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He Rourou Whai Painga Main — Consumer Insights Sub-Study Report

Conroy DM, Young JM, Qu Z

November 2023

Confidential report for:

High Value Nutrition — Ko Ngā Kai Whai Painga — National Science Challenge
Joanne Todd — Challenge Director

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Contents

Executive summary

He Rourou Whai Painga (Main) - Consumer Insights Sub-study report

Conroy D, Young J, Qu, Z
Plant & Food Research Auckland

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This report covers the qualitative consumer sub-studies conducted within the He Rourou Whai Painga (HRWP) dietary intervention. The views of a sample of index participants were explored, including pre-intervention eating habits, perceptions of healthy foods, motivations for joining, potential enablers and barriers and family involvement, to understand what may underlie longer term adoption/ non adoption of the plant-based eating pattern experienced in the intervention.

In-depth interviews were conducted online with 37 index participants, including seven Māori participants, at three time points (6 weeks, 12 weeks, 24 weeks), with seven online focus groups undertaken at approximately 40 weeks. Transcriptions of the interviews were obtained by Otter voice recognition software, before thematic analysis using open coding advancing to axial coding with the interpretation of contrasts between participants.

We found diverse habitual eating habits and pre-dispositions pre-delivery, including the unhealthy and stressed, the passionate food lovers, the emotional eaters, those seeking healthier food implementation, and differing culturally nuanced patterns. Motivations for joining the trial were immediate health issues, but underlying this was weight loss, often for both health and appearance purposes.

Whilst on the 12-week delivery phase, participants typically responded well in the early ‘honeymoon period’. The flavours and convenience of the My Food Bag™ (MFB) meals helped experiential learning and adherence. However, by the late delivery phase, clear differences emerged regarding self-reliance abilities and resilience to challenges.

Following the final interview (at 24 weeks), four distinct groupings of participants emerged regarding perceived ongoing adoption of the pattern: 1) Passionate and empowered; 2) Capable and resourceful; 3) Challenged- emotionally and situationally; 4) Disappointed and disengaged. These were defined by differing motivations, emotions, cognitive processes and resilience to challenge.

The seven focus groups largely echoed the interview findings but as time increased the divergence in adherence was amplified. Strong commitment continued, but others experienced a further reduction in adherence due to situational factors and the return to habitual patterns. Other external factors such as logistical supply issues, over generous supply of foods and Facebook experiences were seen to impact differently across the intervention period.

Overall, the social science perspective clearly demonstrated the way a complex set of personal, social and cultural factors intersect to influence intervention outcomes.

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1 Introduction

Metabolic health diseases, in particular type 2 diabetes, continue to be a major concern in Aotearoa New Zealand and many countries, with a continuing cost on individuals/ families, the healthcare system and the economy (World Health Organisation 2023). Nutrition education and health interventions are important to enable more positive health behaviours, ultimately reducing preventable diseases. Healthy eating interventions for families in the home environment continue to grow in number (Snuggs, et al. 2019), and include the delivery of food to households to improve food security for low-income families (Briefel et al., 2021; Fischer et al., 2022), cost of health care (Berkowitz et al. 2018), adolescent food preparation skills (Utter et al. 2019), and healthy at-home food preparation Horning et al. 2021).

1.1 The HRWP Programme

The He Rourou Whai Painga (HRWP) programme is a long-term, multi-centre dietary intervention exploring whether people at risk of cardiometabolic disease will benefit from an intervention providing an allocated dietary pattern that supports family behavioural change. Funded by High Value Nutrition (HVN), the HRWP study evaluates the effects of a 12-week dietary intervention on metabolic health and long-term dietary choices in the New Zealand population, using New Zealand foods and beverages. In addition, the intervention provides support to participants from dietitians, via Facebook and during clinic visits. The whānau-based whole-diet eating pattern follows the principles of a preponderance of plant-based foods (vegetables, legumes, fruits, unrefined cereals, nuts), together with lean protein from seafood, with smaller portions of lean red meat and dairy. Such plant-based diets have been shown to improve metabolic, cardiovascular and wellbeing profiles in people at risk of cardiometabolic disease in the context of the Mediterranean diet.

