KELLOGG
RURAL LEADERSHIP
PROGRAMME

COLLABORATION OF THE PRIMARY SECTORS TO EDUCATE TOMORROW'S CONSUMERS

Kellogg Rural Leadership Programme

Course 38 2018

Belinda Price

I wish to thank the Kellogg Programme Investing Partners for their continued support:

Executive Summary

Our world in 2018, is one where perception is reality and the new industry buzz word is consumer-centric. In a world where primary industries need be obsessed with their consumer it begs the question, what is the customer's perception of their food and its production? Highlighted to me two years ago when hosting a group of children on farm, I was asked if my cows' poo in the river. Very confidentially I was able to take them to our pristinely planted, fully fenced wetland area and explain that there was absolutely no way our cows could get into or poo in any water. That six year old's perception was then dispelled and she got to see the truth, the reality. It got me thinking that if a child from my local city had that perception, what did children understand in relation to their food and its production? Where did that perception come from at this age? How can primary food producers educate children in the truth so they become well informed consumers of tomorrow? To be consumer-centric and future focused, primary sectors need to understand their future consumers, to be able to educate them so they are less likely to be influenced by mistruths and negative hype.

To start a survey was completed by 80 students (aged five and six) to gauge their understanding of food and where it comes from. Questions were also asked on their lunch box items, who cooked their evening meal and what that usually contained. The findings suggested that overall children knew most dairy, fruit and vegetable foods but meat was not overly known. Low levels of understanding in where the foods came from particularly in the meat, protein, root vegetable and fruit food groups. Mothers were generally the most influential in regards to cooking in the home and protein food was the most consumed dinner food. Interestingly vegetable consumption at dinner overall was only 46% which is also what the health statistics for our children are nationwide.

The current health statistics for New Zealand's five to nine year olds are sad reading with only 74% of children aged five to nine consuming the recommended daily amount of fruit and 45% the recommended intake of vegetables. The other major concern is that 32% of these children are either overweight or obese. Other statistics state that one in four New Zealand children are living without the basics and because of this there are many organisations that provide food into schools, most of these are not government funded but volunteer or corporate funded. In a country where we produce some of the most nutritious food in the world why is this the case? Why are some New Zealand children going to school hungry and not reaching their full academic potential? As a nation we need all children to be educated, healthy functioning members of society.

From challenges come opportunities, the first is for primary sectors to come together and collaborate or cooperate to create a New Zealand food board, were primary sectors can all learn about each other's primary industries to shape the New Zealand food story. Education of tomorrow's consumers will be a vital part in providing a future where our consumers are healthy, well educated, and food knowledgeable with that perception being reality.

Table of Contents

Acknowledgements

I would like to acknowledge everyone who has supported me.
Particularly, I would like to thank:

- The Kellogg Rural Leadership Programme investing partners for the investment they provide to increase the leadership in primary sectors.

- To the Kellogg Rural Leadership team in Patrick Aldwell, Anne Hindson, Scott Champion and Lisa Rogers for constructing and providing such a rewarding programme.

- To AGMARDT for allowing me the opportunity to step outside my comfort zone and attend the Kellogg Rural Leadership Programme.

- A personal thanks to the schools, principals, teachers, farming families and students for allowing me to speak with them and obtain valuable insights for this project.

- A special mention to the following people for their time, discussion and information:
  Michael van de Elzen, restaurateur and television chef
  Rebecca Hyde, Nuffield Scholar
  Dan Ormond, Latitude Public Relations Consultants
  Jo Mortimer, Life Education Trust Programme and Development Manager
  Deborah Kingma and Leeann Morgan, NZ Young Farmers
  Phillipa Adam, External Engagement Manager Dairy NZ
  Emma Bettle, Resource Inventor for School Kit
  Rita Ellis
  Gwen Cater

- To my employees, mentors, employers and friends who have been there for me through the busiest time in my calendar to help me achieve this, thank you.

- To my fellow Kellogg participants. You have inspired me and motivated me more than you will know.

- A special and personal acknowledgement to my husband Ben and sons Hayden and Tobi. Thank you for giving me the time, love and encouragement through this life changing journey.

Introduction

It was the first day of December 2016, the sun shone out amongst the clear blue sky bringing a lovely warmth to the first day of summer. It was 10am and my team and I were well prepared, readying ourselves for the onslaught of a bus full of five and six year old enthusiastic learners to come hurtling up the tanker track and jump out of their bus.

The cowshed was as gleaming as an old cowshed could be, the dark green grass was blowing gleefully in the gentle breeze and the cows where in the closest paddocks chomping at their luscious grass. I had the supplies at the ready, products that contained milk, things like buttons, asthma inhalers, chips and chocolate. Then with a bit of dust and a screech of the brakes they were here so off we went on a big learning adventure. Big smiles and giggles shone from the children's faces as they experienced being a cow taking a ride on the cowshed platform. A competition between boys and girls took place to see who could fill a 20 litre drum with grass the fastest, indicating how much grass a cow would eat in a day through their four stomachs.



The cows loved the visit with the children, they come cautiously forward to have a sniff and quick lick of the many hands sticking out in front of them. Lots of amazing questions were then asked like "What are the brown cows called" and "How long do cows live". We were prepared for this whole day but then came the question from a six year old that I will remember forever "Farmer Belinda, do your cows poo in the river". Slightly taken aback we moved over to our beautiful wetland area that is fully fenced and natively planted where you could hear the birds tweeting in the trees. We explained by showing them that no, there is no way our cows' poo in any water. The learners went on to name a calf after their school and have some picnic lunch in the sunshine. It was then time for them to head back to school, so with their newly found knowledge they boarded their bus, waved goodbye and departed. They left me that day with many questions that, after two years I still have.

Project Purpose

Two years ago, this experience left big questions which remain unanswered:

- Is this really what our young people think of farmers in New Zealand?
- Where are the children getting this misinformation?
- What do our young people in Aotearoa know about their food, where it comes from and how it is grown?
- If they think things like this at such a young age where does it leave food producers in the future with their next generation of consumers?
- If we as food producers don't teach them about food where will the information come from?
- Will that information be accurate or guided by opinion?

Primary food producers in New Zealand have been told to front foot the good news stories in an ever changing fast paced world by telling their story and telling the truth. The latest is that farmers need to be consumer-centric with the consumer in the mind of every part of the food process. Can farmers front food the good news stories by telling the truth starting young and being future consumer-centric? What do tomorrow's consumers need to know in order to make the best decisions for them and for the future of food production in New Zealand.

This report aims to answer these questions and provide some recommendations as to why and how the primary sectors can collaborate to educate tomorrow's consumers.

Setting the scene:

The current situation in New Zealand

Education

The governments education counts[1] website states as of July 2017 the number of New Zealand schools numbered 2,530 with total number of enrolled students tallying 800,334.

The New Zealand School Curriculum[2] (years one -13) is in place to set the direction of student learning providing guidance to these schools to create and review their curriculum. The New Zealand Curriculum vision is: **to have young people who are confident, connected, actively involved life long learners.**

The Curriculum has the following learning areas:

English, Arts, Health and Physical Education, Learning Languages, Mathematics and Statistics, Science, Social Sciences and Technology.

The unique thing about the New Zealand Curriculum is that it does not have specifics about what or how teachers have to teach in these learning areas. The Ministry of Education has made it almost broad in terms of what things and in what areas the teachers can teach. For example, if a school wanted to teach food nutrition, they could have it in the Health and Physical Education, Statistics or Science area with some crossing into the Technology area. There are organisations currently creating programmes for the teachers in these schools doing just this.

Another key area that has a large influence on New Zealand schools is the decile rating system. Decile ratings[3] are an indication, based on the most current census statistics, of the socio-economic position of the community of the school, and its learners, are living in. Decile ratings go from one through to ten with one being the lowest socio-economic communities and ten being the highest.

Schools in decile one to three generally have access to more outside organisations to support the learners, some government funded, but the majority are not particularly with regard to food. The decile ratings allow the government to apply funding differently to schools, allowing higher funding to the lower decile areas.

[1] www.**educationcounts**.govt.nz
[2] http://nzcurriculum.tki.org.nz/
[3] www.education.govt.nz

Tables below show organisations supplying food and food resources into New Zealand Schools.

Table 1. Food supplying organisations

Current organisations supplying food into New Zealand Schools (but not limited to):
KickStart launched in 2009, partnership between Fonterra and Sanitarium. Government funding provided in May 2013 means it now provides **all schools**, if required, breakfast of milk and cereal
KidsCan – Commended in 2005, provides food but also shoes and raincoats for the children in low decile schools. Originally relied mostly on donations but now has some local and national government funding
Feed the Need – providing hot meals and lunches to low decile schools
Garden to Table – teaches children how to grow and cook vegetables from year 3 and above
Eat my lunch – for every lunch purchased by someone, one lunch gets given to a hungry child
Fruit in Schools – provided by the Ministry of Health, started in 2005
Fonterra milk for schools – provides milk to **all primary schools**
Kai Kitchen trust – founded in 2015 in Taranaki. Serves over 70 lunches to local children daily
Churton School Whanganui – Volunteers run a once a week in winter hot meal for 150 students

Table 2. Food education organisations

Current organisations supplying food education into New Zealand Schools (but not limited to):
Life Education Trust - with the mascot Harold the giraffe, Life Education trust makes educational programmes to meet the needs of the particular school based on their values and culture. Food and Nutrition is one of these learning outcomes. Resources are based on the guidelines from Ministry of Health and uses collaboration with other partners like Garden to Table
Enviro Schools - piloted in 1993. Enviro Schools now have 1160 schools, kura and early childhood centres involved focusing on sustainability in their communities
School Kit - Organisations outsource their education or marketing to School Kit. School Kit create free resources for schools that are curriculum based to aid teachers
Agrication - NZ Young Farmers with support from CORE Education has funding from the Red Meat Profit Partnership to help teachers and students learn more about NZ land based industries. Part of this is connecting farmers and schools for school visits
Ministry for Primary Industries (MPI) - has teacher resources available with topics around biosecurity importance, food and primary industry careers
Garden to Table (as above)
5+ a day - A charitable trust formed in 2007 to promote awareness of health eating of 5+ a day. Curriculum based resources are available online
Dairy NZ - Connect farmers and schools to give students the opportunity to visit a dairy farm
SAFE - Animal rights organization providing resources and text books into primary and secondary schools

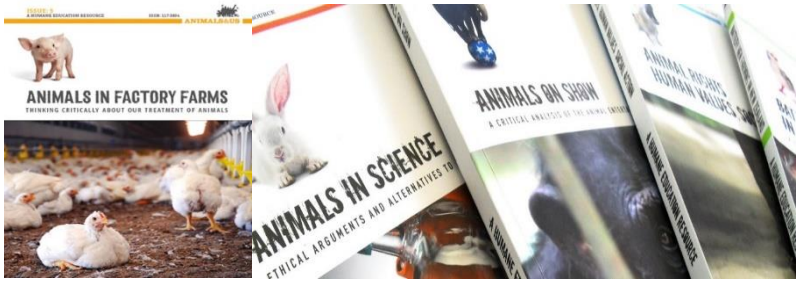


Figure 1. Safe resource material available to schools. Source www.safe.org.nz

New Zealand schools have a large number of resourced organisations providing food and food education into schools for a variety of reasons. One of the biggest reasons and of concern exist due to New Zealand's high level of poverty resulting in the low decile schools requiring extra help to feed hungry school children.

According to the KidsCan[4] website currently over one in four children in New Zealand are living without the basics, that's around 290,000 children. They as an organisation have supplied over 24 million food items, 161,000 shoes, 336,000 raincoats, 322,000 socks, 621,000 health and hygiene products to 732 schools in need in New Zealand. KickStart[5] supplies 125,000 breakfasts to over 900 schools across New Zealand. Schools run their own breakfast clubs every week. A huge number of volunteers, donations, sponsorship and grants need to go into these organisations just to help feed New Zealand's children.

