



TACKLING FOOD WASTE – IMPLEMENTING EDUCATION AND POLICY

9468 – Community and Public Health Nutrition

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Executive Summary

This following submission document has been formulated as part of a Community and Public Health Nutrition unit assessment at the University of Canberra. The primary aim of the project involved designing an intervention alongside The Conservation Council ACT, that tackles the issue of food waste within the ACT.

The initial stages of the assessment, beginning in March 2017, involved developing a needs assessment that would identify the necessity and importance of such an intervention. Global and local data and literature established the necessity for this project. The planning and development of the health promotion program involved consultation with our mentor Larry O’Laughlin, Executive director of The Conservation Council ACT Region. This resulted in formulation of a program that targets the issue of food waste at a community level and at the level of local government. This intervention identifies and proposes the following points for a reduction food waste in the ACT:

- Increasing consumer knowledge on the issue of food waste.
- Increasing consumer education of methods to avoid and reduce food waste.
- Increasing consumer shopping, planning and cooking skills.
- Create enough noise within the community that would advocate the importance of the involvement of local government that will induce policy change.

Through collaboration with stakeholders and volunteers, initially, this program is expected to run for 6 months in 2 districts in the ACT and repeated in all the ACT if evaluation results are positive. Overall, the project was planned considering the many different mediums through which food waste can be targeted. However, the focus was primarily reduced to a community level since the results indicated, that a large number comes from the household level which is easily avoidable.

Program Background

The topic of food waste is becoming a more widespread topic of concern at a local, national, and global scale. Food waste refers to discarded edible items at the consumer level [1]. Currently, approximately 50% of food produced globally is wasted, emphasising the need for intervention strategies to be employed [1]. Interventions are necessary to address a range of food waste issues such as environmental impacts and food insecurity. The definition of food waste does not account for waste across the entire production line, resulting in strategies focusing on a small portion of the issue [2]. One issue is the high aesthetic standard set for farmers before they can be distributed to supermarkets. When organic food does not meet a predefined criterion, they are often discarded along with spoiled organic food items; due to infection from disease, crop abandonment and extreme weather conditions. Supermarket/ Grocery store waste comes from produce damaged during transportation, poor handling and items being close to its use by date [2]. Finally, food ends up in retail sector and households where food is consumed. In developing countries, a large portion of wastage occurs at the beginning stages of food production/gathering, however, in developed countries a significant portion of food waste occurs at later stages within the food supply chain, primarily the consumer level [3]. Therefore, this health promotion program has been developed to target the local community within the ACT, a state of the developed country, Australia.

In Australian households, 33% of food waste is from fresh food every year, 27% is from left overs, 15% is packaged and long life products and 7% is from takeaway food. The amount of food waste thrown on average amounts to \$1036/household/year [5]. ACT is third most wasteful state within Australia, generating up to 14.52kg of food waste/week/household. A 2009 garbage audit of ACT estimated that 39% of food items discarded were fruits and vegetables [4]. According to the ACT Sustainable Waste Strategy 2010-2025, sorting food waste from retail and household waste streams can decrease overall waste in landfills by approximately 30% [2]. However, this is a time consuming and costly process and so in this Health Promotion Program the aim is to reduce the production of food waste at the household level which is equally beneficial to the consumer and local government financially and the environment.

Advantageously, food waste has been a topic that many people are becoming aware of through communal and global efforts and social media campaigns to name a few. While some people may be exposed to the rising global dilemma of food waste, some are not, and some may not know what can be done to reduce food waste. According to ACT Ozharvest Manager Dave Burnet, there has been a steep uprise of food retailers interested in donating leftover/unused food to charities, demonstrating the growing interest of the public in the matter of food waste [6]. Therefore, it is important for the local community to utilise various mediums to increase awareness and provide simple and easy to follow steps to reduce food waste. This report lays out, assesses and evaluates an intervention strategy at the community level that would prove beneficial to reducing food waste in the ACT.

