Te Whare Wānanga
o Awanuiārangi

KA ORA, KA AKO - SOUTHLAND

WILL PAYNE
2025

A thesis presented to Te Whare Wānanga o Awanuiārangi in fulfilment of the requirements for the degree of Doctor of Philosophy, Te Whare Wānanga o Awanuiārangi

WILL PAYNE

IMPACT OF THE KA ORA, KA AKO | HEALTHY SCHOOL LUNCHES PROGRAMME ON ACADEMIC, BEHAVIOURAL AND PHYSICAL PERFORMANCE WITHIN SOUTHLAND PRIMARY SCHOOLS

COPYRIGHT

DECLARATION

To the best of my knowledge and belief, this thesis contains no material previously published by any other person except where due acknowledgment has been made.

This thesis contains no material I have submitted towards the award of any other degree or diploma in any other university or institution.

This thesis represents the research I have undertaken. The findings and opinions in my thesis are my own, and they are not necessarily those of Te Whare Wānanga o Awanuiārangi.

This thesis has been stored at Te Whare Wānanga o Awanuiārangi. It is therefore available for future students and researchers to read and reference.

Will Payne

Signature:

Date: ……...

ACKNOWLEDGMENTS

So many wonderful people have been a part of this project from the beginning to the end. Without your support this study would have been very difficult to complete. I would especially like to thank:

The **participants** were brilliant to work with. This study would not have gone as smoothly without their commitment.

Professor Paul Kayes, I am extremely grateful for all your wonderful support and assistance throughout this project.

S**chool of Sport and Recreation, Southern Institute of Technology**, for allowing time to complete this study. **Duncan McKenzie,** for all of the conversations about my study.

Thank you to the **Te Whare Wānanga o Awanuiārangi** for giving me the opportunity and the support to complete this thesis.

Mum, thank you for all your support.

Renee McGinnis and **Oliver Payne** for all your love and support throughout this journey.

PERSONAL POSITIONING

Will Payne has a Master of Science in Human Nutrition, and lectures at the Southern Institute of Technology in this area. He has also been a Physical Conditioner for elite athletes for over 15 years, including World Champions, Olympic and Para Olympic medals. Also, over the last few years, he has been coaching young children in a variety of sports at the primary school level, and it was there that he noticed that children's mood and performance are subject to what is in their lunch.

Mihi

Ko Hikurangi toku maunga

Ko Wairahi toku awa

Ko Mataatua toku waka

Ko Ngapuhi toku iwi

Ko Whananaki toku marae

Ko Alf Payne toku matua

Ko Liz Payne toku whaea

Ko Renee McGinnis toku Hoa wahine

Ko Oliver ko Maja oku tamariki

Ko Will Payne toku ingoa

Itiiti rearea, teitei kahikatea ka taea – Although the rearea is small it can ascend the lofty heights of the Kahikatea tree

ABSTRACT

Introduction

In New Zealand, parents or guardians have traditionally been responsible for providing school lunches for primary school students. This study examines the effects of a government-funded lunch programme on academic, behavioural, and physical performance in primary schools located in Southland.

Method

The study was conducted in various Southland Primary Schools. It includes four investigations that explore the principals' perspectives through interview before, and at least six months after, they received the free lunch programme. Additionally, an online questionnaire was used to investigate the teaching staff's perspective before they received the programme. Furthermore, a group interview was conducted to examine the perceptions of the children. The results were analysed by exploring the themes of all four studies.

Results

The findings of this thesis indicate that both teachers and principals agreed that implementing a free, healthy lunch program would positively impact the students' academic performance. However, the students had mixed feelings about the programme; some enjoyed it, while others did not. Additionally, the results revealed that the taste of the food played a significant role in the students' willingness to consume the meals. All principals expressed concern about the nutritional guidelines and limitations of the free, healthy lunch programme.

Conclusion

The main discovery of the study is that taste and presentation are crucial factors for the success of the Free Healthy School Lunch Programme. To enhance taste and presentation, different

strategies can be implemented, such as giving providers more nutritional control, gradually introducing children to new tastes, and promoting healthy eating through role modelling. By implementing these strategies, the consumption of school meals can be increased.

CONTENTS

LIST OF TABLES

Table 6.5

Student comments about role modelling *179*

LIST OF FIGURES

CHAPTER ONE

INTRODUCTION

1.0 Introduction

In New Zealand, there are significant issues with children's health, education and future opportunities in life (Child and Youth Wellbeing, 2019b). There are multiple reasons why New Zealand's children are becoming more obese and are not achieving academically (Kelly & Swinburn, 2015). These reasons include increased poverty, high consumption of energy-rich foods, less physical activity, and overworked teachers and parents (Unicef, n.d.).

Obesity rates in New Zealand children are in the third-highest percentage in the Organisation for Economic Co-operation and Development (OCED) countries (Kelly & Swinburn, 2015). Kelly and Swinburn (2015) indicated that this was due to higher consumption of energy-dense foods/beverages and sedentary lifestyles.

> Several groups of New Zealand experts have recommended that the government introduce the following practical strategies to combat childhood obesity. They are all based on sound scientific evidence.
>
> 1. Restrictions on junk food marketing to children
> 2. An excise tax on sugary drinks
> 3. Healthy food service policies implemented in all schools and early childhood centres (Kelly & Swinburn, 2015, p. 7).

This introduction will concentrate on background research, the aims, and the purpose of this study. The introduction will also focus on fundamental research questions and the significance of this research.

1.1 Background to the Study

Eating healthily has been shown to improve academic, behavioural, and physical performance in education. In a global education report, New Zealand showed a decline in academic performance (Long & Te, 2019). The main reasons indicated by the New Zealand government for poor academic performance are bullying, negative attitudes towards school, and unsupportive learning environments (Long & Te, 2019). A survey conducted in 2015 and 2016 found that obesity rates for New Zealanders were one out of three (MOH, 2019c). The ratings for obese children in New Zealand are one out of nine. This survey concluded that socio-economic status and education play an essential role in rates of obesity (MOH, 2019c). These obesity rates can increase the early onset of numerous chronic diseases and influence cognitive function, social interaction and physical mobility (Khan et al., 2014).

The New Zealand government has approached the obesity issue with a range of strategies such as Childhood Obesity Plans, Raising Healthy Kids programme, Healthy Families programme and Green Prescriptions (MOH, 2019c). In 2019, the New Zealand government implemented a Free and Healthy Lunch programme called Ka Ora, Ka Ako | Healthy School Lunches Programme as part of the Child Youth and Wellbeing strategy (Ardern, 2019). The Ka Ora, Ka Ako | Healthy School Lunches Programme would allow New Zealand children to become more active, have better learning opportunities and control body composition.

Southland Primary School

Southland is the southernmost province in New Zealand (Stat NZ, 2018). Southland is known for its beautiful landscape with stunning areas such as Fiordland National Park and Southern Costal line. The major city is Invercargill and there are smaller towns such as Gore, Te Anau, Winton and Bluff. Murihiku is the Māori name for Southland as it is known as the ‘the last joint of the tail’ (Te Ara, 2015, para. 1). The mana whenua of Murihiku is Ngāi Tahu (Te Ara, 2015).

The population of Southland was 97,467 in 2018. The number of Māori in Southland was 14,484, 15% of the population (Stat NZ, 2018). The largest ethnic group is European, 86.5% of the population. Other ethnic groups in the Southland region are Pacific Island people (2.6%), Asian (5.5%) and Middle Eastern/Latin American/African (0.6%) (Stat NZ, 2018). In the Southland region, there are 78 primary schools (refer to Figure 1.1). The 78 primary schools are for new-entry students up to year eight. In the Invercargill region there are 24 primary schools (refer to Figure 1.2) (Education Counts, 2023).

Figure 1.1

Primary schools within the Southland enrolment zones (Education Counts, 2023).

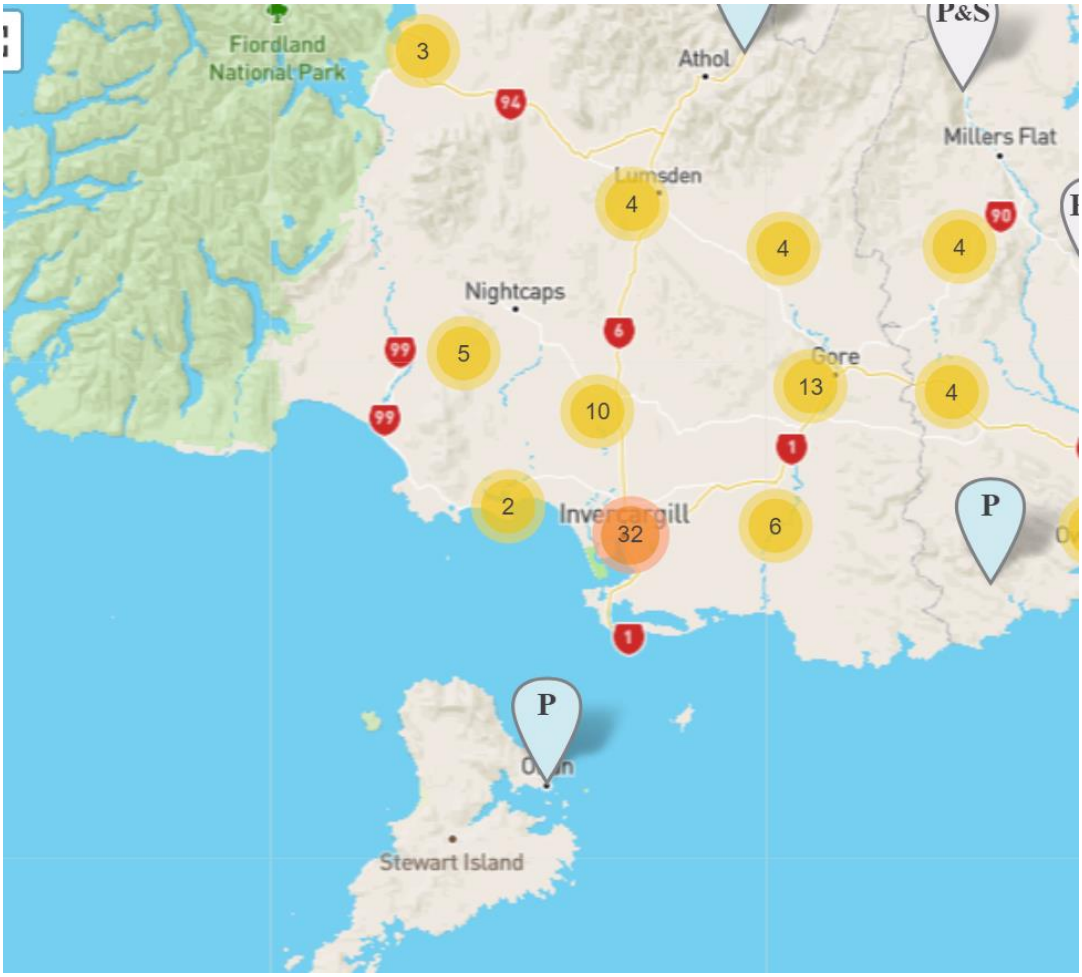
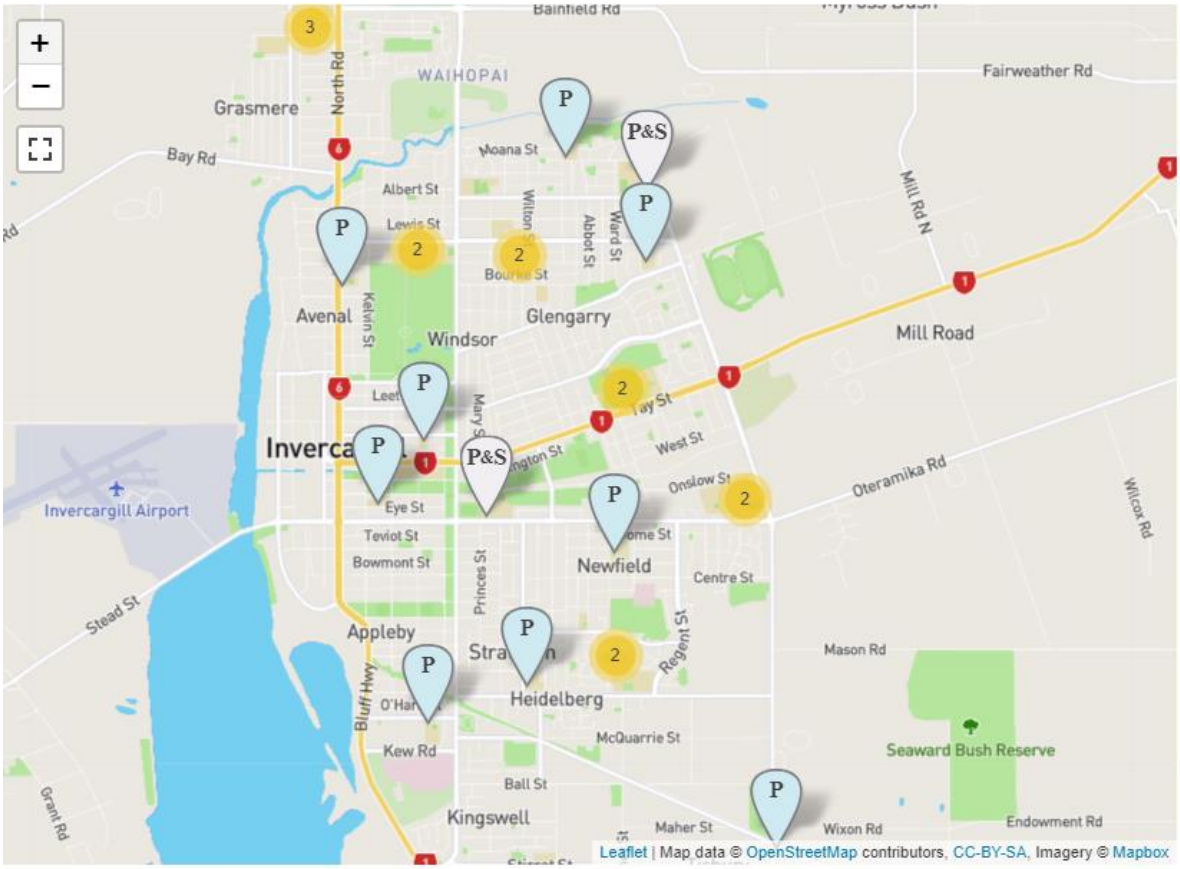


Figure 1.2

The locations of Invercargill primary school (Education Counts, 2023)



In the Southland region in 2020, there were five schools who began the free, healthy lunch programme in term one, and then five other schools in term three, which feed 1,500 children (Henry, 2020). The number of schools on the Ka Ora, Ka Ako | Healthy School Lunches Programme was 22 in June 2023 (MOE, 2020). Out of the 22 schools full primary (year 1 – 8)

and composite (year 1 – 15) there are 16 schools which have 6,609 students. Out of the 16 schools there are ten schools in the Invercargill area.

Figure 1.3

The Southland full primary and composite schools who are on the Ka Ora, Ka Ako | Healthy School Lunches Programme in June 2023 (MOE, 2020)

School Number	School name	Delivery: Internal (schools make lunches themselves) or External (suppliers provide lunches)	School Type	Jul 2022 Roll Total	Territorial Authority	Education Region
398	Takitimu Primary School	External	Full Primary (Year 1-8)	76	Southland District	Otago/Southland
402	Waiau Area School	Internal	Composite (Year 1-15)	129	Southland District	Otago/Southland
1625	Ascot Community School	External	Full Primary (Year 1-8)	287	Invercargill City	Otago/Southland
2116	New River Primary	External	Contributing (Year 1-6)	207	Invercargill City	Otago/Southland
2117	Fernworth Primary School	External	Contributing (Year 1-6)	239	Invercargill City	Otago/Southland
2118	Newfield Park School	External	Contributing (Year 1-6)	215	Invercargill City	Otago/Southland
2120	Bluff School	External	Full Primary (Year 1-8)	131	Invercargill City	Otago/Southland
4008	Riverton School	External	Contributing (Year 1-6)	141	Southland District	Otago/Southland
4017	St Joseph's School (Invercargill)	External	Full Primary (Year 1-8)	161	Invercargill City	Otago/Southland
4019	St Patrick's School (Nightcaps)	External	Full Primary (Year 1-8)	29	Southland District	Otago/Southland
4020	St Patrick's School (Invercargill)	External	Contributing (Year 1-6)	290	Invercargill City	Otago/Southland
4021	St Teresa's School (Bluff)	External	Full Primary (Year 1-8)	26	Invercargill City	Otago/Southland
4027	Te Tipua School	External	Full Primary (Year 1-8)	24	Southland District	Otago/Southland
4032	Tuturau Primary School	External	Contributing (Year 1-6)	30	Southland District	Otago/Southland
4047	Waverley Park School	External	Contributing (Year 1-6)	269	Invercargill City	Otago/Southland
4217	Te Wharekura o Arowhenua	External	Composite (Year 1-15)	205	Invercargill City	Otago/Southland
				6609		

The purpose of this study is:

1. To investigate current trends of meal plans within the New Zealand and Southland primary school sector.
2. To investigate how the Ka Ora, Ka Ako | Healthy School Lunches Programme will influence Southland children's academic, behavioural and physical performance within the classroom.

1.2 Aim and Research Questions

The study aims to find out if Government-run lunches within New Zealand and specifically Southland primary schools will enhance academic, behavioural and physical performance within the classroom.

To achieve this aim, the researcher will answer several questions:

- What is the academic, behavioural and physical impact of free, healthy lunches within Southland primary schools?
- What type of infrastructure will schools need to supply free, healthy lunches within Southland primary schools?
- What are the consequences for the school staff concerning the free, healthy lunch programme within Southland primary schools?

1.3 Research Hypothesis

This study hypothesizes that the free, healthy lunch service within Southland primary schools will increase academic, behavioural and physical performance within the schools. However, this will come with extra burden and cost to each school.

1.4 Significance

Currently, the New Zealand government is trialling free and healthy lunches in 25% of all schools around New Zealand (MOE, 2020). The New Zealand government has a considerable investment in this programme, with a budget of $263 million in 2022/23 (University of Auckland, 2023). At the present time there is a large debate if the free and healthy lunches programme, should continue and should be supplied to every school child in New Zealand.

In New Zealand there are current issues around academic performance and attendance, and it is suggested that the free and healthy lunches programme will improve academic, behavioural and physical performance within primary schools (Vermillion Peirce et al., 2021). In New Zealand there are many issues in education, such as lack of funding for education, and increased workload for teachers, and will the extra burden of the free and healthy lunches programme effect the primary school staff , who are already under huge workloads.

1.5 Overview of Methods

Therefore, the purpose of this study is:

1. To investigate current trends of meal plans within the New Zealand primary school sector.
2. To investigate how the Ka Ora, Ka Ako | Healthy School Lunches Programme will influence New Zealand children academic, behavioural and physical performance within the classroom.

The research methodology used will be a mixture of qualitative and quantitative research. The questionnaire and interview will be the method of data collection to answer the purpose of this study. The questions in the questionnaire will be a mixture of closed and open-ended questions.

> Questionnaires can be classified as both quantitative and qualitative methods depending on the nature of questions. Specifically, answers obtained through closed-ended questions with multiple choice answer options are analysed using quantitative methods, and they may involve pie-charts, bar-charts, and percentages. Answers obtained to open-ended questionnaire questions are analysed using qualitative methods, and they involve discussions and critical analyses without the use of numbers and calculations (Dudovskiy, 2019, para. 1).

The interview methodology will provide a semi-structured interview technique. A semi-structured method uses pre-set questions with the potential to ask further questions in order to seek clarification (Dudovskiy, 2019).

1.5.1 Research question one – What is the academic, behavioural and physical impact of free healthy lunches within Southland primary schools?

Primary data research collects original data to answer a specific question (Allen, 2017). Primary data collection and analysis will provide evidence for answering research question one. Research question one will use the method of questionnaire and interview methodology. The questionnaire research methodology is a technique for collecting data. Open and closed-ended questions give the researcher a variety of question types within the questionnaire. The interview methodology will direct questions to a specific population, which gives the researcher the ability to obtain more reasoning for outcomes (Thomas et al., 2015).

1.5.2 Research question two – What type of infrastructure will schools need to supply for free healthy lunches within Southland primary schools?

Primary data collection and analysis will provide evidence for answering research question two. Research question two will use the method of questionnaire and interview methodology.

1.5.3 Research question three – What are the consequences for the school staff concerning the Free Healthy School Lunch Programme within Southland primary schools?

Primary data collection and analysis will provide evidence for answering research question three. Research question three will use the method of questionnaire and interview methodology.

1.6 Preview of Thesis

There will be eight chapters in this research thesis.

Chapter one will introduce the topics of the thesis. The introduction will investigate the background information of the study, the aims, purpose, research questions and overview of the methodology.

Chapter two will focus on the literature surrounding the impact of lunch programmes within primary schools. The topics in the literature review are:

- History of school lunch service
- New Zealand government's free lunch scheme
- Obesity issues relating to New Zealand children
- Factors influencing children's performance in the classroom
- Nutritional benefits for lunch programmes for primary school children

Chapter three will discuss the methodology of the research. Chapter three includes research questionnaires and interview procedures.

Chapter four will present the key results of the teaching staff perspective of the Free Healthy School Lunch Programme. Results will illustrate the findings of the studies, which will include figures and tables and written information. Chapter four will also discuss the essential findings and interpret information compared to past research.

Chapter five will present the key results of the principals' perspective of the Free Healthy School Lunch Programme. The results will illustrate the findings of the studies, which will include figures and tables and written information. Chapter five will also discuss the essential findings and interpret information compared to past research.

Chapter six will present the key results of the children's perspective of the Free Healthy School Lunch Programme. The results will illustrate the findings of the studies, which will include

figures and tables and written information. Chapter six will also discuss the essential findings and interpret information compared to past research.

Chapter seven will discuss strategies to improve the Ka Ora, Ka Ako | Healthy School Lunches Programme and will justify reasons for recommendations.

Chapter eight will conclude the findings of the thesis and make recommendations/suggestions for future research.

1.7 Summary

Chapter one discussed the background information on this research topic. The introduction included the research aims, purpose, hypothesis, and research questions. Chapter two will review current literature surrounding free healthy lunches within New Zealand primary schools and the impact of academic, behavioural, and physical performance within the classroom.

CHAPTER TWO

LITERATURE REVIEW

2.0 Chapter Introduction

This chapter will investigate the current literature on primary schools' history of academic, behavioural and physical performance related to school lunches. This chapter will examine a government-run lunch programme's potential cognitive and health benefits.

2.1 Key Literature Topics

The New Zealand government implemented a Free Healthy School Lunch Programme for New Zealand primary school children called Ka Ora, Ka Ako | Healthy School Lunches Programme in 2020 (MOE, 2019a). This literature review will investigate the history of school lunches around the world and the impact that school lunches have on children's education. The researcher will also focus on why the New Zealand government is implementing a Free and Healthy Lunch programme within the primary school sector. This literature review will also research the effects of school lunches on childhood obesity, nutritional benefits, and academic, behavioural and physical performance within the classroom.

2.2 History of school lunch service

This part will describe the school lunch programmes around the world. It will briefly review school lunch programmes in the United States of America (USA) and Great Britain (GB).

2.2.1 General school lunch service

The origin of the term "lunch" is unclear. Some researchers propose that it comes from the word "nuncheon", which originated from an Anglo-Saxon word meaning "a quick meal". During the

Middle Ages, workers would rise early to maximise daylight, making them hungry around noon. This led to the development of the lunch concept as we know it today (Winterman, 2012).

Schools in Europe started providing food services in the 1700s. In 1790, German students were given lunch and clothes for their unemployed parents, but with the condition that their parents would work for the army and their children would attend school afterwards. In the 1900s, most countries made food available in schools (Blakemore, 2017).

2.2.2 United States of America School Lunch Service

In the United States (US), school meals were more sporadic than in Europe, with some cities offering food services at schools such as Boston and Philadelphia in the 1890s. In 1910, home economic classes provided lunches in Boston for elementary schools. Initially, the children would eat at their desks, as no lunchroom buildings existed (Avey, 2015).

Between 1929 and 1939, the great depression was the worst economic downturn in US history (Wheelock, n.d.). The great depression severely affected millions of people in the US, through lack of income, starvation, and early death (Wheelock, n.d.). The great depression brought about a significant change in how schools and teachers had to modify the education system and teaching pedagogy (Tucker, 2023). School budgets were cut, teacher salaries were reduced, and curriculum areas such as music and sports programmes were diminished (Grossman, 2015). The additional ongoing challenge for teachers was maintaining the educational environment for the children while battling against the constant lack of food and starving children (Tucker, 2023).

After the great depression and World War II, US Congress passed the National School Lunch Act (1946), that all schools in the US needed to provide lunch at schools (Gay, 1996). The National School Lunch Act was to safeguard the health and well-being of US children. Once the US Congress passed the National School Lunch Act, the US government developed a National School Lunch Programme (NSLP) (ILSNA, n.d.). The NSLP feeds all US children a healthy lunch meal each school day (Avey, 2015).

To achieve the NSLP, the government funded 75% of the cost of the food (Avey, 2015). Government grants helped schools to update building structures to cater for kitchens and dining halls. Schools also required staff for cooking, cleaning, and serving food to the children, which the government funded. The 'Cafeteria Belt' was a popular way of providing meals for a large number of students in schools (Avey, 2015). This method involved an assembly line style of food delivery where the students could choose the food they wanted and place it on their tray (Avey, 2015).

However, over the years, issues with the NSLP have gone from undernutrition to overnutrition. Presently, the rates of obesity for children (2-18 years old) in the US are 18.5% and 19.9% for children in the lowest-income families (CDC, 2019). A study by Ralston et al. (2008) investigated trends and issues with the NSLP. This study focused on three critical issues with the NSLP: nutritional quality of foods, programme costs/revenues, access and integrity. Ralston et al. (2008) suggested that the NSLP has new challenges with concerns over childhood obesity and lack of diversity in children's diets.

In 2010, the US government passed the Healthy, Hunger–Free Act to supply US children with healthy school lunches and improve access to the programme (Kenney et al., 2020). The Healthy, Hunger–Free Act (2010) helped to improve the quality of the school meals and to promote healthier eating habits. A study conducted by Kenney et al. (2020) investigated 173,013 US children from all over the country and found that the Healthy, Hunger–Free Act (2010) was significantly associated with decreasing the risk of obesity for students in poverty. Kinderknecht et al. (2020) found similar findings with the improved quality of children's dietary habits due to the introduction of the Healthy, Hunger–Free Act (2010). More recently however, Richardson et al. (2022) highlighted that the link between decreasing obesity and the introduction to the Healthy, Hunger–Free Act (2010) may not be as straight forward as previously thought. Richardson et al. (2022) quoted, "Results of research evaluating school meals and child obesity

preceding the HHFKA have been mixed, with several reports suggesting that school meals contribute to child obesity, whereas others do not".

Currently, in the US, overconsumption of food is causing a significant cost to the US government due to decreased productivity, increased burden on the health sector and early onset of death (CDC, 2019). Ensuring that school lunches are suitable for students is a significant issue in the US, and standardising meal plans is critical for a healthy school population.

The NSLP serves nearly 100,000 schools across the United States and provides school lunches to 29.6 million children. Depending on their eligibility, children may receive the lunches for free, at a reduced price, or by paying the full cost. In the 2018-2019 school year, 58.2% of children in the US participated in the NSLP (Zuercher et al., 2022).

2.2.3 British school lunch service

The British school lunch service has a similar history to the US. Initially, the school system did not feed the children during school time. However, in Manchester (UK), in 1879, children were fed in some schools (Bradshaw, 2017). In 1905, the English government passed the Education Act, which supplied needy children with meals at school (Holland, 2022). In 1941, the British government introduced the National School Meal policy (Evan & Harpert, 2009).

> Shortly after, the Education Act (1944) made it a duty of all Local Education Authorities (LEAs) to provide school meals for those who wanted them, and from 1947, the full net cost of school meals was met by the Government. Although the principle of a standard charge for the school meal was introduced in 1950, full financial responsibility for the school meal service was passed to LEAs (Local Education Authorises) in 1967. The cost of a school meal continued to rise and was 12 pence in 1971 (Evans & Harper, 2009, p. 90).

In 1980, the British government investigated the school lunch programme and found issues with inequalities in the nutritional value of the food (Holland, 2022). The primary issue was giving children free choices of food, which led to health issues such as increased dental caries and obesity rates (Holland, 2022). In the late 1980s, the British government introduced a tender system for the lunch service, which meant the cheapest food service would get the tender. The tendering service impacted the food quality and nutritional standards (Evan & Harpert, 2009).

In the 2000s, England, Scotland, Wales and Ireland controlled school lunches in schools rather than the British government (Jessiman et al., 2023). All countries followed similar nutritional guidelines and food practices. Although all United Kingdom (UK) countries have similar dietary guidelines, there are various methods of assessing dietary standards (Evans & Harper, 2009).

In the UK currently, household food insecurity is one of the key issues. With increased foodbank demand, low household incomes and increased living costs, the UK population are struggling to supply food in the house (Jessiman et al., 2023). The school lunch programme in Britain is still currently means tested on the parent's income. To receive a free school lunch in the UK will depend on several factors, which include household income and where you live. However, in Scotland, primary school level one to five students received a free lunch at school in 2015. All other school years in Scotland follow the means-tested procedure (Scottish Government, 2021). In Wales, the government is planning a free school lunch programme for all primary school students (Welsh Government, 2022). In Northern Ireland, school lunches are means-tested for all students. All students aged four to seven in English school receive a free lunch. At eight years old in England, free school lunches "are a targeted benefit. Children of all ages in full-time education are eligible for free school meals if their parents/carers receive state benefits such as Child Tax Credit or Universal Credit. However, the eligibility threshold is high (gross income must be less than £16,190 per annum for those in receipt of child tax credit and below £7,400 for those in receipt of Universal Credit)" (Jessiman et al., 2023).

In Britain, children eligible for a free school lunch meal in 2023 were England at 23.8%, Wales at 22.2%, Scotland no numbers available and Northern Ireland at 27.7% (School Food Matters, n.d.).

2.2.4 Lunch systems around the world

Around the world, 83% of countries supply a school lunch meal, which supplies around 418 million children daily (Cohen et al., 2023). Cohen et al. (2023) suggest that only 41% of primary school children are fed, and the majority of students are from high-income countries. Around the world, there are various methods of supplying meals at schools. These can be broken down into three different methods of supplying lunch meals:

1. Students provide their meals/lunches at school.
2. The school/government provides free meals/lunches at school (universal school meals).
3. The school/government provides the meals/lunches for a cost or via a grant.

Countries such as Sweden, Brazil, Estonia, India, Finland, and South Korea have a government-funded programme for free school lunches (Heim et al., 2022). Heim et al. (2022) found that free school meals improved educational health and learning environments. The key findings of this study were that the researchers found improvements in attendance and students building better social relationships (Heim et al., 2022).

One of the first countries to adopt free school lunches was Sweden in 1946 (Cohen et al., 2023), and it was in most schools by the 1960s (Patterson & Elinder, 2014). In 1997, in Sweden, an Education Act occurred to guarantee all children in Sweden have access to a free school meal (Patterson & Elinder, 2014). In 2011 and 2013, the Swedish government created legislation to ensure that school meals were healthy and nutritious.

Rooth and Lundborg (2021) investigated the effects of the Swedish lunch nutrition reforms on lifetime income. In their research, they found “that the programme generated substantial long-term benefits: pupils exposed during their entire primary school period have 3% greater lifetime income compared to unexposed pupils. Second, we find interesting heterogeneity in the effects: children from poor households benefit the most, although children from all households benefit to some extent. While pupils from poor households have 6% greater lifetime income compared to unexposed pupils, those from the other households still benefitted and have about 2% greater lifetime income. Hence, applying the reform to all pupils led to universal effects.” (Rooth & Lundborg, 2021, para. 11).

More recently, in India, the Indian government adopted the free school lunch programme in 2008 (Cohen et al., 2023). The reasons why the Indian government started free school lunches were to increase the number of children enrolling in schools and for children to have at least one healthy meal per day (Rhitu, 2014). The Indian free school lunch programme has improved school enrolment, class attendance, and children’s diet (Chutani, 2012). Chutani (2012, p. 153) states that “school lunch program like the mid day meal scheme help in reducing food insecurity and therefore would help in preventing poverty cycle where poor children go hungry, do not attend school/college and thus remain illiterate and thus fail to rise above their socioeconomic status and in turn have family where children having similar cycle”. The table below shows some countries adopting a free lunch programme in all schools and the year they introduced the policy (Cohen et al., 2023).

Table 2.1

Countries who have adopted a free lunch programme in all schools and the year they introduced the policy

	Year policy introduced
Brazil	2014
Estonia	2002
Finland	1948
India	2008
South Korea	2011
Sweden	1946

Other countries have adopted free school lunches for low-income households, charging other students full or subsidised prices. As previously mentioned, the UK uses a mixture of free school lunches for a specific age or low socio-economic groups, and charges other students full or subsidised prices for other age groups. In the US, free school lunches are supplied to lower socio-economic children and charged to other students. The school lunch programme has been implemented in Japan since 1947 (Cohen et al., 2023). In Japan, students in primary and secondary schools cannot bring their own lunch to school. The school lunch is provided, and all lunches are subsidised (Deirdre, 2019). In Japanese schools, lunch is provided by nutritionists each day, and lunches are eaten in the classroom. In Japan, school lunches are based on 'Shokuiku', which means food and nutrition education (Tanaka & Miyoshi, 2012).

Shokuiku promotes developing the students' knowledge and understanding of food and nutrition, rather than just eating lunch. Tanaka and Miyoshi (2012) suggested that the Shokuiku approach reduces physical and mental issues within Japanese schools. The school/government provides the meals/lunches for a cost or via a grant.

Table 2.2 illustrates countries that have adopted a lunch programme with differing payment methods in all schools and the year they introduced the policy. With many countries providing school lunch meals, it is interesting how different implementation strategies are used and how evidence around different methods (free meals vs user pays) have varying outcomes.

Table 2.2

Countries who have adopted a lunch programme with differing methods of payment in all schools and the year they introduced the policy

	Year policy introduced
England	2014
Japan	1947
Scotland	2015
USA	1980

Participation in school lunch programmes

With 83% of countries providing school lunch meals, there are still barriers for students not to consume their meals from the school (Cohen et al., 2023). Japan has made it compulsory to consume school lunch meals, whereas most countries let students choose if they want a school lunch meal or bring their own packed lunch (Tanaka & Miyoshi, 2012). With school lunch programmes having either universal free or subsidised version of the programme, participation varies between countries. Participation in the British school lunch programme was 47% of all primary and high schools during 2021 and 2022 (Govt.UK, 2023). In England, the number of students eligible for free school meals is 2,019,509 children in 2023 (School-meals-matters, 2023); around 23% of this population. In the US, the school lunch programme supplied 29.7 million students with lunch every day in 2018-19; around 60% of students received a school-provided meal (Hayes & VanHorn, 2021). In 2020, 76.9 percent of the US school lunch programme was either free or reduced-price (USDA, 2022).

A quote from David Sandman, President and CEO of the New York State of Health Foundation, stated, “Only one-third of public-school students eligible for free or reduced-price lunch take part in the program. What is stopping them? Stigma” (Schwartz & Rothbart, 2019, p. 5). One potential factor influencing participation in school lunch programmes is the stigma of poverty (Leos-Urbel et al., 2013). Leos-Urbel et al. (2013) investigated the impact of free school breakfast on meal participation and educational outcomes. The researchers found that using a free school breakfast for all students model increased school breakfast programme participation

and reduced issues such as the stigma of poverty. The number of students previously subsidised by five cents for free meals increased by 20%, and full-priced meals increased (35 cents per meal) by 35%. Schwartz and Rothbart (2019) found similar findings to Leos-Urbel et al. (2013) in a free universal school lunch programme for improving attendance and reducing the stigma of poverty. Schwartz and Rothbart (2019) researched New York City middle schools that received free school lunches for all students. The study results indicate that free school lunches increase educational test scores in poor and non-poor groups. Another result showed that a free school lunch meal increases participation in school meals. Although stigma was not measured, the increase in participation of all students would indicate a decrease in stigma. "Findings for the poor—who largely would experience no direct change in price—suggest that stigma also plays a role in participation decisions. As for unintended consequences, we see no evidence that the reduction in the price of school lunch leads to a decrease in participation in school breakfast due, perhaps, to a substitution effect (Breakfast was already free in NYC public schools.)" (Schwartz & Rothbart, 2019, p. 28).

2.2.5 Lunch system within New Zealand

New Zealand has three school types of classifications: state, state-integrated and private schools (Immigration, 2019). Within state schools, there is a decile rating system of schools. The measurement of the socio-economic position of the school's area determines the decile rating, and the lower the decile, the more government support it recieves (MOE, 2019b). In January 2023, the Ministry of Education (MOE) changed how New Zealand schools are identified and developed a system called 'The Equity Index' (MOE, 2022b). The equity index considers 37 variables related to achievement within the school and is based on the children rather than the school area (MOE, 2022b).

There are a variety of different nutritional strategies that schools use to feed children in New Zealand. The nutritional strategies are:

1. Families supply all food and beverages for their children during the school day.

2. Schools supply breakfast for children. Families supply morning tea and lunch during the school day.
3. Families supply breakfast and morning tea. Schools provide lunch for children during the school day.
4. Schools provide partial meals (fruit or milk), and the family provides the rest during the school day.
5. Schools supply all food during the school day.

2.3 Government's free lunch scheme

In 2019, the New Zealand government implemented the Free and Healthy Lunches in Schools programme called Ka Ora, Ka Ako | Healthy School Lunches Programme as part of the Child Youth and Wellbeing strategy (Ardern, 2019). Implementing the Free and Healthy Lunch programme was part of the Child and Youth Wellbeing Strategy. The purpose of the Child and Youth Wellbeing Strategy was to: "Set out a framework to improve child and youth wellbeing that can be used by anyone. Drive government policy in a unified and holistic way. Outline the strategies the Government intends to implement. Harness public support and community action. Increase political and public sector accountability for improving wellbeing. Improve wellbeing outcomes for Māori children and young people" (Child and Youth Wellbeing, 2019a, para. 3).

According to a 2017 UNICEF report card, New Zealand is in the bottom three of 41 high-income countries for the following wellbeing indicator: Ensuring healthy lives and promoting wellbeing for all ages and children living in jobless households (Child and Youth Wellbeing, 2019a).

The New Zealand government offered the programme to 30 schools in term one in 2020, followed by 120 schools by the beginning of 2021. The Ka Ora, Ka Ako | Healthy School Lunches Programme was to focus on primary schools to improve educational outcomes. The effects of wellbeing and educational performance will determine the programme's success. The

Ka Ora, Ka Ako | Healthy School Lunches Programme was estimated to cost $45 million to the New Zealand government in 2019 (MOE, 2019a).

2.3.1 Ka Ora, Ka Ako | Healthy School Lunches Programme

In 2020, the Ka Ora, Ka Ako | Healthy School Lunches Programme started in different provinces in New Zealand (MOE, 2023b). The initial areas were the Bay of Plenty, Hawke's Bay, Southland, and Otago over the 2020 school year. The Ka Ora, Ka Ako | Healthy School Lunches Programme covered around 13,000 children and 111 schools in 2020 (MOE, 2023b). By the end of 2021, there were 215,000 children in the Ka Ora, Ka Ako | Healthy School Lunches Programme, which included 963 schools. This programme covered over 25% of the school population within New Zealand (MOE, 2023b).

The Ka Ora, Ka Ako | Healthy School Lunches Programme aimed "to reduce food insecurity by providing a nutritious lunch every day"(MOE, 2023b, para. 1). The programme cost $263 million for the 2022/23 fiscal year. In 2023, the New Zealand government increased the budget to allocate $323.4 million for 2024 (Nicol-Williams, 2023). The cost per meal depends on whether the school uses external or internal providers. The external provider cost per meal is $5.56 for years 0-3, $6.50 for years 4-8 and $8.28 for years 9+. The internal provider's cost per meal is $5.14 for years 0-3, $6.02 for years 4-8 and $7.65 for years 9+ (MOE, 2023b).

The Ka Ora, Ka Ako | Healthy School Lunches Programme was based on the specific schools targeted for the programme the low socio-economic schools (Gerritsen, 2023a). The Ministry of Education MOE would select the schools using the Ministry's Equity Index (EQI) (Vermillion Peirce et al., 2021). The EQI takes into account socio-economic factors (37 factors) and barriers rather using than the decile rating of the school (Vermillion Peirce et al., 2021). Once the school has been selected, schools would choose how to deliver this programme: onsite or via a provider(s). For both delivery methods, the provider must follow the MOE nutritional guidelines for all school lunches. These guidelines were for food preparation, delivery and management of waste. The schools that supplied their school lunches on site had to supply a suitable kitchen and

staffing for this programme. If the school choses to use a supplier, then the school would use a tendering system to find an appropriate provider. The school could use multiple providers (Vermillion Peirce et al., 2021).

2.3.2 Ka Ora, Ka Ako | Healthy School Lunches Programme Research

Vermillion Peirce et al. (2021, p. 1) assessed the outcomes of the Ka Ora, Ka Ako | Healthy School Lunches Programme over the last three years. The researchers focused on children's wellbeing, education, attendance and fullness in the classroom. The four key outcomes were:

1. Consumption
    - This research found a 39% increase in having at least one vegetable in their lunch.
    - The students had a reduction of snacks and sweets (15.7% decrease) at school.
2. Satiety
    - There were 0.8% fewer students who were hungry after lunch.
3. Wellbeing
    - There were 9% fewer students with low overall health and quality of life.
4. Attendance
    - There was no clear benefit for attendance at school.

Vermillion Peirce et al. (2021, p. 1) stated that "The pilot contributed to a significant change towards healthy eating behaviours and a slightly happier and healthier (average) primary and intermediate learner in the first few months".

An article published by Gerritsen (2023a, para. 3) stated: "that co-chairperson Boyd Swinburn said that Ka Ora, Ka Ako | Healthy School Lunches Programme was restricted to schools that had the 25 per cent of students with the highest socio-economic need and it should be at least doubled to the next 25 per cent". In 2022/23, the budget was $263 million; if this was doubled, the cost would be $526 million for 2024 (University of Auckland, 2023). Gerritsen (2023a)

reported that this programme helped with students' education, health and employment in the community. University of Auckland (2023, para. 5) also supported these findings: "enrich school environment, boost local economies, enhance availability and affordability of healthy foods and encourage innovations, such as sustainable packaging". The doubling of the Ka Ora, Ka Ako | Healthy School Lunches Programme was supported by the Talbot Mills poll, which suggested that 63% of people supported the increase of school lunches (Health Coalition Aotearoa, 2023).

Vermillion Peirce et al. (2021) investigated the Ka Ora, Ka Ako | Healthy School Lunches Programme and reported that it was important to focus on the whole school rather than individuals to reduce the stigma of poverty for students who needed free lunches. The researchers a finding from a South Korean study that found a positive relationship in self-esteem when the whole school receives free lunches rather than selected students. Zuercher et al. (2022) supported these findings and found a reduced stigma of poverty around students when they were given to all students for free. The key findings of this study found that Ka Ora, Ka Ako | Healthy School Lunches Programme secondary school programme was 54% satisfied with the school day compared to 40% of students at schools who did not have the programme. Another important finding was that the researchers found that eating together improved wellbeing in the classroom. Garton et al. (2023) debated the benefits of the Ka Ora, Ka Ako | Healthy School Lunches Programme concerning the programme's cost. The researchers debated that increasing household income rather than the cost of the programme empowers the parents. On the other hand, the researchers showed the programme's benefits, as it helps provide a nutritional meal when parents lack nutritional knowledge. "Much research already exists on the factors that influence the uptake of lunches (Everitt et al., 2023), and parental perceptions are fundamental, particularly for primary school-aged children (Bailey-Davis et al., 2013; Martinelli et al., 2020). Opportunity remains, therefore, to strengthen children and whānau engagement in food through curriculum and other strategies" (Garton et al., 2023, p. 84).

2.4 Obesity issues relating to New Zealand children

Improving academic and physical performance in education is linked to healthy eating (MOH, 2019a). A survey conducted in 2015 and 2016 found that one out of three New Zealanders were obese (MOH, 2019c). The ratings for obese children in New Zealand are one out of nine (MOH, 2019c). This survey concluded that socio-economic factors and education play an essential role in rates of obesity. High childhood obesity rates can increase the early onset of numerous chronic diseases and influence cognitive function, social interaction and physical mobility (Khan et al., 2014).

The New Zealand government has approached the obesity issue with various strategies, including Childhood Obesity Plans, Raising Healthy Kids, Healthy Families and Green Prescription (MOH, 2019c). More recently, a joint initiative between the Ministry of Health (MOH), Ministry of Education (MOE) and Sport New Zealand (SNZ) are focusing on healthy eating and more physical activity to reduce obesity rates. The New Zealand government is spending 47.6 million dollars to improve child health (Sport NZ, 2019). The New Zealand government has implemented a Healthy Active Learning programme. The Healthy Active Learning programme focuses on six reasons why the government is focused on children at schools.

1. Children spend a significant proportion of their day in school and eat a third of their food there on each school day. For children in early learning services, this can be even more.
2. Good nutrition and quality physical activity both improve physical health and educational outcomes. Being active has also been proven to improve mental health and social connectedness.
3. Children who are malnourished, have nutritional deficiencies or are obese, have an increased risk of poorer education outcomes, while physically active children are more likely to have better physical and mental health, stay in school and kura longer and achieve better academically.
4. All schools and early learning services are involved in the provision of, or education about, food and drink.
5. Schools and kura are key settings for physical activity, whether that is play, physical activity or sport.