So why would this be a problem for primary industries to educate tomorrow's consumers?

Social

Understanding the current issues facing tomorrow's consumers will help build a picture of what is happening and why this is the case. The impacts on the children, communities, schools and New Zealand as a whole need to be understood. Primary industries then can have informed discussion to get the best outcomes for everyone?

As part of the United Nations and under the UN guidelines children have a right to adequate, good quality nutrition (Article 1 of the International Convention on Economic, Social and Cultural Rights and the UN Convention on the Rights of the Child UNCROC) (Wynd.D Twelve Thousand Hours 2014). New Zealand is part of an international agreement to make sure that children have good quality nutrition.

Children's Commissioner in the Solutions to Child Poverty in New Zealand evidence for action 2012[6] report states based on research they have collated, from New Zealand and internationally, indicates that poverty in childhood has negative impacts. Cognitive development and educational achievement are affected. Children have trouble concentrating therefore having poor school performance in particular with numeracy and literacy. They are more likely to be late for school or absent. The report advocates for food in schools, with suggestions on how this recommendation could be attained. Discussions around the roles of the schools, communities, parents, businesses and government have been discussed. A focus on sustainable partnerships with policies and leadership provided by the government to ensure nutritional food is provided to the hungry children coming to school. Recommendation 60 from this report states that the government design and implement a collaborative food-in schools programme, commencing with decile one to four primary and intermediate schools.

4www.kidscan.co.nz

[5] www.kickstartbreakfast.co.nz

[6] http://www.occ.org.nz/assets/Uploads/EAG/Final-report/Final-report-Solutions-to-child-poverty-evidence-for-action.pdf

There are however considerations around sustainability of organisations providing food to New Zealand. This was highlighted in May 2011 when the Countdown Supermarket chain withdrew their sponsorship from the Red Cross Breakfast programme (Wynd.D 2014). This shows that the model of charity dependency definitely has risks for sustainable quality outcomes for those most vulnerable children.

KPMG 2018 reports on social capital stating:

"There is no benefit in trying to be good for the world if we are not good for our own country and people first. There is no point trying to help the world to feed itself if people in our country are unable to access adequate nutrition, useful employment or relevant education."

"Building social capital is no longer just a matter of throwing some money at a range of sponsorship initiatives. It is very much about making a whole of organisation commitment to creating greater opportunity for all the communities that a business interacts with[7]".

With any long term strategy New Zealand has to think about its aging population where baby boomers work fewer hours and require more expensive care. As a country, New Zealand needs to have every child well informed, educated, healthy functioning member of society to be able to meet its future requirements.

Health

Health of children has become a big topic over recent years and celebrity chefs have become advocates for change. In 2010 Jamie Oliver's TED Talk[8] tells of needing to teach our kids about food and get educated about food. Diet related disease is the biggest killer in the United States right now with Mexico, Australia, Germany, India and China having problems with obesity and bad health. Jamie recalls thirty years ago most food was local and fresh, now it's largely processed and full of additives and extra ingredients. He believes that the heart of passing on food culture was at home but now this is not the case. His suggestions to address some of the problems would be to have a food ambassador in every supermarket to aid people about healthy food choices. He also makes reference to corporate responsibility in supplying healthy meals to their employees. Home, Jamie Oliver believes, needs to go back to being the heart of passing on the food culture and cooking again. If one person teaches three people how to cook something then they go and do the same then we have a food revolution.

Concern over the health of children in New Zealand has been a driver for New Zealand television chef, Michael Van de Elzen[9], to write a new cookbook just for children. He toured New Zealand promoting this book in 2018 with cooking demonstrations with the children in schools. He hopes to lure children away from the negative obesity statistics[10]. Michael says he is wants to get kids into the kitchen, using their brain, their hands and taste buds to create fun exciting experiences and memories. Once children start school it is a good time to start helping with cooking and learning, Michael says.

---

[7] KPMG Agribusiness Agenda 2018
[8] https://www.ted.com/talks/jamie_oliver
[9] vandeelzen.com
[10] Whanganui Chronicle 48 Hours/Food 3 November 2018

His top three tips are to make cooking fun, make food from scratch and to eat together, making cooking a social event.

Source: Belinda Price, Good from Scratch Kids Cookbook Tour, Matapu School 2018

New Zealand child health statistics

The Ministry of Health recommendations:

Children should consume at least two servings of fruit per day
Children 2-4 years of age should consume two servings of vegetables per day
Children 5-14 years should consume at least three servings of vegetables per day

Fruit intake

Table 3. Fruit consumption statistics

Percentage of children (aged 2-14) who eat at least two servings of fruit each day, by group		
Age	*2015/2016 Percentage/ estimated number*	*2016/2017 Percentage/estimated number*
2-4 years	80.2% / 144,000	80.6 / 137,000
5-9 years	76.2% / 244,000	74% / 241,000
10-14 years	66.9% / 196,000	66.1% / 197,000

Source: Ministry of Health. Note: The estimated number of children in each group who eat at least two servings of fruit each day has been rounded to the nearest 1,000.

Vegetable intake

Table 4. Vegetable consumption statistics

Percentage of children (aged 2-14) who meet New Zealand's age specific vegetables intake guidelines, by group		
Age	*2015/2016 Percentage/estimated number*	*2016/2017 Percentage/estimated number*
2-4 years	67.7% / 122,000	64.6% / 110,000
5-9 years	43.3% / 139,000	44.6% / 145,000
10-14 years	47.9% / 140,000	51.3% / 153,000

Source: Ministry of Health. Note: The estimated numbers of children in each group who eat at least two servings of vegetables each day has been rounded to the nearest 1,000.

Body Mass Index

Table 5. Overweight and Obese Body Mass Index statistics

Percentage of children (aged 2-14) who are overweight or obese, with a BMI equivalent to an adult BMI of 25.0 or greater, by group		
Age	*2015/2016 Percentage/estimated number*	*2016/2017 Percentage/estimated number*
2-4 years	28.7% / 52,000	31.4% / 57,000
5-9 years	29.7% / 95,000	32% / 104,000
10-14 years	36.1% / 106,000	36% / 107,000

Source: Ministry of Health. Note: The estimated numbers of children in each weight category and group are rounded to the nearest 1,000.

Screen time

Table 6. Television and Screen time statistics

Percentage of children (aged 2-14) who usually watched more than two hours per day of Television only and all screens 2016/2017 by group		
Age	*TELEVISION ONLY Percentage/estimated number*	*ALL SCREENS Percentage/estimated number*
2-4 years	42.9% / 73,000	67.2% / 114,000
5-9 years	38.3% / 124,000	84.3% / 274,000
10-14 years	35% / 104,000	91.5% / 273,000

Source: Ministry of Health. Note: The estimated numbers of children in each weight category and group are rounded to the nearest 1,000.

According to the statistics above using the closest age group researched in this project (ages **five to nine**) based on the most current statistics 2016/2017:

- Daily fruit requirements are consumed by 74% of children
- Vegetable consumption with recommended servings is 44.6%
- There are 32% of children either overweight or obese
- 124,000 of these children watch more than two hours of television per day and a total of 274,000 children in this age group have more than two hours of screen time (television included).

Viewing the 2015/2016 Health Survey results shows that all children (two to fourteen years) had a reduction in television viewing compared with the 2016/2017 results. The screen time data has only been collected in 2016/2017 so this could indicate that possibly television is less popular than other screen devices. This data provides information on understanding how children are using their technology and how much time is dedicated to their screens. There are also questions around physical activity and health of children. This data however is not clear on when this screen time is occurring so children could be doing school work or educational programmes in this time at school or afterwards.

New Zealand adult health statistics, with a focus on total adult population aged 15 years and over, is also concerning. New Zealand now ranks third in the latest findings in the OECD Health Statistics[11] for obesity rates.

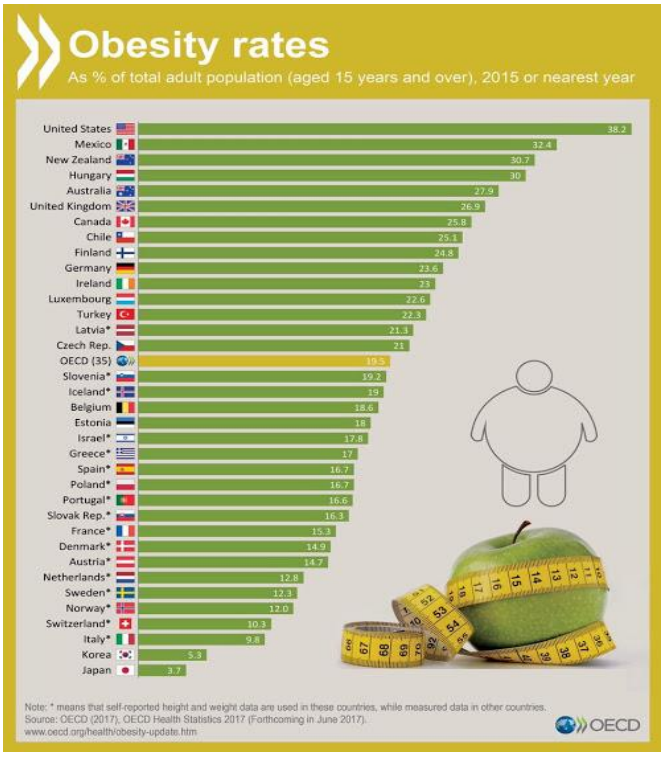


Figure 2. OECD obesity rates from 2017, OECD Health Statistics 2017

Facts from this report are that one in two adults and almost one in six children in the OECD countries are either overweight or obese. By 2030 these rates are expected to increase along with the social inequalities around being overweight and obese, particularly in women. According to the OECD less educated women are over two times more likely to be overweight compared to those with higher educational levels. OECD countries have created schemes around food labelling, media campaigns, social networking, health campaigns and regulations around unhealthy food marketing to children in a bid to curb the statistics. One affordable measure they say to tackle the obesity rates is school based interventions.

How we learn

The Curious Mind[12] documentary with New Zealand psychologist Nigel Latta was able to show how we learn by using Baby X. Baby X is the brain child of academy award winning artificial intelligence engineer Professor Mark Sagar. A virtual baby modelled from a real baby with all the areas of the brain being viewed as Baby X has different experiences.

