The short-term effects of the COOK intervention on cooking skills and self-efficacy for cooking in New Zealand adolescents

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Abstract

**Background:** Consumption of convenience foods is one factor that is potentially contributing to the high rates of obesity in New Zealand adolescents. The increased availability of these convenience foods now means that cooking skills are no longer needed to put food on the table. Cooking foods from scratch can often be a healthier way to consume food, however adolescents are no longer receiving adequate education to learn the basic cooking skills required to do this. Additionally, the lack of opportunities for them to learn to cook may lower their confidence (self-efficacy) for cooking, and therefore demotivate them to cook from scratch. Cooking programmes conducted overseas suggest that hands on cooking classes may be an effective method to improve cooking skills and self-efficacy for cooking, however limitations with study design and methodology makes it difficult to determine their level of success. Additionally, little is known about what effect interventions in the home environment can have on adolescents’ self-efficacy for cooking.

**Objective:** To determine whether participation in phase one (hands on cooking classes) and phase two (take home food bags) of the COOK programme, affects short-term cooking skills and self-efficacy for cooking in adolescents from Dunedin, New Zealand.

**Design:** A randomised control trial was initiated in adolescents aged ‘13-15 years’.

Participants were randomly assigned to the control group (n=18) or the intervention group (n=66). Participants in the intervention group attended a 5-day cooking programme (COOK week) and then received take home food bags, one bag a week for six weeks. A self-administered questionnaire assessing mechanical cooking skills and self-efficacy for cooking was completed at baseline, and at seven weeks (immediately post the six weeks of food bags). Additional questions for these measures were taken immediately after the cooking programme (before the food bags were initiated) in the intervention only.
Results: The intervention group showed increases in total cooking skills and self-efficacy for cooking post intervention. These increases were significantly greater than changes observed in the control group for both the cooking skills and self-efficacy for cooking. Additionally, self-efficacy in the intervention group increased significantly from pre-to-post COOK week, and these changes were maintained up until the end of the take home food bags.

Conclusion: This interim analysis provides evidence that the COOK programme may have the ability to increase adolescents’ cooking skills and self-efficacy for cooking in the short-term. Additionally, take home food bags may play an important role in transferring the self-efficacy gained within cooking classes, into the home environment. Follow-up analysis of the COOK study will help to provide information on the long-term effects that this intervention could have on adolescent cooking skills and self-efficacy for cooking.
Preface

The candidate was supervised by Paula Skidmore, who conceived the research that was completed in this thesis. Paula Skidmore was responsible for the study design and population, ethical approval, and research protocols. Paula Skidmore and Caleb Robinson completed the recruitment and randomisation of participants. Dr. Jill Haszard was responsible for the statistical analysis of the data. One other Master of dietetics (MDiet) student Olivia Toldi, was responsible for analysing data on diet quality, which will be reported separately, in her thesis. The Candidate, Caleb Robinson, Rosie Finigan, Olivia Toldi and Nick Scullion were the key members of the research team responsible for the execution of the study. Along with the research team, the candidate was responsible for the completing the following tasks, under supervision:

- Development of the cooking skills questionnaire and self-efficacy for cooking scales
- Recipe adaptation, and formatting
- Pricing and purchasing of ingredients for phase one
- Execution of all components in Phase one of the intervention, including food preparation, assisting participants in the cooking, demonstrations and education sessions
- Gathering qualitative feedback from participants and their parents
- Organising and constructing the food bags, and coordinating pick-up times
- Co-coordinating data collection at all time points including anthropometry
- Data entry

The candidate was responsible under supervision for the following tasks:

- Review of the relevant literature in this area
- Interpretation of results
- Writing of this thesis
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List of abbreviations

COOK Create Your Own Kai
BMI Body Mass Index
MDiet Master of Dietetics
NZ Dep New Zealand Deprivation Index
Q Question
SCT Social Cognitive Theory
SES Socioeconomic Status
T Time point
USA United States of America
WHO World Health Organisation
YPAQ Youth Physical Activity Questionnaire
1. Introduction

Obesity in New Zealand is a major public health issue, with an estimated 32% of the population classified as obese (1), yet the environment continues to encourage food choices that promote disease and poor health. Increased consumption of energy dense foods such as convenience foods is a factor contributing to the rise in obesity (2). The ready availability of convenience foods means that cooking meals from scratch is no longer essential to put food on the table. Although convenience options are perceived to “fit in” with the busy modern lifestyle, particularly for adults (3), consuming these foods is often associated with a diet higher in saturated fat, sugar and sodium (4), as well as low micronutrients (5). New Zealand adolescent eating behaviours are also of concern, with an estimated 36% of young people aged 10-14 years considered to be overweight or obese (1). Previous research has shown that diet quality improves when adolescents are more involved in cooking food (6). However, it seems that many adolescents are not involved in cooking on a regular basis, with a study in New Zealand finding that 15-22% of adolescents had not cooked a meal in the last year (7).

Although cooking skills are an essential part of cooking, gaining self-efficacy for cooking enjoyable foods may be just as important for motivating adolescents to cook. Self-efficacy describes the belief that a person holds, that they can achieve a specific behavioural outcome (8), and has been deemed an integral part of achieving behaviours relating to health (8). If adolescents do not have the belief, or confidence that they can successfully cook food from scratch, they may not have the motivation to attempt this activity at all. Self-efficacy is gained through successful experiences, and supportive environments (9). In many countries including New Zealand, there is limited exposure to cooking in schools (10). Therefore, it is likely that adolescents are not given enough opportunities, in the right environment, to develop their cooking skills and increase their self-efficacy to cook foods from scratch.
Recently, interventions that expose adolescents to hands-on cooking programmes have been considered as an initiative to increase cooking skills and self-efficacy for cooking. Limited research has been completed in adolescent cooking programmes and of these studies, small increases of cooking skills and/or self-efficacy for cooking were observed (11-14). However, most studies used a pre-post questionnaire study design, with no comparison group (11-14), which makes it difficult to attribute the outcomes to the cooking interventions. Within the studies in adolescents that observed increases, many included family or community aspects within their programme (11, 12, 15). However, limited information is known about the effect that home-based interventions involving take-home food bags could have on self-efficacy for cooking (12).

Previous studies analysing adolescent involvement in cooking programmes have shown tendencies to increase cooking skills and self-efficacy, however the weakness in study designs have made it difficult to attribute any changes to the programmes. Within limited overseas studies, there is little evidence surrounding the effectiveness of moving the intervention into the home environment through take home food bags. Additionally, there is limited research regarding the effect that adolescent cooking programmes could have in New Zealand. Therefore, the purpose of this thesis was to assess the effectiveness of a five-day cooking intervention (phase one) followed by six weeks of take home food bags (phase two), on adolescent cooking skills and self-efficacy for cooking. This study is the first randomised control trial analysing the effect of a cooking intervention on cooking skills and self-efficacy in New Zealand adolescents.
2. Literature Review

There are many definitions for adolescence, as there is no set chronological age for when the physiological and psychological changes of adolescence occur. The World Health Organisation (WHO) defines adolescence as between the ages of 10 and 19 (16). However, for this thesis, adolescence will be defined between the ages of 12 and 18, based on the ages at which most youth attend secondary school in New Zealand.

2.1. Methodology of literature review

Literature for this review was found through the databases of Medline(Ovid), PubMed, and google scholar. Keywords included ‘cooking’, ‘food preparation’, ‘cooking programme’ ‘adolescent’, ‘youth’ ‘cooking skills’, ‘confidence’, ‘self-efficacy’, ‘definition’, ‘convenience food’. Literature was additionally collected from reference lists from peer-reviewed articles. The World Wide Web was used to find government documents relating to adolescents.

2.2. Food preparation and cooking in relation to adolescent health

Cooking practices in the Western world have changed dramatically over the past 50 years, to a point where ready-made foods are promoted by the food industry over cooking meals from scratch (17). Consumption of ready-made or convenience foods such as fast-foods often contribute to a diet high in energy, saturated fat, salt and lower in essential vitamins and minerals (5). These energy dense foods are contributing to the high rates of obesity internationally (18, 19). In New Zealand, WHO found that fast-food purchasing transactions increased by 10.1% from 1999 to 2008 (20), and therefore it is not surprising that in New Zealand, nearly one in three adults are considered obese (1). With 36.1% of adolescents aged 10-14 years, and 43% aged 15-17 years, either overweight or obese, food choices in this age group seem to be an issue too (1). Compared to younger children, adolescents are likely to be less dependent on caregivers to supply food for them, however the environment in New
Zealand is less than ideal for helping adolescents to choose healthy foods. New Zealand studies identified that there is high density of fast-food and convenience food suppliers within walking distances of schools (21) with up to 62% of urban schools having a fast-food store within 800 meters (22). To combat the highly-promoted convenience food industry, there needs to be a strong push to educate and motivate people, including adolescents to choose healthier foods that have been prepared in an appropriate way, to help them to meet nutritional guidelines.

Recently, promoting cooking from scratch at home has been proposed, as a potential intervention for improving health in many Westernised countries (23). The limited published literature generally supports the hypothesis that increased home food preparation is associated with better diet quality (7, 24-26). Specifically, studies in adults have shown that increased food preparation at home is associated with lower consumption of energy, fat and sugar (25), as well as an increased likelihood of meeting dietary guidelines for fruit, vegetables, wholegrains, and calcium (24). Similar trends have been observed in children and adolescents, with those who consume foods cooked in the home tending to consume a diet which would be considered “healthier”. A cross-sectional study of New Zealand adolescents observed that those who reported that they help with cooking meals were significantly more likely to meet the recommendations for fruit and vegetables, as well as consume fast food less frequently (7). Furthermore, research in youth overseas identified that eating meals cooked at home, rather than away from the home was associated with healthier dietary patterns (27-29).

There is a growing body of research concluding that home-based food preparation and cooking may help to improve the nutritional quality of the food being consumed by all age groups, including adolescents. Along with the solid evidence surrounding the nutritional inadequacy and negative health effects of consuming large amounts of pre-prepared and
convenience foods (30-33), promoting home food preparation and cooking could be an important part of improving health in New Zealand adolescents.

2.3. Barriers for cooking

Identifying barriers to healthy eating is essential for implementing realistic public health initiatives. Within the adult population, the perceived cost of healthy food, time to plan and prepare meals, and skills required to prepare a meal that will be enjoyed by family members are all barriers identified within the literature (34, 35). These barriers promote the consumption of pre-prepared or convenience foods, which are often perceived to ‘fit in’ with the busy lifestyle (3).

Adolescents also experience the above barriers for cooking, however there are more complex barriers for this age group to overcome. One main theme identified at this age is the level of exposure to cooking opportunities (7, 36). The importance that the New Zealand school curriculum place on learning basic domestic cooking skills seems to be minimal (10), and therefore adolescents may be relying mostly on exposure to cooking from parents and family members. Regulation of food choice by parents may also be a barrier for this age group. This means that although adolescents may be starting to gain autonomy over their food choices, many could still be reliant on older family members to supply a proportion of their food for them. This can reflect both positively and negatively on their opinions of food and cooking, depending on the opinions and food choices of their family. Furthermore, sensory outcomes of food can play a large role in the food choices that adolescents make (37). Interestingly, food choices in adolescents are often based on factors other than those relating to health benefits (38). A qualitative study by Stevenson et al (2007) signified the important role that texture, taste and smell had on adolescent food choices (37). Visual appearances of food also influenced food choice, with some adolescents indicating that they do not like certain foods that they have never tried before, because of the way that it looks (37). Additionally,
convenience foods are often perceived as tastier and more appetising than home cooked food (35, 39). If adolescents are unable to cook meals or experience home cooked meals that meet their expectations for these sensory qualities, they may be less motivated to cook foods themselves and more inclined to choose convenience food options.

Although cooking skills are no longer considered essential skills, they still have a major role to play in preparing foods from scratch. Considering that foods cooked from scratch are often healthier (7, 25, 27) cooking skills could be considered a necessary part of maintaining a healthy diet. Although possessing a broad range of cooking skills seems to be an important part of encouraging adolescents to cook, it may be just as important to improve their confidence for cooking. The concept of confidence is a significant part of achieving behaviour change (9), and is often referred to as perceived self-efficacy. Improving self-efficacy for cooking in adolescents may help to motivate them to attempt to cook, but also help them to deal with stress, failures and overcome future barriers associated with cooking (9). Within the adolescent population, who may not have a great deal of exposure to cooking opportunities, there may be a potential benefit of developing an effective strategy which helps to improve both their cooking skills and their self-efficacy for cooking.

2.4. Cooking skills

2.4.1. Defining domestic cooking skills

Defining cooking skills in Westernised countries has become increasingly difficult. This is mainly due to the change in food environment, which has been referred to by Lang and Caraher as the “culinary transition” (40). This term describes a change of food preparation methods within a whole culture, to a point where cooking foods from fresh ingredients is no longer essential to produce a meal (40). In America, this change was observed from 1965-1966 to the mid 1990’s, with a dramatic decrease in energy (kilojoules) sources from the home by 23.9% (females) and 24.5% (males) (17). However, this could be an over-
representation of consumption of food cooked from scratch, as the ‘home sourced foods’ were classified as anything purchased at a store, deli or grocery store, which could include convenience foods. An international study that included New Zealand, looked at adolescent fast-food consumption (41). This study showed that above 50% of adolescents consumed fast-food frequently (1-2 times per week) or very frequently (3 or more times per week). Again, this study showed a tendency for foods to be consumed away from home. Now that sourcing a meal outside of the home has become a regular means for accessing food for many people, there is a need for a clear definition of what cooking skills are required to overcome the barriers of today’s society.

Definitions around cooking skills are inconsistent throughout the literature (7, 42-44). Simplistic definitions have been used such as cooking a meal from “basic ingredients” (7). However, these terms have been considered too vague to have any real meaning (43). Distinguishing between pre-prepared (convenience) foods and basic/ raw ingredients can be challenging, with foods such as tinned products, dried pastas and bread falling between these categories. Cooking skills have also been defined solely through distinct cooking methods, also known as mechanical or technical cooking skills (43) (e.g. boiling, chopping, frying, steaming). In previous generations, these skills were essential to put food on the table as convenience foods were less available. However, with the changing food environment in New Zealand, possessing mechanical cooking skills on their own may no longer correlate to being able to prepare the majority of food consumed, at home from scratch (43). This indicates that a broad range of other skills may be needed, such as time management, budgeting skills and creativity in the kitchen, to overcome the barriers of cooking in today’s modern society (42).

A more extensive view on the definition of cooking skills was put forward by Short 2003, who segregated cooking skills into five main areas; mechanical, perceptual, conceptual,
academic and planning (43). Mechanical skills are the technical skills of cooking such as stirring, baking, frying, streaming or roasting. Perceptual skills describe the understanding of the properties of food such as taste, colour, texture and how foods will change under different cooking methods. Conceptual cooking skills refer to the creativity of cooking and being able to visualise outcomes, specifically, how foods will work together with taste, colour, texture and temperature. Academic skills involve understanding food safety, nutrition, seasonality and learning different cuisines and classic food combinations. Lastly planning skills include choosing appropriate kitchen resources, planning meals within budgets and around time constraints as well as considering the food preferences of others (43). Short’s definition looks at cooking holistically, by addressing skills that help to overcome the barriers of today’s society. Although this definition was not specifically designed for application in the adolescent age group, if adolescents were to begin developing these five skills from an early age, they may be more prepared to cook foods from scratch, when full independence of food choice is gained.

2.4.2. What cooking skills do New Zealand adolescents currently hold?

There is relatively little evidence surrounding the cooking abilities of New Zealand adolescents. A recent study by Utter et al (2016) found that around 80% of New Zealand adolescents could cook a meal from basic ingredients, this was lower in those of Pacific Island and Asian ethnicities as well as adolescents who lived in poverty (7). However only 54% reported cooking a meal once or more a week with 22% of males and 15% of females indicating that they had not cooked a meal in the last year (7).

Most New Zealand children do receive some education relating to cooking. In year 7 and 8 (ages 9-12) they are estimated to receive around 1-2 classes per week for 6-14 weeks (10). A New Zealand survey published in 2017 showed that 46% of the food items cooked in year 7
and 8 classes were main meal items, 13% were baked goods and 12% were dessert items (10).
Although this study showed that a lot of the cooking involved main meal items, large
differences in what is taught in cooking classes at each school were identified. Along with the
lack of structure in the food technology class curriculum, this study suggests that not all year
7 and 8 cooking classes expose New Zealand students to adequate cooking experiences. When
these students move on to secondary school, food technology is offered as an optional subject.
Therefore, throughout the 5 years that adolescents are at secondary school, many of these
students will not receive any further training to develop their cooking skills. Food technology
at year 7 and 8 may be the only current cooking opportunity that most children and
adolescents are receiving throughout their schooling years.

Although there is not a lot of evidence surround actual cooking skills in New Zealand
adolescents, what is clear is that adolescents are not receiving a great deal of exposure to
cooking education. The study by Utter 2016 pointed out, that even if adolescents believe that
they can cook a meal from scratch with relative ease, they may not be using their cooking
skills regularly, or at al (7). Improving adolescent cooking skills could help improve the
frequency of cooking from scratch in New Zealand adolescents, however improving their
self-efficacy for cooking as well, could have an even greater effect (8).

2.5. Self-efficacy

2.5.1. Self-efficacy and the Social Cognitive Theory

The increase in convenience food availability is one environmental factor affecting cooking
habits globally. As identified before, other factors such as decreased cooking in school and
lack of time to produce home cooked meals also influence the way New Zealanders cook and
consume food. Considering these factors, along with the health effects of the changing food
culture, there is clearly a need for public health initiatives to be developed in the context of
the modern society.
The social cognitive theory (SCT) is a theoretical model that can be applied to many areas within health and nutrition (8). SCT looks at how human behaviours are influenced by personal, behavioural and environmental factors (45). Within this theory, self-efficacy is a vital component when applying it to a behaviour relating to health. The term self-efficacy has been defined by Albert Bandura as the “belief in one’s capabilities, to organise and execute the courses of action required to produce given levels of attainment” (8). Knowledge and skills are necessary to complete a goal, however if the person does not believe that they can reach the desired outcome, they may have little motivation to undertake the behaviour (8).

2.5.2. Gaining self-efficacy

Bandura 1977 (9) describes the four main routes in which self-efficacy can be affected. The first of these is known as performance accomplishments, where a task that is perceived as difficult, is attempted and completed successfully. This in turn causes an increase in self-efficacy for this specific behavioural task. Multiple successes can also increase the likelihood of overcoming failures (9). The second domain involves modelling of the behavioural task. This is also referred to as a vicarious experience, where the specific behavioural task is completed by another person with similar characteristics to the observer. Vicarious experiences are more effective at increasing self-efficacy if the model is showing some level of effort to make the task, and if there are clear rewarding outcomes for the model at the end of the task. The third domain is referred to as verbal persuasion, which involves suggestions from other people, that the task can be completed, even if the task has previously been too overwhelming for them. Although this domain is commonly used, it can be a weaker method for increasing self-efficacy, as past experiences of failure can be of higher influence. Lastly, emotional arousal is a domain that can affect self-efficacy expectations. The concept of emotional arousal is described as the fear and anxiety a person has around their own
competency of successfully completing a task. When thinking about the situation, and how the person might fail the task, these feelings can often be more intense than the actual feeling of failure. Therefore, reducing emotional arousal can be an important path to increasing self-efficacy. All four domains work together to form a person’s level of self-efficacy in completing a task. Performance accomplishments and vicarious experience are strong enablers of increasing self-efficacy, however all four domains should be explored when attempting to change or implement a behaviour.

Designing an initiative to increase cooking from scratch in adolescents would be most effective if it included aspects of all four domains of self-efficacy. Performance accomplishments and vicarious experience are strong enablers of increasing self-efficacy, and therefore an emphasis should be put on these, however both emotional arousal and verbal persuasion should be included to maximise the amount of self-efficacy that can be achieved.