Planning of Program Intervention

The following program goals, objectives, and strategies have been formulated based on the guidelines listed by Hughes and Margetts (2011) [7]. Furthermore, the timeframe and goal targets have been based on the effectiveness of previous intervention programs that focused on reducing household food waste [4]. The strategies devised will form the basis of the health promotion program. The following stakeholders involved in the project will be contacted to analyse the goal and objectives are realistic, appropriate, and achievable: Larry O'Loughlin (ACT Conservation Council), OzHarvest ACT, and the local council.

Table 1: Health promotion program goal, objectives, and strategies

Program Goal	Program Objectives	Program Strategies
To lower the prevalence of food waste by 10% within the ACT by 2025.	To reduce the proportion of food wasted among ACT households by 15% by 2025.	Implement monthly community cooking workshops educating the ACT community about the impacts of food waste, and what can be done at the household level.
	To increase household knowledge within the ACT of household food waste.	Formulate an app and a website to provide the ACT community with information regarding food waste, and strategies to reduce this at a retail and household level.
	To implement policy outlining regulatory measures on food waste in the household, retail, and production levels within ACT by 2020.	Implement fortnightly education classes on how to best store and utilise perishable items such as fruits, vegetables, bread, meat, and dairy and leftover items.
	To implement policy outlining regulatory measures regarding the pricing of fresh produce items by 2020.	Implement fortnightly cooking education classes on how to re-use leftover food items into meals with the goal to provide the prepared meals in the class to those disadvantaged.
	To decrease the prevalence of food insecurity by 10% in the ACT by 2025.	Utilize social media (Facebook and Instagram) and an app to provide further information and a communication platform to the wider ACT community on ways to reduce food waste, recipe ideas that utilize leftover items that can be shared among the community online.
		Formulate advocacy campaigns regarding the issue of food waste and working alongside Ms Gai Brodtmann MP of Canberra.

Theories of Human Behaviour

Analysing human behaviour is important as it aids health promoters in understanding the reasons why and how individuals engage in behaviours that either promote or hinder health [10]. In this context, it is vital that health promotion practitioner's analyses individual's thoughts, attitudes, and behaviours regarding food waste at the household level. By understanding human behaviour towards food waste, it aids in constructing an effective intervention strategy that positively alter one's beliefs, and behaviours towards food waste [10]. The following theories will form the basis of formulating the program strategies.

Theory of Reasoned Action

The theory of reasoned action recognises that one's intention and estimated probability to perform a certain behaviour determines whether they engage in that positive or negative behaviour [9,10]. In this context, the intention to engage in behaviours that reduce food waste is determined by one's readiness to change based on their attitudes towards food waste and the perceived attitudes society has on food waste [10,11]. Furthermore, one's attitude towards food waste is based on their belief about the importance of food waste, and the consequences food waste has at the individual, societal, economic, and environmental level [10]. By understanding an individual's perception on food waste, health promotion practitioners can construct strategies that aim on altering their views on the issue including education programs designed to provide information on the extent of food waste in their local community as well as on a global scale.

Cognitive Dissonance Theory

Cognitive dissonance theory is based on the notion that individuals seek consistency between their beliefs, attitudes, and behaviour on a certain issue [10]. Moreover, this theory highlights that individuals who experience dissonance (i.e. inconsistency) between their beliefs and their performed actions will alter their beliefs until consistency is again achieved [10]. In relation to food waste, health promotion practitioners need to categorise individuals into the three categories to understand the individual's perceived importance: unrelated (e.g. believe that reducing food waste is important to the economy but that a stable political party is also important), consistent (e.g. believe that reducing food waste will reduce food insecurity), and inconsistent (e.g. believe that reducing food waste is crucial but continues to throw out excessive amounts of perishable items due to purchasing more than what they need) [10]. By categorising individuals into the three categories, it allows health promotion practitioners to tailor education programs that either alter one's beliefs regarding the importance of food waste, or add new beliefs through providing facts on the issue and strategies to help reduce food waste. To alter or add onto the community's beliefs regarding the true impact of food waste, an app will be developed that provides links to bodies such as the World Health Organisation to provide statistics regarding the amount of food wasted and its impacts at the global scale, and OzHarvest to provide individuals with information regarding the environmental and financial severity of food waste at the national and local level.