[11] http://www.oecd.org/health/health-systems/Obesity-Update-2017.pdf

[12] https://www.tvnz.co.nz/shows/the-curious-mind

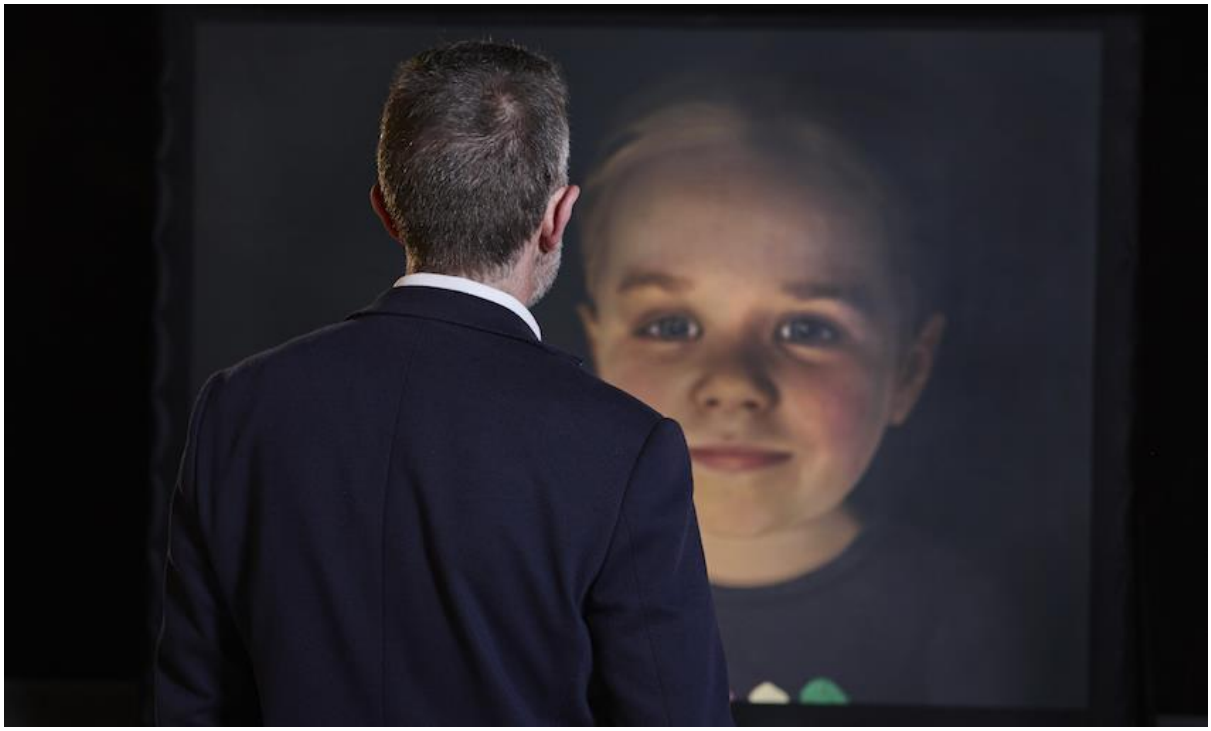


Figure 3. Nigel Latta with Baby X. Source: spinoff.co.nz.

Showing a pathway being created in Baby X, Latta says the word duck, but not much happens in the brain. However, when repeating the word duck over and over with a duck object sighted at the same time the brain lights up with recognition showing a pathway being created. This documentary also explains why as adults, time seems to go so quickly but slowly for a child. Explained by how our brains remember things with consistency or irregularities. A child is having new experiences constantly and creating new pathways in the brain when the first experiences or irregularities happen. With adults they have experienced so many things already, these pathways are stored in our memory as something that is consistent. This is why time seems to go more quickly as an adult because adults experience firsts less often. This information can be useful when thinking about teaching children and creating those consistent pathways in relation to food and food production.

Thinking about the milestones that children have and how they learn at the approximate age of commencing school will guide the right education at the right time to build those pathways.

It is stated that between the ages of six and eight years of age the milestones that you can expect from a child in the following areas are (Berk.Laura E 2008[13]):

Physical – slow gains in height and weight until adolescence, writing becomes smaller and legible, drawings more organized and detailed, rule-based games are common.
Cognitive – Increased logical thought, attention is more selecting and adaptable, uses memory, on task performance improves.
Emotional/Social – independence and responsibility increases.

[13] Berk, Laura E 2008 Exploring Lifespan Development

After one year at school, assuming the child starts at five years of age, there are good opportunities to be able to communicate and connect with these children using writing, games, and drawings. Children at this age use their memories so creating those first experiences and new pathways with consistent messages will be important in building sound understanding around their food.

Understanding why people are why the are can be also traced back to early childhood milestones and the creating of or lack of creating of pathways. In 2016 TVNZ ran a documentary called 'Why am I'[14]. This documentary discussed the findings of an ongoing study, by New Zealand Otago Medical School, of 1073 babies born in Dunedin in 1972/1973 following them throughout their lives. Producing research papers, on average one every 13 days for 40 years, the study has become world leading in research on why people are like they are.

The research is extremely useful to understand the underlying factors for health, happiness and success in children to give them the best future outcomes as tomorrow's consumers.

Researchers found that there are five different personality traits which can be found in children in preschool years that can determine their life outcomes.
These are:
Well adjusted – flexible, resourceful and fit in
Reserved – timid but not paralysed by it
Inhibited – lock themselves away
Under controlled – trouble with self-control, can be highly strung and irritable
Confident – go getters, entrepreneurs

They stated that you can teach any child, no matter what personality trait they had, to increase their health and wealth.

Some of the most influential findings for children's health, happiness and success, scientists discovered, were around children's sleep, self-control and poverty.

Sleep – a study of the individuals at between the ages of five and 11 showed that the less sleep the child had in the early years of life the more likely they were to be overweight at age 32. Lack of sleep had impacts on how hungry you became and the results were on par with the results of physical activity. Lack of sleep at this age also had direct correlation with poor cognitive function and anxiety at 20 years of age.

Self-Control - one of the most powerful predictors of success later in life relates back to testing done at three and four years of age. Studies showed that stable relationships, solid employment, home ownership, being healthy and good money managers were shown by children with the greatest self-control. Being able to self-regulate at a young age meant they were able to distract themselves and look away from temptation which in later years made them more successful.

[14] www.tvnz.co.nz/shows/why-am-i

Poverty – If a child had grown up in poverty with chronic stresses the immune system could be altered, leading to inflammation in the body resulting in those people becoming more vulnerable to diseases and illness later in life. This was also the case if they got out of poverty and become wealthy as an adult.

Primary sector perspective

By understanding our current position, the primary sector can then look for the best opportunities using its strengths and putting provisions in place to lessen the impact of threats and overcome weaknesses.

Table 7. SWOT Analysis for Primary Industries

Strengths	**Weaknesses**
✓ Attractive country ✓ Available natural resources ✓ Family owned businesses ✓ Nutritious, naturally produced produce ✓ Passion and commitment to do the best and be the best ✓ Pasture Based ✓ Research and development ✓ Small country, closer connection to consumers ✓ Stand on our own, no subsidies	✓ Compliance pressure ✓ Export dependency ✓ Future consumers food knowledge ✓ Labour shortages ✓ Lack of good stories in the media ✓ Lack of knowledge with other NZ food producers ✓ Not collectively marketing NZ Food ✓ Public perception ✓ Traceability and block chain
Opportunities	**Threats**
✓ Animal welfare – best in the world ✓ Availability of resources ✓ Education – all children with food knowledge ✓ Informed future consumers ✓ Kiwi attitude – do what needs to be done ✓ Market access ✓ Media ✓ Pasture based ✓ Potential of block-chain ✓ Potential of diversification ✓ Potential research and development ✓ Technology	✓ Activists story telling ✓ Alternative proteins ✓ Bio security ✓ Children not understanding about their food and food production ✓ Climate change ✓ Environment compliance ✓ Land use and value ✓ Media, particularly social media ✓ Traceability ✓ Volatility of markets ✓ Water use and compliance

In April 2018 a Primary Sector Council was announced by Minister of Agriculture and Rural Communities Damian O'Connor.[15] This council was set up to provide independent strategic advice to the Government about primary sector challenges. Some of the issues facing the primary sector the minister refers to are sustainability, grower to plate storytelling, pasture fed protein, alternative protein, water use, personal value products that appeal to consumers and technology. The commonality with all of these challenges or issues is the consumer. Today's consumer, the future consumer – tomorrow's consumer.

Consumer-centric

Of great discussion in the KPMG report was the new industry must do.
"Be obsessed with your consumer" (Proudfoot 2018).
Returning from the Global AgTech and Future Foods Tech conferences he cites this as the fundamental message that he took away. New Zealand food producers must be more consumer focused and be 'consumer-centric'. What the consumer wants, how they want it and when they want it has to be the theme thread through every point of the value chain. The links to the consumer from all aspects of the food production system are shown below in the consumer-centric value web. Farmers and growers have a direct link to consumers and to the community. This leaves a golden opportunity for farmers and consumers to communicate about their produce, to educate the consumers about their produce and bring the communities along too. Other key themes that Proudfoot, 2018 identifies are with are transparency and health, wellness and preventative models.

Transparency – using technology to get the product information out easily, to tell the story and take the consumer with us on the journey. Collaboration, education and technology will aid facilitation in establishing a trusted food system.

Health, wellness and preventative models – consumers want products that have benefits, they want functional, nutritional and personalised products. Our products need to be relevant to our consumers and remain that way.

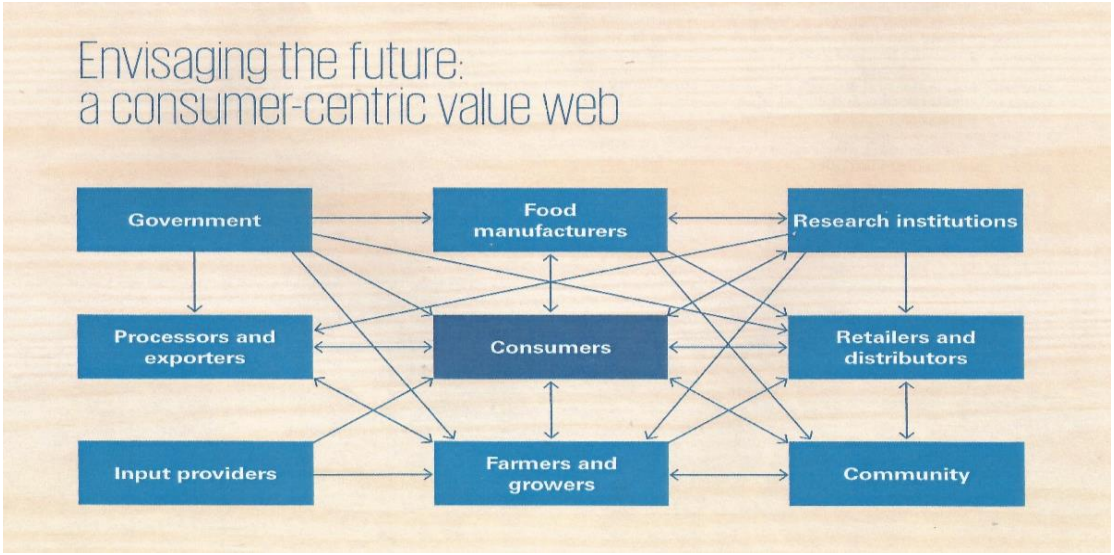


Figure 4. KPMG Report 2018 Consumer-centric web

[15] https://www.beehive.govt.nz/release/primary-sector-council-announced

How do we be primary sectors become consumer-centric?
Simon Sinek[16] talks of the golden circle and the statement that he talks about is **"people don't buy what you do they buy why you do it"**. Start with the WHY then follow with the HOW and then the WHAT.

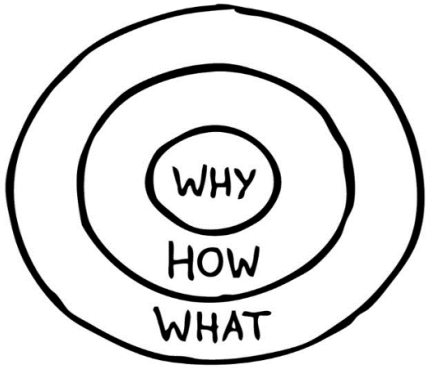


Figure 5. The golden circle by Simon Sinek

An example of using this for the consumer-centric context:
WHY - New Zealand food producers **care** about the health and wellbeing of its consumers and their families.
HOW - **Education** of New Zealand food to children with access to healthy nutritious, naturally grown sustainable food.
WHAT – **Informed** NZ food **consumption** for the **future**

For primary sectors to come together to educate tomorrow's consumers and be consumer-centric for the best future outcomes what set up does this require? There are four clear ways of structuring a system to work together to achieve the common goal for the WHY. These are Networking, Cooperation, Coordination and Collaboration. Each way requires different levels of integration and investment of skill, effort and capital. Hyde 2017[17], on completing the Nuffield scholarship states there are key themes to successful collaboration.

