Hort Innovation initiatives (for example VG16018 Phenomenom and VG15067 Taste and Learn). These best practice resources weren't specifically monitored to evaluate their effectiveness at driving behaviour change; however, the review of global initiatives identified common elements to achieve behaviour change, and some of the underlying resources included data on behaviour change outcomes (with varying degrees of detail). See Appendices 1 & 3 of VG22003 for evaluations of VG16018 Phenomenom and VG15067 Taste and Learn.
- Long day-care and primary school interventions trials. Specific behaviour change metrics (such as capability, opportunity, motivation, attitudes, and consumption intent) were not measured, with a focus on final behavioural change (sales/consumption).
 - Long day care. Across a 12 week trial over 32 daycares, 1039 students, 237 teachers, and 39 cooks, the initiative trialled a combination of interventions to identify the most effective combination in changing vegetable consumption. Training for educators and a lesson package (Taste and Learn) showed:
 - Children at 3x more veggies (from 12g/day to 38g/day) with no significant change in food waste.
 - 81% of teachers would recommend the curriculum to other educators.
- Primary School Canteen intervention trials. Seven strategies tested in randomised controlled trials involving 4302 students across 16 (8 intervention and 8 control) schools.
 - 75% increase vegetable sales with no adverse effect on vegetable waste.
- The VegKIT resources (including the findings and recommendations from the above trials) were ultimately delivered through a dedicated website www.vegkit.com.au. The resources were actively promoted during project delivery, with engagement levels measured through different channels (social media, e-DM, traditional media), website and resource access (9,811 downloads as of October 2022). Specific stakeholder feedback to indicate the effectiveness of the resource implementation was only collected for the long day-care and primary school intervention trials (with the feedback being positive across target stakeholders as identified above).

Efficiency

How were resources used to achieve increased consumption?

- The VegKIT resources were used to deliver a broad program of resources to support vegetable consumption behavioural change across a broad cohort of children (2 to 12 years) and settings (at home, long day-care, primary school, out of school hours care) by engaging parents, carers, educators, researchers, supply chain, and policy makers. The pilot trial of initiatives in long day-care and primary school were intended as a large-scale prototype tested in the intended setting (TRL-5⁶).
- All resources developed through the program were made freely available on a dedicated website. The provision of an overarching resource, integrating other relevant initiatives and resources, has the potential to support greater adoption of behavioural change initiatives in the intended settings. At the same time, however, the lack of integration of the underlying resources potentially limits the ability of target stakeholders to easily apply them in a

⁶ Based off the NASA developed Technology readiness levels (TRLs) and standardised in ISO 16290:2013, TRLs are used by the broader research and innovation community to allow consistent discussions of the commencement and progress of innovation programs across different types of technology.

coordinated fashion. This is potentially a missed opportunity for achieving increased levels of behaviour change (by re-enforcing messaging across multiple engagement channels) and also to reduce the burden for educators in having to potentially choose between multiple resource options with no clear link (i.e. presenting the resources as part of an integrated/layered approach rather than as individual intervention options).

Has the initiative complemented/leveraged other programs to increasing consumption?

- The development and delivery of VegKIT leveraged previous vegetable consumption resources and interventions, including Hort Innovation projects VG13089, VG15067, VG13090, VG15005, VG12078, VG14060, VG16026, and VG16049.
- The Guidelines provided a consolidated reference point for target audiences to identify resources relevant to specific settings (e.g. long day care, primary school, policy). The Guidelines drew on a wide range of existing resources including other Hort Innovation investments such as Taste & Learn (VG13089 and VG15067), and Phenomenom (VG16018).
- VG16065 coordinated with VG15067 (also delivered by CSIRO) to investigate the effectiveness of combining the long day care initiative with the classroom based Taste and Learn intervention.

Legacy

To what extent will the initiative have an on-going residual/lagged effect?

- **Best-practice guidelines and early years advice statements.** In 2022, Hort Innovation initiated the vegetable levy project *Evidence-based education program to support increased vegetable consumption in children* (VG22005), delivered by Nutrition Australia, to maintain and update the resources on the VegKIT website. VG22005 seeks to refine and increase awareness and uptake of the existing VegKIT resources in long day-care, outside school hours care and schools. Survey's conducted in VG22005 found that awareness of the VegKIT resources was low, and they were not being used regularly due to their length and time demands. VG22005 will run for 12 months to the end of 2024. There was not identified plan for ongoing maintenance of the VegKIT resources.
- **National online register of initiatives.** The register was able to attract submissions of just 24 initiatives. Stakeholders noted that engagement was potentially limited due to a lack of incentive for submission, and for smaller community initiatives, potentially a lack of time. There was no information identified to determine the ongoing use and outcomes of the national online register of initiatives. There was a small amount of funding allocated through VG22005 to drive further uptake of the registry.
- **The VISA.** The VISA was discontinued in 2023. The Fruit and Vegetable Consortium (FVC) (established 2020) has taken over from the VISA as the consolidated voice leading the development, promotion and coordination of a long-term strategy to increase fruit and vegetable consumption.
- **Long day-care initiatives.** The long day-care pilot study has not been taken any further beyond the resources and recommendations developed in VG16064. Stakeholders noted that this remains a key gap in providing a layered approach to increasing children's vegetable consumption.
- **Early primary school initiatives.** In 2022, Hort Innovation initiated the multi-industry levy project *Education and tools for canteen managers to increase vegetables in primary school canteens and vegetable consumption by children* (MT22006) was initiated on the back of the primary school canteen intervention trialled in VG16064. The MT22006 delivery partner,

Healthy Kids Association, was directly involved in co-designing the pilot program and has incorporated the findings and recommendations of VG16064 into MT22006 for further refinement, evaluation and extension. The project will conduct a national rollout of the original NSW focussed pilot program (8 intervention schools and 8 control schools) by delivering a large-scale national rollout and evaluation with a goal of 200 intervention schools and 200 control schools over two school terms in 2015. The target outcomes for MT22006 are for 30% of national primary schools to use the resources, resulting in a more than 20% increase in sales of intervention canteen menu items containing vegetables. The project has no specific target for changes in vegetable consumption (grams per day). Stakeholders are positive for the long-term prospects for the canteen intervention given the positive feedback from the NSW pilot program (VG16064), the partnership with state based canteen associations in MT22006 which will be key to long term adoption, and the partnership with a commercial provider of the ready-to-eat meal kits. However, stakeholders also noted the need for the canteen program to be integrated with other interventions to maximise long term success through a layered approach with multiple touch points including classroom based intervention, early learning settings, and policy settings.

- Overall, some of the work conducted in VG16064 has continued into new initiatives or projects relating to best practice guides (through VG22005), consolidated industry coordination (through the FVC), and the primary school intervention (through MT22006). This demonstrates some potential for ongoing legacy; however, stakeholders noted that the original benefit of VegKIT under VG16064 was its program approach which generated efficiencies in stakeholder engagement and resource delivery, which has been lost with the fragmentation of the program into individual projects.

Impact and investment return

Did the intervention increase consumption leading to improved industry (economic) and social benefits?

- The VegKIT trials proved that children can be trained to like vegetables, with the program increasing vegetable consumption in both long day-care and primary school settings. In addition to the success in increasing consumption, the initiatives were deemed to be scalable. As pilot initiatives, the direct impact was limited, with long-term impacts dependent on their further expansion and implementation in large scale trials, and ultimately as part of a broader strategic program.
- More broadly, the resources provided guidance to increase children's vegetable consumption through a range of settings, but as identified in VG22005, the uptake of these resources has potentially been limited.

Did the investment deliver value for money for levy payers and funding bodies?

- Value measures, such as comparing the investment cost with economic and social benefits, were not established as part of VG16064 project M&E. Noting the above comments on legacy and economic and social benefits the direct impact is likely to be small, but the potential legacy impact as part of ongoing and planned investments (such as VG22005, MT22006), has the potential to deliver value for money on the VG16064 investment. VG16064 has been selected for an ex-post impact assessment as part of Hort Innovation's Impact Assessment Program (MT21015), scheduled for completion by June 2024, which will provide a detailed evaluation of the VG16064 and broader VegKIT impact (to-date and projected).

Performance summary (using rubric)

The performance of VegKIT is summarised in Table A2.3 against the evaluation criteria developed for VG22003 considering the evidence compiled to address each KEQ reported on above.

Table A2.3: Performance summary

| Criteria | Performance | Rationale |
|---------------------------------------------------------------------------------------------|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Relevance <i>"Solving the right problems"</i> | Excellent | Guided by Strategy Development (VG13090), Implementation Planning (VG15005), and Development (VG16064), the VegKIT program identified and sought to address multiple barriers impacting children's vegetable consumption across multiple settings. |
| Strategic appropriateness <i>"Strategic approach is suitable to address the problem"</i> | Very good | VegKIT took a multi-faceted approach to addressing behaviour change barriers, including the development of best practices resources for different cohorts (maternal, infant, long day-care, primary school, and out of school hours care), as well as research, supply chain, and policy focussed resources. VegKIT resources sought to centralise all vegetable consumption initiatives to support improved coordination and synergies. The establishment of the VISA sought to address the strategic coordination gap identified throughout previous vegetable demand creation initiatives. There was no explicit call to action identified for VegKIT. |
| Execution effectiveness <i>"Using the right methods that are achieving results"</i> | Good | The review of global initiatives (VG13090, VG15005, VG16064) identified common elements to achieve behaviour change, and incorporated these into the delivery of the program including the best practice guidelines and the day-care and preschool intervention pilots. Knowledge and usage of the online resources including best practice guidelines and the centralised research database appears to have been limited. In contrast, the pilot interventions were supported by rigorous evaluation demonstrating success in increasing behaviour change and vegetable consumption. |
| Efficiency <i>"Use of resources"</i> | Very good | The overarching nature of the program integrating complimentary initiatives into best practice guides, and coordinating stakeholder groups through the VISA, provided a foundation for comprehensive integration of a broader program of work. The primary school trial included testing a combined canteen/classroom intervention from two separate CSIRO projects (VG16064/VG15067). The underlying Best Practice resources were not themselves related or integrated, potentially limiting the practical synergies that could be generated. |
| Legacy <i>"Ongoing utilisation"</i> | Good | VegKIT developed a wide range of resources that are still available through the VegKIT website, and also provided recommendations for the scaled-up rollout of the trialled day-care and primary school interventions. The website resources and guidelines are being updated and extended through VG22005 to address ongoing barriers to resource adoption but with a funding commitment ending in 2024. The primary school canteen initiative is being expanded nationally through MT22006. The levy funded VISA was discontinued in 2023 in favour of ongoing strategic leadership and coordination through the FVC which incorporated the learnings of the VISA. The legacy of the research database could not be determined. Stakeholders noted the need for individual elements to be integrated through a consolidated long-term program to maximise both delivery efficiencies and also increased effectiveness in achieving behavioural change from a layered approach with multiple touch-points. |
| Impact and investment return <i>"Realised increased consumption"</i> | Emerging | The <i>potential</i> for impact (increased vegetable consumption and demand) was clearly demonstrated through the success of the pilot studies; however, as pilot studies, the direct impact was limited, with long-term impact and investment return dependent on their further expansion and implementation in large scale trials (being conducted through VG22005 and MT22006), and ultimately as part of a broader strategic program. The impact of the online best practice resources and VISA were not able to be determined through this evaluation; however, an impact assessment was being completed through MT21015 with delivery in mid-2024. |

Discussion

Overall this evaluation VG16064 performance as being “Excellent” to “Emerging” across the six criteria.

Strengths. The performance was strongest for relevance, which was supported by the projects identification of multiple consumption barriers across multiple cohorts and settings. The strategic appropriateness and execution effectiveness were supported by a three stage approach (strategy (VG13090), planning (VG15005), development and trials (VG16064)). This process identified the need for initiatives across multiple settings to ensure that the tools were effectively targeted at the identified behavioural change barriers. VG16064 also sought to provide a framework for a more efficient consolidation and coordination of resources and stakeholders through the best practice guides and the VISA.

Weaknesses. The performance was weakest impact and legacy. While the pre-school and primary school initiatives demonstrated the potential for impact, as pilot studies, the direct impact was limited, with long-term impact and investment return dependent on their further expansion and implementation in large scale trials. Some of the work conducted in VG16064 has continued into new initiatives or projects relating to best practice guides (through VG22005), consolidated industry coordination (through the FVC), and the primary school intervention (through MT22006). This demonstrates some potential for ongoing legacy and impact; however, stakeholders noted that the original benefit of VegKIT under VG16064 was its program approach which generated efficiencies in stakeholder engagement and resource delivery, which has been lost with the fragmentation of the program into individual projects.

Conclusion. VegKIT delivered a multi-faceted approach to addressing vegetable behaviour change barriers for a range of cohorts, culminating in the development of best practice resources that have been endorsed by stakeholder groups. These resources provide a strong foundation to guide the delivery of interventions targeting behavioural change barriers. The extent to which these resources support and guide ongoing interventions will depend on how they can be expanded beyond pilot testing, to be implemented as part of a broader strategic program.

Implications and learnings for future investment

This section outlines the key implications and learnings for informing future vegetable R&D levy funded programs to increase vegetable consumption.

Scale and leverage

- A clear benefit of the VegKIT initiative was the program approach that allowed resources to be leveraged and coordinated across the different activities within VG16064.
- The demonstration of the effectiveness of combined interventions in the long day care setting provides strong evidence and guidance for developing an integrated program approach to behavioural change.
- Future RD&E should seek to be incorporated into a program approach to support the coordination of resources and the combination of initiatives for testing.

Legacy and impact

- The legacy of the program would be supported by a clear overarching strategy that provides: (1) a long term plan for ongoing and scaled up implementation and stakeholder engagement; (2) a long term plan for updating resources to ensure they remain relevant to children's consumption barriers and the needs of individual settings; and (3) a consolidated approach across the settings to ensure that efficiencies in delivery are maximised, and that the approaches are coordinated and complimentary to provide a multi-layered approach with multiple touch points.
- Any long term strategy would be greatly enhanced by a corresponding long term monitoring and evaluation framework that clearly aligns long collection with desired behavioural change and consumption outcomes across each individual setting, and thereby enhances the ability to evaluate progress success (including through economic impact assessment) and also adjust program delivery over time as necessary.



VG22003: Evaluation report

Attachment 3

Taste and Learn

February 2024

Initiative background

The Vegetable industry strategic investment plan (SIP) 2012 (VG10115) had recommended an increased focus of R&D levy investments into Consumer Alignment (Demand Creation), with a key performance metric of increased Vegetable Consumption beyond domestic population growth. This strategic need was further identified through the CSIRO led projects: VG13090 A Strategy to Address Consumption of Vegetables in Children and VG15005 Implementation Plan for Increasing Children's Vegetable Intake.

From 2016 to 2019, Horticulture Innovation Australia (Hort Innovation) engaged CSIRO Agriculture and Food to deliver *Development of a vegetable education resource – stage 2 (VG15067)*. VG15067 built on the findings and outputs of *Development of a Vegetable Education Kit (VG13089)* also delivered by CSIRO from 2013 to 2016. The combined program developed and evaluated a new vegetable education program for primary schools, aimed at increasing children's enjoyment of vegetables and willingness to consume them. The program ultimately delivered [Taste and Learn](#) – an online resource with lesson manuals, training modules and in-class supports.

Table A3.1 summarises the Taste and Learn initiative, with each element described in further detail below.

Table A3.1: Taste and Learn initiative overview

| Program element | Description |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Funding model | Funded through Hort Innovation using vegetable R&D levies, contributions from the Australian Government, with in-kind contributions from the delivery partners CSIRO Food and Nutrition. |
| Duration | VG15067 ran for three years from 2016-2019 |
| Coverage | Primary school aged children through their educators. |
| Objective | To optimise and expand a new vegetable education resource for primary schools developed in VG13089, with the ultimate goal of increasing children's enjoyment of vegetables and willingness to consume them |
| Delivery | The initiative delivered a teacher-led vegetable education program, supported by online resources and training on a dedicated website Taste and Learn . The program combined sensory education concepts with scientific insights on children's development of vegetable acceptance, to increase vegetable acceptance. The effectiveness of the program was determined in a large cluster randomised controlled trial of 1639 students from 25 schools in NSW and SA. |

Funding model

VG15067 was funded through Hort Innovation using vegetable R&D levies, contributions from the Australian Government, and in-kind contributions from the delivery partners CSIRO Food and Nutrition. The annual cost of VG15067 was \$0.43 million (2022-23 dollars) over three years, including overheads for delivery partners, but excluding project management costs for Hort Innovation.

Duration

Following on from the delivery and recommendations of VG13089 (2013–2016), VG16018 was contracted on 28 June 2016 and concluded on 31 May 2019. The first year of the project included a review of existing resources and new resource development, the second year included pilot trials in NSW schools, and the third year included pilot trials in SA schools and a business model for continuation.

Coverage

VG15067 had a national focus targeting primary school aged children through their educators.

Objective

The objective of VG15067 was to optimise and expand a new vegetable education resource for primary schools developed in VG13089, so that the resources were validated in large scale trials and ready for national rollout. The ultimate goal of the Taste and Learn program was to increase children's enjoyment of vegetables and willingness to consume them.

Delivery

Through VG13089, delivered from 2013 to 2016, CSIRO developed a new primary school education resource and tested it in a pilot and follow on study involving five Sydney primary school (from TRL-1⁷: Idea to TRL-5: prototype tested in intended environment). VG15067 further developed and validated these resources up to TRL-8 (resources complete and qualified). This involved testing the updated resource across 1639 students from 25 schools in NSW and SA including different methods of online and face to face teacher training. The final teacher-led vegetable education program consisted of five vegetable education lessons developed for the three stages of primary school, which combined sensory education concepts with scientific insights on children's development of vegetable acceptance, such as taste exposure and role modelling, to increase vegetable acceptance. The program was supported by online resources and training on a dedicated website <https://research.csiro.au/taste-and-learn/>. A strategy and financial business model for national roll-out (being the final level, TRL-9: resources fully available to consumers) was developed incorporating targeted phases to achieve uptake and a state-by-state roll-out approach based on consultation with nutrition and education experts.

⁷ Based off the NASA developed Technology readiness levels (TRLs) and standardised in ISO 16290:2013, TRLs are used by the broader research and innovation community to allow consistent discussions of the commencement and progress of innovation programs across different types of technology.

Evaluation process

VG15067, as part of the broader investment that contributed to Taste and Learn, was evaluated using six evaluation criteria developed for VG22003 (Task 3). The evaluation criteria focus on the extent to which the campaign supported, and has the potential to further support, increased vegetable consumption. Performance against the evaluation criteria was rated on a six-point scale ranging from poor to excellent (see the VG22004 Evaluation Framework for detail on the evaluation criteria and analytical rubric). The ratings were informed through a review of key material captured across project delivery with a particular focus on project milestone reports. These resources in conjunction with consultation with program delivery partners CSIRO provided suitable evidence to evaluate the initiative against the Evaluation Framework developed for VG22003.

The key material consulted to inform the evaluation as part of VG22003 are summarised in table A3.2 below.

Table A3.2: Resources informing the evaluation of the VG15067 Taste and Learn project

| Resource | Relevance |
|------------------------------------|------------------------------------------------------------------------|
| VG15067 contract | Identifies agreed inputs (funding), activities, outputs, and outcomes. |
| VG15067 Final Report | Identifies actual activities, outputs, and outcomes. |
| VG13089 Final Report | Identifies outputs and outcomes of previous work leveraged by VG15067 |
| VG16064 Final Report and resources | Legacy of VG15067 |

Evaluation findings

This section outlines the evidence collected against each of the six evaluation criteria informed by a detailed review of the material identified in Table A3.2, followed by the assessed performance standard against each criteria, and discussion of the findings.

Evaluation Criteria

The extent to which the Evaluation Framework criteria and underlying key evaluation questions (KEQs) have been supported is summarised below, drawing from the broad range of evidence and feedback collected.

Relevance

Was the initiative targeted to a high priority issue?

- The *Vegetable industry strategic investment plan (SIP) 2012 (VG10115)* had recommended an increased focus of R&D levy investments into Consumer Alignment (Demand Creation), with a key performance metric of increased Vegetable Consumption beyond domestic population growth. This was identified as a high priority issue as increasing vegetable demand supports higher farmgate prices and production. Beyond the vegetable industry, increased vegetable consumption is also linked with positive health outcomes with benefits for individuals (wellbeing) and society at large (healthcare costs and productivity).

Was the intervention targeting a prime prospect cohort?

- VG13089 identified children as a priority cohort due to:
 - National nutrition surveys from 1995 to 2013⁸ consistently showing that children were consuming vegetables well below than recommended intakes.
 - Research⁹ identifying that setting good eating behaviours as a child is essential as it forms the basis for future eating behaviours and relationships with food for the remainder of life.
- To address this need, and after considering examples of successful international interventions (see strategic appropriateness below), VG15067 sought to target behaviour change in primary school aged children (years 2 to 6, or ages 5–12). As a classroom teacher led educational program, the initiative also recognised teacher engagement as a necessary precedent.

To what extent did the initiative target one or more consumption barrier(s)?

- The Taste and Learn initiative developed through VG13089 and VG15067 combined sensory education concepts with scientific insights on children's development of vegetable acceptance. Through this process Taste and Learn sought to achieve behavioural change in six areas that were identified as being associated with vegetable intake.
 - Knowledge of vegetables and the senses involved in eating and drinking.
 - Skills. The ability to verbalise sensory perceptions.
 - Behavioural intention for eating a variety of vegetables, based on the well-established Theory of Planned Behaviour (Fishbein & Ajzen, 1975)
 - Willingness to try new (less common) vegetables.