Health Belief Model

The health belief model primarily focuses on the way individuals perceive the world and how these perceptions motivate their behaviour or to take action to alter their behaviour [10]. The readiness for one to take action on an issue is based around the following: their perception of their susceptibility to the issue, its potential severity, the availability of an effective methods to avoid the issue, and whether they have the ability to implement change [10]. In the context of food waste, one will act whether they believe that they are susceptible to the negative impacts of food waste (e.g. susceptible due to facing financial difficulties), that the impacts of food waste are significant to them (e.g. places financial strain from wasting a large surplus of food), that they have the resources to change their behaviour (e.g. have information on ways to reduce food waste at home), and that they believe that they are able to make the changes (e.g. purchase less food to prevent discarding items due to going past their 'used by' date). To build on the self-efficacy aspect, the community workshops will mainly focus on educating the community on: strategies that enhance their ability to incorporate leftover foods into meals by providing cooking classes, and methods on how to 'shop smart' by educating individuals to 'shop only for what they need' by looking at what they have and formulating a shopping list. These workshops will eventually allow members of the community to improve their financial situation. Thus, improving their food security status. Furthermore, resources that will be accessible by the public will ensure that individuals within the community feel that they have effective methods to reduce food waste at their disposal.

Program Evaluation

Analysing the overall effectiveness of the program is crucial to determine whether the intervention has achieved its goal [12]. The reasons for evaluating a health promotion program is to assess the program's: efficacy (i.e. how effective is the program under ideal circumstances?), effectiveness (i.e. has the project achieved the desired effects in the real-life setting?), efficiency (i.e. how well has the program done compared to previous programs?), and economic impact (i.e. is the project cost-effective?) [12]. To understand the aforementioned points, a process, impact, and outcome evaluation need to be conducted at the beginning, at the end, and throughout the program.

Process Evaluation

The process evaluation of a health promotion program refers to one assessing the strategies that have been formulated to achieve the health promotion program's objectives [12]. Critiquing the program's strategies is vital in understanding whether the strategies are being implemented and delivered as planned [12]. When implementing a process evaluation, the questions need to relate to the reach, participation, delivery, and satisfaction of the strategies and should take both qualitative and quantitative approaches [12]. These concepts have been considered when conducting an evaluation program on the strategies relating to the community workshops and social media sites.

The key questions that will be asked during the process evaluation include:

- ✓ Are the education workshop/ cooking class/ social media sites reaching the target group?
- ✓ Are participants satisfied with the workshops/ cooking class and social media content?
- ✓ Is the information regarding food waste making participants aware of the issue?
- ✓ Are participants benefiting from the workshops/ cooking class/ social media sites?
- ✓ Are staff running the cooking classes and workshops as trained/ planned?
- ✓ Are staff uploading content on the social media sites/ app as trained?
- ✓ Are components of the workshops/ cooking classes/ social media sites of good quality?

The measurement of process evaluation will be carried out by the following:

- ✓ Main target group = ACT community (focusing on households)
- ✓ Assessing reach = focus groups
 - Random selection of participants and non-participants) to discuss reasons for engaging with program + any barriers for those not attending
- ✓ Assessing satisfaction of workshop/ cooking classes = individual questionnaires
 - Are participants able to understand content in education workshop/ cooking classes?
 - Are staff approachable? do the programs fit into their schedule?
 - Is content relevant?
 - Is content interesting?
 - Is the learning pace appropriate, is the content covered in enough detail?
 - Are participants implementing what they have learned at home?
 - Are participants benefiting from the workshop/ cooking class?
- ✓ Assessing satisfaction of social media content = questionnaires
 - Are participants able to understand the content uploaded?
 - Is content relevant?
 - Is content interesting?
 - Does it increase their motivation to change their behaviour?
- ✓ Assessing delivery and quality of contents of workshop/ cooking class = observing staff running classes
 - Are staff addressing components of the class?
 - Are staff engaging with participants?
 - Do they go off track?
 - Do they complete all components of the class on-time?
- ✓ Assessing delivery and quality of contents of social media/ app = monitoring
 - Is content related to issue?
 - Is content being uploaded frequently?
 - Does the content cover any of the key points discussed in the staff meeting?
 - Are any of the hyperlinks provided on the social media pages and app easily accessible and able to be opened?