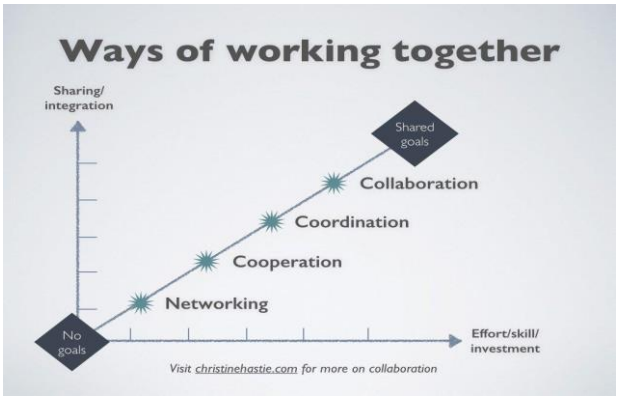


Figure 6. Christine Hastie, different ways of working together

[16] Sinek, 2009

[17] Hyde, 2017

The key themes are:

United voice – Clear vision and goals set with united voice by all industry leaders
Right People – People that understand and empathise with their representative people and can create a movement.
Strong Facilitation – Independent facilitator that can move forward managing differences.
Collaboration – Is collaboration really what is required. Cooperation or partnership may be just as effective with less input.

Each primary sector in New Zealand generally has an industry lead body that are well resourced. To create a New Zealand Food body (THE WHAT) to educate children would need some discussion on whether to collaborate, coordinate, or cooperate. Dependence on all industry leaders coming together, forming a clear vision (THE WHY) and goals (THE HOW). Forming with the right people that can respectfully manage representatives to achieve the goals led by a strong facilitator. Current resources, science and research available within the different industry bodies in the primary sector may mean collaboration may not be required. It could be that primary sectors can cooperate together to enable this project to happen, requiring less capital, skill base and integration.

Literature review

Review of published papers on children's understanding of food and their food perceptions.

Children's perception of food and healthy food preferences
Deniz Atik, Zeynep Ozdamar Ertekin
International Journal of Consumer Studies
09 September 2011

Authors have endeavored to shed the light on the gaps of what other factors, aside from food marketing to children, influence their food preferences and eating habits.
A qualitive study was undertaken interviewing children between seven and 11 years of age with information also collected from teachers and mothers.
Focus is more on the children's thoughts and feelings rather than qualifying the specific data so contains more quotes. Interpreting the data would have been a harder process to keep it relevant. Paper also has mentioned of why the findings are important with the world going through major health epidemics like obesity.

Key points:

- *Marketing* targeted at this level has a massive impact. Food is made to look cool and exciting but often laden with sugar and are low nutrient foods.
- *Education* Children learn about food through their social arena such as family, school and peers, the socio-economic status played a part in this.
- Children like the play and sensory features of food, like odd colourings and shapes particularly in boys. Girls like foods that are have pretty colours and nice appeal. Drawing their meals make light of this.
- Teachers reported that the aesthetic appeal of food was important where the mothers thought that didn't really matter and taste was critical
- *Understanding* of healthy eating and nutrition comes from the age of six.

Children's understanding of food and health in primary classrooms
Sheila A. Turner
International Journal of Science Education
1997. Published online 24 February 2007

Turner 1997, discusses teaching practices with reflection on the science curriculum about food and diet with United Kingdom primary students. Seventy primary school teachers in London across a section of schools interviewed children from five to twelve years of age. Interviews with children whom they taught, in groups of three, gauged aspects of food and nutrition. Pictures of food were used and discussed, grouped into selected groups on food choice and nutrients. Why we eat food and understanding of food and diet information collected.

Key points:

- Students below the age of eight were more likely to group food in the like or dislike category with colour, shape, taste and textures. Older children were more likely to use the healthy and unhealthy categories.
- Many students understood sugar, salt, fat and vitamins and could give examples. Words fibre, minerals and protein were only understood by roughly half the students.
- Five and six year old children have considerable knowledge on food and diet. Importance of the home environment was clear because of the parental influence on food.
- Teachers found the collection of information useful as a starting point to strategies to teach the food subject.
- Highlights in the shift from family meals to more snacking and grazing meals.

Reported food consumption and dietary habits of New Zealand adolescents
A. Worsely, A.J. Worsely, S. McConnon and P.A Silva
Dunedin Multidisciplinary Health and Development Unit, Department of Paediatrics, The Medical School, University of Otago.
1993.

Dunedin Multidisciplinary Health and Development study cohort comprising of six hundred and sixty seven members at fifteen years of ago completed a food frequency and diet habits inventory. Inventory was self administered showing fourteen foods were consumed more regularly with 80% of cohort. Differences found in gender with boys consuming foods high in fat and sugar and girls consuming more fruits and vegetables. Income groups also had an impact of consumption of foods.

Key points:

- Small number of foods make up much of cohort's diet
- Most consumed foods were white and wholemeal breads, water, fruits, cheese, ice cream, honey and vegetables like mashed potato, peas and carrots.
- Assumption that adolescent food choices extend into adult life, encouragement of more nutritious foods appropriate.
- Adolescents from lower income families ate cheaper meats, custard and sweet sauces for rice dishes.

Methodology

Introduction

A quantitative research survey was designed to test awareness of particular foods with five and six year old students. The aim is to gain information on their understanding of what the pictures of food were and where these foods grew or what animals produced them. The foods chosen were on majority grown or produced in New Zealand with bananas being a popular imported food also used. To obtain information on lunchbox foods and dinner information, questions around what foods they had in their lunchboxes for school and who cooked their dinner were asked. An interactive portion was developed so the students could draw a picture of foods they consumed for dinner on a picture of a dinner plate with explanations around what the foods were.

The survey was reviewed by two teachers to confirm there were no leading questions and that is was age appropriate.

A letter advising of the survey and information around the project went out to all students' families via each school with an option for any student to opt out if they wished. No opt outs were received.

Eighty responses were obtained for the survey with all responses taken on a 1:1 basis as not to have any led answers from outside sources or other students.

A teacher questionnaire was also undertaken to enquire as to what students learn about at this age level in relation to food and food production. What resources they used or had access to at their school and suggestions they had for effective education on food and food production for this age level.

Criteria

Age - Five and six year old students were chosen for the survey. This was because the project purpose was to gain understanding of what children knew of their food and production with the focus on them being future consumers. This age level is when the students enter the school system, start to learn gaining their own experiences and perceptions.

Schools - Five schools were approached to be part of the survey. Three schools were available within the time frame required and agreed to take part. School codes were developed to use to keep students and schools confidential.
School A = Decile 1, School T=Decile 5, School W=Decile 3.

Time - The survey was undertaken in term three of the school calendar.

Representation – A variety of schools from a wide range of socio-economic areas were selected ranging from decile one to decile five and included an enviro school. Included as an extra group were farming families that had children of either five or six years of age that attended different schools from the ones surveyed. There code was developed as FK=Farming Kids.

Regions - The schools approached were located in the Taranaki, Whanganui and Wellington regions due to the closer proximity to the author for travel purposes.

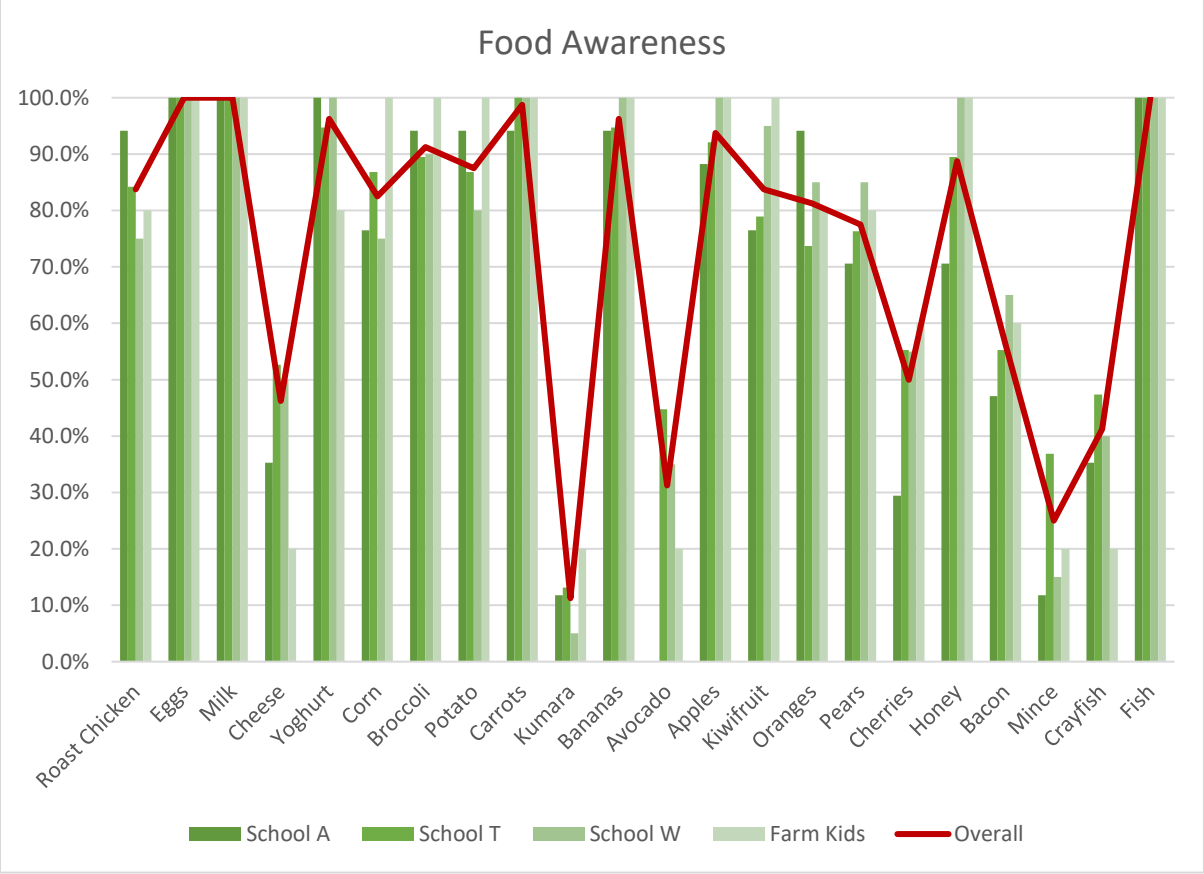
Design

The survey was designed be conducted quickly so it would not detract from teaching time and to keep the attention and engagement of the learners. This was done by using quick visual pictures of the food to complete much of the survey (appendix 1). Completion of each individual survey took approximately five minutes. One of the schools surveyed had an additional educationally trained representative assisting due to the large number of responses. A thank you gift of activity books, pencil and sticker packs were given to each participant for their assistance after the competition of each interview.

Survey findings and analysis

Food Awareness

Children were asked what the pictures of these foods were. Each right answer was recorded along with any unusual responses.



