The mismatch between consumer-demand, health, and supply of fruit and vegetables in Tasmania

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How important are collaborative and holistic approaches to promote and increase fruit and vegetable consumption?
Overview

1. Australian F&V Consumption
2. The Increasing Mismatch in Tasmania
3. Addressing the Mismatch
4. Collaborative approaches to improving livelihoods in PNG
Fruit and Vegetables: Targets

Target:

2 serves fruit &
5 serves vegetables
Australians eating 2 and 5?

5.5% of population
Fruit and Vegetables: Targets

Attaining minimum recommended levels?

**Australia:** 5.6%

**Europe:** 220g p.p./day

**USA:** 6-8%
Australia

Daily Intake of Vegetables [Proportion per person]

<table>
<thead>
<tr>
<th></th>
<th>Males &gt;18 yrs</th>
<th>Females &gt;18 yrs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Does not eat</td>
<td>1.0</td>
<td>0.5</td>
</tr>
<tr>
<td>vegetables</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than 1 serve</td>
<td>4.4</td>
<td>3.2</td>
</tr>
<tr>
<td>1 serve</td>
<td>27.2</td>
<td>19.7</td>
</tr>
<tr>
<td>2 serves</td>
<td>27.7</td>
<td>30.0</td>
</tr>
<tr>
<td>3 serves</td>
<td>22.0</td>
<td>24.7</td>
</tr>
<tr>
<td>4 serves</td>
<td>10.6</td>
<td>12.5</td>
</tr>
<tr>
<td>5 serves</td>
<td>5.1</td>
<td>6.9</td>
</tr>
<tr>
<td>6 or more serves</td>
<td>1.9</td>
<td>2.5</td>
</tr>
</tbody>
</table>
Australia

Daily Intake of Fruit [Proportion per person]

<table>
<thead>
<tr>
<th>Daily Intake of Fruit</th>
<th>Males &gt;18 yrs</th>
<th>Females &gt;18 yrs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Does not eat fruit</td>
<td>7.5</td>
<td>5.0</td>
</tr>
<tr>
<td>Less than 1 serve</td>
<td>16.1</td>
<td>10.3</td>
</tr>
<tr>
<td>1 serve</td>
<td>32.8</td>
<td>31.4</td>
</tr>
<tr>
<td>2 serves</td>
<td>26.1</td>
<td>26.1</td>
</tr>
<tr>
<td>3 serves</td>
<td>11.4</td>
<td>14.7</td>
</tr>
<tr>
<td>4 serves</td>
<td>3.8</td>
<td>3.9</td>
</tr>
<tr>
<td>5 or more serves</td>
<td>2.2</td>
<td>2.0</td>
</tr>
</tbody>
</table>
## Adequate fruit consumption by sex, 18 years and over, Tasmania 2009 and 2013

<table>
<thead>
<tr>
<th>Adequate fruit*</th>
<th>2009</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%</td>
<td>95% CI</td>
</tr>
<tr>
<td>Males</td>
<td>42.9%</td>
<td>[40.4%,45.3%]</td>
</tr>
<tr>
<td>Females</td>
<td>56.4%</td>
<td>[54.4%,58.4%]</td>
</tr>
<tr>
<td>Total population</td>
<td>49.8%</td>
<td>[48.2%,51.4%]</td>
</tr>
</tbody>
</table>

*≥2 serves daily; Tasmanian Population Health Surveys 2013
Table 67: Adequate vegetable consumption by sex, 18 years and over, Tasmania 2013

<table>
<thead>
<tr>
<th>Adequate vegetables*</th>
<th>2009</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%</td>
<td>95% CI</td>
</tr>
<tr>
<td>Males</td>
<td>7.0%</td>
<td>[5.9%, 8.2%]</td>
</tr>
<tr>
<td>Females</td>
<td>14.7%</td>
<td>[13.4%, 16.1%]</td>
</tr>
<tr>
<td>Total population</td>
<td>10.9%</td>
<td>[10.1%, 11.9%]</td>
</tr>
</tbody>
</table>

* ≥5 serves daily; Tasmanian Population Health Surveys 2013
Mismatch in Tasmania

7% exported

73% mainland

20% of produce consumed within Tasmania
## Campaign successes?