⁸ [4364.0.55.012 - Australian Health Survey: Consumption of Food Groups from the Australian Dietary Guidelines, 2011-12](#); and [4364.0.55.007 - Australian Health Survey: Nutrition First Results - Foods and Nutrients, 2011-23](#)

⁹ Birch, L.L. (1998). Development of food acceptance patterns in the first years of life. *Proceedings of the Nutrition Society*, 57, 617–624; Köster, E.P. & Mojet, J. (2007). Theories of food choice development. In: Frewer, L. & Van Trijp, H. C. M. (eds.): *Understanding consumers of food products*, Abingdon, Cambridge UK, Woodhead.

- Acceptance. Positive and negative emotions towards eating new foods and towards eating vegetables.
- Neophobia. Fear of trying new things.
- In terms of the five consumption blockers identified in the VG22003, Taste and Learn focussed on *Taste and Enjoyment* and *Knowledge and Skill*.

Strategic appropriateness

Was the strategy appropriate to the problem being addressed?

- Several settings were identified as providing potential opportunities to improve children's vegetable consumption, including home, community, pre-school and school settings. VG13089 noted that there had been several school programs in various European countries that aimed at behavioural change towards healthier eating through either 'sensory education' or 'taste lessons'. The emphasis of these programs had been to increase enjoyment and willingness to eat healthy foods in order to increase consumption of those foods. These programs had been implemented in schools, some for more than 10 years, with measured effectiveness including higher levels of success in primary school aged children.
- The Taste and Learn resources developed through VG13089 and VG15067 were designed to follow these successful international examples to achieve behaviour change by increasing familiarity and enjoyment of vegetables in a school setting.

To what extent were the right tools, delivery and implementation model used in addressing the consumption barriers?

- The Taste and Learn initiative was supported by a rigorous monitoring, evaluation and refinement process to ensure the materials were appropriate to the combined goals of addressing consumption barriers and maximising school uptake.
- In VG13089 Version 1 of the resource was piloted at a primary school in Sydney, and teacher feedback was incorporated into the revised resource. Version 2 was then tested in a validation study in two different socio-economic status areas in metropolitan Sydney, with teacher feedback was again sought to compliment the student focussed behaviour change analysis.
- VG15067 further developed and validated the resource by reviewing them against the Australian Curriculum (2016), and conducting expanded trials across 1639 students from 25 schools in NSW and SA including different methods of online and face to face teacher training.
- The final teacher-led vegetable education program consisted of five vegetable education lessons developed for each of the three stages of primary school, and was made available on a dedicated Taste and Learn website.
- The final teacher feedback (n=65) on the resource and delivery appropriateness showed:
 - The program and online training module were well received by teachers on all aspects measured.
 - Teachers would re-use and recommend the program.
 - Teachers felt the program had good alignment with the curriculum and materials were easy to use, both of which are important for uptake and reach.
 - Evaluation of preparation effort improved as a result of changes to the program from Version 2.
 - Additional face-to-face training offered some benefits over on-line training alone, indicating some form of teacher support may improve uptake in schools.

Was there a call to action trigger element?

- The resources reviewed in the evaluation did not present a specific call to action for primary adopters (schools, teachers) beyond identifying the pre-established need to increase vegetable consumption for health and wellbeing reasons, and the demonstrated potential for this new initiative to achieve the necessary behavioural change with resources that are relatively easy to use and integrate into the classroom.
- Messaging to students included underlying call to action themes based around: vegetables are fun and vegetables are interesting. The messaging specifically avoided a focus on health based on research showed this negatively impacted food acceptance among children.

Execution effectiveness

Was the program effectively implemented to change attitudes and consumption intent to drive behaviour change?

- The Taste and Learn initiative was supported by a rigorous monitoring and evaluation process to measure success.
- A scientific validation study measured the effectiveness of the vegetable education resources in achieving positive change in students in factors associated with vegetable intake. This culminated in a randomised controlled trial conducted with 1639 students from 25 schools.
 - The results showed that immediately following the intervention there was a significant positive effects of the intervention compared to the control group on all six behavioural metrics: knowledge, skills, acceptance, neophobia, willingness to try, and behavioural intent.
 - A follow up survey three months after the intervention showed that the positive results were only sustained for knowledge.
 - This data indicates the successful implementation of the material in engaging the target audiences and generating behaviour change including intent to eat more vegetables.
- The randomised control trial also sought to measure changes in actual vegetable consumption through a survey of parents whose children had been engaged in the intervention.
 - Unfortunately, only 205 parents completed this survey at post-test, which meant that the test was underpowered for these variables and the analyses did not find any significant effects on vegetable consumption.
 - In the earlier (smaller) trials, VG13089 had also found no significant effects on vegetable consumption.
- The decline in all behavioural variables after three months (except knowledge) and the lack of specific consumption change data generates uncertainty in the scale or duration of any benefit regarding consumption change.

Efficiency

How were resources used to achieve increased consumption?

- The Taste and Learn resources were used to refine and validate a new approach to classroom based vegetable education. The resource development included randomised controlled trials covering 1639 students from 25 schools in NSW and SA. These were intended as a large scale demonstration of concept in the intended setting (TRL-7) to develop a first of its kind education resource (TRL-8). The validation trials provided evidence that the resource could achieve immediate behavioural change including intent to increase consumption (while long term behavioural change and actual changes in consumption remained less certain).

- As noted by the Business Model and Commercialisation Strategy developed in VG15067, the project culminated as a “low intensity” resource, in that is freely available online in a passive setting, where individual teachers or schools can opt-in to use the resources (i.e. the resources are not actively promoted). The digital nature of the resource provides ongoing capacity for scale, but as noted by the Business Model, there is a need for ongoing investment to ensure long term success, particularly relating to the widespread uptake of the resources by schools.

Has the initiative complemented/leveraged other programs to increasing consumption?

- The Taste and Learn initiative (including VG13089 and VG15067) was framed as a novel school-based intervention, largely deviating from previous vegetable demand creation initiatives.
- Integration with VG16018 Phenomenom is one area of potential missed opportunity for integration and synergy. The overlapping goals (children vegetable consumption), cohort (primary school aged children) and strategies (making vegetables fun) suggest a opportunities for the Phenomenom and Taste and Learn resources to be delivered with some level of complementarity. This would not only provide potential synergies in achieving behavioural change outcomes (by providing multiple engagement channels with supporting messaging) but also reduce the burden for educators in having to potentially choose between multiple resource options with no clear link (i.e. presenting the resources as part of an integrated/layered approach rather than as individual intervention options). See Appendix 1 of VG22003 for an evaluation of the Phenomenom initiative.
- The final Taste and Learn resources were integrated into the VG16064 VegKIT resources *Best practice guidelines for increasing children's vegetable intake: Primary schools*, although industry surveys indicate that there has been limited awareness and use of these best practice guides to date (also delivered by CSIRO, see Appendix 2 of VG22003 for an evaluation of the VegKIT initiative).

Legacy

To what extent will the initiative have an on-going residual/lagged effect?

- A Business Model and Commercialisation Strategy for national roll-out was developed to maximise uptake and associated consumption outcomes. The recommendations included targeted phases to achieve uptake and a state-by-state roll-out approach based on consultation with nutrition and education experts:
- Phase 1 occurred in project (a program with low intensity teacher training available; a website with downloadable materials; and teachers accessing the resources through general registration).
- Phases 2-3 were driven by in-kind support from CSIRO and involved ongoing low-intensity promotion. Some of the recommended Phase-2-3 activities were undertaken including inclusion of the Taste and Learn resources in the Best Practice Guides delivered through VG16064 (VegKIT), and Government support for the project including Pick of the Crop – Health and Wellbeing QLD.
- Phase 4 (rollout of medium intensity model on state by state basis) and Phase 5 (Program evaluation). There is no evidence of these Phases having been undertaken, noting the recommendations were dependent on additional funding.

- Overall, the resources remain available for use; however, the program is largely passive, with no active promotion or integration with ongoing programs for changing children’s vegetable consumption.

Impact and investment return

Did the intervention lead to improved industry (economic) and social benefits?

- While project data indicated intent to increase vegetable consumption among children after exposure to the material, this declined after three months, and no data was captured on the specific scale and duration of any consumption change, generating some uncertainty regarding the potential for any sustained consumption change.
- Further, as the project culminated in a “low intensity” passive resource, the expectation for uptake among schools is relatively low. As such, while economic (increased demand supporting increased prices and industry expansion) and social (improved health outcomes) benefits of increased vegetable consumption are well documented, the indications are that the realised or expected industry and social benefits would be limited.

Did the investment deliver value for money for levy payers and funding bodies?

- In the first-round assessment of *Ex-post impact assessment (MT18011)*, the VG15067 was assessed and found to have a marginal positive impact with a benefit-cost ratio of 1.4:1.
- However the impact assessment was based on the assumption that the resources would be rolled out nationally (in line with the Business Model and Commercialisation Strategy) achieving 80% reach among children 8-12 years. These children were assumed to increase consumption by half a serve per day (based on unrelated research regarding the effects of health messaging on vegetable consumption, which was explicitly not part of the Taste and Learn program due to its proven negative effects on children’s vegetable consumption). Given the uncertainty over any long term behavioural and consumption changes, and the uncertainty of any national rollout due to a lack of resourcing to date, this impact appears optimistic.

Overall, was the initiative worthwhile?

- The randomised controlled trial indicated that the target stakeholders (teachers and students) were successfully engaged with the Taste and Learn resources, with short term improvements in behavioural drivers and intent to consume vegetables (although with uncertainty over medium to long term changes). The project also provided a detailed plan for a national rollout and ongoing monitoring and evaluation to driver and monitor the longer term impact for stakeholders. As such, the VG15067 project itself can be seen to have been a worthwhile exercise in concept development and planning for large scale implementation.
- However, the apparent lack of commitment to implement the Business Model and Commercialisation Strategy through further investment (by Hort Innovation or otherwise), highlights either a lack of confidence in the final resource and model, or a missed opportunity to make the final step from technology development to commercialisation.

Performance summary (using rubric)

The performance of VG15067 is summarised in Table A3.3 against the evaluation criteria developed for VG22003 considering the evidence compiled to address each KEQ reported on above.

Table A3.3: Performance summary

| Criteria | Performance | Rationale |
|---------------------------------------------------------------------------------------------|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Relevance <i>“Solving the right problems”</i> | Excellent | Six behavioural drivers were clearly identified and defined for the target cohort of children aged 5–12, as well as barriers to adoption and implementation of the resource in schools. |
| Strategic appropriateness <i>“Strategic approach is suitable to address the problem”</i> | Very good | The initiative demonstrated a comprehensive strategic intent through clear coordinated efforts involving consumption barriers (combining elements from sensory education with scientific insights on children’s development of vegetable acceptance) and implementation (including a randomised controlled trial involving 1639 students from 25 schools in NSW and SA to evaluate the effectiveness of the vegetable education program on student outcomes, and a survey of teachers to monitor and improve on the ease of adoption in the target environment). There was no clear call to action identified in the initiative, with a more subtle, underlying “trigger” of making vegetables fun and vegetable education easy to integrate into a classroom setting. |
| Execution effectiveness <i>“Using the right methods that are achieving results”</i> | Good | A comprehensive coverage of all components of behaviour change strategy were supported through integrated delivery; however, while results showed significant improvements in behavioural drivers and consumption intent, these declined three months after program delivery, and actual changes in consumption were not able found to be significant (due to an insufficiently large survey response). |
| Efficiency <i>“Use of resources”</i> | Emerging | The Taste and Learn initiative (including VG13089 and VG15067) was framed as a novel school-based intervention, largely deviating from previous vegetable demand creation initiatives. The program was incorporated into the resources and trails of VG16064 VegKIT (also delivered by CSIRO) including in the best practice guidelines and as a layered approach within one of the VG16064 primary school interventions. There was potential missed opportunities (notably VG16018 Phenomenom which was also a primary school intervention focussing on making vegetables fun). The validation trials provided evidence that the Taste and Learn resource could achieve immediate behavioural change including intent to increase consumption (while long term behavioural change and actual changes in consumption remained less certain). The digital nature of the final resource provides ongoing capacity for scale, but as noted by the Business Model, there is a need for ongoing investment to ensure long term success. |
| Legacy <i>“Ongoing utilisation”</i> | Emerging | Initial continuity potential was identified through the VG15067 Business Model and Commercialisation Strategy, with the project moving beyond Phase 1 (VG15067) and into Phases 2-3 (further extension through CSIRO in-kind support). Ongoing resource downloads indicate a continued legacy; however, the project noted any larger scale “medium-intensity” rollout would require ongoing funding which have not been committed to date. |
| Impact and investment return <i>“Realised increased consumption”</i> | Emerging | While data indicated intent to increase vegetable consumption among children after exposure to the material, this declined after three months, and insufficient data was able capture on the specific scale and duration of actual consumption change, generating some uncertainty regarding the potential for any sustained consumption change. Uptake of the resources is continuing among schools although at a slow pace reflecting the “low intensity” promotion setting. |

Discussion

Overall this evaluation assessed VG15067 performance as being “excellent” to “emerging” across the six criteria.

Strengths. The VG15067 performance was strongest for relevance, which was supported by the projects identification of multiple consumption barriers across for the target primary school cohort. The strategic appropriateness and execution effectiveness were also strengths, supported by the robust evidence based approach to inform resource development and intervention implementation.

Weaknesses. The performance was weakest in efficiency, impact and legacy. While the Taste and Learn intervention was incorporated the VegKIT canteen intervention trial (also delivered by CSIRO), VG15067 was otherwise a largely stand alone initiative potentially missing other opportunities for coordination with complimentary resources such as VG16018 Phenomenom which was being delivered at the same time. The project also provided a detailed plan for a national rollout and ongoing monitoring and evaluation to driver and monitor the longer term impact for stakeholders. However, the apparent lack of commitment to implement the Business Model and Commercialisation Strategy through further investment (by Hort Innovation or otherwise), highlights either a lack of confidence in the final resource and model, or a missed opportunity to achieve large scale behavioural change and impact.

Conclusion. Taste and Learn delivered vegetable education resources targeted at primary school children, with a focus on engaging across sensory markers (as opposed to nutrition education) to improve children’s vegetable acceptance. The program demonstrated positive effects against all six behavioural metrics: knowledge, skills, acceptance, neophobia, willingness to try, and behavioural intent, however these were only sustained in the short term. The program developed an approach for national rollout however this has not been resourced, resulting in limited uptake across schools beyond the pilot.

Implications and learnings for future investment

This section outlines the key implications and learnings VG15067 for informing future vegetable R&D levy funded programs to increase vegetable consumption.

Legacy and impact

- The legacy of the program would be supported by a clear overarching strategy that provides: (1) a long term plan for ongoing and scaled up implementation and stakeholder engagement; (2) a long term plan for updating resources to ensure they remain relevant to children's consumption barriers and the needs of individual settings; and (3) a mechanism for integrating the Taste and Learn resources into a broader strategy to ensure that delivery efficiencies are maximised, and that the approaches are coordinated and complimentary.
- Any long term strategy would be greatly enhanced by a corresponding long term monitoring and evaluation framework that clearly aligns data collection with desired behavioural change and consumption outcomes across each individual setting, and thereby enhances the ability to evaluate progress success (including through economic impact assessment) and also adjust program delivery over time as necessary.



VG22003: Evaluation report

Attachment 4

VegEze

February 2024

Initiative background

VegEze was an Apple iOS mobile app that engaged users in a 21-day diet challenge with the goal of increasing vegetable variety and overall vegetable consumption for participating Australian adults. VegEze was a pilot initiative funded through the vegetable R&D levy (VG16071 *Boosting vegetable consumption through diet*) and was delivered by CSIRO and Digital Wellness (formerly SP Health). The VegEze app embedded a range of behaviour change techniques to drive an increase in vegetable consumption, including a focus on goal setting and planning. The VegEze app was delivered as a community research study over a 6 month period to determine the validity of the approach for broader implementation to drive vegetable demand. Table A4.1 summarises the program, which each element described in further detail below.

Table A4.1: VegEze overview

| Program element | Description |
|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Funding model | Vegetable R&D levy with matched contributions from the Australian Government. |
| Duration | Launched November 2017 with study data collected over the 6 month period to May 2018. Following this period, the app remained available for download but user data was not collected. |
| Coverage | VegEze was targeted to all adults, however the majority of participants were women (84%). Engagement with the app was stimulated through national media coverage and resulting in data for n=1,313 21-day challenge participants. |
| Objective | The VegEze target behaviour was to increase vegetable variety (3 serves at dinner) as a precursor to overall consumption (0.5-1 serve) by participants over a 21-day challenge period. |
| Delivery | VegEze was delivered as a public Apple iOS mobile app, with development guided by the IDEAS (Integrate, Design, Assess, Share) Framework grounded in behaviour change theory, including with input from levy paying vegetable growers. VegEze was delivered by CSIRO and SP Health. |

Funding model

The development of VegEze was funded through the vegetable R&D levy with matched contributions from the Australian Government. The total levy investment into VegEze was \$949,028 (2022-23 dollars). The main costs related to technical development and establishing the psychological framework and nutritional content for the app.

Duration

The VegEze app was developed in 2017 and launched in November 2017 as a community research study. Using the Apple ResearchKit framework, participant data was collected until May 2018. VegEze remained available for download following the research period however this user data was not collected. As of 2023, the app was no longer available for download.

Coverage

VegEze was targeted at all Australian adults. Over the study period, the VegEze app was downloaded 12,777 times with data collected from 5,092 participants at baseline, 1,224 participants after the 21 day challenge, and 273 participants at a 90 day follow-up. Aside from the large majority (84%) of the baseline sample being female, the demographic characteristics of participants were generally representative of the broader Australian population.

Engagement with the app was supported by a broad range of mainstream media coverage including free-to-air television, radio interviews and social media in November 2017, resulting in over 86,000

impressions and 16,000 views in the App Store over the 6 months to May 2018. The majority of engagement occurred in November when the app was launched.

Objective

The objective VegEze was to increase the variety and overall consumption of vegetables, with a specific target of eating 3 types of vegetables at the main dinner meal through a 21-day challenge format. The focus on increasing vegetable variety as the core challenge was identified following an analysis of the CSIRO Diet Score data through MT16008¹⁰ which identified that people who 'always' have 3 different types of vegetables at their evening meal achieve a higher overall vegetable intake.

An overall study enrolment target of 10,000 participants was set, with 30% (n=3,000) still being active after 90 days. Overall vegetable consumption increases of between 0.5-1 serve were targeted for participants of the 21-day challenge.

Delivery

VegEze was developed as an Apple iOS mobile app that was available for free download for iPhone users. The app development was guided by the IDEAS (Integrate, Design, Assess, Share) Framework, and included input from levy-paying growers. The development of the app was guided by behaviour change theory through the COM-B model (Capability, Opportunity, Motivation to drive behaviour).

VegEze provided users with a 21 day challenge experience, facilitating the ability to track self-reported consumption across all meal occasions with an overall goal of consuming 3 different vegetables at the dinner meal. VegEze incentivised participants to set and meet consumption goals by providing reminders, and awarding participants based on the frequency of achieving consumption of three different vegetables at dinner. Users could access a range of supporting material through the app, including vegetable health benefits, preparation instructions and over 50 recipe meal suggestions that included at least 3 types of vegetables. While the app delivered a 21 day challenge experience, users could continue to log vegetable intake beyond 21 days.

¹⁰ Fruit, Vegetables and Diet Score (MT16008).

Evaluation process

The evaluation of the VegEze mobile app as a pilot intervention to support vegetable consumption behaviour change was informed through a range of material including project reporting, academic evaluations, and feedback from industry stakeholders. These resources provided the evidence to evaluate the intervention against the six evaluation criteria developed for VG22003.

The evaluation criteria focus on the extent to which VegEze supported, and has the potential to further support, increased vegetable consumption. Performance against the evaluation criteria was rated on a six-point scale ranging from poor to excellent (see the VG22003 Evaluation Framework for detail on the evaluation criteria and analytical rubric).

The key material consulted to inform the evaluation for VG22003 are summarised in Table A4.2 below.

Table A4.2: Resources informing the evaluation of VegEze

| Resource | Relevance |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Project reporting (Contract, Milestone Reports, Final Report) for VG16071 <i>Boosting vegetable consumption through diet</i> . | Outlines the objectives, progress, methodology, outputs, outcomes and M&E results regarding the VegEze app development and release. |
| Hendrie et al. (2018). VegEze Impact Report. | Summarises the impact of VegEze on consumption including vegetable variety, serves per day against baseline for 21 day challenge and at a 90 day follow up across a broad range of demographics. |
| Hendrie et al. (2019). The Development of VegEze: Smartphone App to Increase Vegetable Consumption in Australian Adults. <i>JMIR Form Res</i> 3(1):e10731. | Describes the process of developing the VegEze app including the alignment to behaviour change theory including self-monitoring, social comparison and gamification strategies. |
| Hendrie et al. (2020). Impact of a Mobile Phone App to Increase Vegetable Consumption and Variety in Adults: Large-Scale Community Cohort Study. <i>JMIR Mhealth Uhealth</i> 8(4):e14726. | The impact of the VegEze app was assessed considering Reach, Effectiveness, Adoption, Implementation and Maintenance (RE-AIM) leveraging participant data. |

Evaluation findings

This section outlines the evidence collected against each of the six evaluation criteria informed by a detailed review of the material identified in Table A4.2, followed by the assessed performance standard against each criteria, and discussion of the findings.

Evaluation Criteria

Overall the VegEze app demonstrated an emerging level of performance against the criteria. The extent to which the Framework KEQs have been supported is summarised as follows, drawing from the broad range of evidence and feedback collected.

Relevance

Was the initiative targeted to a high priority issue?

- Analysis of vegetable consumption data from the CSIRO Diet Score through MT16008 identified that people who 'always' consumed 3 serves of vegetables at dinner (46%) had an increased likelihood of meeting the recommended vegetable dietary guidelines.
- The VegEze app was structured around achieving the target behaviour to *eat 3 different vegetables at dinner*.
- This represents a novel, specific behaviour associated with increased vegetable consumption.