This intervention is novel in that the entire family (or those willing to participate) receive the intervention, rather than just an index individual. It is common for cardiometabolic risk to cluster within a family/whānau, and therefore, dietary interventions that may improve the health of one individual within a whānau are likely to have beneficial effects for all members.

Following the successful completion of the HRWP feasibility Pilot 4 in 2021/22, the HRWP Main study commenced recruitment of participants in June 2022. Within the study design, index participants were randomised into two groups. Group A were asked to continue their habitual diet for 12 weeks and then received the food deliveries and support, whilst Group B immediately began receiving the food and support for 12 weeks. After the food delivery phase for each group, behavioural support continued to be provided to half of the participants for a further 12-weeks (A1 and B1), whereas the other half (A2 and B2) did not receive ongoing support. This was to understand how continued behavioural support without the provision of food impacts the sustainability of behavioural change.

This report summarises the findings of the first two phases of the Consumer Insights sub-study, namely, the individual in-depth interviews and the focus groups. It will be followed by a separate report containing the findings from the HRWP participant survey once all responses are collected.

1.2 The Consumer insights sub-study aims – HRWP Main

The overall purpose of the Consumer insights sub-study was to understand index participants' engagement, attitudes, emotions and behaviours whilst participating on the trial (possibly with their family members). From this, underlying reasons for longer term perceived adoption/ non adoption of a similar eating pattern post intervention can be understood. Such consumer science can also inform the clinical team, if appropriate, and enable participant-informed design for future intervention trials.

The specific aims were to investigate:

- Pre-invention perceptions of health and wellness, pre-existing diets and cooking practices, motivations for joining and expectations.
- During-intervention (across 40+ weeks): experiences and perceptions of progress. These included concerns with integrating the eating pattern, key lessons learnt, as well as barriers and enablers of compliance/behavioural change. Within this we investigated how family involvement serves as a supportive mechanism to help enact behavioural change.

2 Method

2.1 Study design

Our exploratory research was undertaken within the methodological framework of the interpretivist paradigm using the qualitative methods of in-depth interviews and focus group discussions.

2.2 Recruitment and sample

The authors obtained ethics approval as part of the approval granted for the HRWP Main trial by the New Zealand Health and Disability Ethics Committee – Northern B branch – reference 2022 FULL 12045. Recruitment for the in-depth interviews commenced in August 2022 and was conducted on the following basis as new index participants entered the trial:

1. On the first clinic visit index participants were given an information sheet detailing the Consumer sub-study projects and asked by the clinic staff if they would like to be contacted by the consumer research team.
2. Index Participants who indicated interest in being contacted were entered into the RedCap Consumer sub-study spreadsheet. Care was taken to ensure any identifying participant data remained in a protected location within Plant & Food Research iPlant files.
3. The lead Consumer sub-study researcher emailed an invitation to the index participant, inviting the participant to reply if they wanted to partake and receive more details.
4. The participant information sheet and consent form document (PISCF) was then emailed to the prospective participant once they indicated their acceptance.

5. Consent was obtained prior to the interview by either a signed form or a recorded verbal statement.

The recruitment aim was to undertake in-depth interviews with up to 32 participants from the HRWP main index participants, including up to seven Māori participants. All Māori individual interviews were undertaken by Dr Kiri Dell, a Māori social scientist, and non-Māori interviews by Dr Jenny Young and Dr Denise Conroy. Table 1 shows the participant characteristics from the in-depth interviews.

Table 1 – Participant characteristics - In depth interviews with index participants (n=37)

Characteristics	n	%
Gender:		
Male	14	38
Female	23	62
Age (years):		
25–34	3	8
35–44	9	24
45–54	14	38
55–64	11	29
Location:		
Auckland	11	29
Wellington	10	27
Kokiri Marae	2	6
Christchurch	14	38
Group:		
A1	6	16
A2	4	11
B1	7	19
B2	20	54
Ethnicity:		
NZ European	18	48
Māori	7	19
Samoan	2	6
Chinese	3	8
Indian	1	3
Other	5	13
Unknown	1	3

Six participants did not complete all three interviews, with three of these completing only one interview. The researcher sent one reminder email, but due to ethical requirements further follow-up was not possible.

The nature of the recruitment process meant those who accepted the invitation were included to reach the desired number of interviews. Despite invitations being sent to all interested index participants, considerably greater numbers were interviewed in the Group B2 condition (where support ended after the 12-week food delivery phase).