Review published by Robyn McConchie, University of Sydney

<table>
<thead>
<tr>
<th>Country</th>
<th>Programme</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>Go for 2 &amp; 5</td>
<td>(2002 -2007)</td>
</tr>
<tr>
<td>USA</td>
<td>Fruits and veggies – more matters</td>
<td>(2007—present)</td>
</tr>
<tr>
<td>UK</td>
<td>Food Dudes</td>
<td>(1992-present)</td>
</tr>
<tr>
<td>Denmark</td>
<td>6 a day</td>
<td>(1999 – present)</td>
</tr>
<tr>
<td>New Zealand</td>
<td>5+ A day</td>
<td>(1994 – present)</td>
</tr>
</tbody>
</table>

*Kehky & McConchie (2014) Promoting consumption of fruit and vegetables for better health. Have the campaigns delivered the goals? Appetite 79:113-123*
Campaign successes?

Success is higher:
1. **Holistic interventions**: campaigns that include health, exercise and other behaviours.
2. **Greater spirit of collaboration**: industry, government, NGOs
3. **Visibility and prominence**: variety, convenience, accessibility,
4. **Positive role models/experiences**: School programmes, communities
5. **Culturally relevant**: SES, incomes, age, gender etc,
6. **Incorporate initiatives**: policy measures to lower prices, accessibility etc
Addressing the Mismatch
Addressing the Mismatch

• Grow Eat Learn

Vegetable gardens:

• Healthy diets / life styles
• Promoting science

by Amanda Grover

There is no doubt that society poses science some very 'wicked problems' - problems that are difficult to define and very hard to solve.

Australia's food life cycle is associated with several wicked problems, such as the rising incidence of childhood obesity, depletion of global phosphorus stocks, poverty-related food insecurity and urban waste generation.

Now a team of researchers from the Tasmanian Institute of Agriculture (TIA) hopes to provide a 'wicked solution', through a unique, cross-disciplinary project - one that's thoroughly grounded in community engagement.

The GEL (Grow. Eat. Learn) project is being led by TIA, in collaboration with local business, the University of Tasmania's School of Architecture and Design, UTAS students and Tasmanian primary and secondary students.
Addressing the Mismatch
Addressing the Mismatch

Communication tool for spreading the word about the nutrition and health benefits of vegetables. Information is based on pre-approved nutrition and health claims from FSANZ Standard 1.2.7, and nutritional data from the NUTTAB database.
Cooking for Health and Taste:
Which Vegetables to Steam

Steaming vegetables for (3 minutes) maximises retention of water-soluble vitamins (e.g. Vitamins B and C). It also leaves vegetables with a vibrant colour and crunch!

Vegetables that are best steamed include: green beans, snow peas, leeks, all leafy veg, and brassicas, carrot, corn.
Cooking for Health and Taste: Which Vegetables to Stir-Fry

- Stir-frying adds a little oil, making fat-soluble vitamins (A & E) more bioavailable. Plus, any added water/stock stays with the vegetables, so you still get the water-soluble vitamins (B & C). It also leaves vegetables with a vibrant colour and crunch!

- Use 1-2 tsp of an oil suitable for high temperatures, such as canola, sesame, coconut or olive oil. Don’t use ‘Unrefined’ or ‘Virgin’ type oils.

- Vegetables that are best stir-fried include: onion, carrot, celery, shallot, capsicum, bitter melon, zucchini, squash, daikon, Brussels, broccoli, bean sprouts, spring onion, snow peas, mushrooms, spinach.

3 MINS MAX
Cooking for Health and Taste:
Bake, Steam, Stir-Fry, etc...

- Some veg contain more than 10% of the recommended daily intake (RDI) of some nutrients, per serve. Cooking does not reduce nutrients below this 10% level.
- Some veg do not contain any nutrients above 10% of the RDI/serve, and thus cooking has no impact on health benefits related to these nutrients.
- Either way, you can cook them by steaming, stir-frying, baking, frying, microwaving, or barbecues, in casseroles and slow cookers.

- It's best not to boil any vegetables. And leave the skin on, where possible, for added fibre.
- Use an oil suitable for high temperatures, such as canola, sesame, coconut or olive oil. Don't use "Unrefined" or "Virgin" type oils.
- Vegetables that can be cooked using any method include: tomato, carrot, beetroot, capsicum, onion, zucchini, eggplant, mushrooms.