To what extent did the initiative target one or more consumption barrier(s)?

- *Knowledge and Skills:*
 - Prompting goal setting, planning and self-reported tracking to drive participant knowledge of actual vegetable consumption against target behaviours (motivation).
 - Providing recipes that feature three different types of vegetables, serving size information and preparation tips for a broad range of vegetables (capability and opportunity).

Was the intervention targeting a prime prospect cohort?

- The VegEze app could be downloaded by all iPhone users, however study data was collected from consenting adults aged over 18.
- In 2017, 81% of Australians used a smartphone and 42% of mobile phone users were Apple iPhone. While VegEze was delivered in a format not accessible to all adults, a sufficient participant base was still achieved.
- From November 2017 to May 2018, VegEze generated 86,304 impressions, 16,331 product views, and 12,777 downloads. N=5,092 VegEze users completed the baseline survey, n=1,313 completed the 21 day survey and n=325 completed the 90 day survey.
- The majority of participant data collected at baseline (n=5,092) were female (84%).
- While other user demographics were generally representative of the Australian population, the app was associated with a higher share of users who were overweight or obese.

Strategic appropriateness

Was the strategy appropriate to the problem being addressed?

- VegEze development was grounded in behavioural theory. The theory-based approach recognises that for a behaviour to occur, an individual must have the capability, opportunity and motivation to drive behaviour (COM-B).

- VegEze was developed to support the requirements of behaviour theory, and directly addressed 16 behaviour change techniques which were primarily focused on goals and planning.
- VegEze drew on other strategies including self-monitoring, social comparison and gamification which have been linked to successful dietary change or health interventions.
- Prior to VegEze, strategies to increase the variety of vegetable consumption to support overall intake using a mobile app grounded in behavioural theory had not been explored.
- The VegEze app therefore offered an appropriate strategic intervention concept to drive vegetable consumption.

To what extent were the right tools, delivery and implementation model used in addressing the consumption barriers?

- All aspects of the VegEze app design and development were tested and validated with potential users prior to launch.
- VegEze was launched in November 2017 via the Apple App Store, with associated coverage across mainstream media outlets.
- Following the launch, no other implementation, partner outreach or stakeholder engagement occurred.

Was there a call to action trigger element?

- There was a call to action focused on the target behaviour “Do 3 at dinner” utilised in the VegEze app.
- This call to action was not a strong feature in media or broader app engagement.

Execution effectiveness

To what extent did the creative execution and delivery address behavioural drivers or barriers for the target cohorts?

- Only 15% of sample participants actively used VegEze for the entire 21 days of the challenge. While this attrition is comparable to other eHealth interventions, this highlights a limitation of the approach for sustaining engagement beyond the short term.
- Users actively used VegEze for an average of 6.3 days out of the total 21 day challenge period, with just 1.2% of participants using the app for all 21 days.
- 59% of participants reported an increase in their vegetable consumption from baseline following the 21 day VegEze challenge, with an average increase of 0.48 serves.
- 61% of participants who completed the 90-day survey reported an increase in their vegetable consumption from baseline, at a similar level to end of the 21 challenge period.
- Increases in vegetable consumption were associated with a positive change in the overall types of vegetables consumed per day.
- Participants with higher app usage were associated with higher changes in consumption (0.63 serves) compared to low users (0.32 serves).

Was the creative execution effective at changing attitudes and consumption intent to drive behaviour change?

- A small but significant increase in positive attitudes towards eating a greater variety of vegetables, nutrition self-efficacy and vegetable related planning during the 21 day challenge period was recorded.

- As attitudes towards eating a greater variety of vegetables were high at baseline, the participating sample may already have a high level of motivation, which may impact generalisation to broader populations.
- While the launch of VegEze was initially covered across mainstream media, no ongoing cross-promotion occurred, so there was limited opportunity for ongoing execution.
- Long term changes to attitudes and behaviours beyond the 90 day period were not measured.

Was the program effectively implemented to drive behaviour change?

- Engagement with VegEze was initially supported by a wide range of media coverage aligned to the launch and implementation of the app in November 2017.
- The majority of impressions, product views and downloads occurred in the first month of the app launch which coincided with the media coverage.
- VegEze was focused on recruiting participants over a 6 month study period. While overall participation was sufficient to inform statistically significant analysis of consumption changes, the overall enrolment target of 10,000 was not met.
- The results of VegEze provided a promising intervention concept for driving target behaviours, however as no broader implementation has occurred the opportunity for driving wide scale behaviour change was limited.

Efficiency

How were resources used to achieve increased consumption?

- The development of a mobile app to promote health behaviours provides the opportunity to reach a broad share of the Australian population.
- VegEze was developed as a single version release, with no scope for updates, enhancements or additional content development. To maintain ongoing relevance and functionality, the provision of resourcing for ongoing updates would be required.
- The development of VegEze was based on the Apple operating system. Focusing on a single interface was sufficient for research purposes however additional cost would be required to make the app available for other mobile operating systems.
- The Apple ResearchKit Framework enabled participant usage data to be readily captured in the app for analysis and reporting.

Has the initiative influenced/complemented/leveraged other programs to increasing consumption?

- VegEze has not supported the delivery of other related programs.

Legacy

To what extent will the initiative have an on-going residual/lagged effect?

- The VegEze app continued to remain available after the study period (May 2018), however the total user engagement and behaviour was not recorded.
- As total VegEze downloads dropped significantly after the first month of media promotion it is unlikely that a strong ongoing legacy was supported while the app remained available for download following the study period.
- The long term legacy of participation in the 21 day challenge for influencing broader vegetable consumption behaviours for study participants is unknown.

- As VegEze is now no longer available from the App Store as of 2023, there is limited potential for the intervention to influence additional cohorts.

Impact and investment return

Did the intervention increase consumption leading to improved industry (economic) and social benefits?

- Participation in the 21 day challenge was associated with an increase in the variety and total serves of vegetables consumed.
- With an average increase of 0.48 serves recorded across 1,224 participants across the challenge period, this resulted in approximately 12,000 additional serves of vegetables (or around 925kg assuming a 75 gram serve) directly attributable to VegEze.
- These changes were sustained over a 90 day follow up period.
- The relatively small levels of participation, underpinned by the focus of the intervention for research purposes mean that the immediate impact of the VegEze app was not commercially relevant for the vegetable industry for stimulating more vegetable sales.
- This highlights the importance of establishing a broader implementation plan that can drive ongoing uptake with R&D outputs.

Did the investment deliver value for money for levy payers and funding bodies?

- Total vegetable demand increase of 925kg directly estimated over the study period driven by an increase of 0.48 serves per day by participants. The extent to which consumption changes are sustained over the long term (beyond 90 days) were not determined.
- From a total investment \$763,276 this equates to \$61.89 per serve.
- The absence of broader implementation has resulted in limited value for money being achieved for vegetable levy payers from their levy investment in VegEze.
- VegEze is no longer available for download for the App Store as of 2023.

Overall, was the initiative worthwhile?

- The target behaviour of eating 3 different types of vegetables at dinner through the 21 day challenge via the VegEze mobile app was shown to support short term positive changes in overall vegetable consumption.
- While a positive proof of concept was established, VegEze did not progress or evolve beyond the pilot phase, limiting the capacity of the intervention to drive commercially-relevant vegetable demand outcomes.

Performance summary (using rubric)

The performance of the VegEze levy investment is summarised in Table A4.3 against the evaluation criteria developed for VG22003 considering the evidence compiled to address each KEQ reported on above.

Table A4.3: Performance summary

| Criteria | Performance | Rationale |
|---------------------------------------------------------------------------------------------|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Relevance <i>"Solving the right problems"</i> | Very good | A positive association between vegetable variety and overall intake was established through MT16008, providing a relevant basis for the VegEze target behaviour of consuming 3 different vegetables at dinner to drive overall vegetable intake. |
| Strategic appropriateness <i>"Strategic approach is suitable to address the problem"</i> | Emerging | VegEze was grounded in behavioural theory with a focus on planning and goal setting to support capability, opportunity and motivation to drive behaviour change. The strategic approach was grounded as 'proof of concept' research. Following the launch, no other implementation, partner outreach or stakeholder engagement occurred, limiting the potential for aligning with other supporting initiatives. |
| Execution effectiveness <i>"Using the right methods that are achieving results"</i> | Emerging | Recruitment targets (n=10,000) were not met, however data was still collected for over 1,000 21 day challenge participants. Overall consumption increases of 0.48 serves per day were recorded following the challenge period, and these were sustained when measured at a 90 day follow up. VegEze struggled to maintain user engagement across the challenge period, with just 15% of users actively using the app across the entire period. |
| Efficiency <i>"Use of resources"</i> | Emerging | VegEze was developed exclusively for Apple iPhone, so additional resources would be required to expand the app to other mobile operating systems. The low number of downloads after launch indicates untapped potential in the share of the total possible audience. Ongoing costs for updates and maintenance would be required. The app did not support or influence other programs. |
| Legacy <i>"Ongoing utilisation"</i> | Not yet emerging | VegEze is now no longer available from the App Store as of 2023, so there is limited potential for the intervention to influence additional cohorts. |
| Impact and investment return <i>"Realised increased consumption"</i> | Emerging | Over the study period, approximately 900kg of additional vegetables were consumed through VegEze participation. As the long term impact was not measured and VegEze was not maintained beyond the study period, a commercially relevant return for vegetable levy payers was not realised. |

Discussion

Overall this evaluation assessed VegEze performance as being “Very good” to “Not yet emerging” across the six criteria.

Strengths. VegEze was delivered as an eHealth research intervention to determine whether increasing the variety of vegetables at the dinner meal supported overall increases in vegetable consumption. VegEze engaged participants through a mobile app, which drew on a range of behaviour change techniques and broader strategies such as self-monitoring, social comparison, gamification to influence attitudes, nutritional self-efficacy and planning. As data analysed through the CSRIO Total Wellbeing Diet identified that people who ‘always’ consumed at least three vegetables at dinner had a higher likelihood of meeting the recommended dietary intake, further exploring the potential value of influencing behaviours around vegetable variety was a relevant and valuable approach.

Weaknesses. With a design grounded in behaviour change theory, VegEze was established as a scientifically valid research tool to determine the influence on target behaviour change. However while this research strategy was clearly established, a broader engagement strategy to extend the utilisation of the VegEze platform beyond the research phase was not explored. This was a significant limitation of the research design, given that proof of concept for VegEze was demonstrated through increases in vegetable variety and consumption achieved as a result of participation in the 21 day challenge. Stakeholder feedback identified that future opportunities for VegEze were explored with potential partners, however stakeholder support to provide ongoing funding to enable widescale rollout was not achieved, therefore limiting the ongoing utilisation of the intervention tool to a wider range of specific settings and cohorts.

Conclusion. While a suitable intervention mechanism was validated through the VegEze research phase, a commercially relevant impact for vegetable levy payers and ongoing legacy of the delivered outputs and findings was not realised. The absence of involvement by a strategic commercial partner throughout the planning and research phases to support ongoing legacy was a key gap that impacted the overall investment return and influence.

Implications and learnings

This section outlines the key implications and learnings of VegEze for informing future vegetable R&D levy funded programs to increase vegetable consumption.

Engage commercial partners in the R&D process

- While VegEze served as a scientifically valid intervention to increase vegetable consumption, ongoing impact was limited through the absence of broader implementation with supporting commercial partners (e.g. health care providers, insurers).
- Engaging potential partners in the design and R&D process would support a higher willingness to leverage the outputs as partners can have input and ownership.

Sustained efforts required to maintain awareness and engagement

- The number of VegEze downloads and challenge completions was not sustained over the 6 month study period following the initial launch media coverage.
- Future R&D interventions with a reliance on public participation should be supported by an 'always on' engagement mechanism to drive relevance and awareness.
- Partners to support engagement should be identified during formative research stages and leveraged throughout the R&D cycle to support uptake and relevance across broader cohorts.

Balance short term proof of concept with long term behaviour insights

- VegEze was validated over a short term time horizon (6 months) to serve as a proof of concept approach for driving increased vegetable consumption.
- Establishing the longer term validity of interventions for underpinning behaviour change should also be considered in the R&D design process.
- Stop/Go milestones or a research program approach could be used to ensure that short term validation is secured before funding and R&D can then progress to exploring longer term impacts.

Intervention personalisation

- The proof of concept R&D phase was applied consistently to all participants (Australian adults) resulting in variation to the way demographic cohorts responded to the 21 day challenge stimulus (e.g. App usage, consumption changes).
- Testing and validating a variety of intervention formats could be used to establish intervention 'best fits' that are optimised to specific demographic cohorts.
- Intervention personalisation could be explored through an iterative process underpinned by an initial 'proof of concept' that informs 'personalisation' for target demographics.



VG22003: Evaluation report

Attachment 5

Veggycation®

February 2024

Initiative background

Veggycation® is an online resource (veggycation.com.au) that aims to increase consumer knowledge and awareness about vegetable types, health/nutrition and cooking/preparation methods to drive increased consumption. Veggycation® was an initiative funded through the vegetable R&D levy. Veggycation® was initially developed and launched in 2014 (VG12043), before being refreshed in 2018 (VG16080) to accommodate a contemporary user interface. While focused on consumer education, the website also includes ‘information for farmers’ for each vegetable covering harvesting, postharvest storage requirements, and disease. This evaluation focuses on the consumer education facing elements of the Veggycation® website resource. Table A5.1 summarises the program, which each element described in further detail below.

Table A5.1: Veggycation® overview

| Program element | Description |
|------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Funding model | Vegetable R&D levy with matched contributions from the Australian Government. |
| Duration | Delivered in 2014, updated in 2018. Website is still hosted by Hort Innovation. |
| Coverage | 82 vegetables profiled and mapped across 32 different nutrients, 9 health benefits and 7 cooking methods. The website is targeted at adults who are responsible for the purchase and/or preparation of meals in the household. |
| Objective | Veggycation® seeks to educate and inspire the Australian general public to eat more vegetables through driving an increased understanding of health benefits and cooking methods. |
| Delivery | Veggycation® was delivered as a public website, with input from levy paying vegetable growers and industry stakeholders. Additional media including flyers and posters were also delivered through the website for broader use. Delivery partners involved in the development and refresh included NZ Plant and Food Research; MacTavish West; and HardHat Digital. |

Funding model

The development of Veggycation® was funded through the vegetable R&D levy with matched contributions from the Australian Government. The total levy investment into Veggycation® was \$889,358, delivered across the initial 2013 launch (\$463,563) and subsequent 2018 refresh (\$452,795) (2022-23 dollars). The main costs to Veggycation® included developing content, technical development/hosting, design, and stakeholder workshopping.

Duration

Veggycation® was developed and launched in 2013 through the Hort Innovation project VG12043. Following the launch of the 2017-2021 Vegetable Strategic Investment Plan (SIP), and the Review of Vegetable Digital Assets (VG16014) project, the vegetable industry elected to update and revise the Veggycation® resource in 2017 through project VG16080, given it was noted as a key digital platform for the industry. The Veggycation® website remains live and accessible although no additional investment has been dedicated to maintenance or promotion.

Coverage

Veggycation® profiles 82 vegetable types, including information on nutrients, health benefits and cooking/preparation tips for each vegetable. This was a significant expansion in the number of vegetables profiled up from 22 vegetables in the initial 2013 release.

The initial release had a strong focus on health messaging through aligning vegetables to health claims. This process was based on aligning pre-approved nutrition and health claims (n=9) from FSANZ and nutritional data from Australian Nutrient Tables for each vegetable. The 2018 update,

informed by stakeholder input and the vegetable SIP extended the focus to include cooking/preparation information in support of 'consumer education'. The 9 original health claims were carried over into the 2018 update.

Veggycation® was initially launched with supporting resources such as posters, flyers and flashcards that sought to target a broad audience including teachers/children, healthcare professionals, vegetable grocery buyers and consumers. Resources that supported vegetable growers to market particular vegetables using health claims were also provided through a separate (not public) portal. The 2018 update refined the target audience to adults responsible for the purchase and preparation of household meals, and the general population more broadly, as supporting downloadable resources were removed.

Objective

The initial objective of Veggycation® was to enable greater use of relevant nutrition and health labelling for fresh vegetables to educate consumers on the health benefits of vegetable consumption to drive increased consumption.

The 2018 refresh extended the initial focus on nutrition and health labelling to focus on information relating to vegetable cooking/preparation methods and general tips to enhance the experience when consuming the various vegetables.

Delivery

Veggycation® was first developed and delivered in 2013. The educational content was developed with stakeholder input, and scientifically valid nutrition and health information was assembled using nutrition databases and scientific literature, and translated into consumer-relevant language. Content was organised into a database-style website, with additional downloadable resources, to support engagement and awareness 'offline', e.g. posters of vegetable health benefits to be displayed in health care centres.

Following the website launch in 2013, stakeholder engagement activities to drive awareness occurred at 11 industry conferences, with 22 supporting communications articles and over 15 media articles across 2013 and 2014. In addition, 9 workshops engaging 125 industry stakeholders (grower, wholesaler, retail, education, health care) were held to promote engagement with the website and the potential value integrating vegetable health claims on packaging or in store. There were also opportunistic efforts to engage with complimentary initiatives to drive further utilisation, such as the Stephanie Alexander Kitchen Garden Foundation.

Veggycation® delivery was extended in 2018 through the website refresh, that leveraged best-practice website design principles to deliver a user-friendly experience across desktop and mobile. The total number of vegetables was expanded from 22 to 82 as part of the refresh, and included additional information on preparation and cooking to support consumer education. A process for driving stakeholder engagement did not feature in the 2018 update.

Evaluation process

The evaluation of the Veggycation® educational resource was informed through a range of material including project reporting, academic evaluations and website analytics. Contact details to support consultation with stakeholders who were involved in the development and delivery of Veggycation® could not be identified. These available resources still provided suitable evidence to evaluate the resource against the six evaluation criteria developed for VG22003.

The evaluation criteria focus on the extent to which Veggycation® supported, and has the potential to further support, increased vegetable consumption. Performance against the evaluation criteria was rated on a six-point scale ranging from poor to excellent (see the VG22003 Evaluation Framework for detail on the evaluation criteria and analytical rubric).

The key material consulted to inform the evaluation for VG22003 are summarised in Table A5.2 below.

Table A5.2: Resources informing the evaluation of the Veggycation® resource

| Resource | Relevance |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| Project reporting (Contract, Milestone Reports, Final Report) for VG12043 <i>Conveying the health benefits of Australian vegetables</i> | Outlines the objectives, progress, methodology, outputs, outcomes and M&E results regarding the initial Veggycation® development and release in 2013. |
| Project reporting (Contract, Milestone Reports, Final Report) for VG16080 <i>Vegetable digital asset redevelopment – Veggycation</i> | Outlines the objectives, progress, methodology, outputs, outcomes and M&E results for the Veggycation® refresh process in 2014. |
| Google Analytics data supplied by Hort Innovation for the URL: veggycation.com.au | Identifies the level of engagement achieved through the website platform. |
| Rekhy et al. (2017). Consumer evaluation of 'Veggycation®', a website promoting the health benefits of vegetables. <i>Health Promot J Aust.</i> 28(1) 21-29. | Assessment of how the Veggycation® website appealed to various consumer groups for supporting knowledge and food literacy. |

Evaluation findings

This section outlines the evidence collected against each of the six evaluation criteria informed by a detailed review of the material identified in Table A5.2, followed by the assessed performance standard against each criteria, and discussion of the findings.

Evaluation Criteria

Overall the Veggycation® educational platform program demonstrated an emerging level of performance against the criteria. The extent to which the Framework KEQs have been supported is summarised as follows, drawing from the broad range of evidence and feedback collected.

Relevance

Was the initiative targeted to a high priority issue?

- While vegetables are generally accepted to be ‘healthy’ bespoke consumer research completed through VG12043 (n=1000) and later published¹¹ identified a low level of knowledge regarding the specific health benefits across different vegetables.
- Increased knowledge of vegetables (including health benefits) has been linked with higher intakes amongst Australians. Adequate vegetable knowledge is associated with an additional 95 grams of vegetables consumed daily compared to those with poor knowledge.¹²
- Veggycation® enabled standardised, scientific health claims to be aligned across a broad range of common vegetables.

To what extent did the initiative target one or more consumption barrier(s)?

- *Knowledge and Skills:*
 - Providing scientifically valid health claims and nutrition information for a broad range of vegetables.
 - Providing suitable cooking, preparation and storage tips for a broad range of vegetables.

Was the intervention targeting a prime prospect cohort?

- Veggycation® targets all Australians, however the style and nature of information supplied through the current release was more suited to adults with responsibility for grocery purchase and consumption.
- The 2013 release provided resources and materials suitable for use in school education settings with literate children 7 years or older.
- Accessing health information through the internet is an important tool in supporting and promoting health education and literacy.
- Between 174 and 865 users per month accessed the website in 2015, resulting in between 669 and 2,784 page views per month.
- Throughout 2023, approximately 4,000 pageviews were generated per month from 2,800 users indicating that the website continued to remain relevant for audiences.

¹¹ Rekhy R, Khan A, Mactavish-West H, Lister C, Mcconchie, R (2017). Australian consumer awareness of health benefits associated with vegetable consumption. *Nutr Diet.* 74(2): 175-184.

¹² Hill CR, Blekkenhorst LC, Radavelli-Bagatini S, Sim M, Woodman RJ, Devine A, Shaw JE, Hodgson JM, Daly RM, Lewis JR. (2020). Fruit and Vegetable Knowledge and Intake within an Australian Population: The AusDiab Study. *Nutrients.* 12(12):3628. <https://doi.org/10.3390/nu12123628>

Strategic appropriateness

Was the strategy appropriate to the problem being addressed?