2.6. Addressing the decline in cooking

The increase in nutrition related health issues including obesity (1) has triggered an interest in addressing these problems through education of healthier food choices. Specifically, the relationship between cooking and nutrition has been of interest in the two decades, as it has become increasingly obvious that people are choosing convenience foods more often (17). With this, there has been a decline in the frequency that people (including adolescents) are involved in preparing and eating meals that are cooked from scratch (17). The research community has now started to explore the effectiveness of exposing adolescents to hands on cooking education and whether this exposure will help to improve both their cooking skills and self-efficacy for cooking.
2.6.1. Overview of cooking interventions

A search of the literature identified twelve cooking interventions that included, but not exclusive to adolescent participants (age 12-18), published from the year 2000 onwards. Table 2.7.1 represents an overview of these studies. These interventions included outcomes regarding cooking skills and/or self-efficacy for cooking. All interventions identified had additional aims including nutrition knowledge, healthy eating, diet quality and wellbeing, however these outcomes are outside the scope of this thesis, and will not be reported. All twelve interventions were based around hands-on cooking sessions, however many of the interventions stated that they included other food and nutrition related education sessions (11, 13, 15, 46-48). Family and community components were included in many of the interventions to increase confidence and satisfaction (11-13, 15, 49, 50). The summer cooking programme analysed by Condrasky 2007, involved the participants preparing their favourite meal on the last day, for their families to try (49). Both the Pink Chefs and the Pink and Dude Chefs programmes conducted a family feast for the last session, which involved menu planning and time management (11, 15). Community and family involvement was included in the Cooking Communities intervention (12). Participants learnt to cook different ethnic meals and visited another participating school to teach them to cook one of these meals. Additionally, a food bag consisting of the individual ingredients was given to take home and cook the meal of each session for their friends or family. The study by Thomas et al had participants prepare dinners for two events that involved 50 and 100 people respectively. The foods they prepared were based on recipes they had previously made (50). The summer cooking programme analysed in Beets et al 2007 did allow family members to try some of the foods at the end of the sessions, however there was no set plan to include family in this programme (13).
Duration of the cooking interventions differed dramatically from ten sessions up to thirty-six (11-15, 47-49, 51-54). One intervention did not state whether participants attended all or only some of the sessions (51) and another had variations in the number of sessions each participant attended, from 3 sessions to 20 sessions (52). Three of the interventions were held over a five-day (one week) block (14, 48, 49). The others varied in the time period in which they were implemented (11-15, 47, 51, 52, 54), with the longest being implemented over eighteen months (53). Most were implemented in the United States of America (USA) (11, 13-15, 47-49, 51, 52, 54), although Cooking Communities (12) and Cook it up! (53) were completed in the United Kingdom and Canada respectively. Multiple settings were used, including afterschool programmes (11, 12, 15, 54), summer camps (13, 14, 47, 49) and within the community (48, 50-52). A small proportion of the studies targeted ethnic minorities (48), or communities of high deprivation (47, 48, 50).

2.6.2. Cooking intervention methods of evaluation

Overall the methodologies of the intervention analyses were limited. All twelve studies completed short-term evaluations. One study contained randomisation which placed matched schools into an intervention or control (52). However individual randomisation did not occur within the schools, and the youth knew whether they were in the control or intervention when they were signing up to participate in the study. This may have influenced the baseline characteristics and results, which were found to be significantly different between the two groups, limiting the ability for comparison. All other studies had a pre-post design with no comparison group (11-15, 47-51, 54). This design is restricting, as it does not determine whether the effect was due to the cooking intervention or not. However, the pre-post design can be useful for supplying useful feedback to apply for future interventions. Eight of the twelve interventions included cooking skills as part of their evaluation (12, 13) (47-51, 54). Cooking skills were reported through mechanical methods (53) or their ability to cook.
individual food items (12), however five interventions did not specify what measurements were used (13, 47-49) (51, 54). Detail surrounding methods of evaluation for self-efficacy in cooking were slightly more comprehensive. All six studies used a scaling system to determine their confidence for cooking (11, 14, 15, 49, 50, 52, 53), however different scaling labels were given to represent the level of confidence felt. The questions in Revill (2003) asked how confident the participant was in cooking food items such as rice, pasta or apple crumble. Other studies asked questions regarding how confident the participant was at “cooking a meal from basic ingredients” (11, 15), or “from scratch” (15, 52). The Pink and Dude Chefs programme was adapted from the Pink Chefs intervention in 2008, and therefore a similar questionnaire (adapted from the Cook-Well youth programme) was used to analyse both programmes (11, 15). This questionnaire included additional questions on self-efficacy for knife skills, planning and budgeting, using leftovers and adapting to family preferences (11, 15). It is understandable that most interventions designed their own questionnaires (12, 13, 48, 51, 53) as there is a lack of validated self-administered cooking skills and cooking confidence questionnaires. The cook-well questionnaire that was adapted for the Pink Chefs and Pink and Dude Chefs interventions was based on previous work by Anderson et al (2002) conducted in 11-year-old children (55). Revill (2003) also used this questionnaire for measuring self-efficacy (52). These three studies were the only intervention analyses that utilised a validated questionnaire (11, 15, 52). Only two other validated self-efficacy tools could be identified in the literature, however both were tested in adults, and were not used by any of the studies that met the criteria for this literature search (56, 57).

2.6.3. Cooking interventions’ results

Seven interventions observed an improvement in cooking skills (12, 13, 48, 49, 51, 53, 54), however only two of these studies reported statistical analysis of the changes in cooking skills. The ‘Cooking Communities’ programme saw significant increases (p<0.05) of 33% for
cooking a meal, 25% for simmering food, and 15% for cooking healthy food (12).

Furthermore, Beets et al. (2007) found a significant increase from baseline to post-intervention perceived cooking ability from a score of 3.6 to 4.0 (p=0.04) (13). Only one study found no difference in cooking skills (47). Similar results were found in self-efficacy for cooking, with five out of the six studies that examined this component, finding some improvements post intervention (11, 14, 15, 49) (52, 53). Chessen et al (2008) found that total self-efficacy increased by 1.95 within the possible 5-point maximum score (p=0.005). Also, Condrasky et al (2010) observed significant improvements for cooking healthy meals and using herbs and spices (p<0.0001), but not for the other self-efficacy questions. Qualitative feedback indicated improvements in cooking confidence in two studies, where quantitative data was limited (49, 53). The only intervention analysis that contained a comparison group was that by Revill (2003), who stated that self-efficacy for cooking increased in both the intervention and control. However, this increase was not significantly different between the intervention and control. In this study, the intervention group had a higher level of self-efficacy at 22 points of a possible 27 at baseline compared to 17 in the control. This may have distorted the effect of the cooking intervention, as there would be less room for improvement in the intervention group. Also, participant session attendance varied greatly, and therefore it is possible that some participants did not receive sufficient intervention sessions to have an effect. Sheehan et al 2013 did not find any meaningful increase in overall self-efficacy.

Interventions that included a family or community component, alongside the cooking classes and nutrition education, all showed some degree of improvement in cooking skills and self-efficacy for cooking (11-13, 15, 50). However, no separate analysis of the family and community components were completed, and therefore it is not possible to determine whether these components contributed to the improvements observed within the overall cooking interventions. One intervention involved take home food bags, to cook for the family at home.
(12), but again, the impact of this intervention was not evaluated separately, and therefore it is unknown whether the food bags had an effect above and beyond the cooking classes. From the results of all studies, there does not seem to be a preferable number of sessions or length of time to which the intervention should be completed in. All studies included, measured the short-term effect of the intervention, and therefore it is unable to be determined whether there is a more effective delivery method for maintaining cooking skills or self-efficacy, long term.

Many of the results did not show a significant increase for both cooking skills and cooking self-efficacy, however this is may be due to inadequate study design and small participant numbers, which reduce the power for detecting significance. Because of the limited descriptions and standardisation of these interventions, it is difficult to make comparisons between the studies. Although the evidence is not conclusive, there was some evidence of an improvement in cooking skills and self-efficacy for cooking in adolescents who were involved in these cooking interventions.

2.7. Conclusion

Overall, cooking has been identified throughout the literature as a potential intervention for improving the health of adolescents. This literature review has further identified that self-efficacy (confidence) for cooking could be just as important as the cooking skills themselves. Including both cooking skills and self-efficacy could be essential for overcoming barriers and providing motivation for adolescents to cook meals from scratch, rather than consuming convenience foods. Although there have been analyses of cooking programmes conducted in the USA, UK and Canada, there is still uncertainty over whether cooking programmes are an effective method of improving cooking skills and self-efficacy in adolescents. This review has also identified family or community components, and nutrition education as common trends throughout the more successful programmes. However, there is need for stronger methodology in this area, to allow the effects observed to be attributed to the cooking
programmes. In New Zealand, many adolescents may not be receiving the necessary exposure to cooking to develop their cooking skills and the confidence to cook in daily life. To date, there is no research that has looked at the effectiveness of cooking programmes in New Zealand. Furthermore, there are limited interventions that involve moving the cooking intervention into the home environment through the method of take home food bags.
Table 2.7-1: Overview of adolescent cooking interventions analysing cooking skills and self-efficacy for cooking

<table>
<thead>
<tr>
<th>Author(s), year (country)</th>
<th>Target group</th>
<th>Name of intervention</th>
<th>Intervention description</th>
<th>Outcomes measured</th>
<th>Methods</th>
<th>Measure of cooking skills/ self-efficacy used</th>
<th>Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sheehan 2013 (USA) (15)</td>
<td>Children and adolescents (11-14yrs) n=23</td>
<td>Pink and Dude Chefs. After-school culinary intervention nutrition and culinary skills</td>
<td>6-week intervention. 2 x 2hr sessions per week, 30minute lecture and 90minute cooking session</td>
<td>Self-efficacy for cooking</td>
<td>Pre-and post-intervention questionnaire</td>
<td>No Control</td>
<td>Small increase from 2.95 to 3points (out of 5) for overall confidence score from pre-to post survey, not significant (p=0.9). Small changes observed for individual cooking confidence questions, however none were significant - No change for being able to cook from scratch. - small decrease in score for following a recipe (0.16) and using knife skills safely (0.26) - Increase in creating meals with new ingredients (0.21), using left-overs to create a new meal (0.16) and using coupon and or store fliers to plan a meal (0.11).</td>
</tr>
</tbody>
</table>

1. Being able to cook from scratch  
2. Creating meals using new ingredients  
3. Following a simple recipe  
4. Using a knife safely when cooking  
5. Use coupons and/or store fliers to plan a meal  
6. Using leftovers to create a new meal
<table>
<thead>
<tr>
<th>Author(s), year (country)</th>
<th>Target group</th>
<th>Name of intervention</th>
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<th>Outcomes</th>
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<tbody>
<tr>
<td>Gatenby, Donnelly and Connel 2011 (UK) (12)</td>
<td>Adolescents (12-13yrs) n=55</td>
<td>Cooking communities: afterschool cooking club</td>
<td>1 x 1.5hour session per week for 10 weeks. Sessions aimed at promoting cooking skills and healthy eating. Community learning session was implemented. Students given ingredients from each session to take home and cook with.</td>
<td>Cooking skills</td>
<td>Informal interviews and pre-and post-intervention questionnaire</td>
<td><strong>Self-reported cooking skills:</strong> 1. Simmer food 2. Boil an egg 3. Separate an egg 4. Open a tin 5. Chopping Techniques 6. Cooking a meal 7. Cooking healthy food</td>
<td>All cooking skills reported an increase after the intervention. Significant increase (p&lt;0.05) in perceived cooking skill level for: 1. 33% increase for cooking a meal 2. 25% increase for simmering food 3. 15% increase for cooking healthy food.</td>
</tr>
<tr>
<td>Author(s), year (country)</td>
<td>Target group</td>
<td>Name of intervention</td>
<td>Intervention description</td>
<td>Outcomes measured</td>
<td>Methods</td>
<td>Measure of cooking skills/self-efficacy used</td>
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</table>
| Thomas and Irwin 2012 (Canada) (50, 53) | Adolescents (mean age 14.6) n=5 | Cook it up! Community-based cooking programme for at risk youth. | 2 hr sessions were twice monthly for 18 months and monthly agricultural trips. Cooking Sessions including information on cooking skills, seasonality and locality of foods. | Cooking skills and self-efficacy for cooking | Pre-and post-intervention questionnaire, Individual Interviews with stakeholders. No Control | **Self-reported Cooking skills:**  
- Using a knife safely  
- Peeling, chopping, slicing vegetables or fruit  
- Cooking a piece of raw or frozen meat/chicken/fish (not processed)  
- Cooking a soup, stew, casserole using a pre-packaged mix  
- Choosing a spice or herb that goes well with the food being cooked  
- Adjusting a meal to make it healthier  
- Baking muffins or cake from scratch  
- Baking muffins or cake using a pre-packaged mix  
- Planning a quick healthy meal using only the foods already at home  
- Freezing vegetables or fruit from raw to bagged in a home freezer  
- Canning fruit or salsa from raw ingredients to finished products in sealed glass jars.  
**Self-efficacy for cooking:**  
- Preparing foods at home at least partly from scratch (5-point scale) | All participants identified increase in cooking skills. (Significance not determined).  
Quantitative data showed 2/5 of the participants improved self-efficacy level from “I think I can” to “I know I can”. 2/5 remained in “I know I can” from prep-post intervention  
Qualitative feedback indicated an increase in confidence in the kitchen |
<p>| Condrasky et al 2010 (USA) (14) | Children and Adolescents | Cook like a chef, nutrition camp | One Week (5 days) of full day cooking classes | Cooking skills and cooking self-efficacy | Pre-and post-intervention questionnaire | <strong>Self-reported Cooking skills</strong> (adapted from Cooking up fun! Evaluation tool)(55) | Cooking skills statistics not reported, for pre-post design. |</p>
<table>
<thead>
<tr>
<th>Author(s), year (country)</th>
<th>Target group</th>
<th>Name of intervention</th>
<th>Intervention description</th>
<th>Outcomes measured</th>
<th>Methods</th>
<th>Measure of cooking skills/ self-efficacy used</th>
<th>Outcomes</th>
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</thead>
<tbody>
<tr>
<td>Chessen et al 2008 (USA) (11)</td>
<td>Female Adolescents (12-14yrs) n=22</td>
<td>Pink Chefs After-school culinary intervention involving</td>
<td>6-week intervention. 2 x 2hr sessions per week, comprising of a 30-minute</td>
<td>Cooking Skills, self-efficacy</td>
<td>Pre-and post-intervention survey No control</td>
<td>Self-efficacy for cooking: - Used the assessment tool from the Cook-Well programme - 5 point Likert Scale, to give a total score from 7 self-efficacy questions</td>
<td>A significant increase in total self-efficacy score for cooking by 1.95 out of a maximum score of 5</td>
</tr>
<tr>
<td>Author(s), Target group, year (country)</td>
<td>Name of intervention</td>
<td>Intervention description</td>
<td>Outcomes measured</td>
<td>Methods</td>
<td>Measure of cooking skills/ self-efficacy used</td>
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<tr>
<td>Meehan et al 2008 (USA) (47) Children, adolescents (aged 6-20yrs) n= 15</td>
<td>Nutrition and culinary skills</td>
<td>lecture and a 90-minute cooking session. Included family meal at end of programme</td>
<td>Cooking skills</td>
<td>Prep and post intervention questionnaires</td>
<td>Self-reported cooking skills: adapted from Cullen et al (58)</td>
<td>No significant difference in cooking skills from pre-to post intervention</td>
<td></td>
</tr>
<tr>
<td>Dougherty and Silver 2007 (USA) (48) Children and adolescents (aged 8-12 years) n=31</td>
<td>Meal preparation sessions and nutrition education in North Carolina</td>
<td>5 consecutive days, consisting of 2-hour session each day</td>
<td>Cooking Skills</td>
<td>Pre-and post-intervention questionnaires</td>
<td>Self-reported cooking skills: Specific questions not reported</td>
<td>97% reported learning new skills in cooking. No other statistical results reported.</td>
<td></td>
</tr>
<tr>
<td>Author(s), year (country)</td>
<td>Target group (country)</td>
<td>Name of intervention</td>
<td>Intervention description</td>
<td>Outcomes measured</td>
<td>Methods</td>
<td>Measure of cooking skills/ self-efficacy used</td>
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<tr>
<td>Condrasky 2007 (USA) (49)</td>
<td>Children and adolescents (aged 11-14) n=24</td>
<td>Summer Cooking Camp in Pennsylvania</td>
<td>2 cooking sessions per day for 5 consecutive full days.</td>
<td>Cooking Skills and Self-efficacy</td>
<td>Pre-and post-intervention questionnaires</td>
<td>No control</td>
<td>Self-reported cooking skills and self-efficacy for cooking: (adapted from Cooking up fun! Evaluation tool)(55) - Specific questions not available - scale used to determine skill level 1. “I tried this skill for the first time” 2. I improved 3. I practiced at home 4. I want to practice more 5. I can do this well 6. I taught a friend or family member this skill Most of the participants reported that they learned a new skill post intervention</td>
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<td>Post intervention: - 58% indicated they could use a sharp knife - 19% tried sautéing for the first time, - 84% could use measuring cups and spoons well - 54% could stew well - 79% could use baking processes well. (These results were not compared to baseline questionnaire).</td>
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<tr>
<td>Author(s), year (country)</td>
<td>Target group</td>
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<td>Intervention description</td>
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<tr>
<td>Beets et al 2007 (USA) (13)</td>
<td>Youth (age not reported) n=17</td>
<td>Summer cooking programme</td>
<td>8 x 4hr sessions completed within 2 weeks.</td>
<td>Cooking skills</td>
<td>Pre-and post-intervention questionnaires</td>
<td>Self-reported cooking skills - evaluation tool not reported</td>
<td>Significant increase post intervention in perceived cooking ability from 3.6 to 4 (p=0.04) (maximum value not stated)</td>
</tr>
<tr>
<td>Thonney et al 2006 (USA) (54)</td>
<td>Children and adolescents (aged 9-15yrs)</td>
<td>Cooking up Fun! Outside school cooking programme in New York</td>
<td>6 x 90minute Interactive cooking classes</td>
<td>Cooking skills</td>
<td>Pre, during and post intervention questionnaires. No control</td>
<td>Not stated</td>
<td>Reported successful outcomes for gaining selected skills, knowledge and behaviours regarding preparation No specific results reported.</td>
</tr>
<tr>
<td>Author(s), year (country)</td>
<td>Target group</td>
<td>Name of intervention</td>
<td>Intervention description</td>
<td>Outcomes measured</td>
<td>Methods</td>
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</table>
| Brown and Herman 2005 (USA) (51) | Children and adolescents (average age = 12yrs) n=229 | Cooking Classes based on fruit and vegetable preparation skills, food safety practices and produce nutrition | Hands on cooking classes within 2 months. Classes were designed for both adolescents and adults. Number of classes attended by each participant not stated. | Cooking Skills | Pre-and post-intervention questionnaire No control | **Self-reported cooking skills**  
- Questionnaire pilot tested  
- Specific questions not reported | 67% of youth reported being able to prepare fruits or vegetables in a new way. |
| Revill 2003 (USA) (52) | Year 8 students (average age 12yrs) n= 67 | Afterschool food club in Oregon involving basic food preparation activities along with trying new foods and taking foods home. | 2 hrs per session for 20 weeks. Participants attended a varying number of sessions (minimum of 3 and maximum of 20 sessions) | **Self-efficacy for cooking**  
Participants were asked to scale their ability to make the following 9 different foods without using readymade or packet foods.  
1. Vegetable stir-fry  
2. Coleslaw  
3. Boiled Potatoes  
4. Lentil Soup  
5. Apple Crumble  
6. Boiled White Rice  
7. Boiled Pasta  
8. Bread  
9. Boiled Broccoli  
Scale used:  
- All by myself  
- With a little help  
- With a lot of help  
- Not at all | **Self-efficacy for cooking**  
Participants were asked to scale their ability to make the following 9 different foods without using readymade or packet foods.  
1. Vegetable stir-fry  
2. Coleslaw  
3. Boiled Potatoes  
4. Lentil Soup  
5. Apple Crumble  
6. Boiled White Rice  
7. Boiled Pasta  
8. Bread  
9. Boiled Broccoli  
Scale used:  
- All by myself  
- With a little help  
- With a lot of help  
- Not at all | Perceived cooking confidence (self-efficacy) was higher at baseline in the intervention group 22 compared to 17 respectively (maximum score of 27).  
Results stated that perceived cooking confidence increased significantly in the intervention and control group from pre-to post intervention (p<0.001). |
<table>
<thead>
<tr>
<th>Author(s), year (country)</th>
<th>Target group</th>
<th>Name of intervention</th>
<th>Intervention description</th>
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<th>Methods</th>
<th>Measure of cooking skills/ self-efficacy used</th>
<th>Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revill 2003 (continued)</td>
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<td></td>
<td>However actual figures suggest that the intervention group stayed at a median score of 22 and the control group improved from a score of 17 to 20.</td>
</tr>
</tbody>
</table>

There was no significant difference in the increase of perceived confidence in the intervention compared to the increase in the control group.
3. Objective Statement

Create Our Own Kai (COOK) study is a randomised control trial designed to see whether a week-long comprehensive cooking intervention, followed by six take home food bags (one bag per week) would result in an increase in the following measures:

1) Cooking skills
2) Cooking confidence
3) Well-being
4) Fruit and vegetable intake and Diet Quality

Aim of this thesis: To determine whether participation in both phase one (hands on cooking classes) and phase two (take home food bags) of the COOK programme affects short-term cooking skills and self-efficacy for cooking in adolescents from Dunedin, New Zealand.