Seven online focus groups were conducted between June and October 2023 to capture ongoing post-delivery experiences, involving 30 participants who had **not** already participated in the interviews. Groups consisted of four participants, apart from two groups of six and seven, where other family members joined the index participant. Recruitment followed a similar procedure to that described above for the interviews. Table 2 shows the participant characteristics for the focus groups.

Table 2 – Participant characteristics – Focus Groups index participants (n=30)

Characteristics	n	%
Gender:		
Male	12	40
Female	18	60
Age (years):		
25–34	1	3
35–44	5	17
45–54	11	37
55–64	13	43
Location:		
Auckland	4	13
Wellington	9	30
Kokiri Marae	2	7
Christchurch	15	50
Group:		
A1	12	40
A2	7	23
B1	7	23
B2	4	13
Ethnicity:		
NZ European	22	73
Maori (NZ Euro/Māori)	6	20
Samoan	1	3
Other	1	3

2.3 Data collection

Data were collected via semi-structured interviews undertaken online using the Zoom video-conferencing service, with most participants completing three interviews as follows:

- First interview: approximately 6 weeks after randomisation date
- Second interview: approximately 12 weeks after randomisation date
- Third interview: post-delivery phase (approximately 24 weeks after randomisation date)
- The focus groups took place after week 40.

Interviews were on average 30–40 minutes long, and the focus groups were approximately 60 minutes long. The semi-structured interview guide was developed from previous literature on dietary intervention, nutrition education and consumer health behaviour, and included exploratory questions designed by the research team to examine perceptions and practices regarding dietary processes, roles and responsibilities, and challenges in adhering to the new dietary pattern. The interviewers used probing to explore emerging concepts in a deeper and richer manner. Interviews were video- and audio-recorded for analysis purposes and all participants were made aware of their anonymity and the confidential nature of their data. Incentives ($150 for interviews and $80) for focus groups were provided to participants as a thank you for their contribution.

2.4 Analysis and interpretation

All Zoom-recorded footage was transcribed using Otter.ai online transcription software, and then checked and edited for accuracy by members of the wider research team. Thematic analysis was then conducted using open and then axial coding to identify the major themes emerging from the data (Strauss & Corbin 1998). Two researchers were involved in an iterative coding process, using constant comparison to identify and contest key themes and ideas. Overarching themes were based on primary patterns that emerged earlier in the open coding process. The analysis of the data was enhanced by reference to field notes and collaboration by the researchers.

Thematic analysis of transcript data commenced with open coding using Nvivo 20 and then advanced to interpretation of contrasts between participants, and reasons for these differences in the participants' descriptions and their feelings about the eating patterns/ trial. The findings section includes verbatim quotations from participants (using pseudonyms with area not included to maintain anonymity) to illustrate key findings.

3 Findings

The findings are presented in five parts:

1. **Part One** provides a background to the participants and identifies diverse life situations, relationships and habitual experiences with food.
2. **Part Two** covers the intervention experience and the different ways participants engaged with and adapted to the delivered foods.
3. **Part Three** identifies groupings of participants and interprets the underlying themes explaining why ongoing adoption/ adherence differed markedly.
4. **Part Four** overviews influential external factors from the implementation of the HRWP intervention study itself
5. **Part Five** provides a summary of the seven Focus Groups conducted at the latter stages of the study.

3.1 Part 1 – Participant pre-dispositions

In the first interviews, a highly individualistic picture was uncovered of each participant's relationship with food and the meaning it held for them.

3.1.1 Diverse lived experience

Daily routines, practices and longer-term habits were seen to be influenced by a complex mix of individual constructions about food, broader socio-cultural influences and external situations. Major themes are highlighted below to demonstrate the diversity of participants in their pre-intervention situations.

a) Poor choices under pressure

Several participants indicated their stressful, hectic life/ work situation which impacted food choices and made healthy eating a low personal priority. Jan, a solo mother with several children, working full time with an extremely busy schedule, recognised that her daily intake pattern was not ideal.