- When initially developed in 2013, the internet accounted for around 80% of all health information access (Rekhy *et al.* 2017).
- Until the launch of Veggycation® in 2013, there was no online resource that consolidated the health benefits of vegetables in a consumer-facing format.
- Recent levy funded consumer research has shown that the ‘healthy and nutritious’ needs pillar is responsible for driving only 33% of fresh produce consumption moments, compared with 60% for ‘Tasty’ and 59% for ‘Quick and Easy’.¹³ Therefore health related messaging presents a relatively weaker strategic opportunity to leverage changes to attitudes and behaviours.
- The 2018 update provided a broader coverage of vegetable education topics including preparation and storage, however health and nutrition remained the primary message.
- A standalone ‘health promotion’ strategy is therefore not a favourable approach to drive vegetable consumption behaviour change.

To what extent were the right tools, delivery and implementation model used in addressing the consumption barriers?

- Veggycation® was launched in 2013 as a standalone website, with supporting resources to engage broader audience groups.
- Initial stakeholder engagement occurred around the launch to build understanding with the versatility and potential opportunity for linking health claims across vegetable product marketing.
- The 2013 website was well accepted by users (Rekhy *et al.* 2017) and the 2018 update ensured that navigation and user experience continued to be of an acceptable standard given rapidly changing technology (e.g. mobile compatibility).
- Following the 2018 launch, no other implementation, partner outreach or stakeholder engagement occurred.

Was there a call to action trigger element?

- Two call to action triggers were used over the life of Veggycation®:
 - *Veggycation – loving the health benefits* (2013)
 - *Spreading the vegetable love* (2018)
- These call to actions were seldom used for broader audience engagement.

Execution effectiveness

To what extent did the creative execution and delivery address behavioural drivers or barriers for the target cohorts?

- The Veggycation® design and creative was received favourably by intended audience groups.
- While the design and content was rated favourably, health related messaging is not associated as a strong behavioural driver for increasing vegetable consumption.

¹³ Hort Innovation (2022). *Horticulture Demand Spaces – Introducing the Domestic Growth Framework (MT21003)*. Report produced by Kantar. <https://www.horticulture.com.au/growers/help-your-business-grow/research-reports-publications-fact-sheets-and-more/mt21003/>

- Broader behavioural drivers such as *Taste and Enjoyment* were not addressed, impacting effectiveness.

Was the creative execution effective at changing attitudes and consumption intent to drive behaviour change?

- There was no broader implementation engagement strategy or ongoing cross-promotion of Veggycation® so there was limited opportunity for traction of the creative execution.
- Changes in attitudes and behaviours following the release and update of Veggycation® were not measured.
- With no other supporting behaviour change activity, it is unlikely that any material long term changes to vegetable consumption can be attributed to Veggycation®.

Was the program effectively implemented to drive behaviour change?

- Veggycation® lacked an implementation plan following the completion of each levy-funded R&D project.
- The website had potential to be leveraged across other educational initiatives seeking to increase vegetable consumption, such as Food Sensations® or the Stephanie Alexander Kitchen Garden Program.
- Veggycation® content is still relevant, however limited implementation has stalled any opportunity to drive wide scale behaviour change, with only opportunistic audience engagement.

Efficiency

How were resources used to achieve increased consumption?

- Delivering health related messaging about vegetables through an online format was an efficient platform for reaching a mass audience as most of the Australian population has internet access.
- The 2018 update ensured a professional and mobile-compatible user interface could maintain engagement with audience groups.
- There is the potential for the resource to be leveraged across a range of supporting platforms (e.g. school education, health care professional engagement, health insurance providers), however this has not occurred to date.
- As health and nutrition information fundamentals do not change in the short term, substantial refresh of content is not required.

Has the initiative influenced/complemented/leveraged other programs to increasing consumption?

- Veggycation® has not supported the delivery of other related programs.

Legacy

To what extent will the initiative have an on-going residual/lagged effect?

- While Veggycation® investment concluded in 2018, the website domain has remained active.
- A small, but sustained number of unique users continue to access the website with around 2,800 users generating 4,000 page views per month throughout 2023.
- There is significant potential to strengthen the legacy of Veggycation® through more active engagement and outreach that leverages industry and commercial partners.

Impact and investment return

Did the intervention increase consumption leading to improved industry (economic) and social benefits?

- The impact of Veggycation® on vegetable consumption was not measured.
- Across the total audience that has engaged with the website to date, there is some potential for overall attitudes and knowledge of health benefits and preparation methods to have been supported.
- However, as Veggycation® was not linked to any other supporting behaviour change theory or initiative, it is unlikely that the resource has contributed to any broad and sustained consumption growth.

Did the investment deliver value for money for levy payers and funding bodies?

- Over the period from 2013 to 2018, a total of \$889,358 (2022-23 dollars) was invested in the development of Veggycation®.
- A value for money measure is unclear given there is no discrete measure of impact (consumption increase) available.
- Value for money would be strengthened if the health benefit messaging could be leveraged to elevate broader educational or promotional programs that address other consumption barriers.

Overall, was the initiative worthwhile?

- Veggycation® addressed an important knowledge gap that delivered simple health related identifiers for a broad range of vegetables, representing a suitable use of the R&D vegetable levy funds.
- While Veggycation® was received favourably through independent audience evaluations, the resource has not achieved its full potential given there was no strategic plan for broader implementation and extension.
- The extent to which the resource has influenced behaviours is unclear. As it was delivered 'standalone' it is unlikely that sustained behaviour change has been supported.

Performance summary (using rubric)

The performance of the Veggycation® levy investment is summarised in Table A5.3 against the evaluation criteria developed for VG22003 considering the evidence compiled to address each KEQ reported on above.

Table A5.3: Performance summary

| Criteria | Performance | Rationale |
|---------------------------------------------------------------------------------------------|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Relevance <i>"Solving the right problems"</i> | Very good | Low knowledge of vegetable health benefits combined with a link between improved vegetable knowledge and increased intake represented a suitable consumer education opportunity applicable to a broad population. |
| Strategic appropriateness <i>"Strategic approach is suitable to address the problem"</i> | Emerging | Health related messaging offers a relatively weaker opportunity for influencing consumption compared to 'taste' and 'convenience'. Delivering educational material through online formats is an accepted strategy for reaching wide audiences, however there was no other alignment to complimentary strategies seeking to drive consumption. |
| Execution effectiveness <i>"Using the right methods that are achieving results"</i> | Not yet emerging | There was no sustained engagement or cross-promotion of the resource, resulting in limited opportunity for wide scale public traction. While content detail and messaging were rated positively, limited strategic dissemination impacted the effectiveness of execution. |
| Efficiency <i>"Use of resources"</i> | Emerging | The delivery of educational content through online platforms is an accepted mechanism to efficiently reach a wide audience. The resource continues to generate around 4,000 monthly pageviews, indicates potential in the share of the total possible to leverage ongoing engagement. Veggycation® has not supported or influenced other programs. |
| Legacy <i>"Ongoing utilisation"</i> | Emerging | Website content can still be accessed, representing potential to engage industry and commercial partners with 'health messaging' as part of a broader behaviour change strategy. |
| Impact and investment return <i>"Realised increased consumption"</i> | Not yet emerging | The impact of Veggycation® on vegetable consumption was not measured. While website content was received favourably through audience testing, this standalone element is unlikely to influence sustained behaviour over the long term. |

Discussion

Overall this evaluation assessed Veggycation® performance as being “Very good” to “Not yet emerging” across the six criteria.

Strengths. While it is commonly understood that ‘vegetables are good for you’, a consumer facing resource that identified and linked the specific health benefits of vegetables was not available prior to Veggycation®. Further, as knowledge of specific vegetable health benefits were poor amongst consumers, Veggycation® represented a promising and relevant approach to address this knowledge gap and strengthen attitudes towards consumption. The development of the resource including nutritional information, health benefits, visual appeal and navigation were all positively received during audience testing and underpinned by extensive stakeholder engagement. The online format also aligned with efficiently enabling reach and accessibility for a broad population.

Weaknesses. While the focus on ‘health’ through Veggycation® aligns with the *Knowledge and Skill* consumption barrier, research has since identified ‘health’ to be a relatively weaker vegetable consumption driver compared to other areas such as convenience and taste. Furthermore, as Veggycation® was not implemented strategically (e.g. capitalising on opportunities to connect and drive uptake of the resource with complimentary initiatives), it is unlikely that the single ‘health’ message was sufficient to drive long term behaviour change. As no follow up data has been collected on recall, awareness or utilisation of the resource a return on levy investment figure is challenging to determine. Therefore limited implementation is a ‘missed opportunity’ for generating traction with the resource content, especially given the general high quality nature of material produced.

Conclusion. There remains a consistent level of engagement with 4,000 page views per month recorded in 2023 despite the most recent investment concluding in 2018. This indicates there is potential for an influential legacy to still be realised through Veggycation® if the educational material can be leveraged by other state health, food literacy, or school based intervention programs. Until this occurs, the full potential for Veggycation® in contributing to consumer behaviour change is unlikely to be realised.

Implications and learnings

This section outlines the key implications and learnings of Veggycation® for informing future vegetable R&D levy funded programs to increase vegetable consumption.

Implementation is required to activate consumer education R&D

- R&D that delivers consumer education material to address knowledge gaps and consumption barriers is a legitimate and important mechanism to overcome ‘market failures’.
- While Veggycation® targeted a clear knowledge gap regarding the health benefits of vegetables, its full potential was not realised as there was no structured implementation post-delivery that activated the resource over the long term.
- R&D delivering consumer education must leverage third parties that can extend resources directly to target audiences to ensure full potential is realised and legacy sustained.

One size does not fit all

- While consumer educational resources delivered through levy-funded R&D can address specific *Knowledge and Skills*, behaviour change is underpinned by a much broader range of drivers.
- The conditions to deliver behaviour change outcomes will vary across cohorts so a range of touchpoints are required which go beyond R&D (such as partnerships across consumption settings).
- Opportunities to integrate “health and wellness” knowledge with other behavioural drivers could be supported by a future Veggycation® 2.0 style investment, but only if underpinned by sustained engagement with resources that connect other behavioural drivers. This would require support from third parties (e.g. health funds, schools, health care professionals).

Aligning R&D to behaviour change strategy

- The opportunity to leverage R&D funding to address consumer knowledge gaps and drive increased vegetable consumption should only be delivered where alignment to broader behavioural change strategy can be demonstrated.
- This will ensure that the delivery of R&D can be linked to supporting initiatives in a way that mobilises a greater collective influence for target audiences.
- As such, standalone consumer education R&D lacks the necessary influence to initiate attributable behaviour change outcomes and must be combined with a broader strategy which goes beyond R&D.



VG22003: Evaluation report

Attachment 6

Foodbank WA: Food Sensations® for Adults

February 2024

Initiative background

Food Sensations® was a free four-week nutrition and cooking program targeted at low to middle-income Western Australians seeking to improve their food literacy. The program was delivered by Foodbank Western Australia, who has provided a range of food literacy programs targeting adults, parents, and children since the mid-nineties. This evaluation focuses on the Food Sensations® for Adults (FSA) program that was first implemented in 2011. The aim of the FSA program is to empower participants with the knowledge and skills to make healthy food choices through intentions to select, prepare and eat nutritious foods for sustained healthy lifestyles. Table A6.1 summarises the program, which each element described in further detail below.

Table A6.1: Food Sensations® for Adults Program overview

| Program element | Description |
|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Funding model | Program iterations from 2016 to 2022 were funded by the Department of Health Western Australia. |
| Duration | Commenced in 2011 (ongoing through <i>nom!</i>). |
| Coverage | Over the seven years to 2022 6,837 adults have participated in the program. The program focused on adults earning low to middle-incomes. |
| Objective | People from low to middle income backgrounds increase their food literacy skills, leading to increased intent and consumption of healthy food (including fruit and vegetables). |
| Delivery | The program was delivered over a four-week period that includes a curriculum of x4 2.5 hours sessions. The curriculum lesson content was mapped to the four domains of food literacy (Planning & Management, Selection, Preparation & Cooking and Eating). Programs were delivered face to face at community centres primarily in the metropolitan Perth region, with online videoconferencing formats also used for remote participants and through the COVID-19 pandemic. |

Funding model

The FSA was funded by Department of Health Western Australia, and delivered by Foodbank Western Australia state team. Foodbank is a not-for-profit charity that provides: food and grocery relief for people; education to promote healthy eating; and advocacy for people experiencing food insecurity.

The program is delivered at no cost to participants. The funding received through the Department of Health supports Foodbank staff time, materials, lesson content and venue access. The cost of running the program for the year ending June 2022 was \$639,600.

Duration

The FSA program was delivered from 2011 to 2022. The program underwent extensive redevelopment in 2015 to align with an updated Australian Food Literacy Model and best practice criteria that was commissioned through the Western Australia Department of Health. Since finishing in 2022, the updated program iteration *Nom!* has extended the original food literacy legacy of the FSA through refreshed branding that drives a broader focus across a wider range of cohorts, including for the disabled and in community/workplace settings.

Coverage

The FSA program targeted adults from low to middle income households seeking improvements to their food literacy, although was freely available to all adults. Engagement with the program was supported through social and traditional media, websites, health professional referral and word of mouth. Over the seven years to 2022 a total of 6,837 adults participated in the program.

Objective

The objective of the FSA was to support adult participants increase their food literacy knowledge, skills and confidence and increase intentions to regularly select, prepare and eat nutritious foods. While the program was available for all adults to participate in, there was a specific focus on supporting food literacy for adults from a low to middle income background.

Delivery

The FSA program was delivered across both face to face and videoconferencing formats. FSA is a four session program, each session being 2.5 hours in duration equating to ten hours of contact time for each program. The program's curriculum is divided into four core modules and four optional modules with curriculum lesson content aligned to the four domains of food literacy (Planning & Management, Selection, Preparation & Cooking and Eating) and 11 components of food literacy outlined in the empirically tested Australian Food Literacy Model. Table A6.2 identifies the content topics that are delivered across each session of the program.

Table A6.2: FSA program session content.

| Session 1 | Session 2 | Session 3 | Session 4 |
|-----------------------------------------------------|-----------------------------------------------------|-----------------------------------------------------|-----------------------------------------------------|
| Core Module 1: Healthy Eating | Core Module 2: Label reading and food selection | Core Module 3: Budgeting and meal planning | Optional 1 |
| Core Module 4: Food safety, preparation and cooking | Core Module 4: Food safety, preparation and cooking | Core Module 4: Food safety, preparation and cooking | Optional 2 |
| | | | Core Module 4: Food safety, preparation and cooking |

The program combines demonstration from trained health professional facilitators (dietitians and nutritionists) with 'hands on' activities for participants. This design aims to maximise educational impact by providing multiple opportunities for the application of critical thinking skills, experiential learning and demonstration of technical proficiency to create a sense of accomplishment for participants. The combination of observational learning, practice repetition of skills and reassurance strategies support self-efficacy and motivation, which is noted as a key factor in behaviour change.

Evaluation process

The delivery and achievements of the FSA program have been studied and evaluated in detail over a range of settings in recent years in an academic capacity. Foodbank has also developed several 'impact reports' focusing on the short term changes to attitudes and consumption achieved by the FSA program, drawing on available academic data and internal material. These resources, supported by additional clarification with the Foodbank WA Nutrition and Education Manager, provided suitable evidence to evaluate of the Program against the six evaluation criteria developed for VG22003.

The evaluation criteria focus on the extent to which FSA supported, and has the potential to further support, increased vegetable consumption. Performance against the evaluation criteria was rated on a six-point scale ranging from poor to excellent (see the VG22003 Evaluation Framework for detail on the evaluation criteria and analytical rubric).

The key material consulted to inform the evaluation for VG22003 are summarised in Table A6.3 below.

Table A6.3: Resources informing the evaluation of the Food Sensations® for Adults Food Literacy Program

| Resource | Relevance |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Food Sensations® for Adults Impact Report (2016, 2017, 2018, 2019, 2020, 2023 [summary report]) | Program delivery and participation, changes in food literacy and behaviours. |
| Begley et al. (2018). Evaluation Tool Development for Food Literacy Programs. <i>Nutrients</i> , 10, 1617. | Development of a measurement tool for program evaluation of food literacy programs defining food literacy behaviour factors. |
| Begley et al. (2019). Identifying Participants Who Would Benefit the Most from an Adult Food-literacy Program. <i>Int. J. Environ. Res. Public Health</i> . 16(1272). | Reviews food-literacy behaviours, dietary behaviours and the demographic characteristics of participants on enrolment in a food literacy program to inform suitable cohorts. |
| Begley et al. (2019). Effectiveness of an Adult Food Literacy Program. <i>Nutrients</i> . 11(797). | Assessment of how the FSA program has changed food literacy and selected dietary behaviours of participants. |
| Begley et al. (2020). Identifying Who Improves or Maintains Their Food Literacy Behaviours after Completing an Adult Program. <i>Int. J. Environ. Res. Public Health</i> . 17(4462). | Three month follow up of participants in FSA to assess whether food literacy scores were maintained or improved. |
| Dumont et al. (2021). Effectiveness of Foodbank Western Australia's Food Sensations® for Adults Food Literacy Program in Regional Australia. <i>Int. J. Environ. Res. Public Health</i> . 18(8920). | Assessment of how the FSA program delivered in regional areas has changed food literacy and selected dietary behaviours of participants. |
| Begley et al (2023). Determining the Effectiveness of an Adult Food Literacy Program Using a Matched Control Group. <i>JNEB</i> , 55(9). | Assessment of how the FSA impacts food literacy through a quasi-experimental design with a matched control group. |
| Consultation with Foodbank WA Nutrition and Education Manager | Additional clarification on program funding and performance. |

Evaluation findings

This section outlines the evidence collected against each of the six evaluation criteria informed by a detailed review of the material identified in Table A6.3, followed by the assessed performance standard against each criteria, and discussion of the findings.

Evaluation Criteria

Overall the FSA program performed moderately well against most of the criteria. The extent to which the Framework KEQs have been supported is summarised as follows, drawing from the broad range of evidence and feedback collected.

Relevance

Was the initiative targeted to a high priority issue?

- The FSA program targets low-middle income adults with opportunity to improve food literacy to support *Knowledge and Skills*.
- Declining and low levels of food literacy has been identified as a significant factor impacting diet quality.
- Program research has identified that lower food literacy was associated with lower self-rated cooking skills, a negative attitude to the cost of healthy foods, lower intakes of fruits and vegetables and a higher frequency of consuming takeaway food and sugary drinks.

To what extent did the initiative target one or more consumption barrier(s)?

- *Knowledge and Skills* supported through participants being provided with the opportunity to learn and practice basic cooking skills by health professionals.
- *Taste & Enjoyment* targeted through hands on experiential learning and teaching in a social setting, where participants are sharing food and engaging on the subject.
- *Access and Affordability* supported through providing the program free of charge to participants “on a budget”.
- *Cost and Waste* supported through underlying program focus on meal planning and waste reduction.
- The 2015 WA Nutrition Monitoring Survey identified key household knowledge gaps to support a healthier diet, including quicker ways to prepare healthier food (82%); more ways to prepare healthy food (75%); knowing more about cooking (61%).

Was the intervention targeting a prime prospect cohort?

- While low to middle income adults with low food literacy are the target program demographic, participants from all incomes have engaged in the program.
- Begley et al. (2019) identified that people from high food literacy backgrounds attend food literacy programs as a means to ‘check in’ on their skills.
- Other priority cohorts have also been covered through other iterations of Food Sensations, such as children in schools and parents of young children and is being further encouraged through Nom! where groups can be formed by any community organisation.
- The specific relevance for targeting low-middle income adults vs other cohorts was unclear, given that a range of factors other than income has been linked with influencing food literacy and food choices.
- A total of 6,837 participants were engaged over the most recent seven years of the program to 2022, through 627 program groups delivered across 2,424 sessions.

Strategic appropriateness

Was the strategy appropriate to the problem being addressed?

- The FSA program strategy was revised in 2015 to align with the Australian Food Literacy Model and best practice criteria for food literacy programs directly supporting *Knowledge and Skills*, and *Taste and Enjoyment*.
- The delivery strategy is guided by the Health Belief Model and Social Learning Theory, which moves beyond dissemination of information, to strategies building confidence, self-efficacy and motivation.
- Adult learning theory increases the likelihood of participants attempting to modify dietary intake outside of the session's context.

To what extent were the right tools, delivery and implementation model used in addressing the consumption barriers?

- The delivery model was founded through an 'in person' setting to support participant interaction and engagement with session content and practical cooking demonstrations, however was expanded to include online formats to enable engagement with persons in remote areas and throughout the COVID-19 pandemic.
- Program implementation was supported through professional facilitators who were responsible for delivering content to participants. Over 90% of program hosts stated that they would be willing host again, indicating the perceived usefulness.
- The recruitment and implementation model relied on existing networks, organisations with established community groups and regional Community Resource Centres. The general public could also engage with the program however it was less likely that their awareness would be supported without active intent to seek out the program.
- Provided a good level of contact to support participants build *Knowledge and Skills* and experience *Taste and Enjoyment* for a variety of healthy foods, including vegetables.
- The revised program "Nom!" provides direct scaling opportunities through self-nomination by interested community groups to participate.

Was there a call to action trigger element?

- The program was promoted through traditional and social media, existing community groups, program website and networks. No call to action trigger was used.

Execution effectiveness

To what extent did the creative execution and delivery address behavioural drivers or barriers for the target cohorts?

- Participation in the FSA program has been identified with supporting a statistically significant increase in the three core food literacy behaviour factors (plan & manage; selection; preparation).
- On average 66% of participants moved from a low food literacy group to a moderate or high food literacy group as a result of participation in the program.
- Increased food literacy scores have been linked with improvements to selected dietary behaviours.