6. The food and physical activity preferences developed during childhood influence food and activity choices as an adult - and therefore, future health and wellbeing outcomes (Sport NZ, 2019).

A study by Schanzenbach (2009) investigated the effects of school lunches and the increased risk of childhood obesity. Schanzenbach (2009) used two approaches to assess the effects of school lunches on obesity: changes in time and regression discontinuity. Using both approaches, the researcher found that consuming school lunch meals increases total energy consumption. The researcher found that children who consume school lunch meals consume an extra 40 calories per day compared with students who bring their own lunch. The researcher also indicated that the US school lunch programme is historically focused on reducing hunger, which could be why school lunches are higher in energy. Gundersen et al. (2012) also investigated the impact of the US national school lunch programme on children's health. They found that children who received the free or reduced-cost lunch programme had better health outcomes than those who did not. Gundersen et al. (2012) reported that food insecurity was reduced by 6%, poor health improved by 33%, and obesity decreased by 21%, which is opposite to the Schanzenbach (2009) findings. Bhattacharya et al. (2004) found similar findings to Gundersen et al. (2012) in the US school breakfast programme. Bhattacharya et al. (2004) found that a school breakfast programme enhances students' score in the healthy eating index, increases students' dietary fibre and reduces the percentage of energy from fat, unlike Schanzenbach (2009) who found higher energy intake in the school lunch meal. Bhattacharya et al. (2004) found that packed lunches in the US school breakfast programme did not affect calories. Another study that investigated the effects of school breakfast on obesity and academic achievement found similar effects to the Bhattacharya et al. (2004) study (Corcoran et al., 2016). Corcoran et al. (2016) investigated the school breakfast programme in New York City and found no effects on body composition. From this study, they did find that school breakfast lowered participation in the school lunch programme. Also, the breakfast programme did not influence academic achievement in this study (Corcoran et al., 2016).

Obesity in New Zealand children is a growing concern, and strategies to reduce the

consequences of obesity are of critical importance in New Zealand health. Healthy school lunch programmes have mixed results for reducing obesity rates, with some studies finding a relationship between healthy lunch programmes and reduced obesity rates (Gundersen et al., 2012; Schanzenbach, 2009), whereas other studies did not (Bhattacharya et al., 2004; Corcoran et al., 2016).

2.5 Performance in the classroom

This section will investigate how lunch in primary schools influences academic, behavioural, and physical performance in the classroom. This review will examine how lunch programmes control academic, behavioural, and physical performance.

2.5.1 Performance in the school academically

In 400 BC, Hippocrates stated, "Let thy food be thy medicine, and thy medicine be thy food" (Witkamp & van Norren, 2018, pp., para. 1). The connection between health and performance is closely tied to what we eat. Eating nutritious foods can improve our wellbeing, while consuming unhealthy foods can have the opposite effect. In fact, unhealthy eating habits can lead to obesity, chronic illnesses, poor cognitive function, and reduced physical performance (Powers et al., 2017).

The link between academic performance and a healthy diet has strong research support. A study in Canada investigated the relationship between food intake and academic achievement among adolescents. The researchers found that students who consumed higher amounts of fruit, vegetables and milk scored higher grades (Maclellan et al., 2008). Another Canadian study investigated boys who met current World Health Organisation (WHO) nutritional guidelines and obtained higher grades than students who did not meet the guidelines (Faught et al., 2017).

Correa-Burrows et al. (2016, p. 189) proposed potential reasons why nutrition influences cognitive functioning. The researchers suggested that:

> several dietary components impact on molecular systems or cellular processes that are vital for maintaining cognitive function. In doing so, diet can affect multiple brain processes by regulating neurotransmitter pathways, synaptic transmission, membrane fluidity, and signal-transduction pathways. Omega-3 fatty acids, a key component of neuronal membranes, elevate brain-derived neurotrophic factors, stimulating synaptic plasticity and the efficacy of synaptic transmission. Flavonoid and non-flavonoid polyphenols, which can is found in fruits and vegetables, modulate learning and memory by promoting neuronal signalling and increasing the production of antioxidants and anti-inflammatory agents.
>
> Conversely, excessive exposure to saturated fats and simple sugars decreases levels of hippocampal brain-derived neurotrophic factors and increases oxidative stress (Correa-Burrows et al., 2016, p. 189).

In a review in 2009, 18% of New Zealand children missed breakfast at least once a week (Horizon Poll, 2015). Another study found that children aged two to 14 consumed at least one soft drink per week (Sport NZ, 2019), consequently showing poor eating habits in New Zealand.

Cohen, Hecht, Hager, et al. (2021, p. 10) investigated the effects of a universal school meal on academic performance in a Systematic Review article. These researchers found that "academic performance may also be influenced by universal free school meals, both directly through potential improvements in nutrition, as well as indirectly through potential increases in school attendance rates". A study by Kleinman et al. (2002) found that giving children a universal-free school breakfast improves academic performance and attendance in the classroom. In this study, children who went on the universal-free school breakfast programme decreased their nutritional risk for six months, and significantly improved their math grades. These findings were also supported by Wahlstrom and Begalle (1999), who found that a universal-free school breakfast programme improved children's concentration, alertness and energy. Whereas, Leos-Urbel et al. (2013) who also investigated a universal-free school breakfast programme found no significant influence on academic performance. Similar findings were found in Mhurchu et al. (2013), who

investigated high-income countries (including New Zealand) on the effects of a universal-free school breakfast programme, which found no significant improvements in academic performance.

Although there is good scientific reasoning as to why a Free Healthy School Lunch Programme should improve academic performance, the research around this topic is not as clear as the scientific reasoning.

2.5.2 Behaviour performance in the classroom

Children's behaviour within the classroom can have huge repercussions on their learning opportunities. Teachers spend a lot of their teaching time managing behaviour inside and outside the school, and the impact of this can be a constant distraction for all students involved. Nutritionists have found that behaviour is associated with nutrition and hormonal control. Hormones are "your body's chemical messenger"(Patton, 2018, p. 26) .

Researchers have investigated the link between nutrition and behaviour in the classroom (Burrows et al., 2017). Burrows et al. (2017) found that nutrition affects the ability to think and behave in a specific way, which would impact academic performance. One study found that consuming a high-fat diet in early life impacted the ability to concentrate in the classroom (Stuber, 2014). Brown et al. (2008) found that poor nutrition was associated with poor attendance due to decreased immunity. The researchers also found that eating breakfast made students less aggressive and decreased school suspension rates.

Research conducted by the US School Breakfast Programme found strong evidence to support the link between nutrition and behaviour (Brown et al., 2008). The study revealed that students who consumed breakfast had better concentration and alertness levels, which was also confirmed by teachers who noticed their students having improved energy and attention during class.

Furthermore, the research highlighted that consuming breakfast improved psycho-social functioning in the classroom (Brown et al., 2008).

Macronutrients play an essential role in fuelling the body with energy. Carbohydrates (CHO) supply energy to the muscles and the central nervous system, including the brain. The brain controls all senses, speech, reasoning, emotion, learning and motor control (Patton & Thibodeau, 2016).

The endocrine system controls CHO metabolism (Hiller-Sturmhöfel & Bartke, 1998). The two hormones responsible for CHO metabolism are insulin and glucagon (Tappy, 2008). These two hormones play a role in the supply and demand of CHO. If there is a requirement for glucose, glucagon is released to increase blood glucose levels, whereas if there is an excess, then insulin directs blood glucose to the liver and muscles (McArdle et al., 2015). High blood glucose levels can cause hyperglycaemia (high blood glucose). Hyperglycaemia causes elevated insulin levels, leading to hypoglycaemia (low blood glucose). Hyperglycaemia is caused by but not limited to high consumption of high glycaemic foods such as lollies, white bread, and sugary drinks, especially if they are frequently consumed (Mann & Truswell, 2017).

Hyperglycaemia can cause symptoms of headaches, irritability, trouble concentrating, fatigue and blurred vision to individuals (NHS, 2023). Hypoglycaemia can be caused either by high levels of insulin due to high levels of glucose or through starvation. Hypoglycaemia signs and symptoms include headaches, trouble concentrating, fatigue and blurred vision to individuals (Mann & Truswell, 2017). Both hyperglycaemia and hypoglycaemia would impact behaviour and concentration within the classroom.

Adrenaline and cortisol hormones play a crucial role in regulating our behaviour (Hiller-Sturmhöfel & Bartke, 1998). During stress, the levels of these hormones increase, leading to a decrease in concentration and energy levels (McArdle et al., 2015). Adrenaline, also known as

the fight/flight hormone, releases glucose from the glycogen stores in our body, allowing us to move quickly. However, elevated adrenaline levels can cause high heart rates, sweating, jittery and over-arousal symptoms (McArdle et al., 2015). Cortisol is another hormone released when high adrenaline levels are present for an extended period (Thau et al., 2023). Its role is to regulate our immune and metabolic systems. High cortisol levels can lead to high blood pressure, fatigue, changes in weight, and increased irritability (Thau et al., 2023). Nutritional factors contributing to increased adrenaline and cortisol include an unhealthy diet and high caffeine consumption (McArdle et al., 2015).

Hunger can have a profound effect on behaviour within the classroom. Once a child becomes hungry, they can lose focus and concentration. Researchers have found that hungry children have lower maths scores (NEA, 2019). The No Kid Hungry organisation has found that 74% of teachers have students who regularly come to school hungry (Gunn, 2018).

Humans produce two hormones, leptin and ghrelin, which control hunger and appetite (Hiller-Sturmhöfel & Bartke, 1998). The role of leptin is to control appetite. This hormone is responsible for managing the amount of food we eat. Ghrelin is a hormone that is responsible for triggering hunger (Patton & Thibodeau, 2016). Nutrition influences both leptin and ghrelin. Protein-rich foods can suppress ghrelin, whereas CHO-rich foods initially control ghrelin levels; however, this is only for a short time compared with protein. Consuming a diet rich in dietary fibre and protein and eating food slowly may improve leptin sensitivity (Powers et al., 2017).

2.5.3 Performance in the classroom physically

Primary schools teach core academic subjects in the morning before lunch (Dimitrova, 2016). The reasoning was that morning learning has a superior recall compared to afternoon learning (Wile & Shouppe, 2011). The researchers found that this teaching method may be more complex than first thought. Researchers have found that the left hemisphere in humans dominates short-term information processing better in the morning. The right hemisphere dominates the

processing of long-term information better in the afternoon. Researchers "suggest gifted people do better in afternoons, and children who have difficulty in reading would perform better in afternoon hours" (Wile & Shouppe, 2011, p. 22).

If students have inadequate lunch, this can influence their performance in physical tasks in the afternoon. Humans need CHO for brain function and performance of physical tasks such as sports and physical education classes. Glycogen stores are limited in primary school student**s,** and glycogen depletion would significantly affect classroom performance if CHO intake is minimal (McArdle et al., 2015).

2.6 Teachers' role in the classroom

According to MOE (2023a, para. 1), the role of the teacher is: "Teachers have full responsibility for the inclusion, wellbeing, learning, and behaviour of all the students in their class. They are responsible for planning, implementing, and ongoing monitoring and evaluating all students' learning and behaviour." The role of the parent in New Zealand is: "As a parent or guardian, you'll work with other people to make decisions about your children. This includes making decisions about their schools, healthcare, religion, culture and language and about where they live" (MOJ, 2023b, para 2). The Care of Children Act 2004 states that parents/guardians should: "promote children's welfare and best interests, and facilitate their development, by helping to ensure that appropriate arrangements are in place for their guardianship and care". According to this Act, parents and guardians must supply care and support for their children, including feeding them (MOJ, 2023a, para. 1).

This debate of who is responsible for feeding their children at school is unclear. Teachers/schools' responsibilities have increased from teaching students to pass tests/exams to thinking and challenging ideas. Recently, the teachers' role has been as educator, counsellor, supporter, assessor, mediator and now feeder (Jan, 2017). Joanna et al. (2020) quoted that "All participant groups accepted that schools have an 'in loco parentis' role, where schools are responsible, not just for delivering an academic curriculum, but for their pupils' overall physical

health and emotional well-being".

Benn and Carlsson (2014) questioned whether school meals are the school's or the parents' responsibility. In their research, when it investigated the question of who is responsible for the school lunches, they had mixed results: "The dilemma of school meals and the school's responsibility to ensure pupils receive the necessary nutrition is evident: At C, the headmaster finds it necessary that the school assumes this responsibility, whereas the headmaster at B finds that the nutritional value of the institutionalised school meal is insufficient and that packed lunches from home generally provided a better alternative" (Benn & Carlsson, 2014, p. 28). Benn and Carlsson (2014) also suggested that a school lunch programme reduces the choice for children and there are children not eating the meals, which leads to increased waste.

Goldthorpe et al. (2020) investigated the perspectives of children, parents and teachers on delivering healthy lifestyles in primary schools. The key finding of this study was that it should be a shared responsibility to educate children on healthy lifestyles. Parents accepted MHS food policies apart from what foods were permitted in their children's lunch boxes. Goldthorpe et al. (2020) also suggested the increase in school-packed lunches and the decrease in school dinners were due to the restrictions on meal choices. Evans et al. (2010) investigated the uptake of British school meals compared with children bringing packed lunches. Their investigations found that more than 50% of primary school children in Britain bring their lunch even though there is a school meal programme. When the researcher compared the nutritional values of school meals against packed lunches, the school meals were generally healthier.

A study investigated why children and their parents choose packed lunches over school meals (Hafsah, 2017). Hafsah (2017) found that children were taking a packed school lunch because they decided they would prefer it to the school meal. In this study, the researcher listed several reasons children prefer packed lunches over school meals. These reasons include the availability of treats, the ability to finish lunch quickly and have more time to play, and parents being able to leave out certain vegetables.

2.7 Nutritional benefits of school lunch programmes

Malnutrition is a significant concern in New Zealand children. Malnutrition "includes undernutrition (wasting, stunting, underweight), inadequate vitamins or minerals, overweight, obesity, and resulting diet-related noncommunicable diseases" (WHO, 2018, para. 1).

Doctors indicate that a significant proportion of hospitalisations are due to poor nutrition (Johnston, 2017). "Child hospitalisation data shows around 120 children a year now have overnight stays due to nutritional deficiencies and anaemia, compared to an average 60 a decade ago" (Johnston, 2017, para. 2). Low incomes, the expense of food and poor nutritional knowledge are potential reasons for this increase in child nutritional deficiencies (Johnston, 2017).

To obtain a healthy diet for children is more expensive than eating unhealthy foods. A Cambridge University study found that healthy foods were three times the cost of unhealthy foods (University of Cambridge, 2019). In the US and British school systems, healthy food prices are a significant issue in supplying children's lunches (Ralston et al., 2008).

> Yet, schools already face a "trilemma" involving the meal's nutrition, student participation, and program cost. Improving the nutritional content of school meals may raise program costs, especially if it includes the necessary changes in food purchases, preparation, and marketing to prevent lower participation or higher plate waste. Similarly, both school administrators and school food authorities have struggled to keep budgets balanced as they implement restrictions on competitive foods. Other cost pressures, such as increases in health care costs and charges of indirect costs by school districts, make this balancing even more difficult (Ralston et al., 2008, p. 3).

A study investigating the effects of school lunch intervention on healthy food choices found that students improved their diet by consuming less sugar and saturated fat (Greece et al., 2017). Another study investigated school meals and academic performance and found higher academic scores with a healthy meal (Anderson, 2018). Anderson (2018) indicated that there were potential reasons why healthy lunches improve academic performance. Firstly, increasing the student's fruit, vegetables, whole grains, and nuts could increase cognitive functioning. The second theory is that eating healthy foods can decrease obesity rates. The second theory suggests that a healthy body shape can improve brain function. Thirdly, a healthy lunch meal had less refined sugar. The researchers suggested that refined sugar can impair the frontal, limbic and hippocampal systems, decreasing cognitive functioning (Anderson, 2018).

2.8 Summary

This chapter provides an overview of the key focus points related to school lunches. Firstly, it explores the historical background of school lunches in New Zealand and other countries. Secondly, it reviews recent literature on the impact of school lunches on classroom performance. The chapter also examines the implementation of the Ka Ora, Ka Ako | Healthy School Lunches Programme, along with its benefits and challenges. Overall, this chapter provides valuable insights into the rationale behind this topic.

The next chapter will outline the research methodologies used in this thesis. The methods section will explain the methodology overview, the type of research, how the method answers the research questions, and the procedure of the four studies within this thesis.

CHAPTER THREE

METHODOLOGY

3.0 Chapter Introduction

The previous chapter discussed the focus points related to school lunches. Firstly, it covered the historical background of school lunches in New Zealand and other countries. Secondly, it reviewed recent literature on the impact of school lunches on classroom performance. The chapter also examined the implementation of the Ka Ora, Ka Ako | Healthy School Lunches Programme, along with its benefits and challenges. Overall, the previous chapter provided valuable insights into the rationale behind this topic.

In this chapter, the research methodologies that were employed in this thesis will be discussed. It will provide an overview of the methodology, the type of research, how the method addresses the research questions, and the procedure of the four studies conducted in this thesis.

3.1 Methodology Overview

This chapter will explain the research methodology and procedures used in this thesis. There will be four studies to answer the research questions:

Study one investigated the Southland primary schools' teachers' perspectives on the effects of the government's Free Healthy School Lunch Programme intervention before receiving this programme. Selected primary school teaching staff within the Southland region received an online questionnaire to answer.

Study two interviewed selected Southland primary school principals on their perspectives of the government's Free Healthy School Lunch Programme.

Study three investigated the impact of the government's Free Healthy School Lunch Programme. Study three focused on the schools that have received the Free Healthy School Lunch Programme. This research investigated the perspective of the principals working in schools that have received the lunch programme.

Study four investigated Southland primary schools' students' perspectives of the government's Free Healthy School Lunch Programme. The purpose of this study was to understand students' perspective of how the New Zealand government's Free Healthy School Lunch Programme has influenced their learning.

3.2 Methodology

The methodology mode for this research was using mixed method research. Mixed-method research involves using a mixture of qualitative and quantitative approaches to analyse the topic (Armour & Macdonald, 2012). The various methods used in this research were questionnaires, interviews and focus groups. From these three methods, qualitative and quantitative data were obtained.

"Mixed methods research draws on potential strengths of both qualitative and quantitative methods, allowing researchers to explore diverse perspectives and uncover relationships that exist between the intricate layers of our multifaceted research questions" (Shorten & Smith, 2017, p. 1). The qualitative method in the research involved the focus groups, interviews and open-ended questions in the questionnaire, whereas quantitative data comes mainly from questionnaires and direct questions that lead to numerical data. The mixed-method research allows the flexibility to adapt the research questions around stakeholders such as principals,

teachers and students (Armour & Macdonald, 2012). One of the most important aspects of mixed method research is the triangulation of the participants' views on the Free Healthy School Lunch Programmes and their perspectives, which enhances the validity and reliability of the research results (Shorten & Smith, 2017). Busetto et al. (2020, p. 5) suggested that triangulation of different research is important "to extend the breadth and range of the study, explanation of (unexpected) results generated with one method with the help of another or offsetting the weakness of one method with the strength of another".

The three methodologies used in this research were online questionnaires, interviews and focus group research. The research methodology of questionnaires can be a valuable tool for collecting qualitative and quantitative data. Online questionnaires can sample a targeted group to receive their perspective on a topic (Thomas et al., 2005). Interview research methodology is used to gain in-depth insight and perspective on a specific topic. A semi-structured interview allows the researcher to be flexible, allowing follow-up questions and exploring the topic in great depth (Harvey-Jordan & Long, 2001). A focus group research is a qualitative methodology that targets a selected group to gather insights, opinions and perceptions on a specific topic (Kitzinger, 1995).

Data from interviews, and long answer questions from the questionnaire and focus groups will be analysed using thematic analysis. Thematic analysis is defined as "the process of identifying patterns or themes within qualitative data" (Maguire & Delahunt, 2017, p. 1). Nowell et al. (2017, p. 2) researched thematic analyses as a research tool and highlighted this method's benefits, providing a "highly flexible approach". However, this flexible approach may lead to issues with incoherent themes (Nowell et al., 2017). Nowell et al. (2017) explain a step-by-step approach to conducting a trustworthy thematic analysis, as shown below in Figure 3.1:

Figure 3.1

Nowell et al. (2017, p. 4) "Establishing Trustworthiness During Each Phase of Thematic Analysis" Model.

Phases of Thematic Analysis	Means of Establishing Trustworthiness
Phase 1: Familiarizing yourself with your data	Prolong engagement with data Triangulate different data collection modes Document theoretical and reflective thoughts Document thoughts about potential codes/themes Store raw data in well-organized archives Keep records of all data field notes, transcripts, and reflexive journals
Phase 2: Generating initial codes	Peer debriefing Researcher triangulation Reflexive journaling Use of a coding framework Audit trail of code generation Documentation of all team meeting and peer debriefings
Phase 3: Searching for themes	Researcher triangulation Diagramming to make sense of theme connections Keep detailed notes about development and hierarchies of concepts and themes
Phase 4: Reviewing themes	Researcher triangulation Themes and subthemes vetted by team members Test for referential adequacy by returning to raw data
Phase 5: Defining and naming themes	Researcher triangulation Peer debriefing Team consensus on themes Documentation of team meetings regarding themes Documentation of theme naming
Phase 6: Producing the report	Member checking Peer debriefing Describing process of coding and analysis in sufficient details Thick descriptions of context Description of the audit trail Report on reasons for theoretical, methodological, and analytical choices throughout the entire study

The themes from the qualitative data from all four studies will use the Nowell et al. (2017) approach.

The research design focuses on answering the research questions.

Research question one – What is the academic, behavioural and physical impact of the Free Healthy School Lunch Programme within Southland primary schools?

Primary data research collects original data to answer a specific question (Allen, 2017). Primary data collection and analysis will provide evidence for answering research question one. Research question one will use a questionnaire and interview methodology. The questionnaire research

methodology is a technique for collecting data. Open and closed-ended questions give the researcher a variety of question types within the questionnaire. The interview methodology will direct questions to a specific population, allowing the researcher to obtain more reasoning for outcomes (Thomas et al., 2015).

Research question two – What type of infrastructure will schools need to supply Free Healthy School Lunch Programmes within Southland primary schools?

Primary data collection and analysis will provide evidence for answering research question two. Research question two will use the method of questionnaire and interview methodology.

Research question three – What are the consequences for the school staff of supplying Free Healthy School Lunch Programme within Southland primary schools?

Primary data collection and analysis will provide evidence for answering research question three. Research question three will use the method of questionnaire and interview methodology.

3.3 Methodology Ethical Procedure and Interview Analysis

3.3.1 Ethical consideration

Ethical approval was awarded from the Te Whare Wānanga o Awanuiārangi ethical committee on the 7th of December 2020 (Appendix A). No identification of participants was allowed at any stage. Mean data was calculated rather than individual data. Upon the project's completion, personal information and data was destroyed. Any raw data on which the results of the project are dependent will be in secure storage for five years.

3.3.2 Interview Analysis

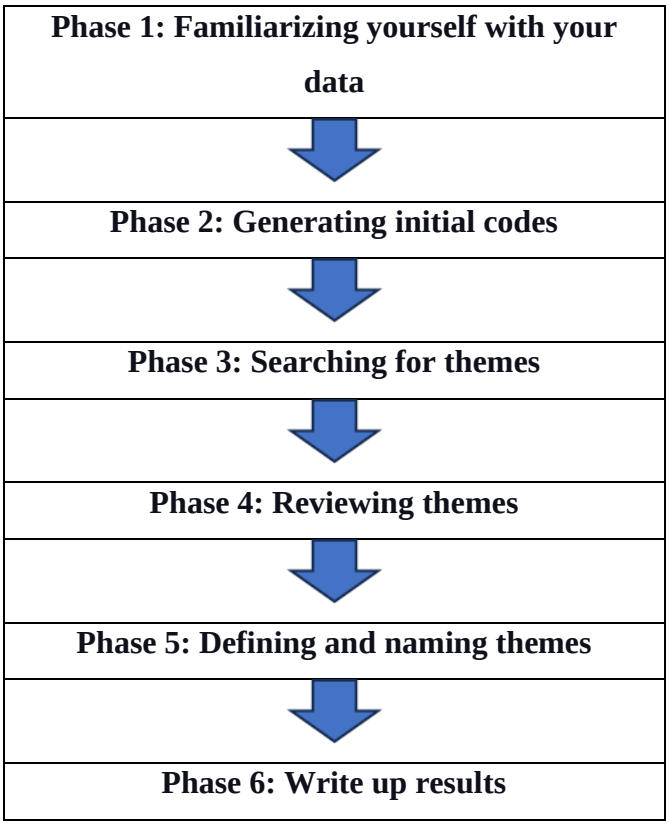
The procedure for analysing long answer questions and interview comments follow the same methodology. The themes were created by the researcher, who looked at patterns from the interview comments / long answer comments and organised them into categories. The thematic approach used within this study was the Nowell et al. (2017) approach. The six-phase approach to creating themes for the two open-ended questions is illustrated in Figure 3.2. The first phase was to become familiarised with the data from the open-ended questions. This was followed by generating initial codes in Microsoft Excel, which was based on previous research and the research questions. The next phase was to organise the data into themes in Microsoft Excel. Once the data was in themes, the information was reviewed. In this phase, the researcher asked himself the following questions, which were developed by Maguire and Delahunt (2017, p. 3358):

- "Do the themes make sense?
- Does the data support the themes?
- Am I trying to fit too much into a theme?
- If themes overlap, are they really separate themes?
- Are there themes within themes (sub-themes)?
- Are there other themes within the data?"

Once the themes are reviewed, the 'refinement of themes' is defined, and the final step is to analyse the themes and compare them to past research (Maguire & Delahunt, 2017).

Figure 3.2

The thematic approach from Nowell et al. (2017, p. 4)



3.3 Study One: Southland primary schools' teachers' perspectives before the government's Free Healthy School Lunch Programme.

Study one investigated Southland primary schools' teachers' perspectives before the government introduced the Free Healthy School Lunch Programme within their school. This study aimed to understand teachers' perspectives on how the New Zealand government's Free Healthy School Lunch Programme will influence their teaching.

3.3.1 Research Participants

Twenty-four teachers from five primary schools participated in this research. The participants conducted this research via an online survey using Google Forms. The participants could decide not to take part in the project at any time without any disadvantage to the participants. All participants met the following criteria: All participants need to be over 18 years old and are teaching at the primary school level within the Southland region in 2021.

3.3.2 Procedure

Upon completing the ethical approval, the researcher contacted each principal to arrange a meeting to discuss the research. After the initial discussion, a formal letter of understanding was followed. Once the principal had formally agreed in writing, the researcher contacted the school's administration or information technology head teacher to send out the questionnaire. The questionnaire was distributed through the school's email via Google Forms. The questionnaire was sent to the teachers before their school had implemented the Free Healthy School Lunch Programme.

The data was collected from March 2021 to August 2021. In the information text on the Google Form, the researcher stated: "This questionnaire is part of research into the impact of lunch on academic, behavioural and physical performance within Southland Primary Schools. This study aims to find out the perspectives of teaching staff on free lunches at primary schools. By

completing this questionnaire, you are giving consent for your information to be used for this research".

3.3.3 Questionnaire

The online questionnaire used a mixture of different methods of questions. These different methods include using:

- Dropdown questions
- Short answer questions
- Linear scale questions
- Yes or No or Sometimes questions
- Multiple choice questions
- Checkboxes questions
- Long answer questions

The questionnaire focused on current trends around behavioural, academic and physical performance associated with lunch. The questions asked about how teachers perceive the impact of the free lunch scheme on their schools (Appendix B).

The questionnaire focused on the following areas:

General information about the school

Trends of eating within the school

Performance within the classroom

Teachers' perception of the government implementing free lunches within schools

The participants had the choice to withdraw from the study at any point by contacting the researcher via email.

3.3.5 Statistical analysis

Results from the questionnaire were analysed initially through the Google Forms application. This study was followed by analysing information in Microsoft Excel. Mean values were calculated using Google Forms software for closed-answered questions in the questionnaire. Figures were also developed by the Google Form software. For the open-ended answers questions, information was coded into Microsoft Excel, where it was put into themes. The two open-ended answered questions were:

> *Do you think that the Free Healthy School Lunch Programme will benefit your teaching practice?*
>
> *Do you see any potential issues with the Free Healthy School Lunch Programme?*

3.4 Study two: Interview with principals on their perspectives of the government's Free Healthy Lunches programme before the implementation of the programme within their schools.

Study two interviewed selected Southland primary school principals on their perspectives of the government's Free Healthy School Lunch Programme before the implementation of the programme within their schools. This study aims to understand principals' perspectives on how the New Zealand government's Free Healthy School Lunch Programme will influence their schools.

3.4.1 Research Participants

The six primary school principals were interviewed. The six primary school principals came from various cohorts within Southland. Three of the primary school's principals came from a rural community, one principal came from a Kura Kaupapa Māori and two principals from the Invercargill town area. Participants could have decided not to take part in the project at any time without any disadvantage to the participants. Participants were limited to the following criteria: All participants need to be over 18 years old and must be a principal at a Southland primary school level within New Zealand during 2021.

3.4.3 Procedure

Upon completing the ethical approval, the researcher contacted each principal to arrange a meeting to discuss the research. After the initial discussion, a formal letter of understanding followed. Once the principal had formally agreed to participate in the study, a meeting was formalised. Each principal signed a consent form before starting the interview.

The meeting used predetermined questions in a semi-structured interview methodology.

> In a semi-structured interview, the interviewer uses a set of predetermined questions, and the respondents answer in their own words. Some interviewers use a topic guide that

> serves as a checklist to ensure that all respondents provide information on the same topics. The interviewer can probe areas based on the respondent's answers or ask supplementary questions for clarification (Easwaramoorthy & Zarinpoush, 2006, para. 4).

The interview methodology aimed to understand the impact of the government's Free Healthy School Lunch Programme. The interviews were conducted separately with the principal. The interview was recorded using an Olympus digital voice recorder (WS-852). Before the interview started, the researcher explained the procedure around a semi-structured interview methodology: the information will be anonymous, and the principals can withdraw at any stage with no disadvantage. Once the interview had finished, the researcher transcribed the interview onto Microsoft Word and then sent the document to the principal for completeness and accuracy before analysing the data. The interviews ranged from 30 to 60 minutes and were conducted from March to September 2021.

3.4.4 Questions

The questions for the interview with each principal were:

1. What do you currently do for school lunches?
2. How do you think the Free Healthy School Lunch Programme will be implemented in your school?
3. What infrastructures will have to be made to cater to the Free Healthy School Lunch Programme?
4. What type of impact will the Free Healthy School Lunch Programme have on your staff?
5. Do you think that a Free Healthy School Lunch Programme will benefit the teaching practice within your school?
6. Do you see any potential issues with the Free Healthy School Lunch Programme?

The principals were asked the questions above, however, due to the semi-structured interview methodology, the questions were not always in this order, as sometimes the principal answered the question before it was asked.

3.4.5 Statistical analysis

Results from the interviews were analysed initially through themes. The researcher created the themes, which looked at patterns from the principals' comments and organised them into categories. Responses were coded into Microsoft Excel for each interview's information, which was put into themes.

The researcher created the themes, looked at patterns from the principals' comments and organised them into categories. The thematic approach used within this study was the Nowell et al. (2017) approach, the six-phase approach to create themes for the interview questions which is demonstrated in Figure 3.2. The process of analysing interview data was the same for all interviews.

3.5 Study Three: Study three investigated the primary school principals' impact of the government Free Healthy Lunch intervention.

Study three focused on the schools that have received the Free Healthy School Lunch Programme. This research investigated the perspectives of the principals working in schools that received the lunch programme.

3.5.1 Research Participants.

The participants for this study were four primary school principals from various cohorts within Invercargill. Three of the schools' principals came from mainstream education, and one came from a Kura Kaupapa Māori. The research participants had to be principals of Southland primary schools which have been involved in the Free Healthy School Lunch Programme. The participants took part in this study via an online survey. Participants can decide not to take part in the project at any time without any disadvantage to the participants. Participants are limited to the following criteria:

- All participants need to be over 18 years old.
- Must be teaching at a Southland primary school level within New Zealand
- Must have been involved in the school's Free Healthy School Lunch Programme.

3.5.3 Procedure

This study investigated the impact of the government's Free Healthy School Lunch Programme. Upon completing the ethical approval, the researcher contacted each principal to arrange a meeting to discuss the research. After the initial discussion, a formal letter of understanding followed. Once the principal had formally agreed to participate in the study, a meeting was formalised. The meeting used predetermined questions in a semi-structured interview methodology.

The interview methodology aimed to understand the impact of the government's Free Healthy School Lunch Programme. The interviews were conducted separately with the principal. The

interview was recorded using an Olympus digital voice recorder (WS-852). Before the interview started, the researcher explained the procedure around a semi-structured interview methodology: the information will be anonymous, and the principals can withdraw at any stage with no disadvantage. Once the interview had finished, the researcher transcribed the interview onto Microsoft Word and then sent the document to the principal for completeness and accuracy before analysing the data. The interviews ranged from 30 to 60 minutes and were conducted from March to September 2021.

3.4.4 Questions

The questions for the interview with each principal centred around:

- General information of the school
- Free lunch protocols
- Trends of eating within the school
- Performance within the classroom

3.5.5 Statistical analysis

Results from the interviews were analysed initially through themes. The researcher created the themes, which looked at patterns from the principals' comments and organised them into categories. Responses were coded into Microsoft Excel for each interview's information, which was put into themes.

3.6 Study Four: Southland primary schools' students' perspectives of the government's Free Healthy School Lunch Programme.

Study four investigated Southland primary schools' students' perspectives of the government's Free Healthy School Lunch Programme. The purpose of this study is to understand the students' perspectives of how the New Zealand government's Free Healthy School Lunch Programme will influence their learning.

3.6.1 Research Participants.

The research participants were students from one Southland primary school. The participants participated in this study via a group interview. Participants could decide not to take part in the project at any time without any disadvantage to the participants. Participants were limited to the following criteria:

All participants must be students from the same primary school which has had the government's Free Healthy School Lunch Programme for at least six months.

3.6.3 Procedure

Upon completing the ethical approval, the researcher contacted the principal to arrange a meeting to discuss the research. After the initial discussion, a formal letter of understanding followed. Once the principal had formally agreed in writing, the researcher contacted the teachers from each classroom. The teachers were given set questions to ask their students, and the teacher facilitated the discussion. The researcher was in the classroom to record the group interview and added in the teacher when required. The group interview was recorded using an Olympus digital voice recorder (WS-852).

3.6.4 Questions for the group interview

The questions focused on the current perspective of the students regarding their views of the government's Free Healthy School Lunch Programme. The lead teacher asked the following questions to the students. The lead teacher facilitated the discussion with the students.

Children's questions on the Lunch Programme:

1. What is your favourite lunch meal in the Free Healthy School Lunch Programme and why?
2. What is your least favourite lunch meal in the Free Healthy School Lunch Programme and why?
3. If you were the chef, what would you do differently when making the school lunches?
4. How could you encourage more kids to eat the school lunches?

3.3.5 Statistical analysis

Results from the interviews were analysed initially through themes. The researcher created the themes, which looked at patterns from the children's comments and organised them into categories. For each group interview's information, responses were coded into Microsoft Excel, which was put into themes.

3.6 Chapter Summary

Chapter three focused on the methodology of the four studies to assess the effects of the Free Healthy School Lunch Programme in New Zealand primary schools. The methods section provided an overview of the methodology, the type of research, how the method addresses the research questions, and the procedure of the four studies conducted in this thesis.

The next chapter examines the findings of the teaching staff's perspective of the Free Healthy School Lunch Programme. It will first focus on the results of a questionnaire from the teaching staff, then discuss the key findings of this questionnaire and analyse the findings with previous research.

CHAPTER FOUR

TEACHING STAFF PERSPECTIVE

FINDINGS/ RESULTS CHAPTER

4.0 Introduction

The previous chapter focused on the methodology of the four studies to investigate the effects of the Free Healthy School Lunch Programme in Southland primary schools.

This current chapter focuses on the teaching staff's perspective of the Free Healthy School Lunch Programme. It focuses firstly on the results of the questionnaire from the teaching staff, then discusses the key findings of this questionnaire and analyses the findings compared with previous research.

4.1 Results

The teacher's role in the classroom is not limited to only transferring information to children; it is shaping the overall educational experiences (MOJ, 2023b). A teacher's perspective on children's needs and requirements within the classroom gives a unique insight into eating behaviours. This chapter investigates the teachers' perspectives of the Free Healthy School Lunch Programme. The first part of this chapter four analyses trends from the results of the questionnaire from the teaching staff. The second part of chapter four explores the major findings of the questionnaire and evaluates the findings as compared to previous research.

4.1.0 Introduction

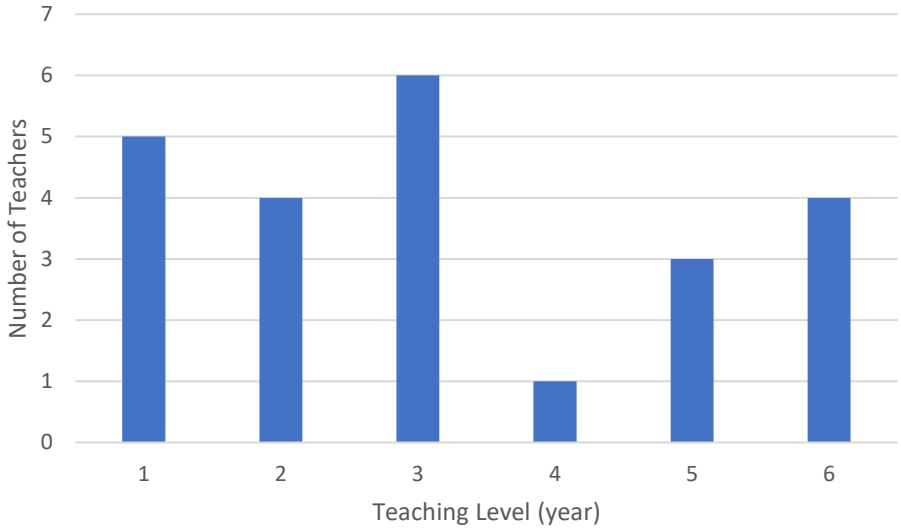
The results section investigates the findings of the online questionnaire completed by teachers in the Southland region. It also investigates key findings from the online questionnaire.

4.1.1 Participants

In the Southland region, 24 responses were collected from five primary schools. The teaching history of the participants ranged from first-year teachers to those with 34 years of experience. Figure 4.1 shows the diverse range of teaching levels among the respondents.

Figure 4.1:

The teachers within the study - years of teaching level (n=23 responses)

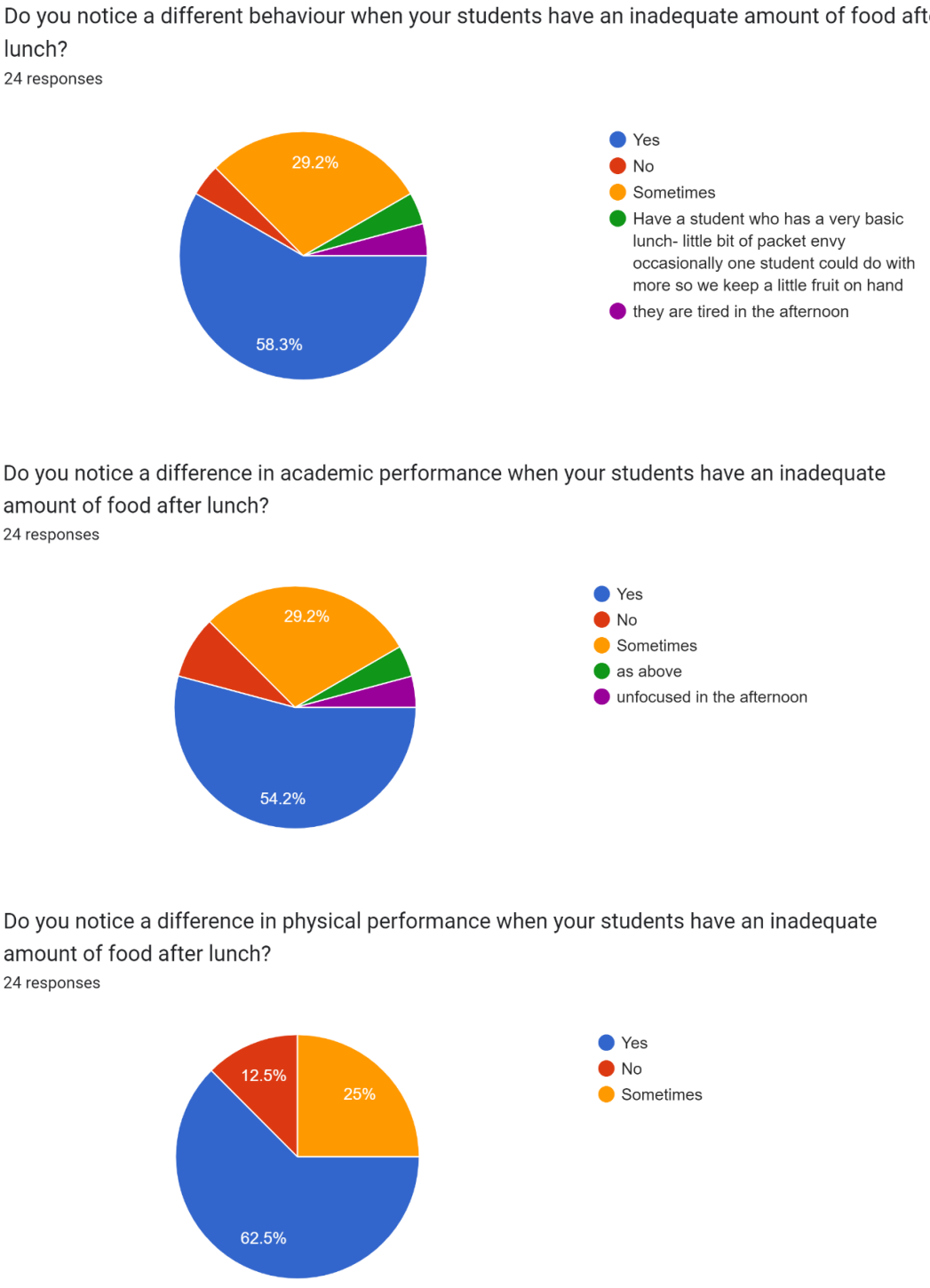


4.1.2 Inadequate consumption of lunch

Inadequate consumption of lunch has unfavourable effects on students. Figure 4.2 illustrates that 58.3% of teachers indicated that lack of food at lunchtime at school impacts behaviour, and 54.2% indicated that lack of food at lunchtime affects academic performance in class. Physical performance after lunch is also impacted by inadequate amounts of food (62.5%).

Figure 4.2:

Southland primary teachers' perspective on the impact of behaviour, academic performance and physical performance when students have inadequate lunch

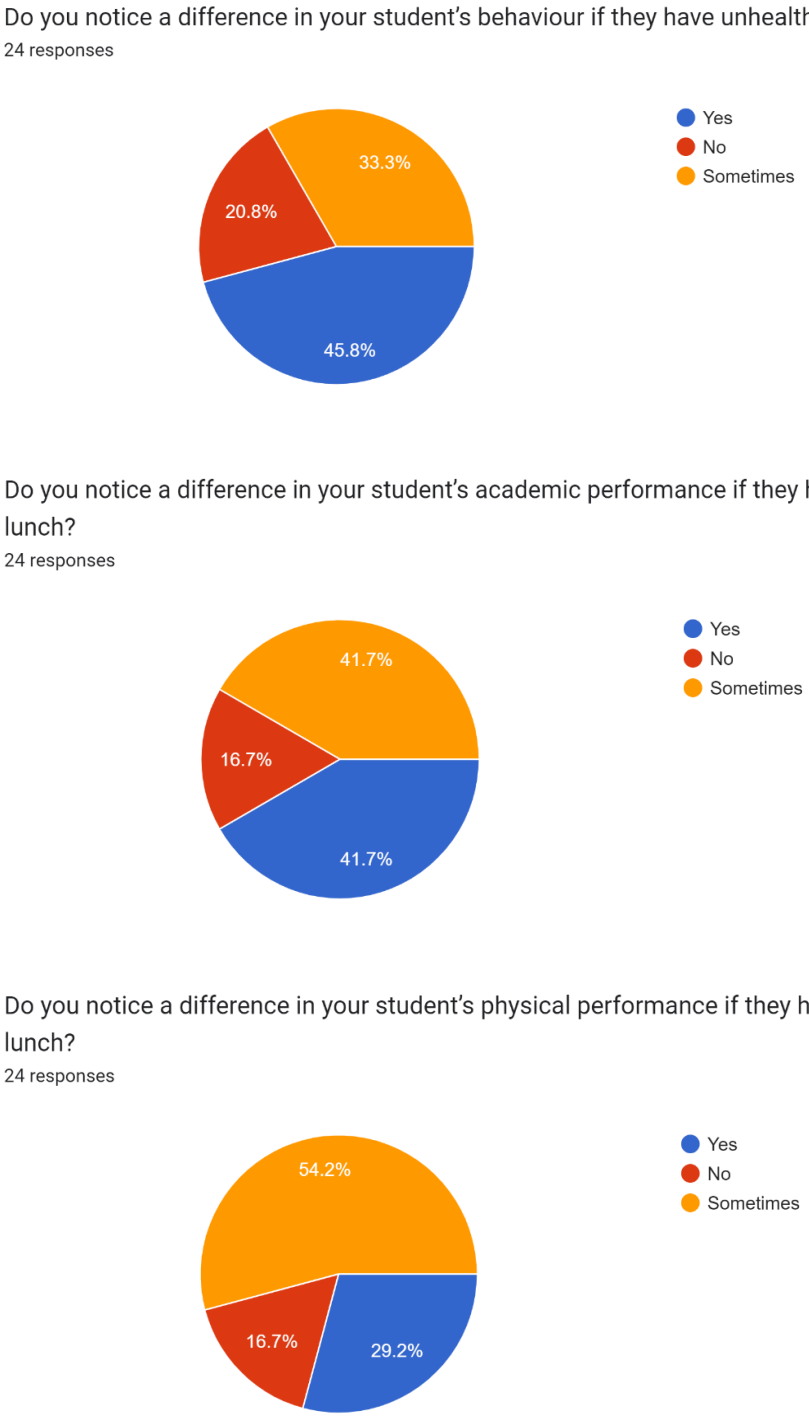


4.1.3 The consumption of unhealthy foods at lunch time at school

The consumption of unhealthy foods can have adverse effects on students' behaviour, academic performance, and physical performance. Teachers report that an unhealthy lunch affects students' behaviour, with 45% saying that it does, 33.3% saying that it does sometimes, and 20.8% saying that it has no impact (Figure 4.3). Regarding academic performance, 41.7% of teachers said that unhealthy eating habits have a negative impact, 41.7% said that unhealthy food sometimes has a negative impact, and 16.7% noticed no effect. For physical performance, a higher percentage of teachers (54.4%) said that unhealthy eating habits sometimes have a negative impact on students' physical performance. 29.2% indicated that they have a negative impact, and 16.7% noticed no impact.