> *Mine's relatively simple. I have absolutely awful eating habits and relationship with food. So essentially, I get up, I'll have a cup of tea before I have to take my kids to school. ….Then we go via the McDonald's drive thru so I can get a coffee. [Jan, female, 35-44yrs, NZ Euro, A1]*

Her typical pattern was no food until the evening, when there was usually something with meat, vegetables, including pasta with creamy, cheesy sauce, sometimes rice, or potatoes. Eating at breakfast led to hunger which resulted in overeating through the day. Although the older children were learning to cook, a tendency for the ease of takeaways prevailed.

> *But lately, there's been just way too many takeaways. Because I'm just too tired. At the end of the night. The kids are just like, I don't want to cook or we haven't been to the supermarket. So there's not reasonable stuff. You know, I've got a freezer full of meat, but didn't have any, like fresh veggies or anything else like that. So it's just been easier to get on my phone and order Uber eats. But that's not generally how we want to.... [Jan, female, 35-44yrs, NZ Euro, A1]*

Jan felt that unfortunately, she hadn't set a good example to her children as they generally didn't eat breakfast or lunch. Despite ensuring a stockpile of food, due to Jan's early food trauma arising from her relatively poor background, this stockpile wasn't necessarily liked or eaten by the children.

For Lyn, a young mother of two young children, working full time, food was of low interest. She mentioned she had social anxiety and very irregular eating patterns:

> *Oh, (XXXXX Partner) and I didn't usually eat breakfast as a rule. We'll just have a coffee and he'd have his energy drink or whatever. And then we'll just go to work. I'll maybe eat a few crackers throughout the day. And then I'll come home and make up the kids dinner, and … …..It's more me trying to remember to eat something at the end of the day, because I'm so tired. [Lyn, female, 25-34yrs, NZ Euro, B2]*

Several other participants depicted their current pattern, which they recognised as unplanned and unhealthy, due primarily to situational factors in the nature of their employment (e.g., shiftwork, unpredictable hours).

But we're at work as we're eating all the time. Like people always bring food or there's events or things like that. So it's, you know, like savouries and sausage rolls or sandwiches and cake, and cupcakes and stuff like that…..I've got a bad habit of snacking, you know, during the day and evening, and sort of all the time. ….we have been terrible, like if we've got days off, or usually I do shift work otherwise, there's really no routine with eating or meals.[Trudi, female, 45-54yrs, Samoan, A1]

b) Knowledgeable and proactive

In contrast, a segment of participants was alike in perceiving their existing knowledge of healthy eating to be reasonable but were not always able to maintain their implementation of healthy consumption practices. They were working on building nutrition knowledge, seeking validation, and wanted to address their health conditions using the latest knowledge/ science to better enact change.

You can read a book saying, dairy is the devil, and then you can read another book that it's like, every study to prove it on 'Oh, this is, you know, reduces heart disease'. So, I was kind of reading opposite ends of the scale, and I'm just like, what do I believe and what works for me? [Grace, female, 45-54yrs, NZ Euro, B2]

c) Passionate about food

An enjoyment of eating was a defining way of relating to food for some participants. For example, Sue saw herself as a food connoisseur favouring shopping in farmers markets for organic produce, a love of camembert cheese and wine. The high food involvement was evidenced by spending time in kitchen shops, cooking classes and subscriptions to women's health/mind and body journalism.

My chiropractor is really good about talking about healthy food and other bits and pieces. So there's, a whole lot of places that I just pick information up from, and also you're talking to friends as well, who are all interested in food. [Sue, female, 55-64yrs, NZ Euro, A1]

Also a food lover, Len held a strong meat attachment and an even more indulgent attitude to food:

I buy meat in bulk, I like working with meat as well. I make my own sausages and cut my own steaks, and then we buy maybe 10kgs of chicken breast and I will cut it into cubes… if we have a barbecue, we always do sausages, and three different kinds of meat, sausages, pork and lamb and steak……I don't only love meat, I love fatty meat…We also eat a lot of cheese, we eat cheese with a lot of stuff. We also have a sweet tooth, if we buy a slab of chocolate, its not for the week, when its open we'll just finish it at the same time [Len, male, 55-64yrs, other, A1]

d) Emotionally obsessed with food

Long-term issues with overweightness and obsession with food were central in some participants lives and were enacted in their self-identity regarding food. This pattern, mostly described by female participants, led to poor food choices such as easy, fast and convenient options. The typical emotional eating pattern was articulated by Wendy:

I've been overweight for about 10, maybe more years. As a fat person I can look and I know where I'm going wrong. …. It's just, I've tried every diet, and done every craze, and I just sort of give up. I think I'm a moody eater. And I don't like that many foods. I'm a little bit fussy. So when I do like something, I go overboard with it….And its never one or two like its always a lot,

> *I've got to have a lot. Yeah. A packet of biscuits. A bag of lollies - the whole bag. It's pretty shocking. [Wendy, female 35-44yrs, NZ Euro, A2]*

Brenda described herself as obsessed and thought about food all the time. This spiralling out of control pattern came from an emotional and complex need for satisfaction from food.

