



# New frontiers in community initiatives to increase vegetable consumption

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## Abstract

**Issue addressed:** Public health concerns about insufficient consumption of vegetables across all demographics in Australia have led to 20 years of behaviour change interventions ranging from social marketing to interactive small group programs, with modest results. To maximise health promotion intervention outcomes, practitioners need up-to-date information that helps them navigate the complexity of food systems and eating behaviours.

**Methods:** This scoping review of Australian and international research, including peer-reviewed and grey literature, provides a picture of health promotion nutrition interventions, as well as other initiatives that may promote increased vegetable consumption. Search terms related to nutrition and vegetable consumption, type of intervention or initiative, for example, campaign; and consumer values and behaviour. A wide range of data sources were used including scholarly papers, market research reports and publicly available websites of community organisations (eg, OOOBY). A broad food systems typology was developed to provide a framework for the review.

**Results:** The review finds an emerging group of community-driven initiatives within local food systems that appear to have positive impacts on vegetable consumption. These initiatives sit within a multi-faceted approach to health and well-being that is consistent with the tenets of the Ottawa Charter for Health Promotion, including community engagement, social justice and sustainability goals.

**Conclusions:** More research into the impact of these new frontiers is needed, but our preliminary findings point to the potential for health promotion practitioners to collaborate on local/community food system initiatives that are not motivated primarily by health goals, but have the potential to deliver multiple health and environmental outcomes.

**So what?** This review demonstrated community-driven initiatives around local food systems show the most promise in promoting vegetable consumption and addressing the determinants of health. Health promotion efforts to encourage food security and

healthy eating could be strengthened through collaborations within these new frontiers.

#### KEY WORDS

behaviour change, community-based intervention, healthy environments, nutrition

## 1 | INTRODUCTION

Maintaining a healthy diet is fundamental to chronic disease prevention, and Australians are failing to meet the dietary guidelines.<sup>1,2</sup> Both the excess intake of energy dense, nutrient-poor foods and/or inadequate consumption of nutrient-dense foods, in particular vegetables, fruit and wholegrain cereals, are key contributors to the burden of disease.<sup>2</sup> The most recent national survey of fruit and vegetable (F&V) consumption by the Australian Bureau of Statistics reports that in 2011-2012, almost 50% of Australians over 18 years were meeting the guidelines for the total number of F&V serves. However within that statistic, fewer than 4% of Australian adults consumed the minimum recommended daily intake of five or more serves of vegetables and legumes.<sup>1</sup> The same survey found particularly low consumption patterns in those 18 years and under (1.8 serves), but consumption increased in adulthood to average three serves per day, still well below the recommended minimum. Consumption of vegetables and legumes is associated with a reduced risk of multiple health, environmental and economic impacts including increased chronic disease, meat-heavy diets contributing to Australia's carbon footprint and higher health costs.<sup>2-4</sup> This paper focuses on health promotion interventions and other community initiatives with the potential to increase vegetable intake.

Reasons for low vegetable intake are multi-faceted. Some population groups may face issues in terms of cost and accessibility. For example, access to a healthy food store in a US study was associated with increased consumption of fruits and vegetables ( $b = -0.19$  servings/day per mile).<sup>5</sup> It has also been suggested that significant changes in the social organisation of food consumption, including replacing food prepared at home with commercially prepared food and reliance on ultra-processed foods, may be contributing to a reduction in nutritious eating, including vegetable consumption.<sup>6,7</sup>

In response to the growing burden of ill-health associated with low F&V consumption, governments and health agencies have developed and delivered health promotion interventions utilising mass media and targeted social marketing techniques to supplement individualised or targeted programs for at risk populations, with modest success across all high-income countries.<sup>8</sup> Beyond the mass media space, health promoters have been instrumental in establishing a range of community initiatives such as community and kitchen gardens.<sup>9</sup> Food security initiatives focusing on access and affordability of food have also become popular in health promotion practice.<sup>10,11</sup> More broadly, community concerns about the impact of the modern industrial food system on both human and environmental health have led to the establishment of other local food networks, such

as community-supported agriculture (CSA), food hub/food box schemes and farmers' markets. Within the health promotion sector, key tenets of the Ottawa Charter for Health Promotion (OCHP) support working beyond the health system to create supportive environments and strengthen community actions, utilising an approach that incorporates holism and ecology.<sup>12</sup> There may be opportunities for health promoters to build partnerships within these "new frontiers," as signposted by Kickbusch and others.<sup>13-15</sup>

The purpose of this paper was to review the landscape of community initiatives and interventions associated with vegetable consumption in Australia and developed countries, and to identify those that offer opportunities for engagement by the Australian health promotion sector to influence vegetable consumption in the community.