Graph 1. Children's food awareness of individual foods by group and overall n=80

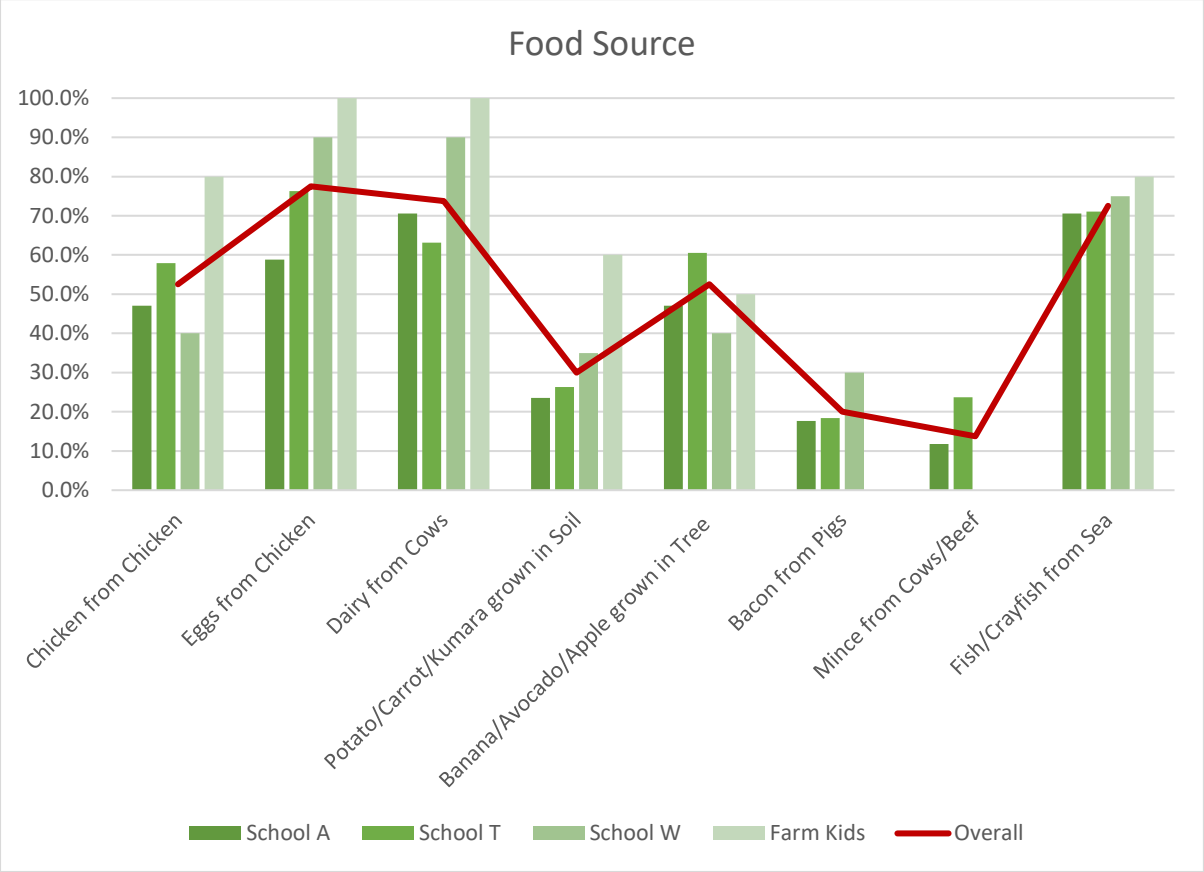
Analysis of food awareness:

- All participants knew what milk, eggs and fish were with 100% scores in for understanding of these foods.
- Most children knew about yoghurt, carrots, bananas and apples with overall results above 90%.
- Foods that were not well known were cheese, kumara, avocado, mince and crayfish. There is some question around how the children see some of these foods i.e. cheese and mince might not look like the pictures provided. These foods might be seen as grated or a cheese slice and mince as cooked in pasta or with sauce rather than raw. Crayfish appears to be something the children do not understand with many of the children commenting that it was a spider.
- Stand outs from data within schools/groups are more within the lower understood foods with Avocado having no understanding from School A (0%) and the most understanding from School T (44.7%).
- Understanding of mince was highest with School T (36.8%) with the next highest group being Farm Kids at 20%. Many children described the mince picture as worms.
- Cheese scored 52.6% with School T, School W 50% and lower with 35.3% understanding with School A and only 20% with Farming Kids.
- Honey appears to have scored highly overall with School A understanding at 70.6% being the lowest score and School W and Farming Kids both scoring 100%.
- The trends across the graph are generally the same in most groups with them all receiving high scores in the same areas and low scores in the same food areas.

Overall the children's knowledge around what their food was indicated good awareness with only four foods of the twenty two foods having overall scores below 50%.

Food Source

Foods were grouped into production sources or animal sources. The children were asked where these fruit groups or vegetable groups grew. What animals' chicken and eggs, dairy products, bacon and mince came from and where fish and crayfish grew.



Graph 2. Children's understanding of where themed food groups grew or what animal produced them by groups and overall n=80

Analysis of food sources:

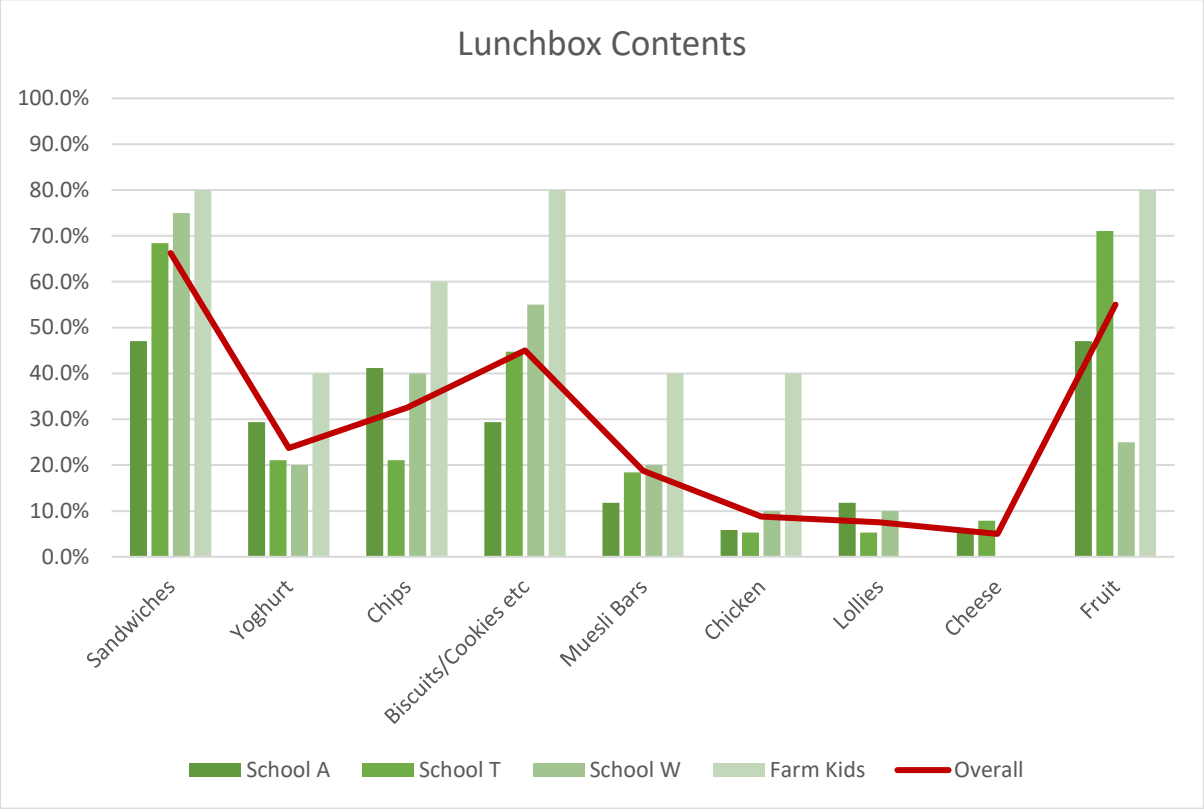
- The lowest scores for understanding of food sources overall were seen in the meat areas with bacon being at 20% and 13.8% for mince. Vegetables were the next lowest scored group overall at 30% then chicken and fruit groups with the same score at 52.5% each.
- The interesting finding with the roast chicken was that on average a little over half of the surveyed group understood that chicken was from chicken. The highest score in this area was Farming Kids at 80% and the lowest was School W at 40%. Both of these groups are classified as having the most rural influences amongst the surveyed participants.
- Bacon and mince had no understanding of source from Farming Kids at all, with mince only having a score from School A and School T being the lowest and highest decile schools.
- The highest levels of understanding from food source came in the areas of eggs, dairy and fish. Fish and crayfish had a lower variance across the groups.
- Farming Kids had the highest understanding with the source of eggs, chicken, dairy and vegetables.

- There were variances of around 40% between the lowest and highest scores in the sources of chicken, eggs, dairy and vegetables.
- Eggs had the highest level of understanding of their source with 77.5% overall getting this correct.

Overall the data indicates that the education of food sources is an area for this age group of children to build more knowledge.

Lunchbox contents

Children were asked what they would have in their lunchboxes when they come to school. From the answers the most popular foods were selected for more analysis.



Graph 3. Contents of school lunchboxes with specific foods and overall n=78

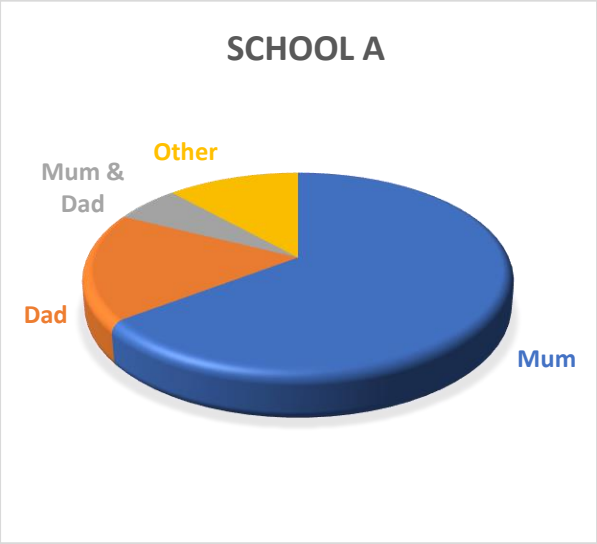
Analysis of lunchbox contents:

- There appears to be a lot of variance of lunchbox foods across these groups. No particular lunchbox food ranked very highly overall.
- The majority of children had sandwiches (66.3%) and fruit (55%) of some description for lunch.
- Farming Kids had the highest percentage of all food groups except lollies and cheese which they had none of in their lunchboxes.
- The lowest scored schools in the fruit group were from schools that have access to fruit in schools. It is unclear whether they didn't bring fruit in their lunchbox as they received it at school, or they would otherwise have no access to fruit.

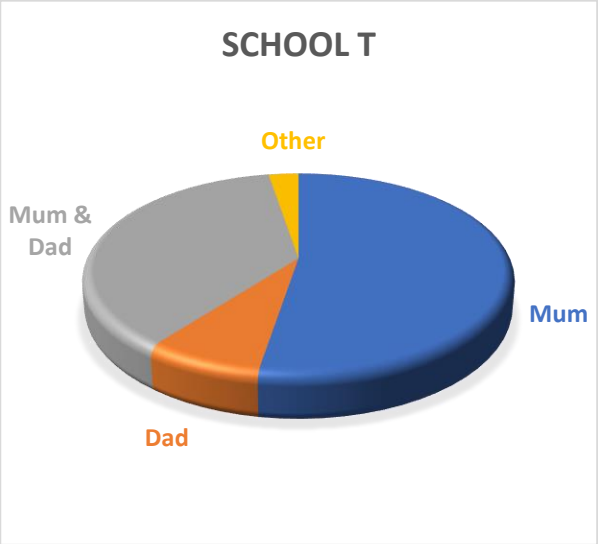
- Farming Kids had the highest percentages of biscuits, cakes, slices etc. at 80%, yogurt at 40%, muesli bars 40% and chips at 60% with a lot of these being grab and pack type foods.
- School A (decile 1) had the lowest levels of sandwiches, biscuits/cookies and muesli bars.
- Although low, overall 7.5% of children surveyed had lollies in their lunchboxes for school.