Objective 1: To assess the short-term effect of the COOK programme on self-reported cooking skills.

Objective 2: To assess the short-term effect that the COOK programme has on perceived self-efficacy for cooking.
4. Participants and Methods

This thesis is an interim analysis, that assesses part of the data set on cooking skills and self-efficacy for cooking in adolescents who took part in the COOK study. Interim measurements for diet quality were also analysed by another MDiet student, which is presented in another thesis.

4.1. Ethical approval

Ethical approval for all aspects of the COOK study was obtained from the University of Otago Human Ethics committee (appendix A). All components of the COOK study were approved (appendix B). Parents or guardians of the participants were required to read the information sheet, and give informed consent (appendix C) before their child could be included in the study. All participants were also asked to read the information sheet and give informed consent (appendix D).

4.2. Study design

This Create Our Own Kai (COOK) study is a randomised-control trial comparing the effect of the COOK project on cooking skills and self-efficacy for cooking with a control group. Measurements and questionnaires were completed at Time point 1 (T1), Time point 2 (T2) and Time point 3 (T3). Time point 4 (T4) will be completed at 12 months after baseline and will not be completed in time to be included in this study. Figure.1 shows the timeline for the completion of each time point for both the intervention and control. Note: Figure 1 was taken from Olivia Toldi’s MDiet thesis (2017), which will analyse other components of the COOK study.
Figure 1: Cook Study Design Timeline. Week 0 = Monday of cooking intervention and baseline. Week 1 = Friday, end of week one and the end of cooking intervention. Week 7 = Seven-week follow-up at end of take home food bags. 12-months = Twelve-month follow-up. YPAQ = Youth Physical Activity Questionnaire.
4.3. Participants and randomisation

This study recruited young adolescents who were in school, Years 9 or 10 at the time of intervention (approximate age of 13-15 years old), living in Dunedin, New Zealand. Participants were recruited through social media (Facebook and Twitter), posters, word of mouth, organizational emails and via a researcher presenting the study to potential participants at local school assemblies. Only one child per family was eligible to enrol in the COOK study. There were no other exclusion criteria, however participants were required to provide their own transport for all components of the study. A total of one-hundred-and-thirty-one participants were recruited. Three streams of participants were formed based on participant’s availability to attend. Within each stream, participants were then randomised into either the COOK intervention or the control group. Randomisation was performed by blindly drawing names out of an envelope. For the intervention, the students cooked in pairs. Pairs were purposely formed based on similar food allergy requirements, vegetarianism or other food avoidances due to religious or other beliefs, and avoiding participant pairing with those who knew each other.

4.4. Mechanical cooking skills

Mechanical cooking skills were measured at T1 and T3 in the control group and at T1, T2 and T3 in the intervention group. Although the COOK intervention addressed all aspects of cooking skills described by Short (2003), as the participants are at the younger end of the adolescent age group, a mechanical skill based measurement tool was developed. This was decided by the research team to be more age appropriate to use than designing a questionnaire based on the highly complex cooking skills definition by Short (2003) (44). This questionnaire was adapted from a measurement tool designed for the use in the “Cook like a chef programme” (58). The 18-item questionnaire (appendix F) asked “Can you perform the following activities” and used a response of “yes” or “no”. A response of “I don’t know what this is” could be selected for the technical questions only. An answer of “yes” corresponded to
1-point, and an answer of “no” or “I don’t know” corresponded to 0-points. Responses from all 18-questions were calculated to give a final cooking skills score. The maximum score that could be achieved for this section was 18. Questions were also broken down into either technical skills (first 12 questions) or preparation skills (last 6 questions), to give an overall score within these categories. Technical skills questions involved analysing individual skills such as boiling, grilling, stewing etc. Preparation skills involved activities that could involve multiple technical skills such as “making sauces and gravy from raw ingredients” and “preparing fresh or frozen green vegetables”. A maximum score of 12 could be given for technical skills and a maximum of 6 for preparation skills.

4.5. Self-efficacy for cooking

Self-efficacy for cooking was also measured at T1 and T3 in the control group and at T1, T2, and T3 in the intervention group. Two different sections were developed to analyse self-efficacy for cooking. Section one involved four self-efficacy questions, based on a previous questionnaire designed to assess the effectiveness of cooking interventions. These questions were: Q1 – “How confident do you feel about being able to cook from basic ingredients?”; Q2 – “How confident do you feel about following a simple recipe?”; Q3 - “How confident do you feel about tasting foods that you have not eaten before?”; Q4 – “How confident do you feel cooking new foods and recipes?”. These questions were part of a questionnaire validity study by Barton et al 2011, and these self-efficacy specific questions were deemed appropriate for the analysis of cooking programmes (56). It was noted that this questionnaire was not tested in adolescents, however the research team discussed this issue and decided that all four questions were appropriate to use in adolescents. A 7-item Likert scaling system was used to rate the level of self-efficacy the participants felt for each question. These ranged from 1 (not confident at all) to 7 (very confident). The maximum score that could be achieved for the total self-efficacy for cooking score, as well as all four individual questions was 7. Section two used the same eighteen items as for the mechanical cooking skills (refer to section 3.5 of this
thesis). However, the participants were asked to rate their confidence in performing the eighteen activities. Again, these eighteen items were broken down into technical and preparation skills and were measured on a 5-point Likert scale from 1 (not confident at all) to 5 (very confident). A maximum score of 5 could be achieved for the total mean mechanical cooking skills self-efficacy score, technical skills self-efficacy score and preparation skills self-efficacy score. The self-efficacy for cooking questionnaire is available in appendix G.

4.6. Phase 1 of the intervention: COOK week

Phase one of the intervention was a week long, hands on cooking programme, referred to as the “COOK week”. Phase one was previously piloted in 23 Dunedin adolescents (aged 12-16), and adjustments were made based on observations and experiences from the participants, staff and volunteers involved in the programme. The intervention group (n=66) completed the one week program, that ran from approximately 9am – 3:15pm, Monday to Friday during the school holidays (appendix H). Each six-hour day involved cooking up to three different recipes as a pair. The COOK week involved a broad range of cooking related activities that encouraged development of mechanical cooking skills as well as all other components described by Short (2003) (43). Activities included different cooking methods, taste of different and new foods, classic food combinations, seasonality and how this relates to taste and flavour. Non-cooking activities and education were also included throughout the week. These included food safety, safety in the kitchen, clear communication, respect, food waste, seasonality and locality of produce, nutrition, budgeting, writing recipes, creating shopping lists, and shopping for food at the local supermarket. Directly before each recipe was cooked, a demonstration of the dish was completed by the chef and dietitian running the programme. Questions could be asked, and tricky components were explained to help encourage success. For every dish, participants were given prepared trays of weighed and portioned raw ingredients, and a recipe. Items such as spices and herbs were given out more generously to allow participants to adjust the taste to their own preferences. Additionally, fruit and
vegetables were not washed and left with skin on and uncut to encourage skill acquisition. Although cooking was completed in pairs, study participants were required to wait until all pairs had completed cooking and cleaned up, to allow the participants to eat as a group. Sitting and waiting to eat together as a group was mandatory. The COOK instructors, who ran the COOK week were available throughout the week for the participants to ask questions, to help with tricky components of the recipes and to offer words on encouragement when needed. Table 4.7-1 contains an example of the second day of intervention. Descriptions of all days can be found in (appendix H).
Table 4.6-1: Example of second intervention day (Tuesday) schedule

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>9am</td>
<td>Recipe 4 demonstration</td>
<td>- Participants view the dish cooked in its entirety by COOK Instructors</td>
</tr>
<tr>
<td>9.20am</td>
<td>Participants cook recipe 4</td>
<td>- Each pair moves to their allocated stations and makes the dish.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Once the dish is ready they must completely clean their station and wait for the rest of the class to be finished before they can eat.</td>
</tr>
<tr>
<td>10am</td>
<td>Seasonality presentation</td>
<td>- Information regarding nutrition, cost, environmental issues relating to seasonality presented by the dietitian.</td>
</tr>
<tr>
<td>1030am</td>
<td>Cooking methods and selection of produce</td>
<td>- Interactive presentation from an experienced chef,</td>
</tr>
<tr>
<td>11am</td>
<td>Food Share</td>
<td>- Representative from the local food rescue organisation presents information regarding how to food waste.</td>
</tr>
<tr>
<td>11.20am</td>
<td>Recipe 5 demonstration</td>
<td>- Participants view the dish cooked in its entirety by COOK Instructors</td>
</tr>
<tr>
<td>11.30am</td>
<td>Participants cook recipe 5</td>
<td>- Each pair moves to their allocated stations and makes the dish.</td>
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<td></td>
<td></td>
<td>- Once the dish is ready they must completely clean their station and wait for the rest of the class to be finished before they can eat.</td>
</tr>
<tr>
<td>12pm</td>
<td>Break</td>
<td>- Participants were allowed free time to mingle and get some fresh air outside.</td>
</tr>
<tr>
<td>12.20pm</td>
<td>Recipe development</td>
<td>- Pairs come up to the dietitian and chef to discuss and finalise their ideas for the two-course meal that they prepare for their family members (on the last day of the COOK week)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Friday family meal is further explained in 1.7.2 Cooking for the family.</td>
</tr>
<tr>
<td>Time</td>
<td>Activity</td>
<td>Description</td>
</tr>
<tr>
<td>----------</td>
<td>-------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>1.30pm</td>
<td>Recipe 6 demonstration</td>
<td>- Participants view the dish cooked in its entirety by COOK Instructors</td>
</tr>
</tbody>
</table>
| 1.45pm   | Participants cook recipe 6    | - Each pair moves to their allocated stations and makes the dish.  
- Once the dish is ready they must completely clean their station and wait for the rest of the class to be finished before they can eat. |
| 2.30pm   | Recipe development            | - Extra time to finalise recipes if needed                                                                                                 |
| 3.15-3.30pm | Completion of day           | - Participants picked up by parent/guardians  
- Study coordinators, instructors and assistants meet for debrief.                                                                           |

### 4.6.1. Recipes

The COOK week used recipes adapted from the Sprout cooking school (Sprout SA Pty Ltd, Adelaide, Australia). These recipes had been previously used in their adolescent cooking classes and were considered generally appropriate for use in New Zealand. However, some recipes were adapted to include seasonal, cultural and affordable foods more applicable to Dunedin, New Zealand. Also, specific ingredients were substituted to reduce the cost of the recipes if it was appropriate. No salt was added in any of the recipes, with a focus on herbs and spices to flavour dishes.

### 4.6.2. Cooking for the family

Each participant was asked to invite one family member to attend a two-course family dinner on the last day of the COOK week. The intention of this dinner was to increase the adolescents’ confidence of cooking meals for their family, and to show the parents how successful their child can be at cooking, with the hope that they would then try and provide a supportive environment at home for their adolescents to cook in. During the COOK week, time was allocated for research, planning and development of the two recipes. The meals had
to be made from fresh ingredients and cooked from scratch. For example; pasta, bread, and pastry recipes had to be made from scratch. All participant recipes were approved for difficulty and creativity by the COOK instructors running the programme. To prepare for this family meal, participants were required to write a shopping list and were then taken to the supermarket on the second to last day to buy the ingredients they needed within their budget. The participants cooked in pairs, and therefore each pair cooked the main and dessert for two people, with a budget of $25. Staple ingredients (appendix I) were supplied to the participants, and these items were not included within the $25-dollar budget.

4.7. Phase 2 of the intervention: Take home food bags

All intervention participants received six food bags, one per week for six weeks, to take home and cook for their families. Each bag consisted of a recipe and the raw ingredients to make an entire meal for four people. The first bag was given out on the Friday of the COOK week (phase one). This bag included extras that would be considered cupboard staples, that could be used for the next 5 bags as well. The budget for each bag was $12 or less, and food donations from multiple organisations were used for some of the recipes. The recipes included in each food bag and the origin of the recipe are stated in Table 3.8-1. Full recipes are available in (appendix I)
Table 4.7-1: Weekly take home food bag recipes

<table>
<thead>
<tr>
<th>Week</th>
<th>Recipe</th>
<th>Origin</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Tofu Jungle Curry</td>
<td>Sprout Cooking School (Australia)</td>
</tr>
<tr>
<td>2</td>
<td>Home-made deep crust Pizza</td>
<td>Australian Women’s Weekly (Australia)</td>
</tr>
<tr>
<td>3</td>
<td>Meetballs with tomato sauce and spaghetti</td>
<td>Beef and Lamb (New Zealand)</td>
</tr>
<tr>
<td>4</td>
<td>Mexican Nachos</td>
<td>FoodShare Dunedin (New Zealand)</td>
</tr>
<tr>
<td>5</td>
<td>Tuna Pasta bake</td>
<td>Sealord (New Zealand)</td>
</tr>
<tr>
<td>6</td>
<td>Past and Bean Soup</td>
<td>Alison and Simon Holst (New Zealand)</td>
</tr>
</tbody>
</table>

4.7.1. Social media

Throughout the week of cooking classes, the participants were encouraged to join the COOK Facebook page. Each COOK stream had their own page in which the participants or their parents could post pictures of the food they had created. This included the meals cooked from the food bags and any other cooking. Prizes were given each week to participants that were involved posting pictures of their food. However, evaluation of the Facebook pages is not within the scope of this thesis.

4.8. Measures

4.8.1. Questionnaires

Questionnaires and anthropometry measurements were completed at T1 and T3 for the intervention and control group. An additional questionnaire was completed at T2 by the intervention group only. Time point 4 (T4) will be implemented one year after T1, and will therefore not be completed in time to be included in this analysis. Baseline (T1) questionnaires and measurements for the intervention group were collected at the start of
phase one of the COOK intervention. T3 questionnaires and measurements were completed at seven weeks (directly after the take home food bags were finished). Two questionnaires were completed at T1 and repeated at T3. Questionnaire one (Q1) was the Food, Cooking and Wellbeing questionnaire which consisted of multiple components that addressed areas including; personal details, home life, cooking frequencies, cooking and food safety knowledge, well-being and diet quality measures, all of which are outside the scope of this thesis. Q1 also contained questions regarding the outcomes for this thesis of cooking skills (appendix F) and self-efficacy for cooking (appendix G). Questionnaire two (Q2) consisted of the Youth Physical Activity Questionnaire (YPAQ), which is outside the scope of this thesis. Questionnaire three (Q3) repeated cooking skills and self-efficacy for cooking measures from Q1. Q3 was only completed by the intervention group, at T2. Additionally, it contained questions on wellbeing as well as feedback from the participants regarding enjoyment and success of phase one of the intervention (both of which will not be analysed in this thesis).

**4.8.2. Anthropometry**

Study assistants who took anthropometric measurements either held level 1 ISAK accreditation, or were trained in the ISAK procedures by accredited study assistants. Anthropometric measurements were taken at T1 and T3. All measurements were taken barefoot and in light clothing. Weight was measured using a bio-electrical impedance scale (BC418, Tanita, Tokyo, Japan), prior to measurement participants were asked if they have any heart problems, pacemakers, metal pins or could be pregnant as these are contraindications for bio-electrical impedance. A standardised clothing adjustment value of 0.5kg was used for all participants. Weights were measured to the nearest 0.1kg. Measurement of standing height was taken using the Wedderburn portable height rod (WS-HRP). All standing height measurements were taken to the nearest 0.1cm. Two initial measurements were taken, however if a difference of 0.5cm or more occurred between
measurements, a third standing height was completed. The average of the closest two measurements was then calculated.

4.8.3. Socioeconomic status

SES (Socioeconomic status) for each participant was estimated through their residential address. Statistics New Zealand data assigns a deprivation level to each neighbourhood using the New Zealand deprivation index 2013 (59). This system gives a level of deprivation to each area (mesh-block) on a scale from 1 (low level of deprivation) to 10 (high level of deprivation), with each number representing 10 percent of the population. For example, an area with a deprivation level of 10, would fall into 10% of the New Zealand areas with the highest level of deprivation. These New Zealand deprivation index (NZ dep) values from 1-10 are determined from 2013 census data using indices of income, employment status, qualification levels, home ownership, family support, access to transport, living space and communication abilities. For this study, deprivation levels were categorised into three SES groups of low (NZdep = 8-10), medium (NZdep = 4-7), and high (NZdep = 1-3).

4.8.4. School decile

School deciles for each participant were collected for descriptive purposes only. School deciles are assigned to each school as a measure of SES, based on the residential addresses of students attending the school. School deciles were obtained from the New Zealand government schools directory excel spreadsheet (60). Each address is categorised into a neighbourhood (mesh-block), which has been assigned a deprivation index from 1-10 based on statistics New Zealand 2013 census data (59). Household income, occupation, household crowding, educational qualification and income support are used to determine the level of deprivation of each mesh-block. From the deprivation indices assigned to each mesh-block, a decile from 1-10 is determined for the whole school, based on their deprivation level.
compared to all other New Zealand schools. Each number from 1 to 10 represents 10% of schools. For example, a school decile of 1 represents a school with a SES in the lowest 10% of schools in New Zealand. For this study, school deciles were categorised into low (decile of 1-3), medium (decile 4-7) or high (decile 8-10).

4.8.5. Ethnicity

All participants were asked to identify their ethnicity, however multiple ethnicities could be selected. From this, prioritisation of ethnicity into Maori, Pacific and then New Zealand European/Other (NZEO) was used for this study based on the New Zealand Ministry of Health, level one ethnic group priority code (61). All other ethnicities were grouped into New Zealand European/Other, due to small numbers limiting separate analysis.

4.8.6. Sample Size

Data from similar studies within this adolescent age group was not available to base power calculations. Therefore, an exact effect size could not be determined in advance. Though, a sample size of 80 participants would provide an 80% chance of detecting a difference of between 0.30 to 0.35 SD in cooking skills and confidence to cook, using a 5% level of significance. Recruitment of 100 participants per group was decided, to account for a 20% dropout rate.