The paper is novel in that it provides both a review of documented interventions and initiatives, and a snapshot of current community initiatives in Australia that show promise for supporting increased vegetable consumption. The aim is to identify what works and what are the new opportunities—"new frontiers." The research questions were as follows:

What community interventions and initiatives are being implemented in Australia and abroad that were either designed to specifically promote vegetable consumption or may have that impact? What evidence exists to demonstrate that these identified community interventions or initiatives can effectively increase vegetable consumption?

## 2 | METHODS

To explore existing knowledge of community interventions and initiatives and their effects, and to identify areas requiring further research and evaluation, the authors carried out a comprehensive scoping review of literature from Australia and developed countries. The research was completed in 2017, supported by funding from Horticulture Innovations Australia Limited (Hort Innovation). Based on an holistic approach to health and well-being as embodied by the OCHP, and using a food systems lens, the authors developed a typology of activities (Table 1). This typology provided a framework that facilitated moving beyond traditional/behaviour change approaches to promoting vegetable consumption to include new frontiers—initiatives which may be motivated by other non-health aims but have the potential to promote vegetable consumption. The working definition of food system was "an interconnected web of

**TABLE 1** Australian food landscape—typology of community interventions and initiatives with potential to increase vegetable consumption

Status	Motivation/aims/key players	Name of community intervention and/or initiative	Settings or target populations	Example/s
Conventional Large-scale or Settings-based Interventions	Food security Behaviour change/health promotion/cultural change Initiated by health or government agency/state/national scale; some industry partnerships Distant relationships between producer and consumer	Mass media and social marketing campaigns [nutrition/dietary education campaigns] Settings or target group based interventions	General population Indigenous communities; Lower socio-economic status (LSES); children and parents; supermarkets	2 Fruit, 5 Veg; Go for 2 and 5 <sup>65</sup> ; Measure up <sup>68</sup> WA FOODcents <sup>26</sup> ; Traffic Light Programs; Jamie Oliver's Ministry of Food <sup>24</sup>
Other mass media initiatives		Edutainment and social media activity [food/cooking education]	General population Children	MasterChef; My Kitchen Rules; Facebook
Established Community Interventions and Initiatives	Reconnection to food and fostering social connection Initiated by local government; health or other agency/social enterprise; some partnerships with local community groups Reconnection to food, cooking and social eating Initiated by agency/social enterprise; some partnerships with philanthropic bodies and government department	Community gardens School Kitchen gardens (expanded food program including kitchen garden)	LowSES; culturally and linguistically diverse; migrants and refugees Urban; health care; education; prisons Children Primary schools all over Australia Indigenous communities	Australian City Farms and Community Gardens Network <sup>50</sup> ; Kooweerup regional health service community garden <sup>2</sup> ; Deakin University Community Garden Stephanie Alexander Kitchen Garden Foundation Program <sup>69</sup> ; Cultivating Community; Eon Foundation Projects <sup>70</sup>
Status	Motivation/aims/key players	Name of community intervention	Settings or target populations	Example/s
Established Community Interventions and Initiatives	Local or regional food systems/fair return to producer/quality food Direct marketing; initiated by small- to medium-scale producers; farmers, local councils, community organisations and service clubs	Farmers' markets <sup>40</sup>	General population mainly educated and financially secure; tourists and day trippers Urban, peri-urban and regional	Victorian Farmers' Markets Association; Melbourne Farmers' Markets
New Frontiers	Food quality/producer sustainability/food systems change/food sovereignty/sustainability Initiated by consumers, environmental and sustainability agencies; cultural organisations Values based supply chains Localised food systems: initiated by consumers and producers or individuals, environmental and sustainability agencies; community and local council Direct relationship between consumer and producer Diverse produce/small scale: initiated by producers	Values driven food choices Localised food supplies Community based or social enterprises, for example, food hubs, cooperatives predominantly in urban settings Community Supported Agriculture (CSA)—single farm (another form of localised food supply) Agritourism and farm tourism (including city farms)	Young adults; older educated adults Local community Peri-urban, educated; mainly women and financially secure Families with young children; experience-seekers Low SES; culturally and linguistically diverse; migrants and refugees	Sustainable Table; Slow Food; Kinfolk Cafe; Lentil as Anything; Sorghum Sisters catering; STREAT Food Connect Sydney and Brisbane <sup>71</sup> ; verge gardens; rooftop gardens; edible streetscapes; bartering and food swaps Transition Farm; PEACE Farm; 2&5 Geelong; Purple Pear Farm Hawkesbury Harvest Trails and Markets <sup>72</sup> ; demonstration and city farms, eg, Collingwood Children's Farm <sup>73</sup> OzHarvest <sup>74</sup> ; Second Bite; Food Justice Truck (Asylum Seekers Resource Centre)