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An easy recipe for
Daikon Radish and Zucchini Fritters

Serves 4

Ingredients
150g zucchini, 150g carrot, 100g daikon radish, 3 eggs, 1/2 cup Panko breadcrumbs, 1/4 cup self-raising flour, 2-3 spring onions, 1/2 chilli, salt and pepper, light vegetable oil for frying.

Preparation
Slice zucchini, carrot and daikon, then agitate water out. Slice spring onions, chop carrot and add shredded chilli flakes. Wash eggs.

Cooking
Heat oil in fry pan, drop spoonful of mixture into oil gently. Fry for a few minutes on each side.

Serving suggestion
Serve immediately. A yoghurt and mint dressing, or sweet chilli sauce goes really well with these.

A diet containing an increased amount of both fruit and vegetables reduces the risk of coronary heart disease.
An easy recipe for

Bitter Melon Omelette

SERVES 2

Ingredients

1 or 2 bitter melons, 3 eggs, 3 spring onion, 2-3 tsp salt, oil for frying.

Preparation

Slice bitter melon lengthwise in half. Spoon out seeds. Slice very finely.

Preparation

Sprinkle salt on melon slices and leave for 15 min. then wash well to remove salt, which removes some bitterness.

Cooking

Drain and squeeze bitter melon. Whisk eggs together, chop deseeded chilli. Add oil to fry pan and heat to mod. Lightly fry bitter melon for 2-3 min. Add eggs and cook for 1 ½ min with stirring, then allow to set.

Serving suggestion

Serve frieded in half with chilli (or fried shallots) sprinkled over, with a leafy salad.

A diet containing an increased amount of both fruit and vegetables reduces the risk of coronary heart disease.
An easy recipe for
Quick Chicken & Vegetable Stir-fry

SERVES 2-4

Ingredients
A handful each of Chinese broccoli & green beans, ½ red and yellow capsicum, 1 carrot, ½ onion, 1-2 cloves of garlic, 1 chicken breast or 2 chicken thighs, small bunch of fresh ginger, 2-3 garlic cloves, 1-2 tbsp soy sauce, 1 tbsp oil (e.g. olive, groundnut or the like), 1 tsp cornflour and ¼ tsp Chinese rice wine.

Prepare chicken
Mix soy sauce with finely sliced ginger and garlic. Slice chicken into 1 cm slices, add soy/garlic mixture and stir, cover and leave for 10 mins in fridge.

Prepare veg
Wash and slice broccoli and beans into 2-3 cm wide pieces diagonally, slice deseeded capsicum into 1 cm slices. Peel carrot, slice carrot and radish diagonally ½ cm thick or less. Slice onion into wedges and break into layers.

Cooking
1. Heat oil to work - medium high.
2. Add chicken and cook, 2-3 mins.
5. Add cornflour: 1 min.

Serving suggestion
Sprinkle with chopped coriander and chilli or roasted peanuts or fried shallots and serve with steamed jasmine rice.

A diet containing an increased amount of both fruit and vegetables reduces the risk of coronary heart disease.
PNG villagers source

- 83% of their energy
- 76% of their protein from their gardens.

Roughly 1/6 lives in severe poverty

94% of these in rural areas

(Bourke and Allen, 2009).
• limited opportunities to generate cash income
• inability to purchase extra sources of protein
• poor access to health services and education

= high infant mortality rates and short life spans
• Large market demand for fresh fruit and vegetables of western origin, driven by middle class and expatriate segments in Port Moresby

• High disposable cash income
Supply Chain

- Inter-disciplinary
- R, D, E, E & T
- 3 Universities
- 1 Research Institute,
- 1 Development and Extension Authority,
- 1 Provincial Government,
- commercial entities,
- individual and groups of farmers
- Relationship building early
to form a functioning team
What was achieved -1

• Work in PNG – production, socioeconomic, value chain
• Complementary value chain, crop adaptation work in Tasmania
• Wide range of activities
• Increased knowledge and capacity of research and extension staff, farmers and farmer cooperatives
• Understanding of value chain function and effectiveness.
• 11 PNG-based staff gained national and international experience as authors of scholarly publications.
• Co-learning by PNG and Australian staff was key contributor and key outcome of the project
How important are collaborative and holistic approaches to increase fruit and vegetable consumption?
Conclusion

• Promoting F & V in Australia is also a challenge
• Education via school
• Teaching programmes (breadth unit) @ UTAS

Integration
• Working in schools