Person cooking evening meal

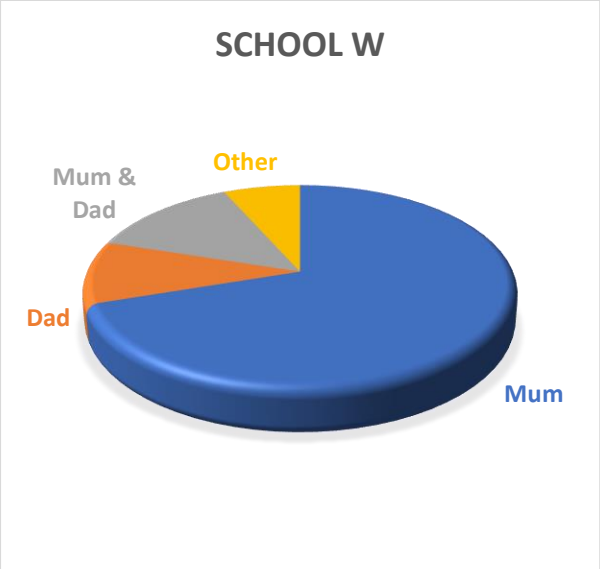
Children were asked who cooked dinner for them at night prior to them drawing what they had for dinner.



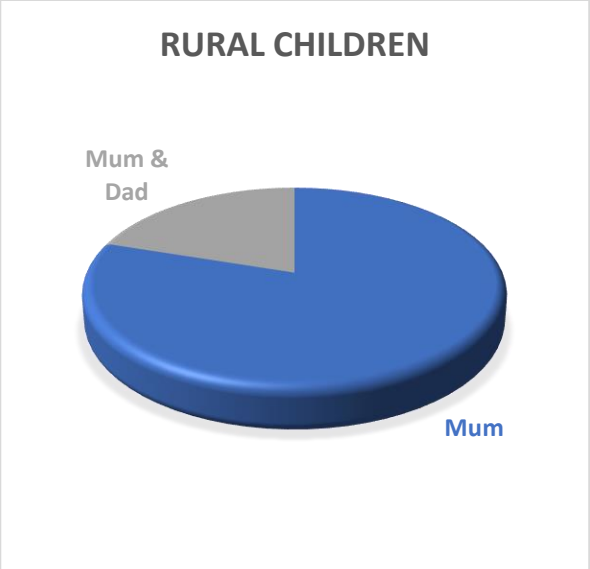
Graph 4. Who cooks evening meal
School Code A n=17



Graph 5. Who cooks evening meal
School Code T n=38



Graph 6. Who cooks evening meal
School Code W n=20



Graph 7. Who cooks evening meal
Code FK n=5

Analysis of who cooks evening meals:

- Farming Kids had the highest percentage of mothers cooking dinner at 80% with the only other source being mum and dad at 20%.
- School W (urban/rural) had the second highest measure of mothers cooking at 70%.
- The lowest level of mothers cooking dinner was School T (decile 5) at 53% but the highest level of mum and dad cooking at 37%.
- School A (decile 1) had the highest level of dad cooking at 18% and also other being Nanas or other family members at 12%. This group also had the lowest level of mum and dad cooking at 6%. Possibly an indicator of more solo parent households.
- All groups except farming kids had percentages of dad only cooking along with mum and dad cooking. This suggest fathers are playing a more active role in this area.

Overall mothers were the people that cooked most evening meals across all groups. This suggests that mothers in general still have the most influence on food consumed by the children in these households.

Foods consumed for dinner

Children were asked, after who cooked their evening meal, to draw what things that person cooked for their dinner. A discussion was then had about what foods the drawings were.

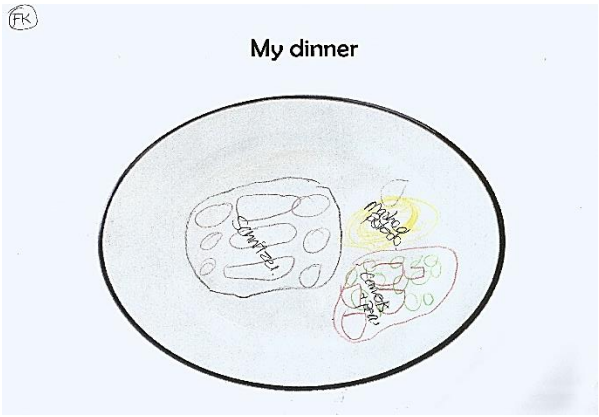


Figure 7. Farming kids' dinner picture sample

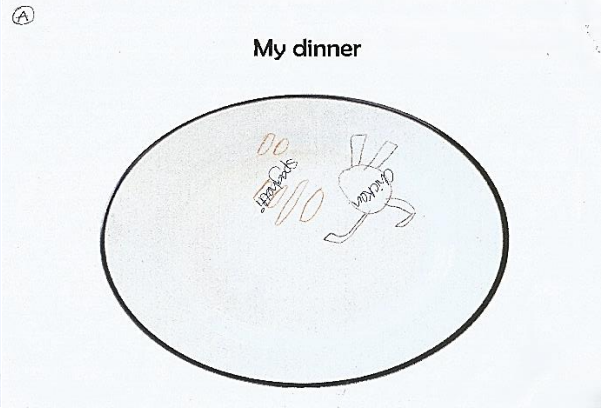


Figure 8. School A student picture sample of their dinner

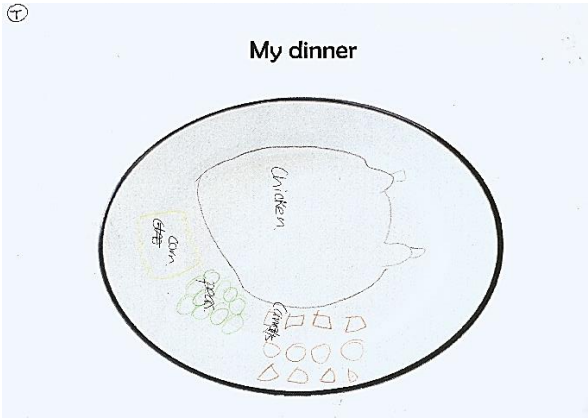


Figure 9. School T student picture sample of their dinner

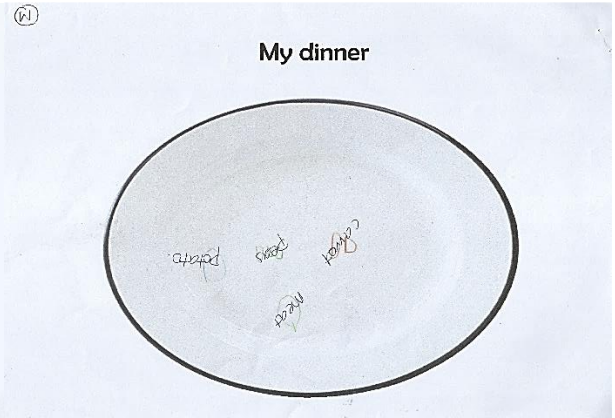
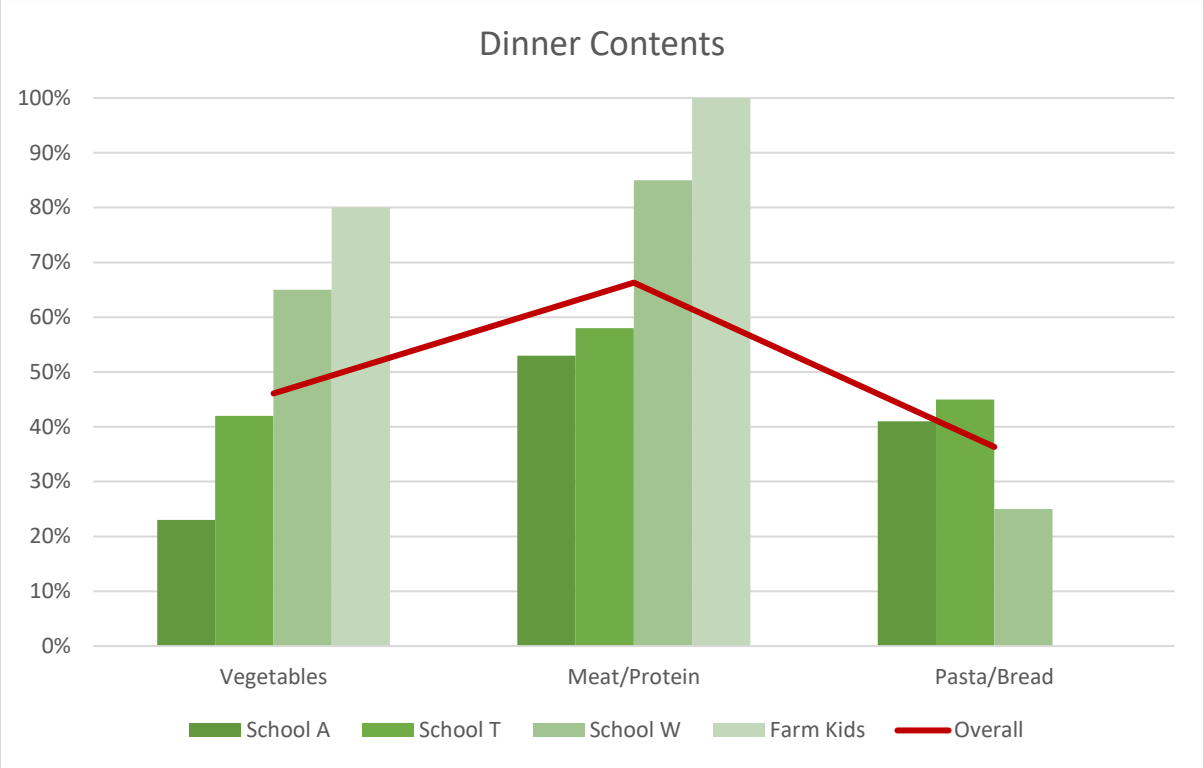


Figure 10. School W student picture sample of their dinner



Graph 8. Dinner foods of children in specific food groupings and overall based on drawings supplied n=80

Analysis of food consumed for dinner:

- The highest consumed food at dinner was a meat/protein food, this includes chicken, at 66% overall.
- Vegetables for dinner had an overall reading of 46% with School A having the lowest consumption at 23% and farming kids the highest at 80%.
- Farming kids also had the highest percentage for protein/meat at 100%. There was no percentage for pasta/bread from the information supplied for farming kids.
- Although under 50%, the highest percentage of pasta/bread at dinner was consumed by School A at 41% and School T at 45% (lowest and highest decile schools in the survey)
- Students from the school with the most rural influence (School W) had the higher percentage of vegetables and meat/protein consumed of all the schools. This was also observed with the farming kids.
- School W students consumed 23% more vegetables and 27% more meat/protein than School T.

Overall the influence of Rural/Urban lifestyle seems to have the biggest impact on what is found on the children's dinner plates. Rural children had more meat and vegetables, with Pasta/Bread featuring more for urban children.

Teachers Questionnaire

Key notes from the teacher's questionnaire from all schools surveyed:

- Life Education Trust, Enviro Schools, School kit and Ministry of Education resources were the most used information tools in these schools for food and food production education at this age level.
- All teachers confirmed, at ages five and six, is a good age to educate children about their food and how it is produced. At this age children share a lot with their families so this information goes home too.
- Food discussion is had with the children by teachers regarding the school policies on rubbish free lunches, water only schools and food in lunchboxes.
- Two of the three schools had been on a farm visit.
- Teachers suggestions for how primary food producers could educate children are around resources via either the ministry of education or school kit which relates to the curriculum. Visits to farms and having hands on experiences were also a popular suggestion.

Discussion

Understanding of the current situation in New Zealand around education and health now provides a starting point. What is currently been educated in schools, how it is done, by whom and with what impact. It is acknowledged that the age when entering the school system would be a good place to start the education of food and food production to plant the seed and promote healthy eating. The New Zealand Curriculum provides a broad range of areas for food education to be taught and allows food experiences to be exciting and interactive. The decile rating of schools showing their socio economic standing and funding capabilities from government and industry organisations could be an opportunity for food producers. Food producers could educate differently in these areas, possibly by supporting current organisations providing food and food education. Children in these low decile areas are probably less likely to be able to visit farms or producers so creating memories and experiences that are life long will have positive impacts for these children. The provision of healthy nutritious food options for these children will also have social benefits and a pride that comes with being able to help feed hungry children in our own country.