Was the creative execution effective at changing attitudes and consumption intent to drive behaviour change?

- Self-reported participant data over the 2018-2021 program period found that 74% of participants had made an overall change in food literacy confidence and behaviours after attending the program.
- The share of participants reporting improvements to attitudes 3 months after program delivery (2018-2021) include: using the nutrition information panel to make food choices (63%); planning meals to include all food groups (48%); planning meals ahead of time (44%); and thinking of healthy food choices when deciding what to eat (44%).
- A statistically significant increase in vegetable consumption by an average of 0.66 serves for metropolitan and 0.25 serves for regional participants was reported at the end of the program.
- These changes experienced minor declines (-8%) over a three month follow up period but still remained above pre-program levels.
- Attitudes were significantly impacted across both metropolitan and regionally based participants.
- Participant changes have not been measured beyond a three month time period so the extent to which long term behaviour change has been sustained is unclear.

Was the program effectively implemented to drive behaviour change?

- The program implementation was managed through a team of university trained nutrition professionals, with capacity to adapt to the interests of participating groups through the flexible modules.
- The program was executed across both metropolitan (75%) and regional (25%) settings.
- The program was adapted in 2015 to align with emerging food literacy models and best practice criteria.
- Participants who completed a food literacy program require support from multiple spheres of influence, including households, setting and the environment – implementation of the FSA program was limited in capacity to provide these linkages.
- Broader behaviour change barriers, including family taste preferences; environmental barriers (e.g. the food affordability) must be addressed through other interventions, impacting the implementation model.

Efficiency

How were resources used to achieve increased consumption?

- The delivery model relies on face to face engagement through a facilitator-participant model, which is relatively resource intensive and challenging to scale without increased funding.
- Online sessions were used to improve accessibility to participants located in remote areas of the state and also supported continuity through COVID lockdowns.
- Lesson plans, recipe content and other resources were available 'on demand' to support participants refer back to content.
- The program delivery was limited by Government funding support, and access to suitable facilities (e.g. with a teaching kitchen).
- An average of 11 participants per session across the program was below the session capacity of 15 participants.
- The existing Foodbank brand and reputation and history of delivering food literacy programs was leveraged to drive participation.

Has the initiative influenced/complemented/leveraged other programs to increasing consumption?

- The Food Sensations® program model was adapted from the initial children in schools program (introduced 2007) and extended to capture parents of young children (introduced 2019) which have also been linked to supporting short term increases in dietary practices for these cohorts.
- In September 2023, the FSA was rebranded to *nom!*, bringing the various iterations of the program under one brand that includes broader opportunities for community organisations to host programs for their clients and staff.

Legacy

To what extent will the initiative have an on-going residual/lagged effect?

- Learnings and program model from FSA have been adapted into *nom!* program, with refreshed branding and a broader participation opportunity. This extends the existing legacy of Food Sensations® over the previous two decades.
- Ongoing participation across target adult cohorts relies on program continuity given the short term delivery model over 4 weeks with no follow up or ongoing support.
- Evidence anecdotally highlighted how the program's impact can be extended from immediate participants through word of mouth sharing with family and friends.

Impact and investment return

Did the intervention increase consumption leading to improved industry (economic) and social benefits?

- Long term changes to consumption (beyond three months) were not measured. Statistically significant short term (3 month) changes in vegetable consumption of approximately 0.5 serves was achieved.
- An average of 976 participants per year over seven years engaged with the program, which is a very small share of the total adult population in Western Australia (<0.1%)
- Participation in the program also delivered indirect social benefits including the development of new social networks, which was identified anecdotally from participant feedback.

Did the investment deliver value for money for levy payers and funding bodies?

- Over the period from 2011 to 2022, the Western Australian Department of Health Funded the delivery of FSA. The cost of running the program for the year ending June 2022 was \$639,600.
- A Foodbank estimate of the social return on investment of the FSA was calculated at 20%: *"When considering environmental, physical health and mental health savings, the conservative value of the Program was found to exceed input costs by almost 20%."*
- As food literacy and connection to behaviour change is subject to a myriad of influence, a distinct 'value for money' measure could not be established.

Overall, was the initiative worthwhile?

- The FSA program has increased the food literacy of participants in the short term, resulting in a significant increase in vegetable consumption of 0.5 serves per day.
- The program was grounded in food literacy best practice concepts, and a mix of adult style learning and hands on activities to develop cooking skills and confidence.
- While the program supported favourable short term outcomes, the long term impact of participation impacting consumption is unknown.

- Only a relatively small proportion of adults were targeted relative to the potential target population of low to middle income earners.

Performance summary (using rubric)

The performance of the FSA program is summarised in Table A6.4 against the evaluation criteria developed for VG22003 considering the evidence compiled to address each KEQ reported on above.

Table A6.4: Performance summary

| Criteria | Performance | Rationale |
|---------------------------------------------------------------------------------------------|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Relevance <i>"Solving the right problems"</i> | Excellent | Low food literacy impacts attitudes and behaviours around the purchase and consumption of healthy foods. The program targeted 'low to middle income' adults, however other factors outside of income also impact food literacy. |
| Strategic appropriateness <i>"Strategic approach is suitable to address the problem"</i> | Good | The program delivery model leverages a proven adult learning model with direct stimulus to encourage positive experience building confidence around selection and consumption of healthy foods. A 'voluntary' recruitment model risks missing cohorts that could sustain a larger benefit through participation, with challenges around scale. |
| Execution effectiveness <i>"Using the right methods that are achieving results"</i> | Emerging | While food literacy was increased in the period directly following the program delivery associated with a 0.5 serve increase in vegetable consumption (three month follow up), long term behaviour change has not been established. |
| Efficiency <i>"Use of resources"</i> | Emerging | The program leveraged previous program design focused on children and provides 'on demand' resources for participants that can be accessed at any time. The extension of delivery to online formats enables access to remote populations and continuation over COVID. Average 11 participants per session was slightly below the session capacity of 15 participants. |
| Legacy <i>"Ongoing utilisation"</i> | Good | The core principles of FSA have been adapted to the refreshed program brand " <i>nom!</i> " which will enable the learning model legacy into the future. However for past program 'alumni' there is no mechanism to support ongoing engagement or utilisation of learnings and literacy developed through the program. |
| Impact and investment return <i>"Realised increased consumption"</i> | Emerging | An average of 976 participants engaged in the program per annum over the 7 years to 2022, representing a small share of the potential population. Long term behaviour change is unclear, however food literacy measures and anecdotal social benefits are recognised. |

Discussion

Overall this evaluation assessed FSA performance as being “Excellent” to “Emerging” across the six criteria.

Strengths. The FSA program was directly aligned with driving increased food literacy for adults at risk of food insecurity to help them prepare nutritious meals on a budget. Following participation in the program, an outcome was associated with impacting healthy food choices, including increasing vegetable consumption. A proven adult learning model underpinning the program strategy ensured that participants were engaged across the duration of the 4-week program, which resulted in clear short-term increases in food literacy measures. The legacy of the program will be maintained as the core learning concepts and delivery strategy have been extended into the *nom!* brand, which seeks to drive wider participation across a range of target cohorts (adults, children, parents, disabled persons).

Weaknesses. While the FSA program generated clear improvements to measures of food literacy in the short term, the extent to which these change have (or will) been sustained over the longer term is unclear. As there was no model for engaging participants in the months (and years) following participation, this factor could limit the retention of attitudes and behaviours over the longer term. While the program sought to target adults from low-moderate income cohorts, a range of other factors outside of income have been linked with low food literacy, suggesting that a more focused approach to recruitment could increase the potential impact for participants.

The capacity to scale the program was constrained by the centralised operating model, where all resources and scheduling was under direct control by Foodbank WA. The recruitment around groups and sessions was reliant on message reach across channels, availabilities of prospective participants and suitable education facilities. With the available resourcing, an average of 976 participants were engaged each year, which is a relatively low number relative to the potential available participation opportunity.

Conclusion. The FSA program has supported a small share of the adult population in Western Australia improve skills food literacy, associated with small increases (0.5 serve) in vegetable consumption in the short term. As the program has evolved into the *nom!* iteration, a wider basis for engaging a broad set of cohorts may support the capacity to drive further influence.

Implications and learnings

This section outlines the key implications and learnings of the FSA for informing future vegetable R&D levy funded programs to increase vegetable consumption.

Program scale

- Centralised program delivery models such as Food Sensations® can easily reach capacity with available funding and resourcing levels, resulting in untapped potential and missed opportunity to engage potential participants.
- There exists the potential to leverage resources from other programs with the same intent e.g. No Money No Time (University of Newcastle), and FEAST (Oz Harvest).
- The full opportunity would be supported through a scaling mechanism, for example by expanding delivery to other centres to amplify the potential reach, through approaches like a 'train the trainer' or 'hub and spoke' model or 'fee for service' corporate versions.

Engagement post-program

- Short term programs (e.g. 4-8 week duration) such as Food Sensations® are associated with a higher intensity learning and engagement to achieve the specific learning objectives.
- Programs of this nature are well placed to trigger strong short term responses to target areas (e.g. food literacy), however must be underpinned by an ongoing support mechanism to ensure that participants remain engaged and connected with learning content.
- A transition model for program 'alumni' that provides opportunities to apply new acquired skills and abilities especially beyond the short-term program delivery would drive engagement and avenues to leverage existing content over the long term.

Recruitment and participation

- The program targets cohorts that stand to receive the most benefit in providing for a missing skill, ability or behavioural opportunity (i.e. food insecure, on a budget).
- There exists a trade-off in pursuing targeted or open recruitment for programs and initiatives seeking to drive vegetable consumption.
 - Targeted recruitment offers the potential to strategically target 'at risk' cohorts (e.g. single males).
 - Open recruitment offers a wider remit, however can result in participant engagement who have limited scope for achieving a response or target benefit from the program.
 - Programs which encourage engagement and interaction over an enjoyable meal have the potential to offer further social good and reinforce healthy eating behaviours.



VG22003: Evaluation report

Attachment 7

Stephanie Alexander Kitchen Garden Program

February 2024

Initiative background

The Stephanie Alexander Kitchen Garden Program (SAKGP) delivers curriculum-integrated food education where children grow, harvest, prepare and share fresh, seasonal, delicious food to form positive food habits for life. The aim of a kitchen garden program is for children to gain life skills, self-confidence, and develop a healthy relationship with food through practical learning that is integrated with the curriculum whilst also engaging with parents and communities. Table A7.1 summarises the program, which each element described in further detail below.

Table A7.1: Stephanie Alexander Kitchen Garden Program overview

| Program element | Description |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Funding model | Program is administered through a non-for-profit Foundation structure utilising Government, corporate, philanthropy and fundraising funds. |
| Duration | Commenced in 2004 (ongoing). |
| Coverage | Over 1,000 primary & secondary schools and early childhood education settings participate nationally. The original primary school (grades 3-6) focus was expanded in 2020 to include early childhood and secondary school settings. |
| Objective | Children develop healthy food relationships through practical learning opportunities that leads to improved health and wellbeing outcomes for life. |
| Delivery | Fee-based membership that entails access to resources and support to deliver the program. The delivery of each place-based program is curated by an onsite coordination team that support kitchen garden establishment and delivery of the syllabus regarding gardening and kitchen activities. |

Funding model

The SAKGP has been delivered and funded by the Stephanie Alexander Kitchen Garden Foundation, a not-for-profit charity that provides the inspiration, information, professional development and support for educators to deliver pleasurable food education to children in Australia.

As of 2022/23, the Foundation recorded a \$4.89 million income stream, with the majority (60%) coming from Government sources (Healthy Kids Advisor Initiative – funded by the Victorian and Australian Government). Additional funding was sourced through Corporate Partnerships¹⁴ (30%) with the remaining funding coming from philanthropy, fundraising and membership fees (10%). Income sources vary annually, with corporate partners typically contributing the majority of income in previous years. Income is primarily used to fund the Foundation's 37 full-time equivalent employees, who enable day to day campaign delivery.

Corporate partners are established on an identified shared opportunity and value from improved food education. Coles has donated over \$2 million to the Foundation since launching a partnership in 2020 with over 50 stores partnering directly with a local Kitchen Garden program school supporting activities such as working bees and in store activations to support local fundraising efforts.

Duration

The SAKGP has been delivered continuously in primary school settings since 2004, following a successful pilot program at Collingwood College in Melbourne in 2001. An early childhood and secondary school variation of the program was introduced in 2020.

¹⁴ Coles, Saputo Dairy Australia, The Ian Potter Foundation, The Fabric by Mirvac, General Mills and Arnold Bloch Leibler.

Coverage

The SAKGP model originally targeted primary school students in grades 3-6 (ages 8-12). Early childhood and secondary school variations were introduced in 2020, so the program can now cover children of all ages from 0-18 years.

The program was originally delivered across Victoria until 2008, where Government funding supported a national rollout through supporting the development of garden and kitchen infrastructure in 177 government primary schools until October 2011. The SAKGP is now delivered across more than 1,000 primary and secondary schools, early childhood services and community settings nationally. Since its inception, the Foundation estimates that over 1 million children, their families and broader communities have benefited through program delivery.

Objective

The objective of the SAKGP is to support children gain life skills, self-confidence, and shape a healthy relationship with food through practical learning opportunities that are integrated with the curriculum.

Delivery

The Stephanie Alexander Kitchen Garden Foundation provides the inspiration, information, professional development and support for interested educational providers to access and deliver the Program according to their individual needs. The Foundation produce and maintain educational resources to give educators the tools they need to run a best-practice, sustainable kitchen garden program. An online portal provides and downloadable educational resources, recipes, garden activities and lesson plans that link the program to the curriculum. The Foundation recommend a team of at least two people (e.g. existing or new staff members and/or volunteers) to support program delivery and coordination.

Participation in the SAGKP is based on a recommended minimum 45 minutes of weekly time in the “kitchen garden” and 90 minutes in the “kitchen classroom” to teach children how to grow, harvest, prepare and share fresh, seasonal and environmentally sustainable food. The program’s kitchen garden element entails a strong focus on fresh fruits, vegetables and herbs.

The Program is delivered through a membership fee-based subscription model. Membership provides access to resources, communications, support and training to enable program delivery in the specific educational setting. The fee schedule is summarised in Table A7.2.

Table A7.2: Program fee schedule

| Educational setting | Joining fee (24 months) | Renewal fee (every 24 months thereafter) |
|----------------------------|--------------------------------|-------------------------------------------------|
| Primary and secondary | \$1,650 | \$440 |
| Early childhood | \$975 | \$440 |

Evaluation process

The evaluation of the SAKGP was informed through review of a broad range of material provided by the Foundation that captured detail on delivery and performance, including annual reports, program impacts reports and strategic plans. In addition, the Foundation has commissioned three independent evaluations since inception which have each examined a unique aspect of delivery including the short term performance of the program at both state and national implementation levels, as well as a longer term legacy influence of the program. These resources provided suitable evidence to evaluate of the Program against the six evaluation criteria developed for VG22003.

The evaluation criteria focus on the extent to which SAKGP supported, and has the potential to further support, increased vegetable consumption. Performance against the evaluation criteria was rated on a six-point scale ranging from poor to excellent (see the VG22003 Evaluation Framework for detail on the evaluation criteria and analytical rubric).

The key material consulted to inform the evaluation for VG22003 are summarised in Table A7.3 below.

Table A7.3: Resources informing the evaluation of Stephanie Alexander Kitchen Garden Program

| Resource | Relevance |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SAKGP Annual Reports (various) | Foundation income, expenses, partnerships, key activities and achievements. |
| Stephanie Alexander Kitchen Garden Foundation Strategy 2023-2028 | Vision, purpose, role, values and strategic focus areas. |
| Foundation Theory of Change Model | Outlines the settings, activities, outcomes and impacts targeted by the program. |
| SAKGP Impact Report | Summary of program impacts informed through past evaluations, including alignment to a cross-portfolio curriculum, wellbeing and sustainability drivers. |
| Block et al. (2009). <i>Evaluation of the Stephanie Alexander Kitchen Garden Program: Final Report</i> . Melbourne: McCaughey Centre. | A mixed-methods longitudinal evaluation across n=12 participating primary schools throughout Victoria over two and a half years from 2006 to 2009, examining the processes, impacts, costs and outcomes of the SAKGP. "Short term state based" |
| Yeatman et al. (2013). <i>Stephanie Alexander Kitchen Garden National Program Evaluation: Final Report</i> . Centre for Health Service Development, Australian Health Services Research Institute, University of Wollongong. | Evaluation of the process, impact and outcomes of the Stephanie Alexander Kitchen Garden National Program, rolled out to 177 government primary schools across Australia in 2008 – covering the period from June 2011 to May 2012. "Short term nationally based" |
| Block et al. (2019). <i>What's Cooking? Evaluation of the long-term impacts of the Stephanie Alexander Kitchen Garden Program</i> , University of Melbourne: Centre for Health Equity, Melbourne School of Population and Global Health. | Evaluation of the longer-term influence of the Kitchen Garden Program by comparing the cooking, eating and gardening attitudes and behaviours of young adults who had participated in the program in primary school with those who had not undertaken the program. "Long term nationally based" |
| Holloway et al. (2023). Enhancing Food Literacy and Food Security through School Gardening in Rural and Regional Communities. <i>Int J Environ Res Public Health</i> . 21;20(18):6794. | Evaluation of the kitchen garden program delivery in rural and regional settings including construct of logic models. |

Evaluation findings

This section outlines the evidence collected against each of the six evaluation criteria informed by a detailed review of the material identified in Table A7.3, followed by the assessed performance standard against each criteria, and discussion of the findings.

Evaluation Criteria

Overall the program has performed well against the majority of the criteria. The extent to which the Framework KEQs have been supported is summarised as follows, drawing from the broad range of evidence and feedback collected.

Relevance

Was the initiative targeted to a high priority issue?

- Targets the rising incidence of childhood obesity driven through poor food and lifestyle choices which has emerged as a high national public health priority.
- Approximately 1 in 4 Australian children aged between of 2 and 17 (1.25 million), are overweight or obese with a total national cost across all populations of \$11.8 billion in 2019¹⁵.
- The *National Obesity Strategy 2022-2032* identified the importance of increasing vegetable consumption to reduce discretionary food choices, through creating supportive, sustainable and healthy environments that empower people to stay healthy.

To what extent did the initiative target one or more consumption barrier(s)?

- *Taste & Enjoyment* and *Knowledge & Skills* targeted through hands on experiential learning.
- School garden and kitchen-based lessons offered opportunities for ‘hands-on learning’ in a variety of curriculum.

Was the intervention targeting a prime prospect cohort?

- Approximately 90% of children are not eating the recommended serves of vegetables.
- Primary school children (aged 8-12) were targeted until 2019, with early childhood and secondary education settings included in 2020.
- Early and repeated positive exposure and experiences to vegetables have been linked with influencing lifelong attitudes to vegetable consumption (SOURCE), therefore the focus on children in an educational setting is a suitable and relevant approach to drive increased vegetable consumption.

Strategic appropriateness

Was the strategy appropriate to the problem being addressed?

- The focus on pleasurable eating offered through cooking garden grown produce direct supports the *Taste & Enjoyment* barrier.
- Previous evaluations have identified how participation in the program have influenced both short term and long term attitudes to trying new foods (including vegetables).
- While 52% of survey respondents identified that participation in the program has continued to influence their food choices across the 10 year period following participation, no statistical

¹⁵ Commonwealth of Australia 2022, *The National Obesity Strategy 2022–2032*, www.health.gov.au/resources/publications/national-obesitystrategy-2022-2032

difference was identified in the overall daily serves of vegetables consumed between SAKGP and control groups.

To what extent were the right tools, delivery and implementation model used in addressing the consumption barriers?

- Program membership provides access to the tools enabling delivery of the program in the relevant school setting.
- The extent to which the program is implemented will vary based on the specific school setting, and resources available.
- The SAKGP model served as the ideal standard but this wasn't always achievable for some schools to completely implement due to their socioeconomic or other factors (Yeatman et al. 2013).
- Opportunities exist for anticipating different types of support required by schools at different stages of development, with a focus on building self-capacity rather than relying on the Foundation.
- Actual change in health and consumption outcomes in the short term generated through the program is unlikely, because the short term program is contrasted with the long term nature of the broader educational setting (St Leger et al, 2007).

Was there a call to action trigger element?

- The program identifies as providing "Pleasurable food education" however this does not incorporate a trigger action element directly to the target cohort.

Execution effectiveness

To what extent did the creative execution and delivery address behavioural drivers or barriers for the target cohorts?

- The delivery model seeks to empower children to grow, harvest, prepare and share fresh, seasonal food through participation in gardening and subsequent cooking activities using harvested produce.
- The execution of the core program elements by participating schools have supported a willingness to towards try new foods; improved knowledge of fresh foods; and that cooking skills were transferred to the home – directly addressing the *Taste and Enjoyment* and *Knowledge & Skills* barrier.
- The 'Stephanie Alexander' Brand has been leveraged to underpin credibility and purpose with the program mission

Was the creative execution effective at changing attitudes and consumption intent to drive behaviour change?

- There is a strong body of evidence identifying how the SAKGP provides an engaging platform to influence knowledge and attitudes towards fruit and vegetable produce (short term).
- A 10 year follow up evaluation of n=118 past participants could not provide a statistically significant difference in the use of in-season produce, and the consumption of fresh fruit and vegetables to the comparison group.

Was the program effectively implemented to drive behaviour change?

- Program outcomes (e.g., engagement, participation, knowledge, skills) were dependent on underlying factors, including dedicated support of school leadership, teaching staff, and the

parent body for effective student engagement in the teaching spaces and wider engagement from families and the community (Holloway et al. 2023).