4.8.7. Statistical analysis

Participant characteristics were described for the intervention and control group. Scores were determined for overall cooking skills (18 items), technical skills (12 items), and preparation skills (6 items) by taking the mean of the contributing items. Section one of self-efficacy for cooking were measured on a 7-point Likert scale. Section two of self-efficacy for cooking used a 5-point Likert scale. The total self-efficacy scale scores were calculated to obtain the mean of the individual item scores. For all the above measures differences between the groups
was determined using regression analysis, adjusted for baseline values. Linear regression coefficients (representing the mean difference between the groups in change of score between T1 and T3) and 95% confidence intervals were calculated. P-values are not presented to limit premature conclusions given that these are interim analyses. Change in self-efficacy for cooking section one and section two, between T1 and T2, and T2 and T3 was completed for the intervention only. Mean differences and 95% confidence intervals between time-points in the intervention for self-efficacy were calculated with paired t-tests.
5. Results

5.1. Participant characteristics

Baseline characteristics of the intervention and control group are presented in Table 5.1-1. Overall, 85 participants completed both T1 and T3 questionnaires and measurements. Participant numbers were much smaller in the control (n=18) compared with the intervention (n=66). This was mainly due to the control group being told they would not be completing the cooking classes before baseline measurements were taken, and therefore they no longer wanted to be involved in the study. Control participants were also excluded from the study as they could not be contacted or had not completed follow-up measurements in time for this analysis. For the intervention group, 68 participants completed the intervention, however n=2 did not complete follow-up measurements. Differences between males and females were identified, with more females than males in both groups. There were discrepancies between the two groups with regards to ethnicity, with all participants in the control group indicating NZEO. The intervention group was composed of 9% Maori, and 91% NZEO. Most participants in the intervention (86%) and control (95%) were of middle to high socio-economic status, with only n=9 of the intervention and n=1 of the control with low SES. All participants attended schools with a decile rating of 5 or higher.
<table>
<thead>
<tr>
<th>Table 5.1-1: Baseline (T1) characteristics of COOK study participants</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Intervention Group</strong> n (%)</td>
</tr>
<tr>
<td>Participant Numbers</td>
</tr>
<tr>
<td>Age (years)</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
</tr>
<tr>
<td>Male</td>
</tr>
<tr>
<td>Female</td>
</tr>
<tr>
<td><strong>Ethnicity</strong></td>
</tr>
<tr>
<td>NZEO</td>
</tr>
<tr>
<td>Maori</td>
</tr>
<tr>
<td>Pacific Island</td>
</tr>
<tr>
<td><strong>Socio-economic status</strong></td>
</tr>
<tr>
<td>Low (deprivation 8-10)</td>
</tr>
<tr>
<td>Medium (deprivation 4-7)</td>
</tr>
<tr>
<td>High (deprivation 1-3)</td>
</tr>
<tr>
<td><strong>School decile</strong></td>
</tr>
<tr>
<td>Low (1-3)</td>
</tr>
<tr>
<td>Medium (4-7)</td>
</tr>
<tr>
<td>High (8-10)</td>
</tr>
<tr>
<td><strong>Anthropometry</strong></td>
</tr>
<tr>
<td>Weight (kg)</td>
</tr>
<tr>
<td>Height (cm)</td>
</tr>
</tbody>
</table>

* Mean (SD)
5.2. **Cooking skills**

Both the control and intervention groups improved their mean overall cooking skills score from baseline (T1) to post intervention (T3). However, this improvement was significantly greater in the intervention group by 2.9 points (95%CI: 1.6, 4.2). Results for total mechanical cooking skills, technical and preparation skills are presented in Table 5.2-1. Similar results were observed when analysing only the technical skills component, where the intervention group significantly improved by 2.3 points beyond the improvements observed in the control (95%CI 1.5, 3.2). No significant differences between groups were observed for the preparation skills (95%CI: -0.3, 1.3).
Table 5.2.1: Short term comparison of mean cooking skill scores in COOK participants

<table>
<thead>
<tr>
<th></th>
<th>Control T1 mean (SD)</th>
<th>Control T3 mean (SD)</th>
<th>Intervention T1 mean (SD)</th>
<th>Intervention T3 mean (SD)</th>
<th>Mean difference <em>(95%CI)</em></th>
</tr>
</thead>
<tbody>
<tr>
<td>Preparation skills score (maximum score = 6)</td>
<td>4.3 (1.5)</td>
<td>5.2 (3.1)</td>
<td>4.0 (1.4)</td>
<td>5.6 (0.7)</td>
<td>0.5 (-0.3, 1.3)</td>
</tr>
<tr>
<td>Technical skills score (maximum score = 12)</td>
<td>8.6 (2.3)</td>
<td>9.1 (2.3)</td>
<td>7.1 (1.9)</td>
<td>10.8 (1.6)</td>
<td>2.3 (1.5, 3.2)</td>
</tr>
<tr>
<td>Total mechanical cooking skills score (maximum score = 18)</td>
<td>12.8 (3.7)</td>
<td>14.2 (4.2)</td>
<td>11.1 (2.7)</td>
<td>16.4 (2.0)</td>
<td>2.9 (1.6, 4.2)</td>
</tr>
</tbody>
</table>

* - represents the mean difference in the difference between the groups between T1 and T3.

5.3. Self-efficacy for cooking

Overall, the cooking intervention significantly improved the adolescents’ total self-efficacy for cooking over and beyond any changes observed in the control group. Results from section one (four individual questions) and section two (technical and preparation skills questions) of self-efficacy for cooking questionnaire have been presented in Table 5.3.1.

Section one results: The mean total self-efficacy score for all four questions improved from T1 to T3 in the intervention group by 1.0 point, and no improvement was observed in the control. Between groups, the difference between the change from T1 to T3 was 0.9 of a point more in the intervention, which was significant (95%CI: 0.6, 1.3). The change between T1 and T3 was significantly more in the intervention group, compared to the control for Q1 with a difference of 1.2 (95%CI: 0.7, 1.6), Q2 with a difference of 0.9 (95%CI: 0.5, 1.4), and Q4 with a difference of 1.2 (95%CI: 0.5, 1.8). Q3 (How confident do you feel about tasting foods that you have not eaten before?) showed no difference between the two groups.

Section two results: In the intervention group, the mean score for self-efficacy from T1 to T3 improved by 1.0 point in all areas (total self-efficacy cooking skills score, technical skills self-efficacy score and preparation skills self-efficacy score). No improvements were observed in
the control group from T1 to T3. All the increases observed in the intervention were significantly different to the control.
Table 5.3-1: Comparison of mean Self-efficacy for cooking in COOK participants

<table>
<thead>
<tr>
<th>Section one:</th>
<th>Control T1 mean (SD)</th>
<th>T3 mean (SD)</th>
<th>Intervention T1 mean (SD)</th>
<th>T3 mean (SD)</th>
<th>Mean difference <em>(95%CI)</em></th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1. How confident do you feel about being able to cook from basic ingredients?</td>
<td>4.7 (1.3)</td>
<td>4.9 (1.5)</td>
<td>4.4 (1.3)</td>
<td>6.0 (0.9)</td>
<td>1.2 (0.7, 1.6)</td>
</tr>
<tr>
<td>Q2. How confident do you feel about following a simple recipe?</td>
<td>6.1 (0.9)</td>
<td>5.7 (1.4)</td>
<td>5.7 (1.0)</td>
<td>6.5 (0.8)</td>
<td>0.9 (0.5, 1.4)</td>
</tr>
<tr>
<td>Q3. How confident do you feel about tasting foods that you have not eaten before?</td>
<td>4.5 (1.7)</td>
<td>4.9 (1.6)</td>
<td>4.5 (1.8)</td>
<td>5.3 (1.4)</td>
<td>0.4 (-0.2, 0.9)</td>
</tr>
<tr>
<td>Q4. How confident do you feel cooking new foods and recipes?</td>
<td>4.8 (1.2)</td>
<td>4.4 (1.6)</td>
<td>4.8 (1.2)</td>
<td>5.6 (1.3)</td>
<td>1.2 (0.5, 1.8)</td>
</tr>
<tr>
<td>Total self-efficacy score</td>
<td>5.0 (0.9)</td>
<td>5.0 (1.2)</td>
<td>4.8 (1.0)</td>
<td>5.8 (0.8)</td>
<td>0.9 (0.6, 1.3)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Section two:</th>
<th>Preparation skills self-efficacy score</th>
<th>Technical skills self-efficacy score</th>
<th>Total cooking skills self-efficacy score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control T1 mean (SD)</td>
<td>2.4 (1.0)</td>
<td>2.5 (0.8)</td>
<td>2.5 (0.9)</td>
</tr>
<tr>
<td>T3 mean (SD)</td>
<td>2.4 (0.9)</td>
<td>2.4 (0.7)</td>
<td>2.4 (0.7)</td>
</tr>
<tr>
<td>Intervention T1 mean (SD)</td>
<td>2.2 (0.7)</td>
<td>2.1 (0.6)</td>
<td>2.1 (0.6)</td>
</tr>
<tr>
<td>T3 mean (SD)</td>
<td>3.3 (0.7)</td>
<td>3.1 (0.7)</td>
<td>3.2 (0.6)</td>
</tr>
<tr>
<td>Mean difference <em>(95%CI)</em></td>
<td>1.0 (0.7, 1.4)</td>
<td>1.0 (0.7, 1.3)</td>
<td>1.0 (0.7, 1.3)</td>
</tr>
</tbody>
</table>

* - represents the mean difference in the difference between the groups between T1 and T3.
1 – maximum score = 7
2 – maximum score = 5
5.4. **Time series analysis of self-efficacy for cooking within the intervention**

Time series results of self-efficacy for cooking in the intervention group are presented in Table 5.4-1. T1 to T2 represents pre- and post measurements for phase one of the intervention (the COOK week). Changes between these time points for self-efficacy for cooking showed that all mean self-efficacy scores for *section one* increased significantly. The mean total self-efficacy score for *section one* increased by 1.1 points (95%CI: 0.9, 1.3). The largest increase was shown for Q1. (How confident do you feel about being able to cook from basic ingredients?), which increased by 1.7 points (95%CI: 1.4, 2.0) from T1 to T2, however Q2, Q3, and Q4 all showed significant increases in mean score as well. Significant increases were observed from T1 to T2 in *section two* of self-efficacy for cooking. Individually, mean preparation skills self-efficacy score improved by 1.3 points (95%CI: 1.1, 1.5) and mean technical skills self-efficacy score improved by 1.1 points (95%CI: 1.0, 1.3), with mean total self-efficacy score for *section two* questions improving by 1.2 points (95%CI: 1.0, 1.3). Impact of phase two of the intervention (the take home food bags) was analysed through changes between T2 and T3 measurements. Overall no changes were observed for any areas of *section one* or *section two* of the self-efficacy for cooking measurements.
Table 5.4-1: Self-efficacy for cooking in phase one and two of the COOK intervention group.

<table>
<thead>
<tr>
<th>Section one:</th>
<th>Mean change between T1 and T2 (95% CI) (n=68)</th>
<th>Mean change between T2 and T3 (95% CI) (n=66)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1. How confident do you feel about being able to cook from basic ingredients</td>
<td>1.7 (1.4, 2.0)</td>
<td>-0.1 (-0.3, 0.1)</td>
</tr>
<tr>
<td>Q2. How confident do you feel about following a simple recipe</td>
<td>0.9 (0.7, 1.1)</td>
<td>-0.1 (-0.2, 0.1)</td>
</tr>
<tr>
<td>Q3. How confident do you feel about tasting foods that you have not eaten before</td>
<td>1.0 (0.6, 1.3)</td>
<td>-0.1 (-0.4, 0.2)</td>
</tr>
<tr>
<td>Q4. How confident do you feel cooking new foods and recipes</td>
<td>1.0 (0.7, 1.3)</td>
<td>-0.2 (-0.5, 0.1)</td>
</tr>
<tr>
<td>Total self-efficacy score</td>
<td>1.1 (0.9, 1.3)</td>
<td>-0.1 (-0.3, 0.02)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Section two:</th>
<th>Mean change between T1 and T2 (95% CI) (n=68)</th>
<th>Mean change between T2 and T3 (95% CI) (n=66)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preparation skills self-efficacy score</td>
<td>1.3 (1.1, 1.5)</td>
<td>-0.1 (-0.3, 0.03)</td>
</tr>
<tr>
<td>Technical skills self-efficacy score</td>
<td>1.1 (1.0, 1.3)</td>
<td>-0.1 (-0.2, 0.1)</td>
</tr>
<tr>
<td>Total cooking skills self-efficacy score</td>
<td>1.2 (1.0, 1.3)</td>
<td>-0.1 (-0.2, 0.02)</td>
</tr>
</tbody>
</table>

1. Maximum possible score that could be achieved = 7
2. Maximum possible score that could be achieved = 5
6. Discussion

Overall, this interim analysis showed that the COOK programme led to significant increases for both cooking skills and self-efficacy (confidence) for cooking, compared to the control group. Additionally, cooking skills and self-efficacy increased significantly during phase one (COOK week), and these changes were maintained to the end of phase two (take home food bags). The overall results of this study suggest that the COOK programme was effective at increasing adolescent cooking skills and self-efficacy for cooking and maintaining them in the short term.

For the adolescents that completed the COOK programme, total mean cooking skills improved by 2.9 points within a scale with a maximum of 18-points, however a significant increase was only observed for the mechanical skills, and not the preparation skills. These results are similar to those found by Gatenby et al 2011, who also observed significant increases for a selection of cooking skills, but not all (12). Although the preparation skills did not show improvement, the adolescents’ confidence with performing these preparation skills did increase significantly more in adolescents undertaking the COOK programme, than the changes observed in the control. These results may have been due to the relatively small sample size in the control group (n=18), and therefore a lack of power to detect significant change. Also, both groups have relatively high preparation skills scores at baseline, and therefore less room for improvement. Most other self-efficacy measures also increased including the adolescents’ confidence to prepare meals from basic ingredients, following a simple recipe, cooking new foods and recipes, and their confidence to perform mechanical skills. These results also align with the more robust quantitative analyses of adolescent cooking programmes by Chessen 2008 (11) and Condrasky et al 2010 (14), who both found significant improvements in self-efficacy for cooking.
The overall desired behavioural outcome for the cook programme is to motivate adolescents to cook foods from scratch, rather than choosing less healthy convenience food options. Although the COOK programme showed positive results for increasing adolescent cooking skills, it may be the significant increases in self-efficacy that could have the greatest impact on promoting cooking from scratch in this age group. Bandura 1998 described the importance of gaining self-efficacy in the process of changing behaviours relating to health (8). When trying to achieve a goal, the specific skills to complete the goal are needed, however they also need the belief that they can reach the desired outcome. If they do not have this belief or confidence, they may feel it is pointless trying and lose motivation. The COOK programme increased the cooking skills needed to cook meals from scratch, as well as their confidence to use those cooking skills, and prepare food from basic ingredients. Therefore, the COOK programme may have had a positive impact on their motivation for choosing to cook from scratch, rather than consume convenience food options, as they may now have the belief that the effort required to cook from scratch will have a positive outcome.

The effectiveness of the take home food bags on self-efficacy for cooking was relatively unknown from previous peer-reviewed literature, with only one previous adolescent cooking intervention including this type of component (12). Interestingly, significant increases of self-efficacy for cooking were observed from pre-to-post COOK week (phase 1 – T1 to T2), however we saw no change in self-efficacy from the end of the cook week to post intervention (phase 2 – T2 to T3) in the intervention group. The intervention scores were relatively high at the end of T2 with the mean total self-efficacy score for section one of 5.8 out of a possible 7, and section two with a total self-efficacy score of 3.2 out of a possible 5. Therefore, it is possible that no changes were observed as there was less room for improvement after the COOK week. Considering this, it seems that the take home food bags (phase two), may have
helped to maintain the self-efficacy for cooking that was gained during the COOK week. The take home food bags could be a way of transitioning the skills and self-efficacy the participants learned, from the safe environment of the COOK week kitchen, into the home, where there is likely to be less support and appropriate equipment.

It is possible that the significant increases observed were due to the design of the intervention. The COOK week included the four components identified by Bandura 1977 that are needed when trying to improve self-efficacy (performance accomplishments, vicarious experience, verbal persuasion, emotional arousal) (9). For example, the programme provided multiple opportunities for the participants to complete different cooking skills and recipes, within a supportive environment, that provided the necessary help to achieve successful outcomes (performance accomplishments). This was especially important when cooking for the family, where the COOK instructors made sure that each pair cooked the two-course meal successfully, by checking recipes, shopping lists and preparation timing, as well as helping with difficult cooking skills that the participants had never attempted before. Additionally, demonstrations were given before every recipe was cooked, with extra tips given for difficult components that could have potentially reduced success (vicarious experience). Participants were also given extra support when they did fail to reduce the anxiety around the failure. Often the participants would have to repeat the component of cooking again, with the COOK instructors giving them encouragement that they could complete the activity successfully (performance accomplishments, verbal persuasion and emotional arousal) (9). Another strength of the study was the standardisation of programme delivery, which was recently raised as an issue within the New Zealand cooking education system (10). The COOK week achieved standardisation through a strict programme plan, with set recipes and the same COOK instructors delivering all three streams of the COOK week. This may have strengthened the results of this study, as all intervention participants had the same opportunity.
to develop their cooking skills and self-efficacy for cooking. Additionally, the comprehensive study design (randomised control trial) and methodology may have help to find the associations between the COOK intervention and increases in cooking skills and confidence to cook in adolescents. Previous adolescent cooking programme analyses were relatively weak, with the majority using a pre-post questionnaire design with no comparison group (11-15, 47, 49, 51, 53, 54). However, a similar study in Australian adults, which also contained a comparison group, showed comparative results, with both short term (immediately after intervention) and long-term (six-months post intervention) improvement in confidence for cooking after the cooking intervention (62).

The decision to use a randomised control group may have been beneficial at strengthening the study design, however dropout was high in the control group due to participant burden. Questionnaires and measurements at all time points required transport to the clinic/kitchen, and took around 40-minutes to complete. For these young adolescents, this was an issue as they were most likely reliant on family members for transport and had commitments of school and extra-curricular activities to work around. Transport and questionnaire burden also influenced the intervention group, specifically for T3 follow-up. T1 and T2 measurements had been taken at the time of the COOK week and therefore no extra effort was required to attend, whereas T3 measurements required a separate trip. Although T3 measurements were meant to be obtained at seven weeks, for many participants, data was not collected until ten weeks’ post intervention. Additionally dropout occurred in the control group due to disappointment that they would not be participating in the programme. The control dropout rate meant that the intervention group had significantly more participants than the control. This may have contributed to the markedly different demographics, specifically in ethnicity. A lack of time to analyse results meant that meant that baseline demographics could not adjusted for. Therefore, it is unknown whether these discrepancies influenced the positive outcomes.
observed. Although weight and height measurements were collected, baseline Body Mass Index (BMI) data was not calculated due to the lack of time to complete data analysis. BMI data would have been useful for this study, to see baseline differences in weight categories between the two groups. It was noted that most the research surrounding the success of cooking programmes (including the COOK study) involves self-reported questionnaires, however this method has been considered weak, in other areas of nutrition research (63). For this study, limited time and resources meant that it was the most effective way of gathering information on cooking skills and would have been unrealistic to gain data through other methods such as observation. Although this specific questionnaire was based on a previous validated questionnaire (57), these measures had not been used in New Zealand adolescents. To combat this, COOK instructors were available to clarify details for each adolescent, and extra help and explanation was given to participants with learning difficulties. It was also decided that a self-reported questionnaire was appropriate for the self-efficacy component, as this component was considered a subjective measure. However, for two participants with learning difficulties, they were unable to complete T1 questionnaires within the timeframe allotted at the start of the intervention. The cooking and nutrition questions were prioritised, and the Youth Physical Activity Questionnaire was completed in stages throughout the first three days of intervention. Although this is not ideal, it is unlikely that responses to the questions would have been influenced by the intervention.

6.1. Conclusion

The results from this thesis indicate that the COOK programme was successful at improving both short-term cooking skills and self-efficacy for cooking. The long-term analysis of the COOK programme will investigate whether these effects are sustained. Although there is no guarantee that the COOK programme will have lasting effects, it is encouraging that one week of intensive cooking classes along with six weeks of take home food bags showed significant increases short-term for cooking skills and self-efficacy for cooking in New
Zealand adolescents. Within the COOK programme, it seems the COOK week was more effective at developing cooking skills and confidence to cook, whereas the food bags worked to maintain pre-existing confidence and may contribute to transferring self-efficacy for cooking into the home environment. Additionally, the take home food bags worked to overcome barriers associated with cooking from scratch, such as time to plan and prepare meals and perceived cost of healthy ingredients (34, 35). The addition of the take-home food bags allowed us to address these barriers in the short term, as all ingredients were supplied to the participants, only basic equipment was required to cook the meals and simple recipes were supplied.

Development of other aspects of modern skills, (other than the mechanical component) such as defined by Short 2003, may be an area for future research, as there is limited research regarding acquiring these skills in adolescence. Additionally, it would be useful to know whether the increase in skills and confidence observed throughout the COOK programme resulted in an increase in cooking from scratch, long-term. The development of a validated cooking skills and confidence tool in adolescents would be highly beneficial for future intervention analyses, allowing more comprehensive comparisons when testing the effectiveness between cooking interventions. For the COOK programme, research targeting lower income and ethnic minorities would be beneficial, as these groups have higher rates of obesity and nutrition related diseases in New Zealand, and were under-represented in this study (1). Although substantial effort was put into recruiting from a broad range of schools, it was hard to achieve a high percentage of participants from at risk groups. Ethnic minorities for the COOK study were under-represented compared to the New Zealand percentages, as the higher NZEO/Other percentage reflects the Dunedin population (64). This poses a risk for further health inequalities for low SES, and non-NZEO adolescents when applying this study to a national level. Accessibility to the COOK programme for these at-risk groups as well as
all other New Zealand adolescents is an important consideration that needs to be addressed. Therefore, it would be ideal for the COOK study to be introduced into New Zealand high school curriculum, to ensure that every New Zealand adolescent has the opportunity to gain basic cooking skills and confidence to cook healthy, nutritious food.