**TABLE 2** Overview of search strategy and outcomes for peer-reviewed and grey literature search

Community intervention type	Indicative search terms	No. of peer-reviewed articles retrieved	No. of grey literature articles retrieved
Large campaigns	Government nutrition campaign*/Go for 2 and 5/AND Australia/edutainment AND Australia	31	15
Emergency food	Food security or emergency food AND vegetable consumption or intake or increase	9	12
Community garden	Communit* N2 garden* AND Vegetable* AND intake or consumption	31	32
Kitchen gardens	Kitchen garden* AND vegetable consumption or intake	20	21
Agritourism	On farm tourism; farm gate; demonstration farms AND vegetable consumption	18	19
Farmers' markets	Farmers market* AND (vegetable N2 consumption or intake or purchas*)	20	18
Value driven food choices	Conscious or ethic* AND consumer* or consumer behaviour AND vegetable	27	19
Local food networks	Food hub* or food co-op or social enterprise* AND vegetable consumption or intake	13	37
Community Supported Agriculture	Community Supported Agriculture AND Vegetable consumption or intake	25	29

activities, resources and people that extends across all domains involved in providing human nourishment and sustaining health, including production, processing, packaging, distribution, marketing, consumption and disposal of food<sup>16</sup>

The typology was developed iteratively as the data emerged from the literature searches. The typology boundaries are arbitrary as in practice some of these interventions and initiatives overlap. The left-hand axis of the table reflects the idea that interventions and initiatives have been informed by different food paradigms (eg, nutrition, food security, food sovereignty) that are interconnected and evolve over time. The middle column outlines the interventions and/or initiatives explored, and the right-hand axis provides a snapshot of population profiles and examples of strategies within each group. At one end of the typology are large-scale, population-based approaches characterised by distant relationships between the producer and the consumer or between the designer of the intervention or initiative and the targetted audience. Conversely, new frontiers are characterised by closer connections between producers and consumers, concern for healthy food systems and for the global environment, for example, concern to reduce waste and fossil fuel inputs. Philosophically, the focus shifts from nutrition and food security to social justice and food sovereignty (Table 1).

Literature searches were conducted around each intervention type using the EBSCO Host search engine. A wide range of databases were included due to the health, social, economic, environmental and cultural themes associated with the determinants of vegetable consumption. These included Academic Search Complete, Education Source, Environment Complete, ERIC, Garden, Landscape & Horticulture Index, and Global Health.

The search of peer-reviewed literature was augmented with a search of grey literature from government websites, non-government organisations and industry association websites. As

with the peer-reviewed literature, broad search terms covered issue, geographic location, community intervention type and characteristic of interest (Table 2). Expert informants were identified to provide additional information about emerging areas.

The following inclusion/exclusion criteria were applied to identify relevant studies: articles published in English and from 1996 onwards; studies that reported on the impacts of community interventions on vegetable consumption in Australia or other developed nations (ie, US, Canada, New Zealand, UK, Europe); interventions with publicly available websites or social media pages (for grey literature); and peer-reviewed qualitative studies, quantitative studies, cross-sectional studies, longitudinal studies, systematic reviews and mixed methods studies. Studies that reported on individual level dietary interventions and/or policy initiatives were excluded.

The two sets of literature were independently analysed, and the results combined into theme-based narratives and summary tables for each area of the typology. These reviews described the demographics, impacts on vegetable consumption, and knowledge and research gaps. The key findings were then reviewed in the context of the action areas of the OCHP,<sup>12</sup> and the implications for health promotion practitioners.