- This presents a limitation in managing the expectations around the consistency of program delivery in educational settings and the associated experience.
- The program currently does not engage with state health departments or other health initiatives in schools (and communities) to reinforce messaging and maximise the opportunities to impact on children's health (Yeatman et al. 2013).
- In 2022, the SAKGP commenced delivery of the Healthy Kids Advisor initiative on behalf of the Victorian Government to support each community's unique healthy eating goals and encourage participation in the state-wide Vic Kids Eat Well movement.
- No other linkages with state based programs in other jurisdictions were identified, representing a significant opportunity to enhance future implementation and effectiveness.
- Other initiatives where potential alignment could be supported include with the National Healthy School Canteen Guidelines.

Efficiency

How were resources used to achieve increased consumption?

- The membership model requires the mobilisation of resources, such as kitchen and garden infrastructure, program coordinators and curriculum planning on site by the participating institution to deliver the program.
- This enables a fit-for-purpose approach to program delivery which may support the capacity to leverage existing resources, or mobilising new resources efficiently.
- However there is a reliance on an existing resource base across schools which may be constrained by a busy timetable of planned activities and curriculum planning.
- The efficiency of converting support offered by the Foundation to driving attitude and consumption changes were limited by funding, staff commitment, access to volunteers and physical space.
- The ability for the Foundation to partner and communicate in an advisory capacity across eight states/territories required additional resources that potentially impacted resource use at the foundation level.

Has the initiative influenced/complemented/leveraged other programs to increasing consumption?

- The SAKGP recently commenced delivery of the Victorian Healthy Kids Advisor program, which provides resources across 13 communities to drive participation in Vic Kids Eat Well.
- Partnerships with programs in other jurisdictions are limited.
- Opportunities remain for aligning the SAKGP with state-based curriculum requirements, state education health promotion (e.g. QLD 'pick of the crop') and canteen guidelines (e.g. NSW healthy school canteens) to achieve further leverage and scale.

Legacy

To what extent will the initiative have an on-going residual/lagged effect?

- Many of the schools participating in the SAKGP have done so over a number of years, such that the program is integral to the school identity.
- The availability of the program has been a factor informing the decision to send students to a particular the school in some instances, enhancing the school's profile.
- The extent of ongoing support for the program within the institution maintains a significant influence over the support and influence realised.

- The development of kitchen gardens and kitchen infrastructure require ongoing maintenance but are available in perpetuity for future program cohorts, providing a strong basis to support the continuing legacy of the program.

Impact and investment return

Did the intervention increase consumption leading to improved industry (economic) and social benefits?

- Statistically significant changes in long term sustained consumption of vegetables over a 10 year period could not be established, however qualitative attitudes towards cooking and healthy eating anecdotally improved.
- Key social benefits of the program include wider application of kitchen garden infrastructure to involve the broader community in gardening activities; encouraged social inclusion and inclusivity; and improved student behaviours (e.g. leadership development and responses to challenging situations). Direct provision of veg in response to health issue (Produce Prescriptions).

Did the investment deliver value for money for levy payers and funding bodies?

- Over the period from 2008 to 2011, the Federal Government supported the expansion of the program on a national level through funding the program across 177 schools.
- On average a total of \$137,221 was generated within each school community to run the program, from initial investment by the Australian Government of \$44,758 per school for supporting a national rollout (Yeatman et al. 2013), equivalent to an economic multiplier of 5.07 for each dollar of Government Funding.
- The Foundation functions as a not-for-profit entity, sourcing funds primarily across government and corporate partnerships, where ongoing measures of value are derived through the nature of partnerships and funding expectations.
- Given the wide range of interest in the design, funding, and delivery of the program, a single 'value for money' measure pertaining to these stakeholders was not applicable.

Overall, was the initiative worthwhile?

- The SAKGP is a worthwhile initiative that has continued to grow and expand since its commencement and is now delivered nationally to a range of childhood education settings (from early childhood through to secondary).
- The program has contributed to improving children's attitudes and confidence in growing, selecting and preparing healthy meals with a focus on fresh fruit and vegetables.
- The short term influence of the program has supported lifestyle and attitude changes that have maintained relevance over a longer term 10 year horizon.
- The program has continued to evolve and respond to changing requirements, which ensures that has continued to remain worthwhile for participating members.

Performance summary (using rubric)

The performance of the SAKGP program is summarised in Table A7.4 against the evaluation criteria developed for VG22003 considering the evidence compiled to address each KEQ reported on above.

Table A7.4: Performance summary

| Criteria | Performance | Rationale |
|---------------------------------------------------------------------------------------------|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Relevance <i>"Solving the right problems"</i> | Excellent | Experiential learning methods engage children to drive attitudes and confidence regarding fresh food and cooking behaviours to support vegetable consumption. |
| Strategic appropriateness <i>"Strategic approach is suitable to address the problem"</i> | Good | The Foundation delivers the 'gold standard' program model and support, however implementation is variable based on school capacity. Aligning short term program delivery for influencing behaviours against the long term education model remains unresolved. |
| Execution effectiveness <i>"Using the right methods that are achieving results"</i> | Emerging | While short term willingness to try new foods and knowledge is consistently influenced, long term behaviour changes have not been established. |
| Efficiency <i>"Use of resources"</i> | Emerging | Recent integration with select health promotion campaigns in Victoria, however several gaps exist that establish linkages with other jurisdictions. There is additional burden aligning delivery to meet different curriculum requirements across jurisdictions, impacting efficiency. |
| Legacy <i>"Ongoing utilisation"</i> | Very good | The SAKGP has been continuously delivered since 2004. The initial success of the program's primary school focus has been expanded to secondary and early childhood education settings with expanding involvement from corporate funders. The nature of garden and kitchen infrastructure developed promotes sustained delivery and involvement. |
| Impact and investment return <i>"Realised increased consumption"</i> | Good | While long term behaviour changes have not been demonstrated, a range of short term social impacts have been identified relating to behavioural improvements and enhanced community connection. |

Discussion

Overall this evaluation assessed SAKGP performance as being “Excellent” to “Emerging” across the six criteria.

Strengths. The SAKGP demonstrated very good alignment to addressing the highly relevant childhood obesity problem through supporting children to increase confidence and knowledge of fresh produce, cooking and exposure new foods, that focuses on increasing healthy lifestyles. The program delivery model directly aligns with the *Taste and Enjoyment* and *Knowledge & Skills* vegetable consumption barrier through the experiential learning focus. The program has also demonstrated very good legacy, given it has been continuously delivered in primary schools for almost 20 years, with more recent expansion to across early childhood and secondary education phases.

Weaknesses. The strategic approach was a good mechanism to drive the program and associated implementation through empowering schools and providing best practice resources and guidance. However program strategy was limited through a reliance on the school for implementation efficacy, which may be impacted by school capacity, staff commitment and other external factors. While short term social benefits are well documented, demonstrating the how the program has materially impacted vegetable consumption over the long term as participants have emerged into early adulthood could not be established. Anecdotal evidence suggested that some positive social impact has been supported.

Program performance was considered as emerging in the phases of execution given that long term behaviour and consumption changes could not be established. The programs efficiency was also identified as emerging given the limited connection with other school-focused health programs, the non presence of the state health departments ,and associated challenges in reconciling curriculum-aligned program content across multiple school jurisdictions.

Conclusion. The SAKGP has emerged as a trusted and respected program for engaging children with a focus on growing and preparing vegetables. The significant legacy of the program has ensured the participation of a large cohort of children. Integrating the program with supporting state-based initiatives (e.g. Vic Kids Eat Well) and the recently extended coverage across early childhood and high school will provide a wider basis for supporting long term behaviour change.

Implications and learnings

This section outlines the key implications and learnings of the SAKGP for informing future vegetable R&D levy funded programs to increase vegetable consumption.

Longevity and legacy

- Program longevity is enabled by aligning the vision and mission to a relevant and relatable problem, supported by a consistent and credible voice that generates goodwill.
- Engaging partnerships on a shared alignment with values is critical for supporting long term financial viability and program scale.
- Experiential learning targeted across all ages of children in educational settings has been established as a proven and enduring way to support and influence *Taste and Enjoyment* attitudes around food, including vegetables.

Execution timeframes

- Education settings are bound to deliver educational outcomes across a long term horizon, which are not easily reconciled when considering the relatively short term nature of focused programs such as SAKGP.
- In the context of programs focused on children this highlights the importance of maintaining an ongoing and equivalent 'long term' implementation model that applies across the entire education lifecycle.
- Behaviour change from program implementation can only be demonstrated over the long term, which may potentially supersede the program tenure. Designing programs with a long term, multi-life stage perspective is key.

Delivery and alignment across jurisdictions

- State-level health and education policy requirements (e.g. school curriculums) should be reconciled where possible by nationally focused programs seeking to leverage health and/or educational formats for their delivery to support efficiencies and interoperability.
- Efforts to support consistent implementation of program materials across school-based settings are important to enable consistent delivery outcomes given the strong reliance on schools for delivering the program on the ground.
- There is a trade off between a "one size fits all" and "direct implementation" educational model.

Partnerships and scale

- Educational programs targeting children's health and lifestyle can overlap with existing state-based government initiatives. These initiatives should be recognised and integrated to ensure maximum impact and alignment.
- Engaging with partners that have a national scale but presence at a local community level can provide an attractive means to amplify program initiatives.



VG22003: Evaluation report

Attachment 8

George Institute Produce Prescription Program

February 2024

Initiative background

The provision of healthy foods or meals into the healthcare system has recently been explored to prevent or improve the management of nutrition-sensitive conditions (“produce prescriptions”), aligned to the ‘Food is Medicine’ movement. Across the US and Europe, various produce prescription programs have been linked with improvement in diet behaviour and health risk factors in patients, through an average combined fruit and vegetable intake increase of between 0.8-0.85 serves (22% increase). The opportunity for produce prescription programs have been recognised as being especially relevant for patient cohorts in resource-poor settings, where knowledge and access to nutrition rich foods may be impacted and contribute to poor health.

Drawing on success of these programs, a Produce Prescription program has been established in Australia, following initial feasibility testing in 2021. The program is based on providing free, healthy produce to food insecure individuals with Type-2 diabetes to improve health outcomes through increased consumption of healthy food, including vegetables. Table A8.1 summarises the Produce Prescription Program, which each element described in further detail below.

Table A8.1: Produce Prescriptions Program overview

| Program element | Description |
|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Funding model | Managed by the George Institute, with grant funding from the Ian Potter Foundation and backing from the Future Food Systems CRC and Harris Farm Markets. |
| Duration | Feasibility study: 12 weeks in 2021 Randomised Control Trial (RCT): 6 months between September 2023 and 2027 |
| Coverage | Feasibility study: n=50 RCT: n>200 Participants with type 2 diabetes from a food insecure background and their families have been the focus of the program to date. Participants for the initial phases are based in the Sydney region. |
| Objective | Improve diet quality and health outcomes for food-insecure patients with non-communicable disease (type 2 diabetes) through a “produce prescription” of healthy foods. |
| Delivery | Patients are supplied with weekly healthy food boxes (including fresh fruit and vegetables), recipes and access to a fortnightly Accredited Practising Dietician appointment for behaviour change support. |

Funding model

The Produce Prescription Program is delivered by the George Institute, a global medical research institute that was founded in Sydney in 1999, that focuses on global health challenges in resource-poor settings. The produce prescription RCT trial will be run over a 4 year period at a cost of \$1.125 million, supported by grant funding from the Ian Potter Foundation. The feasibility study was funded by an Australian National Health and Medical Research Council Program Grant and a University of New South Wales Scientia Fellowship.

Duration

The initial feasibility study was delivered over a 12 week period to establish proof of concept and to support progression to a RCT. The RCT has recently commenced and will run over a 4 year period to 2027, recruiting participants for a 6 month period.

Produce prescription programs globally have been delivered between a 1 and 10 month period.

Coverage

The Produce Prescription Program has focused on engaging individuals from food insecure backgrounds with type-2 diabetes. The prevalence of food insecurity impacts the ability to eat a healthy diet through socioeconomic factors including food affordability and access, while metabolic diseases such as type 2 diabetes are linked with unhealthy behaviours including poor diet quality. Therefore the program coverage offers the opportunity to demonstrate the potential impact of changes in diet for target vulnerable populations to improve health outcomes.

Objective

The objective of the Program is to improve diet quality and health outcomes for food-insecure patients with non-communicable disease (type 2 diabetes) through a “produce prescription” of healthy foods.

The Program will provide evidence that could support clinical guideline updates for the nutritional management of type 2 diabetes, creating a healthcare ‘paradigm shift’ from an over-reliance on drug-centred models of disease treatment towards solutions that address direct causes of ill-health for disease prevention.

Delivery

Pre-diabetic and Type 2 Diabetes patients are supplied with healthy food boxes weekly to prepare 2 meals per day across 5 days of the week (with an emphasis on fresh fruit and vegetables). The food boxes are supplied through a partnership with Harris Farm Markets. Recipes and access to a fortnightly Accredited Practising Dietician appointment for behaviour change support is also provided.

At the mid-point and on completion of the six month trial, key health markets will be recorded and impacts on dietary behaviours will be established through a 24 hour diet recalls administered by accredited dieticians.

Evaluation process

Evaluation of the Produce Prescription Program was informed through a review of the results of the Australian feasibility study that were published in 2022, two systematic meta-analysis reviews produce prescription programs delivered in other settings across the US and Europe and a cost-effectiveness simulation study. A complete summative evaluation of the current Australian RCT was not possible given that delivery remains ongoing with final results and outcomes not expected until 2027. Evaluation of the feasibility study and international prescription programs against the six evaluation criteria developed for VG22003 was used to inform potential design features and opportunities for future levy-funded programs supporting the increased consumption of vegetables.

The evaluation criteria focus on the extent to which the Produce Prescription Program supported, and has the potential to further support, increased vegetable consumption. Performance against the evaluation criteria was rated on a six-point scale ranging from poor to excellent (see the VG22003 Evaluation Framework for detail on the evaluation criteria and analytical rubric).

The key material consulted to inform the Produce Prescription evaluation for VG22003 are summarised in table A8.2 below.

Table A8.2: Resources informing the evaluation of Produce Prescription Program

| Resource | Relevance |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| Wu et al. (2022). Testing the Feasibility and Dietary Impact of a “Produce Prescription” Program for Adults with Undermanaged Type 2 Diabetes and Food Insecurity in Australia. <i>J Nutr.</i> 152(11):2409-2418. | Feasibility study delivery and outcomes that provides proof of concept for food-insecure type 2 diabetes patients. |
| Bhat et al. (2021). Healthy Food Prescription Programs and their Impact on Dietary Behavior and Cardiometabolic Risk Factors: A Systematic Review and Meta-Analysis. <i>Adv Nutr.</i> 12(5):1944-56. | Systematic review and meta-analysis evaluating the impact of healthy food prescription programs on dietary behaviour and cardiometabolic parameters. |
| Hager et al. (2023). Impact of Produce Prescriptions on Diet, Food Security, and Cardiometabolic Health Outcomes: A Multisite Evaluation of 9 Produce Prescription Programs in the United States. <i>Circ Cardiovasc Qual Outcomes.</i> 16: 575-585. | Largest produce prescription study to assess health outcomes, pooling data across 22 program locations in the United States (n=3881). |
| Future Food Systems (2023). Produce prescriptions: Delivering free fruit & veg to cut T2D costs. Accessed https://www.futurefoodsystems.com.au/produce-prescriptions-delivering-free-fruit-veg-to-cut-t2d-costs/ | Overview of the Sydney based Produce Prescription Program, including funding value, partners, recruitment targets and delivery mechanism. |
| George Institute (2023). Produce Prescription: innovative ‘Food is Medicine’ intervention to improve health among people with type 2 diabetes. Accessed https://www.georgeinstitute.org.au/projects/produce-prescription-innovative-food-is-medicine-intervention-to-improve-health-among | Produce Prescription study design. |
| Wang et al. (2023). Health and Economic Impacts of Implementing Produce Prescription Programs for Diabetes in the United States: A Microsimulation Study. <i>J. Am. Heart Assoc.</i> 12:e029215. | Simulation of the cost effectiveness of produce prescription programs in the US for adults aged 40-79 with diabetes and food insecurity. |

Evaluation findings

This section outlines the evidence collected against each of the six evaluation criteria informed by a detailed review of the material identified in Table A8.2, followed by the assessed performance standard against each criteria, and discussion of the findings.

As the full scale trial is still underway, a formative *ex-ante* evaluation that considers the general approach and model combined with evidence from similar programs delivered internationally is used.

Evaluation Criteria

The extent to which the Framework KEQs have been supported is summarised below, drawing from the broad range of evidence and feedback collected.

Relevance

Was the initiative targeted to a high priority issue?

- Targets the rising incidence of food insecurity (5% of Australians) and looming Type 2 Diabetes epidemic (4.6% of Australians).
- The existing study focuses on a relatively small but growing health/socioeconomic issue.
- Results are expected to be relevant for other metabolic and non-communicable disease where diet is a major risk factor. Non-communicable disease estimated to account for over 90% of total deaths in Australia¹⁶.

To what extent did the initiative target one or more consumption barrier(s)?

- *Access and affordability* targeted through subsidised access to fresh produce.
- *Knowledge and skill* targeted through provision of recipe card and access to dietician support and coaching to improve consumption behaviours.
- *Taste and enjoyment* through supporting food preparation with satisfying recipes.
- *Cost and wastage* as produce amounts are portioned to reduce waste.
- *Quality and convenience* supporting through vegetable delivery.

Was the intervention targeting a prime prospect cohort?

- Approximately 5% of the Australian population are food insecure and 4.6% of the population have type 2 diabetes. This represents a relatively small, but rising share of the total population who are not meeting the recommended daily vegetable intake.
- Scaling the prescription program to a range of other non-communicable diseases would ensure a broader coverage of the population not achieving recommended vegetable consumption.

Strategic appropriateness

Was the strategy appropriate to the problem being addressed?

- Directly providing access to vegetables (and other healthy foods) mitigates food security symptoms, however does not address the underlying causes of food security.
- Links between dietary quality and type 2 diabetes outcomes has been well documented, so the provision of healthy produce (including vegetables) is an appropriate treatment pathway.

¹⁶ Islam et al (2019). The burden and trend of diseases and their risk factors in Australia, 1990–2019: a systematic analysis for the Global Burden of Disease Study 2019. *Lancet Public Health*; 8: e585–99.

- Ongoing dietician support coupled with recipe ideas were noted as being useful by participants for building knowledge and confidence.

To what extent were the right tools, delivery and implementation model used in addressing the consumption barriers?

- The program relies on the recruitment through primary healthcare providers where patients have already been receiving treatment and care. This model could potentially overlook other eligible populations.
- Targeting food insecure individuals supports direct response to the *Access and Affordability* barrier
- The Produce Prescription Program relies on behaviour changes driven at the household level. Beyond the supply of healthy food boxes and support, these changes are beyond direct control of the intervention.

Was there a call to action trigger element?

- No call to action. Patients are recruited through a voluntary (feasibility) or random (full trial) process as per the current study protocols.

Execution effectiveness

To what extent did the creative execution and delivery address behavioural drivers or barriers for the target cohorts?

- The majority of international Produce Prescription Programs have alleviated low vegetable consumption through directly addressing *Access and Affordability*.
- The execution is supported through clinician collaborators and dietician support.
- The Australian feasibility study demonstrated that participants identified the program's delivery as being helpful in improving their diets and also their household members.

Was the creative execution effective at changing attitudes and consumption intent to drive behaviour change?

- Produce Prescriptions have been executed between a 1-10 month period.
- Fruit and vegetable consumption has increased by an average of 0.80 to 0.85 serves per day across the duration of Program Prescription Programs.
- Changes to long term attitudes and vegetable consumption behaviours from participation have not been measured, so long term effectiveness is unclear.

Was the program effectively implemented to drive behaviour change?

- Program outcomes are impacted by the quality of nutrition education, the selection of retail partners and existing attitudes/behaviours.
- There is no 'binding' commitment for the program to support behaviour change beyond the term of the program.
- Implementation effectiveness could be improved through combining across other policies to address *Access and Affordability* and *Knowledge and Skill* barriers such as limited access to food stores, lack of cooking skills, and/or access to high quality kitchens.

Efficiency

How were resources used to achieve increased consumption?

- Program participation grants free or subsidised access to healthy food products and ingredients including vegetables.
- The majority of participants report that the produce supplied was utilised and suitable for requirements.
- Resources allocated to providing dietary consultations were a useful component of the program.
- The logistics of implementing the program nationally have not been explored.

Has the initiative influenced/ complemented/leveraged other programs to increasing consumption?

- Produce Prescriptions represent a new approach to the “Food is Medicine” health system strategy.
- Evidence is still emerging and large scale rollouts of programs on a national basis is yet to occur, including integration with other health-department programs, or industry initiatives.

Legacy

To what extent will the initiative have an on-going residual/lagged effect?

- Produce Prescription Programs have been shown to increase fruit and vegetable consumption by an average of 0.80-0.85 serves/day per participant over program duration (between 1-10 months)
- The longer term impacts on consumption behaviours have not yet been studied in the context of food security (*Accessibility and Affordability*).

Impact and investment return

Did the intervention increase consumption leading to improved industry (economic) and social benefits?

- As the Australian Produce Prescription Program is still being tested under the RCT study design, the capacity of the program to influence statistically significant changes in long term sustained consumption of are not yet understood.
- Key social benefits of international programs include improved diet quality, improved health markers such as blood pressure, blood sugar and body mass index for type 2 diabetes patients. Measures of food insecurity were also improved.
- The program offers a direct pathway for increasing vegetable consumption of target cohorts.

Did the investment deliver value for money for levy payers and funding bodies?