Adolescence is an ideal time to influence eating habits, as this is the age where we begin to gain autonomy over food choices and other lifestyle factors (65). The food environment has changed dramatically to a point where these less healthy “convenience” foods are readily available, and the environment is promoting consumption of these foods over meals cooked at home from scratch (17, 29). Consumption of convenience foods are contributing to the high rates of obesity and associated health effects of excessive weight and inadequate nutrition (30-32). Therefore, the COOK programme has the potential to be a platform for developing healthy eating habits, by motivating adolescents to cook foods from scratch, and consume less convenience foods.
7. Application to Dietetics

The role of the dietitian is to take the most up-to-date scientific research and use this information to formulate realistic public health initiatives (66). Dietitians also turn scientific research regarding food, nutrition and health and create recommendations in a language that the public can understand (66). The results from this COOK analysis suggest that exposing adolescents to the COOK intervention can improve and maintain their cooking skills and self-efficacy for cooking. The next step for the dietitian, is to understand how these results can be applied to positively influence health and nutrition in the future.

Within this COOK study, there are relevant scientific results that can be applied to the public health realm of dietetics. These interim results suggest that implementing the COOK programme in New Zealand adolescents could be successful at motivating adolescents to cook more foods from scratch, rather than choosing convenience food options. From a dietetics perspective, there is a need for development of preventative measures to reduce the incidence of obesity in all ages, including adolescents. If these results are an accurate representation of the effect that a cooking intervention could have, then cooking interventions that have similar qualities of the COOK study should be encouraged by public health dietitians. However, from a public health perspective, the COOK study or similar cooking programmes would ideally be implemented into the high school curriculum, to ensure that all New Zealand adolescents have the same opportunity to improve cooking skills and confidence to cook. Ensuring that every adolescent in New Zealand is involved, reduces the risk of increased health inequalities.

Additionally, the literature review revealed the importance that self-efficacy for cooking may play in motivating adolescents to cook foods from scratch. From a clinical perspective, this information is incredibly important when dietitians are making recommendations to a client.
Dietitians can describe nutrients in the form of everyday foods. If dietitians recommend for clients to choose foods made from scratch over convenience options, they need to consider whether the client has the skills and confidence to go away, and put the recommendations into practice. In this situation, it may be the job of the dietitian to find ways that could increase the clients cooking skills and self-efficacy for cooking. This study identifies key aspects of increasing these measures such as providing an environment that will encourage success in cooking, seeing others around them cooking food from scratch and making sure that meal options are achievable for the client so they are not discouraged by failure.
References


11. Chessen JA. The development and pilot of a culinary intervention designed using the social cognitive theory to teach nutrition to adolescent girls. MSc in Agriculture thesis: California Polytechnic State University 2008.


15. Sheehan T. Pink and Dude Chefs - A nutrition and culinary intervention for middle school students. MSc in Agriculture thesis: California Polytechnic State University 2013.


40. Lang T, Caraher M. Is there a culinary skills transition? Data and debate from the UK about changes in cooking culture HEIA. 2001;8(2).


Appendices

A. Information for ethical approval
B. University of Otago ethical approval letter
C. Parent or guardian information and consent forms
D. Participant information and consent forms
E. Additional information for participants selected into either intervention or control
F. Mechanical cooking skills questionnaire
G. Self-efficacy for cooking questionnaire
H. Full COOK week programme description
I. Pantry Staple ingredients
J. COOK week Recipes
K. Take home food bag recipes
Appendix A – Information for ethical approval

UNIVERSITY OF OTAGO HUMAN ETHICS COMMITTEE
APPLICATION FORM: CATEGORY A

NB. AMENDMENTS MADE TO THIS BASED ON ETHICS COMMITTEE FEEDBACK
AND REQUESTS MADE BY STUDY TEAM.

ETHICAL APPROVAL GIVEN FOR SEPARATING OUT PHASE 1 AND 2, PHASE 2
PARTICIPANTS ENROLLED VIA SCHOOLS AND SOCIAL MEDIA, NOT
THROUGH PHASE 1.

COOKING CLASSES TO TAKE PLACE OVER 1 WEEK (MON TO FRI) RATHER 5
SATURDAY/SUNDAYS. SIX WEEKS OF BAGS PROVIDED NOT FIVE. FOLLOW
AT END OF WEEK ONE, AT END OF TAKE HOME BAG PHASE AND ONE YEAR
(WEEK NUMBERS WILL DIFFER FROM THA ON APPLICATION)

1. University of Otago staff member responsible for project: Skidmore, Paula, Dr
2. Department/School: Human Nutrition
3. Contact details of staff member responsible (always include your email address):
e-mail: paula.skidmore@otago.ac.nz phone: 479 8374
4. Title of project: Cooking with confidence: Providing adolescents with tools for a healthy life.
5. Indicate project type and names of other investigators and students:
   Project type: Intervention study
   Staff Co-investigators
   Names: Dr Katherine Black, Carla Thomson, Amber Robertson, Mary Spiers
Application Form for ethical consideration of research and teaching proposals involving human participants

Student Researchers

3 x MDiet Students, names TBC

External Researchers

Name: Themis Chryssides
Institute/Company: Sprout Cooking and Health School, Adelaide, Australia

6. Is this a repeated class teaching activity? No
7. Fast-Track procedure No

8. When will recruitment and data collection commence? 1st September 2016
When will data collection be completed? 31st March 2018

9. Funding of project
Is the project to be funded by an external grant? YES

Funding has been obtained from Lotteries Health and Foodstuffs Community Trust.

If commercial use will be made of the data, will potential participants be made aware of this before they agree to participate? If not, explain: N/A

10. Brief description in lay terms of the purpose of the project:

Involvement in preparing family meals in adolescence has been shown to improve body composition and overall health. Given the high levels of obesity and the poor diets consumed by many New Zealand adolescents, taking a novel approach based around cooking to improve diet has the potential to be beneficial to both current and long term health. Therefore, we will implement a pilot community-based cooking programme focusing on affordable, nutritious meals made from readily available ingredients that will specifically appeal to teenagers and will also provide other cooking and health related skills. We will investigate if this programme improves cooking skills and confidence, increases involvement in family meal preparation and cooking, selected known psychosocial determinants of food choice and dietary quality.

11. Aim and description of project:
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This project comprises two phases.

Phase 1 is an online survey to be conducted in Year 10 pupils from Otago secondary schools to describe dietary quality, attitudes to and beliefs about healthy eating and weight, self-efficacy for cooking, confidence in food preparation and cooking skills and physical activity.

In phase 2 we will implement and deliver an interactive intensive cooking programme to 100 Year 11 students from Dunedin schools, followed by a five week social-media led programme, followed by gradually decreasing social media content over the following year, so that students:
(a) have increased self-efficacy for cooking.
(b) want to, and are able to cook affordable, nutritious and appealing meals.
(c) have confidence to cook for their family and,
(d) have improved dietary quality.

We will follow up participants directly after completion of the intensive programme and at one year after completion of the five week social media programme to assess changes from baseline in self-efficacy for cooking, attitudes to and beliefs about healthy eating, confidence in food preparation and cooking skills, and dietary quality. We will also recruit an additional group of 100 Year 11 students to act as a control group.

12. Researcher/instructor experience and qualifications in this research area

Dr Paula Skidmore is an epidemiologist with 15 years experience in designing and conducting studies in children, adolescents and adults. She has extensive experience in the design and use of all major dietary assessment methodologies, physical activity and body composition measurements.

Dr Katherine Black is also experienced in the design of and conducting studies in adolescents, particularly with regard to the assessment of fitness and physical activity.

Carla Thomson and Amber Robertson's teaching and research specialty is in foodservice and they are responsible for the delivery of this component in the Human Nutrition undergraduate degree. Carla and Amber are both qualified chefs. Carla has extensive experience in delivering community cooking classes in adults.

Mary Spiers is a registered dietitian with extensive experience in delivering community cooking classes in adults.

Themis Chryssidis is a registered dietitian and director of Sprout. Sprout have developed and delivered intensive cooking classes for this age group in Australian schools.

13. Participants

13(a) Population from which participants are drawn:
Phase 1: Students in Year 10 (age 14 to 15) from all participating secondary schools in Otago.

Phase 2: Students from Dunedin schools participating in phase 1 who indicated that they would like to take part in phase 2.

13(b) Inclusion and exclusion criteria:

Phase 1 and 2 Inclusion criteria:
- Boys and girls attending Secondary Schools in the Otago area;
- Aged between 14 to 15 years old and in school year 10

Phase 1 Exclusion criteria:
- Boys and girls under the age of 14 and over the age of 15;
- Those whose parents return the reply slip indicating they do not wish their children to take part in the survey.

- Students who do not give informed consent;

Phase 2 Exclusion criteria – from those indicating in phase 1 that they would like to take part in phase 2

- Students who do not give informed consent;
- Students whose parents do not give informed consent.

13(c) Estimated number of participants:

Phase 1: 2000

Phase 2: 300

13(d) Age range of participants: 14 to 15 years and in year 10 during phase 1 of the project.

13(e) Method of recruitment:

Phase 1: All Secondary Schools in Otago will be invited to participate in the study. Principals of all these schools will receive an official letter with detailed information about the study and an invitation to participate. An appointment will be scheduled with each school principal in which members of the study team will discuss the study. In each school, all those in Year 10 will be invited to take part. Members of the study team will visit each school to explain the study to Year 10 classes. This school visit will take place at least one week prior to the scheduled date for data collection. Information packs including invitation letters from the study team and the school principal will be given to students at these visits. The pack will also contain a reply
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slip for parents/guardians to return to the school if they do not wish their children to take part in the study.

The last section of the Phase 1 survey will contain a description of phase 2 (the cooking intervention) and participants will be asked to talk to the researchers to obtain a copy of the information sheet and consent form for phase 2 and their name, postal address, e-mail address and cellphone number will be recorded if they indicate that they would like to take part in phase 2. Participants for Phase 2 will be drawn from these participants.

13(f) Specify and justify any payment or reward to be offered

Phase 1: Participants will be entered into a draw to win one of twenty sets of $30 movie vouchers.

Phase 2: Intervention group - $20 voucher at weeks 11 and 62

Control group - $20 voucher at weeks 0, 6, 11 and 62.

We will also offer two $25 vouchers for each of the six weeks of the social media phase of the intervention as a prize, drawn from those who submit pictures of the food made to the study Facebook page.

14. Methods and Procedures:

Phase 1: Students will be surveyed only once and data will be collected using an online survey. The questionnaire will be delivered and completed during class time and the questionnaire should take around 45 minutes to complete. The questionnaires include previously validated questions on demographics, dietary quality, attitudes to and beliefs about healthy eating and weight, self-efficacy for cooking, confidence in food preparation and cooking skills and physical activity. These questionnaires have already been modified for use in NZ, and where appropriate, have been tested in NZ adolescents and show good reproducibility and validity. The data collection for Phase 1 will take place during Term 4 (October to December) of 2016.

The questionnaire is currently being formatted and prepared for online use. Apologies for the differing formats/text size in the paper copy attached. This contains the questions being asked but the final version will be consistent in format and text size.
Phase 2: Baseline (Week 0). Participants will complete the same questionnaire administered in phase 1, but in paper format. Participant height and weight will be measured. They will also wear an accelerometer for seven days to record physical activity and sleep.

Cooking classes intervention (weeks 1 to 5): This cooking intervention comprises five days of interactive lessons where participants (in classes of around 20) will learn to become active in the kitchen by preparing and cooking at least one new recipe every day, in small groups. These classes consist of a mixture of cooking demonstrations, hands-on experience of cooking meals and informal nutrition and health information sessions. Informal question and answer/discussion sessions with local role models such as members of local sports teams will also be held. Participants will be provided with all necessary ingredients to cook their dishes during the classes and will be provided with copies of recipes and additional ingredients so that they can continue to cook these recipes at home, if they wish. As part of the five-session programme participants will also be asked to set their own personal cooking goals, which they will try to achieve in the following five weeks. On the last day of the intervention, participants’ families will be invited to the class and participants will show their new culinary skills by cooking for their families and eating together as part of the final class. This final class will also allow for parents of participants to ask any questions they have about food, cooking and health.

Social media/home based intervention (weeks 6 to 10): Participants will be provided with ingredients and a recipe to cook at least one meal for their family every week for the next five weeks. A Facebook group/page will be set up to allow participants to socially engage with each other about their cooking skills/experiences, to view other recipes and videos and for mini food challenges to be posted regularly. Participants will be encouraged to post photographs of the food they have prepared (where possible) and to post comments on the foods they have prepared and any other food experiences/recipes they would like to share. Regular reminders to visit the Facebook page will be sent to participants and Facebook polls will be conducted to assess whether participants have met their own personal weekly goals over this five-week period. Random weekly prizes ($25 supermarket vouchers) will be awarded to participants who meet their personal goals, to those posting pictures of the meals they have created, or who have shared food experiences/challenges or recipes. As all participants may not have internet access at home we will ask schools to allow participants access to the Facebook page at certain times during the school day.

First follow-up (Week 11): The study co-ordinator and trained research assistants will visit schools of participating pupils to administer the Phase 1 questionnaire. Height and
weight will be measured. Participants will be asked to wear an accelerometer for the following week. All participants will also fill in a feedback questionnaire on the intervention. As an incentive, all participants who complete these questionnaires and return the accelerometer will receive a $20 supermarket voucher. Focus groups will be conducted with a sub-set of 24 participants after the end of the six-week intervention period to assess satisfaction with the intervention and to identify areas of the programme that were most and least successful, in order to modify the programme for future use. (Information and consent forms for these focus groups to be submitted for Ethics consideration in February to allow investigators to identify any potential issues/topics that they may wish to cover in the focus groups).

Follow-up period (Week 12 to week 61): Participants will be encouraged to continue using the Facebook page and sent regular reminders to do so but site updates and competitions will be phased out throughout the year. The page will be maintained and moderated by a research assistant and the study co-ordinator.

Second follow-up (Week 62): Trained research assistants will visit schools to administer the Phase 1 questionnaires to all participants. Height and weight will be measured. Participants will also be asked to fill in feedback questionnaires on their use of the Facebook site during weeks 12 to 61 and to wear an accelerometer for the following week. As an incentive, all participants who complete these questionnaires and return the accelerometer will receive a $20 supermarket voucher.

Control group: We will also recruit an additional 100 students from the same schools as the intervention group to form a control group for the study. These participants will not receive any intervention but will complete all study questionnaires and accelerometry at the same time points as the intervention group.

15. **Compliance with The Privacy Act 1993 and the Health Information Privacy Code 1994 imposes strict requirements concerning the collection, use and disclosure of personal information. The questions below allow the Committee to assess compliance.**

15(a) Are you collecting and storing personal information (e.g. name, contact details, designation, position etc) directly from the individual concerned that could identify the individual?

Yes: We will be collecting personal information including name, age, gender, ethnicity, home address, and self-reported height and weight.

If you are collecting the information indirectly, please explain why:
Participants will be asked questions directly. The only indirect information that will be collected is the home address of participating children. This data will be used solely for determining neighbourhood deprivation index (NZdep) scores.

15(b) Are you collecting information about individuals from another source?

NO

15(c) Collecting Personal Information (Delete the answer that does not apply):

- Will you be collecting personal information (e.g. name, contact details, position, company, anything that could identify the individual)?
  
  YES

- Will you inform participants of the purpose for which you are collecting the information and the uses you propose to make of it?
  
  YES

- Will you inform participants of who will receive the information?
  
  YES

- Will you inform participants of the consequences, if any, of not supplying the information?
  
  YES

- Will you inform participants of their rights of access to and correction of personal information?
  
  YES

If you are NOT informing them of the points above, please explain why: N/A

15(d) Outline your data storage, security procedures and length of time data will be kept (Mark Borrie, ITS Security Manager, can provide data security and storage options in particular while in the field):

Anonymised electronic responses will be stored on a secure server belonging to Lime Survey (the survey provider). Data will be downloaded from this server as soon as possible after collection and these responses will be identifiable by ID number only. Height, weight and accelerometer data will be entered in a database using study IDs only and stored under
Application Form for ethical consideration of research and teaching proposals involving human participants

This project comprises two phases.

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(a) have increased self-efficacy for cooking,
(b) want to, and are able to cook affordable, nutritious and appealing meals.
(c) have confidence to cook for their family and,
(d) have improved dietary quality.

We will follow up participants directly after completion of the intensive programme and at one year after completion of the five week social media programme to assess changes from baseline in self-efficacy for cooking, attitudes to and beliefs about healthy eating, confidence in food preparation and cooking skills, and dietary quality. We will also recruit an additional group of 100 year 11 students to act as a control group.

12. Researcher/Instructor experience and qualifications in this research area

Dr Paula Skidmore is an epidemiologist with 15 years experience in designing and conducting studies in children, adolescents and adults. She has extensive experience in the design and use of all major dietary assessment methodologies, physical activity and body composition measurements.

Dr Katherine Black is also experienced in the design of and conducting studies in adolescents, particularly with regard to the assessment of fitness and physical activity.

Carla Thomson and Amber Robertson’s teaching and research specialty is in foodservice and they are responsible for the delivery of this component in the Human Nutrition undergraduate degree. Carla and Amber are both qualified chefs. Carla has extensive experience in delivering community cooking classes in adults.

Mary Spiers is a registered dietitian with extensive experience in delivering community cooking classes in adults.

Themis Chryssidis is a registered dietitian and director of Sprout. Sprout have developed and delivered intensive cooking classes for this age group in Australian schools.

13. Participants

13(a) Population from which participants are drawn:
17. **Disclose and discuss any potential problems or ethical considerations:**

While we acknowledge that research involving children generates specific issues for consideration, the risk to participants is low. We are not using invasive measurements such as blood sampling, and participants will be able to decline participation in any one part of the study if they are uncomfortable taking part. Experience from previous studies has provided us with information to make participation as easy and comfortable as possible for participants. For example, by showing participants where weight measurements are being taken, particularly highlighting the fact that these measurements are private, and that their classmates cannot see their data provides a more comfortable study environment.

The only potential risk is around food allergies and we will ask all participants in the intervention arm of Phase 2 about these and we will not supply a food to participants where they have indicated that they have an allergy to that particular food.

18. **Applicant's Signature:**

[Signature]

*Name: Paula Skidmore   Date: 7th August 2016*

19. **Departmental approval:** *I have read this application and believe it to be valid research and ethically sound. I approve the research design. The Research proposed in this application is compatible with the University of Otago policies and I give my consent for the application to be forwarded to the University of Otago Human Ethics Committee with my recommendation that it be approved.*

Signature of **Head of Department:** .................................................................

**Name of HOD (please print):** .................................................................

**Date:** .................................................................

**Where the Head of Department is also the Applicant, then an appropriate senior staff member must sign on behalf of the Department or School.**
Appendix B – University of Otago ethical approval letter

31 August 2016

Dr P Skidmore
Department of Human Nutrition
Division of Sciences

Dear Dr Skidmore,

I am again writing to you concerning your proposal entitled “Cooking with confidence:
Providing adolescents with tools for a healthy life”, Ethics Committee reference number
16/126.

Thank you for your e-mail of 26th August 2016, with attached revised documentation,
addressing the issues raised in relation to the cooking intervention, (Phase 2), of the above
study.

On the basis of this response, I am pleased to confirm that the cooking intervention, Phase 2
of the proposal, now has full ethical approval to proceed.

Approval is for up to three years from the date of this letter. If this project has not been
completed within three years from the date of this letter, re-approval must be requested. If
the nature, consent, location, procedures or personnel of your approved application change,
please advise me in writing.

The Human Ethics Committee asks for a Final Report to be provided upon completion of the
study. The Final Report template can be found on the Human Ethics Web Page
http://www.otago.ac.nz/council/committees/committees/HumanEthicsCommittees.html

Yours sincerely,

[Signature]

Mr Gary Witte
Manager, Academic Committees
Tel: 479 8256
Email: gary.witte@otago.ac.nz

c.c. Professor S Samman  Department of Human Nutrition
Appendix C – Parent or guardian information and consent forms

Create Our Own Kai Project

Information Leaflet for Parents

We are writing to invite your child and the other pupils in your child's class to take part in an important study. This sheet gives you some information about this study.