### 3 | FINDINGS AND DISCUSSION

Over 180 peer-reviewed articles and 200 grey literature articles/reports were examined. This section summarises the findings for each of the main interventions and initiatives before discussing the implications of the results. By design, it is weighted towards discussion of new frontiers and possibilities, which are the focus of this enquiry. For brevity, this section does not present results for two elements

of the typology: agritourism including demonstration farms and farm gate sales, and new approaches to food security including waste reduction and rescue of fresh food. While they may have potential to support increased vegetable consumption, there is a paucity of research to draw on.

### 3.1 | Conventional large-scale or settings-based interventions

Thirty years of large-scale and increasingly sophisticated social marketing campaigns to address the low rates of F&V consumption across all age groups in parts of Europe, Australia and the Americas have yielded disappointing results.<sup>8</sup> These campaigns frequently combine mass media (advertising and public relations) with community-based initiatives. In Australia, despite large investments of money and effort, social marketing campaigns reviewed for this study increased awareness and intention, but made small inroads on increasing long-term vegetable consumption.<sup>17–19</sup> An example of this is the “Go for 2&5” campaign (\$4.76 million), which increased vegetable serves amongst a proportion of very low consuming parents of primary school aged children; however, across the sample, the percentage achieving the recommended daily serves did not change.<sup>19</sup> In Australia at the time of the literature review, there were no known large-scale social marketing campaigns on increasing vegetable consumption.<sup>20</sup>

An extensive review of campaigns by Pomerleau et al<sup>21</sup> found that the most effective impacts on consumption were smaller, focussed and/or targeted population interventions with an interactive personalised component such as phone calls. Our review supports this. The most impressive results are from Jamie Oliver’s Ministry of Food (JOMoF) intervention. A UK evaluation of this program reported an increase in combined F&V intake of 1.5 serves 6 months post-intervention.<sup>22</sup> The Australian version of this program delivered and evaluated in Queensland (2014) and Victoria (2015) reported significant ( $P < 0.001$ ) sustained increases in vegetable eating 6 months post-program (Queensland 0.6 serves; Victoria 0.43 serves a day more).<sup>23,24</sup> Another intervention in WA, the FOODcents program, provided an individually focused and holistic approach to nutrition knowledge, food shopping, budget management and cooking for participants from disadvantaged communities. It had some success in improved knowledge of health and nutrition, and in particular reported an increase in F&V consumption by Aboriginal participants.<sup>25,26</sup>

A promising intervention from New Zealand was a recent study of educated, low F&V consuming young adults, which compared the use of a mobile phone-based intervention with provision of additional F&V s to participants over 13 days.<sup>27</sup> It found that both strategies increased consumption by more than one serve per day. The mobile phone approach involved sending two daily prompts to participants to eat at least five serves of F&V s per day. Prompts were based on research with the target group as well as behaviour change theory.

### 3.2 | Established community interventions

In the past 20 years, community gardens have become increasingly popular, favoured as a setting for promoting community building among culturally and linguistically diverse communities (CALD), and psycho-social and food security benefits.<sup>28</sup> A recent US report claimed that two million more households were involved in community gardens in 2013 compared to 2008, with a total of three million gardens.<sup>29</sup> In 2016, there were at least 557 community gardens in Australia, the majority in Victoria (291) and NSW (176), followed by South Australia (49) and WA (45)<sup>30</sup>; this figure did not include school kitchen gardens.

Community gardens encompass a range of demographic profiles and settings including local council land, health care agencies, prisons, schools, and urban, rural and indigenous communities.<sup>31</sup> Some community gardens originate from concerns about food security or social cohesiveness, for example programs for refugees.<sup>32</sup> Individuals’ motivations for joining a community garden include the desire to eat fresh, locally produced food and the desire to engage with the broader community, to save money and improve health, and to address concerns for environmental impacts of the modern industrialised food system.<sup>33</sup>

The most impressive evidence for involvement in a community garden having a positive effect on F&V consumption comes from evaluation of school garden projects, based on a “kitchen garden” model that includes food production, cooking and social eating as part of the classroom curriculum. Caution is however needed in interpreting the results since F&Vs are generally combined in the reports, and children’s self-report is the main method of evaluation. A body of literature supports positive influences on food-related behaviours such as increased ability to identify and try different F&Vs, greater interest and confidence in cooking, and increased accessibility to fresh produce.<sup>34–36</sup> In Savoie’s recent international review, 10 out of 14 studies reported statistically significant increases in fruit or vegetable consumption among children ranging from 2 to 15 years after they were involved in a gardening intervention.<sup>35</sup> Overall, these results are more positive than for community gardens that concentrate primarily on food production, although several papers evaluating community gardens have demonstrated positive outcomes for adults including access to fresh vegetables and increased vegetable consumption amongst participants.<sup>31,37</sup> In Australia, the total number of school kitchen gardens is not known, but the Stephanie Alexander Kitchen Garden Foundation alone resources more than 800 schools (J. Duffy, pers. commun.).