Figure 4.3:

Southland primary teachers' perspective of the impact of behaviour, academic performance and physical performance when students have unhealthy lunch at school



4.1.4 Does the school provide free breakfast and an onsite cafeteria.

From the teachers' questionnaire results, 60.9% of teachers reported that breakfast was not provided at school, while 17% of schools/teachers provide breakfast for children in need who have not had breakfast (Figure 4.4). Additionally, 21.7% of respondents reported providing breakfast to children if the child indicates that they are hungry. Figure 4.5 illustrates that no school had a school cafeteria; however, a small percentage of schools use their school kitchen for heat-ups and have a school canteen.

Figure 4.4:

Results from the Southland primary teachers' questionnaire on how many schools provide free breakfast at their school

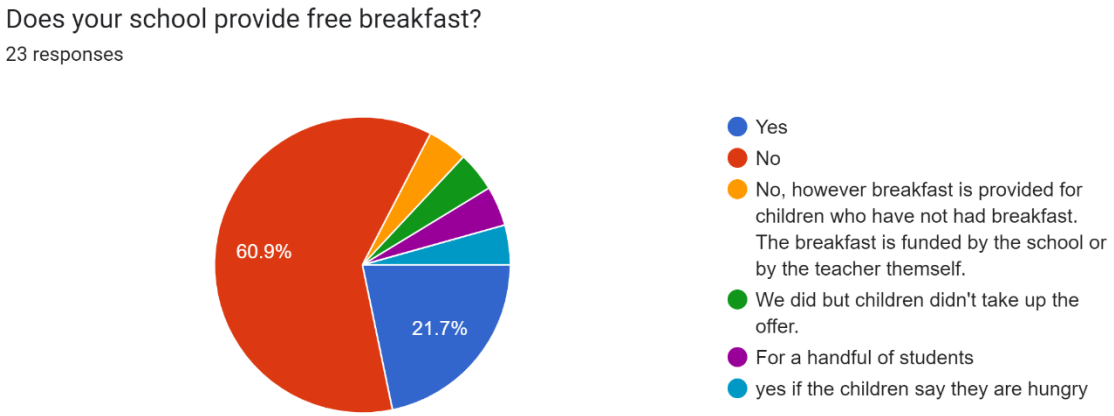
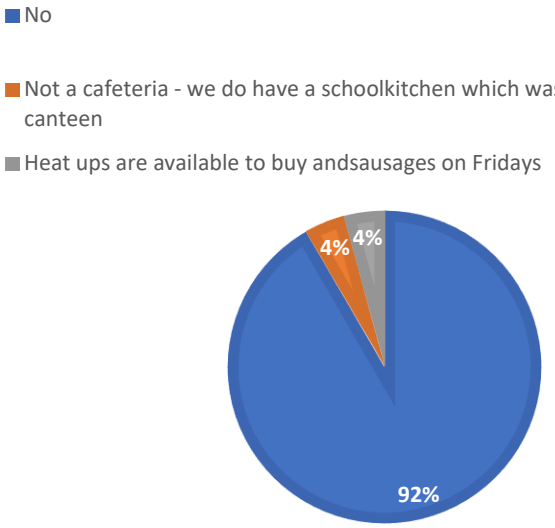


Figure 4.5:

Results from the Southland primary teachers' questionnaire on 'does your school have a cafeteria onsite?' (n = 24 responses)

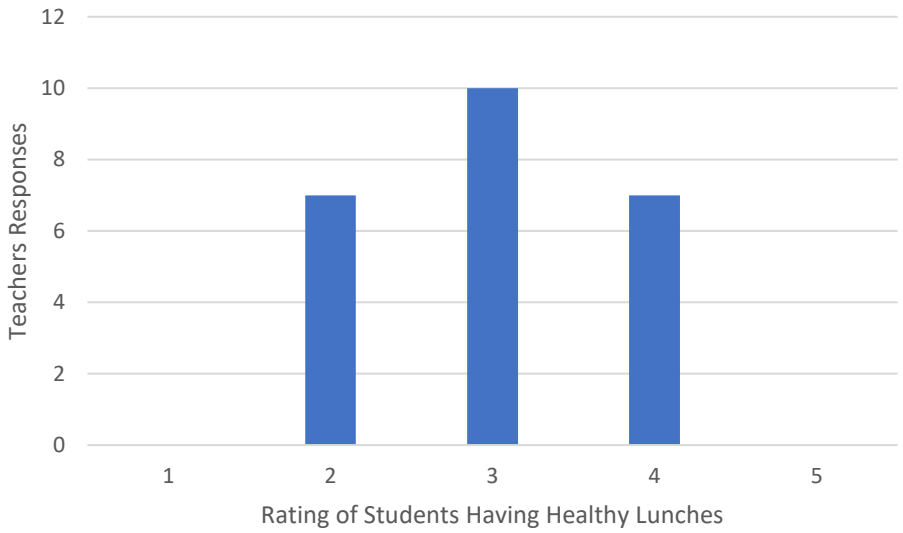


4.1.5 Southland primary teachers' perspective on their students' school lunches and the number of students who do not supply a school lunch

As shown in Figure 4.6, the teaching staff gave their opinion about the healthiness of the students' lunches, with an average rating of "unhealthy" and "very healthy" from ten out of 24 teachers. Seven teachers rated their students' lunches as two out of five in terms of healthiness, while the other seven teachers rated their students' lunches as four out of five in terms of healthiness.

Figure 4.6:

Southland primary teachers' perspective on their students' school lunches (24 reponses)



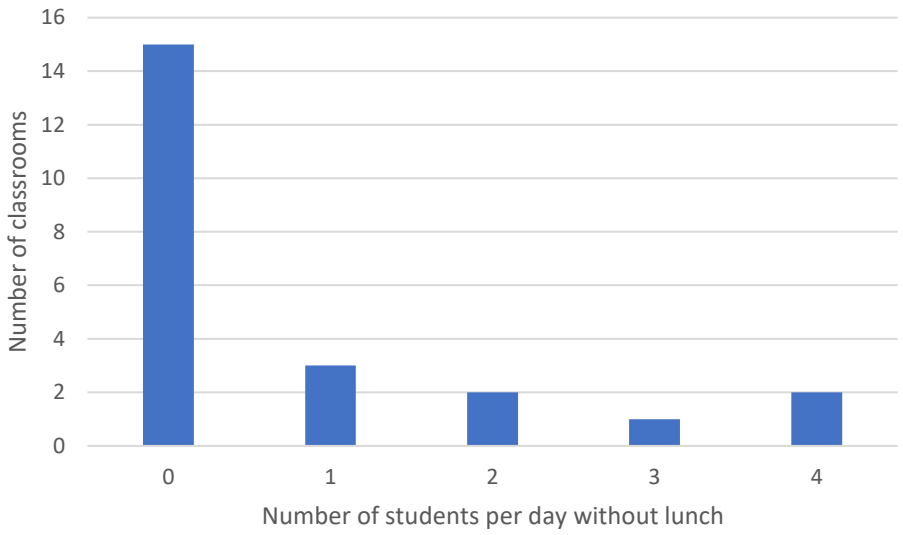
Note: Rating scale

1= Unhealthy 5 = Very Healthy

The results from Figure 4.7 show that 65% of the 23 teachers had all students with packed lunches, while 35% of teachers reported that one or more students had no packed lunch.

Figure 4.7:

Southland primary teachers' perspective on the number of students in their classroom who do not have a school packed lunch (n=23 responses)

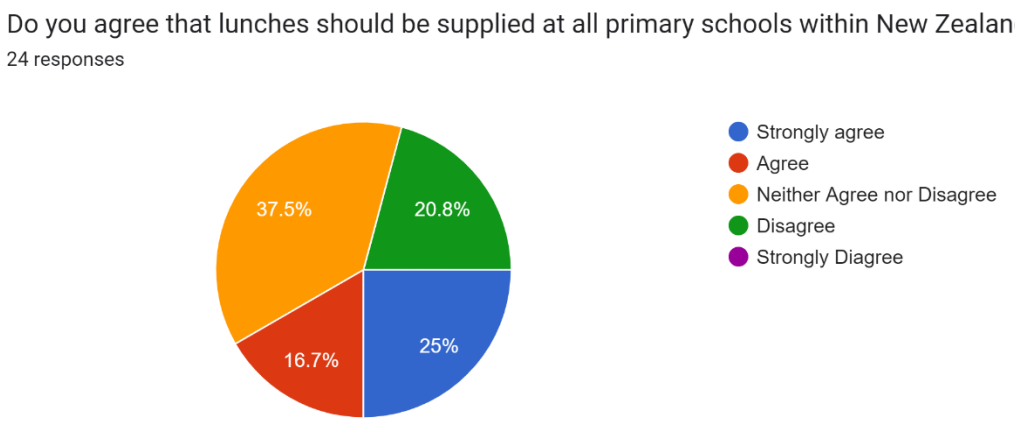


4.1.6 A teacher perspective on Free Healthy School Lunch Programme.

According to the results depicted in Figure 4.8, 25% of the surveyed teachers strongly support the provision of free lunches to all primary schools. Seventeen % of the teachers agree with this idea, whereas 21% disagree with it. The largest percentage, 38%, comprises teachers who neither agree nor disagree that all primary school children should receive a free school lunch.

Figure 4.8*:*

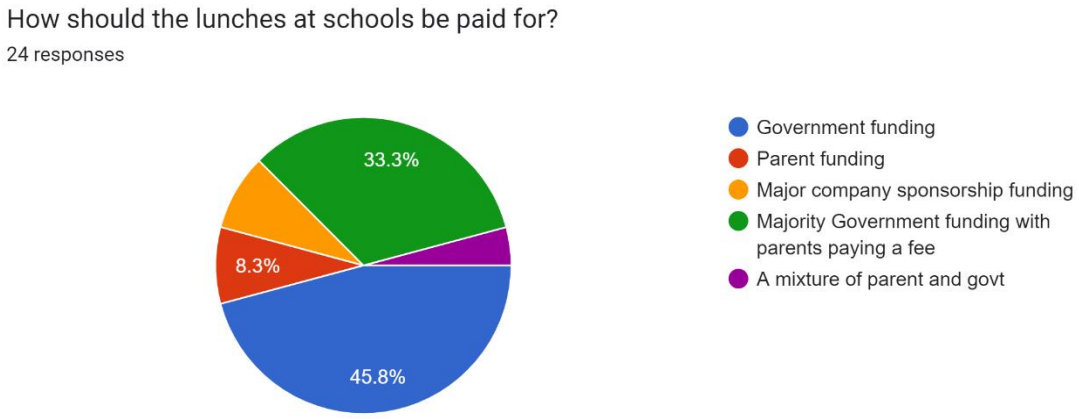
Southland primary teachers' perspective on the question: 'should all primary schools within New Zealand receive a free lunch at school?'



Based on this questionnaire conducted among teachers, it was found that 46% of them believe that the government should fund the programme (Figure 4.9). The second most popular option was for the government to be the primary funder while parents pay a fee, with 33% of teachers supporting this idea, as shown in Figure 4.9.

Figure 4.9:

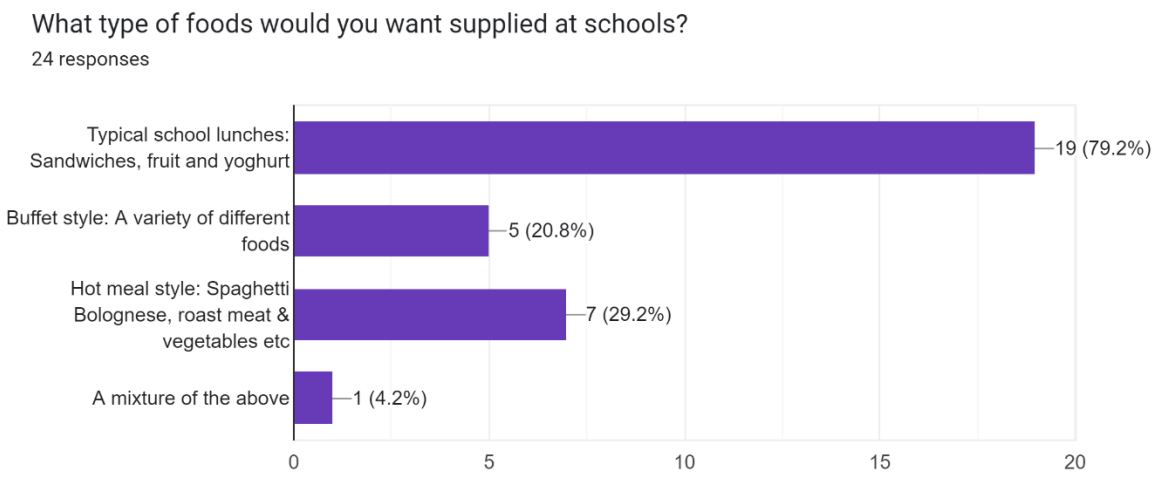
Southland primary teachers' perspective on 'who should pay for the free school lunch programme'



The most preferred type of food for the school lunches was the typical school lunch of sandwiches, fruit and yoghurt at 79% according to the teachers' perspective (Figure 4.10). A hot meal style followed this at 29%, and a third was buffet-style school lunches (Figure 4.10).

Figure 4.10*:*

Southland primary teachers' perspective on the types of foods their students prefer for school lunches



In Figure 4.11, there were two clear options for providing school lunches that teachers preferred: using the existing school lunch provider (50%) or hiring individuals from the community to create jobs (38%).

Figure 4.11:

Southland primary teachers' perspective on what food provider they prefer to supply the school lunch programme (n = 24 responses)

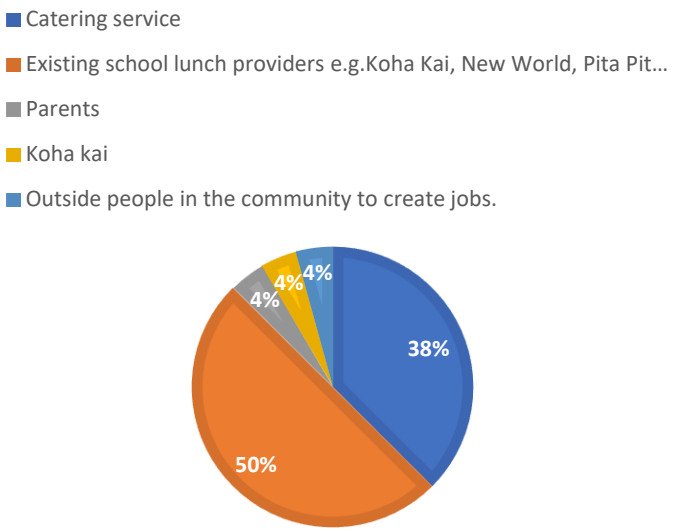


Table 4.1 illustrates the results from the surveyed teachers' comments on the question: 'Do you think the Free Healthy School Lunch Programme will benefit your teaching practice?'. The results were separated into four themes: Reduce hunger and improve learning, improve current dietary habits, no improvements, and other comments. The teachers commented that the free healthy school lunch would improve teaching practice in the afternoon and the students' current dietary habits. However, some teachers commented that there is no need for a Free Healthy School Lunch Programme or that school lunches are unhealthy in other countries.

Table 4.1:

Southland primary teachers' perspective on the benefits for their teaching practice with the inclusion of the free healthy lunch school programme

Reduce hunger and improve learning	**Improve current dietary habits**	**No improvements**
"Would this benefit my teaching practice - it would certainly benefit the learning of the student and ensure that they had sufficient amount of food to help them learn for the day. The benefit of this would be that I'd be teaching a child who was happy, not hungry and ready for learning for the majority of the day."	"Possibly. For those who only have food given (not their choice) that is high in sugar, even though it says fruit on the label."	"All of the children in my class at this school seem to all have healthy packed lunches every day so personally I do not think it would."
"Yes, focus and engagement would improve for all students"	"Yes- makes for equality within the classroom."	"We are very lucky that all of our students usually have a well balanced lunch that includes things parents know they will already eat."
"Yes children will be more focused and attentive when eating healthy foods"	"Others need to break their unhealthy eating habits'.	"Not necessarily. I taught in England where some children received free lunches. They were not always the best food nutritionally".
"I have worked at a lower decile school in the past and the free lunch scheme was excellent for those children who required extra food. Children were all fed healthy lunches, and everyone was given the same thing. It made getting extra food for lunch 'not a big deal' and it meant that nobody was hungry while trying to learn."	"Yes if the children had a variety of healthy food they liked, no child would go without food."	"Possibly- not so much this year but knowing students have food - not an extra thing to worry about"

Reduce hunger and improve learning	Improve current dietary habits	No improvements
"Yes; children having a balanced meal /on task /no sugar highs and lows/ not stealing lunches or food from others/no anxiety about not having lunch - having to ask staff for lunch"		
"Yes. Knowing that the students have had a hot, healthy lunch and they have the reliable knowledge they will get a good meal each day is priceless. School lunches in London were excellent and teachers ate them too!"		
"Yes, to fill stomachs therefore ideally have more focused tamariki in the afternoon."		
"In those areas where there is a genuine need I do believe it will encourage attendance and boost learning."		
Other comments "For some kids yes. Also to see if the need was there in the school. It should be like free breakfast. Only the kids who needed it, get it otherwise it is a big waste of food as at times it is not being eaten. Lots of govt money has been wasted on not setting this system up properly and not researching the needs properly." "I'm unsure. Maybe less rubbish around the school. More environmental awareness."		

The teachers in this study had some concerns with the Free Healthy School Lunch Programme. These concerns were: increased environmental waste, children not eating the meals, money could go into other areas within the school, and more responsibility for the teachers. In Table 4.2, the comments from the teachers on potential issues are separated into five themes: environmental waste, fussy eaters, money could be directed in other areas, more responsibility for the teachers and other comments. The two major concerns with the most comments from the teachers' perspective of potential issues were environmental waste and fussy eaters.

Table 4.2:

Southland primary teachers' perspective on any potential issues with the Free Healthy School Lunch Programme

Environmental waste	**Fussy eaters**	**Money could be directed in other areas**	**More responsibility for the teachers**
"Environmental Issues - plastic waste, food waste - not all children like the same food, where would the leftovers go? This food that is not eaten could quite easily go to another family in need of food."	"Some of the meals the children have never eaten anything like it - so they starve."	"$$$$$ less money to be spent on other things."	"Schools already take on more responsibilities with 'teaching' e.g. wellbeing, additional opportunities etc. It couldn't be a teacher requirement to be involved. We already have more than enough to do."
"Different cultures. and beliefs. and allergies - really concerned about food waste and wrapping waste and the loss of knowledge and control of parents in the lunches their children get. Also parents may not know what is and isn't being eaten."	"The food so healthy that at times it doesn't taste nice. What is the point if majority of the children are going hungry because they don't like the food."	"Kids eat some lunches and not much of others so some days the kids are still hungry after lunch. If the lunches are charged per person there is a lot of overspending as lots of kids aren't eating it some days."	"I have seen a lot of positives but only issue is the amount of teacher time to make sure everything is eaten, tidied up, put away, etc often taking up most of the teachers own lunch time."
"There is a lot of food wasted - food is given to everyone whether it is needed or not."	"Students can be fussy."	"Cost. Can be divisive: can afford lunches vs free food."	
"Extra rubbish/ packaging. Waste of good food if they don't like it."	"The downside of this is that some children do not eat the lunches and food is thrown out."	"As long as it doesn't eat into class resource funding"	
"Food wastage."	"Picky eaters would not eat anything."		
"Food wastage."	"Children not used to having such healthy food and rejecting it in favour of unhealthy alternatives."		
"Might be a lot of wasted food."	"If the student doesn't like the lunch they may go without if no backup from home".		
	"Food going to waste."		
	"Fussy eaters, food being wasted."		

Other concerns:

"I think it has the potential to benefit some but I don't think it is necessary for everyone."

"Students have so many allergies now-a-days. Very hard to meet everyone's needs."

"The pros of this is that everyone receives the same meal and there is no shame associated with being given a free lunch."

"Families should be allowed to sign a waiver so that food can be sent home with children who want to take it home and shared out with whanau rather than being thrown out."

"No - only dietary requirements and allergies need to be strictly monitored"

"I see an issue with money-hungry catering companies providing poor quality, uninspired lunches that are flown in from other parts of the country. Would love to see a programme that supports local and provides and opportunities for Southlanders."

"Cost setting up the canteen, cooking area, eating area etc. Parents losing control of their children's diet. Allergies etc needing to be addressed."

"Some whanau do not come with healthy options for morning tea - if they haven't liked their lunch, they will eat their junk food".

4.2 Discussion

The discussion section discusses the main findings on the teachers' perspective on the Ka Ora, Ka Ako | Healthy School Lunches Programme to investigate if the teachers agree that a Free Healthy School Lunch Programme will increase academic, behavioural and physical performance in the classroom after lunch.

4.2.1 Introduction

This section investigates the teachers' perspectives questionnaire results and analyses the results against previous research to explain outcomes. In this section, the results from the teachers' questionnaire will be separated into the following areas:

- Inadequate school lunches and the impacts within the classroom
- Unhealthy school lunches and the impacts within the classroom
- Impact of missing school lunches and the consequences within the classroom
- Teachers' perspective on the Free Healthy School Lunch Programme
- Implementation of the Free Healthy School Lunch Programme: A teachers' perspective

4.2.2 Inadequate school lunches and the impacts within the classroom

One of the key outcomes of this study was that teachers suggested that inadequate lunch consumption has unfavourable effects on students in the classroom. Of the respondents, 58.3% of teachers believe that insufficient food intake during lunchtime affects behaviour, 54.2% believe that it affects academic performance in class, and 62.5% believe that it impacts on physical performance after lunch. Numerous studies, including those by Hickey et al. (2019), Schwartz and Rothbart (2019), and Stuber (2014), have supported the notion that school lunches have a significant impact on children's learning ability. Schwartz and Rothbart (2019) researched the effects of universal free meals on student performance. Their findings indicate that academic performance improved for all students, regardless of their financial situation, with greater improvements observed in poorer students. The study also highlighted the importance of free school lunches in reducing stigma, improving food security for needy students, enhancing student readiness to learn, and reducing administrative burden.

A Stuber (2014) report analysed the connection between students' academic performance and nutrition in the US school lunch programme. The report identified several reasons for poor academic performance after consuming an inadequate school lunch. It suggested that poor nutrition could result in low blood glucose, causing reduced concentration in the classroom and increased risk of illness (Stuber, 2014).

Physiological factors, such as the endocrine system, may influence poor performance in the classroom after lunch. Ghrelin and leptin are the hormones responsible for controlling appetite (Powers et al., 2017). Ghrelin drives hunger, while leptin reduces it, and food plays a crucial role in regulating these hormones. When you are full, the leptin level increases, making you feel fuller and reducing ghrelin levels (McArdle et al., 2015). Research has shown that feeling hungry can negatively affect academic and athletic performance. A study on college students found that hunger impacted 34% of students' academic and athletic performance (Hickey et al., 2019). The decline in performance was attributed to hunger affecting the students' ability to engage in the classroom fully (Hickey et al., 2019).

Gómez-Pinilla (2008) investigated the effects of nutrition on the brain. Gómez-Pinilla (2008) researched the relationship between gut hormones and the consequences of emotions and cognitive processes. In obese rodent trials, impaired leptin receptors in the hypothalamus, cerebral cortex and hippocampus have shown "impairment in long-term potentiation and long-term depression and difficulties in spatial learning" (Gómez-Pinilla, 2008, p. 4). The same research found that when ghrelin hormones are high, there is a "reorganization of synaptic terminals in the hypothalamus", enhancing spatial learning and memory formation (Gómez-Pinilla, 2008, p. 4). Glucagon-like peptide 1 (GLP1) is a hormone responsible for controlling glucose intake to the glycogen stores. Researchers have found that an infusion of GLP1 can improve association and spatial memory in rodents. These three hormones impact the brain and influence cognition and emotion when stimulated or reduced (Gómez-Pinilla, 2008).

Carbohydrates (CHO) is vital in the human body, serving as an essential nutrient. Its key functions is supplying energy to the body, maintaining gut health, and providing the central

nervous system, including the brain, with the necessary nutrients (Mann & Truswell, 2017). CHO is the primary fuel source for the brain, utilizing roughly 5.6mg of CHO per minute. Until the age of 16, children have a higher glucose metabolic rate than adults, as the cerebral cortex requires more glucose (Drozdowska et al., 2022). Research has shown that cognitive function decreases when blood glucose levels decrease. Hypoglycaemia occurs when blood glucose levels fall below the healthy range. Symptoms include shakiness, confusion, irritability, and light-headedness. Although uncommon in children without diabetes, these symptoms may occur during extended fasting (Mann & Truswell, 2017).

The effects of fasting on cognition function for school children have been investigated for decades (Pollitt et al., 1998). In the late 1990s, a review article examined the effects of fasting cognition on well- and undernourished school children (Pollitt et al., 1998). This review article found that undernourished school children who had an overnight and morning fast showed a decrease in their academic performance. Adolphus et al. (2013) investigated the effects of missing breakfast on school performance. They found that students who skipped breakfast were more likely to be distracted, cause disruptive behaviour in class and have negative relationships with the other students. Researchers have found that missing breakfast can impact academic and behavioural performance within the classroom. If a child misses breakfast, they go to school with an eight to ten-hour fast. If they don't have lunch, this period increases to 12 to 16 hours without food.

Micronutrients play a role in many body processes, including critical brain roles. Iron is essential in producing red blood cells and supplying oxygen to the brain to have energy for cellular function (McArdle et al., 2015). Zinc is also important to make red blood cells as it is a co-enzyme. Other micronutrients also play an important role in the central nervous system, such as potassium and vitamin B12 (Mann & Truswell, 2017). Although missing one or two lunches will not significantly impact brain function, the accumulation of a low intake of these micronutrients will eventually affect brain function (McArdle et al., 2015).

Having inadequate school lunches has unfavourable effects on students in the classroom. These adverse effects have been associated with a lack of energy in school due to a prolonged fast, low

blood glucose, unfavourable hormone levels in the brain and the potential long-term effects of low micronutrients in the diet. All of these factors can impact children's learning within the classroom.

4.2.3 Unhealthy school lunches and the impacts within the classroom

Masters (2023, para. 1) defines an unhealthy diet as "An unhealthy diet fails to provide your body with the correct amounts and types of nutrients for maximum health." One of the key findings from the current research was that teachers noticed differences in academic, physical, and behavioural performance depending on what the children ate during lunchtime. Unhealthy eating at lunchtime had the highest percentage for 'sometimes' and 'yes' responses regarding effects on academic, behavioural and physical performance in the classroom. The 'no' rating ranged from 16.7 to 20.8% for the three areas. This would indicate that the teachers perceive that what the children eat impacts the classroom. Research has shown that unhealthy school lunches can negatively impact academic, behavioural, and physical performance in the classroom. A study by Florence et al. (2008) examined the academic performance of 5,200 fifth-grade students in Canada concerning their diet quality. The study found that a higher-quality diet was associated with improved academic performance in the classroom. The study's key findings highlighted the importance of having a diverse selection of foods, especially fruits and vegetables, to ensure that each food group is adequately represented (Florence et al., 2008).

A famous television chef, Jamie Oliver, made a documentary about improving British school meals (Oliver, 2023). This documentary series started a campaign on unhealthy school meals, which is still running today (Macdonald, 2023). Jamie Oliver campaigned against unhealthy foods in British school lunch programmes (Macdonald, 2023).

Kim et al. (2016) investigated potential mechanisms for unhealthy lunches and decreased academic performance. The study revealed that high school students who consumed breakfast, fruits, vegetables, and milk demonstrated improved academic performance. The researchers found that these foods positively affected hormonal control, cognitive function, and appetite control. Conversely, consuming processed foods more than seven times a week was linked to decreased academic performance.

Carbohydrate-rich foods have been found to impact cognitive function (Mann & Truswell, 2017). Carbohydrate-rich foods are classified into different ratings based on their absorption into the blood vessels. This rating is called the glycaemic index, which was introduced in the 1980s (Mann & Truswell, 2017). The cooking process influences the glycaemic index as well as the amount of dietary fibre and other macronutrients. Over the years, researchers have investigated the relationship between the glycaemic index and its effect on the body physically and cognitively. It has been proposed that low glycaemic index (LGI) foods have a more physically and cognitively favourable outcome than high glycaemic index (HGI) foods (Powers et al., 2017). The potential reason for this is that the body, especially the brain, is sensitive to glucose changes in the blood, and the glycaemic index can influence blood glucose levels. LGI foods have been shown to improve attention and short-term memory after consuming the LGI meal two hours later compared with HGI meals (Philippou & Constantinou, 2014). Drozdowska et al. (2022) investigated the impact of lunch with differing glycaemic indexes on 212 children over a 90-minute period. Drozdowska et al. (2022) found no difference in academic performance when consuming either an HGI or a medium glycaemic index (MGI) meal. Researchers have found in adults that lunch causes an impairment in cognitive function (Christie & McBrearty, 1979; Smith & Miles, 1986), however Drozdowska et al. (2022) did not find this in their study. Drozdowska et al. (2022) suggested that the glycaemic response may be more different at lunch time if the child has missed breakfast. A recent study investigated the effects of different glycaemic foods on school children aged five to seven years old (Sünram-Lea et al., 2021). This study looked at different breakfast meals and their effects across the school morning period. The findings of this study showed that consuming an LGI meal helps release glucose slowly compared to a higher glycaemic meal and helps with cognitive function and academic performance throughout the school morning.

Consuming unhealthy food can lead to various health problems for children, including an increased risk of chronic diseases like obesity, heart disease, diabetes, and certain cancers (Mann & Truswell, 2017). One out of every eight children in New Zealand is classified as obese (MOH, 2019c). As the school lunch is one of the three main meals in a child's school day, it accounts for roughly one-third of their daily energy intake (Harvard Medical School, 2015). Datar and

Nicosia (2012) investigated the association between the availability of junk food at school and the increased risk of obesity. The researchers found a significant increase in both BMI and obesity when junk food is available in schools. The availability of junk food at school was a concern for the researchers as they stated that there was a "strong correlation between childhood overweight and obesity in adolescence and adulthood" (Datar & Nicosia, 2012, p. 14). In New Zealand, there is no set policy for healthy eating in schools; however, there is a National Administration Guidelines (NAG) 5b, which requires schools to promote healthy food and nutrition (MOE, 2022d). A review article examined the impact of school nutritional policies and found that they are mostly linked to increased availability of healthy foods and reduced unhealthy options at schools (Grigsby-Duffy et al., 2022). Grigsby-Duffy et al. (2022) suggested that having a healthy food policy increases the availability of fruits and vegetables and reduces unhealthy snack foods.

Unhealthy school lunches can negatively impact academic, behavioural, and physical performance in the classroom by several mechanisms. Hormonal influence from the effects of glycaemic index, appetite control and macronutrient imbalances in the school lunch has an impact after the consumption of school lunch. Also, the link between obesity and junk food is a primary concern in New Zealand.

4.2.4 Impact of missing school lunch and the impacts within the classroom

Missing lunch can significantly impact a child's development at school. It is important to ensure proper nutrition to support their learning and growth. The results from this current study illustrate that out of 23 teachers, 65% had all children with a packed lunch in their classrooms, although 35% reported that one or more students had no packed lunch. A recent study of Canadian school children found that 5% miss lunch (University of Ottawa, 2021). Tugault-Lafleur and Black (2022, p. 763) found that "students were more likely to miss lunch if they were older, lived in a food insecure household, or smoked. Sex, ethnicity, income and weight status were not associated with lunch consumption". According to a study conducted in the Netherlands, approximately 11% of children skip lunch, and this rate is higher in lower socio-economic populations (Wijtzes et al., 2015).

In New Zealand, Stock (2018) reported that the social enterprise ‘Eat My Lunch’ claimed that 290,000 children went to school daily without lunch. When converting it to a ratio, it would be one in four children who do not bring a lunch to school. KidsCan estimates that it is around 55,000 children who don’t bring lunch to school each school day (Stock, 2018). MacNamara (2023b, para. 2) stated that "Extrapolating from it gives a rough figure of 138,000 food insecure school kids, some 70,000 of whom are completely missed by the school lunches”. The New Zealand government have reported that one in five children in New Zealand live in households that struggle to put healthy food on the table, and this increases to two out of five children in lower socio-economic communities (MOE, 2023b).

In New Zealand, some children miss school due to the inability to bring a school lunch (Black, 2017). Potential reasons behind some children missing school is based on shame and embarrassment for parents due to the fact that they can’t supply enough food for school lunches (Black, 2017). Westwater (2022) reported on this issue of embarrassment of poverty and missing school or going hungry because they don’t want their peers to see that they qualify for the free lunch programme in the UK. Food insecurity is a rising issue in New Zealand and worldwide (Leung et al., 2020; MOH, 2019b). A study examining psychological distress due to food insecurity found that it leads to chronic stress in childhood (Leung et al., 2020). Leung et al. (2020) found six themes related to this topic, and embarrassment about their food situation was one of them. Missing lunch can have a significant impact on a child's development at school. Parents may not supply their children with school lunches due to factors such as food insecure households, poverty, and embarrassment, which can in turn negatively impact the child's education.

It is crucial to note that missing lunch can have a profound impact on a child's development while at school. Potentially, one in four children in New Zealand does not bring lunch to school. Some children may miss school due to the shame and embarrassment that their parents feel because they cannot provide enough food for their school lunches. This issue can significantly affect a child's performance at school. If New Zealand can reduce the number of children who miss lunch at school, it could provide them with more opportunities to excel in school and life.

4.2.5 Teachers' perspective on the Free Healthy School Lunch Programme

The results of this current study showed that there were three strong themes from the teachers on their perspective on the Free Healthy School Lunch Programme. The three themes were:

- Benefits on education
- Increased in waste within the school
- The effects of fussy eaters

4.2.6 Benefits on education

The teachers' perspective on the Free Healthy School Lunch Programme is important as they understand how children respond in the classroom. In this study, several teachers commented on the potential positive nature of the Free Healthy School Lunch Programme, especially in the relationship between reduced hunger and an effective learning environment.

> "The benefit of this would be that I'd be teaching a child who was happy, not hungry and ready for learning for the majority of the day."
> "Yes, to fill stomachs therefore ideally have more focused tamariki in the afternoon."
> "Yes, focus and engagement would improve for all students".

Cohen, Hecht, McLoughlin, et al. (2021) investigated the effects of a universal school meal and the association with education. The researcher used a systematic review and found that a universal school meal had positive effects on education. The positive effects of the universal school meal were improvements in students' diet, food security and academic performance. The researchers suggest that improvements of academic performance were "directly through potential improvements in nutrition, as well as indirectly through potential increases in school attendance rates" (Cohen, Hecht, McLoughlin, et al., 2021). The researchers found in their systematic review that out of ten studies, four found positive effects and the other six studies found mixed results on the effects of universal school meal on academic performance (although six studies investigated free school breakfast). Kitchen et al. (2013, p. 1) conducted a UK government report on the "evaluation of free school meals pilot". This pilot interviewed parents, staff and students before and two years later, on their diet, health and behaviour on the free school meal programme. In this report, the researchers found mixed results on behaviour after consuming the

school lunch. Some school staff noticed that some students were tired after consuming a large meal, whereas other staff reported “the pilot had improved children’s social skills such as awareness of dining etiquette” (Kitchen et al., 2013, p. 80).

Heim et al. (2022) found in Norway that students socialize better when they receive free lunches with peers and teachers. This created a more peaceful environment during lunch and in the classroom. Other factors also improved, such as reduced shoplifting, better attendance, and academic performance when students received free lunches for all (Heim et al., 2022). A research study conducted by Anderson (2018) explored the relationship between school meals and academic performance. The study found that healthy meals led to higher academic scores. Anderson (2018) suggested that there could be several reasons why healthy lunches improve academic performance. Firstly, including fruits, vegetables, whole grains, and nuts in students' diets could improve cognitive functioning. Secondly, eating healthy foods can decrease the rates of obesity, which in turn can improve brain function. Thirdly, healthy lunch meals contain less refined sugar. Refined sugar has been associated with impairment of the frontal, limbic and hippocampal systems and a decrease in cognitive function (Anderson, 2018).

The benefits of the free healthy school lunch meal have mixed results in this research. However, from the teachers’ perspectives, there are more educational benefits for children when they are not hungry.

4.2.7 Increase in Waste within the school

Waste from school lunches can come from the food, wrapping and transporting of the lunches. One of the key findings of this current study was the concern of teachers about increased waste from the Free Healthy School Lunch Programme. There were several teachers who commented:

> “Environmental Issues - plastic waste, food waste - not all children like the same food, where would the leftovers go? This food that is not eaten could quite easily go to another family in need of food.”
> “Might be a lot of wasted food.”
> “There is a lot of food wasted - food is given to everyone whether it is needed or not.”

"Extra rubbish/ packaging. Waste of good food if they don't like it."

The issue of increased food waste is a significant problem with the US school food programme, which costs USD 9.7 million per day, due to wasted food (World Wildlife Fund, 2019). The food waste comprises 32% fruit and vegetable waste, 26% milk waste, and 42% other food waste. The researchers discovered that each student generates 18 kilograms of food waste annually (World Wildlife Fund, 2019). A study conducted by Cohen et al. (2013) investigated the impact of the school lunch programme on waste. This study followed middle school students from Boston (US) over a two-year period and calculated the students' waste from the school lunch programme. From this study the researcher found that 26.1% of the food was not consumed by the students. The majority of the food waste came from the entrees, milk, fruit and vegetables. The largest waste product was from vegetables, with students not eating 73% of their vegetables. There was also no difference in food waste in genders. The reasoning for these results was that students and servers overestimated the amount of food that they can consume as well as students not enjoying the taste of the meals.

In a Ka Ora, Ka Ako | Healthy School Lunches Programme report conducted by Vermillion Peirce et al. (2021), they found that 73% of the schools on the programme use external providers for delivery of the school lunches. The Ka Ora, Ka Ako | Healthy School Lunches Programme has a distinct supply model, where food providers deliver food to the school premises, unlike the US school lunch programme, where the food is prepared and cooked onsite. Therefore, the waste generated from the US school lunch programme might differ slightly from that of the Ka Ora, Ka Ako | Healthy School Lunches Programme. The Ka Ora, Ka Ako | Healthy School Lunches Programme has limited information on waste outcomes from the programme, however, there has been a report conducted by the New Zealand Treasury stating the cost of the waste. The New Zealand Treasury report stated that the Ka Ora, Ka Ako | Healthy School Lunches Programme had as many as 10,000 school lunches per day not being consumed (Gerritsen, 2023b).

Education Minister of New Zealand Jan Tinetti was reported in saying that "As lunches were provided to all students there was "unavoidable surplus" as students could be absent any given day. Surplus food was not wasted or thrown in the bin though" (Schwanecke, 2023b, para. 17).

For the Ka Ora, Ka Ako | Healthy School Lunches Programme, the meals which are not eaten are controlled by the school or food provider, but must meet specific food safety requirements (MOE, 2020). The food which cannot be given out is reported to go to pig farms; however the food wrap goes to land waste (MOE, 2020; Northland Age, 2022).

Food and other waste from the Ka Ora, Ka Ako | Healthy School Lunches Programme is an important consideration, and having strategies such as improving taste, monitoring the correct number of meals and good sustainable waste management strategies is critical to reduce the environmental and financial burden.

4.2.8 The effects of fussy eaters

Fussy or picky eating is defined as "unwillingness to eat familiar foods or to try new foods, as well as strong food preferences" (Taylor et al., 2015, p. 1). In children, food preference occurs over time and is influenced by "factors such as pressure to eat, personality factors, and parental practices/feeding styles, including parental control and social influences" (Taylor et al., 2015, p. 1). One of the main concerns from teachers within this study were the issues around fussy eaters:

> "Fussy eaters, food being wasted."
> "Food going to waste."
> "Students can be fussy."

A systematic review conducted by Wolstenholme et al. (2020) investigated eating behaviour of fussy children. This systematic review found that parents' feeding habits and parental behaviour around mealtimes were contributing factors influencing fussy children. Taylor et al. (2015) found similar findings to Wolstenholme et al. (2020), that the development of fussy eating is based on parental habits and develops over time. The Taylor et al. (2015) study found that the prevalence rate of picky eaters ranges from 5-50% in 24 studies focusing on this topic. Mascola et al. (2010) investigated a longitudinal study of fussy eaters in childhood. These researchers found that picky eating habits peaked in early childhood and decreased at age six years old. However, the children who were still classified as 'picky eaters' at six years old were more likely to remain as such thereafter. This would indicate that at six years old, picky eating has become a habit whereas

before this age, it is a short-term issue. Parents who had children who were picky eaters at age 11 years old mention that they struggled “with the child over eating, particularly struggles over the type of food, often preparing special meals for the child, and commenting on their child's eating” (Mascola et al., 2010, p. 5). In the Ka Ora, Ka Ako | Healthy School Lunches Programme this may be a challenge for students who are already fussy eaters, as at age six years, if they are not accustomed to the foods that they are given it would be unlikely that they consume the new foods.

Another issue that teachers were concerned with in this current research was the fussy eater and the consequence of not eating food at all.

> “Children not used to having such healthy food and rejecting it in favour of unhealthy alternatives.”
> “If the student doesn't like the lunch they may go without if no backup from home”
> “Wasted food due to fussy eaters”
> “If the children don't like the meal they are given, then they starve and are unsettled/disruptive or not engaged in the afternoons.”

With the Ka Ora, Ka Ako | Healthy School Lunches Programme, students can order only one type of meal (with slight variations of vegetarian options). If a child does not like the food, the school will need to look at another option, or the parent will need to supply a second lunch meal. Mauer et al. (2022, p. 1) quoted “Simply providing a free school meal is not a guarantee that pupils will eat the food”. Mauer et al. (2022) investigated why some children participate in Oslo’s free school lunch programme and other not. Food preference was one of the main factors why students did not participate in the free lunch programme. The findings from Mauer et al. (2022) found that students did not like the food, so they chose not to be on the programme, and even the students who ate the free lunch did not eat all of their food. Mauer et al. (2022) suggested that popular foods were not associated with healthy foods and questioned what was more important, feeding children or feeding healthy foods.

The teachers’ perspective of the Free Healthy School Lunch Programme is an important part of a

successful programme. Teachers within this research commented on the potential positive nature of the Free Healthy School Lunch Programme, especially in the relationship between reduced hunger and an effective learning environment. However, teachers were concerned about the amount of waste and the consequences for fussy eaters. Food preference is one of the main factors why students don't participate in the free lunch programme around the world. Also, one of the most important questions for the Ka Ora, Ka Ako | Healthy School Lunches Programme is what is more important: feeding children or feeding healthy foods.

4.2.6 Implementation of the Free Healthy School Lunch Programme: A teacher's perspective

Implementing the Free Healthy School Lunch Programme from a teacher's perspective will give an insight into how teachers envision the programme occurring. The results of this study indicate that teachers have a mixture of perspectives on whether all schools should have a Free Healthy School Lunch Programme. When combining the "strongly agree" and "agree" groups, 42% of teachers were in these categories. The largest category was the teachers who disagreed that free lunches should be provided to all primary schools at 37%. Twenty one % of teachers disagreed that all schools should receive the Free Healthy School Lunch Programme. Potential reasons for this divide are that some teachers may be happy with the current status. Some examples of comments made by the teachers who don't agree that all children should get the Free Healthy School Lunch Programme are given below:

> "I think it has the potential to benefit some, but I don't think it is necessary for everyone."
> "All of the children in my class at this school seem to all have healthy packed lunches every day so personally I do not think it would."
> "We are very lucky that all of our students usually have a well-balanced lunch that includes things parents know they will already eat."
> "Not necessarily. I taught in England where some children received free lunches. They were not always the best food nutritionally.
> "Possibly- not so much this year but knowing students have food - not an extra thing to worry about".

> "No, as I believe our children have on the whole healthy lunches, every day. No children come to school without lunch - if they do it has been accidently left behind and parents will bring it for them."