The benefits of having healthy children coming to school to achieve and learn are huge. Should the children not have adequate nutrition they are likely to lag behind in development both in physical and educational areas. The long term effect for that child and for New Zealand are of concern. New Zealand requires all its children to reach their full potential to be able to fill the requirements into the future. They also require all children in New Zealand to be educated about New Zealand, what it produces and how it produces it, they need this information first hand. Children that have knowledge and understand will have less questions and be less likely to believe the untruths when they hear them.

New Zealand's health statistics are worrying. With 32% of our five to nine year old's overweight and obese and the statistics that New Zealand is the third obese county in the OECD does not bear well for the country. With only 74% of children in this age bracket consuming the recommended amount of fruit and only 45% the recommended vegetable intake. There are opportunities here for food producers to change these statistics and make a valuable contribution to their sector and to the children. These statistics make for sad reading in a country that produces nutritious, delicious, sustainable, healthy food every day. Data from the survey matches these statistics with vegetable consumption overall at 46%. The lunchbox data regarding fruit suggested 55% overall consuming fruit which is less than the statistics but does not allow for access to fruit outside of school or provided at school.

Interesting statistics have come from the survey in terms of who cooks dinner in households. Who cooks dinner will probably play host to who provides the most influence of food for the children in the survey. This was highlighted in the literature review findings. The amount of different food influences a child has could depend on the family structure, for example if you have two income families and both parents cook there will be more two influences in terms of food choice. Compared to that of solo parent family. A two-income family could also indicate food affordability and availability was not as much of an issue and food choice was more varied.

Results find that overall only 11% of children knew what a kumara looked like but they knew about the potatoes and carrots. Could this be an indication of the unaffordability of this

particular food? According to the Stats NZ[18] kumara prices rose 83% to $8.99 per kilogram to November 2017. Pumpkin rose 176% in the same year all due to the poor growing conditions creating low supply. Other than farming kids at 60% all other groups had a low level of understanding of how these vegetables grew with an understanding of 35% or lower. This suggests that a number of root vegetables are not being consumed and that again could be an opportunity for primary sectors to rectify. It could also suggest that people do not have vegetable gardens that grew these foods.

People's time management appears to have an influence with the type of foods cooked and who cooks them. A pleasing result to see dads have more of a mention in who cooks for the children. In the high decile area 37% of meals cooked were by both mum and dad. The lower decile area had the highest proportion of dad only cooking at 18% and also the most other which indicates Nanas and other family members cooking dinner.

Farming households showed the majority of dinner meals prepared by mum at 80%. Farming Kids, interestingly, had the highest percentages of 'grab and pack' food in their lunchboxes. These foods are the muesli bars, biscuits, cakes, chips and fruit to a lesser extent. This could indicate the time pressure in these households possibly due to the home and work environment being the same. It is not known however if these food items are prepared at home which would then indicate that the children have the opportunity to learn, prepare and bake from scratch. This information would be useful to know for more discussion around time pressures or not.

Children generally understood that milk comes from a cow, but didn't really understand that cheese and yogurt also came from the same source. Honey was well known to the children with many children saying that honey came from bees without that being a question.

Answering the project purpose questions, children know about food, the extend of their knowledge could be enhanced. Showcasing New Zealand's food and food producers in a fun interactive environment would add truth to their knowledge and perceptions, making them less likely to be influenced by other people's opinions. It is up to primary sectors to make the difference.

The new questions are what could this education look like? Could we have a My School Food bag with children producing a meal whilst learning about its fresh contents? With screen time being a big factor, could there be a 3D simulation for food production? Sponsorship of school gardens, interactive games, more farm visits or a food camp. The options are vast and exciting.

There are many opportunities for primary food producers to educate the children about food. The age level is right, the need is there, the availability of healthy food is there, we just need the cooperation of all primary sectors to build the story. The vision of feeding the children, providing them an opportunity to reach their potential, and at the same time, selling our story makes sense. Providing those consumer-centric connections to our future consumers for the benefit of agriculture, apiculture, aquaculture and horticulture.

[18] https://www.stats.govt.nz/news/pumpkin-and-kumara-prices-at-record-level

Conclusion

Food education to New Zealand children is paramount. Statistics are clear, children are not consuming the recommended requirements of fruit or vegetables and large percentages are either overweight or obese. Vegetables were consumed at guideline levels by less than 50% of all children between the ages of five and nine. There are children from the survey that do not understand that roast chicken comes from chicken. Many believed that crayfish was a spider and that mince were worms. Food source was an area that many children showed a low level of knowledge. Food education for children starting the school system is the best place to start to build food knowledge. It requires food producers to showcase their produce in fun and exciting ways to install new pathways in children's brains and for this to be a consistent message. The New Zealand Curriculum allows these messages to be woven through several areas of learning. Food knowledge will also filter through to other food influences in the child's life's in their home and school environments.

Socially New Zealand has an obligation to make sure all children have access to adequate nutrition. Development and education for every child relies on it. Food producers can be part of the solution but more needs to be done nationally to rectify the poverty statistics in children. Solely relying on corporate agencies and community volunteer organisations work short term, but long term is not a sustainable solution.

A customer-centric philosophy starts by having well informed consumers with the connections built at a young age providing a futuristic approach to long term sustainability of food production in New Zealand.

Primary sectors connecting via collaboration or cooperation methods to create a New Zealand Food brand could provide a larger opportunity for all food producers to educate consumers, build a food culture and shape the future of food.

Tomorrow's consumers need education around their food and food production, nobody is more knowledgeable and equipped in this field to provide this than food producers in the primary sectors.

Recommendations

The hope in completing this project was to discover just what our young children knew about their food and where that food came from. Where their food knowledge came from and who taught it.

To help enhance the answers further and provide next steps for the education of tomorrow's consumers by the primary sector I would recommend the following actions to take place:

- ✓ **Increase of the survey size**
  This survey should be extended nationwide to gather a larger collection of data and analysis on nationwide trends on city, urban and rural children. Information from schools up to the decile ten level would provide a more detailed socio economic element allowing more analysis on any themes with regards to income base of families these children reside in.
- ✓ **Educate all food producers on different food sectors**
  A united New Zealand food voice needs communication and collaboration of all the producers of food nationwide. It would be opportunistic for each food producer to have an understanding of each other's sector as to educate effectively about New Zealand produced food. It could also bring opportunities of diversification to business.
- ✓ **Communication of industry leaders**
  The opportunity is available for primary sector industry leaders to come together and discuss the creation of a New Zealand Food body. Each sector pulling resources and expertise in form of cooperation or collaboration to drive benefits to all primary food producers and the future customers.
- ✓ **Government lobbying**
  The poverty and health statistics of New Zealand children do not make good reading. Lobbying the government to step in and make some long term sustainable goals to meet and exceed the United Nations guidelines should be a key social driver for all New Zealanders.
- ✓ **Educate and be educated = consumer-centric**
  Primary food producers can individually start the New Zealand food story by educating their communities, schools and their own children. Whilst educating food producers will be becoming customer-centric. Tomorrow's consumer will also be able to educate the food producer. Discovering all about the consumer will build knowledge on what they want, when they want it, how they consume it, who influences them, how to personalize products to suit them, how technology can help tell the story and how is best to educate them.

Education is key to understanding, Understanding is the key to Knowledge,
Knowledge is the key to Success

References

Atik D., and Ertekin Z., 2011: Children's perception of food and healthy food preferences. *International Journal of Consumer Studies/Volume 37*

Berk Laura. E., 2003: Exploring Lifespan Development. Milestones. Development in Middle Childhood.

Carpenter V. and Osborne S., 2014: Twelve Thousand Hours. Education and Poverty in Aotearoa New Zealand.

Children's Commissioner., 2012: Solutions to Child Poverty in New Zealand Evidence for Action.

Henderson C., 2017: Once Upon a Time Down on the Farm; A study to help dairy farmers tell their story. (A Kellogg project)

Hyde R., 2017: Effective Industry Collaboration for Environmental gains. (A Nuffield project)

KidsCan. 2011: Food for Kids. Overview and Massey Research 2010.

KPMG., 2018: KPMG Agribusiness Agenda. Social capital.

Ministry of Health., 2017: Children and Young People Living Well and Staying Well, New Zealand Childhood. Obesity Programme Baseline Report 2016/2017.

OECD., 2017: OECD Obesity Update.

Sinek S., 2009 Start with the Why.

Turner S., 1997: Children's understanding of food and health in primary classrooms. *International Journal of Science Education*

Wynd D., 2011: Hunger for Learning, Nutritional Barriers to Children's Education. *Child Poverty Action Group*

Worsley A., Worsley A J., McConnon S., Silva P A., 1993: Reported food consumption and dietary habits of New Zealand adolescents. *Dunedin Multidisciplinary Health and Development Unit, Department of Paediatrics*

Website references

5+ a day www.5aday.co.nz
Enviro Schools www.enviroschools.org.nz
Garden to Table www.gardentotable.org.nz
Jamie Oliver Ted Talk 2010: Teach every child about food
https://www.ted.com/talks/jamie_oliver
Kai Kitchen http://www.thekaikitchen.co.nz/index.html
KickStart https://kickstartbreakfast.co.nz
KidsCan www.kidscan.org.nz
Life Education Trust www.lifeeducation.org.nz
Ministry of Education www.education.govt.nz
Ministry of Health www.health.govt.nz
New Zealand Curriculum http://nzcurriculum.tki.org.nz/
OECD reports www.oecd.org/health/obesity-update.htm
Primary Sector Council www.beehive.govt.nz/release/primary-sector-council-announced
School Kits www.schoolkit.co.nz
Simon Sinek www.ted.com/talks/simon_sinek_how_great_leaders_inspire_action
TVNZ – Curious Mind www.tvnz.co.nz/shows/the-curious-mind
TVNZ – Why am I www.tvnz.co.nz/shows/why-am-i

Appendices

1. Survey

What do New Zealand 5 & 6 year old children understand about their food?

What is this?

A **1** **2**

What animal does this come from? A1. A2.

B **1** **2** **3**

What animal do these foods come from?

C **1** **2**

D **1** **2** **3**

Where do these foods grow?

E **1** **2** **3**

How do these foods grow?

F **1** **2** **3**



G **1** **2**


H **1** **2**


What animal does this food come from H1. H2.

G **1** **2**


Where do these foods grow?

Question 2.

When you come to school what kinds of food do you have in your lunchbox to eat?

Question 3.

Who cooks your dinner/tea for you at home?

Question 4.

I have a picture here of a plate for your dinner, can you please draw what food you have for dinner/tea.

School Code:

Urban/Rural City Decile_____

Can you please tell what this is:

A	1	2		Which animal does this come from?_____
B	1	2	3	Which animal do these foods come from?_____
C	1	2		
D	1	2	3	How do these foods grow?_____
E	1	2	3	How do these foods grow?_____
F	1	2	3	
G	1	2		
H	1	2		Which animal does this food picture come from?____
				Which animal does this food picture come from?____
I	1	2		Where do these foods grow?_____

2. Raw data

Kellogg's - Collaboration of the primary sectors to educate tomorrows consumers

What do our 5-6 year olds understand about their food?