Farmers’ markets and associated direct food purchasing by consumers have increased in both prevalence and popularity in Australia in recent years.<sup>38,39</sup> Farmers’ markets provide a space where producers and consumers meet to sell and buy local produce. They are held on a regular basis, and there are varying rules relating to the distance that the produce has travelled from its place of origin, and the methods of production (eg, organic).<sup>40</sup> In Victoria, the state government has previously provided financial support to encourage

the establishment of farmers' markets, which may account for the greater numbers in that state.<sup>38</sup>

Most of the research literature investigating use of farmers' markets and vegetable consumption comes from the United States and surveyed low-income women. These studies consistently report increased vegetable consumption associated with shopping at farmers' markets.<sup>41-43</sup> One study of shoppers in general found that the farmers' market shoppers were more likely to also shop at food cooperatives, health food and ethnic food stores.<sup>44</sup> They were more likely to be women in multi-adult households, have their own vegetable garden and to buy organic food. There is limited information about the demographic profiles of Australian farmers' market shoppers.

A study that surveyed 100 market patrons provides an insight into the impact of farmers' markets in a rural Australian community experiencing "a high perception of community division" and high rates of obesity. Their survey demonstrated motivations for attending included shopping locally/access to local produce, shopping outdoors and contact with other people.<sup>40</sup> More than two-thirds of respondents (71%) reported their vegetable consumption had increased as a result of shopping at the farmers' market.

### 3.3 | New frontiers

The typology (Table 1) identified three key new frontiers in the relationship between the community and food in Australia, linked to a rise in ethical consumerism. This section provides a snapshot of them: values driven food choices, localised food chains (food hubs) and producer-consumer direct relationships (CSA).

Evidence suggests that ethical and health considerations about food are important to some consumers.<sup>45,46</sup> This trend is observed in Australian and overseas research into organic purchasing, which consistently found that health was the most frequently mentioned motivation, and that the benefits were around what was *not* in the produce—pesticides, additives, chemicals and GMO—rather than the method of production.<sup>45,47</sup> The increase in community-based food enterprises, the growth of the organic industry<sup>46,47</sup> and the rise of community food movements around food sovereignty and local food security<sup>48</sup> are manifestations of increasing interest in the provenance and quality of food, as well as support for local food systems. As an example of the scale of these community initiatives and interventions, a total of 746 community food enterprises were identified across the 79 councils and shires of Victoria.<sup>49</sup> The term "local food system" includes local and regional community-initiated interventions as well as short supply food systems such as food hubs and neighbourhood networks. Each of these contributes to a localised food supply, and connections between growers and eaters. Local and community food networks are often guided by values related to social and environmental capital—bio-diversity, environmental sustainability, food sovereignty, food quality and supporting local producers.<sup>50</sup> Because of this focus, little of the research literature explores the impact on vegetable consumption.

Food hubs are a relatively recent contributor to local food networks. They are "businesses or organisations that actively manage the aggregation, distribution, and marketing of source-identified food

products".<sup>51</sup> Food hubs operate within a values framework that may include commitment to local fresh food, connecting growers with eaters, access for vulnerable populations, and contributing to a sustainable and resilient food system.<sup>51</sup> Food hubs can provide much-needed, size-appropriate infrastructure and marketing functions for local food produced by small and midsized producers, and provide consumers access to quality fresh food.<sup>51</sup> There is considerable overlap between cooperatives and food hubs; for example, FoodConnect sells to local food cooperatives who distribute to their members (R. Pekin, pers. commun.).