For other teachers, they can see the benefits of running the Free Healthy School Lunch Programme across New Zealand. Below are the teachers' comments that agree that all children should receive the Free Healthy School Lunch Programme in New Zealand.

> "Yes; children having a balanced meal /on task /no sugar highs and lows/ not stealing lunches or food from others/no anxiety about not having lunch - having to ask staff for lunch".
> "Yes. Knowing that the students have had a hot, healthy lunch and they have the reliable knowledge they will get a good meal each day is priceless. School lunches in London were excellent and teachers ate them too!"
> "Yes, to fill stomachs therefore ideally have more focused tamariki in the afternoon."

The differing opinions of the Free Healthy School Lunch Programme for all students in New Zealand is a common debate. With the cost of the programme, the shortage of resources in schools and a greater need for more teachers and support staff, the benefits of the Ka Ora, Ka Ako | Healthy School Lunches Programme can be questionable, especially for teachers (Gibbens, 2023). The Gibbens (2023) article investigated how the New Zealand Treasury does not support the Ka Ora, Ka Ako | Healthy School Lunches Programme due to the lack of value for money. In contrast, the Commissioner for Children, Judge Frances Eivers, disagrees with the findings. Vik et al. (2019) reported that free lunches at school increase healthy food consumption and help to reduce social inequality within the school. The researcher also suggested that the Free Healthy School Lunch Programme can reduce the financial burden of the expense of healthy foods.

According to the findings of this study, teachers hold varying opinions regarding implementing a Free Healthy School Lunch Programme in all schools. Given the high cost of the programme, limited resources in schools, and the pressing need for more teachers and support staff, the benefits of the Ka Ora, Ka Ako | Healthy School Lunches Programme may need to be revised,

particularly from the teachers' perspective.

4.2.8 Conclusion

The main findings from the teachers' perspective on the Ka Ora, Ka Ako | Healthy School Lunches Programme are that teachers agree that a Free Healthy School Lunch Programme will increase academic, behavioural and physical performance after lunch. This is supported by previous researchers who found similar results (Hickey et al., 2019; Schwartz & Rothbart, 2019; Stuber, 2014). In this research, the teachers indicated they believe that the majority of their students already have a healthy school lunch; however, there are some children in the classroom who either have no school lunch or have inadequate lunch to perform in the afternoon classes optimally.

Teachers were concerned about how the Ka Ora, Ka Ako | Healthy School Lunches Programme would be implemented. The current education status within New Zealand has many issues, such as lack of funding for education, increased workload for teachers and the low number of teachers. Other concerns for the teachers were the food and environmental waste of the programme. Other government-run school lunch programmes worldwide support this concern of increasing food waste (World Wildlife Fund, 2019). The research also found that teachers were concerned about the impact of fussy children and what would occur if the child did not like the meal supplied by the programme.

Overall, the teachers do see the benefits of the Ka Ora, Ka Ako | Healthy School Lunches Programme. However, teachers are concerned about the cost, how it will be implemented and the extra work for the teachers.

4.3 Chapter Summary

In this chapter, the perspective of the teaching staff on the Free Healthy School Lunch Programme was examined. The chapter presented the questionnaire results administered to the teaching staff, then discussed and analysed the questionnaire's key findings concerning previous research.

The next chapter will focus on the school principals' perspectives of the Free Healthy School Lunch Programme. This will first focus on the results of interviews with the principals who have not received Ka Ora, Ka Ako | Healthy School Lunches Programme, followed by principals who have received the Ka Ora, Ka Ako | Healthy School Lunches Programme, then discuss the key findings of these interviews and analyse the findings compared to previous research.

CHAPTER FIVE

PRINCIPALS' PERSPECTIVES

FINDINGS/ RESULTS CHAPTER

5.0 Chapter Introduction

The previous chapter focused on the teaching staff's perspective of the Free Healthy School Lunch Programme. It focused firstly on the results from the questionnaire from the teaching staff, then secondly it discussed key findings from the questionnaire and then analysed the findings with previous research.

This current chapter focuses on the principals' perspectives of the Free Healthy School Lunch Programme. It will firstly focus on the results of interviews with the principals who have not received the Ka Ora, Ka Ako | Healthy School Lunches Programme, followed by principals who have received the Ka Ora, Ka Ako | Healthy School Lunches Programme, then secondly it discusses the key findings of this interview and analyses the findings with previous research.

5.1 Results Introduction

This results section delves into the outcomes of interviews conducted with principals in Southland primary schools who have yet to receive the Free Healthy School Lunch Programme, followed by interviews with primary school principals who have been receiving the programme for over six months. These two categories of principals are discussed in tandem as the research aims to interpret the trends over time. The results section examines the key findings from the principals' interviews.

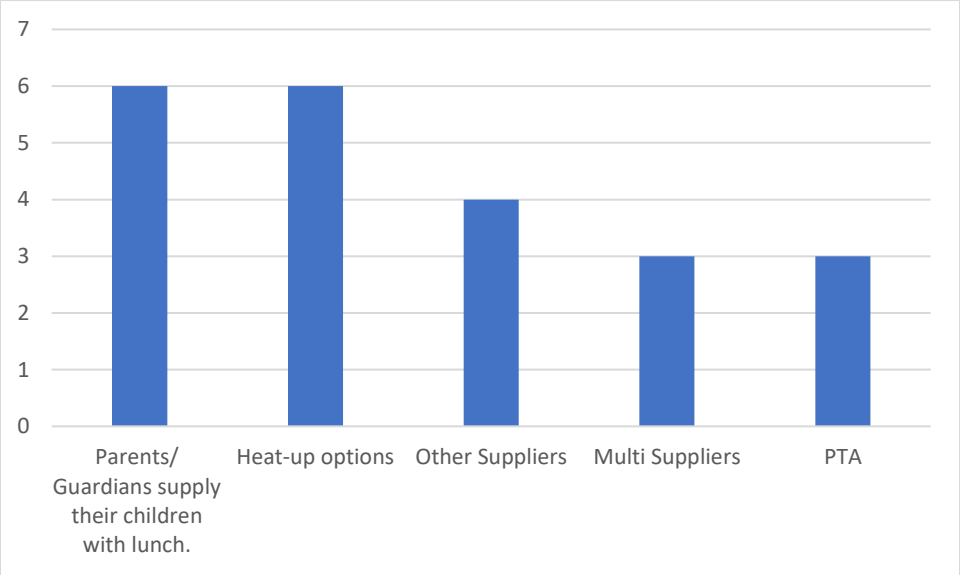
5.1.1 Participants and Meal Options

The participants of this study were six primary school principals who came from different

cohorts within Southland. Three of the primary schools were located in rural communities within Southland, one was a Kura Kaupapa Māori, and two were from the Invercargill town area. From the interviews, the principals indicated that most students in their schools brought their lunch from home, and the school provided heat-up options as well. Additionally, some schools offered food purchasing options from their PTA or external suppliers on certain days (Figure 5.1).

Figure 5.1*:*

The six Southland primary schools' method of lunch delivery within their school



Three principals indicated that around one child per month came to school without lunch, although the school did supply lunch to the child. One of the principals indicated that they had at least one child having no lunch daily, though the other two principals did not mention this in the interview. The school, which had at least one child per day with no lunch, was supplied with lunch, and the school provided their lunch. However, the other two schools that did not indicate the number of children missing lunch did mention that the school would provide lunch if a child does not have lunch. Two out of the six schools supplied their children with free breakfast at school.

5.1.2 Principals' perspective of infrastructures required to cater to the Free Healthy School Lunch Programme

Five out of six principals commented that their current kitchen would not be suitable for running the lunch programme. These principals also indicated that there was no suitable dining hall. Most schools indicated they prefer an external provider to supply and manage the waste. The one school that wanted to supply its food was due to its location and size.

> *"It would be nice to be cooked on-site and make our lunches within the school rather than suppliers. But the most challenging thing is keeping to the government standard around healthy eating."*
>
> *"Cafeteria: We have a covered area outside, which would be suitable for this, however, the noise is extremely loud, and some staff would need earmuffs to protect hearing. A purpose space would be nice, but in reality, it's not going to happen in the near future. We need an area that can be cleaned up easier and faster with tables."*
>
> *"It would be nice to be cooked on-site and if we could make our own lunches."*
>
> *"With no barriers: Propose made kitchen and hall. All preparation could be done here on site. In reality: We won't get that type of funding. What we would need is a double-sided fridge to store food. This would help with food safety."*

During the discussion, one of the principals expressed the desire of having a dining hall or covered area, but it was also mentioned that it may not be possible due to the high cost involved. Additionally, most principals felt that a fully equipped kitchen would be beneficial, but it may not be feasible due to the lack of funding.

5.1.3 Principals' perspective on the impact the Free Healthy School Lunch Programme would have on their staff

All principals agreed that a healthy lunch would increase productivity in the classroom. Below are some of the comments from the principals:

> *"Yes, it's around sustaining concentration within the classroom. Their engagement is food driven. This will depend on the food and if the kids like the food."*
> *"Good nutritional food will help with their learning within the class and boost the afternoon learning".*

There were concerns from the principals about the increased workload for their staff and the impact of lunch time on staff and students.

> *"If the contractor set up the lunches well, there should be little burden on teachers. If this was done poorly, this would increase staff work."*
> *"The biggest concerns are developing an effective system, so staff and kids are not held up during lunchtimes."*
> "*More workload on least one staff/teacher/office staff or caretaker"*

5.1.4 Principals' perspective on potential issues with the Free Healthy School Lunch Programme

Waste

Waste was one of the main concerns with this programme. The principals were concerned about food waste and packaging waste.

"Increase of waste due to this programme. The current issue is that the Invercargill City Council charges the school for extra recycling. The Free Healthy School Lunch Programme could increase this burden."

"Waste issues"

"The potential waste from food, lids, knives, forks, wraps etc., is massive."

"Food waste: What is done with the extra food?"

Other concerns were the serving sizes of food and what happens if a child either doesn't like the food or doesn't eat the food.

"Portion size: In my experience, with the government lunch scheme (user-pay model), the meals were not big enough for our older boys."

"Portion size, especially older kids."

"There are also issues around quantity meal size for different ages and the ability to eat meals."

A few principals mentioned free milk in schools programme, which became extremely hard to manage for the schools involved.

"The previous experiences with free milk in schools. At the start of the programme, there was extensive participation within the school, then decreased rapidly. Initially, issues were littering, not washing up and folding correctly. For recycling, it only needed one dirty one for the large bucket to be rejected."

"Milk in school was a programme that became a burden to teachers and increased waste in the school."

One of the main concerns of the Ka Ora, Ka Ako | Healthy School Lunches Programme is the cost of this programme. One of the main issues is that the funding of this programme could be used in other areas of their school.

> *"Budget: Cost, quality and quantity"*
>
> *"I believe that if someone needs money/funding for eating, it should go to that"*
>
> *"Money invested into the programme should go somewhere else. The communities which need it should have it. In our community, I would prefer to see it spent somewhere else. Such as learning support. Although our community may change, so we might need it."*
>
> *"Budget: Cost and quality"*

In the study, all principals expressed concerns about the potential issues arising from the Ka Ora, Ka Ako | Healthy School Lunches Programme, which included an increase in waste, negative past experiences with the free milk programme, the programme's cost, and the portion size of the meals.

Food preference

Principals were concerned about the type of food and how it would meet the MOE nutritional guidelines.

> *"What is classed as healthy? Food that is classed as healthy may actually have high fat and sugar content."*
>
> *"Will the children eat what is provided"*
>
> *"What do you do around fussy eaters and food conditions/allergies?"*

"Keeping to the government standard around healthy eating"

"What happens if a child doesn't eat the meal?"

"What is the backup plan if the child doesn't want the lunch? Use the food from the freezer, which is made by the staff. A hungry kid will not refuse food (without standing dietary issues). However, there may be issues with how familiar the foods are for the kids. Potential problems with lunch consumption are non-common foods, a rice dish, and fussy eaters."

*"We did *** five times per week, and then when they shifted to the government lunch scheme foods, the number dropped away. Some days, we were getting two children ordering the meal. The admin was not worth the trouble of the five meals per week. So, we went to *** and asked to change it. We talked with parents and kids, and they said they didn't like it. They didn't like the lack of choice and only one hot meal. The meals were not enough for some kids (for example, year six boys)."*

Some principals did not see the benefit of the cost of the Ka Ora, Ka Ako | Healthy School Lunches Programme.

"I see the benefits of free lunches for schools and reducing the burden on parents. In our school, some children will benefit from the free lunch, however generally children are well provided for at our school. I am not sure we would see the same gains as other schools."

"Would a free lunch programme improve academic performance throughout the school? At our school, potentially not, however other schools yes, especially when children are coming to school hungry. Our kids already have good lunches."

Some principals were sceptical of the cost-benefit of the Ka Ora, Ka Ako lunch programme and questioned its compliance with MOE nutritional guidelines. Other potential issues around the Ka

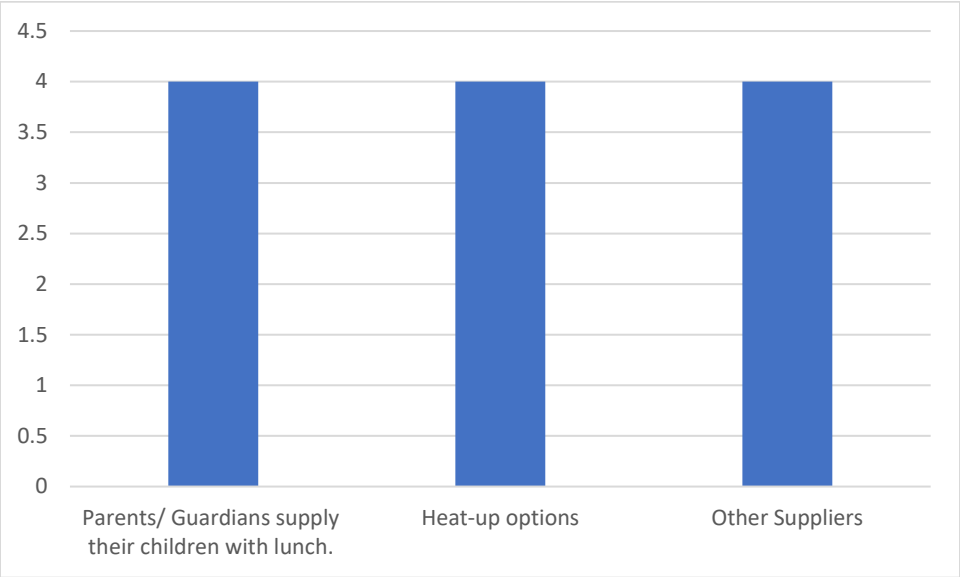
Ora, Ka Ako lunch programme is the issue around if a child does not eat the food and what would be the back-up plan. One school indicated that they tried the Ka Ora, Ka Ako lunch programme food from a provider using a subsidized meal model and found that the students disliked the food, and the serving size was too small for older students.

5.1.5 Principals at least six months into the Ka Ora, Ka Ako | Healthy School Lunches Programme interview - Participants and Meal Options

The participants from this study were four primary school principals who came from various cohorts within Invercargill. Three of the principals came from mainstream education, and one was from Kura Kaupapa Māori. Before the Free School Lunch programme, the majority of the children from the schools consumed lunch provided by their parents and guardians. All schools had a heat-up option, and some had a day or days when food could be purchased from their external suppliers. Before the Ka Ora, Ka Ako | Healthy School Lunches Programme, three out of four schools used the same food provider to supply a lunch option at a cost of $2 per meal. Figure 5.2 illustrates the four Southland primary schools' method of lunch delivery within their school before the Ka Ora, Ka Ako | Healthy School Lunches Programme.

Figure 5.2:

The four Southland primary schools' method of lunch delivery within their school before the Ka Ora, Ka Ako | Healthy School Lunches Programme.



5.1.6 Implementation of the Ka Ora, Ka Ako | Healthy School Lunches Programme

All four schools within this study had a different provider or approach to the Ka Ora, Ka Ako | Healthy School Lunches Programme.

School 1

School 1 used two lunch providers in a school week for the Ka Ora, Ka Ako | Healthy School Lunches Programme.

The first provider supplied four days of school lunches. The provider would travel over 400km per day to deliver the meals. The meals were cold food such as yoghurt, fruit and sandwiches. The second provider supplied once a week and was in the Invercargill area. The meals were sandwich-based.

"We started the programme by getting the kids to sit and eat the meals for the first 10 minutes of lunch. Staff would eat as well to promote the meals. If they didn't like it, we gave them a taste, and then they could get their lunch from their bag and eat that meal instead. We wanted to promote eating, and we didn't want hungry kids."
"*The kids did initially like the food. Initially, everyone was into the meals, then the numbers of meals decreased."*

After a year, school 1 changed its provider to a more local one, offering a hot meal option.

*"We wanted to look at different styles of meals. *** offered a hot meal option. We wanted to see if the cold meals kept the kids from eating the food. We hoped that the kids would prefer the meal style …"*

School 2

School 2 uses a non-local provider (same as school 1), which is 200km from the school. This provider supplies school 2 with cold meals four days a week.

"a choice of wraps, sandwiches, fruit, dried fruits/nuts and muffins."

The second provider is locally based which supplies the school once a week with wrap style meals.

"Corn chips and salad or a wrap".

School 3

School 3 uses a local provider for the whole week. The meals are hot although sometimes cold meals as well, and they vary daily with a two-week rotation.

School 4

School 4 uses a local provider who cooks and prepares food onsite and uses food from the school gardens. This provider supplies the school for the whole week. The food is typically hot meals, although sometimes cold meals as well.

5.1.7 Successes from the Free Healthy School Lunch Programme from the principals' perspective

Food providers

A couple of principals have been impressed with the food servers:

> *"All we have to do is give out the meals. The food provider drops off the food at a drop-off point at the school. Our senior's student's deliver the hot boxes to each class, and then, after 40 to 45 mins, they are returned to the drop-off point. Then the provider picks up the hot boxes. This is the gold standard service that our provider is supplying."*
> *"The food provider goes out of their way to supply and deliver food to our children, e.g. delivering to different locations."*

Figure 5.4 illustrates one of the schools on the Ka Ora, Ka Ako | Healthy School Lunches Programme showing the food boxes from food providers.

Figure 5.4

Photo of one of the schools on the Ka Ora, Ka Ako | Healthy School Lunches Programme showing the food boxes from the food providers

Figure 5.4 shows where the students will pick up the box and take it to the classroom, and then, once finished, they will drop off leftovers at the same place. The school found the Ka Ora, Ka Ako | Healthy School Lunches Programme procedure easy to follow, and the provider supplied amazing services.

Leftover meals and serving size

Principals commented on the waste management and serving sizes for their students. The principals were happy with the waste management from the providers.

> *"The whole school gets the lunches. The food doesn't get wasted as it is reused for our families. The food waste returns to the company for reuse (pig farm).*
> *"All foods are wrapped, so there is glad wrap rubbish, although the lunch boxes are reused."*

Principals also commented on portion size and mentioned that every child gets the same meal, and if the child is still hungry, they use the leftover meals. Two out of the four schools reuse the school lunches within the school. The other two schools' leftovers go back to the provider for reuse.

> *"The size doesn't change, but there are enough meals left over for seconds."*
> *"Leftover meals, we freeze some of them for our families."*

Figure 5 demonstrates one of the meals from the Ka Ora, Ka Ako | Healthy School Lunches Programme and the size compared with a typical white board marker.

Figure 5.5

Photos of Macaroni and Cheese meal from the Ka Ora, Ka Ako | Healthy School Lunches Programme.

Overall, the principals were satisfied with the waste management and serving size of meals in the Ka Ora, Ka Ako | Healthy School Lunches Programme, as students could consume multiple meals.

5.1.6 Principals' perspective on improved teaching practices due to the Ka Ora, Ka Ako | Healthy School Lunches Programme

Three out of the four principals agreed that the Ka Ora, Ka Ako | Healthy School Lunches Programme improves the teaching practices within the school.

> *"Yes, when children have a full belly, they are ready to learn. This is part of the Te Whare Tapa Whā model. Feeding the children helps with concentration and behaviour."*
> *"We don't see hurangry kids now."*
> *"Yes, but it's hard to determine as we have gone through Covid times as people have been away for a long time during this period. It's good for the fact that the kids who need it get it but I think it could be done a better way."*
> *"It's hard to gauge, however, you have kids who are happy then they learn. There are kids in this school who have limited food at their homes as money runs out during the week. So having lunch at school means that the kids have regular food each day."*

The one principal who didn't see improvement commented:

> *"I haven't noticed huge improvements in focus after lunch (I have only been at the school for nine weeks). "*

Based on the interviews with the principals, it was found that the Ka Ora, Ka Ako | Healthy School Lunches Programme positively impacted the school's teaching practices. However, the principals found it challenging to assess the exact magnitude of the improvements made in the school.

5.1.7 Principals' perspective on issues around the Ka Ora, Ka Ako | Healthy School Lunches Programme

The main issue around the Ka Ora, Ka Ako | Healthy School Lunches Programme is children not consuming the lunches. Principals commented on this:

> *"We have a role of 280 students, and we are ordering 202 meals per day, which is reduced to 180 meals on average due to kids being away. So basically, 2/3 are ordering the meals."*
> *"Initially everyone was into the meals, then numbers of meals decreased"*

The reason why there is a drop off in numbers is related to the MOE nutritional guidelines and the food providers trying to cater for taste and nutritional rules.

> *"When the programme started, MOE placed rules around the meals. The consumption of meals decreased. Example lasagna: They could not put cheese in the lasagna as it didn't fit the nutrition rules. The food provider knew the issue, but their hands were tied due to the nutritional restrictions."*
> *"Too healthy and the children are not used to this type of food."*
> *"I think feeding kids healthy lunches is the issue and we should feed the kids lunches instead. I am not saying feeding them junk food but foods that they would eat: feed them white bread, give them food that they like the taste of in their lunches."*
> *"The decline of numbers of students eating the meals. I think it's a combo of taste and type of food. There is no class with all eating the meals. This is the main reason for the decline."*
> *"The only barrier is the nutritional guidelines that the MOE follow."*
> *"The nutritional guidelines are difficult. The food companies are not going to give unhealthy foods to the kids."*

The primary concern regarding the Ka Ora, Ka Ako | Healthy School Lunches Programme is that some children are not eating the provided lunches. This drop in consumption can be attributed to

the Ministry of Education's nutritional guidelines and the food providers' attempts to balance taste and nutrition requirements.

5.2 Discussion

The discussion section analyses the key findings from the principals' interviews and compares them with previous research on school lunch programmes. The comments from both the principals who have not received the Ka Ora, Ka Ako | Healthy School Lunches Programme and principals who have received the Ka Ora, Ka Ako | Healthy School Lunches Programme for more than six months are discussed to explain the progress of the lunch programme within Southland.

5.2.1 Introduction

In this discussion section, six different areas are discussed. The comments both from the principals who have not received the Ka Ora, Ka Ako | Healthy School Lunches Programme and from the principals who have received the Ka Ora, Ka Ako | Healthy School Lunches Programme for more than six months are discussed together so that a comparison can be made between the before and after of the principals' perspectives on the programme.

The six areas of focus on the principals' perspectives of the Ka Ora, Ka Ako | Healthy School Lunches Programme are:

1. Restrictive food guidelines of the Ka Ora, Ka Ako | Healthy School Lunches Programme
2. Cost versus benefit of the Ka Ora, Ka Ako | Healthy School Lunches Programme
3. Infrastructure of the Ka Ora, Ka Ako | Healthy School Lunches Programme
4. Waste and leftovers of the Ka Ora, Ka Ako | Healthy School Lunches Programme
5. Ka Ora, Ka Ako | Healthy School Lunches Programme food providers
6. Parental influence on the Ka Ora, Ka Ako | Healthy School Lunches Programme

5.2.2 Restrictive food guidelines of the Ka Ora, Ka Ako | Healthy School Lunches Programme

One of the major concerns for principals in both groups was the restrictive nutritional guidelines for the Ka Ora, Ka Ako | Healthy School Lunches Programme. The principals who have not received the Ka Ora, Ka Ako | Healthy School Lunches Programme were concerned about potentially restrictive food guidelines:

"What is classed as healthy? Food that is classed as healthy may actually have high fat and sugar content."

"Will the children eat what is provided?"

*"We did *** five times per week, and then when they shifted to the government lunch scheme foods, the number dropped away. Some days we were getting two children ordering the meal. The admin was not worth the trouble of the five meals per week. So, we went to *** and asked to change it. We talked with parents and kids, and they said they didn't like it. They didn't like the lack of choice and only one hot meal. The meals were not enough for some kids (for example, year six boys)."*

One of the major issues for principals with the Ka Ora, Ka Ako | Healthy School Lunches Programme was the dietary restriction of meals within the programme. All principals who had the Ka Ora, Ka Ako | Healthy School Lunches Programme for over six months had issues with government dietary restrictions. One principal stated:

"When the programme started, MOE placed rules around the meals. The consumption of meals decreased."

This was reinforced by other principals having similar issues with the Ka Ora, Ka Ako | Healthy School Lunches Programme:

"Too healthy, and the children are not used to this type of food."
"I think feeding kids healthy lunches is the issue".

Setting guidelines is crucial to establishing nutritional standards for school lunch programmes. Such standards aid in controlling the consumption of unhealthy foods and achieving a balance in nutritional requirements. Providing guidelines can help mitigate problems like obesity, nutrient deficiencies, and even improve school learning (Grigsby-Duffy et al., 2022).

In 2019, the MOE released nutritional guidelines for healthy school lunch programmes for all food providers within this Ka Ora, Ka Ako | Healthy School Lunches Programme (MOH, 2019a). The MOE (2022c, p. 5) stated that the purpose of the guidelines was that food insecurity is more than eating lunch at school: "It means ensuring food is personally and culturally acceptable, as well as nutritionally adequate". The nutritional standards for Ka Ora, Ka Ako | Healthy School Lunches Programme for the first two years were challenging, according to the principals on the Ka Ora, Ka Ako | Healthy School Lunches Programme as stated above.

The MOE use a traffic light system for food providers on the Ka Ora, Ka Ako | Healthy School Lunches Programme to help them organize food portions and fit the three fundamental principles when constructing lunch meals. The three key principles when creating a meal are :(MOE, 2022c; 2023b, p. 4; MOH, 2019a).

1. "Offer a variety of healthy foods from the four food groups.
2. Food should be prepared with or contain minimal saturated fat, salt (sodium) and added sugar, and should be mostly whole or less processed.
3. Offer only water and unflavoured milk as drink options."

The MOH (2019a) guided schools on what foods were acceptable for the Ka Ora, Ka Ako | Healthy School Lunches Programme. This gave principals and food providers the rules around the types of lunches for the Ka Ora, Ka Ako | Healthy School Lunches Programme. Grigsby-Duffy et al. (2022) reviewed 18 studies examining the impact of primary school nutrition policies and found several positive findings within their research. The major findings of Grigsby-Duffy et al. (2022) research were that implementing healthy options increased the consumption of fruit and vegetables in the children's diet. There was also a decrease in unhealthy food consumption when healthy choices were available.

The MOE guidelines are similar to UK government guidelines (2023) for school lunches, which focus on consuming lots of foods, fruit and vegetables, unrefined starchy foods, and some good sources of protein, dairy and reducing foods / drinks in high fat, sugar and salt (GOV.UK, 2023). For the British regulations, school meals must include the following (GOV.UK, n.d., para. 2):

- "one or more portions of fruit and vegetables every day

- one or more portions of starchy food, such as bread or pasta every day
- a portion of food containing milk or dairy every day
- a portion of meat or poultry on 3 or more days each week
- oily fish once or more every 3 weeks"

According to the principals in this study, it took a lot of time and work to get the guidelines in place between the start of the Ka Ora, Ka Ako | Healthy School Lunches Programme and the end of term four, 2022. Two principals in this study commented about the difficulties of the MOE nutritional guidelines:

> *"The only barrier is the nutritional guidelines that the MOE follow."*
> *"The nutritional guidelines are difficult."*

The MOE traffic light system for coding food based on the health rating for the Ka Ora, Ka Ako | Healthy School Lunches Programme is stated below:

Green foods

- are a good source of nutrition
- are the basis of a healthy diet
- are generally lower in saturated fat, salt and added sugar
- are mostly whole and less processed
- come from the four food groups: vegetables and fruit; grain foods (mostly wholegrain and those naturally high in fibre);
- milk and milk products (mostly low fat); and legumes, seafood, eggs and meat with fat removed.

Amber foods

- are not part of an everyday diet
- may have some nutritional value
- are often more processed
- in large serving sizes, can contribute to consuming excess kilojoules/calories.

Red foods

- have poor nutritional value
- are high in saturated fat, salt and/or added sugars
- can contribute to consuming excess kilojoules/calories
- are often highly processed foods and drinks (MOE, 2022c, p. 6)

For preparing meals, the food provider needs to prepare 75% of green foods with a maximum percentage allowance of 25% for amber foods, and red foods cannot be included (MOE, 2020). Within this research, the principals indicated that the issue for the food providers was around the MOE nutritional requirement for each colour classification. The amber foods included food items, making balancing meals difficult. For example, one of the principals stated:

> *"Example Lasagna: They couldn't put cheese in the lasagna as it didn't fit the nutritional rules. The food provider knew the issue, but their hands were tied due to the nutritional restrictions."*

In 2022, the MOE did change the nutritional standards of the Ka Ora, Ka Ako | Healthy School Lunches Programme and implemented the changes in term one 2023. The major changes included (MOE, 2023c, p. 1):

- "All information is in one place and is easier to follow
- Four main components now make up a meal
- Food categories – restructured and simplified
- Minimum weights – decreases, increases, more added
- Amber allowance – measured in grams & easier to apply
- Portion size limits – some added, some removed
- Criteria for classifying food is clearer and simpler"

These changes allow the food providers more flexibility in their food preparation (MOE, 2023c). In the US lunch programme, the USDA also changed the regulations around the original 2010 Healthy, Hunger-Free Kids act to be more flexible around milk, whole grains and sodium requirements in 2019 (Johnson & Ellis, 2023).

The MOH in 2019 released findings from New Zealand children's dietary habits (MOH, 2022). This report found that only 44.1% of children surveyed consumed the recommended amount of fruit and vegetables. One out of ten children consumed takeaways three or more times per week. In this survey, 49.8% of children ate red meat and 39.3% ate processed meat three times or more a week. For bread consumption, 7.5% consumed heavy grain bread, 40% ate white bread, and 51% ate light grain bread (MOH, 2022). For the Ka Ora, Ka Ako | Healthy School Lunches Programme, children who typically don't eat large amounts of the green food category will struggle to consume this type of food.

Within this current study, principals commented on how their students struggle with the type of food being served from their lunch programme:

> *" I am not saying feeding them junk food but foods that they would eat: feed them white bread, give them food they like the taste of in their lunches."*
> *"Too healthy and the children are not used to this type of food."*

According to the MOE (2023e, para. 1), the purpose of the guidelines is to "address food insecurity involves more than simply filling tummies. It means ensuring food is personally and culturally acceptable, as well as nutritionally adequate". However, it is not clear that restrictive dietary policy is an effective tool in promoting healthy diets for children (Micha et al., 2018). A systematic review of the effectiveness of school food policies on eating behaviours by Micha et al. (2018) found that direct provision policies only increased fruit and vegetable daily consumption by 0.27 and 0.04 serving / day respectively. The researchers found that implementing restrictive diets in schools may have the opposite effect outside of school and lead to an increase in unhealthy food consumption. Micha et al. (2018) studied the correlation between sodium intake during school hours and after school hours. They found that the school lunch programme's low sodium intake did not impact overall sodium consumption. Another study found that the school policy of changing to a healthy nutritional environment increased fruit consumption over the whole day but had a negligible effect on vegetable consumption (Rosettie et al., 2018). Rosettie et al. (2018) indicated that the preference for fruit consumption outside of school could be due to the ease of consumption. However, Rosettie et al. (2018) did

suggest that having a healthy food policy could potentially lead to small or moderate changes in childhood obesity which over time can reduce the risk of cardiometabolic disease deaths.

Research on restrictive eating for children has produced conflicting results. Restricting foods can increase the dietary habits of a specific food (healthy), or it can heighten the attractiveness of the restricted food (unhealthy) (Rollins et al., 2014). Anzman and Birch (2009, p. 1) found in their study that restrictive eating was negatively affected by temperament in girls aged between seven and 15 years old, and girls "who perceived higher parental restriction exhibited the strongest inverse relation between inhibitory control and weight status". These findings from Anzman and Birch (2009) were reinforced by Rollins et al. (2014), who found similar findings in younger children (three to five years old), that restricting foods can have differing effects on children depending on their temperament.

Haines et al. (2019) suggested that by creating healthy habits, children need to take responsibility for food selection and how much they consume. This self-regulation method helps the child to take control of their eating and listen to their internal signals and cues (Haines et al., 2019). Another key factor for children creating healthy eating habits is feeding practices. Haines et al. (2019) suggest that supporting children's eating practices is important for developing healthy eating habits, especially for children up to seven years old.

Principals in both groups expressed significant concerns regarding the restrictive nutritional guidelines for the Ka Ora, Ka Ako | Healthy School Lunches Programme. Establishing nutritional standards for school lunch programmes is essential, and setting guidelines is a crucial part of this process. These standards help to control the consumption of unhealthy foods and achieve a balance in nutritional requirements. However, research on restrictive eating for children has produced conflicting results. Overall, the Ka Ora, Ka Ako | Healthy School Lunches Programme needs to consider their goals of either feeding children or feeding them healthy foods as outcomes of success may differ.

5.2.3 Cost versus benefit of the Ka Ora, Ka Ako | Healthy School Lunches Programme

Woodham (2023, para. 10) reported that Jan Tinetti, Minster of Education, stated, "any money spent on children is money well spent". Ka Ora, Ka Ako | Healthy School Lunches Programme in 2023 provided more than 220,000 students at 989 schools (RNZ, 2023a). The Ka Ora, Ka Ako | Healthy School Lunches Programme costs around $130 million per year of government funding. This is at a cost of $1,692.31 per student per year. However, more recently, the New Zealand Treasury forecasted the Ka Ora, Ka Ako | Healthy School Lunches Programme will cost around $274 million per year to keep the programme going with the same number of students (MacNamara, 2023a).

A pre-Budget Treasury report in 2023 stated that it was reported that as many as 10,000 lunches a day are not eaten. Each lunch cost ranges from $5.14 for years 0-3 (school led model) to $8.28 for years 9 + students (supplier led model), and if the 10,000 lunches cost is the cheapest, this would cost over $51,000 per day or $256,000 per week (Gerritsen, 2023b).

Within this research, the programme's funding and expense were a significant concern for the principals who had yet to receive the Ka Ora, Ka Ako | Healthy School Lunches Programme. One principal suggested that the funding could be used in other areas of their school:

> *"Money invested into the programme should go somewhere else. The communities which need it should have it. In our community, I would prefer to see it spent somewhere else. Such as learning support".*

The principals who received the Ka Ora, Ka Ako | Healthy School Lunches Programme did not mention this funding issue. However, the number of children who started the programme has reduced:

> *"We have a role of 280 students, we are ordering 202 meals per day, which is reduced down to 180 meals on average due to kids being away. So basically 2/3 are ordering the meals."*
> *"Initially everyone was into the meals, then numbers of meals decreased".*

New Zealand school academic performance over the last two decades has been declining. In 2000, New Zealand was rated the third highest OECD country in mathematics, and fourth for reading. In 2018, New Zealand was ranked 27th for mathematics, and reading, it is above the OECD average (Hartwich, 2022). One of the main reasons for this decline in academic performance in the classroom is the ratio of students to teacher, which is now 28 students per teacher. The average student to teacher ratio in the OECD in 2014 was 21 students per teacher (OECD, 2014). Luxembourg primary schools have 16 students per teacher, compared to over 30 students per teacher in Chinese primary schools.

In this current research, the principals who had not received the Ka Ora, Ka Ako | Healthy School Lunches Programme were concerned by the programme's cost. The principals commented on this in the interviews:

> *"Budget: Cost, quality and quantity"*
> *"Budget: Cost and quality"*

In England, the school lunch programme is funded by the government or by the users. All year one and two students are eligible for free lunches in England, and after that, children can apply for free lunches, depending on age, where they live and their parent's income (McRae & Westwater, 2023). McRae and Westwater (2023) stated that two million children are eligible for the Free Lunch Programme in England. Each school lunch costs around £2.41 in England, which is $4.98 NZD. The students who are not eligible are user pays. This method is similar to the USA model, which provides all school children with a nutritionally balanced low-cost or no-cost lunch. In the US, children are eligible based on similar principles as in England (USDA, 2019). A school lunch per student per day costs USD 3.81, which is $6.08 NZD. Finland, Denmark, and South Korea have the highest quality rating in the 2020 education poll ranking of primary education worldwide. Finland's government supplies every school child with a free school lunch. Children also receive a free snack if they participate in before and after school activities. The Finnish government supplies nearly 850,000 free lunches at a cost of 2.41 euros per day per student, which is $4.31 NZD (YLE News, 2020). The South Korean government also supplies all

children with free lunches in schools (Travelmonk, 2022) at a cost of 700 billion won per year, which is $10 836 410.33 NZD (Ting, 2022). In Denmark, children supply their packed lunch from home (Andersen et al., 2015).

With the cost of the Ka Ora, Ka Ako | Healthy School Lunches Programme losing $51,000 per day and the starting rate of a primary school teacher being $55,000 per year or teacher aide costing $30 per hour, this may be a wiser investment for the MOE (MOE, 2023f)? One of the most important factors in a successful education system is the student to teacher ratio. Tinetti (2023, para. 3), the Minister of Education in 2023, stated “I’m not happy with the downward trends we are seeing in maths, reading and writing. More teachers, targeted to where they are most needed is a practical way, we can improve results for our kids.” The strategy for Tinetti was to move the classroom ratio from 1:29 to 1:28 students to teachers. Kelleher and Weir (2016) investigated classroom ratios in Ireland and other OECD countries to see the effects. Ireland had one of the highest student to teacher ratios in the 1980s and developed a government policy to reduce this ratio around the 2000s. One of these policies was the Delivery Equality of Opportunity in Schools policy, which allows schools from disadvantaged backgrounds to have a maximum of 20 students to teacher ratio (Kelleher & Weir, 2016).

Jakavonytė-Staškuvienė and Mereckaitė-Kušleikė (2023) researched conditions for successful learning in primary schools and suggested that there are two important areas for learning, which are content and environment of education. To implement these two areas, teachers are the centre of learning. The Education Review Office (2018, p. 12) stated, "With the quality of teaching the single most important school variable influencing student achievement, teachers are central to all school improvement efforts”. According to this research, all principals who have yet to receive the Ka Ora, Ka Ako | Healthy School Lunches Programme believe that a healthy lunch would enhance productivity in the classroom. Of the four principals who have received the Ka Ora, Ka Ako | Healthy School Lunches Programme, three agree that it improves teaching practices in the school. However, with a high student to teacher ratio in New Zealand (28:1), the money going into waste from the Ka Ora, Ka Ako | Healthy School Lunches Programme could be spent on more teachers or teacher aids to reduce this ratio.

With the forecasted Ka Ora, Ka Ako | Healthy School Lunches Programme costing around $274 million per year, the cost versus benefits angle needs to be investigated. With 10,000 meals a day not been eaten, the decreasing education levels in New Zealand and poor teacher to student ratio, the cost of the Ka Ora, Ka Ako | Healthy School Lunches Programme needs to be investigated in more depth.

5.2.4 Infrastructure of the Ka Ora, Ka Ako | Healthy School Lunches Programme

To supply a school lunch programme, infrastructures such as cooking facilities, managing waste products, and serving food to children are important factors that need to be considered. This section will discuss facilities, meal delivery, leftovers and the taste of the school lunch.

Kitchen and Dining Hall

In this study, five out of the six principals who have yet to receive the Ka Ora, Ka Ako | Healthy School Lunches Programme commented that their current kitchen would not be suitable for running the lunch programme. These principals also indicated that there was no suitable dining hall. Most schools said they would prefer an external provider to supply and manage the waste. The one school that wanted to provide its food was due to its location and size. The principals commented on their school facilities and their ability to run the lunch programme:

> *"It would be nice to be cooked on-site and make our lunches within the school rather than suppliers. But the most challenging thing is keeping to the government standard around healthy eating."*
>
> *"Cafeteria: We have a covered area outside, which would be suitable for this, however, the noise is extremely loud, and some staff would need earmuffs to protect hearing. A purpose space would be nice, but in reality, it's not going to happen in the near future. We need an area that can be cleaned up easier and faster with tables."*
>
> *"It would be nice to be cooked on-site and if we could make our own lunches."*

"With no barriers: Propose made kitchen and hall. All preparation could be done here on site. In reality: We won't get that type of funding. What we would need is a double-sided fridge to store food. This would help with food safety."

In the UK, most primary schools have dining halls and kitchens onsite. Children can be supplied lunch in the British school lunch programme or bring lunch from home (Holland, 2022). Also, children can apply for free school lunches. However, in New Zealand, most schools do not have a dining hall, and predominately, external suppliers supply the lunch from the Ka Ora, Ka Ako | Healthy School Lunches Programme (MOE, 2023b).

The Ka Ora, Ka Ako | Healthy School Lunch programme school lunches are prepared and implemented in two main strategies, which are made onsite or offsite via a supplier (MOE, 2023b). Which strategy the school selects depends on what the school chooses. If the school decides on the offsite provider, the provider will be selected by a tender system, and the school can also select one or more suppliers for their lunches. On the 24th of July, 2023, there were 231 providers for the Ka Ora, Ka Ako | Healthy School Lunch programme (MOE, 2023b). Ka Ora, Ka Ako | Healthy School Lunch programme was evaluated by Vermillion Peirce et al. (2021). Vermillion Peirce et al. (2021) reported that out of 715 schools, 28% of schools hired staff and used school facilities to provide lunches. The other 73% of schools used an external provider for their lunch programme. For the surveyed schools within this current study, no schools had a specific cafeteria to eat their lunches in. The schools either ate their lunches outside their classroom or in the classroom.

Compare this with other lunch programmes around the world, especially in the USA. Most schools in the USA have a school kitchen and cafeteria within their infrastructure (Prescott et al., 2022). Moore et al. (2010) investigated the social, physical and temporal characteristics of primary school dining halls and the implications for children's eating habits. The researchers found a positive outcome in school performance with a suitable school dining hall. In New Zealand, primary school students predominantly consume their lunch inside or outside the

classroom. The principals who have received the Ka Ora, Ka Ako | Healthy School Lunches Programme have all used external providers, and no school has obtained a dining hall.

Classroom space has been in demand in Southland primary schools over the last 20 years. In 2004, the New Zealand government closed several Invercargill schools and merged them into existing schools. An example was the merging of Clarendon, Clifton, Kew and Invercargill South schools as a Year 1 - 6 school on the Kew school site (Mallard, 2004). This meant for South Invercargill, that there were two primary schools instead of six primary schools. The impact of this decision over the next 20 years was overpopulated schools within Invercargill (Moore, 2017). The consequence of this decision to reduce the schools in Invercargill was that schools would use school halls, libraries and staffrooms for classrooms (Moore, 2017).

This was a concern for principals who felt that the money could be invested in other areas such as building:

> *"Money invested into the programme should it go somewhere else".*

Around the world, countries such as the UK and the US have shown the benefits of school infrastructures such as cooking and dining facilities (Moore et al., 2010). In New Zealand, most primary schools do not have suitable cooking and dining facilities. In Southland, the situation is worse due to the closing of primary schools, which has created overpopulated schools and limited classroom space. If the New Zealand government wants to increase the participation of the Ka Ora, Ka Ako | Healthy School Lunches Programme, focusing on school infrastructure is important for long-term success.

Waste

Most principals in this current research presented various concerns regarding the Ka Ora, Ka Ako | Healthy School Lunches Programme, with waste being a major issue. Specifically, both food and packaging waste were worrying factors for the principals:

"Increase of waste due to this programme. The current issue is that the Invercargill City Council charges the school for extra recycling. The Free Healthy School Lunch Programme could increase this burden."
"Waste issues"
"The potential waste from food, lids, knives, forks, wraps etc., is massive."
"Food waste: What is done with the extra food?"

An article published in 2022 by the Northland Age, New Zealand, drew attention to the significant amount of food waste resulting from the Ka Ora, Ka Ako | Healthy School Lunches Programme (Northland Age, 2022). This article suggested that children were not eating the food, as demonstrated by a parent's comments: "We tried the school lunches, but nine times out of 10 Ollie didn't like it, so we just gave up," (Northland Age, 2022, para. 7). Another article by Schwanecke (2023a) reinforced this issue, highlighting that 12% of lunches were surplus due to student absences or eating preferences. These inefficiencies need addressing to ensure that the excess food waste is minimized. One of the schools in the study who received the Ka Ora, Ka Ako | Healthy School Lunches Programme reuse or dispose of the excess waste or surplus.

"The whole school gets the lunches. The food doesn't get wasted as it is reused for our families. The food waste goes back to the company to be reused (pig farm).
All foods are wrapped so there is glad wrap rubbish, although the lunch boxes are reused."

However, another principal in this study doesn't know where the waste of the lunches goes, but also indicated that they have a lot of waste:

"I don't know where the left-over food goes"
"We think we have a lot of waste but the provider says we have one of the low waste usage. They are dealing with a lot of food waste. So it takes one little nibble for the food not to be reused. "

Figure 5.2 illustrates the amount of food which is not being consumed from one day on the Ka Ora, Ka Ako | Healthy School Lunches Programme in a class of 30 students. Out of the 30 students there were 13 meals that were not consumed.

Figure 5.6

A classroom of 30 student food waste from one day on the Ka Ora, Ka Ako lunch programme.