This study will be run by researchers from the University of Otago and is planned to take place over the school holidays in 2017, with three further follow-up appointments over the next year. We very much hope that your child will be able to take part in the study. We have enclosed an information sheet and consent form for you. Please discuss the study with your child and fill in and sign the consent form enclosed with this letter to say whether or not you are happy for your child to take part.

Please put the parental consent and student consent forms in the Freepost envelope provided and return these to us. If you would like any more information or if you have any questions please contact the Study Co-ordinator:

Name: Caleb Robinson
Address: Department of Human Nutrition, University of Otago, PO Box 56, Dunedin 9054
Phone: 021 0446404
E-mail: cookingwithconfidence@otago.ac.nz

Thank you for considering your child’s participation in this research study. Your help is greatly appreciated.

Principal Investigator:

Dr Paula Skidmore
Department of Human Nutrition

On behalf of the Research Team – Dr Katherine Black, Caria Thomson, Caleb Robinson, Rosie Jackson and Olivia Toldi

University of Otago Human Ethics Committee reference number 16/126
What is the study about?
Research shows that being involved in preparing and cooking family meals as a teenager is associated with better health both as a teenager and in adulthood. However, recent research in other countries shows that not many teenagers are actively involved in preparing family meals. Therefore we are inviting your child to take part in a five day cooking course, where they will be taught to cook tasty, cheap and nutritious meals in a fun and relaxed atmosphere.

Who are we seeking to participate in the project?
We are asking children aged 12 to 15 from Year 8, 9 and 10 classes in schools in Dunedin to take part in the study.

What will the study involve for your child?
If you and your child decide that they will take part, your child will randomly be chosen to take part in the intervention or the control group.

If your child is in the intervention group there are three parts to this study. For the first part we will ask your child to attend some informal, interactive cooking classes for five days during the summer holidays. They will learn how to cook ten meals, in groups of two, and we will provide all the food for them to do this. These classes are especially designed for people your child’s age and to be fun. They will be led by trained chefs and there will be input from local role models. They will also be able to ask any questions they have about food and health. We will also ask them to fill in a questionnaire about food and cooking and things related to this (e.g. physical activity, food choice) and measure their height and weight. On the last day of the classes they will cook a meal for their family and we would like to invite you to come along and taste it and to take part in another cooking and information session. We will also ask them to fill in the questionnaire again.

For the second part of the study we will give your child food to cook at least one family meal per week for the next six weeks. We will post new recipes and competitions on a Facebook page and we will have a weekly prize draw for those who post pictures of the meals that they cook, or who take part in the competitions. At the end of the six weeks we will ask your child to fill in a questionnaire about food and cooking, and measure their height and weight. We will reimburse them with a $20 voucher for completing this set of questionnaires and measurements.

We will keep updating the Facebook page for the rest of the year and your child can continue posting pictures of their food, or their favourite recipes. At the end of the year we will ask them to fill in another copy of the questionnaire and measure their height and weight. We will reimburse them with a $20 voucher for completing this set of questionnaires and measurements.

If your child is in the control group they just have to fill in the questionnaires and have their height and weight measured three times over the year at weeks 1, 7, and 52. We will reimburse them with a $20 voucher for completing each set of questionnaires and measurements.

All of these questionnaires and measures have been used before in studies in students and are very safe. However, they do not have to complete all the questions/undergo measurements if they don’t want to.

University of Otago Human Ethics Committee reference number 16/126
Is there any risk of discomfort or harm from participation?
There is low risk to all children taking part in the study. No invasive measurements such as blood samples will be taken. We will ask you and your child about any food allergies that they may have and we will not provide them with that particular food, or allow them to cook with it.

What will the study team do with the things your child tells them?
Each student’s personal information will be collected on a separate paper form and this will be kept separate from the information we collect during the study. The anonymised information from all the questionnaires will be sent to the University web server and only the researchers involved in the project will have access to the data. The data collected will be summarised, presented to policy makers, and reported in research journals. At the end of the study the overall results will be available to children and parents who take part. No personal information about individual children will be reported.

What do I do now?
We very much hope that your child will be able to take part in the study. Please discuss the study with your child. Your child can choose not to take part, or he/she can withdraw from the study at any time. Please fill in and sign the consent form whether or not you wish your child to take part in this study. You can return the reply form in the envelope provided.

This study has been approved by the University of Otago Human Ethics Committee. If you have any concerns about the ethical conduct of the research you may contact the Committee through the Human Ethics Committee Administrator (ph +64-3-479 8256 or gary.witte@otago.ac.nz). Any issues you raise will be treated in confidence and investigated and you will be informed of the outcome.
Create Our Own Kai Project

Parent/Guardian Consent form

Name of parent: ........................................

Name of participating child: ........................................

1. I have read the Information Sheet concerning this study and understand the aims of this research project.

2. I have had sufficient time to talk with other people of my choice about participating in the study.

3. I confirm that my child meets the criteria for participation which are explained in the Information Sheet.

4. All my questions about the project have been answered to my satisfaction, and I understand that I am free to request further information at any stage.

5. I know that my and my child’s participation in the project are entirely voluntary, and that we are free to withdraw from the project at any time without disadvantage.

6. I understand that my child will take part in five days of cooking classes and that they will be provided with food to cook a family meal for the next six weeks afterwards only if they are in the study intervention group.

7. I know that the questionnaires will explore my child’s dietary and physical activity habits, and that if the line of questioning develops in such a way that they feel hesitant or uncomfortable they may decline to answer any particular question(s), and/or may withdraw from the project without disadvantage of any kind.

8. I understand the nature and size of the risks of discomfort or harm which are explained in the Information Sheet.

9. I know that when the project is completed all personal identifying information will be removed from the paper records and electronic files which represent the data from the project, and that these will be placed in secure storage and kept for at least ten years.

10. I understand that the results of the project may be published and be available in the University of Otago Library, but I agree that any personal identifying information will remain confidential between myself and the researchers during the study, and will not appear in any spoken or written report of the study.

University of Otago Human Ethics Committee reference number 16/126
11. I know that no commercial use will be made of the data. However I know that my child will receive some $20 vouchers as a thank you for taking part in the study.

Signature of parent/carer: ________________________________

Date: ____________________

Name of child (please print): ______________________________

Telephone number: Home phone: __________________________ 

Cell phone: ________________________________

Postal address: _________________________________________

Email address: __________________________________________

We are asking for your phone number(s) and addresses so we can arrange delivery of food bags, if needs be.

Please tell us about any food allergies/intolerances that your child has, below:

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

Please indicate with a tick, if your child is free to take part in the study on the following weeks:

☐ Monday January 9 2017 to Friday January 13 2017

☐ Monday January 16 2017 to Friday January 20 2017

☐ Monday January 23 2017 to Friday January 27 2017

Please EITHER:

• Return this consent form along with your child’s consent form using the Freepost envelope provided

OR

University of Otago Human Ethics Committee reference number 16/126
If you would prefer, you can give consent via email for you and your child to participate. Please contact cookingwithconfidence@otago.ac.nz and we will initiate this.
Appendix D – Participant information and consent forms

Create Our Own Kai Project

Information Leaflet for Students

Why are we doing this study?
Research shows that being able to prepare and cook tasty and healthy meals is associated with better health in teenagers and that these health benefits can last into adult life.

Why me?
You are receiving this information leaflet as we are recruiting Year 8, 9 and 10 students from Dunedin schools to take part in a cooking study.

What would I have to do?
If you do decide to take part, you will randomly be chosen to take part in the intervention or the control group.

If you are in the intervention group there are three parts to this study. For the first part we will ask you to attend some informal, interactive cooking classes for five days during your summer holidays. You will learn how to cook several meals, in groups of two, and we will provide all the food for you to do this. These classes are especially designed for people your age and to be fun. They will be led by trained chefs and there will be input from local role models. You will also be able to ask any questions you have about food and health. We will also ask you to fill in a questionnaire about food and cooking and things related to this (e.g. physical activity, food choice) and measure your height and weight. On the last day of the classes you will cook a meal for your family and they will be invited to come along and taste it and to take part in another cooking and information session, if they want to. We will also ask you to fill in the questionnaire again.

For the second part of the study we will give you food to cook at least one family meal per week for the next six weeks. We will post new recipes and competitions on a Facebook page and we will have a weekly prize draw for those who post pictures of the meals that they cook, or who take part in the competitions. At the end of the six weeks we will ask you to fill in the questionnaire again and measure your height and weight. We will reimburse you with a $20 voucher for completing this questionnaire and measurements.

We will keep updating the Facebook page for the rest of the year and you can continue posting pictures of your food, or your favourite recipes. At the end of the year we will ask you to fill in the questionnaire again, and measure your height and weight. We will reimburse you with a $20 voucher for completing this questionnaire and measurements.

If you are in the control group you just have to fill in the questionnaire, and have your height and weight measured, three times over the 62 weeks, at weeks 1, 7, and 52. We will reimburse you with a $20 voucher for completing each set of questionnaires and measurements.

University of Otago Human Ethics Committee reference number 16/126
All of these questionnaires and measures have been used before in studies in students and are very safe. However, you do not have to complete all the questions/undergo measurements if you don’t want to.

What do I do now?
Thank you for reading this information. We hope you will be able to take part in our study. Please fill in the reply form with your parent or guardian and bring it back to school. If you have any questions you can contact us by telephone, email or by writing to us:

Study coordinator name: Caleb Robinson
Telephone: 021 046404
E-mail: cookingwithconfidence@otago.ac.nz
Address: Department of Human Nutrition, PO Box 56, Dunedin, 9054
Create Our Own Kai Project

CONSENT FORM FOR STUDENT PARTICIPANTS

Thank you for reading the information sheet for this study. Please ask us if there is anything that is not clear or if you would like more information.

I understand what this study is about. All my questions have been answered in a way that makes sense.

I know that:

1. Participation in this study is voluntary, which means that I do not have to take part if I don’t want to and nothing will happen to me. I can also stop taking part at any time and don’t have to give a reason;

2. Anytime I want to stop, that’s okay.

3. If I don’t want to answer some of the questions, that’s fine.

4. If I have any worries or if I have any other questions, then I can talk about these with Paula, Caleb, or the rest of the study team.

5. The computer file with my answers will only be seen by Paula and the people she is working with. They will keep whatever I say private.

6. Paula and her team will write up the results from this study for their University work. The results may also be written up in journals and talked about at conferences. My name will not be on anything that Paula and her team write up about this study.

I agree to take part in the study.

Signature: _______________________________________

Name (print): ___________________________________

Date: __________________________

University of Otago Human Ethics Committee reference number 16/126
Appendix E – Additional information for participants selected into either intervention or control

Information Leaflet for Students in the Intervention Group

Thank you for agreeing to take part in the study and for returning the parent and student consent forms.

Why are we doing this study?
Research shows that being able to prepare and cook tasty and healthy meals is associated with better health in teenagers and that these health benefits can last into adult life.

What do I have to do?
For this study, students are randomly chosen to take part in the intervention or the control group. You have been chosen to take part in the intervention group.

There are three parts to this study. For the first part we will ask you to attend some informal, interactive cooking classes for five days during your summer holidays. You will learn how to cook several meals, in groups of two, and we will provide all the food for you to do this. These classes are especially designed for people your age and to be fun. They will be led by trained chefs and there will be input from local role models. You will also be able to ask any questions you have about food and health. We will also ask you to fill in a questionnaire about food and cooking and things related to this (e.g. physical activity, food choice) and measure your height and weight. On the last day of the classes you will cook a meal for your family and they will be invited to come along and taste it and to take part in another cooking and information session, if they want to. We will also ask you to fill in the questionnaire again.

For the second part of the study we will give you food to cook at least one family meal per week for the next six weeks. We will post new recipes and competitions on a Facebook page and we will have a weekly prize draw for those who post pictures of the meals that they cook, or who take part in the competitions. At the end of the six weeks we will ask you to fill in the questionnaire again and measure your height and weight. We will reimburse you with a $20 voucher for completing this questionnaire and measurements.

We will keep updating the Facebook page for the rest of the year and you can continue posting pictures of your food, or your favourite recipes. At the end of the year we will ask you to fill in the questionnaire again, and measure your height and weight. We will reimburse you with a $20 voucher for completing this questionnaire and measurements.

All of these questionnaires and measures have been used before in studies in students and are very safe. However, you do not have to complete all the questions/undergo measurements if you don’t want to.
What do I do now?

Thank you for reading this information. Once we see you on Monday we will ask you to complete the week 1 questionnaires and measurements. If you have any questions now then please ask us. If you have any questions at any point of the study you can contact us by telephone, email or by writing to us:

Study coordinator name: Caleb Robinson
Telephone: 021 0448404
E-mail: cookingwithconfidence@otago.ac.nz
Address: Department of Human Nutrition, PO Box 58, Dunedin, 9054

University of Otago Human Ethics Committee reference number 16/126
Information Leaflet for Students in the Control Group

Thank you for agreeing to take part in the study and for returning the parent and student consent forms.

Why are we doing this study?
Research shows that being able to prepare and cook tasty and healthy meals is associated with better health in teenagers and that these health benefits can last into adult life.

What do I have to do?
For this study, students are randomly chosen to take part in the intervention or the control group. You have been chosen to take part in the control group.

For this study we ask that you fill in the questionnaire, and have your height and weight measured, three times over the 52 weeks, at weeks 1, 7, and 52. We will reimburse you with a $20 voucher for completing each set of questionnaires and measurements.

All of these questionnaires and measures have been used before in studies in students and are very safe. However, you do not have to complete all the questions/undergo measurements if you don’t want to.

What do I do now?
Thank you for reading this information. We will now ask you to come in and complete the week 1 questionnaire and measurements. If you have any questions now then please ask us. If you have any questions at any point of the study you can contact us by telephone, email or by writing to us:

Study coordinator name: Caleb Robinson  
Telephone: 021 9446404  
E-mail: cookingwithconfidence@otago.ac.nz  
Address: Department of Human Nutrition, PO Box 56, Dunedin, 9054

University of Otago Human Ethics Committee reference number 16/126
Appendix F – Mechanical cooking skills questionnaire
(Technical skills section)

21. Can you perform the following activities? Circle one answer per line.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Yes</th>
<th>No</th>
<th>I don’t know what this is</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use knife skills in the kitchen</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Basic cooking techniques (e.g. mixing)</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Steaming</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Sautéing</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Stir-frying</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Grilling</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Poaching</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Baking</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Roasting</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Stewing</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Boiling or Simmering</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Microwaving</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
22. Can you perform the following activities? Circle **one** answer per line.

Preparing cooking raw meat, poultry and fish

Yes  No

Making sauces and gravy from raw ingredients.

Yes  No

Preparing fresh or frozen green vegetables (e.g. broccoli, spinach, peas)

Yes  No

Preparing root vegetables (e.g. potatoes, kumara, carrots, parsnip)

Yes  No

Preparing fruit (e.g. peaches, pineapple, grapefruit, kiwifruit, apple)

Yes  No

Using herbs and spices (e.g. basil, thyme, rosemary, paprika)

Yes  No
Appendix G – Self-efficacy for cooking questionnaire

(Section 1)

23. How confident do you feel about being able to cook from basic ingredients? (Please select one number)

<table>
<thead>
<tr>
<th>Not at all confident</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>Very confident</th>
</tr>
</thead>
</table>

24. How confident do you feel about following a simple recipe? (Please select one number)

<table>
<thead>
<tr>
<th>Not at all confident</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>Very confident</th>
</tr>
</thead>
</table>

25. How confident do you feel about tasting foods that you have not eaten before? (Please select one number)

<table>
<thead>
<tr>
<th>Not at all confident</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>Very confident</th>
</tr>
</thead>
</table>

26. How confident do you feel about preparing and cooking new foods and recipes? (Please select one number)

<table>
<thead>
<tr>
<th>Not at all confident</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>Very confident</th>
</tr>
</thead>
</table>
Appendix G continued – Self-efficacy for cooking questionnaire  
*(Section 2)*

27. How confident do you feel about being able to perform the following activities?

<table>
<thead>
<tr>
<th>z</th>
<th>Not at all confident</th>
<th>Very Confident</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Using knife skills in the kitchen</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>Using basic cooking techniques e.g. stirring, mixing, blending food.</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>Steaming</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>Sautéing</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>Stir-frying</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>Grilling</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>Poaching</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>Baking e.g. cakes, buns, breads.</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>Roasting</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>Stewing</td>
<td>□</td>
<td>□</td>
</tr>
</tbody>
</table>
27. (continued) How **confident** do you feel about being able to perform the following activities?

<table>
<thead>
<tr>
<th>Activity</th>
<th>Not at all confident</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>Very Confident</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boiling or Simmering</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Microwaving</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preparing cooking raw meat, poultry and fish</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Making sauces and gravy from raw ingredients.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preparing fresh or frozen green vegetables (e.g. broccoli, spinach)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preparing root vegetables (e.g. potatoes, beets, sweet potatoes)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preparing fruit (e.g. peaches, watermelon)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Using herbs and spices to flavor food (e.g. basil, thyme, cayenne pepper)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


## Appendix H – Full COOK week programme description

### (Monday)

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>9am</td>
<td>Welcome</td>
<td>- Participants arrive at kitchen and are introduced to the COOK study</td>
</tr>
</tbody>
</table>
| 9.10     | T1 Questionnaire and measurements             | - Consent forms are signed  
- Participants start on questionnaires and are taken for anthropometric measurements                                                  |
| 10am     | Introduction                                  | - The COOK instructors are introduced  
- COOK handbooks were given out  
- Expectations of the week were outlined  
- Handwashing procedures explained  
- Icebreaker game                                                                  |
| 10.20am  | Recipe 1 demonstration                         | - Participants view the dish cooked in its entirety by COOK instructors                                                                    |
| 10.35am  | Participants cook recipe 1                    | - Each pair moves to their allocated stations and makes the dish.  
- Once the dish is ready they must completely clean their station and wait for the rest of the class to be finished before they can eat. |
| 11.10am  | Safety in the kitchen presentation            | - Power-point information regarding food safety, hygiene, and kitchen safety; presented by the chef.                                       |
| 11.30am  | Recipe 2 demonstration                         | - Participants view the dish cooked in its entirety by COOK instructors                                                                    |
| 11.45am  | Participants cook recipe 2                    | - Each pair moves to their allocated stations and makes the dish.  
- Once the dish is ready they must completely clean their station and wait for the rest of the class to be finished before they can eat. |
| 12.30pm  | Break                                         |                                                                                                                                              |
| 12.50pm  | Food and nutrition presentation               | Power-point information regarding the food groups, and consuming a balanced diet.                                                           |
| 1.20pm   | Introduction to the family meal that will be cooked on Friday | Participants introduced to the family meal planning.  
Information regarding budget, timing, recipe books, and the level of cooking expected given.                                                |
<p>| 2pm      | Recipe 3 demonstration                         | - Participants view the dish cooked in its entirety by COOK instructors                                                                    |</p>
<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
<th>Description</th>
</tr>
</thead>
</table>
| 2.15pm| Participants cook recipe 3 | - Each pair moves to their allocated stations and makes the dish.  
- Once the dish is ready they must completely clean their station and wait for the rest of the class to be finished before they can eat. |
| 3-3.15pm| Completion of day      | - Participants picked up by parent/guardians  
- COOK instructors meet for debrief.                                                                                                    |
## Appendix H – (Tuesday)