Such process evaluation will be delivered to the following stakeholders: ACT community, Larry O'Loughlin from ACT Conservation Council, local council bodies, program staff, and Ms Gai Brodtmann MP for Canberra.

Impact Evaluation

Defining and implementing impact evaluation is a necessary procedure when conducting an intervention as it allows for the identification of any impacts brought about by the program. When conducted within an appropriate time frame from the start of intervention, this will help determine if the method implemented is effective and identify any changes that can be made, accordingly, to achieve the intended objectives [13].

A 6-month randomised experimental pilot program will be carried out since this is a new program that has not been implemented within the ACT. Of the 7 district in the ACT, a test group and control group will be chosen. There will be two districts in the test group and two districts in the control group which will be randomly selected. To minimise bias, the aim is to have at least 50% of chosen population, families with children or young adults, as they have been identified as the highest contributors to food waste.

The main key evaluation questions that have been formulated are as follows:

- ✓ Was there an impact observed?
- ✓ Was there active community engagement?
- ✓ Did the intervention improve the communities understating and skills to reduce food waste?
- ✓ Is local community interest and participation in food waste prevention methods being advocated enough to encourage local government to inspire policy change?
- ✓ What worked well in the intervention and what did not, that can be altered to influence a positive impact?

The methods that will be conducted to calculate impact evaluation is

- ✓ Identify how many people within the community have been attending workshops by taking a head count at the start, 3 months in and then again at 6 months.
- ✓ Count how many resources have been handed out.
- ✓ Do a survey in test group and control group before the start of the program an at end the end of the program. In this survey, there will be questions such as what are their thoughts on food waste, any steps they take to reduce food waste, how much food they have waste in the past week (Refer to Appendix A.).
- ✓ Count number of people downloaded the food waste app that will be developed.
- ✓ Conduct a focus group with random selection of members in the community to observe the level of their knowledge on food waste pre- and post-intervention.

Based on the results obtained from this method of evaluation, any positive or negative impacts will be identified. By consulting with community members and stakeholders, the appropriate changes can be made to reintroduce a more productive and cost effective program in all ACT states.

Outcome evaluation

Outcome evaluation is an all-encompassing analysis of long term intervention performance and measuring whether the goal of the project has been attained. It is essential in identifying the long-term sustainability of the program, since the evaluation is carried out a period after the completion of the intervention [9].

For this intervention, the key question for the outcome evaluation is as follows:

- ✓ Has food waste in the ACT been reduced by 10% in the year 2025?

The measurement of outcome evaluation is to be carried out by:

- ✓ Conducting a waste bin audit and comparing to the results from previous waste bin audits in the ACT, 1 year after the intervention has completed and then again in 2025.

Economic evaluation

Working with valuable stakeholders such as Oz harvest who have access to kitchens where cooking classes can be carried out and they can also provide ingredients. The Conservation Council is in contact with members at different levels within the community that can provide the space to carry out education programs and interactive workshops. Recruiting volunteers within the community that are interested in the cause will be another cost-effective way to run the program. A small cost will go towards creating the app and the printing out of resources.

Resources

The resources that will be formulated and utilised include app and social media content (e.g. social media layout, and app design), advocacy tools (e.g. banners and flyers), and community workshop flyers (e.g. facts sheet, recipe cards, and household tips facts sheet). A sample of the community workshop resources that will be used are evident in Appendix B.

Summary

Food waste is becoming a growing topic of concern across all sectors, as half of all food produced globally is being wasted. Currently, ACT household food waste is the main contributor to food waste at the local consumer level, and food insecurity in this region is highly prevalent. This project report provides a thorough analysis of an intervention that would address the issue of food waste at a community level, by accounting for theories of human behaviour and program evaluation.