Zuercher et al. (2022) found that in US, there is an estimated $1.7 billion USD of school food waste per year. A study investigated waste from the US school lunch programme and found that one third to half of the waste comes from vegetables and fruit that are not eaten (Cohen et al., 2013). Byker Shanks et al. (2017) conducted a systematic review on the food waste in the US school lunch programme from 1978 to 2015. This study investigated the differences in food waste over time in the US school lunch programme. The major finding of this systematic review was that fruits and vegetable waste was the greatest waste in this programme. An interesting finding was that older students create more waste than younger students, and females create

more waste than males. Also, since the 1970s most of the studies have reported more than 30% of food waste and no study has report a zero food waste (Byker Shanks et al., 2017).

Lunch Method

The US delivery method of school lunch differs from the New Zealand system. The US method uses more of a food chain than New Zealand's approach, giving children a set lunch box. Calvert et al. (2021) investigated school meal food waste from the US school lunch programme. This study surveyed a national sample of elementary schools during 2019 and 2020. The key finding of this study was that schools have been using evidence-based practices to reduce waste over the last few years, which include longer seating time and recess before eating lunch. An interesting finding from Calvert et al. (2021) is that seating time for lunch also influences waste. They found that the longer the child eats, the more they consume. Another interesting finding from Calvert et al. (2021) was that having recess before lunch increased the children's food consumption and reduced waste. In this current research, having playtime before lunch was a strategy that some schools used in this study with good results. One principal who has not received the Ka Ora, Ka Ako | Healthy School Lunches Programme made a comment about how they flipped their lunch time around:

> *"We have noticed a big difference in children eating lunch at the end, not the start. They are more likely to eat it in this order. Also, the lunch boxes are now empty due to this change."*

Taste

The taste of food is critical to the success of the Ka Ora, Ka Ako | Healthy School Lunches Programme (Story, 2009). Meeting nutritional guidelines and reducing inequality is often the key driver for school lunch programmes; however, the taste of the food can be overlooked (Story, 2009). Guerrero et al. (2018) reviewed the literature on the role of taste in school meals. The key finding of this research was that taste plays a critical role in students eating and staying on the lunch programmes (Guerrero et al., 2018). One of the key findings of Guerrero et al. (2018) research was that students felt like they had no voice in food selection for the school lunch programme. If students could communicate their taste preferences, this would foster a positive relationship with the school meals. Fostering a positive relationship with the school meals can be challenging, especially if the food is unfamiliar (Lakkakula et al., 2011). The fear and rejection of new or unfamiliar foods is defined as neophobia (Lakkakula et al., 2011). In this current study, the principals indicated that the food of the Ka Ora, Ka Ako | Healthy School Lunches Programme was unsuitable for some children as these foods were unfamiliar:

> *"Too healthy and the children are not use to this type of food."*
> *"I think feeding kids healthy lunches is the issue and we should feed the kids lunches instead. I am not saying feeding them junk food but foods that they would eat: feed them white bread, give them food that they like the taste of in their lunches."*
> *"The decline of numbers of students eating the meals. I think it's a combo of taste and type of food. There is no class with all eating the meals. This is the main reason for the decline."*

Lakkakula et al. (2011) found that to change children's perspective of fruits and vegetables in a positive manner, children would need to consume fruits at least two times and vegetables five times. A possible reason fruits needed less exposure than vegetables was associated with children's innate preference for sweet foods rather than bitter (Lakkakula et al., 2011). A more recent study in the Dutch lunch school programme investigated taste lesson strategies to increase children's consumption of vegetables (Battjes-Fries et al., 2017). This study found that taste

testing on familiar vegetables had a positive effect; however, on unfamiliar foods, taste testing did not affect children's willingness to eat these foods (Battjes-Fries et al., 2017).

Other strategies that have been shown to increase children's consumption of fruits and vegetables are garden-enhanced learning strategies and nutritional classes (Dudley et al., 2015). Research has found that school-based nutrition programmes positively affect the consumption of fruits and vegetables (Verdonschot et al., 2023). The garden-enhanced learning strategy has been found to "positively influence vegetable preferences and consumption among primary school children, which has been found to be the strongest predictor of future consumption" (Dudley et al., 2015, p. 23). These findings were also supported by Heim et al. (2009), who found that a 12-week garden intervention increased children's willingness to consume fruit and vegetables. Making the children more familiar with fruits and vegetables before they receive unfamiliar foods from the Ka Ora, Ka Ako | Healthy School Lunches Programme may increase consumption and reduce wastage.

Within Ka Ora, Ka Ako | Healthy School Lunches Programme in New Zealand, the MOE expects the following to happen in the school: "Some children may need five to 15 positive experiences with new foods before they learn to like it. This can include touching, smelling, seeing, and tasting the food. While some children adapt faster, others may be less confident and will need more time, and you may see a lot of food wastage when you first start lunches. Many suppliers involved in Ka Ora, Ka Ako | Healthy School Lunches Programme reported higher levels of food waste in the first few weeks that steadily reduced as the term progresses, resulting in the majority of ākonga eating the lunch menu by the end of term" (MOE, 2021b, p. 2).

According to some of the principals in this study, there is still food waste. Some children pick and choose what they eat, and some choose not to be on the programme because they dislike the food. Also, in 2021, the MOE indicated that the providers and MOE were working on a guide for suppliers to introduce unfamiliar foods for the children. The MOE also gave schools six practical activities to improve the school environment (MOE, 2021b). These practical activities focus on the timing of lunch, the five bite policy, creating a long duration of time to eat, rewarding positive eating behaviour, explaining benefits and adult role modelling (MOE, 2023b).

Leftovers

The leftover procedure was different for the schools within this study. One school gave all leftovers back to the provider and was unaware of where the leftovers went:

> *"I don't know where the left-over food goes"*

Another school took control of the surplus meals, and they decided on the procedure of redistribution of the meals:

> *"At our school there are families who need that extra support. Leftover meals we freeze some of them for our families and ### have a food bank, which we direct our families to it."*

The third school gave food to the children who want to take it home:

> *"The whole school gets the lunches. The food doesn't get wasted as it is reused for our families."*

The final school used two providers, meaning that one allowed the children to take meals home, and the other did not.

> *"The benefits of ### meals is that you could take the meals away and used for families who need it. You couldn't do that for ###'s as they reuse the lunch boxes. ###'s take away all waste."*

According to the MOE (2021a) the redistribution of leftovers is up to the school. As long as the food is safe, it can be sent home with the child and shared with the community; this is the school's responsibility, not the responsibility of the external providers.

Overall, infrastructures such as cooking facilities, managing waste products, taste of food and serving food to children are critical for the success of the Ka Ora, Ka Ako | Healthy School Lunches Programme. According to research on the infrastructure of the school lunch programme, having a suitable dining hall is beneficial for students' eating habits. Currently, in New Zealand, most schools, especially in the Southland, still eat inside or outside the classroom rather than in a specific dining hall. Waste management is an issue around the Ka Ora, Ka Ako | Healthy School Lunches Programme, and there are a high number of leftovers from the lunches. One of the major findings from this study is that according to the principals, the taste of the food is the reason why a number of students are going off the Ka Ora, Ka Ako | Healthy School Lunches Programme. Strategies to improve taste and to get students more familiar with healthy food will increase the likelihood of students staying on the programme. Other strategies to help students remain in the Ka Ora, Ka Ako | Healthy School Lunches Programme include increasing the length of time consuming the lunch and having lunch after playing.

5.2.5 Ka Ora, Ka Ako | Healthy School Lunches Programme food providers

One of the key outcomes of this research was the positive relationships between the principals and the food providers. All principals had positive feedback on the providers:

> *"This is gold standard service that our provider is supplying."*
> *"The food provider goes out of their way to supply and deliver food to our children eg delivering to different locations."*

Chote et al. (2022) found that external providers found the MOE nutritional guidelines difficult to meet and, at times, challenging to provide a meal that the students would enjoy. The research reported that getting feedback from students helps the provider to provide healthy and tasty food for the school lunches (Chote et al., 2022).

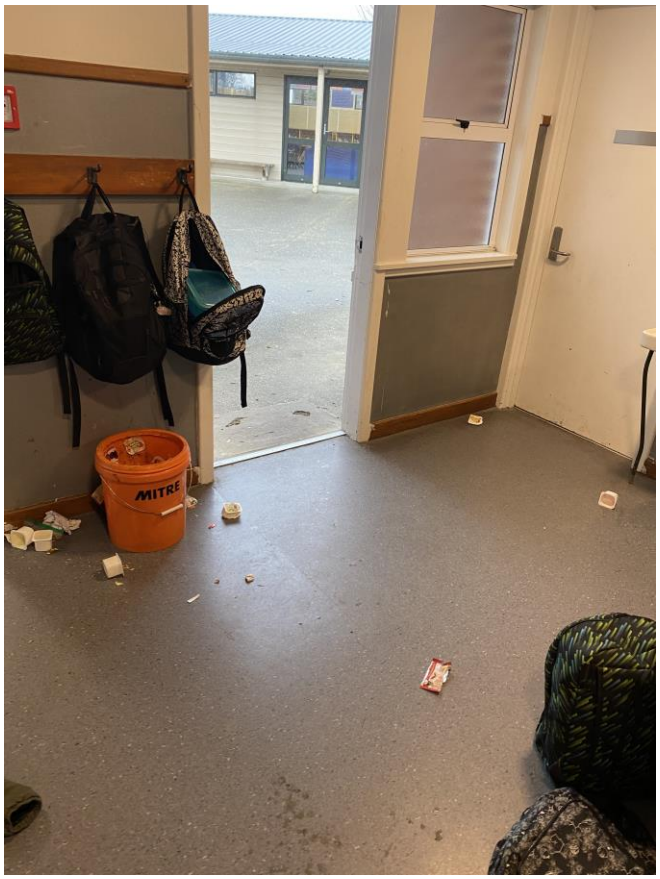
However, there were a few concerns about the quality of food and the restrictions of the MOE nutritional guidelines within this current research. A couple of principals commented on the issues around the MOE nutritional guidelines:

"The only barrier is the nutritional guidelines that the MOE follow."
"The decline of numbers of students eating the meals. I think it's a combo of taste and type of food".

In the current research, two schools had a provider over 200 km away from the cohort of schools interviewed. The provider would have to travel over 2,000 km weekly to provide these schools with school lunches. With the current environmental crisis and the New Zealand focus on reducing its carbon footprint, this seems conflicting (MFE, 2022). Other concerns for the principals were food waste and food wrapping. Each provider had a different method for waste management. One food provider used by a school in this research, has minimal waste. They use reusable plastic lunch boxes, paper wrapping for wraps and metal utensils. This food provider is also locally based in Invercargill. Another food provider utilises the school kitchen and gardens for their programme. This provider also has minimal waste as they reuse their plates and utensils. The final food provider uses a typical cold lunch pack of yoghurt, fruit and sandwiches. There is some waste from this provider, such as brown paper bags and food wrapping. This company also travels 400 km per day to supply the lunches. Figure 5.3 demonstrates the waste from yoghurt pottles from the Ka Ora, Ka Ako | Healthy School Lunches Programme in a cloakroom in a primary school:

Figure 5.7

Photo of waste from yoghurt pottles from the Ka Ora, Ka Ako | Healthy School Lunches Programme in a cloakroom in a primary school



This research revealed that there were various methods of disposing of the leftovers from lunches One way was for the food provider to return all leftover meals to their business. From that point, the food provider would give them to different food charities or the local pig farm. Another method was that all leftover lunches were given to the children to take home and feed their families. The final method was that the school would hand out the leftover school lunches to their families in need. Schools, in conjunction with food providers, determine the fate of leftover school lunches as long as they adhere to food safety guidelines, as stated by the MOE (2023b).

Another potential strategy is to increase the choice of meals per day. Bucher et al. (2013) found that increasing the variety of vegetables served per day had a positive impact on student vegetable consumption. In Bucher et al. (2013) study, children were given two different options of vegetables, and this change almost doubled the consumption of vegetables compared to when there was only one choice (Bucher et al., 2013). Bean et al. (2018) also investigated giving students more choice for school lunches using a salad bar. This study found that after one month of using a salad bar for the school lunches, there was an increase in the different types of fruit and vegetables; however, overall consumption of fruit and vegetables decreased. The researchers found that the students selected more variety but less fruit and vegetables from the salad bar. These results could be because the student may be interested in trying the food but reluctant to consume a large amount and may also related to cafeteria staff giving large servings normally (Bean et al., 2018).

One of the positive outcomes of this research was the strong relationships between the principals and the food providers. There were concerns about the quality of food and MOE nutritional guideline restrictions in the current research. Various methods existed to dispose of the leftovers and waste from lunches. One potential strategy is to offer more meal options to students.

5.2.4 Parental influence on the consumption of the school lunch meal

One of the key influences on children's behaviour is parents' behaviour (Mahmood et al., 2021). The child's decision to eat and stay on the Free Healthy School Lunch Programme is subject to the beliefs and role modelling of the parents (Nepper & Chai, 2017). Some principals within this study commented on the role of parents in the Free Healthy School Lunch Programme:

> *"Is this going to be sustained permanently, and do families know what the children are eating?"*

"It's taking ownership off the parents; the kids get free fruits and now free lunches and what are you teaching the parents". Referring to the question "Do you see any potential issues with the Free Lunch Programme".

Researchers have investigated the home environment's influence on the child's school lunch meal selection (Mahmood et al., 2021). Mahmood et al. (2021) investigated the effect of parental dietary behaviours on their children's eating habits. As the parent/s / guardians are the main food suppliers for primary school children, the food selection, frequency of eating, eating behaviours toward food and general nutritional knowledge are ingrained in the household.

Children's eating habits can be linked to parental behaviour toward food. For example, if parents role model to the child that they dislike a food or food type, the child will mirror this attitude (Draxten et al., 2014). This can lead to children not selecting school lunches as they become less flexible with new foods in the school meals. Draxten et al. (2014) found that parents' perception of meals correlated to their children's meals. This research demonstrates that if parents encourage their children to eat healthy food, they are more likely to consume this type of food. On the other hand, if a parent dislikes a food or food type, their child will likely adopt the same attitude. Yee et al. (2017, p. 10) stated that "a child will imitate or adopt behaviours when they observe an influential role model in their lives (e.g., a parent)".

Parent perspectives impact their child's decision-making in many ways, including what foods they consume. Several parental factors influence children's decision-making on finishing the school lunch programmes. One of these factors is the mother's educational level; the higher the mother's education level, the more likely the child will consume the school lunch meal (Mirtcheva & Powell, 2009). Another important factor is the parents' attitude towards feeding style, how they prepare meals and their beliefs towards foods (Savage et al., 2007). Another factor in children consuming the lunch programme is the parental knowledge of the food

supplied at school (Martinelli et al., 2020). Martinelli et al. (2020) indicated that keeping parents up to date with the school lunch programme will, in turn, increase the consumption of the meals.

Restricting unhealthy foods has been a practice parents have done for years. According to DeCosta et al. (2017), there are two main methods of parental control of food restriction: covert and overt. Covert control is where parents hide or avoid unhealthy foods in the house. Overt control is where the parents have unhealthy food in the house but control the amount going to the child. Parents with higher education tended to use cohort control, whereas parents with "pressure to eat" used overt control. Brown et al. (2008, p. 258) stated that: "Furthermore, the impact of factors such as parental age, education and whether or not they are a stay-at-home parent suggests that the choice of strategy may relate not only to parenting style and beliefs about food management but also to more structural factors such as time and support."

Parents play an important role in their children's education and nutrition. Research has indicated how parents' response to food and their attitude towards the Free Healthy School Lunch Programme will influence their children's decision to consume the school lunch programme (Mahmood et al., 2021; Nepper & Chai, 2017).

5.2.6 Conclusion

All principals agreed that the Ka Ora, Ka Ako | Healthy School Lunches Programme improves the teaching practices within the school. However, principals in both groups expressed concern about the restrictive nutritional guidelines in the Ka Ora, Ka Ako | Healthy School Lunches Programme. According to some of the principals in this study, there is still food waste. Some children pick and choose what they eat, and some choose not to be on the programme because they dislike the food. If students could communicate their taste preferences, this would foster a positive relationship with the school meals (Lakkakula et al., 2011).

In this study, five out of the six principals who have yet to receive the Ka Ora, Ka Ako | Healthy School Lunches Programme commented that their current kitchen would not be suitable for running the lunch programme. These principals also indicated that there was no suitable dining hall. The researchers found a positive outcome in school performance with an appropriate dining hall. Also, outcomes are better with a suitable dining hall. Most schools said they would prefer an external provider to supply and manage the waste. The one school that wanted to provide its food was due to its location and size.

With the combination of high student / teacher ratios, and a lack of classrooms, the money invested into the Ka Ora, Ka Ako | Healthy School Lunches Programme could be used for staffing or infrastructure. This was a concern from principals, that the money could be invested in other areas such as buildings or extra teachers. One of the key outcomes of this research was the positive relationships between the principals and the food providers. However, there were a few concerns about the quality of food and the restrictions of the MOE nutritional guidelines. Parents play an important role in their children's education and nutrition. Research has indicated that the parents' response to food and their attitude towards the Free Healthy School Lunch Programme influences their children's decision to consume the school lunch programme.

Overall, all principals see the benefits of the Ka Ora, Ka Ako | Healthy School Lunches Programme, especially in populations who need extra support. For the principals who currently run the Ka Ora, Ka Ako | Healthy School Lunches Programme, the key issues are the restrictiveness of the MOE nutritional guidelines, the decrease in consumption of the school meals due to taste and presentation, the waste of food from this programme, and the cost-benefit of the programme.

5.3 Summary

This chapter presented the perspective of school principals regarding the Free Healthy School Lunch Programme. The chapter included findings from interviews with two groups of principals - those who have not received the Ka Ora, Ka Ako | Healthy School Lunches Programme and those who have. Additionally, the chapter discussed the key findings of the interviews and analysed them against previous research.

The next chapter will focus on the children's perspective of the Free Healthy School Lunch Programme. This will firstly focus on the results of group interviews from the children, then secondly discuss the key findings of this interviews and analyse the findings compared with previous research.

CHAPTER SIX

CHILDREN'S PERSPECTIVES

FINDINGS/ RESULTS

6.0 Introduction

The previous chapter focused on the principal's perspective of the Ka Ora, Ka Ako lunch programme. It focused on the results of interviews with the principals who have not received Ka Ora, Ka Ako lunch programme followed by principals who have received the Ka Ora, Ka Ako lunch programme. The key findings of these interviews and the comparisons with previous research findings were discussed.

This chapter focuses on the children's perspectives of the Ka Ora, Ka Ako lunch programme. It firstly focuses on the results of group interviews with the children, then secondly discusses the key findings of this interview and analyses the findings compared with previous research.

6.1 Results

This section focuses on the interview results of the children's perspectives of the Ka Ora, Ka Ako lunch programme. It covers the participant information, lunch meal structure, meal preference, children's perspectives on changes to the programme and children's perspectives on how to encourage more children to eat the school lunches.

6.1.1 Participants

The participants of this study were 80 primary school students from the same school from three classes. There was a year one and two class of 24 students and two teachers; a year three and four class of 28 students and one teacher; and a year five and six class of 28 students and one teacher (refer to table 6.1). At the time of the interview, according to the principal of this school: "at the start of the lunch programme, the majority of students consumed the school meals and now it's down to 2/3 of the school".

Table 6.1

The number of students and the current level of the students who participated in the group interview

Year	Number of students
1 and 2	24
3 and 4	28
5 and 6	28

6.1.2 School Lunch Meal Plan

The meal plan for this school is based on a two-week rotation for ten weeks (term three, 2022). At the time of the interviews, it was week four, term three. The school meal plan for term three is shown in table 6.2:

Table 6.2

The school meal plan for the Ka Ora, Ka Ako lunch programme.

Day	Week 1	Week 2
Monday	Nacho mince with sour cream and corn chips	Turkish Baked Potato
Tuesday	Chicken BBQ Bento Bowl	Chicken Teriyaki Bento Bowl
Wednesday	Butter Chicken with Naan	Creamy Coconut Beef Curry
Thursday	Meatloaf with coleslaw and new potato	Oodles of noodles frittata with coleslaw and new potato
Friday	Chicken wrap with yoghurt, fruit and chia pudding	Chicken pasta salad with layered fruit and yoghurt crumble

Figures 6.1 to 6.3 show photos of examples of meals from the Ka Ora, Ka Ako lunch programme:

Figure 6.1

Chicken pasta salad with layered fruit and yoghurt crumble

Figure 6.2

Creamy Coconut Beef Curry

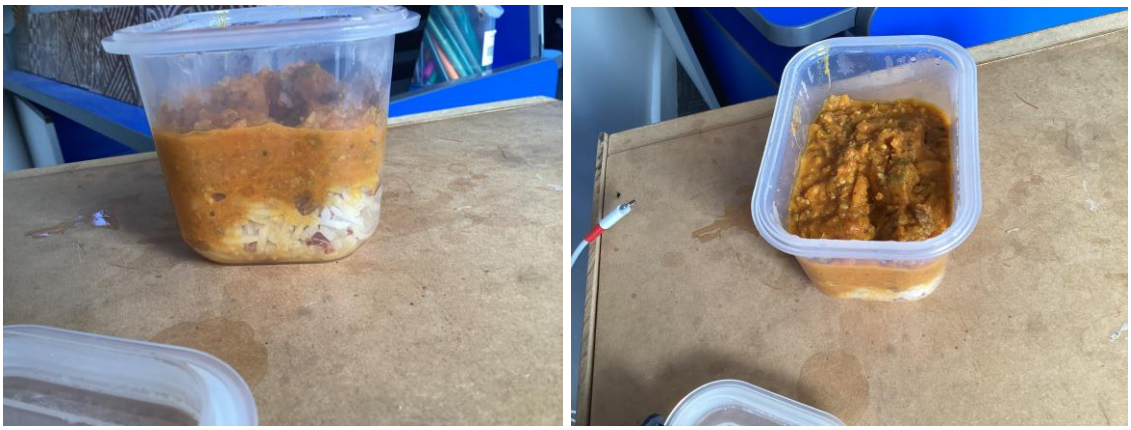


Figure 6.3

Chicken BBQ Bento Bowl

6.1.3 Meal Preference

Students from all three classes were asked about their meal preferences from the school lunch programme, the results of which are illustrated in Figures 6.4 to 6.6. The results showed similar trends in meal preferences in all age groups. The butter chicken meal for all age groups was the most preferred school meal. This was followed by nachos meals in all age groups.

Figures 6.7 to 6.9 illustrate which meals the students disliked from the school lunch programme. Certain meals were not popular among students, and different age groups had varying opinions on the matter. The year one and two students disliked the bento bowl and wraps meals. The year three and four students disliked the pumpkin soup meal the most. The year five and six students disliked the wraps, bento bowls and the meat loaf. Overall, the wraps and bento bowl meals were the less-liked meals

Figure 6.4

Year 1 and 2 meal preferences

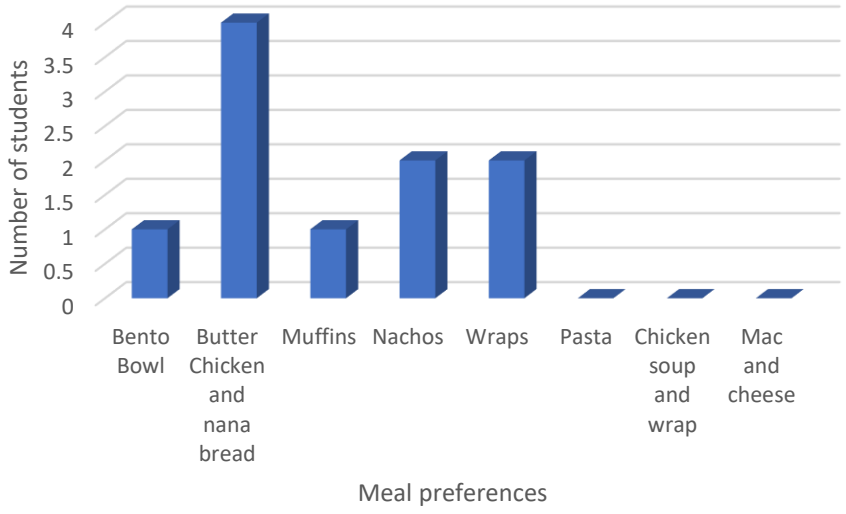


Figure 6.5

Year 3 and 4 meal preferences

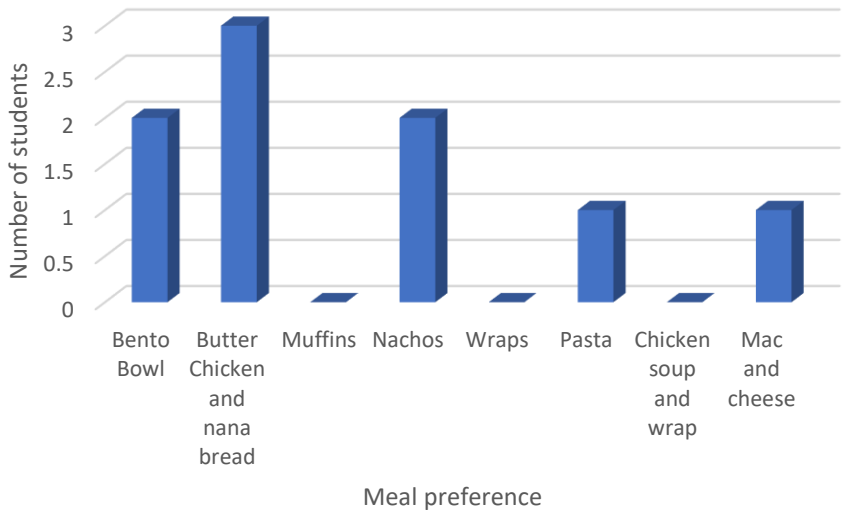


Figure 6.6

Year 5 and 6 meal preferences

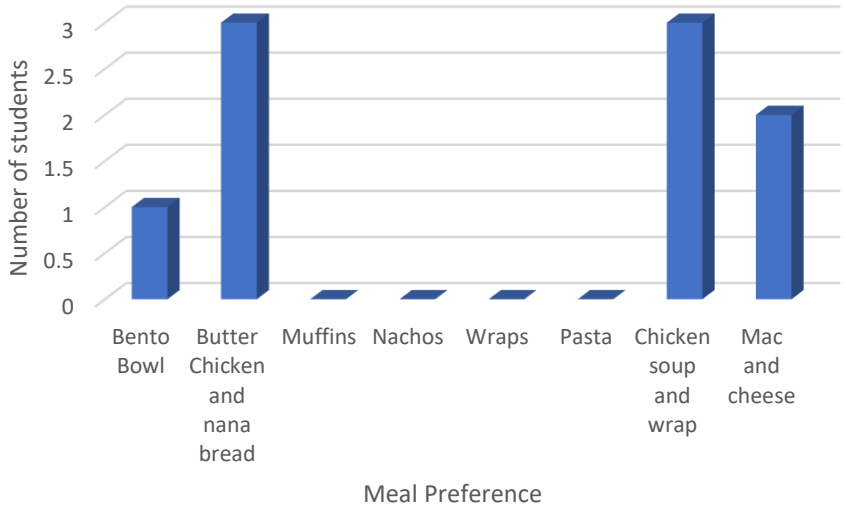


Figure 6.7

Year one and two meal dislikes

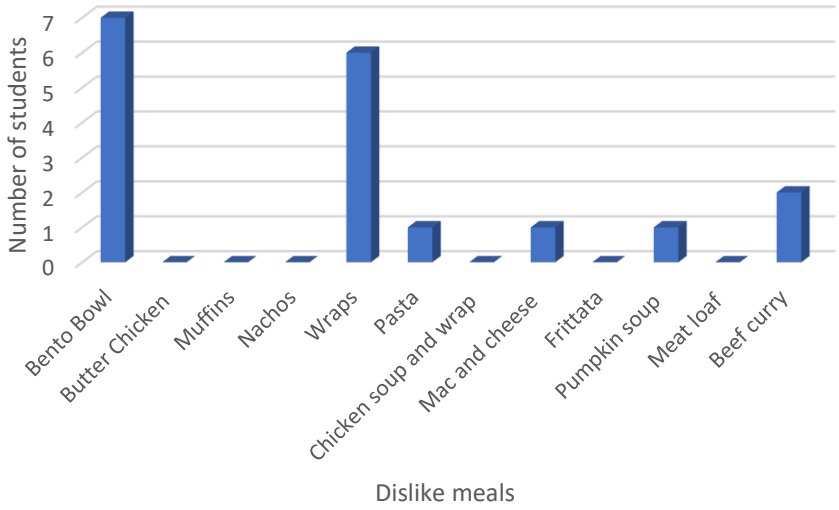


Figure 6.8

Year three and four meal dislikes

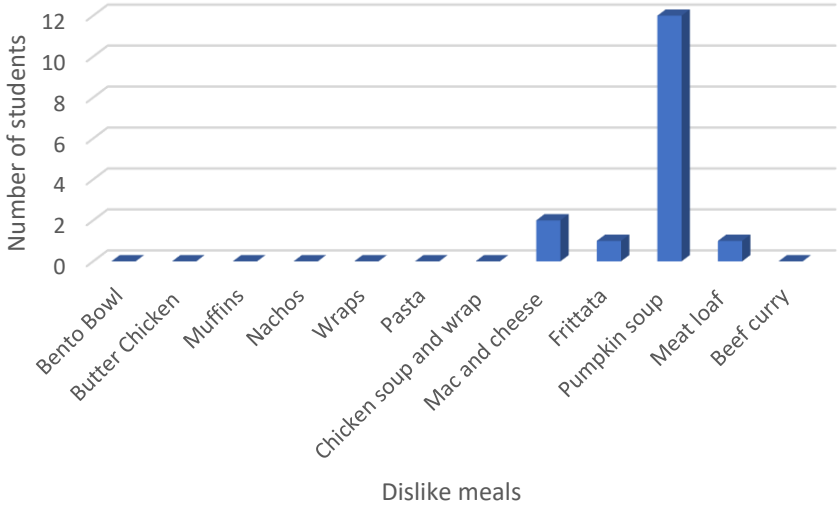
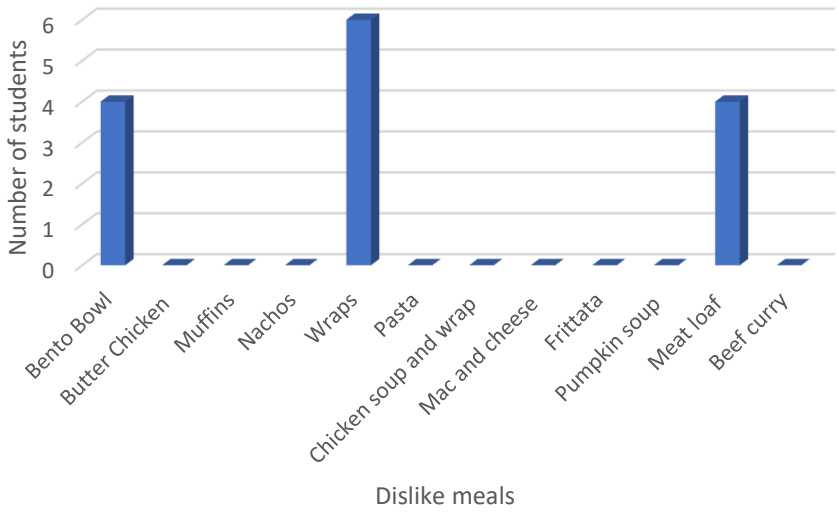


Figure 6.9

Year five and six meal dislikes



6.1.4 Children's perspectives on what we should do differently to the school meals

In the interviews, students were asked, "What would you do differently for the school lunch?". Table 6.3 shows the students' responses from the three year groups. The main findings from this specific question were that the year one and two students tended to suggest either treat foods or reducing vegetables in their suggestions on how they would do the school meals differently. In comparison, the year three and four and the year five and six students tended to have more suggestions on changing the meals to make them more palatable.

Table 6.3

Children's responses to the 'what would you do differently for the school lunch?' and the corresponding year group

Year 1 and 2	Year 3 and 4	Year 5 and 6
I would like a chicken burger	"Add more seasoning to the Mac and cheese"	Choice of food: Write down what the children wants eat.
Make the wrap taste better. Add pineapple to the wrap to make it more yummy.	"Add more seasoning to the Mac and cheese"	Special meal for special days. For example if it was easter I would have a special meal.
I would make them yummier Not add seeds	"Add more pasta to the Mac and cheese"	Different food every day more variety. You get a wide variety of what you want. You also get to try different foods.
I would add green stuff to the pasta (pesto)	"They should mash the pumpkin" "I don't like the lumpy bits"	They bring the lunches at morning tea and they are cold once we eat them. I would bring them later closer to lunch time (it's too cold), so it's still hot. It would keep the juice in so the chicken would not be dry.
Change wraps no vegetables, I would have chicken and rice	"Take out curry out of the butter chicken"	Find out what the students' favourite meals are and then select of foods they like.
Chicken nuggets	More chicken and sauce	Cook rice longer, so it's not crunchie or hard.
French fries	Is the chicken dry?	Make sure that the chicken is not dry but moist.
Happy meals		You get a little snack with the meals, they could do something sweet.
Butter chicken and coloured pancakes		Tie their hair or use a hair net
"have cake and fruit"		
"add cake"		
I would make a blueberry pie		
Pancakes		
Ice-cream on a pancake		
No pickles		
No pineapple		
Pies		
I want more pineapple for the school schools		
I would add pickles to the wrap		
I would add cake to the wrap		
Burger		
Hot Chips		
Like the spicy chips		

6.1.5 Children's perspectives on how to encourage more kids to eat the school lunches.

In the interviews, students were asked how to encourage more children to eat school lunches. Table 6.4 shows their responses and the corresponding themes. The main findings from this question showed that the children's suggestions had specific themes for all ages. The primary way the students suggested encouraging more children to eat the school lunches was via persuasion strategies. Other methods for this particular question were using role modelling and bribery.

Table 6.4

Children's responses to the "How could you encourage more kids to eat the school lunches?' and the corresponding year group with the type of theme

Year 1 and 2	**Themes**
Try it	Persuasion
They taste like pancakes and try a little bit	Persuasion
Eat it or you will be hungry	Fear of missing out (FOMO)
Help them. Show them that they are yum.	Persuasion / Role Modelling
To try it	Persuasion
You can tell them that the school lunches are super yummy.	Persuasion
To try it and to mix it around	Persuasion / Education
Year 3 and 4	
Eat together	Peer Support
Trick them: tell them that there is lots of sugar	Persuasion
Give them a sweet at the end of the meal	Bribery
Give them a sweet at the end of the meal	Bribery
Role modelling "the teacher eats the meal with us to support us eating" " you tell us how to make it more enjoyable" Mixing them up	Role Modelling

Year 5 and 6	
Can tell other children that people take of lot of effort to make your lunches.	Persuasion
So people who are having the lunches explain what it tastes like.	Persuasion
You can explain how lucky you are to have it, for example people overseas would love it.	Persuasion
Be more positive about the food as people may not eat the food if you say negative comments about the lunches.	Role Modelling
Add a little toy or book to it	Bribery
Reduce cost to family	Persuasion

6.2 Discussion

6.2.1 Introduction to the discussion section

This section will compare and evaluate the key results from the three group interviews compared with past research. From the results of the children's perspectives, there are several key areas of focus in this discussion section, which are:

- The effects of taste and food choice on the consumption of the school lunch meals
- The role of peer influence and the effect of consumption of the school lunch meals
- Children's perspective on what we should do differently to the school lunch meals
- The influence of role modelling within the classroom and the effects on consumption of the school lunch meals

Once the four focus points are completed, they will be summarised and concluded.

6.2.2 Introduction

"A child's voice, however honest and true is meaningless to those who have forgotten how to listen" - Albus Dumbledore (Mullen, n.d., para 1)

The main results from this study found that in this particular school, the number of students having school lunches had decreased by a third over one year. The children in this research indicated several factors that influence them to consume the school lunch:

- The taste of the meal
- Influence from peers
- The meal's presentation

The findings are similar to other research that has been conducted on children's perspectives and reasoning for food choices (DeCosta et al., 2017; Waddingham et al., 2018; Wansink & Hanks, 2013). Children's eating habits are a complex matter that involves several factors. "Children's eating behaviour is fundamentally governed by what foods are available and accessible to them, and the food made available to them, intentionally or unintentionally, will affect what they eat" (DeCosta et al., 2017, p. 349).

Healthy eating for children is extremely important for academic performance, reducing chronic disease risks and improving mental wellbeing. With increases in childhood obesity within New Zealand, strategies to improve children's consumption of healthy eating will have positive effects. Several factors influence children's eating decisions, according to Waddingham et al. (2018), which include: food choice, restricting unhealthy foods, innate tastes, sensory properties such as texture, the food industry and media, aspects of versatility, social acceptability, peer influence and home environment.

In this research, the children's perspectives on what we should do differently to the school lunch meals, the influence of role modelling within the classroom, and the effects on consumption of the school lunch meals is discussed in this section.

6.2.3 The effects on taste and food choice on the consumption of the school lunch meal

Taste is defined as "one of the five senses that people have, and taste is the individual quality which it has when you put it in your mouth, and which distinguishes it from other things. For example, something may have a sweet, bitter, sour, or salty taste" (Collins, 2023, para. 2). The taste of food is crucial in a child's food selection. If the child dislikes the taste, they will likely not eat it again (Guerrero et al., 2018). Taste can impact decision-making later in life when it comes to food selection. Genetic, prenatal and environmental factors influence taste. Mennella (2014, p. 705) investigated taste preferences for different age groups. The researcher found **"**that the preference for sweet taste is universal and evident among children around the world". Mennella (2014) suggested that primary school students prefer high-fat and sweet foods. The

innate taste preference does have variance depending on which country the child is born in. “The highest prevalence values were observed for sweet sensitivity in Italian and Estonian children, for bitter sensitivity in Hungarian and Spanish children and umami in Hungarian children” (Ahrens, 2015, p. 5).

Savage et al. (2007) found that during the foetus stage, the mother's nutritional choices influence the amniotic fluid, which has been associated with the infant's acceptance of solid foods. Mennella (2014) found that mothers who had carrot juice for three weeks in the last trimester had infants who had fewer negative reactions to carrot-flavoured cereal. For preschool-aged children, they need to try a new meal ten to 16 times before they accept the food (Savage et al., 2007). According to the MOE (2021b, p. 2), “it takes five to 15 positive experiences with new foods before they learn to like it”. A positive food experience for children is individual, however, it would include a positive and safe environment to try new foods.

In this research, taste and food choice were issues, with several themes occurring in the interview with all three groups. The meals that students disliked from the school lunches were predominantly the wraps and bento bowl meals. Some of the comments from the students were:

Wraps comments:

> “Not much chicken and dry, also there is not much flavour”.
>
> “There is a lot of vegetables and not much meat”.
>
> “Most of the chicken meals are dry”.
>
> “It’s separate between vegetables and meat”.
>
> “They have half the wrap with coleslaw and the other half with meat, so if you take a bite on one side, you only get coleslaw”
>
> “I don’t like the wraps”.

Bento Bowl comments:

> "The one with the pickles"
>
> "It's just not my type of food".
>
> "Rice and chicken, it's dry".
>
> "Carrots are dry".
>
> "Do not like sauce"

These comments from the children support previous studies, suggesting that food taste and choice are some of the most important determinants of children eating school meals. Waddingham et al. (2018, p. 1) investigated what motivated Australian children in their food choices. The researchers found that children can explain why they select food choices. This research found that the key drivers of children's food choices come from: "social acceptability, eating context (such as hot food on cold days), texture, pleasure and versatility". Waddingham et al. (2018) suggested that the taste can drive children's eating habits even if the child knows the health benefits of the foods. This finding suggests that even if the children have a healthy environment, it doesn't mean they will eat healthy foods. Wansink and Hanks (2013) indicate that exposure to healthy foods is important and that taste is the main driver for children to eat meals. In the US, "the costs associated with discarded foods are high; if translated nationally for school lunches, roughly $1,238,846,400 annually is wasted. Students might benefit if additional focus were given to the quality and palatability of school meals" (Cohen et al., 2013, p. 1).

Cohen et al. (2013) are also supported by Wansink and Hanks (2013), who found similar findings that children consume more school lunches when they are more palatable. Wansink and Hanks (2013) investigated whether a chef affects the consumption of school lunches and the effects of increasing fruit and vegetables. In this study, the researchers found that the consumption of meals

was higher than normal when a chef prepared the meals and there was a higher consumption of fruit and vegetables. Even though it costs more money to have a chef preparing meals, this cost was offset by decreased wastage.

Several studies have investigated if the chef's cooking can influence children to consume more school meals (Wansink & Hanks, 2013) (Cohen et al., 2013). Cohen et al. (2013) looked at the effects of palatability of meals on the impact of waste from school meals. They found that school meals need to be more palatable for students to eat and finish their meals. The researchers also found that how the meals are prepared determines whether the students eat the meals. The current research supports these findings that the presentation of school lunches as an important factor in the child's decision to eat the food or not. Twenty-three students in the year five and six class commented that they have "hair or something in their school lunch". Also, from this year five and six class, only 19 out of 32 students now eat the school lunches. This would mean that 41% of the class have had bad experiences and stopped eating the school lunches, as at the start of this programme in this school, the majority of students consumed the school lunches. Figure 6 illustrates a half-eaten meal from the Ka Ora, Ka Ako lunch programme. This photo demonstrates the foods that choose not to finish.

Figure 6.10

Photo of a Mac and Cheese meal from the Ka Ora, Ka Ako lunch programme, which is only haft-eaten

Wansink and Hanks (2013) investigated whether primary school students consumed more fruit if it was pre-sliced. Their results showed that children preferred sliced apples compared to whole fruits. Briefel et al. (2009) examined the dietary behaviours of US school children in consuming school meals. These researchers discussed the research on fruit and vegetable consumption in children at school. “A number of studies conducted in school settings have examined interventions designed to increase fruit and vegetable consumption in multiple ways:

- by offering free fresh fruits and vegetables,

- by providing variety through salad bars,
- by improving the quality and variety of fresh produce or fruits and vegetables offered in school meals,
- by providing nutrition education to children and families, and
- by making point-of-purchase or foodservice changes" (Briefel et al., 2009, p. 104).

The Briefel et al. (2009) study shows that increasing accessibility, presentation, and normalisation of fruits and vegetables in school lunches leads to higher consumption.

Taste and food choice are critical to a successful school lunch programme. Humans are born with innate taste preferences and aversions, which are hard to change. Children's food experiences at school can influence them for life. The French education system has a preschool and primary school programme that teaches taste education in their curriculum. The Japanese have a similar programme on meat consumption using the five senses to increase meat consumption (Shon et al., 2012). Shon et al. (2012) investigated the effects of a taste-based programme for preschool children and found positive changes in children's dietary habits. This research found that children's taste preferences can change in a positive direction, leading to healthier food choices (Shon et al., 2012). Another study also researched the effects of taste education, 'Flavour school' and found that sensory education increases children's confidence around food, especially fruits and vegetables (Wilkinson et al., 2022).

Changing taste preferences is difficult, especially when children start school. A study investigated a health education programme at a primary school using the Transtheoretical Model of stages of change to increase nutritional knowledge (Vieira & Carvalho, 2021). Vieira and Carvalho (2021) found that using the Transtheoretical Model of stages of change significantly changed children's eating habits to eat healthier foods and decrease unhealthy foods. Their research found that students preferred eating more nutritious foods due to changes in the children's motivation to eat them (Vieira & Carvalho, 2021). This supports the idea that we cannot simply provide healthy food and expect children to consume it. The Transtheoretical

Model of stages of change follows a five step process to explain individuals need for change (Powers et al., 2017):

Step 1: Precontemplation: This is where an individual is not interested in change.

Step 2: Contemplation: The individual is thinking about change.

Step 3: Preparation: The individual is preparing for change.gerrist

Step 4: Action: The individual is making change.

Step 5: Maintenance: The individual is sticking to the changes.

There is another step which is relapses, where is individual can go back to any stage.

Another method to improve taste preference is using taste tests, which is common practice in the US school lunch programme (Cohen, Hecht, Hager, et al., 2021). Bean et al. (2018) assessed the impact of taste testing in a school cafeteria on the waste product from fruits and vegetables. In this study, the cafeteria staff would offer students a taster of future lunches twice a week for eight weeks. The results of Bean et al. (2018) found an increase in students' exposure to fruits and vegetables and a significant reduction in waste six weeks after the intervention. Another study that investigated the effects of taste testing on the consumption of a school lunch programme was conducted by Pope et al. (2018). In this study, the researchers investigated the effects of giving a vegetable entrée the day before the entrée is given as a meal. The results from Pope et al. (2018) found that there was an increase in the school lunch programme meals once students received the entrée the day before the meal. The other finding from this study showed a slight decrease in other meals, such as pizza and deli sandwiches. Snelling et al. (2017) used a taste-testing competition to increase school vegetable consumption. The findings of Snelling et al. (2017) showed that black beans and broccoli increased in consumption due to the taste-testing competition; however, spinach decreased in consumption. The results of this study indicate that students who are engaged in preparing and cooking vegetables increased their consumption of this food (Snelling et al., 2017). This supports previous studies (Bean et al., 2018; Cohen, Hecht, Hager, et al., 2021; Pope et al., 2018) on taste testing and the benefits of preparing children to eat new food and increasing their taste preferences, especially towards healthy foods.