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>9am</td>
<td>Recipe 4 demonstration</td>
<td>Participants view the dish cooked in its entirety by COOK instructors</td>
</tr>
<tr>
<td>9.20am</td>
<td>Participants cook recipe 4</td>
<td>Each pair moves to their allocated stations and makes the dish.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Once the dish is ready they must completely clean their station and wait</td>
</tr>
<tr>
<td></td>
<td></td>
<td>for the rest of the class to be finished before they can eat.</td>
</tr>
<tr>
<td>10am</td>
<td>Seasonality presentation</td>
<td>Information regarding nutrition, cost, environmental issues relating to</td>
</tr>
<tr>
<td></td>
<td></td>
<td>seasonality presented by the dietitian.</td>
</tr>
<tr>
<td>10.30am</td>
<td>Cooking methods and selection of produce</td>
<td>Interactive presentation from an experienced chef.</td>
</tr>
<tr>
<td>11am</td>
<td>Food Share</td>
<td>Representative from the local food rescue organisation presents information</td>
</tr>
<tr>
<td></td>
<td></td>
<td>regarding how to food waste.</td>
</tr>
<tr>
<td>11.20am</td>
<td>Recipe 5 demonstration</td>
<td>Participants view the dish cooked in its entirety by COOK Instructors</td>
</tr>
<tr>
<td>11.30am</td>
<td>Participants cook recipe 5</td>
<td>Each pair moves to their allocated stations and makes the dish.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Once the dish is ready they must completely clean their station and wait</td>
</tr>
<tr>
<td></td>
<td></td>
<td>for the rest of the class to be finished before they can eat.</td>
</tr>
<tr>
<td>12pm</td>
<td>Break</td>
<td>Participants were allowed free time to mingle and get some fresh air outside.</td>
</tr>
<tr>
<td>12.20pm</td>
<td>Recipe development</td>
<td>Pairs come up to the dietitian and chef to discuss and finalise their ideas</td>
</tr>
<tr>
<td></td>
<td></td>
<td>for the two-course meal that they prepare for their family members. (on the</td>
</tr>
<tr>
<td></td>
<td></td>
<td>last day of the COOK week)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Friday family meal is further explained in 1.7.2 Cooking for the family.</td>
</tr>
<tr>
<td>1.30pm</td>
<td>Recipe 6 demonstration</td>
<td>Participants view the dish cooked in its entirety by COOK instructors</td>
</tr>
<tr>
<td>1.45pm</td>
<td>Participants cook recipe 6</td>
<td>Each pair moves to their allocated stations and makes the dish.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Once the dish is ready they must completely clean their station and wait</td>
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<td></td>
<td></td>
<td>for the rest of the class to be finished before they can eat.</td>
</tr>
<tr>
<td>Time</td>
<td>Activity</td>
<td>Description</td>
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<tr>
<td>--------------</td>
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</tr>
<tr>
<td>2.30pm</td>
<td>Recipe development</td>
<td>- Extra time to finalise recipes if needed</td>
</tr>
<tr>
<td>3.15-3.30pm</td>
<td>Completion of day</td>
<td>- Participants picked up by parent/guardians</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- COOK instructors meet for debrief.</td>
</tr>
</tbody>
</table>
## Appendix H – (Wednesday)

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>9am</td>
<td>Recipe and shopping list</td>
<td>- Information regarding how to write a recipe out appropriately and how to write a detailed shopping list to allow for efficiency in the supermarket.</td>
</tr>
<tr>
<td></td>
<td>presentation</td>
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</tr>
<tr>
<td>9.30am</td>
<td>Recipe development</td>
<td>- Participants write out recipes for their family meal and start writing shopping lists (based on these recipes) for the shopping trip.</td>
</tr>
<tr>
<td>10am</td>
<td>Recipe 7 demonstration</td>
<td>- Participants view the dish cooked in its entirety by COOK instructors</td>
</tr>
<tr>
<td>10.15am</td>
<td>Participants cook recipe 7</td>
<td>- Each pair moves to their allocated stations and makes the dish.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Once the dish is ready they must completely clean their station and wait for the rest of the class to be finished before they can eat.</td>
</tr>
<tr>
<td>11am</td>
<td>Break</td>
<td></td>
</tr>
<tr>
<td>11.30am</td>
<td>Recipe 8 demonstration</td>
<td>- Participants view the dish cooked in its entirety by COOK Instructors</td>
</tr>
<tr>
<td>1.45am</td>
<td>Participants cook recipe 8</td>
<td>- Each pair moves to their allocated stations and makes the dish.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Once the dish is ready they must completely clean their station and wait for the rest of the class to be finished before they can eat.</td>
</tr>
<tr>
<td>12.30pm</td>
<td>Recipe 9 demonstration</td>
<td>- Participants view the dish cooked in its entirety by COOK instructors</td>
</tr>
<tr>
<td>12.45pm</td>
<td>Participants cook recipe 9</td>
<td>- Each pair moves to their allocated stations and makes the dish.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Once the dish is ready they must completely clean their station and wait for the rest of the class to be finished before they can eat.</td>
</tr>
<tr>
<td>1.30pm</td>
<td>Recipe development</td>
<td>- More time set aside to write out recipes and shopping lists for the supermarket trip</td>
</tr>
<tr>
<td>2pm</td>
<td>Preparation for Thursday</td>
<td>- Pairs are joined into groups of four participants. All groups are given a different recipe for a dish to cook for the group lunch. They are then asked to form another grocery list for this dish within the group of four.</td>
</tr>
<tr>
<td></td>
<td>Shared lunch</td>
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</tr>
<tr>
<td>3pm -</td>
<td>Completion of day</td>
<td>Participants picked up by parent/guardian</td>
</tr>
<tr>
<td>3.30pm</td>
<td></td>
<td>- COOK instructors meet for debrief.</td>
</tr>
</tbody>
</table>
## Appendix H – (Thursday)

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>9am</td>
<td>Recipe 10 demonstration</td>
<td>- Participants view the dish cooked in its entirety by COOK instructors</td>
</tr>
</tbody>
</table>
| 9.15am  | Participants cook recipe 10                   | - Pairs move into groups of four, for this recipe  
|         |                                                | - Recipe 10 put in the freezer to set |
| 9.45am  | Supermarket trip                              | - Participants walk to supermarket with COOK instructors  
|         |                                                | - Firstly they gather their ingredients for the shared lunch recipes in groups of four.  
|         |                                                | - Secondly they gather ingredients for the family meal in their pairs. |
| 11.30am | Break                                         |             |
| 12.15   | Participants cook shared lunch recipes         | - Participants move into their group of four and begin the cook the recipe(s) that were assigned to them. Help given to those with more complicated recipes such as the pasta.  
|         |                                                | Once the dish is ready they must completely clean their station and wait for the rest of the class to be finished |
| 1.30pm  | Eat Shared lunch                              | - All participants come up by group and help themselves to the shared lunch. Participants are encouraged to have some of every dish on their plate. COOK instructors also eat the shared lunch. |
| 2pm     | Create Sample timeline for Friday family lunch and placeholders | - Participants are given a sample timeline and are asked to develop a timeline for preparation and cooking of their two course meal for their family.  
|         |                                                | - List is then checked off by study COOK instructors  
|         |                                                | - Participants are asked to prepare placeholders with their family member’s name on it |
| 2.45pm  | Recipe 10 eaten                               | - Recipe 10 taken out of freezer, and eaten  
|         |                                                | - participants then clean up |
| 3.30pm  | Completion of day                             | - Participants picked up by parent/guardians  
|         |                                                | - Study coordinators, instructors and assistants meet for debrief. |
### Appendix H – (Friday)

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>9am</td>
<td>Introduction to the day</td>
<td>- Participants are told by COOK instructors what to expect from the day, where to find staple ingredients, and what time they are aiming to get the first course out.</td>
</tr>
</tbody>
</table>
| 9.20am   | Participants begin to cook two-course family meal | - COOK instructors walk around room, helping participants and making sure they are on track.  
- COOK instructors begin to cook lunch for participants using as many left overs as possible |
| 10.30am  | Set table for family meal                     | - Participants go up one by one to set a place at the table for their family member. Participants continue cooking                                                                                           |
| 11am     | Lunch for participants served                 | - Participants stop cooking for 10-20 minutes and eat the lunch that was cooked by the COOK instructors.                                                                                                |
| 11.45am  | Family members arrive                         | COOK instructor meets family members and takes them to the dining room                                                                                                                                       |
| 12pm     | Main meal delivered                           | - Participants all go up together and deliver their main meal to their family member                                                                                                                        |
| 12.10pm  | Dessert is plated up                          | - Participants finish off preparing their desserts and begin to plate up                                                                                                                                    |
| 12.25pm  | Dessert delivered                             | - Participants all go up together and deliver their dessert to their family member  
- Clean-up of kitchen and dishes                                                                                                                    |
| 12.45pm  | Family and participant debrief                | - All participants, COOK instructors and study coordinators join family members and discuss the successes of the week  
- Participants and family members are introduced to the take-home food bags.  
- Family members leave                                                                                                                               |
| 1pm      | Cleaning                                      | - Participants complete a thorough clean of their benches, draws and appliances  
- Kitchens checked off by COOK instructors                                                                                            |
| 1.30     | T2 Questionnaire                              | - Participants complete T2 questionnaire.  
- Qualitative feedback session completed to find out what participants thought of the programme, what they learned etc.                                                                                 |
| 2.15pm - 2.30pm | Completion of day and week                  | - Participants picked up by parent/guardian  
- COOK instructors meet for debrief.                                                                                                               |
## Appendix I – Pantry Staple ingredients

<table>
<thead>
<tr>
<th><strong>Dry goods</strong></th>
<th><strong>Fresh Herbs</strong></th>
<th><strong>Oils and Vinegars</strong></th>
<th><strong>Dried Herbs/Spices</strong></th>
<th><strong>Other</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Plain flour</td>
<td>Oregano</td>
<td>Olive oil</td>
<td>Oregano</td>
<td>Eggs (for back-up)</td>
</tr>
<tr>
<td>Self-raising flour</td>
<td>Coriander</td>
<td>Canola oil</td>
<td>Thyme</td>
<td>Garlic</td>
</tr>
<tr>
<td>Corn Flour</td>
<td>Parsley</td>
<td>Sesame oil</td>
<td>Paprika</td>
<td>Ginger</td>
</tr>
<tr>
<td>White Sugar</td>
<td>Mint</td>
<td>Vanilla essence</td>
<td>White pepper</td>
<td></td>
</tr>
<tr>
<td>Castor Sugar</td>
<td>Rosemary</td>
<td>White wine vinegar</td>
<td>Chilli powder</td>
<td></td>
</tr>
<tr>
<td>Brown Sugar</td>
<td>Basil</td>
<td>Red wine vinegar</td>
<td>Peppercorns</td>
<td></td>
</tr>
<tr>
<td>Cocoa Powder</td>
<td></td>
<td>Mirin</td>
<td>Dill</td>
<td></td>
</tr>
<tr>
<td>Baking Powder</td>
<td></td>
<td>Rice wine vinegar</td>
<td>Ground cumin</td>
<td></td>
</tr>
<tr>
<td>Baking Soda</td>
<td></td>
<td>Balsamic vinegar</td>
<td>Ground coriander</td>
<td></td>
</tr>
<tr>
<td>Reduced salt vegetable stock</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Sesame seeds</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Pepitas</td>
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</tbody>
</table>
Appendix J – COOK week Recipes

Recipe 1

Sweet Corn Fritters with Avocado Salsa & Smoked Salmon

Ingredients: (Serves 2)
1 Cob corn kernels removed (or 100g frozen corn, defrosted)
5 Tablespoons wholemeal flour
⅓ Teaspoon baking powder
⅛ Bunch coriander, stems and leaves (reserve some leaves for salsa)
1 small egg
Pinch chilli flakes
¼ Avocado, diced
⅛ Red onion, sliced as thinly as possible
1 ½ Teaspoons olive oil
1 ½ Teaspoons lime juice
50g Smoked salmon, to serve

Method:
1. Combine half the corn, flour, coriander, egg, chilli flakes and salt in a small food processor and blitz to combine. Stir in remaining corn.
2. Heat a non-stick pan over high with the oil. Divide the batter into equal amounts and cook for 1-2 minutes each side or until golden brown and cooked through.
3. Combine avocado, onion and remaining coriander leaves in a small bowl. Drizzle with olive oil and lime juice. Spoon onto corn fritters and serve immediately with salmon.

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Appendix J – Recipe 2
Asparagus, Chicken & Chorizo Cous Cous

**Ingredients:** (Serves 2)

- ½ Tablespoon olive oil
- ¾ Chorizo sausage, thinly sliced
- 1 Chicken breast, cut into 2.5cm dice
- ¾ Bunch Asparagus, sliced into thirds
- 2 Spring onions, finely sliced
- 2 Cloves garlic, sliced thinly
- 1 Teaspoon smoked paprika
- 1 Teaspoon ground cumin
- 1/3 Cup wholemeal cous cous
- ½ Cup chicken or vegetable stock, salt reduced
- ½ Cup baby spinach
- Zest and juice of ½ a lemon
- 2 Tablespoons kalamata olives, pitted
- ¼ Bunch basil, leaves picked

**Method:**

1. Heat a wide frying pan with the olive oil. Add chorizo and chicken. Cook, turning occasionally, for 2-3 minutes or until browned. Remove from the pan and add asparagus, spring onions and garlic. Stir for 2-3 minutes until lightly browned.

2. Add garlic, paprika and cumin. Stir to coat. Return chicken and chorizo to the pan. Add cous cous, stock and baby spinach. Simmer until cous cous has absorbed the liquid and is tender.

3. Stir through lemon zest and juice. Remove from heat, top with olives and basil to serve.
Appendix J – Recipe 3

Banana & Peanut Butter Ice-cream with Malt Crumble

**Ingredients:** (Serves 2)
- 2 Bananas, peeled, thickly sliced and frozen in a plastic bag or container
- 2 Tablespoons peanut butter
- 2 Teaspoons low fat cream

**Malt Crumble:**
- ⅛ Cup roasted peanuts
- ⅓ Tablespoon plain flour
- 1 Tablespoon milo

**Method:**
1. First, make the crumble. Combine all ingredients in a small food processor and blitz until fine. Heat a non-stick frying pan over high heat. Add crumble and stir constantly for 1-2 minutes or until golden brown and fragrant. Remove from heat.

2. To make the instant banana ice-cream, combine frozen banana, peanut butter and cream in a food processor and blend until smooth and creamy. Scrape the mixture down with a spatula if there are any lumps and blend briefly again. Return mixture to the freezer until serving, or use immediately.

3. Serve banana ice-cream topped with malt crumble.
Appendix J – Recipe 4

Fennel, Dill and Fish Risotto

Ingredients: (Serves 2)
- 500 ml Good quality low salt chicken stock
- ½ Tablespoon olive oil
- ½ Brown onion, finely sliced
- 3 Sprigs thyme, leaves picked
- 2 Cloves of garlic, sliced
- ½ Lemon
- ½ Cup arborio rice
- 1 Teaspoon rice bran oil
- 2 x 120g Pieces of fish
- ¼ Fennel bulb, sliced thinly, fronds reserved
- ½ Bunch broccoli, sliced into 2cm pieces
- ¼ Cup frozen peas
- Small handful fresh dill, roughly chopped
- 30g Feta, crumbled

Method:
1. Bring stock to the boil in a saucepan, set aside and keep warm.

2. Fry onion, thyme and garlic in a large pot with the olive oil, stirring, until translucent. Add rice and stir for 30 seconds to toast the rice. Zest the lemon and add to the pan along with the juice. Add a ladleful of hot stock and simmer. Add more stock as required throughout the process to make sure the rice is just covered with liquid. Stir occasionally. The risotto will take about 16-18 minutes to cook. If you run out of stock before this time use a little hot water.

3. Once your risotto is happily cooking away, get a large frying pan on high heat and add the rice bran oil. Add fish and cook for 2-3 minutes each side or until just cooked through. Remove fish from pan, add the sliced fennel and broccoli and stir for 2 minutes or until vegetables are bright in colour but snap-tender. Add the frozen peas and reserved fennel fronds and stir for a minute to defrost them. Remove from heat.

4. When the rice is al dente, stir in the vegetables. Stir through dill. Divide amongst bowls, top with fish and feta and serve.

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Appendix J – Recipe 5

Pork Tacos with Apple and Cabbage Salsa

**Ingredients:** (Serves 2)

100g Pork loin steak
1 ½ Teaspoons ground cumin
1 ½ Teaspoons ground coriander
¼ Bunch coriander, leaves picked
1 ½ Spring onions, finely sliced or grated
½ Granny smith apple, finely juliened or grated
1/8 Purple cabbage, sliced
Juice of half a lemon
1 ½ Teaspoons olive oil
½ Avocado
2 Corn tortillas

**Method:**

1. Combine pork with cumin and ground coriander in a bowl.

2. Combine coriander leaves, spring onions, cabbage and apple in a bowl. Squeeze over the juice of quarter of a lemon. Stir to combine.

3. Preheat a non-stick frying pan over high heat. Add one oil, then pork and cook for 2-3 minutes each side or until just cooked. Remove pork from heat.

4. In a bowl mash avocado and remaining lemon juice together with a fork.

5. Warm tortillas if desired. Spread with guacamole, top with pork, cabbage and green apple salad. Serve immediately.
Appendix J – Recipe 6

Raspberry Soufflé

Ingredients: (serves 4)
- 120g Frozen raspberries, defrosted
- 60g Caster sugar
- 4 Teaspoons water
- 2/3 Teaspoon (rounded) corn flour
- 2 Egg whites
- 10g (2 Teaspoons) extra caster sugar
- Caster sugar, for dusting
- Spray oil, for ramekins

Method:
1. Preheat oven to 180C. Use a spatula to force defrosted raspberries through a fine sieve. Discard seeds.

2. Place the sugar and water in a small saucepan over low heat and stir until the sugar is dissolved, brushing down any sugar crystals from the sides of the pan.

3. Meanwhile, add the corn flour to the raspberry puree and stir until the corn flour is dissolved. Add the raspberry mixture to the sugar syrup, increase heat to high and bring to the boil, stirring until thickened slightly. Remove from the heat and cool slightly.

4. Whisk the egg whites until soft peaks form. Gradually add the extra sugar and whisk until stiff peaks form. Fold through the raspberry syrup. Spray four ramekins with oil and dust with sugar, Spoon the soufflé mixture into the dishes until ⅔ full, place the dishes on a baking tray and bake for 12 minutes or until risen and golden. Serve immediately, soufflés don’t wait for anyone!

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Appendix J – Recipe 7

Tofu Jungle Curry

**Ingredients:** (Serves 2)

- 100ml Can low-fat coconut milk
- 150ml Salt-reduced vegetable stock
- 2 Cloves garlic, finely sliced
- Half a thumb-sized piece ginger, grated
- 2 Coriander roots and stems, cleaned and finely sliced (reserve leaves for serving)
- 1/8 Teaspoon freshly ground white pepper
- ½ Stick lemongrass, bruised
- 1 ½ Teaspoons soy sauce
- 1 ½ Teaspoons brown sugar
- 2 Kaffir lime leaves
- ½ Medium head broccoli
- ½ Punnet cherry tomatoes, halved
- ½ Cup diced pineapple
- 70g Firm tofu, cubed
- Rice, to serve
- Basil, to serve

**Method:**

1. Pour just the creamy white top of the coconut milk into large frying pan or saucepan over high heat. Cook until the coconut splits and looks oily, about 1-3 minutes. Add the garlic, ginger, coriander, pepper and lemongrass. Cook, stirring, for 1-2 minutes or until fragrant.

2. Add the soy sauce and brown sugar, stir to dissolve, then add remaining contents of coconut milk and the vegetable stock. Add tomatoes, broccoli, pineapple and tofu. Cook until broccoli and tomato soften but still retains their colour. Add a little water at any stage if the curry is lacking moisture.

3. Serve curry with ½ cup of cooked rice each, fresh coriander leaves and basil.

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Appendix J – Recipe 8

Roasted Strawberry Fool with Pepita Brittle

**Ingredients:** (Serves 2)
- 1 Tablespoon caster sugar
- 3 Black peppercorns
- Zest and juice of ½ lemon
- 1 Punnet strawberries, tops sliced off and halved
- ½ Cup of cream
- ½ Cup Thick Greek yoghurt
- 1 Teaspoon sumac
- Basil leaves, to serve (optional)

**Pepita brittle:**
- ⅛ Cup caster sugar
- 1 Teaspoon butter
- ⅛ Teaspoon bicarb soda
- 2 Tablespoons pepitas (pumpkin seeds)

**Method:**
1. To make the brittle, heat a saucepan over high heat and line a tray with baking paper. Add a teaspoon of sugar and cook until starting to melt. Add another teaspoon and repeat process, stirring occasionally until it forms into a caramel. Whisk in butter and once melted whisk in bicarb soda. Pour brittle onto tray, sprinkle with pumpkin seeds and allow to cool before snapping into pieces.