- The Australian feasibility study participants reported a willingness to pay between \$51 and \$100/week for the program, while the weighted average cost of the healthy food boxes was \$150 and average cost per meal of \$7.50.
- As this willingness to pay measure is below the food box value, a copayment model would be required to cover the food and distribution costs.
- A US microsimulation model estimates that produce prescription programs implemented nationally for US adults aged 40 to 79 years with diabetes and food insecurity could prevent 292,000 cardiovascular disease events, gain 260,000 quality adjusted life years, save \$39.6 billion in health care costs and \$4.8 billion in productivity costs over a lifetime – a net saving of \$0.47B over program costs.
- A cost effectiveness analysis of the Australian RCT trial will be completed to assess if the intervention represents value for money in an Australian setting.

Overall, was the initiative worthwhile?

- The Produce Prescription is a worthwhile initiative with strong evidence demonstrating statistically significant short term changes to fruit and vegetable consumption and health care markers.
- The Program targets a relatively small segment of the eligible population (<10% of eligible persons not meeting the recommended serves of vegetables). However the share of affected persons has been steadily increasing in recent years.

Performance summary (using rubric)

The performance of the Produce Prescription Program is summarised in Table A8.3 against the evaluation criteria developed for VG22003 considering the evidence compiled to address each KEQ reported on above.

Table A8.3: Performance summary

| Criteria | Performance | Rationale |
|---------------------------------------------------------------------------------------------|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Relevance <i>"Solving the right problems"</i> | Very good | Multiple consumption barriers are directly supported through improved access to healthy foods for food secure populations impacted by type 2 diabetes. The current scope is focused on a relatively small but growing population share (<10% of eligible persons not meeting vegetable consumption targets). There is strong potential to scale to other non-communicable diseases which affect a large share of the population. |
| Strategic appropriateness <i>"Strategic approach is suitable to address the problem"</i> | Very Good | Produce Prescriptions directly address consumption barriers for food insecure cohorts through improving access to health foods and driving knowledge and skills through behaviour change support. |
| Execution effectiveness <i>"Using the right methods that are achieving results"</i> | Good | Increased consumption of fruit and vegetables (0.80-0.85 serves/day) over program duration (12-10 months) have been established, however the prospects for impacting long term behaviour changes beyond program participation have not been established. |
| Efficiency <i>"Use of resources"</i> | Not yet emerging | Produce Prescriptions are a relatively new health care model concept and are yet to be integrated with other complimentary health care programs. |
| Legacy <i>"Ongoing utilisation"</i> | Emerging | A relatively new "Food is Medicine" healthcare concept, with significant promise but limited tangible uptake across mainstream healthcare models at present. If long term funding and delivery models can be agreed, the program has the potential to deliver a lasting legacy. |
| Impact and investment return <i>"Realised increased consumption"</i> | Emerging | Simulation studies in the US have shown potential for strong cost effectiveness including overall savings to healthcare costs, and improved healthcare outcomes. Cost effectiveness testing is pending the results of the Australian RCT study currently underway, however willingness to pay measures indicate that a co-funding approach would be required to fund the full cost of the program. |

Discussion

Overall this evaluation assessed the Produce Prescription Program performance as being “Excellent” to “Emerging” across the six criteria.

Strengths. The Produce Prescription Program demonstrates a very clear strategy that directly targets the needs of food insecure populations impacted by type 2 diabetes (with likely relevance for other non-communicable diseases, e.g. heart disease). The program model supports many consumption barriers including of *Access and Affordability*, *Knowledge and Skill*, *Taste and enjoyment*, *Cost and wastage* and *Quality and convenience*. While these barriers are highly relevant for the target cohorts, they represent less than 10% of the eligible population not consuming the recommended serves of vegetables. However the nature of the Program model suggests that the approach could be readily scaled to other non-communicable diseases.

Weaknesses. While short term increases in consumption have been well documented through program participation, longer term impacts have not been demonstrated. The extent to which behaviour change would be consolidated in food insecure populations once access to fruits and vegetables ceases through the relatively short term duration of the program is uncertain. This represents a potential weakness of the program delivery in terms of providing a transition pathway if other socioeconomic factors influencing food insecurity are not addressed.

Conclusion. The cost effectiveness of the program is yet to be understood in the Australian context, however simulations from the US indicate that program funding has the potential to generate greater returns through healthcare cost savings and quality of life improvements. In Australia, willingness to pay measures indicate that there is a small gap between the total cost of supplying the produce and the value associated with receiving, such that cofounding approaches would be required. The legacy of the Produce Prescriptions Program is still emerging as a novel healthcare model however it could represent a significant mechanism for increasing vegetable consumption if scaled to be used as a treatment pathway for other non-communicable diseases.

Implications and learnings

This section outlines the key implications and learnings of the Produce Prescription Program for informing future vegetable R&D levy funded programs to increase vegetable consumption.

Execution timeframes

- A “prescription lifecycle” that supports participants transition to a self-fulfilling approach is required to reconcile the short-term changes achieved from the produce prescription timeframes with a longer-term timeframe enabling sustained behaviour change.
- The implementation of such programs with a long term, multi-life stage perspective is key.

Longevity and legacy

- Program longevity and cofounding opportunities will only be secured through integration and or replacement with existing health care models that are receiving existing funding.
- The potential for industry to grow volumes through this program would be significant if existing pharmaceutical subsidies were diverted into preventative health care models.
- While the evidence is well established in terms of increased consumption of vegetables supporting lifestyle related disease such as type 2 diabetes, additional evidence demonstrating impacts in an Australian setting and across a wider range of diseases are required to drive legacy.

Program coverage and scale

- The existing program has a narrow focus on a small cohort of the eligible population not meeting vegetable consumption in a single state.
- To achieve a more significant potential change, the program must be expanded to cover other non-communicable diseases or health treatments on a national basis.
- Providing recommended vegetable combinations and their subsequent impact on treating specific disease types could support a broad, yet targeted approach.

Distribution and logistics

- The distribution and logistics underpinning fresh produce supply is a key enabler of Produce Prescriptions, directly addressing several consumption blockers (e.g. *Quality and convenience*).
- Opportunities exist for growers to supply direct to produce consolidators to bypass retail partners if programs expand, or through existing food charities.



VG22003: Evaluation report

Attachment 9
LiveLighter campaign

February 2024

Initiative background

Mass media public health campaigns have been used to promote and influence healthy lifestyle behaviours including diet in response to increased rates of lifestyle-related diseases such as obesity and heart disease. These campaigns have the potential to encourage a wide range of actions through their broad messaging and delivery across mainstream media platforms.

In 2012, the Western Australian Government through the Department of Health launched the LiveLighter® campaign in order to encourage people to eat a healthy diet, engage in an active lifestyle and maintain a healthy weight. The delivery of the LiveLighter® campaign provides a mechanism to support increased consumption of vegetables through the focus on healthy diet messaging (amongst other lifestyle behaviours). LiveLighter® incorporates the key messages of previous healthy lifestyle campaigns such as Go for 2&5® and Find 30®. Table A9.1 summarises the LiveLighter® Program, with each element described in further detail below.

Table A9.1: Produce Prescriptions Program overview

| Program element | Description |
|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Funding model | Funded by the Western Australia Department of Health, and delivered by the Heart Foundation WA and Cancer Council WA. |
| Duration | Campaign commenced in 2012 (ongoing). |
| Coverage | Targets WA adults aged 25-64 years. From 2012-2019, seven TV led phases have been delivered, aired over 22 campaign waves. Key messages related to healthy eating, an active lifestyle and the achievement and maintenance of a healthy weight. |
| Objective | Encourage people to eat well (including a focus on increased vegetable consumption), be physically active and maintain a healthy weight through a public health education platform. |
| Delivery | Mass media television advertising, social media content, digital platforms (e.g. website, video), and development of printed tools and resources. |

Funding model

The LiveLighter® campaign has been funded by the Western Australian Department of Health. The program was initially delivered by the Heart Foundation WA, delivered in association with the Cancer Council WA. Since July 2018, the program has been delivered exclusively by the Cancer Council WA. The annual cost of campaign delivery across three delivery waves is approximately \$3 million per annum (2022-23 dollars), inclusive of pre-campaign, production and broadcast costs.

Duration

A range of campaigns have been delivered since commencing in 2012 through LiveLighter®, including 'Toxic Fat', 'Sugary Drinks', 'Eat Brighter', and 'Holidays'. Campaigns are delivered across waves, of approximately 2-3 months in duration. The most recent campaign 'Reverse' was launched in 2022 with wave 3 being delivered from the 17th September to the 25th November 2023.

Coverage

LiveLighter targets all Western Australia adults through its mass media approach. A total of 18 campaign phases, including 7 television-led campaigns have been delivered since 2012. Campaign messaging varies across the topics of healthy eating, an active lifestyle and the achievement and maintenance of a healthy weight.

Objective

The LiveLighter® campaign aims to reduce the burden of chronic disease caused by overweight and obesity, unhealthy diets, and physical inactivity. The campaign's objectives include:

- Stabilise rates of growth and reversing the current trend of overweight and obesity in Western Australia.
- Increase the prevalence of Western Australian adults consuming a diet in line with the national dietary guidelines.
- Increase the prevalence of Western Australian adults meeting the physical activity and sedentary behaviour recommendations.

The campaign messaging regarding the prevalence of meeting dietary guidelines is of most relevance for the vegetable industry, given the current gap in vegetable consumption around meeting the recommended dietary intake and associated demand opportunity.

Delivery

LiveLighter® delivers a range of hard-hitting, TV and digital public education campaigns, as well as the production and distribution of public education materials (e.g. recipes and food label information), public relations activities, media and political advocacy on obesity prevention issues. Campaign material, educational and other consumer resources are accessible through the LiveLighter® website. Bespoke material for engaging health professionals and other health-orientated stakeholders has been produced to extend the reach of the campaign material broadcast across mainstream media channels.

While the LiveLighter® campaign is predominantly focused on delivery within Western Australia, core campaigns have also been licensed for use across Victoria, South Australia, the ACT and Northern Territory jurisdictions.

This evaluation focuses on the delivery of the public health campaigns and education initiative delivery components in Western Australia.

Evaluation process

Evaluation of the LiveLighter® campaign was informed through a broad range of material captured across campaign delivery including campaign performance reports, annual reports, and strategic plans. LiveLighter® has been subject to several academic evaluations since inception which have each examined a unique aspect of delivery such as cost effectiveness, campaign messaging delivery and cut through across target cohorts. These resources provided suitable evidence to evaluate of the Program against the six evaluation criteria developed for VG22003.

The evaluation criteria focus on the extent to which LiveLighter supported, and has the potential to further support, increased vegetable consumption. Performance against the evaluation criteria was rated on a six-point scale ranging from poor to excellent (see the VG22003 Evaluation Framework for detail on the evaluation criteria and analytical rubric).

The key material consulted to inform the evaluation for VG22003 are summarised in Table A9.2 below.

Table A9.2: Resources informing the evaluation of LiveLighter®

| Resource | Relevance |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Ananthapavan et al. (2022). Cost-effectiveness of LiveLighter® - a mass media public education campaign for obesity prevention. <i>PLoS ONE</i> 17(9). e0274917. | Quantifies the value for money of the campaign as an obesity prevention initiative across two campaigns from 2013-2017. |
| Morley et al. (2016). Population-based evaluation of the 'LiveLighter' healthy weight and lifestyle mass media campaign. <i>Health Educ. Res.</i> 31(2):121-135. | Review of campaign awareness, recall, and mapping of proximal and intermediate markers of campaign impact. |
| Miller et al. (2022). Further evidence from the LiveLighter® campaign: A controlled cohort study in Victoria and South Australia. <i>Health Promot J Austr.</i> 33(1): 34-39. | Evaluation of the campaign in jurisdictions outside of Western Australia – awareness, message recall and action intent. |
| Morley et al. (2022). LiveLighter® 'Junk Food' mass media campaign increases behavioural strategies to reduce consumption. <i>Health Educ. Res.</i> 31(2):121-135. | Review of conversion between a LiveLighter mass media campaign on impacting junk food consumption behaviours and attitudes towards policies to encourage healthy eating. |
| Morley et al. (2019). Association of the LiveLighter mass media campaign with consumption of sugar-sweetened beverages: Cohort study. <i>Health Promot J Austr.</i> 30(S1):34-42. | Evaluation of campaign focused on sugar sweetened beverages impacting behaviours, including fruit and vegetable consumption. |
| Humphreys et al. (2023). Public support for obesity prevention policies in Western Australia from 2012 to 2020: Findings from cross-sectional surveys. <i>Health Promot J Austr.</i> doi: 10.1002/hpja.801. | Identifies public perception for obesity prevention policies in Western Australia, including the LiveLighter® campaign. |

Evaluation findings

This section outlines the evidence collected against each of the six evaluation criteria informed by a detailed review of the material identified in Table A9.2, followed by the assessed performance standard against each criteria, and discussion of the findings.

Evaluation Criteria

The extent to which the Framework KEQs have been supported is summarised below, drawing from the broad range of evidence and feedback collected. The evaluation criteria focus on the extent to which the campaign has the potential to support increased vegetable consumption.

Relevance

Was the initiative targeted to a high priority issue?

- Targets adults who are overweight or obese, not achieving recommended dietary intakes of healthy foods (including vegetables), and who are not meeting physical activity requirements for optimal health.
- These lifestyle markers are a significant and important determinant of chronic disease – including type 2 diabetes, heart disease and 13 different cancers.
- Most of the Western Australian adult population does not meet at least one of the lifestyle markers identified above.

To what extent did the initiative target one or more consumption barrier(s)?

- The LiveLighter® campaign focuses on high impact public health messaging centred on identifying opportunities for adapting lifestyle in support of improved health outcomes.
- *Knowledge and Skill* supported through provision of online resources through the 'Eat Brighter LiveLighter' campaign, including shopping and cooking tips, consumption ideas, produce selection and meal plans.
- Resources supporting *Knowledge and Skill* are targeted for a range of foods (e.g. seasonal eating, snack ideas) including vegetables.

Was the intervention targeting a prime prospect cohort?

- More than 70% of adults in Western Australia are overweight or obese¹⁷ and 90.9% of the Western Australian population do not meet the recommended vegetable intake¹⁸.
- This represents a broad prospective cohort to benefit through the LiveLighter® campaign messaging and educational material.

Strategic appropriateness

Was the strategy appropriate to the problem being addressed?

- LiveLighter® builds on learnings and experience obtained through the previous long running and well-known *Go for 2&5*® and *Find 30*® campaigns.
- The campaign leverages 'hard hitting' explicit and potentially confronting messaging and imagery to drive message cut through and recall with adults.

¹⁷ Western Australia Department of Health. https://www.health.wa.gov.au/Articles/N_R/Obesity-Physical-activity-and-Nutrition

¹⁸ ABS National Health Survey: State and territory findings. <https://www.abs.gov.au/statistics/health/health-conditions-and-risks/national-health-survey-state-and-territory-findings/latest-release>

- The development of the campaign was informed by a review of best practice approaches to mass media and social marketing campaigns on physical activity, healthy eating and healthy weight. Pretesting of material occurs prior to launch.

To what extent were the right tools, delivery and implementation model used in addressing the consumption barriers?

- The campaign uses mass media (TV, radio, print, cinema, social media, online advertising) to reach a wide audience who would benefit from lifestyle improvement (including increased vegetable consumption).
- A range of messaging across campaign waves focusing on the 'why' (e.g. achieve a healthy weight) and the 'how' (e.g. improvements to dietary behaviours) of the lifestyle opportunity, provide both initial motivation and demonstration of practical changes to encourage action.
- The sustained delivery of LiveLighter campaigns since 2012 has continued to lay the groundwork to support behaviour change through *Knowledge and Skill*, but relies on broader environmental conditions to further reinforce behavioural change (e.g. *Access & Affordability*).
- Increases in vegetable consumption are an implicit, but not direct message in the 'how' campaign messaging elements.

Was there a call to action trigger element?

- Each LiveLighter® campaign delivers a clear call to action trigger, focused on either 'why' (e.g. health consequences) or 'how' (e.g. specific action change opportunities).
- Relevant call to actions include *"Reduce the Junk. Reduce your Cancer Risk."*
- Call to action messages are not directly focused on vegetable consumption.

Execution effectiveness

To what extent did the creative execution and delivery address behavioural drivers or barriers for the target cohorts?

- The literature recognises that impacting behavioural drivers through mass media campaigns is only possible through sustained campaign delivery – a feature of LiveLighter®.
- Select campaigns achieved approximately 50% awareness at the total population level.
- Evaluations of previous campaign waves (e.g. health consequences of excess weight) have identified positive impacts on behavioural intentions through *Knowledge and Skill*, only after the delivery of a second consecutive campaign wave.
- The extent to which behavioural drivers have been consolidated over a multi-year campaign delivery phase has not been measured.

Was the creative execution effective at changing attitudes and consumption intent to drive behaviour change?

- Campaigns that seek to reframe an issue as a public health problem and provide suggestions for resolution are less likely to prompt defensive responses than health threats alone.
- Evaluations of previous LiveLighter® campaign execution has impacted short term measures of attitudes and intent.
- Impacting long term attitudes towards vegetable consumption behaviours are not a direct focus of the campaign, with a focus on higher level macro lifestyle drivers such as 'make healthier choices'.

Was the program effectively implemented to drive behaviour change?

- The mass media campaign messaging has been effective at achieving cut through for target populations in unlocking motivational drivers to shape general lifestyle improvements.
- There exists the opportunity to 'level up' campaign collateral by integrating with other supporting resources and programs (e.g. cooking skills) to directly influence behaviour change.
- A range of behaviours are targeted across the various campaign waves (e.g. healthy eating, exercise, sugary drink consumption) – however it is unclear how campaign messaging is reconciled to collectively drive the target behaviours.
- The opportunity for behaviour changes that relate specifically to increased vegetable consumption do not feature directly in the program messaging, resulting in potential missed opportunities relating to the execution for driving the intake of specific healthy food groups.

Efficiency

How were resources used to achieve increased consumption?

- The program allocates the majority of funding to broadcasting costs (70%).
- Several campaign messaging formats (e.g. TV, social media) are delivered to improve recall and message awareness.
- Delivering resources suitable for health professionals provides the opportunity to extend the campaign reach across specific target populations.
- Stakeholder or industry partnerships could have provided further opportunity to amplify the existing resource base and drive additional efficiency (e.g. linked material across retail environments to reinforce messaging).

Has the initiative influenced/ complemented/leveraged other programs to increasing consumption?

- The LiveLighter® campaign has been licenced for use in Victoria, South Australia, the ACT and Northern Territory.
- The delivery of LiveLighter® was influenced by previously successful campaigns including Go for 2&5® and Find 30®.
- The initial 'Toxic Fat' campaign delivered by LiveLighter® in 2012 was relaunched in 2020, demonstrating messaging legacy and relevance.
- There has been limited linkage between LiveLighter® and supporting initiatives seeking to influence vegetable consumption (e.g. Food Sensations® – refer Appendix 6).

Legacy

To what extent will the initiative have an on-going residual/lagged effect?

- Mass media campaigns should be one aspect of a comprehensive suite of initiatives including broader community engagement and policy-level interventions to drive behaviour change.
- Sustained campaign delivery is required over an extended period to achieve target behaviour changes.
- The extent to which the campaign will support residual vegetable demand is unlikely, given the broad range of general lifestyle messaging that is used, weakening the extent to which increased vegetable consumption is attributed.

Impact and investment return

Did the intervention increase consumption leading to improved industry (economic) and social benefits?

- Specific changes in vegetable consumption have not been measured as the campaign is focused on achieving behaviour change at an overall diet level.
- Preliminary behavioural drivers from standalone campaigns have been demonstrated (e.g. intentions to lose weight, reducing sugary beverages and discretionary food consumption).
- A past campaign (2013-2017) focused on reducing sugary drink and sweet food consumption was estimated to result in an average lifetime population weight reduction of 0.58kg through changed behaviours.
- Extending the campaign with a direct focus on vegetable consumption messaging provides the opportunity to drive more tangible industry benefits.

Did the investment deliver value for money for levy payers and funding bodies?

- A past campaign focused on reduction of sugary beverages and discretionary foods was found to be highly cost effective, with net health gains and cost savings (from avoided disease costs) relative to the campaign investment of \$0.85 million.
- Value measures for the vegetable industry are not available.

Overall, was the initiative worthwhile?

- The LiveLighter® campaign has emerged as an important public health intervention with a demonstrated capacity to affect broad attitudes and lifestyle behaviours across the Western Australian adult population.
- The extent to which the initiative has impacted vegetable consumption is unclear, given that campaign messaging only focuses on broad lifestyle actions, with changes to specific healthy foods not a direct focus.

Performance summary (using rubric)

The performance of the LiveLighter® campaign is summarised in Table A9.3 against the evaluation criteria developed for VG22003 considering the evidence compiled to address each KEQ reported on above.