In Australia, the scale of food hubs varies considerably. The largest is CERES Fair Food. In 2016, 55 000 CERES customers ordered food boxes amounting to 13 tonnes of organic food each week, sourced from over 60 local farmers and grocery makers.<sup>52</sup> CERES Food Hub is part of a set of initiatives designed to build environmental and social capital in urban Melbourne including having a positive impact at every part of the food chain. Food is sourced from their own urban farms and from local/regional farmers. In Brisbane, FoodConnect has between 2500 and 3500 customers subscribing either to a weekly box, or part of a wholesale buying club, co-op or regional buying network; precise numbers are difficult to ascertain. Food is sourced from farmers in the south-eastern region of Queensland; Oooby in Sydney is of similar size.<sup>51,53</sup>

While the number of studies is limited, the existing evidence provides some support for the idea that community food networks, including food hubs, can positively influence vegetable consumption as well as providing populations at risk of food insecurity with access to fresh vegetables.<sup>54,55</sup>

Like food hubs, CSA is a local food initiative but in a CSA the produce is sourced from one farm, and is based on a contractual arrangement between the farmer and consumers. The producer generally provides each member with a weekly food box for a specified period/season, which is either collected from the farm or from an agreed distribution point.<sup>56</sup> The scale of CSAs internationally varies dramatically, culminating with Europe at 2783<sup>56</sup> and the United States with 7398 in 2015.<sup>57</sup> In Australia, this is a fledgling sector, with probably fewer than 20 CSAs producing F&V boxes.<sup>20</sup>

The impact on vegetable consumption is addressed in a small number of studies where CSA members have reported that the variety and amount of vegetables they consume have increased through their involvement in the scheme<sup>58,59</sup> and/or that they have made changes to their shopping, cooking and eating habits towards more local, seasonal and healthy foods.<sup>60-62</sup> Farmers observed changes in members' dietary habits and saw a role for education in encouraging consumers to try a greater diversity of vegetables.<sup>63</sup>

The distinction between these initiatives is often muddled by the fact that they are multi-dimensional; for example, a community garden may also contribute to a farmers' market, for example, CERES Community Environment Park in Melbourne.<sup>64</sup> However together, these initiatives form local food networks which align with increased consumer interest in locally produced food, albeit for a small but significant percentage of the population.

## 4 | IMPLICATIONS FOR HEALTH PROMOTION

This picture of emerging and established community interventions and initiatives linked to vegetable (and fruit) consumption has identified promising developments that create possibilities for health promotion. Top-down behaviour change approaches have had limited success in changing long-term behaviour, and at the time of publication, there were no significant social marketing campaigns in Australia. However, in contrast to the prevalence of low levels of vegetable consumption in the Australian population (noted above), developed countries (including Australia) are experiencing a growing socio-cultural trend whereby some consumers are consciously engaging with the food system through connections with producers and/or considerations about how and where food is produced. Reasons for participating in local/community food systems in Australia and abroad are varied but recurring motivations for consumers include accessibility to fresh, good quality produce and community engagement, and for producers, engagement with buyers and greater profits.<sup>41,65</sup> Concern for health is frequently stated as a priority.<sup>33,47</sup> An increase in home vegetable growing is a related manifestation of reconnection to production outside the scope of this paper.<sup>29</sup> These initiatives and trends are characterised by a holistic approach to production, consumption and food security, and by closer relationships between consumers and producers. “New frontiers” align with a broad approach to health and well-being that acknowledges the multiple determinants of health, in particular vegetable consumption, and mirror the health promotion principles for action of the OCHP: (a) build healthy public policy, (b) create supportive environments, (c) strengthen community action, (d) develop personal skills and (e) reorient health services.<sup>12</sup> The following discussion highlights key synergies and entry points for health promotion action.

### 4.1 | Build healthy public policy

US experience suggests that community-based or local food systems combined with policy and tax incentives to increase access can support vegetable consumption and food security among vulnerable populations, as well as support small- to medium-size producers.<sup>55,66</sup> Agricultural and economic policies focused on export growth generate entirely different strategies to policies focused on supporting small- to medium-scale farming and providing access for vulnerable communities.<sup>38</sup> There is clearly potential for health promotion practitioners to advocate for building stronger public policy as well as economic support from government at all levels to enable synergies around local and global food systems that include food system sustainability, culture, social justice, health and well-being.<sup>13</sup>