2. Combine sugar, peppercorns, lemon zest and juice in a saucepan. Bring to the boil, turn down heat and simmer for 1-2 minutes or until sugar has dissolved.

3. Preheat oven to 200°C. Line a tray with baking paper. Place half the strawberries onto the tray and pour over the syrup. Mix briefly to combine. Transfer to the oven and cook for 10-15 minutes or until tender. Check the strawberries after five minutes; if they are starting to colour or burn too much, cover them with a piece of foil. Remove from oven and allow to cool slightly. Transfer to a small blender and puree until smooth.

4. Whip cream to stiff peaks, then whisk through the yoghurt. Fold through strawberry puree. Toss reserved fresh strawberries with sumac. Serve fool topped with shards of pepita brittle, sumac strawberries and basil if using.

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Appendix J – Recipe 9

Korean Beef with Sesame Slaw & Pickled Cucumber

**Ingredients:** (serves 2)
- ½ Lebanese cucumber, thinly sliced
- 2 Tablespoons rice wine vinegar
- 1 ¼ Teaspoons caster sugar
- 1 ¼ Teaspoons rice bran oil
- 1 x 200g Beef steak
- ¼ Chinese cabbage, finely sliced
- ½ Carrot, juliened or grated with a mandolin
- 1 ½ Spring onions, finely sliced on an angle
- 1 Tablespoon pickled jalapenos, roughly chopped
- ½ Teaspoon sesame oil
- 1 Teaspoon sesame seeds (white or black)

**Ginger sauce:**
- 1 Tablespoon salt reduced soy sauce
- 1 Tablespoon Chinese cooking wine
- 1 Tablespoon mirin
- ½ Tablespoon honey
- 1cm piece ginger, grated

**Method:**
1. Place cucumber in a small bowl. Combine rice wine vinegar and caster sugar in a small saucepan and heat until sugar dissolves. Pour pickling liquid over cucumber and set aside to cool.

2. In the same saucepan, make the ginger sauce. Combine all ingredients in the saucepan and simmer until aromatic, about 30 seconds. Set aside.

3. Heat a large heavy-based frying pan over high heat with the rice bran oil. Add the steak and cook for 2-3 minutes each side or until cooked to your liking. Remove the pan from heat and pour in the ginger sauce. Turn the beef until it is coated in the sticky reduced sauce then remove to a chopping board to rest.

4. Combine Chinese cabbage, carrot, spring onion, jalapenos, sesame oil, cucumber and the pickling liquid in a large bowl. Divide slaw between serving plates. Slice beef thinly and arrange on plates. Top with sesame seeds then serve.

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Summer Parfait

**Ingredients:** (Serves 4)

1. Cup thick Greek yoghurt
2. Teaspoons vanilla bean paste (substitute vanilla extract)
3. Finely grated zest of a lemon
4. Egg whites
5. ¼ Cup caster sugar
6. ½ Cup frozen raspberries
7. 1 Peach, diced into 1cm pieces
8. ¼ Cup pistachios, roughly chopped
9. 4 Peaches, sliced into wedges, to serve

**Method:**

1. Line a 12cm x 22cm loaf pan with cling film. Stir together yoghurt, vanilla and lemon zest.

2. Place egg whites in a large bowl. Use electric beaters or a whisk to whip eggs to soft peaks, then slowly add the sugar, whisking all the time, until a stiff, shiny meringue is reached.

3. Use a whisk to fold egg white mixture and yoghurt mixtures together. Carefully fold through peach, pistachios and then the raspberries. Try not to over mix as the raspberries will bleed and turn the parfait pink.

4. Spoon mixture into the loaf pan and smooth with a spatula or knife. Freeze for 4 hours or overnight until firm.

5. Turn parfait out, remove cling film and cut into slices. Divide parfait slices between plates and serve.
Appendix J – Thursday shared lunch recipes

Chicken & Mango Salad with Nahm Jim

**Ingredients:** (Serves 4)

- 2 Chicken breasts
- 750ml Chicken stock
- 2 Lebanese cucumbers, deseeded and diced
- 1 Punnet cherry tomatoes, halved
- 1 Mango, flesh removed, diced
- 3 Spring onions, finely sliced on an angle
- ½ Bunch mint, leaves torn
- ½ Bunch coriander, leaves picked

**Nahm jim:**

- 1 1/2 Tablespoons fish sauce
- 1 Tablespoon brown sugar
- Juice of 1 lemon
- 1 Garlic clove, finely grated
- 2cm Piece ginger, finely grated
- 1 Long green chilli, deseeded and finely sliced

**Method:**

1. Combine chicken breasts and stock in a large saucepan. Bring to the simmer and cook for 15 minutes or until chicken has just cooked through. Remove from heat, then shred the chicken into bite-sized pieces.

2. Meanwhile, to make the nahm jim, stir fish sauce, brown sugar and lemon juice together until sugar dissolves. Stir through garlic, ginger, and green chilli.

3. Combine cucumbers, cherry tomatoes, mango, spring onion, mint and coriander in a large bowl.

4. Stir nahm jim and chicken through the salad. Transfer salad to a large platter then serve.

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Haloumi with tomato and asparagus salad

**Ingredients:** (Serves 4)
- 1/3 Cup balsamic vinegar
- 2 Tablespoons honey
- 1kg mixed colour tomatoes
- 1 bunch basil, leaves picked
- 2 shallots, sliced as thinly as possible
- 2 Tablespoons olive oil, plus 2 tablespoons extra
- 1/4 cup red wine vinegar
- 2 bunches asparagus, cut into 4cm pieces
- 300g Haloumi

**Method:**

1. Combine balsamic vinegar and honey in a small saucepan. Bring to the boil and cook for 1-2 minutes or until a very light syrup forms. Remove from heat and allow to cool.
2. Cut tomatoes into different shapes and sizes and place into a large bowl. Add basil leaves, shallots, 2 Tablespoons olive oil and red wine vinegar just prior to serving.
3. Heat a frying pan over high heat with remaining olive oil. Add asparagus and cook for 2-3 minutes or until just tender. Remove from pan.
4. Slice haloumi 1cm thick and add to the same pan the asparagus was cooked in. Cook for 1 minute each side or until golden brown. Remove from heat.
5. Arrange tomato salad on a large serving plate. Top with asparagus and haloumi then serve drizzled with balsamic glaze.

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Pickled radish, hummus and tzatziki

**Ingredients:** (Serves 4)

**Rosemary and olive focaccia, sliced, to serve**

**Pickled radishes:**
1. Bunch radishes, quartered
2. ⅓ Cup white wine vinegar or apple cider vinegar
3. ⅛ Cup sugar
4. 12 Peppercorns

**Hummus:**
5. 300 g (11 oz) Tin of chickpeas, rinsed and drained
6. 2 Tablespoons tahini (optional)
7. Zest and juice of a lemon
8. 1 Tablespoon ground cumin
9. 2 Teaspoons smoked paprika
10. ⅛ Cup olive oil

**Tzatziki:**
11. 1 Lebanese cucumber
12. 1 Cup low fat Greek-style yoghurt
13. 1/3 Bunch mint leaves, leaves roughly chopped
14. 1 Tablespoon lemon juice
15. 1 Tablespoon olive oil

**Method:**

1. To make the pickled radish, place radishes in a heat proof bowl. Combine vinegar, sugar and peppercorns in a saucepan and bring to the boil. Pour over the radishes and set aside for at least 20 minutes to pickle.

2. To make the hummus, combine all ingredients in a food processor. Blend until smooth.

3. To make the tzatziki, grate the cucumber, then use paper towel to squeeze out any excess moisture. Combine with yoghurt, mint leaves, lemon juice and olive oil.

4. Serve pickled radishes, hummus and tzatziki with rosemary and olive focaccia.

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Rosemary and olive sourdough

**Ingredients:** (Serves 4)
- 3 Cups self-raising flour
- 1 1/2 Tablespoons castor sugar
- 1/4 Cup olive oil, plus extra, for drizzling
- 330ml Soda water
- 3 Sprigs rosemary, leaves picked
- 1/3 Cup pitted kalamata olives
- 1/4 Teaspoon salt

**Method:**

1. Preheat oven to 200C. Grease and line a large baking tray with baking paper.

2. In a large bowl, combine self-raising flour, castor sugar, olive oil and soda water. Mix with a wooden spoon until a soft, sticky dough forms. Transfer the dough onto the oven tray. Rub flour on your hands to stop the dough sticking, then press the dough out with your fingertips into an oval shape, about 3cm thick. Brush or drizzle with extra olive oil. Push the rosemary and olives (if using) lightly into the dough. Sprinkle salt evenly over the top. Transfer to the oven and bake for 25-30 minutes or until golden brown.

3. Remove focaccia from oven. Allow to cool slightly. Cut or tear into chunks and serve while it’s still warm.

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Meatballs on cous cous with zucchini salad

**Ingredients:** (Serves 4)
- 500g Beef mince
- 2 Tablespoons fennel seeds
- 1 Long red chilli, finely sliced
- 1 Red capsicum, finely sliced
- 4 Cloves garlic, finely sliced
- ¾ Bunch of basil, leaves picked
- 700g jar tomato passata
- 1 Cup salt reduced chicken or vegetable stock
- ½ Cup of cous cous
- 1 Tablespoon olive oil, plus 1 teaspoon extra
- 2 Zucchini, sliced into ribbons with peeler
- 2 Cups baby spinach
- 1 Apple, finely sliced
- 1 Tablespoon red wine vinegar
- 20g Parmesan, grated to serve

**Method:**

1. Using your hands combine mince and fennel seeds. Shape mince mixture into 3cm meatballs. Add one tablespoon olive oil to a large frying pan. Heat over high heat and then add the meatballs. Cook, turning occasionally, for about two minutes or until browned all over. Remove meatballs from the pan and set aside.

2. In the same pan add chilli, capsicum and garlic. Cook until vegetables soften and then stir through tomato puree. Bring to the boil, cook for 2-3 minutes. Add the meatballs back into the sauce and reduce heat to low. Cook for a further 3-5 minutes or until meatballs have just cooked through. Stir through basil leaves.

3. Bring the chicken stock to the boil over high heat in a small saucepan. Carefully pour it over the cous cous and set aside for 5 minutes to absorb. Fluff with a fork before serving.

4. Toss zucchini, baby spinach, apple, vinegar and remaining 1 teaspoon of oil together. Serve meatballs on cous cous with zucchini salad. Garnish with freshly shaved parmesan.

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Pesto pasta with slow roast tomatoes and broccoli

**Ingredients:** (Serves 4)
- 1 Punnet cherry tomatoes, halved
- ¾ bunch flat leaf parsley, leaves picked
- ½ bunch basil, leaves picked
- ¾ cup toasted pine nuts
- Zest and juice of 2 limes
- 1 tablespoon olive oil, plus 1 tablespoon extra
- 1 long red chilli, finely sliced
- 3 cloves garlic, finely sliced
- 1 head broccoli
- 2 tablespoons capers
- 1 zucchini, shredded into long strips on a mandolin or box grater
- 50g Parmesan, finely grated

**Pasta:**
- 270g Plain flour, plus extra for dusting
- 3 eggs
- 1 tablespoon olive oil

**Method:**
1. Combine all pasta ingredients in a food processor until a dough forms. Knead for 2-3 minutes or until smooth, then cover in plastic wrap and refrigerate for 15-30 minutes.
2. Roll pasta out through a pasta roller. Roll through the thickest setting 5-6 times, rotating the pasta by 90 degrees at each turn, until pasta sheets are very smooth. Roll from the thickest to the thinnest setting, then slice pasta sheets 1cm thick. Toss in a little extra flour then set aside.
3. Preheat oven to 200°C. Place cherry tomatoes onto a lined tray. Drizzle with olive oil and cook until golden brown and softened. Remove from oven and allow to cool slightly.
4. To make the pesto, combine parsley, half the basil, pine nuts, lemon zest and juice in a small food processor and blitz until smooth. Stir through one tablespoon of olive oil.
5. Bring a pot of water to the boil and add the pasta. Cook for 1-2 minutes or until just tender before draining. Toss in a little olive oil to stop the pasta sticking.
6. Heat a large frying pan over high heat. Add the remaining tablespoon of olive oil, chilli, garlic and broccoli. Cook for 2-3 minutes or until garlic has softened and turned golden. Add capers and stir in shredded zucchini and drained pasta. Stir through pasta.
7. Divide pasta between serving bowls. Top with roasted cherry tomatoes, grated pecorino and remaining basil leaves to serve.

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Appendix K – Take home food bag recipes
Tofu Jungle Curry

**Ingredients:** (Serves 4)

- 200ml Can low-fat coconut milk
- 300ml Salt-reduced vegetable stock
- 3 Cloves garlic, finely sliced
- Thumb-sized piece ginger, grated
- 4 Coriander roots and stems, Cleaned and finely sliced (reserve leaves for serving)
- ½ Teaspoon freshly ground white pepper
- 1 Stick lemongrass, bruised
- 1 Tablespoon soy sauce
- 1 Tablespoon brown sugar
- 3 Kaffir lime leaves
- 1 Medium head broccoli
- 1 Punnet cherry tomatoes, halved
- 1 Cup freshly diced pineapple
- 140g firm tofu
- Rice, to serve
- Basil, to serve

**Method:**

1. Pour just the creamy white top of the coconut milk into large frying pan or saucepan over high heat. Cook until the coconut splits and looks oily, about 1-3 minutes. Add the garlic, ginger, coriander, pepper and lemongrass. Cook, stirring, for 1-2 minutes or until fragrant.

2. Add the soy sauce and brown sugar, stir to dissolve, then add remaining contents of coconut milk and the vegetable stock. Add tomatoes, broccoli and pineapple. Cook until broccoli and tomato softens but still retains its colour, then add tofu. Cook a further two minutes or until tofu is cooked. Add a little water at any stage if the curry is lacking moisture.

3. Serve curry with ½ cup of cooked rice, fresh coriander leaves and basil if using.
Deep crust pizza with sausage

**Ingredients:** (Serves 4)

- 3 sausages
- 2 cups self-raising flour
- 1/2 tsp salt
- 2 tbsp olive oil
- 1/2 cup cold water to mix (approximately)
- 1/2 cup tomato paste mixed with 1/2 cup cold water
- 1 tsp dried oregano
- 1 onion, chopped
- 1 small carrot, grated
- 1 small courgette, grated
- 1 cup sliced mushrooms
- 1 cup grated cheese

**Method:**

1. Preheat the oven to 220°C.
2. Split the skins of the sausages with a knife and squeeze the filling into a small pan. Brown the sausage meat, crumbling it with a potato masher as it cooks. Once browned, set aside.
3. While the sausage meat is cooling make the base. Mix the flour, salt and oil in a bowl or food processor and add just enough cold water to form a dough. Turn onto a lightly floured bench and roll out to a circle approximately 27cm in diameter. Place on a greased baking sheet.

4. Spread the base with 1/2 the tomato paste mixture. Sprinkle with oregano then add the onion. Squeeze the grated carrot and courgette firmly to release the excess moisture, then sprinkle over the base and add the crumbled sausage.

5. Spread the remaining tomato mixture over the top, then add the mushrooms, cheese, capsicum and then olives. Bake in the preheated oven for 20-25 minutes, or until golden and bubbling.

*Any variety of cold meat could be used on this pizza, as well as any selection of vegetables. For example, ham, cooked bacon, chicken or salami, capsicum, roasted pumpkin, red onions, spinach.*
Lamb meatballs with tomato sauce and spaghetti

Ingredients: (Serves 4)

- 400g lamb mince
- ¾ cup rolled oats
- ¾ cup onion, finely chopped
- 3 cloves garlic, crushed
- 1 egg, lightly beaten
- 2 tablespoons parsley, finely chopped
- 1 tablespoon fresh thyme leaves, finely chopped
- 2 tablespoons tomato paste
- 1 tablespoon olive oil
- 2 cups liquid Beef stock
- ¾ cup tomato paste
- 400g can chopped tomatoes in juice
- 1 tablespoon dried oregano
- 1 tablespoon balsamic vinegar
- 2 teaspoons brown sugar
- 1 x 500g pack of dried spaghetti

Method:

Meatballs

1. Add the mince to a large bowl with the rolled oats, onion, garlic, egg, herbs, tomato paste, olive oil and season. Mix gently to combine using clean hands. Shape the mixture into golf ball sized balls. Cover and refrigerate for 20 minutes to set.
2. Heat a little oil over a medium-high heat in a large frying pan and brown the meatballs all over (do this in batches). Once browned, remove carefully with tongs and set aside on a plate.

Sauce

1. Drain any oil from the pan and return it over a high heat. Add ¾ of the stock and let it bubble for 30 seconds, scraping the pan with a wooden spoon to incorporate all those crunchy caramelised meat juices from the meatballs.
2. Add the remaining stock, tomato paste, tomatoes, oregano, balsamic vinegar and sugar. Stir. Add the meatballs back to the pan and simmer uncovered for 15-20 minutes, or until the sauce has thickened to a pasta sauce consistency (turn the meatballs over once). Taste and season as required.
Create Our Own Kai Project

Mexican nachos

**Ingredients:** (Serves 4)

2x 400g can of kidney beans drained
1x bag of 8 tortillas

*For the nacho sauce:*
1 onion finely diced
1 carrot diced
400g canned tomatoes
200ml water
1 tsp sugar
1 tsp chilli powder
½ tsp dried oregano
2 tsp paprika
1 ½ tsp ground cumin

**Method:**

1. Preheat oven to 180°C.

2. Brush the top of each tortilla with a small amount of oil and stack on top of each other. Cut tortillas into quarters or eights.

3. Combine all the ingredients for the nacho sauce in a pot and bring to a boil, then turn down the heat and simmer for 30 minutes stirring often.

4. Arrange the tortilla wedges in a single layer on an oiled tray and bake for 8-10 minutes, checking regularly. Remove from oven and let cool.

5. Add the drained red kidney beans to the nacho mixture and allow the beans to heat through.

6. Serve the nacho beans over the corn chips.

7. Serve with sour cream and grated cheese if desired.
Tuna pasta bake

**Ingredients:** (Serves 4)

- 2 x 185g cans of tuna
- 4 cups large shell pasta
- 100g butter
- 1 white onion, sliced
- 1 cup plain flour
- 4 cups milk
- 1 cup courgettes, diced
- 1 broccoli, sliced
- 1/4 cup grated cheese
- 1 cup breadcrumbs

**Method:**

1. Pre-Heat Oven to 180°C.
2. Cook pasta according to packet Instructions. Once pasta is cooked, drain and place in an ovenproof dish and mix tuna through.
3. Melt butter in a medium saucepan and lightly cook onion for 1-2 minutes, add flour and mix thoroughly. Slowly add milk, whisking to form a smooth sauce. Stir through courgettes and broccoli and cooking for a further 2 minutes.
4. Pour sauce and vegetables over tuna and pasta.
5. Sprinkle breadcrumbs and grated cheese on top then bake for 15-20 minutes, or until top is golden in colour.

Any tinned fish could be used in this recipe, e.g. salmon or smoked fish
For a non seafood version you could also use cooked bacon or left over ham.
And for a vegetarian version any cooked left over vegetables e.g. cooked pumpkin, spinach, broccoli etc., could be used.
Pasta and bean soup

Ingredients: (Serves 4)

- 3 tablespoons of olive oil
- 1 clove of garlic peeled and chopped
- 1 onion peeled, quartered and sliced
- 2 bay leaves
- ½ teaspoon dried thyme
- 2 x 400g tin Italian style tomatoes
- 1 x 400g tin Mexican Chilli beans
- 1 x 400g four bean mix
- 4 cups of vegetable stock
- 100g macaroni pasta
- ½ teaspoon of salt
- Basil to garnish

Method:

1. Heat the olive oil in large pot, add the garlic and onion and sauté until softened and clear.
2. Stir in the bay leaves and thyme cook for a few minutes longer.
3. Add the chopped tinned tomatoes, the rinsed drained beans and the stock. Heat until boiling then add the pasta. Allow to boil gently until the pasta is cooked (about 10-15 minutes) then add salt and pepper to taste.
4. Serve with fresh basil and grated cheese if desired.

Many different vegetables or meat could be added to this soup. It is perfect for using up left over ham or cooked bacon, or cooked vegetables such as corn, carrots, capsicums etc.