Table A9.3: Performance summary

| Criteria | Performance | Rationale |
|---------------------------------------------------------------------------------------------|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Relevance <i>"Solving the right problems"</i> | Good | <i>Knowledge and Skill</i> regarding healthy diet behaviours addresses a broad range of lifestyle related challenges affecting the majority of the adult population. While vegetables are a key pillar of a healthy diet, the specific relevance of vegetables in the context of a healthy diet is only provided indirectly. |
| Strategic appropriateness <i>"Strategic approach is suitable to address the problem"</i> | Good | Campaign messaging focusing on 'why' and 'how' to address specific health challenges is strategically delivered to drive target behaviour changes through broad channels. There remains untapped potential for engaging specific dietary behaviours regarding vegetable consumption within broader lifestyle messaging. |
| Execution effectiveness <i>"Using the right methods that are achieving results"</i> | Emerging | The mass-media approach has achieved awareness of campaign delivery across most WA adults. Previous campaign evaluations did not identify significant changes to intended dietary behaviours (including fruit and vegetables) however there remains the potential to impact the attitudes needed to underpin longer-term behavioural change. |
| Efficiency <i>"Use of resources"</i> | Emerging | While the efficiency of campaign delivery increases the longer a campaign is in-market, the effect of rotating LiveLighter® campaigns on message salience and retention for supporting behaviour change is unclear. The development of the campaign has leveraged learnings from "Go for 2&5" and can be licensed for use in other states. |
| Legacy <i>"Ongoing utilisation"</i> | Good | LiveLighter® is a long running mass media campaign in Western Australia that has developed extensive collateral and resources that continue to remain relevant across a broad population. The legacy would be strengthened through national implementation, alignment with supporting programs and avenues for direct industry linkages. |
| Impact and investment return <i>"Realised increased consumption"</i> | Not yet emerging | Cost effectiveness of campaign delivery regarding reduced health care costs from population level weight loss was established. However, with a focus on achieving this outcome through reductions in discretionary food consumption, the extent to which increased vegetable consumption has been supported as a result is unknown. |

Discussion

Overall this evaluation assessed the LiveLighter® performance as being “Good” to “Not yet emerging” across the six criteria.

Strengths. LiveLighter® demonstrates the role that a mass-media campaign can play in supporting behaviour change across broad adult cohorts. Campaigns focusing on improving healthy eating habits, weight reduction and exercise are highly relevant and the delivery of messaging that leverages both ‘why’ and ‘how’ avenues is a useful strategy for encouraging audience action. Given that consuming vegetables are a key pillar of maintaining general health, there remains additional opportunity for leveraging this as a specific element of the ‘how’ message.

Weaknesses. The effectiveness of LiveLighter® has been assessed at a specific campaign level, however the impact on vegetable consumption has not been measured, given that campaign messaging is targeted to high-level lifestyle behaviours. Where intentions to change dietary behaviours were measured for one campaign (including increased fruit and vegetables), a significant change was not identified. Further, given the campaign’s current focus on general lifestyle and diet opportunities, attributing specific increases to vegetable consumption is challenged given the range of other factors and barriers influencing this outcome (e.g. *Taste & Enjoyment, Cost & Waste, Access & Affordability, Quality and Consistency*). Therefore, unless vegetable consumption messaging (why and how) is specifically profiled in future LiveLighter® campaigns, establishing the effectiveness for driving consumption will be challenged.

As LiveLighter® rotates a diverse range of material, the cumulative effectiveness of the entire campaign ‘program’ is also unknown. While the legacy of LiveLighter® is well established in Western Australia, future campaign design could be influenced and supported by the vegetable industry given the strong affiliation with supplying products that support the ‘how’ behaviour opportunities.

Conclusion. LiveLighter® has demonstrated the role of a mass media campaign for influencing public perception of target behaviour through ‘why’ and ‘how’ messaging. Whilst the campaign was not focused directly on vegetables, there is an indirect association between the target behaviours and vegetable consumption although the attribution of behaviour change has not been established. LiveLighter® provides a useful case study for the vegetable industry to inform ‘what works’ when considering the development of a mass market campaign.

Implications and learnings for future investment

This section outlines the key implications and learnings of the Produce Prescription Program for informing future vegetable R&D levy funded programs to increase vegetable consumption.

Industry partnerships

- The vegetable industry should identify avenues to partner with public health mass-media campaigns to amplify existing healthy diet messaging that delivers a vegetable-specific focus.
- Developing specific healthy food associations provides the opportunity to drive more direct 'call to actions' beyond general lifestyle and diet messaging.

Cross-initiative linkages

- While mass-media campaigns can drive message saliency for 'healthy eating', there remain opportunities to strengthen specific behaviour change outcomes through linkages with other supporting vegetable-specific initiatives that impact self-efficacy (e.g. skills and confidence).
- Veggycation[®] is an example of a vegetable levy funded initiative that could be linked with mass-media campaign delivery to support the conversion between message saliency and self-efficacy.

Aligning campaign investment with R&D pathways

- As the challenge of low vegetable consumption applies to the majority of the adult population, mass-media campaigns are effective at achieving the necessary reach to realise wide-scale potential change.
- Health and lifestyle messages delivered through mass media campaigns apply across a wide demographic – therefore a national delivery model would maximise the opportunity.
- Annual costs to deliver a state-based campaign of circa \$3 million suggest that a national campaign could be delivered for \$5-10 million annually – consistent with the findings from VG17013 *Building the Case to Grow Domestic Demand for Vegetables*.
- Opportunities to utilise levy-funded vegetable R&D investment to influence campaign strategy development that capitalises on opportunities to drive vegetable consumption should be explored.



VG22003: Evaluation report

Attachment 10

Veg Education – Schools Farm Gate Program

February 2024

Initiative background

The Veg Education Schools Farm Gate Program delivers curriculum integrated food experiences for primary and secondary students with an emphasis on the fresh vegetable industry that reflects the product lifecycle from production to consumption. The aim of the Schools Farm Gate Program is to foster a love of vegetables amongst children, including the overall perception and appreciation for the industry. As Registered Training Organisation (RTO) Veg Education delivers a range of other vocational training opportunities for students seeking to gain qualifications, which may be initiated from student participation in the Farm Gate Program. Table A10.1 summarises the Schools Farm Gate Program, with each element described in further detail below.

Table A10.1: Schools Farm Gate Program overview

| Program element | Description |
|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Funding model | Self-funded through Government grants, and on a fee for service basis. |
| Duration | Commenced 2021 (ongoing). |
| Coverage | Focused on Victorian school students and teachers across both primary and secondary settings. Approximately 120 schools and 4,000 students have participated in the program to date. |
| Objective | Instil a broad appreciation for the vegetable industry that generates ongoing interest and participation (e.g. through pursuing further education, a career, and/or increased vegetable consumption). |
| Delivery | In person 2 hour site excursion to a commercial vegetable farm that includes experiential learning opportunities, supported by follow up class room activities that integrate with the curriculum. |

Funding model

The majority of participating schools have been funded through Government and Industry grants that deliver the program at no cost to participants. The program is currently fully supported until July 2024 through, the Victorian Government's Agriculture TAFE and Training Fund and prior to that was supported by the Kids to Ag grant, administer by the Victorian Farmers' Federation on behalf of the Department of Agriculture. A small number of schools (n=10) have self funded their participation in between grant funding.

Each farm visit is valued at \$2,000, which includes transporting students and teachers to and from the site. Participation is generally between 30-50 students per visit, equivalent to an average cost of \$40-\$67 per student.

Beyond the current Training Fund Grant secured to July 2024, no additional funding is supporting delivery of the program. Veg Education are actively seeking out partnership opportunities to expand the program delivery and reach.

Duration

Veg Education's Farm Gate Program has been running for three years, commencing in 2021. Each farm tour experience is delivered over a two-hour period and provides coverage of key curriculum areas addressing food production environments and preparation. Follow up curriculum aligned lesson plans are also provided to consolidate learning.

Coverage

Students and teachers of primary and secondary schools located in Victoria are targeted by the program. Veg Education are not actively promoting the program as all available grant funded places have been filled.

To date, 120 schools and over 4,000 students have participated over the last three years since the program was established.

Objective

The Farm Gate Program seeks to increase student exposure and awareness of where food comes from, supply chains and promotion of the dynamic and diverse career opportunities available in the horticulture sector. Delivered on a commercial vegetable farm, the program seeks to instil an appreciation for the industry, which translates to improved attitudes towards consuming vegetables, and ultimately long term consumption behaviours.

Delivery

Over the two hour experience, the Farm Gate Program allows students to observe the major operations of a commercial vegetable farm, (e.g. in-field, picking, packing, transport) and provides opportunities to consume farm grown produce raw and in simple recipes prepared on site. The programs are delivered in a way that engage all senses (e.g. smell, touch, hearing) to provide a memorable and realistic experience for students outside the classroom. Additional curriculum-integrated learning material is supplied for classroom follow up consolidating the farm experience.

Evaluation process

Evaluation of the Schools Farm Gate Program was informed through direct consultation with the Veg Education program team. Aside from high level information published through their website, no additional documentation (e.g. program plan, strategy, performance reviews) were available to review. The Veg Education team advised that the Program is currently being evaluated independently to satisfy the requirements of the current round of grant funding, however at the time of writing, results were not available. Consultation with program staff (Managing Director, CEO, Lead Education Trainer) provided suitable evidence to evaluate of the Program against the six evaluation criteria developed for VG22003.

The evaluation criteria focus on the extent to which the Schools Farm Gate Program supported, and has the potential to further support, increased vegetable consumption. Performance against the evaluation criteria was rated on a six-point scale ranging from poor to excellent (see the VG22003 Evaluation Framework for detail on the evaluation criteria and analytical rubric).

The key material consulted to inform the evaluation for VG22003 are summarised in table A10.2 below.

Table A10.2: Resources informing the evaluation of Schools Farm Gate Program

| Resource | Relevance |
|-----------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Consultation with Veg Education Managing Director, CEO and Lead Education Trainer. | Overview of all operational aspects of the Veg Education Schools Farm Gate Program. |
| Veg Education website (https://www.vegeducation.com/) | Program background and delivery. |

Evaluation findings

This section outlines the evidence collected against each of the six evaluation criteria informed by a detailed review of the material identified in Table A10.2, followed by the assessed performance standard against each criteria, and discussion of the findings.

Evaluation Criteria

The extent to which the Framework KEQs have been supported is summarised below, drawing from the broad range of evidence and feedback collected. The evaluation criteria focus on the extent to which the Program has the potential to support increased vegetable consumption.

Relevance

Was the initiative targeted to a high priority issue?

- Directly addresses curriculum priorities regarding the modern food production systems. With a focus on vegetable production, the program seeks to increase attitudes towards fresh produce, translating to increased consumption that will address the rising incidence of childhood obesity.
- Approximately 1 in 4 Australian children aged between of 2 and 17 (1.25 million), are overweight or obese with a total national cost across all populations of \$11.8 billion in 2019¹⁹.
- The *National Obesity Strategy 2022-2032* identified the importance of increasing vegetable consumption to reduce discretionary food choices, through creating supportive, sustainable and healthy environments that empower people to stay healthy.
- Approximately 95% of children are not eating the recommended serves of vegetables.

To what extent did the initiative target one or more consumption barrier(s)?

- The Farm Gate Program focuses on sensory experiences that are engaging and appealing to children that foster an appreciation for vegetables in support of improved attitudes towards consumption.
- *Taste & Enjoyment* and *Knowledge & Skills* targeted through hands on experiential learning focusing on how vegetables are produced, and how they can be consumed through simple and creative preparation methods.

Was the intervention targeting a prime prospect cohort?

- Early and repeated positive exposure and experiences to vegetables during childhood have been linked with influencing lifelong attitudes to vegetable consumption (SOURCE).
- Delivering an experiential platform to deliver the curriculum focusing on modern food production and preparation provides a novel and unique approach to engage children's appreciation of vegetables.

Strategic appropriateness

Was the strategy appropriate to the problem being addressed?

- The in person setting of the Farm Gate program directly addresses a low level of understanding and experience by children relating to modern food production and preparation.

¹⁹ Commonwealth of Australia 2022, *The National Obesity Strategy 2022–2032*, www.health.gov.au/resources/publications/national-obesitystrategy-2022-2032

- The farm experience draws on the rich sensory experiences that are offered to engage students at a deeper level beyond what would otherwise be offered through a classroom based setting.
- The program ensures a holistic experience that also profiles the available career pathways in horticulture.
- Program staff commented this is a deliberate focus to highlight possible involvement in the vegetable industry beyond as a consumer and this affiliation would provide another platform for supporting lifelong vegetable consumption habits.

To what extent were the right tools, delivery and implementation model used in addressing the consumption barriers?

- The Program has leveraged the experience of qualified education professionals to ensure a delivery model that supports school and teacher requirements for addressing the curriculum.
- The in person delivery model provides a unique way to engage students through activities such as vegetable sampling and simple meal preparation to drive *Taste & Enjoyment* and *Knowledge & Skills*.
- The focus on consuming vegetables is absorbed into broader messaging that profiles the value of the industry more broadly.

Was there a call to action trigger element?

- As a school focused education program, a call to action element is not applicable.

Execution effectiveness

To what extent did the creative execution and delivery address behavioural drivers or barriers for the target cohorts?

- The delivery of an experience based on observing and participating in farm activities, handling and tasting vegetable products directly appeals to students.
- The execution and delivery of the program is founded in educational principles that are intended to provide students with an exceptional basis for influencing attitudes towards food production and vegetable consumption more broadly.
- The extent to which behavioural drivers have been impacted across participating student cohorts has not been measured, however an evaluation of the program is currently underway.

Was the creative execution effective at changing attitudes and consumption intent to drive behaviour change?

- Outdoor, place-based education has been demonstrated to support lasting knowledge, attitude and behaviour change compared with class-based activities.²⁰
- The extent to which the campaign has changed attitudes and consumption behaviours of participating students have not yet been measured.
- Anecdotal feedback received from schools following participation in the program has been consistently positive, with students showing high levels of engagement with the follow up classroom based activities.

²⁰ Rafferty and Laird (2013). Children's Observations of Place-Based Environmental Education: Projects Worlds apart Highlight Education for Sustainability Inherent in Many Programs. *JSE(5)* 138-153.

- The current 'once off' delivery model would reduce the likelihood that attitudes and intentions are influenced compared to if a staged or multi-touch point participation model was used.

Was the program effectively implemented to drive behaviour change?

- The program is delivered by a dedicated educator, with a focus on educational activities that foster a holistic perspective of modern food production in a vegetable-based setting.
- The program staff reflected the importance of providing a holistic perspective of the industry, as this is a proven way to implicitly nudge consumption behaviours, instead of them being pushed onto students.
- The effectiveness of this holistic approach serving as a behaviour change enabler has not yet understood been measured.

Efficiency

How were resources used to achieve increased consumption?

- The program allocates the majority of its funding to covering the transport of teachers and students to and from the farm site.
- A dedicated space for student education has been integrated into the farm office/administration building.
- The delivery of the program is entirely face to face. Approximately 30 students participate over a 2 hour period.
- As the program is managed by the owner-operator of the farm site, student activities can be thoughtfully integrated around daily operations.
- While capacity to scale the program could be easily supported by 'virtual' farm experiences, the program team stressed the importance of retaining place based elements to ensure the most worthwhile experience.
- Extending the availability of the program to other farms across the state (or nationally) could provide another means to scale the program, however site compliance and delivery methods may need to be adapted.
- The Registered Training Organisation structure enables Veg Education to connect students with other training and career development opportunities.

Has the initiative influenced/ complemented/leveraged other programs to increasing consumption?

- The Schools Farm Gate program leveraged best practice principles for engaging children developed by CSIRO and presented through VegKIT. The program team also mentioned that insights from other levy-funded programs such as Harvest to Home have informed the design and delivery of the program.
- The Program has not directly influenced or complimented any other supporting programs.

Legacy

To what extent will the initiative have an on-going residual/lagged effect?

- Delivery of program modules across multiple school years would enhance the legacy of the program beyond the current 'once off' engagement touchpoint.
- The holistic focus of the program, including profiling the possible careers available within the vegetable industry offers the opportunity for broader legacy, e.g. actively prompting training and then seeking employment in the industry. However this is not directly associated with increasing in vegetable consumption.

Impact and investment return

Did the intervention increase consumption leading to improved industry (economic) and social benefits?

- Specific changes in student vegetable consumption as a result of participating in the program have not been measured.
- Delivering the program as a staged model over consecutive years or curriculums would provide the pathway for building continuity of student engagement and capacity to measure timeseries changes in attitudes and behaviours.

Did the investment deliver value for money for levy payers and funding bodies?

- Over the three year period to 2023, approximately 120 schools and over 4,000 students have participated in the Veg Education Farm Schools Program.
- The program is delivered at a cost of \$2,000, equating to a per-student cost of between \$40-\$67 (midpoint \$53.50).
- While value for money measures are not available, the program would be required to stimulate an additional 240 additional serves of vegetables per student to break even, assuming an average vegetable retail value of \$2.97/kg (Hort Stats Handbook 2021/22) – equivalent to increasing the number of serves by 0.65 per day over a 1 year period.
- Based on the existing program scale, broad industry economic impacts are not anticipated.

Overall, was the initiative worthwhile?

- The Schools Farm Gate Program offers a new and unique local program delivering an engaging holistic education experience for primary and high school students.
- The extent to which the initiative will support long term behaviours around vegetable consumption is unclear, and has not been directly measured.
- Unless the program can be scaled beyond a local model, it is unlikely that a commercial economic return will be supported for the vegetable industry as a result of increased consumption.

Performance summary (using rubric)

The performance of the Veg Education Schools Farm Gate Program is summarised in Table A10.3 against the evaluation criteria developed for VG22003 considering the evidence compiled to address each KEQ reported on above.

Table A10.3: Performance summary

| Criteria | Performance | Rationale |
|---------------------------------------------------------------------------------------------|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Relevance <i>"Solving the right problems"</i> | Very Good | 95% of children are not eating the recommended daily serves of vegetables. Behavioural drivers <i>Taste & Enjoyment</i> and <i>Knowledge & Skills</i> are supported through hands on, curriculum aligned, place based experiential learning that foster a broad appreciation for vegetables (production through to consumption). |
| Strategic appropriateness <i>"Strategic approach is suitable to address the problem"</i> | Good | The program content is holistically focused on all aspects of vegetable production and potential career pathways, with the view to positively influencing student attitudes towards vegetable consumption. The place-based delivery model offers a unique opportunity to ensure deep and memorable student engagement. |
| Execution effectiveness <i>"Using the right methods that are achieving results"</i> | Emerging | The program is delivered by qualified educators which ensures alignment with curriculum requirements. The extent to which behaviours have been affected through participating in the program have not yet been measured. The 'once off' nature of program design may present a limitation in influencing longer term behaviours. |
| Efficiency <i>"Use of resources"</i> | Emerging | Connecting interested students with other training and career pathway support is a beneficial way to build momentum from existing engagement. The program team are familiar with supporting resources and these have been integrated. A suitable model for scaling the program without compromising the in person delivery has not been identified. |
| Legacy <i>"Ongoing utilisation"</i> | Not yet emerging | The Program is currently delivered as a 'one off' engagement, limiting the longer term association. Delivering the program in a staged approach for students at multiple age levels would improve the potential to generate greater legacy. |
| Impact and investment return <i>"Realised increased consumption"</i> | Not yet emerging | A total of 120 schools and over 4,000 students have participated in the program to date. In order to 'break even' with program costs, each student would need to increase consumption by 0.65 serves/day over a 1 year period. The existing program scale limits the extent to which commercial impact for the vegetable industry would be realised. |

Discussion

Overall this evaluation assessed the Schools Farm Gate performance as being “Very good” to “Not yet emerging” across the six criteria.

Strengths. The Schools Farm Gate Program provides a novel approach to engage students in the curriculum through providing a holistic perspective of the vegetable lifecycle from production to consumption. The holistic and place based approach ensures that a greater level of appeal for students is realised than what would be otherwise realised through a classroom setting. While the overall aim of the program is to foster a love and appreciation of vegetables amongst students, the program team intend for this to be associated with an implicit increase in consumption as a result. The credibility and delivery of the program through Veg Education as a Registered Training Organisation offers an effective platform to link interested students with additional career pathways.

Weaknesses. The program has achieved a considerable level of participation, primarily provided ‘at no cost’ to schools support through several grants that have been secured to cover running costs. While some schools have self-funded their participation, the delivery of self-funded programs for periods outside available grant funding was not at the level as when grant funding support was available. A self-funded model also raises issues of accessibility for participation by public schools who generally are challenged to fund participation in external activities (which can still be delivered in the classroom), in contrast with private schools.

While a range of positive anecdotal feedback has been collected by the program team regarding student engagement and enthusiasm post-participation, the extent to which the program has influenced consumption behaviours has not been assessed. Currently there is no feedback mechanism to establish the extent to which behaviours have been impacted.

Conclusion. The Schools Farm Gate Program delivers an engaging place-based experience for students that activates appreciation and knowledge of vegetable production in a curriculum aligned way beyond what could be achieved in the classroom. Structuring the program using a series of ‘modules’ could improve the capacity by which changes in behaviour can be demonstrated over a longer period of time. Developing a model to license the delivery of the program across other farms (supported by qualified educators) would also improve the scale of program delivery and ultimate potential for generating commercial returns across the vegetable industry.

Implications and learnings for future investment

This section outlines the key implications and learnings of the Schools Farm Gate Program for informing future vegetable R&D levy funded programs to increase vegetable consumption.

Recognising and leveraging industry assets

- The vegetable industry is poorly understood by most children, yet offers the opportunity a platform for delivering sensory rich, experiences that are highly appealing to children.
- Place-based experiences that incorporate the interesting and appealing aspects of the vegetable industry will elevate programs that target children and students by offering a direct and stimulating point of engagement.
- There exists the opportunity for further R&D that explores what elements of place based experiences most effectively impact children's attitudes and behaviours.

Program scale

- As a centralised delivery model, the Farm Gate Program can easily reach capacity with available funding and resourcing levels, resulting in untapped potential and missed opportunity to engage wider cohorts.
- Additional opportunity exists through exploring a licensing model that recruits additional farms to enable a wider rollout on a state or national basis through approaches like a 'train the trainer' or 'hub and spoke' model.

Execution timeframes

- Education settings are bound to deliver educational outcomes across a long term horizon, which are not easily reconciled against the short term nature of engagement presented within the Schools Farm Gate Program.
- Programs that maintain a focus on children in an educational setting should be delivered across a multi-stage platform that aligns with the 'longer term' implementation model that applies across the entire education lifecycle.
- Behaviour change from program implementation can only be demonstrated over the long term, which supersedes the Farm Gate Program delivery model. Designing programs that can be applied across the entire educational pathway (and beyond) is key.