The role of taste and how food is presented is critical for the success of the Ka Ora, Ka Ako lunch programme. Strategies such as having a proper chef prepare the meal, taste testing the food before the meals are on the menu and taste testing programmes will enhance the likelihood of children eating and staying on the programme. The idea of children eating just whatever is in front of them and not challenging the presentation, familiarity and taste is unrealistic and the Ka Ora, Ka Ako lunch programme needs to listen to the children's perspectives.

6.2.4 The role of peer influence and the effect on consumption of the school lunch meal

For primary school children, the influence of their peers becomes a major factor in their life choices. Peer influence in primary school can also determine food choices. Cullen et al. (2001) researched the effects of parents and peers on consuming fruit, juice and vegetables. The researchers found that parents and peers influenced fruit, juice and vegetable consumption. This peer influence can also be attributed to eating snack foods, especially among younger adolescents and females (Kümpel Nørgaard et al., 2013). Kümpel Nørgaard et al. (2013) also suggested that peer influence has more of an effect than personal factors when choosing snack foods.

Kalavana et al. (2010) found similar findings on the impact of peer influence, and that peer influence can influence both healthy and unhealthy eating practices. This research found that overcoming unhealthy eating strategies to resist peer influence is important in reducing unhealthy eating. Also, this research found goal efficacy was another determinant for reducing unhealthy eating practices. Setting goals is important in healthy eating (Kalavana et al., 2010).

The group setting is an important factor that influences children through peer pressure. It has been found that children are likely to mirror each other's behaviours, especially in food selection (Nørgaard et al., 2014). In a study by Nørgaard et al. (2014) looking at the social and individual determinants of adolescent food choices, they concluded that peer influence was the critical determinant of adolescent food choices. In this research, peer influence increased the incidence of children buying snacks around their peers compared to when they are alone. This would suggest that peer approval is an important factor in food choice.

Peer influence plays a significant role in determining the success of the Ka Ora, Ka Ako lunch programme in a school setting. According to this study's results, when the children were asked about ways to encourage more kids to eat, the classes made comments such as:

> "You can tell them that the school lunches are super yummy." - Year 1 and 2 students
>
> "Be more positive about the food as people may not eat the food if you say negative comments about the lunches." - Year 5 and 6 students

Andersen et al. (2015) investigated the importance of classmates' options and the consumption of school meals. When students are introduced to a new meal, the consumption of the meal and enjoyment are influenced by the other classmates. The potential mechanism for this influence could be from the judgement of the peers through praise or disklike of the meal. Andersen et al. (2015) also mention that new school meals that don't fit the child's food norms will influence the consumption of the meal. Peer influence can also affect packed lunches versus school lunches, as packed lunches can have foods that may get the child's praise after each day. Andersen et al. (2015, p. 1) state: "If we want children to like healthy meals, and if we wish to increase the likelihood that they will eat such meals, we must consider their peers when designing and implementing new initiatives and interventions".

A systematic literature review article researched the influence of peers and siblings on healthy eating habits (Ragelienė & Grønhøj, 2020). This research found that "peers, and to a lesser extent, siblings' influence on children's and adolescents' healthy eating behaviour more often is negative than positive" (Ragelienė & Grønhøj, 2020, p. 1). The potential mechanism for these results is the strong relationship between peers and siblings. Children observe the eating habits of peers and other groups within the school, which influences their behaviours to fit into social norms (Ragelienė & Grønhøj, 2020). Another important aspect of food choice is the influence of social media, and how peers and siblings respond to these messages. Ragelienė and Grønhøj (2020, p. 6) suggested that there are many factors that we need to consider when implementing food changes: "friends' social influence, approval by peers of new eating habits, peer attitude to food, peer food liking, perception of healthy eater prototype, social norms, or genetic factors, sibling intimacy and conflict, in the minority of studies speaking about siblings' influence on eating behaviour".

The theory of social norms suggests that our peers shape our behaviour (Johnson, 2012). Peer influence can shape positive or negative behaviour in children. A study by Watts et al. (2018) investigated peers' effects on sugar-sweetened beverage intake consumption. In this study, the researchers used a food frequency questionnaire on student eating habits in a public high school (mean age 14.5 years old). From the results, the researchers found "small positive associations were found with peers' sugar-sweetened beverage intake and small negative associations with peers' attitudes towards healthy eating" (Watts et al., 2018, p. 7). These results indicate that peer relationships contribute to selecting unhealthy beverages/food. Watts et al. (2018) findings are also supported by Bruening et al. (2014), who found an association between peer influence and consumption of sugar-sweetened beverages. Bruening et al. (2014) conducted a cross-sectional survey study on 2,043 adolescents and found a significant association between peers, especially best friends, and the consumption of sugar-sweetened beverages. These results indicate that friendship can influence unhealthy practices such as consuming sugary drinks (Bruening et al., 2014).

Peer influence has also been associated with helping to create healthy eating habits (Rosenrauch et al., 2017). A study that investigated peer support to develop healthy eating habits was conducted by Rosenrauch et al. (2017). This study sampled 1,785 Australian adolescent students and found that friends who eat healthy foods together are less likely to skip breakfast or lunch (Rosenrauch et al., 2017). The researcher suggested that peer support, sharing healthy beliefs, and verbal persuasion are possible factors for children not to skip meals.

Peer influence can also affect children's eating duration (Salvy et al., 2012). Time of eating at school lunch has a positive relationship with consuming the whole school meal and reducing food waste (Cohen, Hecht, Hager, et al., 2021). De Castro (1990) suggested that the more people there are around mealtime, the longer the meal duration. Peers have also been found to influence not only the duration as well as the amount of food consumed (Herman et al., 2003). The presence of peers can either increase or decrease the amount of food depending on the amount of food the peers are eating (Herman et al., 2003).

Another factor when eating with peers is the size of the groups. Lumeng and Hillman (2007) investigated the effects of group size in children aged between 2.5 to 6.5 years old. Lumeng and Hillman (2007, p. 386) split the children into a group of three or nine to eat a snack meal. This study found that "children consumed 30% more food when eating in a group of nine children than when eating in a group of three children during longer snacks". This result showed that younger children are influenced by group size when consuming meals and that children devoured more food in large amounts in bigger groups. Lumeng and Hillman (2007) found more social interaction in the group of three than in the group of nine.

A study examined the effects of overweight and normal-weight children's eating habits around their peers (Salvy et al., 2007). Salvy et al. (2007) investigated children who were overweight and of normal weight and the effects of peer influence on food intake. The findings of this study found that overweight children eat more food compared to when they are in a group setting. The

results of this study could be analysed in two ways. Firstly, these results may help overweight children reduce food overconsumption in a group setting. Secondly, it may cause overweight children to be stigmatised in a group setting and increase anxiety.

When considering implementing a lunch programme in primary schools, peer influence in the school is important. Looking at strategies to enhance the attractiveness of the school lunch meal will increase the consumption and adherence to the programme. Another important factor for a successful school lunch programme is positive peer role modelling to create a healthy environment within the school. Also, schools need to consider group sizes and not create a time-pressured environment, so that the children can socialise with peers and are not under pressure to finish lunch quickly.

6.2.3 Children's perspectives on what we should do differently to the school meals

Understanding children's perspectives can provide valuable insights into their thought processes and behaviour. The findings in this study showed that the recommendations for improving school meals differed among age groups. While students in year one and two suggested either modifying foods or reducing vegetables, those in years three-four and five-six tended to offer suggestions for making the meals more palatable. The latter group also tended to provide more specific guidance on how the meals could be modified to meet their preferences. The year one and two students made comments on what they would do differently, such as:

> "French fries"
>
> "Happy meals"
>
> "Ice cream on a pancake"

The year three and four students offered more constructive suggestions on the cooking process:

"Add more seasoning to the Mac and cheese."

"They should mash the pumpkin." "I don't like the lumpy bits."

"More chicken and sauce"

The year five and six students made suggestions on the cooking process and the presentation/purpose of the meals.

"Choice of food: Write down what the children want to eat."

"Special meal for special days. For example, I would have a special meal if it was easter."

"Cook rice longer, so it's not crunchie or hard."

"Make sure that the chicken is not dry but moist."

Children's perspectives are important in the continuation of a food programme. In business, the first impression is critical for the product's success, which is also true regarding food. Ensuring that the food is cooked thoroughly and presented attractively will encourage the students to stay on the food programme. Research has found that the presentation of a meal increases the likelihood of a person enjoying the meal (Michel et al., 2014). Michel et al. (2014) found that the meal's presentation enhanced the perception of the meal, and they stated that "we eat with our eyes first".

Another important factor is the palatability of the school's lunches (Cohen, Hecht, Hager, et al., 2021). A study examining the effects of adding spices and herbs to vegetables found that this increased the consumption of vegetables (D'Adamo et al., 2021). The palpability is a primary determinant of consuming them and repeating consumption next time (Cohen, Hecht, Hager, et

al., 2021). The US school lunch programme used professional chefs who used seasoning to increase consumption and make meals more culturally appropriate (Cohen et al., 2015; Cohen et al., 2012; Just et al., 2014; Zellner & Cobuzzi, 2017).

Bribery / Rewards

In this study, students mentioned the use of bribery for consuming lunch meals:

> "Give them a sweet at the end of the meal."
>
> "Add a little toy or book to it."

This method of bribery has been used in other school lunch programmes. The use of bribery/rewards has been studied to increase the consumption of school meals and/or types of food such as vegetables and fruits with success (Cohen, Hecht, Hager, et al., 2021). Hendy et al. (2005) gave out tokens for children consuming fruits and vegetables during the school lunch. The researchers gave tokens at the end of the week that could be traded for small prizes. This increased the consumption of fruits and vegetables throughout the intervention; however, seven months later, fruit and vegetable consumption returned to baseline (Hendy et al., 2005).

Jones et al. (2014) also used an incentive-based approach to increase fruits and vegetables in school. These researchers used a virtual game-based reward system, and students would receive benefits for the game on consumption of fruits and vegetables. The results from this intervention increased fruit and vegetable consumption compared to the baseline levels. Another study found that role modelling and reward programmes for eating fruits and vegetables during the school lunch increased consumption during the trial (Wengreen et al., 2013). These researchers used a heroic peer (food dude) in a short video eating fruit and vegetables to promote consumption. Also, the students were rewarded after eating fruits and vegetables during the school lunch. The

combination of role models and rewards increased fruit and vegetable consumption by an average of 0.49 cups per day (Wengreen et al., 2013).

The use of rewards to get children to eat healthy foods has been investigated by different researchers (Farrow et al., 2015; Fedewa & Davis, 2015; Jansen et al., 2020). Parents have been using rewards to promote good behaviour for years (Jacob-Files et al., 2018). Jansen et al. (2020) investigated the effects of parents using food to reward their child's eating habits. Two-thirds of parents with four-year-old children use food as a reward, and over half of parents with nine-year-olds use it as well. Parents' reasons for using food as a reward vary from emotional overeating to picky eating. The researchers stated, "Potentially, because of being rewarded with food, children may learn to associate the used food - most likely unhealthy food high in fat and sugar with emotions" (Jansen et al., 2020, p. 7). Another interesting point raised by the researchers was that using food to treat negative behaviour may increase that habit and the negative emotion. There is also another issue of using food as a treat, which is the danger of fostering a negative attitude towards healthy foods. If parents use treat foods as a reward, this may decrease the attractiveness of healthy foods (Jansen et al., 2020). Within the school classroom, some teachers use food as a reward for good behaviour or academic performance (Turner et al., 2012).

The method of bribery has been used in other school lunch programmes. Bribery/rewards have been found to increase the consumption of school meals with success. However, for the Ka Ora, Ka Ako lunch programme, implementing bribery/rewards may provide short-term benefits, but in the long term, it may foster a negative attitude towards healthy foods.

6.2.4 Role modelling

Role modelling is an important aspect of learning. Role modelling shows us what the social norms are and can promote positive outcomes. Teachers and peers play an important role in creating a positive environment. In this research, students mention how role modelling is important in consuming the school lunch (Refer to Table 6.5).

Table 6.5

Student comments about role modelling

Year 1 and 2	**Themes**
Show them that they are yum.	Role Modelling
Year 3 and 4	
Role modelling "the teacher eats the meal with us to support us eating" "you tell us how to make it more enjoyable" Mixing them up	Role Modelling
Year 5 and 6	
Be more positive about the food as people may not eat the food if you say negative comments about the lunches.	Role Modelling

Research also supports the importance of role modelling in consuming school lunches (Cohen, Hecht, Hager, et al., 2021). Machado et al. (2020) investigated the effects of role modelling on the consumption of fruit and vegetables in school lunches. This study used two cafeteria role models who were college students to promote the consumption of fruit and vegetables in an elementary school. The cafeteria role models would sit and eat with the students and verbally commend the fruits and vegetables to the students. The cafeteria role models also praised students who consumed fruits and vegetables and gave out raffle tickets for a prize. The results from Machado et al. (2020) indicated that role models increase the consumption of fruits and vegetables and reduced the waste from the school lunch programme. Thompson et al. (2022) studied the impact of a teacher who ate the same food as the students in the same environment to see if this increased the teacher's perspective of the school lunch meals and encouraged the students to eat the school lunches. This research found that having adults eat with students encouraged students to eat the school meals. Interestingly, the researchers found that the teacher's perspective (positive or negative) of the school lunch had a lesser effect than eating with the students (Thompson et al., 2022).

Lunchtime at schools has become more political, and the role of lunchtime at schools is a healthy eating agenda rather than a social aspect of children's education (Baines & MacIntyre, 2022). A study looked at the role of lunch meals from the child's perspective rather than from the school's. Baines and MacIntyre (2022) found that children viewed lunchtime as important time spent with their friends, and the period included every aspect of lunch, from cueing in line to leaving the lunch areas and had strategies to ensure they were together. This also leads to student frustration when teachers intervene in the student's strategies (Baines & MacIntyre, 2022). The findings from Baines and MacIntyre (2022) are reinforced by Fossgard et al. (2021), which found similar findings in Norwegian primary school children. Fossgard et al. (2021) found that a children's lunch break is an important time for the child to talk with friends and have a relaxing environment. Fossgard et al. (2021, p. 12) stated, "As we have seen, many students associated good lunch breaks in the classroom with those that occurred without any haste or fuss, either by fellow students or the teacher. Students want freedom and not oversteering". These results would indicate that children want the ability to control their lunchtime habits, which impacts the Free Healthy School Lunch Programme.

A study conducted by Liang et al. (2022) investigated children's behavioural influences on picking up rubbish. The researchers found that if a teacher picked up litter in front of students, this significantly improved the student's attention to the environment. When a peer picked up the litter in front of students, this had no impact on the student's attention to the environment. This study shows how important teacher role modelling is to the students' habits. These findings of Liang et al. (2022) on the importance of teacher role modelling are similar to the research of Cheung (2019) in preschool children. The Cheung (2019) study investigated the teacher's role in modelling to their students. In this study, the researcher found that active teachers' had more active students than less active teachers. Cheung (2019) discussed that teachers' behaviour positively affects their students by "motivating students, positive teacher–student relationship, enthusiasm for teaching and enthusiasm and excitement towards learning outcomes".

Results from Hegarty et al. (2020) study contrast with the research of Cheung (2019) finding no relationship between teachers' and students' physical activity levels. Hegarty et al. (2020) researched the effects of teacher's and parent's physical activity levels on nine- and ten-years-old children. The results found no association between teachers' or parents' physical activity and the children's activity levels.

The use of trained peer models to encourage food acceptance in preschool children showed positive findings (Hendy, 2002). In the Hendy (2002) study, 16 children trained as peer models to promote three novel foods to 38 children. The study found that girl models were more effective than boy models in increasing food acceptance. One potential reason why the girls were more effective than the boys may be linked to women being perceived as the 'nutritional gate keepers', which may influence the children's decision of who to listen to (Hendy, 2002). Another potential mechanism the author proposed was that the girl models were less aggressive than the boys, so their message was clearer. Interestingly, there was no difference in acceptance after one month compared with baseline levels. This would indicate that peer modelling needs to be an ongoing strategy to promote new foods. Schunk (1987, p. 18) also found that peer modelling can promote behavioural change in a positive manner: "successful groups in which each member has some responsibility and members share rewards based on their collective performance can reduce negative ability-related social comparisons by low achievers".

Using teachers and peers to promote the school lunch has promising outcomes. The consumption and promotion of the school lunch daily would encourage students to eat the meals. Also, the teachers could help the younger students with strategies around eating new foods and creating good habits around eating. Another key factor is the encouragement of children's peers when consuming the school lunch. A potential strategy is to train leaders in the class to promote the school lunches and utilise technology to promote the school lunches via blogs on the school's Facebook or newsletters.

6.2.5 Conclusion

Gaining an understanding of children's perspectives can offer valuable insights into their thought processes and behaviour. The success of the Ka Ora, Ka Ako lunch programme largely depends on the presentation and taste of the food. Adopting strategies like having a professional chef preparing the meal, conducting taste tests before adding the meals to the menu, and implementing taste testing programmes can increase the chances of children eating and remaining on the programme.

When considering implementing a lunch programme in primary schools, it is important to consider the influence of peers on the school. Strategies to make school lunch meals more attractive can increase consumption and adherence to the programme. Positive peer role modelling is also essential in creating a healthy environment within the school, thus increasing the chances of a successful school lunch programme. Additionally, schools should consider group sizes and avoid creating an environment where children feel rushed to finish their meals, as this can hinder socialising opportunities with peers.

Understanding children’s perspectives can provide valuable insights into their thought processes and behaviour. The findings found in this study showed that the recommendations for improving school meals differed among age groups. In this research, taste and food choice were major issues in the children’s perspective on the school lunch programme, with several themes occurring in the interviews with all three groups. The meals that students disliked from the school lunches were predominantly the wraps and bento bowl meals. For primary school children, the influence of their peers becomes a major factor in their life choices. Peer influence in primary school can also determine if the child consumes the school lunch programme.

Role modelling and bribery have been used to increase the consumption of school lunch programmes in other countries, with mixed results. Teachers and peers play an important role in

creating a positive environment where students are more likely to consume the school lunch. In this research, students emphasized the importance of role modelling in promoting the school lunch programme. To increase its consumption, schools can consider training class leaders to promote the school lunches or using technology such as blogs on the school's Facebook or newsletters to raise awareness about the programme.

Overall, children's main reasons for consuming the Free Healthy School Lunch Programme are based on the presentation and taste of the meal. Other factors such as peer and teacher support, parental views, role modelling and bribery play an important role in the success of the Ka Ora, Ka Ako lunch programme. Also, obtaining feedback from the students will give food providers and principals critical feedback on the meals, which will help them adhere to the programme and reduce waste.

6.3 Summary

This chapter focused on the children's perspectives of the Free Healthy School Lunch Programme. It described the results of group interviews with the children, then secondly discussed the key findings of this interview and analysed the findings compared with previous research.

The next chapter will focus on strategies to enhance the Ka Ora, Ka Ako lunch programme based on current and past research recommendations. These strategies will include increasing school lunch consumption, reducing food waste and costs, and improving implementation with a staircase approach.

CHAPTER SEVEN

STRATEGIES TO IMPROVE THE FREE HEALTHY SCHOOL LUNCH PROGRAMME

7.0 Chapter Introduction

The previous chapter focused on children's perspectives regarding Ka Ora, Ka Ako | Healthy School Lunches Programme. The chapter presented the results of group interviews conducted with children, and the key findings of the interviews were analysed and compared with previous research.

This chapter will provide strategies to enhance the Ka Ora, Ka Ako | Healthy School Lunches Programme based on current and past research recommendations. These strategies include increasing school lunch consumption, reducing food waste and costs, and improving implementation with a staircase approach.

7.1 Introduction

The chapter will explores different strategies to increase the consumption of school lunch meals, reduce food waste, reduce the cost of the programme, improve the implementation of the school lunch programme and use a staircase approach to the programme. This research suggests that some children dislike school meals due to their taste and presentation. Several potential strategies exist to improve the taste and presentation of school meals within the Southland region:

1. Start a taster programme in early childhood centres in Southland.
2. Give the food providers more flexibility.
3. Have more meal options.
4. Improve the quality of the meals.

This chapter will also discuss other strategies, which include:

1. Costing of the programme

2. Implementation of the programme

At the end of this chapter, strategies to increase school lunch consumption, reduce food waste and costs, and improve implementation with a staircase approach, are discussed.

7.2 Start a taster programme in early childhood centres in Southland / New Zealand

Exposing children to healthier foods early is important to increase their likelihood of participating in the Ka Ora, Ka Ako | Healthy School Lunches Programme when they enter primary school. In New Zealand, early childhood education is available from birth to school entry age but is not compulsory. However, around 96.8% of children attend early childhood centres, which include kindergartens, education and care services, home-based education and care, Te Kura, Te Kōhanga Reo, play centres/groups, Ngā Puna Kōhungahunga and Pacific Island Playgroups (MOE, 2022a). The MOE funds children over three years old for 30 hours of free education in early childhood centres within New Zealand (MOE, 2023d).

The rationale for supplying meals/taste testers to early childhood centres is to help children to adapt to foods or similar foods that they will consume when they enter primary school, so they become more familiar with this food and are less likely to reject the Ka Ora, Ka Ako | Healthy School Lunches Programme. This approach is similar to the US food programme (Lakkakula et al., 2011) and the taste education programme (Shon et al., 2012). For the New Zealand strategy, early childhood students would be supplied with foods that are similar to the Ka Ora, Ka Ako | Healthy School Lunches Programme, and all students could go through a taste education programme. This taste programme would resemble the French and Korean tasting education programmes. These tasting programmes are based on letting children explore the five food senses in the classroom, led by a nutritionist. Studies investigating taste education programmes have found that children with neophobia are more likely to eat new foods after these programmes (Battjes-Fries et al., 2017; Guerrero et al., 2018; Shon et al., 2012).

Dazeley et al. (2012) suggested that there is a timeframe limit to this benefit, as research found that after ten months, the effects disappear. This would lead to more benefits around the age of four to implement this programme and have a staircase approach for taste testing for younger students.

The staircase approach would use a four-step approach in early childhood centres, starting at three years old until they enter primary school. The four-step approach could be as follows:

1. Start the early childhood programme at the age of three years old
2. Food taste tests for children from three to four years old
3. Once every two weeks, the early childhood centre receives samplers or smaller meals from the Ka Ora, Ka Ako | Healthy School Lunches Programme
4. At age four, they will go through a taste programme for eight weeks, followed by receiving the Ka Ora, Ka Ako | Healthy School Lunches Programme once they complete the programme

Taste is a crucial aspect of a successful school lunch programme. Humans are born with innate taste preferences and dislikes that are difficult to change. Children's food experiences at school can significantly impact their food habits. However, changing taste preferences can be challenging, particularly when children start school. This research supports the idea that providing healthy food is insufficient when they enter primary school, and targeting children earlier may make it easier for them to change.

7.3 Give the food providers more flexibility

"Food may be essential as fuel for the body, but good food is fuel for the soul" (Forbes, n.d., para. 1). The Ka Ora, Ka Ako | Healthy School Lunches Programme aims to "provide access to a nutritious lunch every day" (MOE, 2020, para. 1). A study conducted by Chote et al. (2022) found that external food providers had difficulty meeting the MOE nutritional guidelines.

Additionally, they found it challenging to provide meals that students would enjoy. To address this issue, it is recommended to give more flexibility to food providers in preparing healthy and tasty school lunch meals.

7.5 Have more meal options

Food choice is important for a successful school lunch programme. To expect a whole school to consume the same meal is like asking everyone in a restaurant to eat the same meal. Having a couple of options per day would increase the selection of meals and give children more control over their school lunches. This would also decrease the wastage of food as the child would select foods that they enjoy. With the increased use of technology apps such as Seasaw and School Bridge, schools could communicate with students and parents more than ever before. Students could select a meal from a selection day (choice can be from two or more options depending on the school size or the provider's ability to cook different options).

One option could be that the student orders the meals they want to consume for the following week in class online. If the student is absent, there would be a default meal option, so the student still receives a meal. Also, if the student is away, they can choose the meals for the following week using the school app. The other option could be that the child and parent select the meals for the week and potentially for the term at home. If the child and parent/s do not choose an option, they could receive a notification about selecting foods, and there would be a default setting to choose a default menu for the week. Also, there would be an option for the parent not to opt into the lunch programme.

Studies show that where students have more variety of foods in their school lunch meal, this positively affected their diet (Bean et al., 2018; Bucher et al., 2013). Increasing daily options for students who consume the school lunch meal would help with adherence to the programme.

7.6 Improve the quality of the meals.

The quality of the school lunches was an issue for students in this research. Making school lunches is an important factor in children's eating and staying on the school lunch programme. There are several ways of improving the school lunch meal, which include:

- Improve the presentation of the meals
- Focus on more quality rather than quantity
- Using qualified chefs
- More frequent feedback from the students and teachers

First impressions are important for children to eat and enjoy school lunch meals. In the current model, most schools receive school lunches in reusable plastic containers or brown paper bags.

The primary objective of this programme is to minimize plastic waste caused by excessive wrapping and promote the reuse of plastic containers. Although this is a highly effective approach to waste reduction, the delivery method can impact the visual appeal of the meals. Figure 7.1 illustrates a typical meal from one of the food providers from the Ka Ora, Ka Ako | Healthy School Lunches Programme.

Figure 7.1

Photo of a typical meal from the Ka Ora, Ka Ako | Healthy School Lunches Programme

To ensure optimal food presentation, it is important to consider key factors such as appropriate proportion, food styling, and garnishing techniques (The Restaurant Times, 2023). It is common for school lunch programs to serve reheated meals. Cohen et al. (2015) conducted a study and found that using a chef to cook meals for school lunch programmes can increase meal consumption. The study improved the quality of meals, making them more palatable. Additionally, using a chef increased fruit and vegetable consumption among students. Although the cost of a professional chef is higher, Cohen et al. (2015) noted that the reduced waste from leftovers offsets the additional cost.

Obtaining regular student feedback regarding the food quality served during school lunches is crucial. This enables the provider to make necessary cooking adjustments and ensure that the meals are more satisfactory. An app could be utilised to provide more frequent feedback and improve the food quality.

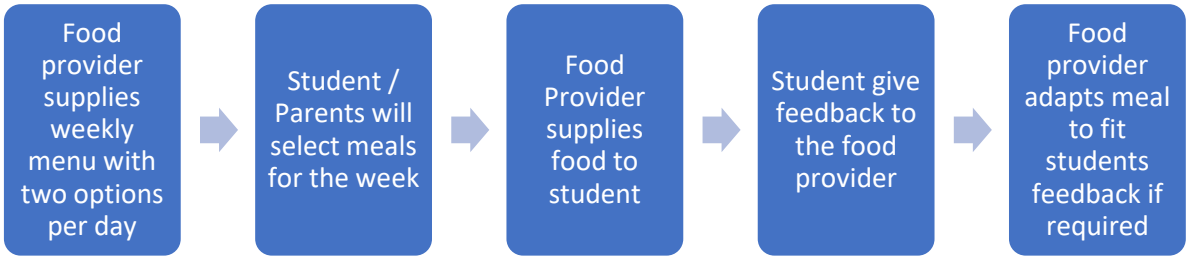
7.7 School lunch timing and duration

The consumption of school lunches has been found to be influenced by the timing and duration of the lunch period. In most primary schools in New Zealand, lunchtime lasts around one hour, and only 10-15 minutes are allocated for eating. Some schools allow playtime before lunch, while others have lunch before playtime. According to Cohen, Hecht, Hager, et al. (2021), students should have sufficient time to eat their lunch. The researchers suggest that the ideal lunch duration is 30 minutes, which is longer than the range of 15-45 minutes typically allocated for school lunches. This longer duration allows students to enjoy their meals without feeling rushed.

However, the lunch programme in New Zealand may not need to be as long as that for US students, as New Zealand students don't have to queue for their meals like in the US school lunch programme.

7.8 School Lunch App

Developing a school lunch programme app or developing a current school app would enhance communication between food providers, children, the school, and parent/s. The purpose of the app would be to give the student the school lunch menu and to give feedback to the provider. The procedure of this app would be as follows:



This feedback loop model helps the provider to adjust their meal based on the feedback from students and teachers. Another benefit of this school lunch app is that if a child does not want a meal from the two choices, then the student could bring their own lunch on that day, and the parent is informed. This should also reduce waste for the school lunch programme as the food provider will get a more accurate number of meals.

7.9 Meals for the teachers

From the results of this study, only one school on the Ka Ora, Ka Ako | Healthy School Lunches Programme ordered school meals for the teachers. The other schools do not order meals for the teachers; however, the teachers usually do eat the school lunch meals, according to the principals. The research around adult role modelling is important in children consuming the school lunch programme (Cohen, Hecht, Hager, et al., 2021). Research has found that the practice of teachers eating with students encourages the students to eat the school meals. Even if

the teachers dislike the school lunches, it is less important than eating with the students (Thompson et al., 2022).

7.10 Costing of the school lunches

One of the biggest concerns of the Ka Ora, Ka Ako | Healthy School Lunches Programme is the cost of running this programme. The other major issue is the cost of waste and uneaten meals from this programme, which is costing New Zealand $1 million per month in waste. The programme cost $263 million for the 2022/23 fiscal year. In 2023, the New Zealand government increased the budget to allocate $323.4 million for 2024, although this programme is for only 25% of schools. In 2023, New Zealand had the largest ever teachers strike: " an estimated 50,000 kindergarten, primary, secondary and area school teachers, along with primary and area school principals took to the streets in protest" (Wiggins, 2023, para. 7). The New Zealand Post Primary Teachers' Association quoted that "PPTA Te Wehengarua members have shown they are serious about getting a new collective agreement with salaries and conditions that will stem the worsening secondary teacher shortage throughout the motu" (Wiggins, 2023, para. 8). The cost versus benefit for the Ka Ora, Ka Ako | Healthy School Lunches Programme is debatable in the current living crisis (Gerritsen, 2023b). The New Zealand treasury does not support the Ka Ora, Ka Ako | Healthy School Lunches Programme due to the cost and effectiveness of the programme (Gerritsen, 2023b). However, according to Health Coalition Aotearoa (2023, para. 4) "all children should flourish and we completely reject the notion that the wellbeing of our poorest children should be sacrificed to save a few dollars. There is a wealth of international evidence to show that singling out poor kids to receive free school meals reduces uptake because of the shame and stigma those kids feel". Some principals indicate they prefer money to be spent on teachers, infrastructure, and teacher aids. In Southland, schools are struggling for space and are using school gyms and libraries as classrooms. As well as teachers not being happy with current pay rates, this programme seems to be a lot of money for few gains, especially when many children are not eating the food.

Potential strategies to reduce cost:

1. Follow the US and UK lunch programme for costing: In the US and the UK, the school lunch programme is charged to the child either for free if they qualify, at a reduced priced, or user pays. These strategies mean that only the school and parents know who qualifies for the free lunch programme. This will help reduce the potential stigma around children being perceived as deprived.
2. By being able to opt in or out of the programme, there would be no need to supply all students with a lunch. In the UK, over 50% of the children still eat packed lunches. There is little value in providing children with a school lunch if they, firstly, don't want to eat it, and secondly, if the parent supplies their child with a second lunch (just in case the child doesn't like the school lunches).
3. Only target schools who need the Ka Ora, Ka Ako | Healthy School Lunches Programme.
4. Teachers are striking due to working conditions, and spending millions of dollars seems an inefficient way to spend government funds.
5. Use local providers: A lot of money is being spent on transporting school lunches. We need to reduce the impact on the environment and to support local providers. There needs to be a rule around only using local providers within a 100km radius of each school.

7.11 Conclusion

The research shows that some children dislike school meals due to the taste, unfamiliar food, and presentation. This chapter discusses several potential strategies to improve the taste, unfamiliar food, and the presentation of school meals within the Southland region. Starting a taster programme in early childhood centres in Southland and staircasing this into the primary schools would help students get accustomed to the healthy foods. As a result, the children's adherence to the school lunch programme would increase, in a way similar to the US school lunch programme.

One of the key findings in this research is that the food providers are delivering an excellent service. However, the MOE needs to give the food providers more flexibility in implementing the meals. The school lunch meals must be healthy and palatable so the children are more likely

to eat the meals. Also, the food providers need to give the students more options, as giving the students variety will increase their adherence to eating the meals. Another strategy is to increase the quality of the meals being served. The providers need to improve the presentation of the meals, and focus on quality rather than quantity. They need to use a qualified chef, and receive more frequent student and teacher feedback.

Developing a school lunch programme app or developing a current school app would enhance communication between food providers, children, schools, and parents. The purpose of the app would be to give the students the school lunch menu and for them to give feedback to the provider.

From the results of this study, only one school on the Ka Ora, Ka Ako | Healthy School Lunches Programme ordered school meals for the teachers. The other schools do not order a meal for the teachers. However, the teachers usually do eat the school lunch meals, according to the principals. The research around adult role modelling is important in children consuming the school lunch programme (Cohen et al., 2021).

The Ka Ora, Ka Ako | Healthy School Lunches Programme poses two main concerns - the cost of running it, and the cost of waste, which results in $1 million of waste per month in New Zealand. A possible solution to reduce costs is to adopt the approach used in the US and the UK lunch programmes where the school lunch programme is charged to the child either for free if they qualify, at a reduced price, or the user pays. With this strategy, only the school and parents know who is eligible for the free lunch programme, thereby eliminating any stigma attached to children being perceived as deprived. The programme should be optional, and only schools in need should be targeted. In the UK, over 50% of children still bring packed lunches, indicating little value in supplying children with a school lunch if they don't want to eat it. Moreover, parents may provide a second lunch for their child, just in case they don't like the school lunches.

Lastly, it is advisable to use local providers to reduce the environmental impact and to support local businesses.

7.12 Summary

This chapter provided strategies to enhance the Ka Ora, Ka Ako | Healthy School Lunches Programme based on current and past research recommendations. These strategies included increasing school lunch consumption, reducing food waste and costs, and improving implementation with a staircase approach.

The next chapter will conclude the thesis and highlight key points of this thesis.

CHAPTER EIGHT

CONCLUSIONS

8.0 Chapter Introduction

The previous chapter focused on strategies to enhance the Ka Ora, Ka Ako | Healthy School Lunches Programme based on current and past research recommendations. These strategies include increasing school lunch consumption, reducing food waste and costs, and improving implementation with a staircase approach.

This chapter will conclude the thesis and highlight key points of this thesis.

8.1 Thesis Overview

There were eight chapters in this research thesis.

Chapter one introduced the topics of the thesis. The introduction investigated the study's background information, the aims, purpose, research questions and methodology overview.

Chapter two focused on the literature surrounding the impact of lunch programmes within primary schools. The topics of the literature review were:

- History of school lunch service
- New Zealand government's free lunch scheme
- Obesity issues relating to New Zealand children
- Factors influencing children's performance in the classroom

- Nutritional benefits for lunch programmes for primary school children.

Chapter three discussed the methodology of the research, including the procedures for the research questionnaire and interviews.

Chapter four presented the key results of the teaching staff's perspective of the Free Healthy School Lunch Programme. These results, including figures, tables, and written information, illustrate the studies' findings. Chapter four also discussed the essential findings and interpreted information compared to past research.

Chapter five presented the results of the Free Healthy School Lunch Programme from the principals' perspective. The findings of the studies were illustrated using figures, tables, and written information. The chapter also discussed the key findings and interpreted data compared to past research.

Chapter six highlighted the important results of the Free Healthy School Lunch Programme from the children's point of view. These findings were conveyed through various mediums, such as figures, tables, and written explanations. Additionally, the chapter investigated the discoveries and provided an interpretation of the data in relation to previous research.

Chapter seven discussed strategies to improve the Ka Ora, Ka Ako | Healthy School Lunches Programme and justified reasons for recommendations.

Chapter eight concluded the findings of the thesis and made recommendations/suggestions for future research.

8.2 Key findings

8.2.1 Teachers' perspectives

According to the teachers' perspectives on the Ka Ora, Ka Ako | Healthy School Lunches Programme, providing a free healthy lunch would enhance academic, behavioural, and physical performance in the classroom after lunch. This finding is consistent with previous research. Additionally, the teachers reported that while most of their students have a healthy school lunch, some students in the classroom either have no lunch or an inadequate lunch, which impairs their ability to perform optimally in afternoon classes.

The implementation of the Ka Ora, Ka Ako | Healthy School Lunches Programme raised concerns among teachers, given the current state of education in New Zealand. Some of these issues include inadequate funding for education, increased workload for teachers, and doubts about whether free lunches would genuinely benefit the schools. Teachers were also worried about the food and environmental waste the programme could generate. Similar government-run school lunch programmes around the world support this concern. Another concern expressed by teachers was the impact on picky eaters and what would happen if they didn't like the meals provided by the programme.

Overall, teachers recognise the benefits of the Ka Ora, Ka Ako | Healthy School Lunches Programme. However, they have concerns regarding its cost, implementation, and the additional workload it may create for teachers.

8.2.2 Principals' Perspective

One of the major concerns for principals in both groups was the restrictive nutritional guidelines for the Ka Ora, Ka Ako | Healthy School Lunches Programme. The principals who have yet to receive the Ka Ora, Ka Ako | Healthy School Lunches Programme were concerned about potentially restrictive food guidelines.

According to some of the principals in this study, there is still food waste. Some children pick and choose what they eat, and some choose not to be on the programme because they dislike the

food. Also, concern over the high ratio of students to teachers, and inadequate classrooms, highlights the need to reconsider investing money into the Ka Ora, Ka Ako | Healthy School Lunches Programme. Principals have expressed concerns that the funds could have been better utilized for staffing or infrastructure, such as building improvements.

One of the key outcomes of this research was the positive relationships between the principals and the food providers. However, there were a few concerns about the quality of food and the restrictions of the MOE nutritional guidelines. Five out of the six principals who have yet to receive the Ka Ora, Ka Ako | Healthy School Lunches Programme commented that their current kitchen would not be suitable for running the lunch programme. These principals also indicated that there was no suitable dining hall. Most schools said they would prefer an external provider to supply and manage the waste. The one school that wanted to provide its own food was due to its location and size.

The Ka Ora, Ka Ako | Healthy School Lunches Programme is viewed positively by all principals, particularly in populations that require additional support. For principals who currently operate the programme, some of the main issues include the strictness of the MOE nutritional guidelines, the decline in consumption of school meals due to taste and presentation, the wastage of food from the programme, and the cost-benefit analysis of the programme.

8.3.3 Children's Perspectives

Understanding children's perspectives can provide valuable insights into their thought processes and behaviour. The success of the Ka Ora, Ka Ako | Healthy School Lunches Programme depends largely on the presentation and taste of the food. To increase the chances of children eating and remaining on the programme, it is recommended to adopt strategies such as having a professional chef prepare the meal, conducting taste tests before adding meals to the menu and implementing taste testing programmes.

When considering implementing a lunch programme in primary schools, it is crucial to consider the influence of peers on the school environment. Positive peer role modelling is also vital in creating a healthy environment within the school, thus increasing the likelihood of a successful school lunch programme. Furthermore, schools should consider group sizes and avoid creating an environment where children feel rushed to finish their meals as this can hinder socializing opportunities with peers, which is equally important for their overall development.

Understanding children's perspectives can offer valuable insights into their thought processes and behaviour. The findings of this study revealed that recommendations for improving school meals differed among various age groups. Taste and food choice emerged as major issues in the children's perspective on the school lunch programme, with several themes occurring in the interviews with all three groups. The meals that students disliked from the school lunches were predominantly wraps and bento bowl meals. For primary school children, peer influence plays a significant role in their life choices and determines if they consume the school lunch programme.

Role modelling and bribery have been used to increase the consumption of school lunch programmes in other countries, with mixed results. Teachers and peers play an important role in creating a positive environment where students are more likely to consume the school lunch. In this research, students emphasized the importance of role modelling in promoting the school lunch programme. To increase its consumption, schools could consider training class leaders to promote the school lunches or using technology such as blogs on the school's Facebook or newsletters to raise awareness about the programme.

Overall, children’s main reasons for consuming the Free Healthy School Lunch Programme are based on the presentation and taste of the meal. Other factors such as peer and teacher support, parental view, role modelling and bribery play an important role in the success of the Ka Ora, Ka Ako | Healthy School Lunches Programme. Also, obtaining feedback from the students would

give food providers and principals critical feedback on the meals, which will help children adhere to the programme and reduce waste.

8.3.4 Recommendations

Research has shown that some children prefer to avoid the school meals provided due to the taste, unfamiliarity with the food, and its presentation. There are various strategies to enhance the taste, presentation, and familiarity of school meals in the Southland region. One of the potential solutions is implementing a taster programme that can begin in early childhood centres and gradually progress to primary schools. This programme can help students become accustomed to healthy foods, leading to an increase in the number of children who participate in the school lunch programme, similar to the US school lunch programme.

One of the key findings from this research is that food providers are doing an excellent service. However, the MOE needs to give them more flexibility in implementing meals. The school lunch meals must be healthy and palatable, so children are more likely to eat them. The food providers should also offer more options to the students, as variety can increase adherence to meal plans. Another strategy is to improve the quality of the meals being served. Providers should focus on quality over quantity and use qualified chefs. Frequent feedback from students and teachers can also improve presentation and overall quality.

Developing a school lunch programme app or adding it to an existing school app could enhance communication between the food provider, the child, the school, and the parents. The app's primary purpose would be to provide students with the school lunch menu and allow them to give feedback to the provider.

From the results this study, only one school in the Ka Ora, Ka Ako | Healthy School Lunches Programme orders meals for their teachers. The other schools do not order meals for the

teachers, but according to the principals, the teachers usually do eat the school lunch meals. Research indicates that adult role modelling encourages children to consume the school lunch programme (Cohen et al., 2021).

The Ka Ora, Ka Ako | Healthy School Lunches Programme faces two significant concerns: the cost of running the programme and the cost of waste and uneaten meals, causing New Zealand to lose $1 million every month. The programme could follow the US and UK models to reduce costs and potential stigma around children being perceived as deprived. In these models, the school lunch programme is charged to the child through free, reduced pricing or user-pay systems. This way, only the school and parents will know who qualifies for the free lunch programme, and there would be no need to supply all children with a lunch. In the UK, over 50% of children eat packed lunches, proving that supplying children with a school lunch is of little value if they don't want to eat it or if their parents provide them with a second lunch. The Ka Ora, Ka Ako | Healthy School Lunches Programme should only target schools requiring it. Additionally, to support local providers and reduce the environmental impact, the programme should use local providers instead of spending a lot of money on transporting school lunches.

8.4 Purpose, Aim and Hypothesis

The purpose of this study was:

1. **To investigate current trends of meal plans within Southland and New Zealand primary school sector**

Throughout this thesis, trends of meal plans in Southland primary schools were investigated. In Southland and New Zealand primary schools, school lunches follow the five nutritional strategies, which are:

1. Families supply all food and beverages for their children during the school day.
2. Schools supply breakfast for children. Families supply morning tea and lunch during the school day.

3. Families supply breakfast and morning tea. Schools provide lunch for children during the school day.
4. Schools provide partial meals (fruit or milk), and the family provides the rest during the school day.
5. Schools supply all food during the school day.

The number of schools on the Ka Ora, Ka Ako | Healthy School Lunches Programme in Southland is 22 in June 2023 (MOE, 2020). Out of the 22 schools full primary (year 1 – 8) and composite (year 1 – 15) there are 16 schools which have 6,609 students. Out of the 16 schools there are ten schools in the Invercargill area. The Ka Ora, Ka Ako | Healthy School Lunches Programme covered around 13,000 children and 111 schools in 2020 (MOE, 2023b). By the end of 2021, there were 215,000 children in the Ka Ora, Ka Ako | Healthy School Lunches Programme, which included 963 schools. This programme covered over 25% of the school population within New Zealand (MOE, 2023b).

2. To investigate how the Ka Ora, Ka Ako | Healthy School Lunches Programme influences New Zealand children's academic, behavioural and physical performance within the classroom

Based on the research from this thesis, it was found that the Ka Ora, Ka Ako | Healthy School Lunches Programme positively impacted the school's teaching practices. However, the principals found it challenging to assess the exact magnitude of the improvements made in the school. Other research around the Ka Ora, Ka Ako | Healthy School Lunches Programme has found similar issues around the difficulties of assessing if the Ka Ora, Ka Ako | Healthy School Lunches Programme influences New Zealand children's academic, behavioural and physical performance within the classroom (Vermillion Peirce et al., 2021). Evidence around the world also has mixed results around Free Healthy School Lunch Programmes and the impact on children's academic, behavioural and physical performance in the classroom (Anderson, 2018; Florence et al., 2008.

8.5 Aim and Research Questions

The study aims to find out if Government-run lunches within New Zealand primary schools will enhance academic, behavioural and physical performance in the classroom.

To achieve this aim, the researcher posed several questions:

What is the academic, behavioural and physical impact of free healthy lunches in Southland primary schools?

According to this research, all principals who have yet to receive the Ka Ora, Ka Ako | Healthy School Lunches Programme believe that a healthy lunch would enhance productivity in the classroom. Of the four principals who have received the Ka Ora, Ka Ako | Healthy School Lunches Programme, three agree that it improves teaching practices in the school.

What type of infrastructure will schools need to supply free healthy lunches in Southland primary schools?

In this study, five out of the six principals who have yet to receive the Ka Ora, Ka Ako | Healthy School Lunches Programme, commented that their current kitchen would not be suitable for running the lunch programme. These principals also indicated that there was no suitable dining hall. Most schools said they would prefer an external provider to supply and manage the waste.

In the UK, most primary schools have dining halls and kitchens onsite. Children can be supplied lunch in the British school lunch programme or bring lunch from home. Also, children can apply for free school lunches. However, in New Zealand, most schools do not have a dining hall, and predominately, external suppliers supply the lunch from the Ka Ora, Ka Ako | Healthy School Lunches Programme.