### 4.2 | Create supportive environments

Across the range of community interventions reviewed for this report, partnerships between community and industry are a recurring

theme. In food security initiatives, community and kitchen gardens, and short supply chain enterprises like farmers' markets and food hubs, key elements of success include collaboration, novel partnerships and relationships, and systems thinking.<sup>20</sup> The findings highlight the opportunities for health promotion to move beyond traditional health settings and embrace these more holistic approaches to health and well-being that also incorporate environmental and economic sustainability for local communities. The synergies are obvious between the national dietary guidelines to increase vegetable consumption, the growing interest in “natural” food, and environmental concerns. Health promotion, which sees health and well-being requiring a healthy planet, can operate effectively within a broader food systems paradigm to create supportive environments and strengthen community action. Indeed, the OCHP dictates that “The protection of the natural and built environments and the conservation of natural resources must be addressed in any health promotion strategy” and Kickbusch's 2010 paper focussing on food systems provides guidance for future health promotion practice in this arena.<sup>12,13</sup>

### 4.3 | Strengthen community action

The research/literature summarised above supports positive changes to vegetable intake and associated food-related choices for people engaged in a range of community interventions.<sup>35,42,43</sup> For children, there is evidence to suggest that engagement with food and exposure to the process of harvesting and production has a positive impact on willingness to eat a wider range of vegetables.<sup>35</sup> Projects that involve children and adults in growing food appear to have a positive effect on consumption, especially where there is an element of food preparation.<sup>37</sup> These results highlight the value of community-driven interventions, and the importance of continued investment by government and health promotion practitioners to strengthen community action. The potential for creating more community-based versions of the kitchen garden model, that includes preparation and social eating, could be explored. The potential for home gardening to promote vegetable consumption should also be investigated.

### 4.4 | Develop personal skills

The school kitchen garden program and the interactive nutrition interventions described above (JOMoF, FoodCents) highlight the importance of developing personal skills to support ongoing behaviour change; however, this is most likely to succeed where there is a supportive environment.<sup>36,67</sup>

### 4.5 | Reorient health services

The OCHP highlights the importance of aiming for the pursuit of health rather than a focus on clinical and curative services. For example, involvement in community gardens has been shown to have mental health and social benefits.<sup>65</sup> A food systems lens, grounded in local food networks, offers possibilities for pursuing health and

well-being goals beyond nutrition, in particular including the well-being of producers and the environment where food is grown.

It is acknowledged that this scoping review was broad and exploratory in nature and did not investigate all facets of this multidisciplinary body of literature; however, forays into environmental, economic and consumer literature provided valuable information. The quality of the sources varied. Most of the papers reviewed on community initiatives were based on self-report, small in participant numbers and short in timescale, and infrequently evaluated the impacts for the intervention group against a control group.

The paucity and uneven quality of current research highlights the need to prioritise building a research base to guide investment and action. Further research is needed to establish the strength of the relationship between greater personal engagement with all facets of local food systems and the impact on vegetable consumption. A research approach that explored the synergies between vegetable consumption and levels of knowledge/self-confidence/skills, as well as mental health and attitudes to sustainable food systems would enact the holistic approach demanded by the OCHP and reflect the holistic nature of these community initiatives. Particular emphasis should be given to identifying broad-based strategies for increasing accessibility and potential benefits for vulnerable groups in Australia.

## 5 | CONCLUSION

This review provides a picture of opportunities for health promotion interventions. By casting a wide net, it has demonstrated the value of adopting a food systems model to move beyond traditional health promotion approaches and broaden the potential scope of action. It has constructed a picture of new frontiers around local food systems, where health promotion practitioners have an important role to play. The authors acknowledge that these local food initiatives are currently small scale in comparison with the mainstream food system; however, their numbers and reach are growing as the review has shown. Importantly, these initiatives hold the promise of new possibilities for promoting healthy eating that align with both broader global sustainability goals as well as enacting the five actions areas of the OCHP and addressing multiple determinants of health. Health promotion currently works in some of these spaces but can strengthen collaborations with partners who are creating holistic approaches to health and sustainability. To justify investment, more needs to be done to model new approaches and measure the impact of these strategies on vegetable consumption.

The challenge is to bring the benefits of these new initiatives to all sectors of the community. To do this, and to enhance health promotion practice, we will need new or perhaps more nuanced frameworks to guide practice—a sustainable food systems model that can identify multiple points of entry across sectors including agriculture, health and environment.<sup>13</sup> This broader agenda will build long-term support for positive community commitment to health and well-being and support community-driven initiatives around local food systems.

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## CONFLICT OF INTEREST

The authors declare that there are no conflicts of interest in connection with this article.

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