School Code: A Decile 1 Total 17 Learners

Slide	Food No.	Result	Animal/Gr	Result2
A	1	16	1	3
	2	17	2	10
B	1	17		12
	2	6		
C	1	13		
	2	16		4
D	1	16		
	2	16		
E	1	16		8
	2	0		
F	1	13		
	2	16		
G	3	12		
	1	5		
H	2	12		3
	1	8	1	
I	2	6	2	
	1	6		12
	2	17		

*2 x special needs

Lunchboxes	8
Sandwiches	5
Yoghurt	7
Chips	5
Biscuits/Cookies etc	2
Muesli Bars	1
Chicken	2
Lollies	1
Cheese	8
Fruit	

*2 unknown

Person who prepares dinner	11
Mum	3
Dad	1
Mum & Dad	2
Other	

Dinner Results

Slide	Food No.	Result	Animal/Gr	Result2
A	1	94.1%		
	2	100.0%		47.1%
B	1	100.0%		58.8%
	2	35.3%		70.6%
	3	100.0%		
C	1	76.5%		
	2	94.1%		
D	1	94.1%		23.5%
	2	94.1%		
	3	11.8%		
E	1	94.1%		47.1%
	2	0.0%		
F	3	88.2%		
	1	76.5%		
	2	94.1%		
	3	70.6%		
G	1	29.4%		
	2	70.6%		
H	1	47.1%	1	17.6%
	2	11.8%	2	11.8%
I	1	35.3%		
	2	100.0%		70.6%

Lunchboxes	
Sandwiches	*2 unknown
Yoghurt	47.1%
Chips	29.4%
Biscuits/Cookies etc	41.2%
	29.4%

17

School Code: T Decile 5 Total 38 Learners

Slide	Food No.	Result	Animal/Gr	Result2
A	1	32	1	22
	2	38	2	29
B	1	38		24
	2	20		
	3	36		
C	1	33		
	2	34		
D	1	33		10
	2	38		
E	3	5		
	1	36		23
	2	17		
F	3	35		
	1	30		
	2	28		
G	3	29		
	1	21		
H	2	34		
	1	21	1	7
I	2	14	2	9
	1	18		
	2	38		27

Lunchboxes	26
Sandwiches	8
Yoghurt	8
Chips	8
Biscuits/Cookies etc	17
Muesli Bars	7
Chicken	2
Lollies	2
Cheese	3
Fruit	27

*2 unknown

Person who prepares dinner	20
Mum	3
Dad	14
Mum & Dad	1
Other	

Dinner results

Slide	Food No.	Result	Animal/Gr	Result2
A	1	84.2%		
	2	100.0%	1	57.9%
B	1	100.0%	2	76.3%
	2	52.6%		63.2%
	3	94.7%		
C	1	86.8%		
	2	89.5%		
D	1	86.8%		26.3%
	2	100.0%		
	3	13.2%		
E	1	94.7%		60.5%
	2	44.7%		
F	3	92.1%		
	1	78.9%		
	2	73.7%		
	3	76.3%		
G	1	55.3%		
	2	89.5%	1	18.4%
H	1	55.3%	2	23.7%
	2	36.8%		
I	1	47.4%		
	2	100.0%		71.1%

Lunchboxes	
Sandwiches	68.4%
Yoghurt	21.1%
Chips	21.1%
Biscuits/Cookies etc	44.7%

38

School Code: W Decile 3 Total 20 Learners

Slide	Food No.	Result	Animal/Gr	Result2
A	1	15	1	8
	2	20	2	18
B	1	20		18
	2	20		
	3	20		
C	1	15		
	2	18		
D	1	16		7
	2	20		
E	3	1		
	1	20		8
	2	7		
F	3	20		
	1	19		
	2	17		
G	3	17		
	1	11		
H	2	20		
	1	13	1	6
I	2	3	2	0
	1	8		
	2	20		15

Lunchboxes	15
Sandwiches	4
Yoghurt	4
Chips	8
Biscuits/Cookies etc	11
Muesli Bars	4
Chicken	2
Lollies	2
Cheese	0
Fruit	5

Person who prepares dinner

Mum	11
Dad	3
Mum & Dad	4
Other	2

Dinner results

Slide	Food No.	Result	Animal/Gr	Result2
A	1	75.0%		
	2	100.0%	1	40.0%
B	1	100.0%	2	90.0%
	2	50.0%		90.0%
	3	100.0%		
C	1	75.0%		
	2	80.0%		
D	1	80.0%		35.0%
	2	100.0%		
	3	5.0%		
E	1	100.0%		40.0%
	2	35.0%		
F	3	100.0%		
	1	95.0%		
	2	85.0%		
	3	85.0%		
G	1	55.0%		
	2	100.0%		
H	1	65.0%	1	30.0%
	2	15.0%	2	0.0%
I	1	40.0%		
	2	100.0%		75.0%

Lunchboxes	
Sandwiches	75.0%
Yoghurt	20.0%
Chips	40.0%
Biscuits/Cookies etc	55.0%

20

Farming Kids

Slide	Food No.	Result	Animal/Gr	Result2
A	1	4	1	4
	2	5	2	5
B	1	5		5
	2	4		
	3	4		
C	1	5		
	2	5		
D	1	5		3
	2	5		
E	3	1		
	1	5		3
	2	1		
F	3	5		
	1	5		
	2	4		
G	3	4		
	1	3		
H	2	5		
	1	3	1	0
I	2	1	2	0
	1	1		
	2	5		4

Lunchboxes	4
Sandwiches	2
Yoghurt	3
Chips	3
Biscuits/Cookies etc	3
Muesli Bars	2
Chicken	0
Lollies	0
Cheese	0
Fruit	4

Person who prepares dinner

Mum	4
Dad	1
Mum & Dad	
Other	

Dinner results

Slide	Food No.	Result	Animal/Gr	Result2
A	1	80.0%		
	2	100.0%	1	80.0%
B	1	100.0%	2	100.0%
	2	20.0%		100.0%
	3	80.0%		
C	1	100.0%		
	2	100.0%		
D	1	100.0%		60.0%
	2	100.0%		
	3	20.0%		
E	1	100.0%		50.0%
	2	20.0%		
F	3	100.0%		
	1	100.0%		
	2	80.0%		
	3	80.0%		
G	1	60.0%		
	2	100.0%		
H	1	60.0%	1	0.0%
	2	20.0%	2	0.0%
I	1	20.0%		
	2	100.0%		80.0%

Lunchboxes	
Sandwiches	80.0%
Yoghurt	40.0%
Chips	60.0%
Biscuits/Cookies etc	80.0%

5

Overall

Slide	Food No.	Result	Animal/Gr	Result2
A	1	67	1	42
	2	80	2	62
B	1	80		59
	2	37		
	3	77		
C	1	66		
	2	73		
D	1	70		24
	2	79		
E	3	79		
	1	77		42
	2	25		
F	3	75		
	1	67		
	2	65		
G	3	62		
	1	40		
H	2	71		
	1	45	1	16
I	2	20	2	11
	1	33		
	2	80		58

Lunchboxes	53
Sandwiches	19
Yoghurt	26
Chips	35
Biscuits/Cookies etc	15
Muesli Bars	7
Chicken	6
Lollies	4
Cheese	44
Fruit	

*2 unknown

Person who prepares dinner	46
Mum	9
Dad	20
Mum & Dad	5
Other	

Slide	Food No.	Result	Animal/Gr	Result2
A	1	83.8%		52.5%
	2	100.0%	1	77.5%
B	1	100.0%	2	73.8%
	2	46.3%		
	3	98.3%		
C	1	82.5%		
	2	91.3%		
D	1	87.5%		30.0%
	2	98.8%		
	3	31.3%		
E	1	96.3%		52.5%
	2	31.3%		
F	3	93.8%		
	1	83.8%		
	2	81.3%		
	3	77.5%		
G	1	50.0%		
	2	86.8%		
H	1	56.3%	1	20.0%
	2	25.0%	2	13.8%
I	1	41.3%		
	2	100.0%		72.5%

Lunchboxes	
Sandwiches	66.3%
Yoghurt	23.8%
Chips	32.5%
Biscuits/Cookies etc	45.0%

80

Muesli Bars	11.8%
Chicken	5.9%
Lollies	11.8%
Cheese	5.9%
Fruit	47.1%

Person who prepares dinner	
Mum	64.7%
Dad	17.6%
Mum & Dad	5.9%
Other	11.8%

Dinner Results

SCHOOL A

Muesli Bars	18.4%
Chicken	5.3%
Lollies	5.3%
Cheese	7.9%
Fruit	71.1%

Person who prepares dinner	
Mum	52.6%
Dad	7.9%
Mum & Dad	36.8%
Other	2.6%

Dinner Results

SCHOOL T

Muesli Bars	20.0%
Chicken	10.0%
Lollies	10.0%
Cheese	0.0%
	25.0%

Person who prepares dinner	
Mum	55.0%
Dad	7.9%
Mum & Dad	10.5%
Other	5.3%

Dinner Results

SCHOOL W

Muesli Bars	40.0%
Chicken	40.0%
Lollies	0.0%
Cheese	0.0%
	80.0%

Person who prepares dinner	
Mum	80.0%
Dad	0.0%
Mum & Dad	20.0%
Other	0.0%

Dinner Results

RURAL CHILDREN

Muesli Bars	18.8%
Chicken	8.8%
Lollies	7.5%
Cheese	5.0%
Fruit	55.0%

Person who prepares dinner	
Mum	57.5%
Dad	11.3%
Mum & Dad	25.0%
Other	6.3%

Dinner Results

PERSON WHO COOKS DINNER

Any consumption for dinner:	
Vegetables	23%
Meat/Protei	53%
Pasta/Bread	41%

Lunchboxes	47.1%
Sandwiches	29.4%
Yoghurt	41.2%
Chips	29.4%
Biscuits/Coo	11.8%
Muesli Bars	5.9%
Chicken	11.8%
Lollies	5.9%
Cheese	47.1%
Fruit	0.0%

Vegetables	42%
Meat/Prot	58%
Pasta/Brea	45%

	68.4%
	21.1%
	21.1%
	44.7%
	18.4%
	5.3%
	5.3%
	7.9%
	71.1%
	0.0%

Vegetables	65%
Meat/Prot	85%
Pasta/Brea	25%

	75.0%
	20.0%
	40.0%
	55.0%
	20.0%
	10.0%
	10.0%
	0.0%
	25.0%
	0.0%

Vegetables	80%
Meat/Prot	100%
Pasta/Brea	0

	80.0%
	40.0%
	60.0%
	80.0%
	40.0%
	40.0%
	0.0%
	0.0%
	80.0%
	0.0%

Vegetables	46%
Meat/Prot	69%
Pasta/Brea	36%

	66.3%
	23.8%
	32.5%
	45.0%
	18.8%
	8.8%
	7.5%
	5.0%
	55.0%
	0.0%

3. Parent Information Letter

11 September 2018

Dear parents/caregivers

I am currently undertaking study with the Lincoln University for the Kelloggs Rural Leadership Programme. As part of this study we do a mini thesis for something that interests us in/or to do with the rural sector. My research topic is "Collaboration of the primary sector to shape tomorrow's consumers".

I want to find out what our young people understand about their food and how it is produced/grown. To do this I aim to interview one on one around one hundred 5-6 year old learners from city, urban and rural schools to get a gauge of the learners understanding at this level. I also want to find out from the teachers what is available to them and how it could be more useful.

The interviews will be taking place across the North Island prior to the end of this term.

For---------- School this will be on Tuesday 25th of September.

This survey is completely anonymous, there will be nothing recorded that will identify any child or school in the findings. My full project will be available to view after marking and presentation in late November if you would like to view.

All participants will receive a little gift as a token of thanks for their participation. Should you not wish your child to participate please let the school know.

If you have any questions please don't hesitate to contact me.

Kind regards

Belinda Price

bbprice80@xtra.co.nz

4. Teacher Questionnaire

Teacher Questionnaire: School Code

What do these children at this level learn about in regards to food and the production of food?

What resources do you/the school use or have access to? i.e. school kits, farm visits

In your opinion as a teacher of this age group is this a good age to teach children about their food and how it is produced?

What would your suggestions be on the most constructive way for NZ's primary food producers to come together collectively to tell these children about their food? Bearing in mind what would aid you as teachers to do this easily.