Moore et al. (2010) investigated the social, physical and temporal characteristics of primary school dining halls and the implications for children's eating habits. The researchers found a positive outcome in school performance with a suitable school dining hall. Furthermore,

outcomes are better with a suitable dining hall, “A multi-component intervention conducted in primary schools in England which improved the physical dining environment as well as revising the menu found that the children’s learning behaviours in the classroom improved”. The principals who have received the Ka Ora, Ka Ako | Healthy School Lunches Programme have all used external providers, and no school has obtained a dining hall.

Classroom space has been in demand in Southland primary schools over the last 20 years. In 2004, the New Zealand government closed several Invercargill schools and merged them into existing schools. The result of this decision over the next 20 years was overpopulated schools (Moore, 2017). The consequence of this decision to reduce the schools in Invercargill was that schools had to use school halls, libraries and staffrooms for classrooms (Moore, 2017).
This was a concern from principals where the money could be invested in other areas such as buildings.

What are the consequences for the school staff concerning the Free Healthy School Lunch Programme in Southland primary schools?

The main findings from the teachers’ perspectives of the Ka Ora, Ka Ako | Healthy School Lunches Programme is that teachers agree that a Free Healthy School Lunch Programme would increase academic, behavioural and physical performance in the classroom after lunch. This was supported by previous researchers who found similar results (Anderson, 2018; Florence et al., 2008). The previous research also indicated that the teachers believe that the majority of their students already have a healthy school lunch; however, there are some children in the classroom who either have no school or have inadequate lunch to optimally perform in the afternoon classes (Byker Shanks et al., 2017; Florence et al., 2008).

Teachers were concerned about how the Ka Ora, Ka Ako | Healthy School Lunches Programme would be implemented. The current education status in New Zealand has many issues, such as lack of funding for education, and increased workload for teachers. Overall, the teachers do see

the benefits of the Ka Ora, Ka Ako | Healthy School Lunches Programme, however, they are concerned about the cost, how it will be implemented and the extra work for the teachers.

The principals' perspective of the Ka Ora, Ka Ako | Healthy School Lunches Programme was predominantly positive. However, principals were concerned about the high ratio of students to teachers and inadequate classrooms, which highlights the need to reconsider investing money into the Ka Ora, Ka Ako | Healthy School Lunches Programme. Principals have expressed concerns that the funds could have been better utilized for staffing.

8.6 Research Hypothesis

This study hypothesized that free healthy lunch service in Southland primary schools would increase academic, behavioural, and physical performance within the schools. However, this would come with extra burden and cost to each school.

This study agrees with the hypothesis that free healthy lunch service in Southland primary schools would increase academic, behavioural, and physical performance within the schools. Also, the researcher agrees that the school lunch programme has come with extra burden and cost to each school.

8.7 Limitations

The research study presented here has several potential limitations. One of the major limitations is the small sample size of the participants. Only 25 teachers completed the online questionnaire, and there were six participants for the principal interviews before the Ka Ora, Ka Ako | Healthy School Lunches Programme, and four for the interviews of principals who had received the Ka Ora, Ka Ako | Healthy School Lunches Programme. Additionally, the study interviewed 80 students from only one school.

It is important to consider that using online questionnaires and interviews to collect data from children, teachers, and principals may introduce bias due to self-reporting. Participants may provide responses they believe are expected or socially desirable rather than their true feelings or experiences. It is essential to acknowledge that the findings from a single school in a specific context may not apply to other schools with different settings, resources, or student populations. Thus, the outcomes can be context-specific and may not be generalized to a larger population.

Furthermore, the absence of statistical analysis for all four studies is another limitation of this thesis. This was due to the small sample sizes and difficulty evaluating a particular subject. The lack of statistical analysis can limit the research since it involves quantitative data. Statistical analysis can offer important insights into the connections and significance of the variables studied.

To gain a complete understanding of all aspects of the Ka Ora, Ka Ako | Healthy School Lunches Programme, the inclusion of the food providers' and parental perspectives would have been helpful to understand all dimensions of this programme. Another limitation is the heavy reliance on qualitative data (interviews and group discussions). In addition, quantitative data to support and complement findings would be beneficial.

It is crucial to openly acknowledge these limitations in the thesis and discuss how they can affect this research's completeness and generalizability. By recognizing these limitations, informed decisions can be made about the study's findings and the implications for future research.

8.8 Recommendations

Recommendations for future work are increasing the sample size of all four research studies. Increasing the number of participants, especially teachers and principals, will enhance the statistical power of future studies and improve the representativeness of these findings. By

increasing the sample size, a more robust statistical analysis can be conducted for this type of research. Another recommendation is to compare different areas around New Zealand to understand the population differences to cater for specific populations needed. The Ka Ora, Ka Ako | Healthy School Lunches Programme requirements may differ between regions within New Zealand.

Also recommended is to conduct a longitudinal study that would monitor the impact of the Ka Ora, Ka Ako | Healthy School Lunches Programme over an extended period. This could provide insights into the programme's long-term effects on student health, academic performance, and overall well-being. Integrating both qualitative and quantitative data in future research would provide a more comprehensive understanding of programme outcomes and help triangulate findings.

It would also be important to conduct research on the food providers and the parental views on the Free Healthy School Lunch Programme to understand their perspectives. Also, it would be helpful to collaborate with relevant stakeholders, such as government agencies, educators, nutrition experts, and community organisations, to gather comprehensive perspectives and expertise. In addition, utilising and incorporating ethnographic research methods to provide a deeper understanding of the daily experiences and interactions of students, teachers, and parents within the programme, would be beneficial.

Future research endeavours are suggested to consider these recommendations which would contribute towards a more comprehensive and detailed understanding of the Ka Ora, Ka Ako | Healthy School Lunches Programme. This understanding would help to inform policy decisions and programme improvements, ultimately leading to better outcomes for students and communities across different regions and populations of New Zealand.

8.9 Current status of the Ka Ora, Ka Ako | Healthy School Lunches Programme

The current status of the Ka Ora, Ka Ako | Healthy School Lunches Programme is a topical debate within New Zealand in 2023. With the election in New Zealand in 2023 and the debate around the benefits over cost of the Ka Ora, Ka Ako | Healthy School Lunches Programme, the programme's direction may change in 2024. The section below investigates the New Zealand election campaign promises and the current perspectives of teachers and principals of the programme.

In 2023, New Zealand had its general election to govern the country (Electoral Commission New Zealand, 2023). Throughout the 2023 election campaign, the two major parties, National and Labour, campaigned on the Ka Ora, Ka Ako | Healthy School Lunches Programme. Labour stated that if they were elected that, "Labour will commit $650 million to continue the programme at nearly 1,000 schools and kura through the next term of Government" (Labour, 2023, para. 2). The Labour Party's reasoning for the increased funding was that "parents, principals, and teachers are all agreed on the benefits of kids learning on full tummies. Principals I meet with tell me this is a game-changer for supporting kids' wellbeing, attendance, and focus" (Labour, 2023, para. 3). The National Party also supports the continuation of the Ka Ora, Ka Ako | Healthy School Lunches Programme; however, the leader of the party indicated that there needs to be a change in the current programme (RNZ, 2023b). The National party leader Chris Luxon was quoted as saying, "We just want to make sure that every dollar, taxpayer dollar that we're putting towards all programmes, we will stop the dumb stuff and we'll continue to invest in the good stuff" (RNZ, 2023b, para. 6). In another interview, Chris Luxon stated that he wanted to have "less wastage and more appealing food" (Desmarais, 2023, para. 20). In the same interview, the ACT party leader (which is a minor political party) would end the Ka Ora, Ka Ako | Healthy School Lunches Programme. Another minor party leader, Marama Davidson of the Green Party, wanted to increase the number of children receiving the Ka Ora, Ka Ako | Healthy School Lunches Programme to 58% of the population compared to 25% of school children in New Zealand (Otago Daily Times, 2023). The reasoning behind the Green Party election promise was that "Feeding children is essential and I know that many people in Aotearoa understand the basic need to just make sure as a country that no child goes hungry," (Otago Daily Times, 2023, para.

6). The Otago Daily Times (2023, para. 16) stated that the Green's policy of the Ka Ora, Ka Ako | Healthy School Lunches Programme would cost around "$1.1 billion over the next three years, which would be paid for from the party's proposed wealth tax".

There is also debate around principals' and teachers' perspectives on the Ka Ora, Ka Ako | Healthy School Lunches Programme. There are schools around New Zealand promoting the benefits of the programme in the media:

> "If you don't have a lunch and you have nothing to eat and you're sitting there by yourself, in terms of not having something to eat, it does actually make a difference to that child and their sense of belonging," Sunnynook Primary School Principal, Virginia Montague (Nicol-Williams, 2023, para. 15).
>
> "There's stigma that used to come with not having any lunch. So now everyone is getting a lunch and those who haven't previously been able to bring a lunch haven't been standing out anymore and I think that's really safe and good for them." Ngāti Toa Principal, Kathleen O'Hare, on the Kapiti Coast (Health Coalition Aotearoa, 2023, para. 12)

However, other principals have opted out of the programme:

> "school requested lunches for more than a quarter of its 1,411 students, but decided to opt out because to accept would have resulted in a huge amount of food waste" (Neilson, 2023, para. 9).
>
> "really good initiative" but did not suit the school's needs at the time". Waitākere College Principal Mark Shanahan (Neilson, 2023, para. 11)

The major issue with the Ka Ora, Ka Ako | Healthy School Lunches Programme is the cost and the waste from the programme.

The current waste and cost issues remain problematic with the Ka Ora, Ka Ako | Healthy School Lunches Programme. National's education spokesman Paul Goldsmith said that New Zealand's education system needs funding in other areas, including truancy and support for students with disabilities, and the money for the Ka Ora, Ka Ako | Healthy School Lunches Programme is "very poorly targeted" (Neilson, 2023, para. 13). One of the major concerns about the Ka Ora, Ka Ako | Healthy School Lunches Programme was a Treasury report, which indicated that the programme had 10,000 meals left over per day (Gerritsen, 2023b). Wade (2023) reported that the MOE found that 61% of leftovers go home with the children, and 21% go to the community. The leader of the ACT party stated, "In fact, they're almost literally feeding taxpayers' hard-earned money to pigs," (Wade, 2023, para. 14). The Labour Education Minister Jan Tinetti stated, "That's a little bit insulting to be saying wastage is going through to pigs." (Wade, 2023, para. 15). With the evidence of Figures 8.1 and 8.2, the Treasury report and this research from principals and children, there does seem to be a serious issue around waste and the cost of the programme.

One of the most important justifications behind the Ka Ora, Ka Ako | Healthy School Lunches Programme is to feed the whole school rather than individuals to reduce the stigma of poverty for students who need free lunches. Previous researchers report a positive relationship in self-esteem when the entire school receives free lunches rather than selected students (Vermillion Peirce et al., 2021; Zuercher et al., 2022). However, if the school gives the leftovers to students, does that not increase the stigma of poverty? Another question is whether the schools order the correct amount rather than having lots of leftovers to feed families and communities. Also, shouldn't the government funding go to living costs rather than families and communities relying on school lunch leftovers?

Overall, with a change of government to a National-led country, the validity of the Ka Ora, Ka Ako | Healthy School Lunches Programme will be in question for its long-term future. The initial goal of the Ka Ora, Ka Ako | Healthy School Lunches Programme was to roll it out to New Zealand's primary schools. The likelihood of a nationwide programme is improbable under a

National government. However, a more focused approach may be more successful and, in turn, reduce waste and the cost of the programme.

8.10 Thesis closing.

The benefits of the Ka Ora, Ka Ako | Healthy School Lunches Programme have been shown to increase student learning. The issue around the Ka Ora, Ka Ako | Healthy School Lunches Programme is the cost of running this programme. The other major issue is the cost of waste and uneaten meals from this programme, which is costing New Zealand $1 million per month in waste. The MOE needs to give the food providers more flexibility in implementing meals. The school lunch meals must be healthy and palatable, so the children are more likely to eat the meals. Also, the food providers need to give the students more options, as providing them with variety will increase their adherence to eating the meals. The providers need to improve the presentation of the meals and focus on quality rather than quantity. The food providers must receive more frequent feedback from the students and teachers. Overall, making the school lunch meal more appealing will make the programme more successful and reduce waste.

References

Adolphus, K., Lawton, C. L., & Dye, L. (2013). The effects of breakfast on behavior and academic performance in children and adolescents. *Front Hum Neurosci*, *7*, 425. https://doi.org/10.3389/fnhum.2013.00425

Ahrens, W. (2015). Sensory taste preferences and taste sensitivity and the association of unhealthy food patterns with overweight and obesity in primary school children in Europe—a synthesis of data from the IDEFICS study. *Flavour*, *4*, 8. https://doi.org/10.1186/2044-7248-4-8

Allen, M. (2017). *Primary Data Analysis*. https://methods.sagepub.com/reference/the-sage-encyclopedia-of-communication-research-methods/i11221.xml

Andersen, R., Biltoft-Jensen, A., Christensen, T., Andersen, E. W., Ege, M., Thorsen, A. V., Knudsen, V. K., Damsgaard, C. T., Sørensen, L. B., Petersen, R. A., Michaelsen, K. F., & Tetens, I. (2015). What do Danish children eat, and does the diet meet the recommendations? Baseline data from the OPUS School Meal Study. *J Nutr Sci*, *4*, e29. https://doi.org/10.1017/jns.2015.17

Anderson, M. L., Gallagher, J., & Ritchie, E. R. (2018). *School Meal Quality and Academic Performance*. University of California.

Anzman, S. L., & Birch, L. L. (2009). Low inhibitory control and restrictive feeding practices predict weight outcomes. *J Pediatr*, *155*(5), 651-656. https://doi.org/10.1016/j.jpeds.2009.04.052

Ardern, J. (2019). *Child and Youth Wellbeing Strategy*. https://childyouthwellbeing.govt.nz/resources/child-and-youth-wellbeing-strategy-html

Armour, K., & Macdonald, D. (2012). *Research Methods in Physical Education and Youth Sport*. Taylor & Francis Group. http://ebookcentral.proquest.com/lib/sitlibrary-ebooks/detail.action?docID=957563

Avey, T. (2015). *The History of School Lunch*. https://www.pbs.org/food/the-history-kitchen/history-school-lunch/

Bailey-Davis, L., Virus, A., McCoy, T., Wojtanowski, A., Veur, S., & Foster, G. (2013). Middle School Student and Parent Perceptions of Government-Sponsored Free School Breakfast and Consumption: A Qualitative Inquiry in an Urban Setting. *Journal of the Academy of Nutrition and Dietetics*, *113*, 251-257. https://doi.org/10.1016/j.jand.2012.09.017

Baines, E., & MacIntyre, H. (2022). Children's social experiences with peers and friends during primary school mealtimes. *Educational Review*, *74*(2), 165-187. https://doi.org/10.1080/00131911.2019.1680534

Battjes-Fries, M. C. E., Haveman-Nies, A., Zeinstra, G. G., van Dongen, E. J. I., Meester, H. J., van den Top-Pullen, R., van't Veer, P., & de Graaf, K. (2017). Effectiveness of Taste Lessons with and without additional experiential learning activities on children's willingness to taste vegetables. *Appetite*, *109*, 201-208. https://doi.org/https://doi.org/10.1016/j.appet.2016.05.020

Bean, M. K., Brady Spalding, B., Theriault, E., Dransfield, K. B., Sova, A., & Dunne Stewart, M. (2018). Salad Bars Increased Selection and Decreased Consumption of Fruits and Vegetables 1 Month After Installation in Title I Elementary Schools: A Plate Waste Study. *J Nutr Educ Behav*, *50*(6), 589-597. https://doi.org/10.1016/j.jneb.2018.01.017

Benn, J., & Carlsson, M. (2014). Learning through school meals? *Appetite*, *78*, 23-31. https://doi.org/https://doi.org/10.1016/j.appet.2014.03.008
Bhattacharya, J., Currie, J., & Haider, S. (2004). Breakfast of Champions? The School Breakfast Program and the Nutrition of Children and Families. *National Bureau of Economic Research, Inc, NBER Working Papers*, *41*. https://doi.org/10.2307/40057265
Black, E. (2017). Children are missing school rather than turn up without lunch. *Stuff NZ*. https://www.stuff.co.nz/life-style/parenting/family-life/97293632/children-are-missing-school-rather-than-turn-up-without-lunch
Blakemore, E. (2017). *A Brief History of School Lunch*. https://www.mentalfloss.com/article/86314/brief-history-school-lunch
Bradshaw, B. (2017). INFANT SCHOOL MEALS – A BRIEF HISTORY AND WHY WE NEED TO SAVE THEM. https://foodactive.org.uk/infant-school-meals-a-brief-history-and-why-we-need-to-save-them/
Briefel, R. R., Crepinsek, M. K., Cabili, C., Wilson, A., & Gleason, P. M. (2009). School food environments and practices affect dietary behaviors of US public school children. *J Am Diet Assoc*, *109*(2 Suppl), S91-107. https://doi.org/10.1016/j.jada.2008.10.059
Brown, J., Beardslee, W., & Prothrow, D. (2008). *Impact of school breakfast on children's health and learning*.
Bruening, M., MacLehose, R., Eisenberg, M. E., Nanney, M. S., Story, M., & Neumark-Sztainer, D. (2014). Associations Between Sugar-Sweetened Beverage Consumption and Fast-Food Restaurant Frequency Among Adolescents and Their Friends. *Journal of Nutrition Education and Behavior*, *46*(4), 277-285. https://doi.org/https://doi.org/10.1016/j.jneb.2014.02.009
Bucher, T., Siegrist, M., & van der Horst, K. (2013). Vegetable variety: an effective strategy to increase vegetable choice in children. *Public Health Nutrition*, *17*, 1232 - 1236.
Burrows, T. L., Whatnall, M. C., Patterson, A. J., & Hutchesson, M. J. (2017). Associations between Dietary Intake and Academic Achievement in College Students: A Systematic Review. *Healthcare (Basel)*, *5*(4). https://doi.org/10.3390/healthcare5040060
Busetto, L., Wick, W., & Gumbinger, C. (2020). How to use and assess qualitative research methods. *Neurological Research and Practice*, *2*(1), 14. https://doi.org/10.1186/s42466-020-00059-z
Byker Shanks, C., Banna, J., & Serrano, E. L. (2017). Food Waste in the National School Lunch Program 1978-2015: A Systematic Review. *J Acad Nutr Diet*, *117*(11), 1792-1807. https://doi.org/10.1016/j.jand.2017.06.008
Calvert, H. G., Ohri-Vachaspati, P., McQuilkin, M., Boedeker, P., & Turner, L. (2021). Prevalence of Evidence-Based School Meal Practices and Associations with Reported Food Waste across a National Sample of U.S. Elementary Schools. *Int J Environ Res Public Health*, *18*(16). https://doi.org/10.3390/ijerph18168558
CDC. (2019). *Childhood Obesity Facts*. https://www.cdc.gov/obesity/data/childhood.html
Cheung, P. (2019). Teachers as role models for physical activity: Are preschool children more active when their teachers are active? *European Physical Education Review*, *26*(1), 101-110. https://doi.org/10.1177/1356336X19835240
Child and Youth Wellbeing. (2019a). *Child and Youth Wellbeing Strategy*. https://childyouthwellbeing.govt.nz/resources/child-and-youth-wellbeing-strategy-html

Child and Youth Wellbeing. (2019b). *Opportunity and challenges*. https://www.childyouthwellbeing.govt.nz/our-aspirations/context/opportunity-and-challenges

Chote, B., Rees, D., Swinburn, B., McKelvie-Sebileau, P., Glassey, R., & Tipene-Leach, D. (2022). Systems Mapping of the New Zealand Free and Healthy School Lunch Programme: Perspectives from Lunch Providers. *Nutrients*, *14*(20). https://doi.org/10.3390/nu14204336

Christie, M. J., & McBrearty, E. M. (1979). Psychophysiological investigations of post lunch state in male and female subjects. *Ergonomics*, *22*(3), 307-323. https://doi.org/10.1080/00140137908924615

Chutani, A. M. (2012). School lunch program in India: background, objectives and components. *Asia Pac J Clin Nutr*, *21*(1), 151-154.

Cohen, J. F., Richardson, S. A., Cluggish, S. A., Parker, E., Catalano, P. J., & Rimm, E. B. (2015). Effects of choice architecture and chef-enhanced meals on the selection and consumption of healthier school foods: a randomized clinical trial. *JAMA Pediatr*, *169*(5), 431-437. https://doi.org/10.1001/jamapediatrics.2014.3805

Cohen, J. F. W., Hecht, A. A., Hager, E. R., Turner, L., Burkholder, K., & Schwartz, M. B. (2021). Strategies to Improve School Meal Consumption: A Systematic Review. *Nutrients*, *13*(10). https://doi.org/10.3390/nu13103520

Cohen, J. F. W., Hecht, A. A., McLoughlin, G. M., Turner, L., & Schwartz, M. B. (2021). Universal School Meals and Associations with Student Participation, Attendance, Academic Performance, Diet Quality, Food Security, and Body Mass Index: A Systematic Review. *Nutrients*, *13*(3). https://doi.org/10.3390/nu13030911

Cohen, J. F. W., Richardson, S., Austin, S. B., Economos, C. D., & Rimm, E. B. (2013). School Lunch Waste Among Middle School Students: Nutrients Consumed and Costs. *American Journal of Preventive Medicine*, *44*(2), 114-121. https://doi.org/https://doi.org/10.1016/j.amepre.2012.09.060

Cohen, J. F. W., Smit, L. A., Parker, E., Austin, S. B., Frazier, A. L., Economos, C. D., & Rimm, E. B. (2012). Long-Term Impact of a Chef on School Lunch Consumption: Findings from a 2-Year Pilot Study in Boston Middle Schools. *Journal of the Academy of Nutrition and Dietetics*, *112*(6), 927-933. https://doi.org/https://doi.org/10.1016/j.jand.2012.01.015

Cohen, J. F. W., Verguet, S., Giyose, B. B., & Bundy, D. (2023). Universal free school meals: the future of school meal programmes? *Lancet*. https://doi.org/10.1016/s0140-6736(23)01516-7

Collins. (2023). *Taste*. https://www.collinsdictionary.com/dictionary/english/taste

Corcoran, S. P., Elbel, B., & Schwartz, A. E. (2016). The Effect of Breakfast in the Classroom on Obesity and Academic Performance: Evidence from New York City. *J Policy Anal Manage*, *35*(3), 509-532. https://doi.org/10.1002/pam.21909

Correa-Burrows, P., Burrows, R., Blanco, E., Reyes, M., & Gahagan, S. (2016). Nutritional quality of diet and academic performance in Chilean students. *World Health Organisation*, 185-192.

Cullen, K. W., Baranowski, T., Rittenberry, L., Cosart, C., Hebert, D., & de Moor, C. (2001). Child-reported family and peer influences on fruit, juice and vegetable consumption: reliability and validity of measures. *Health Educ Res*, *16*(2), 187-200. https://doi.org/10.1093/her/16.2.187

D'Adamo, C. R., Parker, E. A., McArdle, P. F., Trilling, A., Bowden, B., Bahr-Robertson, M. K., Keller, K. L., & Berman, B. M. (2021). The addition of spices and herbs to vegetables in the National School Lunch Program increased vegetable intake at an urban, economically-underserved, and predominantly African-American high school. *Food Qual Prefer*, *88*. https://doi.org/10.1016/j.foodqual.2020.104076

Datar, A., & Nicosia, N. (2012). Junk Food in Schools and Childhood Obesity. *J Policy Anal Manage*, *31*(2), 312-337. https://doi.org/10.1002/pam.21602

Dazeley, P., Houston-Price, C., & Hill, C. (2012). Should healthy eating programmes incorporate interaction with foods in different sensory modalities? A review of the evidence. *British Journal of Nutrition*, *108*(5), 769-777. https://doi.org/10.1017/S0007114511007343

De Castro, J. M. (1990). Social facilitation of duration and size but not rate of the spontaneous meal intake of humans. *Physiology & Behavior*, *47*(6), 1129-1135. https://doi.org/https://doi.org/10.1016/0031-9384(90)90363-9

DeCosta, P., Møller, P., Frøst, M. B., & Olsen, A. (2017). Changing children's eating behaviour - A review of experimental research. *Appetite*, *113*, 327-357. https://doi.org/https://doi.org/10.1016/j.appet.2017.03.004

Deirdre, A. (2019). *Japan's School Lunch Program Serves Nutritious Meals with Food Education*. https://www.nycfoodpolicy.org/food-policy-snapshot-japans-school-lunch-program/

Desmarais, F. (2023). *National, ACT at loggerheads over free school lunches* https://www.1news.co.nz/2023/09/05/national-act-at-loggerheads-over-free-school-lunches/

Dimitrova, V. (2016, 31 July 2016). The afternoon effect: differential impacts on student performance in maths and history. Education, Economics, Mathematics, University of Hamburg.

Draxten, M., Fulkerson, J. A., Friend, S., Flattum, C. F., & Schow, R. (2014). Parental role modeling of fruits and vegetables at meals and snacks is associated with children's adequate consumption. *Appetite*, *78*, 1-7. https://doi.org/10.1016/j.appet.2014.02.017

Drozdowska, A., Sinningen, K., Falkenstein, M., Rudolf, H., Libuda, L., Buyken, A. E., Lücke, T., & Kersting, M. (2022). Impact of lunch with carbohydrates differing in glycemic index on children's cognitive functioning in the late postprandial phase: a randomized crossover study. *Eur J Nutr*, *61*(3), 1637-1647. https://doi.org/10.1007/s00394-021-02766-y

Dudley, D. A., Cotton, W. G., & Peralta, L. R. (2015). Teaching approaches and strategies that promote healthy eating in primary school children: a systematic review and meta-analysis. *International Journal of Behavioral Nutrition and Physical Activity*, *12*, 1-26.

Dudovskiy, J. (2019). *Interviews*. https://research-methodology.net/research-methods/qualitative-research/interviews/

Easwaramoorthy, M., & Zarinpoush, F. (2006). https://sectorsource.ca/sites/default/files/resources/files/tipsheet6_interviewing_for_research_en_0.pdf

Education Counts. (2023). *Education Counts*. https://www.educationcounts.govt.nz/find-school?&type=primary&region=15#fas-search-section-specific

Education Review Office. (2018). *Leading Innovative Learning in New Zealand Schools*. https://ero.govt.nz/sites/default/files/2021-05/Leading-Innovative-Learning-in-Schools-2018.pdf

Electoral Commission New Zealand. (2023). *Preliminary results for the 2023 General Election*. https://elections.nz/media-and-news/2023/election-night-results-for-the-2023-general-election/

Evan, C., & Harpert, C. (2009). A history and review of school meal standards in the UK. *Journal of Human Nutrition and Dietetics*, 89-99.

Evans, C. E., & Harper, C. E. (2009). A history and review of school meal standards in the UK. *J Hum Nutr Diet*, *22*(2), 89-99. https://doi.org/10.1111/j.1365-277X.2008.00941.x

Evans, C. E. L., Cleghorn, C. L., Greenwood, D. C., & Cade, J. E. (2010). A comparison of British school meals and packed lunches from 1990 to 2007: meta-analysis by lunch type. *British Journal of Nutrition*, *104*(4), 474-487. https://doi.org/10.1017/S0007114510001601

Everitt, H., van der Werf, P., & Gilliland, J. A. (2023). A Review of Household Food Waste Generation during the COVID-19 Pandemic. *Sustainability*, *15*(7), 5760. https://www.mdpi.com/2071-1050/15/7/5760

Farrow, C. V., Haycraft, E., & Blissett, J. M. (2015). Teaching our children when to eat: how parental feeding practices inform the development of emotional eating--a longitudinal experimental design. *Am J Clin Nutr*, *101*(5), 908-913. https://doi.org/10.3945/ajcn.114.103713

Faught, E. L., Montemurro, G., Storey, K. E., & Veugelers, P. J. (2017). Adherence to Dietary Recommendations Supports Canadian Children's Academic Achievement. *Canadian Journal of Dietetic Practice and Research*, *78*(3), 102-108. https://doi.org/10.3148/cjdpr-2017-008

Fedewa, A. L., & Davis, M. C. (2015). How Food as a Reward Is Detrimental to Children's Health, Learning, and Behavior. *J Sch Health*, *85*(9), 648-658. https://doi.org/10.1111/josh.12294

Florence, M. D., Asbridge, M., & Veugelers, P. J. (2008). Diet quality and academic performance. *J Sch Health*, *78*(4), 209-215; quiz 239-241. https://doi.org/10.1111/j.1746-1561.2008.00288.x

Forbes, M. (n.d.). *More Quotes on Sou*. https://www.forbes.com/quotes/theme/soul/#:~:text=Food%20may%20be%20essential%20as,is%20fuel%20for%20the%20soul.&text=Years%20may%20wrinkle%20the%20skin,up%20interest%20wrinkles%20the%20soul.&text=I%20am%20fully%20convinced%20that,activity%20will%20continue%20through%20eternity.

Fossgard, E., Wergedahl, H., & Holthe, A. (2021). Children's experienced and imaginary stories about lunch packs and lunch breaks: Associations and perceptions of school lunch among primary school students in Norway. *Appetite*, *164*, 105274. https://doi.org/https://doi.org/10.1016/j.appet.2021.105274

Garton, K., Riddell, C., McKelvie Sebileau, P., Glassey, R., Tipene Leach, D., Rees, D., & Swinburn, B. (2023). Not Just a Free Lunch a logic model and evidence review for the Ka Ora, Ka Ako | Healthy School Lunch programme. *Policy Quarterly*, *19*(2), 75-87. https://cdn.auckland.ac.nz/assets/auckland/news-and-opinion/2023/06/Garton%20et%20al%202023_Ka%20Ora%20Ka%20Ako%20Policy%20Pathways_Policy%20Quarterly.pdf

Gay, J. T. (1996). Richard B. Russell and the National School Lunch Program. *The Georgia Historical Quarterly*, *80*(4), 859-872. http://www.jstor.org/stable/40583600

Gerritsen, J. (2023a). *Call for free school lunches to be extended to more children*. https://www.rnz.co.nz/news/national/483765/call-for-free-school-lunches-to-be-extended-to-more-children

Gerritsen, J. (2023b). *Treasury unsure school lunch scheme represents value for money - Budget document*. https://www.rnz.co.nz/news/national/493640/treasury-unsure-school-lunch-scheme-represents-value-for-money-budget-document

Gibbens, K. (2023). Demand for help would 'go through the roof' if free school lunches dropped. *Stuff NZ*. https://www.rnz.co.nz/news/national/493816/demand-for-help-would-go-through-the-roof-if-free-school-lunches-dropped

Goldthorpe, J., Tracy, E., Chris, K., Rachel, C., Joanna, B., & Chris, A. (2020). What do children, parents and staff think about a healthy lifestyles intervention delivered in primary schools? a qualitative study. *BMJ Open*, *10*(8), e038625. https://doi.org/10.1136/bmjopen-2020-038625

Gómez-Pinilla, F. (2008). Brain foods: the effects of nutrients on brain function. *Nat Rev Neurosci*, *9*(7), 568-578. https://doi.org/10.1038/nrn2421

GOV.UK. (2023). *School meals - food standards*. https://www.gov.uk/school-meals-food-standards

GOV.UK. (n.d.). *School meals - food standards*. https://www.gov.uk/school-meals-food-standards

Govt.UK. (2023). https://explore-education-statistics.service.gov.uk/find-statistics/widening-participation-in-higher-education#releaseHeadlines-summary

Greece, J. A., Feld, S., DeJong, W., Cozier, Y. C., & Quatromoni, P. A. (2017). Effects of a School-based Intervention on Middle School Children's Daily Food and Beverage Intake. *Health Behavior and Policy Review*, 24-36.

Grigsby-Duffy, L., Brooks, R., Boelsen-Robinson, T., Blake, M. R., Backholer, K., Palermo, C., & Peeters, A. (2022). The impact of primary school nutrition policy on the school food environment: a systematic review. *Health Promot Int*, *37*(5). https://doi.org/10.1093/heapro/daac084

Grossman, R. (2015). Teachers went begging during the Great Depression. *Chicago Tribune*. https://www.chicagotribune.com/history/ct-great-depression-chicago-teachers-scrip-pay-cps-ctu-flashback-0906-jm-20150904-story.html

Guerrero, K., Olsen, A., & Wistoft, K. (2018). What Role Does Taste Play in School Meal Studies? A Narrative Review of the Literature.

Gundersen, C., Kreider, B., & Pepper, J. (2012). The impact of the National School Lunch Program on child health: A nonparametric bounds analysis. *Journal of Econometrics*, *166*(1), 79-91. https://doi.org/https://doi.org/10.1016/j.jeconom.2011.06.007

Gunn, J. (2018). *Hunger Pains: Teaching Hungry Students*. https://education.cu-portland.edu/blog/classroom-resources/hunger-pains-teaching-hungry-students/

Hafsah, J. (2017). Teacher of 21 st Century: Characteristics and Development. *Research on Humanities and Social Sciences*, *7*, 50-54.

Haines, J., Haycraft, E., Lytle, L., Nicklaus, S., Kok, F. J., Merdji, M., Fisberg, M., Moreno, L. A., Goulet, O., & Hughes, S. O. (2019). Nurturing Children's Healthy Eating: Position statement. *Appetite*, *137*, 124-133. https://doi.org/https://doi.org/10.1016/j.appet.2019.02.007

Hartwich, O. (2022). ONCE WORLD-CLASS, NZ'S EDUCATION SYSTEM IS NOW A DISASTER. HOW DO WE FIX IT? *NZ Herald*. https://www.nzinitiative.org.nz/reports-

and-media/opinion/once-world-class-nzs-education-system-is-now-a-disaster-how-do-we-fix-it/
Harvard Medical School. (2015). *School Lunches*. https://www.health.harvard.edu/child-and-teen-health/school-lunches
Harvey-Jordan, S., & Long, S. (2001). The process and the pitfalls of semi-structured interviews: The Journal of the Health Visitors' Association. *Community Practitioner*, *74*(6), 219. https://login.ezproxy.sit.ac.nz/login?qurl=https%3A%2F%2Fwww.proquest.com%2Fscholarly-journals%2Fprocess-pitfalls-semi-structured-interviews%2Fdocview%2F213313284%2Fse-2%3Faccountid%3D46872
Hayes, T. O. N., & VanHorn, M. (2021). *Health and Education Impacts of the School Breakfast Program and National School Lunch Program*. https://www.americanactionforum.org/research/health-and-education-impacts-of-the-school-breakfast-program-and-national-school-lunch-program/#:~:text=Background%20and%20Program%20Context,School%20Breakfast%20Program%20(SBP).
Health Coalition Aotearoa. (2023). *HCA research shows 63% of people support doubling Ka Ora Ka Ako healthy school lunches*. https://www.healthcoalition.org.nz/hca-research-shows-63-of-people-support-doubling-ka-ora-ka-ako-healthy-school-lunches/
Hegarty, L., Murphy, M. H., Kirby, K., Murtagh, E., Mallett, J., & Mair, J. L. (2020). The Influence of Role Models on the Sedentary Behaviour Patterns of Primary School-Aged Children and Associations with Psychosocial Aspects of Health. *International Journal of Environmental Research and Public Health*, *17*(15), 5345. https://www.mdpi.com/1660-4601/17/15/5345
Heim, G., Thuestad, R. O., Molin, M., & Brevik, A. (2022). Free School Meal Improves Educational Health and the Learning Environment in a Small Municipality in Norway. *Nutrients*, *14*(14). https://doi.org/10.3390/nu14142989
Heim, S., Stang, J., & Ireland, M. (2009). A garden pilot project enhances fruit and vegetable consumption among children. *J Am Diet Assoc*, *109*(7), 1220-1226. https://doi.org/10.1016/j.jada.2009.04.009
Hendy, H. M. (2002). Effectiveness of trained peer models to encourage food acceptance in preschool children. *Appetite*, *39*(3), 217-225. https://doi.org/https://doi.org/10.1006/appe.2002.0510
Hendy, H. M., Williams, K. E., & Camise, T. S. (2005). "Kids Choice" school lunch program increases children's fruit and vegetable acceptance. *Appetite*, *45*(3), 250-263. https://doi.org/10.1016/j.appet.2005.07.006
Henry, L. (2020). *Thousands of Southland school kids to get healthy, free lunches*. https://southlandapp.nz/news/news/thousands-of-southland-school-kids-to-get-healthy-free-lunches?id=5efecfcbe25ac510171901ad
Herman, C. P., Roth, D. A., & Polivy, J. (2003). Effects of the presence of others on food intake: a normative interpretation. *Psychological bulletin*, *129*(6), 873.
Hickey, A., Shields, D., & Henning, M. (2019). Perceived Hunger in College Students Related to Academic and Athletic Performance. *Education Sciences*, *9*, 242. https://doi.org/10.3390/educsci9030242
Hiller-Sturmhöfel, S., & Bartke, A. (1998). The endocrine system: an overview. *Alcohol Health Res World*, *22*(3), 153-164.

Holland, F. (2022). *Lessons from the dining hall: the history of free school meals and the changes needed to improve pupils' nutrition*. https://foodmatterslive.com/article/the-history-of-free-school-meals-in-the-uk-and-the-changes-needed/

Horizon Poll. (2015). *How many are missing breakfast?* https://www.horizonpoll.co.nz/page/399/how-many-are

ILSNA. (n.d.). *History of School Lunch*. https://www.ilsna.net/resources/schoolnutrition/historyschoollunch#:~:text=Though%20school%20foodservice%20began%20long,of%20diet%2Drelated%20health%20problems.

Immigration, N. Z. (2019). *New Zealand Now*. https://www.newzealandnow.govt.nz/living-in-nz/education/school-system

Jacob-Files, E., Powell, J., & Wright, D. R. (2018). Exploring parent attitudes around using incentives to promote engagement in family-based weight management programs. *Prev Med Rep*, *10*, 278-284. https://doi.org/10.1016/j.pmedr.2018.04.007

Jakavonytė-Staškuvienė, D., & Mereckaitė-Kušleikė, I. (2023). Conditions for Successful Learning of Primary School Pupils in the Context of Integrated Education: A Case Study. *Interchange*, *54*(2), 229-251. https://doi.org/10.1007/s10780-023-09489-5

Jan, H. (2017). Teacher of 21 st Century: Characteristics and Development. *Research on Humanities and Social Sciences*, *7*, 50-54.

Jansen, P. W., Derks, I. P. M., Mou, Y., van Rijen, E. H. M., Gaillard, R., Micali, N., Voortman, T., & Hillegers, M. H. J. (2020). Associations of parents' use of food as reward with children's eating behaviour and BMI in a population-based cohort. *Pediatr Obes*, *15*(11), e12662. https://doi.org/10.1111/ijpo.12662

Jessiman, P. E., Carlisle, V. R., Breheny, K., Campbell, R., Jago, R., Robinson, M., Strong, S., & Kidger, J. (2023). A qualitative process evaluation of universal free school meal provision in two London secondary schools. *BMC Public Health*, *23*(1), 300. https://doi.org/10.1186/s12889-023-15082-3

Joanna, G., Tracy, E., Chris, K., Rachel, C., Joanna, B., & Chris, A. (2020). What do children, parents and staff think about a healthy lifestyles intervention delivered in primary schools? a qualitative study. *BMJ Open*, *10*(8), e038625. https://doi.org/10.1136/bmjopen-2020-038625

Johnson, A., & Ellis, E. (2023). *Get to Know Your School Lunch Program*. Get to Know Your School Lunch Program

Johnson, M. B. (2012). Experimental test of social norms theory in a real-world drinking environment. *J Stud Alcohol Drugs*, *73*(5), 851-859. https://doi.org/10.15288/jsad.2012.73.851

Johnston, K. (2017). A number of New Zealand children hospitalised with malnutrition doubles as food costs bite. *NZ Herald*. https://www.nzherald.co.nz/nz/news/article.cfm?c_id=1&objectid=11923626

Jones, B. A., Madden, G. J., & Wengreen, H. J. (2014). The FIT Game: preliminary evaluation of a gamification approach to increasing fruit and vegetable consumption in school. *Preventive Medicine*, *68*, 76-79. https://doi.org/https://doi.org/10.1016/j.ypmed.2014.04.015

Just, D. R., Wansink, B., & Hanks, A. S. (2014). Chefs move to schools. A pilot examination of how chef-created dishes can increase school lunch participation and fruit and vegetable intake. *Appetite*, *83*, 242-247. https://doi.org/10.1016/j.appet.2014.08.033

Kalavana, T. V., Maes, S., & De Gucht, V. (2010). Interpersonal and self-regulation determinants of healthy and unhealthy eating behavior in adolescents. *J Health Psychol*, *15*(1), 44-52. https://doi.org/10.1177/1359105309345168

Kelleher, C., & Weir, S. (2016). Class size and student teacher ratio at primary level in Ireland and other OECD countries. *The Irish Journal of Education / Iris Eireannach an Oideachais*, *41*, 39-60. http://www.jstor.org/stable/24891698

Kelly, S., & Swinburn, B. (2015). Childhood obesity in New Zealand. *The New Zealand Medical Journal (Online)*, *128*(1417), 6.

Kenney, E. L., Barrett, J. L., Bleich, S. N., Ward, Z. J., Cradock, A. L., & Gortmaker, S. L. (2020). Impact Of The Healthy, Hunger-Free Kids Act On Obesity Trends. *Health Affairs*, *39*(7), 1122-1129. https://doi.org/10.1377/hlthaff.2020.00133

Khan, N. A., Raine, L. B., Donovan, S. M., & Hillman, C. H. (2014). IV. The cognitive implications of obesity and nutrition in childhood. *Monogr Soc Res Child Dev*, *79*(4), 51-71. https://doi.org/10.1111/mono.12130

Kim, S. Y., Sim, S., Park, B., Kong, I. G., Kim, J. H., & Choi, H. G. (2016). Dietary Habits Are Associated With School Performance in Adolescents. *Medicine (Baltimore)*, *95*(12), e3096. https://doi.org/10.1097/md.0000000000003096

Kinderknecht, K., Harris, C., & Jones-Smith, J. (2020). Association of the Healthy, Hunger-Free Kids Act With Dietary Quality Among Children in the US National School Lunch Program. *Jama*, *324*(4), 359-368. https://doi.org/10.1001/jama.2020.9517

Kitchen, S., Tanner, E., Brown, V., Payne, C., Crawford, C., Dearden, L., Greaves, E., & Purdon, S. (2013). Evaluation of the free school meals pilot. *Department for Education: London, UK*.

Kitzinger, J. (1995). Qualitative Research: Introducing focus groups. *BMJ*, *311*(7000), 299-302. https://doi.org/10.1136/bmj.311.7000.299

Kleinman, R. E., Hall, S., Green, H., Korzec-Ramirez, D., Patton, K., Pagano, M. E., & Murphy, J. M. (2002). Diet, breakfast, and academic performance in children. *Ann Nutr Metab*, *46 Suppl 1*(0 1), 24-30. https://doi.org/10.1159/000066399

Kümpel Nørgaard, M., Nørgaard Hansen, K., & Grunert, K. G. (2013). Peer influence on adolescent snacking. *Journal of Social Marketing*, *3*(2), 176-194.

Labour. (2023). *Release: School lunches on the line this election* https://www.labour.org.nz/news-release_school_lunches_line_election

Lakkakula, A., Geaghan, J. P., Wong, W.-P., Zanovec, M., Pierce, S. H., & Tuuri, G. (2011). A cafeteria-based tasting program increased liking of fruits and vegetables by lower, middle and upper elementary school-age children. *Appetite*, *57*(1), 299-302. https://doi.org/https://doi.org/10.1016/j.appet.2011.04.010

Leos-Urbel, J., Schwartz, A. E., Weinstein, M., & Corcoran, S. (2013). Not just for poor kids: The impact of universal free school breakfast on meal participation and student outcomes. *Econ Educ Rev*, *36*, 88-107. https://doi.org/10.1016/j.econedurev.2013.06.007

Leung, C. W., Stewart, A. L., Portela-Parra, E. T., Adler, N. E., Laraia, B. A., & Epel, E. S. (2020). Understanding the Psychological Distress of Food Insecurity: A Qualitative Study of Children's Experiences and Related Coping Strategies. *J Acad Nutr Diet*, *120*(3), 395-403. https://doi.org/10.1016/j.jand.2019.10.012

Liang, M., Chen, Q., & Zhou, Y. (2022). The Influence of Various Role Models on Children's Pro-environmental Behaviours [Original Research]. *Frontiers in Psychology*, *13*. https://doi.org/10.3389/fpsyg.2022.873078

Long, J., & Te, M. (2019). *New Zealand top-end in OECD's latest PISA report but drop in achievements 'worrying'*. https://www.stuff.co.nz/national/education/117890945/new-zealand-topend-in-oecds-latest-pisa-report-but-drop-in-achievements-worrying

Lumeng, J. C., & Hillman, K. H. (2007). Eating in larger groups increases food consumption. *Archives of disease in childhood*, *92*(5), 384-387.