References

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Appendix A- ACT community food survey

Part A

1. Gender: Male / Female
2. How old are you?

18-34	<input type="text"/>
35-64	<input type="text"/>
65 and over	<input type="text"/>

3. How many people alive in your household?

1 adult > 18 years (no kids)	<input type="text"/>
2 adults > 18 years (no kids)	<input type="text"/>
1 adult with children	<input type="text"/>
2 adults with children	<input type="text"/>
Other combination	<input type="text"/>

4. If applicable, how many children living in your household?

5. What is the employment status of the main earner of the household?

Employed full time	<input type="text"/>
Employed part time	<input type="text"/>
Not currently employed	<input type="text"/>
Stay-at-home parent	<input type="text"/>
Long term sick/disabled	<input type="text"/>
Retired	<input type="text"/>

6. Describe the job of the main earner of the household.

Part B

1. How much of the total food in your household do you throw away daily?

Significant amounts	<input type="text"/>
Quite a bit	<input type="text"/>
A small amount	<input type="text"/>
Hardly any	<input type="text"/>
None	<input type="text"/>

2. In the last week how often have you thrown out food because they are no longer consumable (out of date/ mouldy)/ didn't look good)?

All the time	
Most of the time	
Sometimes	
Hardly ever	
Never	

- 2a. To what extent, if at all, did that bother you?

A great deal	
A fair amount	
A little	
Not very much	
Not at all	

3. In the last week, thinking about meal leftovers, what did you do with those leftovers? (Tick all applicable)

Threw them out	
Stored them to consume later	
Used the to make a new meal	

- 2a. How often do you throw out leftovers?

All the time	
Most of the time	
Sometimes	
Hardly ever	
Never	

- 2b. To what extent, if at all, did that bother you?

A great deal	
A fair amount	
A little	
Not very much	
Not at all	

4. How much effort do you and the members in your household put to minimise food waste?

A great deal	
A fair amount	
A little	
Not very much	
Not at all	

Part C

1. How would you rate yourself in the following food shopping routines and food habits?

	Very good	Fairly good	Average	Not very good	Don't do this
Pre-shopping planning (e.g. making a list, checking the cupboards to see what you already have)					
Meal planning (e.g. knowing what you are going to prepare in the week ahead)					
Portioning (e.g. knowing how much rice or pasta to cook)					
Fridge/cupboard organisation at home (e.g. knowing what you have and when products' "use by" or "best before" dates are coming up)					
Making useful storage choices (e.g. freezing extra portions or using containers to prolong the life of food, store bananas away from other fruit)					
Cooking skills (e.g. understanding the range of things you can prepare from raw/fresh ingredients)					
Making best use of leftovers (e.g. taking food leftovers/random ingredients and making a meal)					

Figure 1. 5 Tips to reduce food waste.