Macdonald, F. (2023). *A brief history of school meals in the UK: from free milk to Jamie Oliver's campaign against Turkey Twizzlers*. The conversion. https://theconversation.com/a-brief-history-of-school-meals-in-the-uk-from-free-milk-to-jamie-olivers-campaign-against-turkey-twizzlers-198124

Machado, S. S., Burton, M., Loy, W., & Chapman, K. A. (2020). Promoting school lunch fruit and vegetable intake through role modeling: a pilot study. *AIMS Public Health*, *7*(1), 10-19. https://doi.org/10.3934/publichealth.2020002

Maclellan, D., Taylor, J., & Wood, K. (2008). Food Intake and Academic Performance Among Adolescents. *Canadian journal of dietetic practice and research : a publication of Dietitians of Canada = Revue canadienne de la pratique et de la recherche en diététique : une publication des Diététistes du Canada*, *69*, 141-144. https://doi.org/10.3148/69.3.2008.141

MacNamara, K. (2023a). No such thing as a free lunch? Cost of free school lunches a hungry hole in Budget 2023. *NZ Herald*. https://www.nzherald.co.nz/business/cost-of-free-school-lunches-a-hungry-hole-in-budget-2023/NYPIWIIGGJBWNEIJM2XXT3MLG4/

MacNamara, K. (2023b). Public Purse: Why so many of NZ's neediest school children could be missing out on a free school lunch. *NZ Herald*. https://www.nzherald.co.nz/business/public-purse-why-so-many-of-nzs-neediest-school-children-could-be-missing-out-on-a-free-school-lunch/UPNPF7NNMBDY5O5KSQOXN5C3XE/

Maguire, M., & Delahunt, B. (2017). Doing a Thematic Analysis: A Practical, Step-by-Step Guide. *AISHE-J 9*, 1-14. https://www.researchgate.net/publication/349506918_Doing_a_Thematic_Analysis_A_Practical_Step-by-Step_Guide#full-text

Mahmood, L., Flores-Barrantes, P., Moreno, L. A., Manios, Y., & Gonzalez-Gil, E. M. (2021). The Influence of Parental Dietary Behaviors and Practices on Children's Eating Habits. *Nutrients*, *13*(4). https://doi.org/10.3390/nu13041138

Mallard. (2004). *Final decisions for Invercargill review*. https://www.beehive.govt.nz/release/final-decisions-invercargill-review

Mann, J., & Truswell, A. (2017). *Essentials of human nutrition*. Oxford University Press.

Martinelli, S., Acciai, F., Au, L. E., Yedidia, M. J., & Ohri-Vachaspati, P. (2020). Parental Perceptions of the Nutritional Quality of School Meals and Student Meal Participation: Before and After the Healthy Hunger-Free Kids Act. *J Nutr Educ Behav*, *52*(11), 1018-1025. https://doi.org/10.1016/j.jneb.2020.05.003

Mascola, A. J., Bryson, S. W., & Agras, W. S. (2010). Picky eating during childhood: A longitudinal study to age 11years. *Eating Behaviors*, *11*(4), 253-257. https://doi.org/https://doi.org/10.1016/j.eatbeh.2010.05.006

Masters, M. (2023). *70 Dieting Statistics You Should Know*. https://www.livestrong.com/article/408469-what-is-an-unhealthy-diet/

Mauer, S., Torheim, L. E., & Terragni, L. (2022). Children's Participation in Free School Meals: A Qualitative Study among Pupils, Parents, and Teachers. *Nutrients*, *14*(6). https://doi.org/10.3390/nu14061282

McArdle, W., Katch, F., & Katch, V. (2015). *Exercise physiology, nutritionm energy and human performance*. Wolter Kluwer.

McRae, I., & Westwater, H. (2023). *Free school meals: Everything you need to know*. https://www.bigissue.com/news/social-justice/free-school-meals-everything-you-need-to-know/

Mennella, J. A. (2014). Ontogeny of taste preferences: basic biology and implications for health. *Am J Clin Nutr*, *99*(3), 704s-711s. https://doi.org/10.3945/ajcn.113.067694

MFE. (2022). *Te Kete Āhuarangi me Te Taiao: Environment and Climate Research Strategy*. https://environment.govt.nz/facts-and-science/science-and-data/environment-and-climate-research-strategy/

Mhurchu, C. N., Gorton, D., Turley, M., Jiang, Y., Michie, J., Maddison, R., & Hattie, J. (2013). Effects of a free school breakfast programme on children's attendance, academic achievement and short-term hunger: results from a stepped-wedge, cluster randomised controlled trial. *J Epidemiol Community Health*, *67*(3), 257-264. https://doi.org/10.1136/jech-2012-201540

Micha, R., Karageorgou, D., Bakogianni, I., Trichia, E., Whitsel, L. P., Story, M., Peñalvo, J. L., & Mozaffarian, D. (2018). Effectiveness of school food environment policies on children's dietary behaviors: A systematic review and meta-analysis. *PLoS One*, *13*(3), e0194555. https://doi.org/10.1371/journal.pone.0194555

Michel, C., Velasco, C., Gatti, E., & Spence, C. (2014). A taste of Kandinsky: assessing the influence of the artistic visual presentation of food on the dining experience. *Flavour*, *3*(1), 7. https://doi.org/10.1186/2044-7248-3-7

Mirtcheva, D., & Powell, L. (2009). Participation in the National School Lunch Program: Importance of School-Level and Neighborhood Contextual Factors. *The Journal of school health*, *79*, 485-494. https://doi.org/10.1111/j.1746-1561.2009.00438.x

MOE. (2019a). *Free and healthy lunches in schools*. https://www.education.govt.nz/our-work/overall-strategies-and-policies/wellbeing-in-education/free-and-healthy-school-lunches/

MOE. (2019b). *School deciles*. https://www.education.govt.nz/school/funding-and-financials/resourcing/operational-funding/school-decile-ratings/

MOE. (2020). *Ka Ora, Ka Ako | Healthy School Lunches Programme: Nutrition guidelines*. https://extranet.who.int/nutrition/gina/sites/default/filesstore/NZL%202020%20Ka-Ora-Ka-Ako.%20Nutrition%20Guidance.pdf

MOE. (2021a). *Guidance on the safe handling and redistribution of surplus lunches*. https://assets.education.govt.nz/public/Uploads/Guidance-on-the-safe-redistribution-of-surplus-lunches.pdf

MOE. (2021b). *Information for schools and kura on the Pathway to Nutrition*. https://assets.education.govt.nz/public/Uploads/Pathway-to-Nutrition-information-for-schools-and-kura-March-2021.pdf

MOE. (2022a). *Education in New Zealand*. https://www.education.govt.nz/our-work/our-role-and-our-people/education-in-nz/#:~:text=The%20government%20subsidises%20all%20children,5%20years%20who%

20attend%20ECE.&text=You%20can%20learn%20more%20about,Parents%20section%20of%20this%20website.
MOE. (2022b). *The Equity Index (EQI)*. https://www.education.govt.nz/news/the-equity-index-eqi/
MOE. (2022c). *Nutrition Standards for Ka Ora, Ka Ako | Healthy School Lunches Programme*. https://assets.education.govt.nz/public/Documents/Nutrition-Standards-for-Ka-Ora-Ka-Ako-Healthy-School-Lunches-Programme-v2.pdf
MOE. (2022d). *Promoting healthy food and nutrition in schools*. https://www.education.govt.nz/news/promoting-healthy-food-and-nutrition-in-schools/#:~:text=Regulations%20will%20replace%20the%20soon,schools%20provide%20only%20healthy%20drinks.
MOE. (2023a). *Inclusive education*. https://www.education.govt.nz/school/student-support/inclusive-education/
MOE. (2023b). *Ka Ora, Ka Ako | Healthy School Lunches Programme*. https://www.education.govt.nz/our-work/overall-strategies-and-policies/wellbeing-in-education/free-and-healthy-school-lunches/
MOE. (2023c). *Nutrition Standards 2023: Summary of changes*. https://assets.education.govt.nz/public/Documents/Summary-of-Changes-on-a-Page_FINAL.pdf
MOE. (2023d). *Practical information about education for parents and carers*. https://parents.education.govt.nz/early-learning/early-childhood-education/different-kinds-of-early-childhood-education/
MOE. (2023e). *Providing healthy kai to ākonga*. https://kaorakaako.education.govt.nz/working-together/nutrition/why-we-dont-serve-pies-and-chips
MOE. (2023f). *Support Staff in Schools' Collective Agreement*. https://www.education.govt.nz/school/people-and-employment/employment-agreements/collective-agreements/support-staff-in-schools-collective-agreement/part-3a-teacher-aide-remuneration/
MOH. (2019a). *Healthy Food and Drink Guidance -Schools*. https://consult.health.govt.nz/nutrition-and-physical-activity/healthy-food-and-drink-guidance-survey/supporting_documents/Healthy%20Food%20and%20Drink%20Guidance%20%20Schools.pdf
MOH. (2019b). *Household Food Insecurity Among cldren: New Zealand health Survey*. https://www.health.govt.nz/system/files/documents/publications/household-food-insecurity-among-children-new-zealand-health-survey-jun19.pdf
MOH. (2019c). *Obesity statistics*. https://www.health.govt.nz/nz-health-statistics/health-statistics-and-data-sets/obesity-statistics
MOH. (2022). *Children's Dietary Habits*. https://www.health.govt.nz/publication/childrens-dietary-habits
MOJ. (2023a). *Care of Children Act 2004*. https://www.legislation.govt.nz/act/public/2004/0090/latest/DLM317239.html
MOJ. (2023b). *What being a guardian means*. https://www.justice.govt.nz/family/care-of-children/guardianship/being-a-guardian/

Moore, R. (2017). Crowded rolls and a lack of classrooms in schools. *Stuff NZ*. https://www.stuff.co.nz/southland-times/news/88749936/crowded-rolls-and-a-lack-of-classrooms-in-schools

Moore, S., Murphy, S., Tapper, K., & Moore, L. (2010). The social, physical and temporal characteristics of primary school dining halls and their implications for children's eating behaviours. *Health Education*, *110*, 399-411. https://doi.org/10.1108/09654281011068540

Mullen, J. A. (n.d.). *Seeing the Unseen, Listening to the Unheard: Unsilencing Sexually Traumatized Children's Voices in Play Therapy*. https://www.researchpress.com/seeing-the-unseen-listening-to-the-unheard-unsilencing-sexually-traumatized-childrens-voices-in-play-therapy/

NEA. (2019). *Facts About Child Nutrition*. http://www.nea.org/home/39282.htm

Neilson, M. (2023). Lunch in schools: National says 'poorly targeted', schools missing out. *NZ Herald*. https://www.nzherald.co.nz/nz/lunch-in-schools-national-says-poorly-targeted-schools-missing-out/74KJYJCGHMCY6NZVHYBHZSPCNM/

Nepper, M. J., & Chai, W. (2017). Parental Views of Promoting Fruit and Vegetable Intake Among Overweight Preschoolers and School-Aged Children. *Glob Qual Nurs Res*, *4*, 2333393617692085. https://doi.org/10.1177/2333393617692085

NHS. (2023). *Hyperglycaemia (high blood sugar)*. https://www.nhsinform.scot/illnesses-and-conditions/blood-and-lymph/hyperglycaemia-high-blood-sugar/

Nicol-Williams, K. (2023). *Growing calls for free school lunch programme to be extended*. https://www.1news.co.nz/2023/06/17/growing-calls-for-free-school-lunch-programme-to-be-extended/

Nørgaard, M. K., Sørensen, B. T., & Grunert, K. G. (2014). Social and individual determinants of adolescents' acceptance of novel healthy and cool snack products. *Appetite*, *83*, 226-235. https://doi.org/10.1016/j.appet.2014.08.028

Northland Age. (2022). Large amounts of food waste' thanks to lunches in schools programme. *Northland Age*. https://www.nzherald.co.nz/northland-age/news/large-amounts-of-food-waste-thanks-to-lunches-in-schools-programme/HYUGUZL56YTCV7SLRHFMMIV7OE/

Nowell, L. S., Norris, J. M., White, D. E., & Moules, N. J. (2017). Thematic Analysis: Striving to Meet the Trustworthiness Criteria. *International Journal of Qualitative Methods*, *16*(1), 1609406917733847. https://doi.org/10.1177/1609406917733847

OECD. (2014). *How many students are in each classroom?* https://doi.org/doi:https://doi.org/10.1787/eag_highlights-2014-24-en

Oliver, J. (2023). *Jamie's Today Programme takeover*. https://www.jamieoliver.com/campaigns/

Otago Daily Times. (2023). Greens want to expand free lunch in schools programme. *Otago Daily Times*. https://www.odt.co.nz/news/national/greens-want-expand-free-lunch-schools-programme

Patterson, E., & Elinder, L. S. (2014). Improvements in school meal quality in Sweden after the introduction of new legislation—a 2-year follow-up. *European Journal of Public Health*, *25*(4), 655-660. https://doi.org/10.1093/eurpub/cku184

Patton, K. T. (2018). *Anatomy & physiology* (Vol. 10). Elsevier

Patton, K. T., & Thibodeau, G. A. (2016). *Anatomy and Physiology*. Mosby Elsevier.

Philippou, E., & Constantinou, M. (2014). The influence of glycemic index on cognitive functioning: a systematic review of the evidence. *Adv Nutr*, *5*(2), 119-130. https://doi.org/10.3945/an.113.004960

Pollitt, E., Cueto, S., & Jacoby, E. R. (1998). Fasting and cognition in well- and undernourished schoolchildren: a review of three experimental studies. *The American Journal of Clinical Nutrition*, *67*(4), 779S-784S. https://doi.org/https://doi.org/10.1093/ajcn/67.4.779S

Pope, L., Roche, E., Morgan, C. B., & Kolodinsky, J. (2018). Sampling tomorrow's lunch today: Examining the effect of sampling a vegetable-focused entrée on school lunch participation, a pilot study. *Prev Med Rep*, *12*, 152-157. https://doi.org/10.1016/j.pmedr.2018.09.010

Powers, S., Dodd, S., & Jackson, E. (2017). *Total fitness & wellness*. Pearson.

Prescott, M. P., Gilbride, J. A., Corcoran, S. P., Elbel, B., Woolf, K., Ofori, R. O., & Schwartz, A. E. (2022). The Relationship between School Infrastructure and School Nutrition Program Participation and Policies in New York City. *Int J Environ Res Public Health*, *19*(15). https://doi.org/10.3390/ijerph19159649

Ragelienė, T., & Grønhøj, A. (2020). The influence of peers′ and siblings′ on children's and adolescents′ healthy eating behavior. A systematic literature review. *Appetite*, *148*, 104592. https://doi.org/https://doi.org/10.1016/j.appet.2020.104592

Ralston, K. L., Newman, C., Clauson, A. L., Guthrie, J. F., & Buzby, J. C. (2008). *The national school lunch program: Background, trends, and issues* [Report]. E. publications. https://www.ers.usda.gov/webdocs/publications/46043/12051_err61_1_.pdf?v=0

Rhitu, C. (2014). India's school lunch program not only fights hunger — it can breed tolerance. *The World*. https://theworld.org/stories/2014-07-17/indias-school-lunch-program-not-only-fights-hunger-it-can-breed-tolerance

Richardson, A. S., Weden, M. M., Cabreros, I., & Datar, A. (2022). Association of the Healthy, Hunger-Free Kids Act of 2010 With Body Mass Trajectories of Children in Low-Income Families. *JAMA Network Open*, *5*(5), e2210480-e2210480. https://doi.org/10.1001/jamanetworkopen.2022.10480

RNZ. (2023a). *Inside the government's school lunches programme*. https://www.rnz.co.nz/programmes/the-detail/story/2018888208/inside-the-government-s-school-lunches-programme

RNZ. (2023b). *National supports school lunch scheme but it must provide value for money - Luxon*. https://www.rnz.co.nz/news/political/495891/national-supports-school-lunch-scheme-but-it-must-provide-value-for-money-luxon

Rollins, B. Y., Loken, E., Savage, J. S., & Birch, L. L. (2014). Effects of restriction on children's intake differ by child temperament, food reinforcement, and parent's chronic use of restriction. *Appetite*, *73*, 31-39. https://doi.org/10.1016/j.appet.2013.10.005

Rooth, D.-O., & Lundborg, P. (2021). *Swedish school lunch reform, nutrition, and lifetime income*. https://cepr.org/voxeu/columns/swedish-school-lunch-reform-nutrition-and-lifetime-income

Rosenrauch, S., Ball, K., & Lamb, K. E. (2017). Associations between perceived friends' support of healthy eating and meal skipping in adolescence. *Public Health Nutrition*, *20*(18), 3266-3274. https://doi.org/10.1017/S136898001700235X

Rosettie, K., Micha, R., Cudhea, F., Peñalvo, J., O'Flaherty, M., Pearson-Stuttard, J., Economos, C., Whitsel, L., & Mozaffarian, D. (2018). Comparative risk assessment of school food

environment policies and childhood diets, childhood obesity, and future cardiometabolic mortality in the United States. *PLoS One*, *13*, e0200378. https://doi.org/10.1371/journal.pone.0200378

Salvy, S.-J., Coelho, J. S., Kieffer, E., & Epstein, L. H. (2007). Effects of social contexts on overweight and normal-weight children's food intake. *Physiology & Behavior*, *92*(5), 840-846. https://doi.org/https://doi.org/10.1016/j.physbeh.2007.06.014

Salvy, S.-J., de la Haye, K., Bowker, J. C., & Hermans, R. C. J. (2012). Influence of peers and friends on children's and adolescents' eating and activity behaviors. *Physiology & Behavior*, *106*(3), 369-378. https://doi.org/https://doi.org/10.1016/j.physbeh.2012.03.022

Savage, J. S., Fisher, J. O., & Birch, L. L. (2007). Parental influence on eating behavior: conception to adolescence. *J Law Med Ethics*, *35*(1), 22-34. https://doi.org/10.1111/j.1748-720X.2007.00111.x

Schanzenbach, D. W. (2009). Do School Lunches Contribute to Childhood Obesity? *Journal of Human Resources*, *44*(3), 684-709. https://doi.org/10.3368/jhr.44.3.684

School-meals-matters. (2023). *School food facts*. https://www.schoolfoodmatters.org/news-views/school-food-facts

School Food Matters. (n.d.). *School food facts*. https://www.schoolfoodmatters.org/news-views/school-food-facts

Schunk, D. H. (1987). Peer Models and Children's Behavioral Change. *Review of Educational Research*, *57*(2), 149-174. https://doi.org/10.2307/1170234

Schwanecke, G. (2023a). KidsCan defends food in schools programme after highly critical Treasury report. https://www.stuff.co.nz/national/education/300927051/kidscan-defends-food-in-schools-programme-after-highly-critical-treasury-report

Schwanecke, G. (2023b). Up to 10,000 healthy school lunches leftover each day, critical treasury report finds. *The Post*. https://www.thepost.co.nz/a/nz-news/350034716/10000-healthy-school-lunches-leftover-each-day-critical-treasury-report-finds#:~:text=A%20Treasury%20report%20hugely%20critical,report%20released%20on%20Wednesday%20revealed.

Schwartz, A., & Rothbart, M. (2019). Let Them Eat Lunch: The Impact of Universal Free Meals on Student Performance. *Journal of Policy Analysis and Management*, *39*. https://doi.org/10.1002/pam.22175

Scottish Government. (2021). *Free school meals* https://www.gov.scot/news/free-school-meals-1/

Shon, C., Park, Y., Ryou, H., Na, W., & Choi, K. (2012). The development of a taste education program for preschoolers and evaluation of a program by parents and childcare personnel. *Nutr Res Pract*, *6*(5), 466-473. https://doi.org/10.4162/nrp.2012.6.5.466

Shorten, A., & Smith, J. (2017). Mixed methods research: Expanding the evidence base. *Evidence Based Nursing*, *20*, ebnurs-2017. https://doi.org/10.1136/eb-2017-102699

Smith, A. P., & Miles, C. (1986). Effects of lunch on selective and sustained attention. *Neuropsychobiology*, *16*(2-3), 117-120. https://doi.org/10.1159/000118309

Snelling, A., Newman, C., Ellsworth, D., Kalicki, M., Guthrie, J., Mancino, L., Malloy, E., Dyke, H., George, S., & Nash, K. (2017). Using a Taste-test Intervention to Promote Vegetable Consumption. *Health Behavior and Policy Review*, *4*, 67-75. https://doi.org/10.14485/HBPR.4.1.8

Sport NZ. (2019). *Annual Report*. https://sportnz.org.nz/media/3577/201920-sport-nz-annual-report-12_22-web.pdf

Stat NZ. (2018). Southland Region. https://www.stats.govt.nz/tools/2018-census-place-summaries/southland-region
Stock, R. (2018). Eat My Lunch back-pedals on claim that 290,000 children go to school without lunch every day. *Stuff NZ*. https://www.stuff.co.nz/business/money/105680404/eat-my-lunch-backpeddles-on-claim-that-290000-children-go-to-school-without-lunch-every-day#:~:text=Julie%20Chapman%20from%20KidsCan%20estimates,at%20points%20during%20the%20week.
Story, M. (2009). The Third School Nutrition Dietary Assessment Study: Findings and Policy Implications for Improving the Health of US Children. *Journal of the American Dietetic Association*, *109*(2, Supplement), S7-S13. https://doi.org/https://doi.org/10.1016/j.jada.2008.11.005
Stuber, N. (2014). *Nutrition and Students' Academic Performance*. https://www.wilder.org/wilder-research/research-library/nutrition-and-students-academic-performance
Sünram-Lea, S. I., Gentile-Rapinett, G., Macé, K., & Rytz, A. (2021). Assessment of Glycemic Response to Model Breakfasts Varying in Glycemic Index (GI) in 5-7-Year-Old School Children. *Nutrients*, *13*(12). https://doi.org/10.3390/nu13124246
Tanaka, N., & Miyoshi, M. (2012). School lunch program for health promotion among children in Japan. *Asia Pac J Clin Nutr*, *21*(1), 155-158.
Tappy, L. (2008). Basics in clinical nutrition: Carbohydrate metabolism. *E-spen, The European E-journal of Clinical Nutrition and Metabolism*, *3*. https://doi.org/10.1016/j.eclnm.2008.06.010
Taylor, C. M., Wernimont, S. M., Northstone, K., & Emmett, P. M. (2015). Picky/fussy eating in children: Review of definitions, assessment, prevalence and dietary intakes. *Appetite*, *95*, 349-359. https://doi.org/10.1016/j.appet.2015.07.026
Te Ara. (2015). *Story: Southland region*. https://teara.govt.nz/en/southland-region
Thau, L., Gandhi, J., & Sharma, S. (2023). Physiology, Cortisol. In *StatPearls*. StatPearls Publishing.
The Restaurant Times. (2023). *Make Your Dishes Look Irresistible With These 5 Proven Food Presentation Techniques- A 2023 Edition*. https://www.posist.com/restaurant-times/restro-gyaan/essential-food-presentation-techniques-make-dishes-look-irresistible.html
Thomas, J. R., Nelson, J. K., & Silverman, S. J. (2005). *Research methods in physical activity* (5th ed.). Human Kinetics.
Thomas, J. R., Nelson, J. K., & Silverman, S. J. (2015). *Research Methods in Physical Activity*. Human Kinetics.
Thompson, H. R., Machado, S. S., Madsen, K. A., Cauchon-Robles, R., Neelon, M., & Ritchie, L. (2022). Impact of a Teacher Intervention to Encourage Students to Eat School Lunch. *Int J Environ Res Public Health*, *19*(18). https://doi.org/10.3390/ijerph191811553
Tinetti, J. (2023). *Smaller class sizes to improve teaching and learning outcomes*. https://www.beehive.govt.nz/release/smaller-class-sizes-improve-teaching-and-learning-outcomes
Ting, J. (2022). *School Lunches: New York vs. South Korea*. https://storymaps.arcgis.com/stories/0e789380136b4e8a85d3dfde04026412
Travelmonk. (2022). *A Closer Look at Korean school lunch*. https://livelearnventure.com/school-lunches-in-south-korea/

Tucker, E. (2023). *Understanding the Great Depression*. https://teachingamericanhistory.org/blog/understanding-the-great-depression-an-interview-with-professor-john-moser/

Tugault-Lafleur, C. N., & Black, J. L. (2022). Who Misses Lunch on School Days in Canada? *Journal of Hunger & Environmental Nutrition*, *17*(6), 763-779. https://doi.org/10.1080/19320248.2021.1984359

Turner, L., Chriqui, J., & Chaloupka, F. (2012). Food as a Reward in the Classroom: School District Policies Are Associated with Practices in US Public Elementary Schools. *Journal of the Academy of Nutrition and Dietetics*, *112*, 1436-1442. https://doi.org/10.1016/j.jand.2012.03.025

Unicef. (n.d.). *New report card shows that New Zealand is failing it's children*. https://www.unicef.org.nz/media-releases/new-report-card-shows-that-new-zealand-is-failing-its-children

University of Auckland. (2023). *Study finds unexpected benefits from free school lunches*. https://www.nzdoctor.co.nz/article/undoctored/study-finds-unexpected-benefits-free-school-lunches

University of Cambridge. (2019). *Price gap between more and less healthy foods grows*. https://www.cam.ac.uk/research/news/price-gap-between-more-and-less-healthy-foods-grows

University of Ottawa. (2021). *How many children don't eat lunch on school days in Canada? A new study documents the gaps of current school food programs*. https://www.eurekalert.org/news-releases/933133

USDA. (2019). *National School Lunch Program (NSLP) Fact Sheet*. https://www.fns.usda.gov/nslp/nslp-fact-sheet

USDA. (2022). *National School Lunch Program*. https://www.ers.usda.gov/topics/food-nutrition-assistance/child-nutrition-programs/national-school-lunch-program/

Verdonschot, A., Follong, B. M., Collins, C. E., de Vet, E., Haveman-Nies, A., & Bucher, T. (2023). Effectiveness of school-based nutrition intervention components on fruit and vegetable intake and nutrition knowledge in children aged 4-12 years old: an umbrella review. *Nutr Rev*, *81*(3), 304-321. https://doi.org/10.1093/nutrit/nuac057

Vermillion Peirce, P., Blackie, M., Morris, B., B, J.-C., & Engelbertz. (2021). *New Zeland Healthy School Lunch pilot. Ka Ora, Ka Ako Interism Exaluation.*

Vieira, M., & Carvalho, G. S. (2021). Children Learn, Children Do! Results of the "Planning Health in School", a Behavioural Change Programme. *Int J Environ Res Public Health*, *18*(18). https://doi.org/10.3390/ijerph18189872

Vik, F. N., Van Lippevelde, W., & Øverby, N. C. (2019). Free school meals as an approach to reduce health inequalities among 10–12- year-old Norwegian children. *BMC Public Health*, *19*(1), 951. https://doi.org/10.1186/s12889-019-7286-z

Waddingham, S., Shaw, K., Van Dam, P., & Bettiol, S. (2018). What motivates their food choice? Children are key informants. *Appetite*, *120*, 514-522. https://doi.org/https://doi.org/10.1016/j.appet.2017.09.029

Wade, A. (2023). *Education Minister Jan Tinetti says 'insulting' to say free school lunch wastage going to pigs*. https://www.newshub.co.nz/home/politics/2023/07/education-minister-jan-tinetti-says-insulting-to-say-free-school-lunch-wastage-going-to-pigs.html

Wahlstrom, K. L., & Begalle, M. S. (1999). More than test scores: results of the Universal School Breakfast Pilot in Minnesota. *Topics in Clinical Nutrition*, *15*(1), 17-29.

Wansink, B., & Hanks, A. (2013). Slim by Design: Serving Healthy Foods First in Buffet Lines Improves Overall Meal Selection. *PLoS One*, *8*, e77055. https://doi.org/10.1371/journal.pone.0077055

Watts, A. W., Miller, J., Larson, N. I., Eisenberg, M. E., Story, M. T., & Neumark-Sztainer, D. (2018). Multicontextual correlates of adolescent sugar-sweetened beverage intake. *Eating Behaviors*, *30*, 42-48. https://doi.org/https://doi.org/10.1016/j.eatbeh.2018.04.003

Welsh Government. (2022). *Universal Free School Meals Roll-out to Commence in September* https://www.gov.wales/universal-free-school-meals-roll-out-commence-september#:~

Wengreen, H. J., Madden, G. J., Aguilar, S. S., Smits, R. R., & Jones, B. A. (2013). Incentivizing children's fruit and vegetable consumption: results of a United States pilot study of the Food Dudes Program. *J Nutr Educ Behav*, *45*(1), 54-59. https://doi.org/10.1016/j.jneb.2012.06.001

Westwater, H. (2022). *School life leaves children in poverty feeling 'embarrassed and excluded'*. https://www.bigissue.com/news/social-justice/school-life-leaves-children-in-poverty-feeling-embarrassed-and-excluded/

Wheelock, D. C. (n.d.). *The Great Depression: An Overview*. https://www.stlouisfed.org/-/media/project/frbstl/stlouisfed/files/pdfs/great-depression/the-great-depression-wheelock-overview.pdf

WHO. (2018). *Malnutrition*. https://www.who.int/news-room/fact-sheets/detail/malnutrition

Wiggins, A. (2023). More teachers' strikes for secondary schools. *NZ Hearld*. https://www.nzherald.co.nz/bay-of-plenty-times/news/more-teachers-strikes-for-secondary-schools/J7CUGQYRVJAGXMLLBQZXJGXFIU/

Wijtzes, A. I., Jansen, W., Jaddoe, V. W., Franco, O. H., Hofman, A., van Lenthe, F. J., & Raat, H. (2015). Social Inequalities in Young Children's Meal Skipping Behaviors: The Generation R Study. *PLoS One*, *10*(7), e0134487. https://doi.org/10.1371/journal.pone.0134487

Wile, A., & Shouppe, G. (2011). Does Time-of-Day of Instruction Impact Class Achievement? *Perspectives in Learning: A Journal of the College of Education & Health Professions*, *12*(1), 21-25.

Wilkinson, N. M., Kannan, S., Ganguri, H., Hetherington, M. M., & Evans, C. E. L. (2022). Study protocol: Evaluation of the 'Flavour School' sensory food education programme: a cluster-randomised controlled trial in UK primary school children, aged 4–7 years, to determine impact on confidence and curiosity in tasting vegetables and fruit. *Trials*, *23*(1), 705. https://doi.org/10.1186/s13063-022-06612-2

Winterman, D. (2012). Breakfast, lunch and dinner: Have we always eaten them? . *BBC News Magazine*. https://www.bbc.com/news/magazine-20243692

Witkamp, R. F., & van Norren, K. (2018). Let thy food be thy medicine….when possible. *Eur J Pharmacol*, *836*, 102-114. https://doi.org/10.1016/j.ejphar.2018.06.026

Wolstenholme, H., Kelly, C., Hennessy, M., & Heary, C. (2020). Childhood fussy/picky eating behaviours: a systematic review and synthesis of qualitative studies. *International Journal of Behavioral Nutrition and Physical Activity*, *17*(1), 2. https://doi.org/10.1186/s12966-019-0899-x

Woodham, K. (2023, Wed, 16 Aug 2023). *Kerre Woodham: Cost of school lunches is $325 million a year. Is it value for money?*

World Wildlife Fund. (2019). *Food waste warriors. A deep dive into food waste in US schools*. https://c402277.ssl.cf1.rackcdn.com/publications/1271/files/original/FoodWasteWarriorR_CS_121819.pdf?1576689275

Yee, A. Z. H., Lwin, M. O., & Ho, S. S. (2017). The influence of parental practices on child promotive and preventive food consumption behaviors: a systematic review and meta-analysis. *International Journal of Behavioral Nutrition and Physical Activity*, *14*(1), 47. https://doi.org/10.1186/s12966-017-0501-3

YLE News. (2020). Finland's cheapest school meal costs just 64 cents per day. *YLE NEWS*. https://yle.fi/a/3-11152708

Zellner, D. A., & Cobuzzi, J. L. (2017). Eat your veggies: A chef-prepared, family style school lunch increases vegetable liking and consumption in elementary school students. *Food Quality and Preference*, *55*, 8-15. https://doi.org/https://doi.org/10.1016/j.foodqual.2016.08.007

Zuercher, M. D., Cohen, J. F. W., Hecht, C. E., Hecht, K., Ritchie, L. D., & Gosliner, W. (2022). Providing School Meals to All Students Free of Charge during the COVID-19 Pandemic and Beyond: Challenges and Benefits Reported by School Foodservice Professionals in California. *Nutrients*, *14*(18). https://doi.org/10.3390/nu14183855

APPENDICES

Appendix A – Letter to schools

Letter to the schools

Dear Principal (add name)

I am conducting an online survey and interview which will focus on teaching staff and principal's perspective on free lunches in primary schools.

The study aims to find out the perspectives of teaching staff and principals on free lunches at primary schools. The purpose of this study is to survey teaching staff perspective on the government supplying free lunches to primary school students.

There will be two different studies in this research. Your teaching staff will participate in the first study via an online survey, which should take between 5 to 10 minutes. The second study will be a interview with you, which should take around 15 to 20 minutes. You and your staff can decide not to take part in the project at any time without any disadvantage to the participants.

Participants in these studies will be required to meet the following criteria:

- Teaching staff must work at a Southland primary school during 2020.

All participants need to be over 18 years old

Questionnaire

The questionnaire will be developed through an online survey. There will be several questions related to the perspectives of teaching staff on free lunches at primary schools.

Once I have your approval, I will follow this procedure:

The questionnaire will be distributed throughout the school's via email.

The questionnaire should take between 5 to 10 minutes.

Interview

The meeting will go over predetermined questions using a semi-structured interview method. The interview will be based around your perspective of the government free healthy lunches intervention. The interview should take between 15 to 20 minutes.

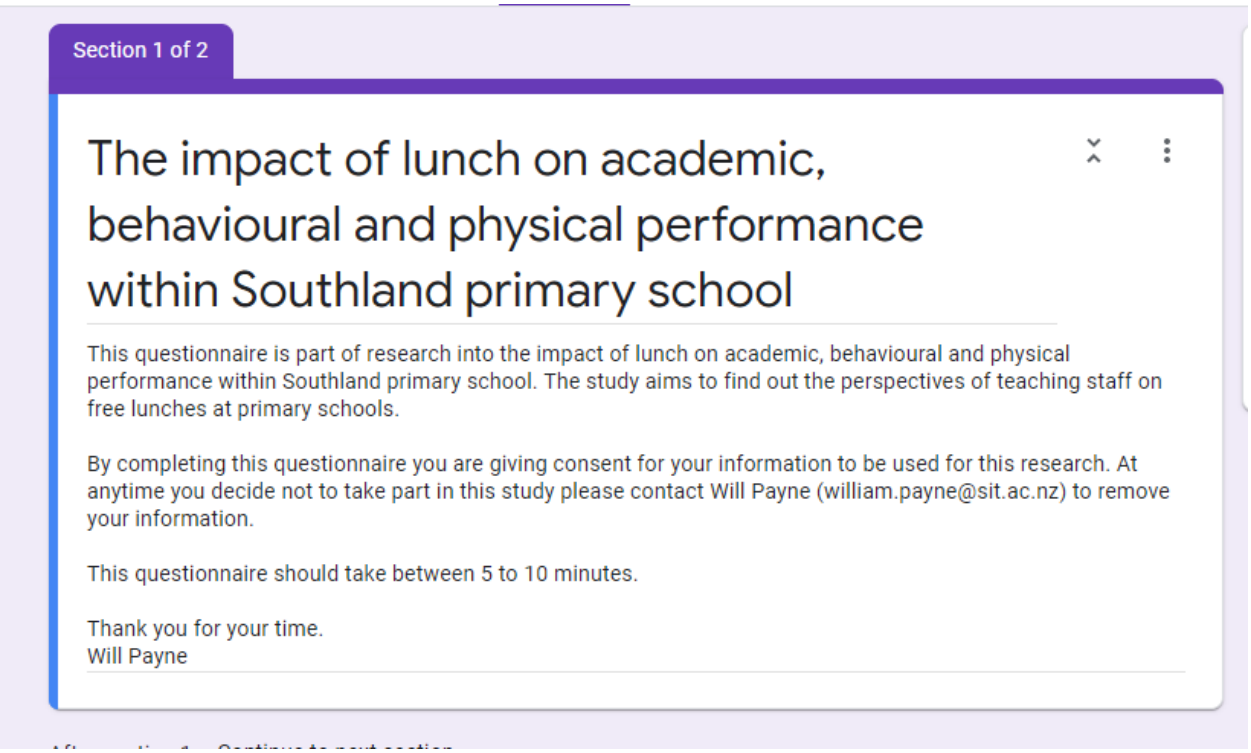
Once the questionnaire and interview are completed, I will write up the findings and submit it to a journal. I will send the journal article to the schools and highlight the key points of the findings.

Thank you for your time.

Sincerely

Will Payne

Appendix B – Questionnaire



Section 1 of 2

The impact of lunch on academic, behavioural and physical performance within Southland primary school

This questionnaire is part of research into the impact of lunch on academic, behavioural and physical performance within Southland primary school. The study aims to find out the perspectives of teaching staff on free lunches at primary schools.

By completing this questionnaire you are giving consent for your information to be used for this research. At anytime you decide not to take part in this study please contact Will Payne (william.payne@sit.ac.nz) to remove your information.

This questionnaire should take between 5 to 10 minutes.

Thank you for your time.
Will Payne

Name of school that you teach at (note that schools will not be identified in research):

1. Waverley Park School
2. Middle Primary School
3. Fernworth Primary School
4. New River Primary School
5. Te Wharekura O Arowhenua
6. Rimu Primary School
7. Makarewa Primary School
8. Ascot Community School

How many years have you been teaching at the primary school level?

Short answer text

How many years have you been teaching at the primary school level?

Short answer text

What level do you currently teach at this year?

1	2	3	4	5	6
○	○	○	○	○	○

Does your school have a free breakfast provided?

- ○ Yes
- ○ No
- ○ Other...

Does your school provide lunch for your students?

- Yes
- No
- Other...

Does your school have a cafeteria onsite?

- Yes
- No
- Other...

Do you allow your students to have snacks during class time?

- Yes
- No
- Sometimes
- Other...

What time is your morning tea?

Time

What time is your lunchtime?

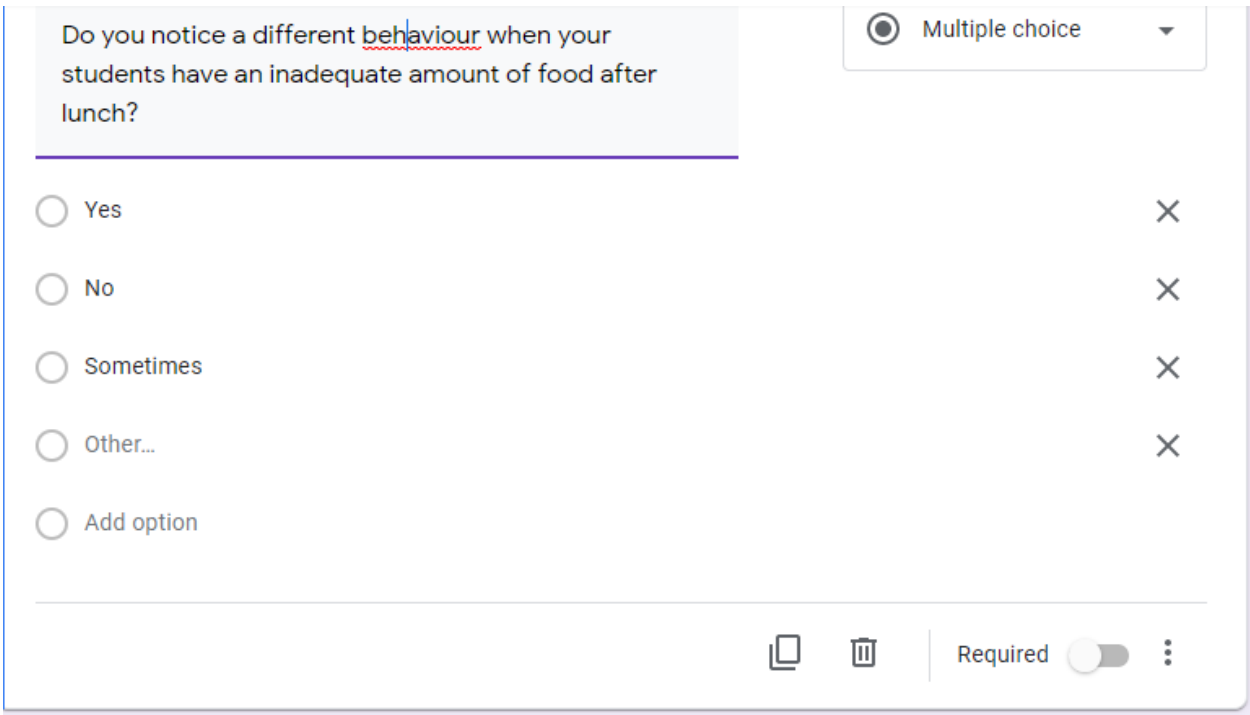
Time

10. On average, would you perceive that your students have a healthy lunch?

	1	2	3	4	5	
Unhealthy	○	○	○	○	○	Very healthy

On average, how many students have no lunch (number per day)?

Short answer text



Do you notice a difference in academic performance when your students have an inadequate amount of food after lunch?

- Yes
- No
- Sometimes
- Other...

Do you notice a difference in academic performance when your students have an inadequate amount of food after lunch?

- ◯ Yes
- ◯ No
- ◯ Sometimes
- ◯ Other...

Do you notice a difference in physical performance when your students have an inadequate amount of food after lunch?

- ◯ Yes
- ◯ No
- ◯ Sometimes
- ◯ Other...

Do you notice a difference in your student's behaviour if they have unhealthy foods at lunch?

- ○ Yes
- ○ No
- ○ Sometimes
- ○ Other...

Do you notice a difference in your student's academic performance if they have unhealthy foods at lunch?

- ○ Yes
- ○ No
- ○ Sometimes
- ○ Other...

Do you notice a difference in your student's physical performance if they have unhealthy foods at lunch?

- ○ Yes
- ○ No
- ○ Sometimes
- ○ Other...

Do you agree that lunches should be supplied at all primary schools within New Zealand?

- ○ Strongly agree
- ○ Agree
- ○ Neither Agree nor Disagree
- ○ Disagree
- ○ Strongly Diagree

Who would you perceive cooking and supplying the lunches?

- ○ The school
- ○ Catering service
- ○ Existing school lunch providers e.g. Koha Kai, New World, Pita Pit..
- ○ Parents
- ○ Teachers
- ○ Other...

Do you think that free healthy lunch programme will benefit your teaching practice? Please explain

Long answer text

Do you see any potential issues with the free healthy lunch programme? Please explain

Long answer text

How should the lunches at schools be paid for?

- ○ Government funding
- ○ Parent funding
- ○ Major company sponsorship funding
- ○ Majority Government funding with parents paying a fee
- ○ Other...

What type of foods would you want supplied at schools?

- ○ Typical school lunches: Sandwiches, fruit and yoghurt
- ○ Buffet style: A variety of different foods
- ○ Hot meal style: Spaghetti Bolognese, roast meat & vegetables etc
- ○ Other...

When do you think lunch should be served?

Time

Appendix C – Schedule for Interview with Principals

Interview with principals on their perspectives of the government free healthy lunches intervention.

The meeting will go over predetermined questions using a semi-structured interview method. The interview will be on your perspectives of the government free healthy lunches intervention. The interview should take between 15 to 20 minutes.

The questions for the interview with each principal are:

1. What do you currently do for school lunches?
2. How do you think the free lunch programme will be implemented in your school?
3. What infrastructures will have to be made to cater to the free lunch programme?
4. What type of impact will the free lunch programme have on your staff?
5. Do you think that a Free Healthy School Lunch Programme will benefit the teaching practice within your school?
6. Do you see any potential issues with the Free Healthy School Lunch Programme?

Appendix D – Schedule for Interview with Principals at least six months after implementing the Free Healthy School Lunch Programme

Interview with Principals at least six months after implementing the Free Healthy School Lunch Programme.

The meeting will go over predetermined questions using a semi-structured interview method. The interview will be on your perspectives of the government free healthy lunches intervention. The interview should take between 15 to 20 minutes.

1. What did you do for school lunches?
2. Do you think that a Free Healthy School Lunch Programme will benefit the teaching practice within your school?
3. Do you see any potential issues with the Free Healthy School Lunch Programme?
4. What do you currently do for school lunches?
5. What type of impact did the free lunch programme have on your staff?

Appendix E – Schedule for Interview with Principals at least six months after implementing the Free Healthy School Lunch Programme

Group Interview with children at least six months after implementing the Free Healthy School Lunch Programme.

The meeting will go over predetermined questions using a semi-structured interview method. The teacher will be asking children in their class on their perspectives of the government free healthy lunches intervention. The interview should take between 15 to 20 minutes.

Kids questions on Lunch Programme

1. What is your favorite lunch meal in the lunch programme and why?
2. What is your less favorite lunch meal in the lunch programme and why?
3. If your were the chef what would you doing differently, when making the school lunches?
4. What could you do to encourage more kids to eat the school lunches?

Appendix F – Ethical Aproval

TE WHARE WĀNANGA O
AWANUIĀRANGI

EC2020.35

24/02/2021 Student ID: 2182634

William Oliver Payne
60 Isabella Street
Glengary
Invercargill
9810

Tēnā koe Will

Tēnā koe i roto i ngā tini āhuatanga o te wā.

Ethics Research Committee Application Outcome: Approved

The Ethics Research Committee met on 07.12.2020 and I am pleased to inform you that your ethics application has been approved. The committee commends you on your hard work to this point and wish you well with your research.

Please contact your Supervisor Professor Paul Kayes as soon as possible on receipt of this letter so that they can answer any questions that you may have regarding your research, now that your ethics application has been approved.

Please ensure that you keep a copy of this letter on file and use the Ethics Research Committee document reference number: EC2020.35 in any correspondence relating to your research, with participants, or other parties; so that they know you have been given approval to undertake your research. If you have any queries relating to your ethics application, please contact us on our free phone number 0508926264; or e-mail to ethics@wananga.ac.nz.

Nāku noa nā
Kahukura Epiha
Ethics Research Committee Administrator

Ethics committee document reference number: EC2020.35