Figure 2. Reduce food waste with these simple steps

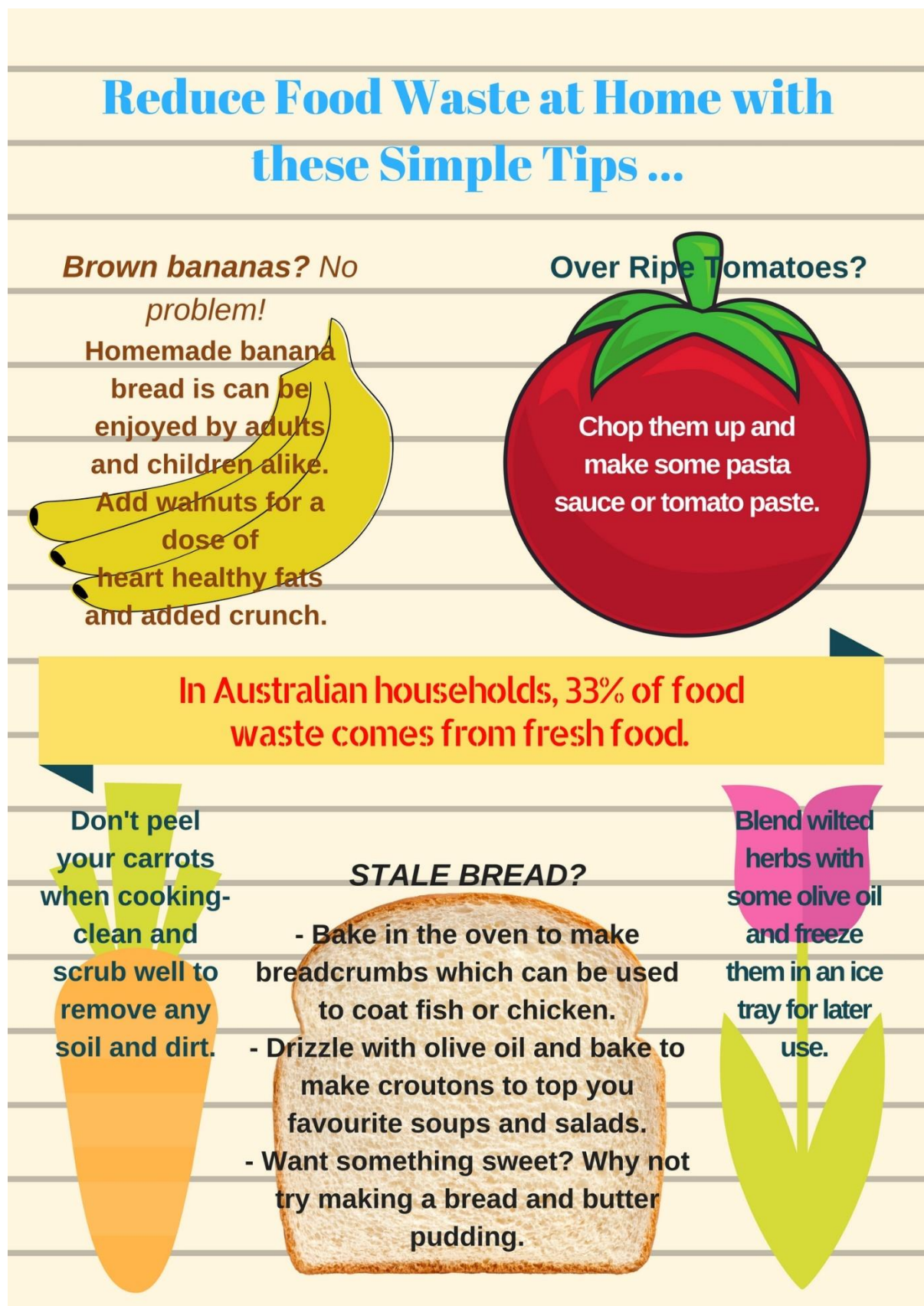


Figure 3. Recipe using leftovers – Roast beef and caramelised onion sandwich.

Recipe Card

Roast Beef & Caramelised Onion Sandwich

RECIPE NAME

4

SERVES

30 minutes

TOTAL TIME

Easy

LEVEL

Roast Beef

LEFTOVER INGREDIENT

This recipe customised based on the ingredients you have at home and what your family enjoys.

NOTES

INGREDIENTS

250g thinly sliced roast beef
2 large onions, sliced
8 slices of crusty bread
4 slices of Gruyere cheese
2 tbsp wholegrain mustard
1 tsp rosemary leaves
Olive oil
Salt and pepper

PROCEDURE

1. Heat olive oil in pan over medium heat. Add onion, season with salt and pepper, and cook, covered, stirring occasionally for 12 minutes. Reduce heat and add rosemary leaves, cook uncovered until onions are golden brown.
2. Brush outside of each slice of bread with olive oil. Assemble the sandwiches with the bread by adding whole grain mustard, Gruyere cheese, roast beef and the onion mixture.
3. Cook sandwiches on hot pan until bread is golden brown, crisp and cheese has melted, 4 to 5 minutes per side.

ENJOY!