> *Sometimes I have a really strong urge and I can't it explain it.... and then I justify it. Like because there's no reason to be a piglet like that, but I do. And then I'll just eat it. You know, all the time... I have to have...just something sweet. [Brenda, female, 55-64yrs, Other, B2]*

There was an emotional love/hate relationship, where food was seen as an enemy. They theorised often over the source of their lack of control in situations, and even felt sabotaged by shopping in supermarkets. Within this way of thinking, there was a tendency to describe food in terms of its temptation power and these participants were often searching for a better way of obtaining control. Freda had formed strategies to overcome her lack of control and exercised excessively as she had not recently been able to lose weight.

> *Well, I am a food addict. So I have to be very careful. Now. I had sugar last week. It wasn't good. Nearly poisoned myself….You got to know that when you get your next hit. [Freda, female, 55-64yrs, NZ Euro, B2]*

These participants often reflected on the way their mind and body were 'separate' in the decision making, and that the mind was not behaving due to the influence of the body signals.

e) Culturally influenced patterns

Several participants of Asian/ Indian heritage discussed their own historically derived socio-cultural patterns, involving consumption of large amounts of staples, such as white rice or noodles.

> *I always add white rice and steamed rice and then serve this dish. In typically Asian food and Chinese food we use sauce and there's oil... cooking oil and... soy sauce or some pepper or salts and introducing ginger, onion…From my culture, I need a big bowl of noodles in order to survive the whole day. [Pete, male, 55-64yrs, Chinese, A1]*

Pete was interested in making changes to eat more healthily and follow a Western style diet as the options he typically saw around his work locality, such as steaks, fish and chips, weren't considered as healthy. Rodney wanted to bring a more western style of eating into his household, being inspired by the preferences of his young son.

Included within the Māori interviewees was a larger extended whānau of three generations. There were varied individual patterns oscillating between being '*on the waka'* and eating healthier meals, and regular meals of steak, eggs and chips, roast dinners, takeaways, diet drinks and alcohol drinking at home. Mealtimes and duties were shared and central to the whānau as a time to catch-up at the end of the day. There was little breakfast consumption apart from the younger children and a fried breakfast in the weekends.

3.1.2 Existing views on healthy food and lifestyle

Virtually all participants, when asked to comment on what constituted healthy food/ eating, discussed the importance of vegetables and fruit, as well as having a balanced intake, and lower intake of processed foods. Within this discussion in general however, there was often a lack of knowledge

about portion control. Although participants knew the genre of foods they considered healthy, they struggled to feel confident to make a significant and meaningful change in implementing new habits.

The perception was also held that healthy food is expensive, becoming more unaffordable and of declining quality. Intending to do more exercise was a common thread and seen as a very important part of an overall lifestyle improvement, but across most participants there was procrastination and even a reluctance to start due to one's current standpoint.

> *So I'm not going to go and try and get into it because I'm too unfit, in which case you get unfitter, which means you're not going to keep going and so it goes on. [Trent, male, 35-44yrs, Other, A2]*

3.1.3 Motivations for joining the HRWP intervention

The HRWP study was widely publicised in various New Zealand media channels in July 2022 and received considerable interest. The overriding motivation for our participants was to address issues with personal health, both in general and as it related to a specific health indicator (e.g., raised blood pressure, high cholesterol) arising from a GP visit.

> *Because I wanted to do it for my health. I spent many, many years taking my health for granted. I mean, one day, I suddenly had high blood pressure. [Brenda, female, 55-64yrs, Other, B2]*

> *So it was it was a combination of things. It was poor health. My doctor said that I had high cholesterol. So I needed to start rethinking it. [Oscar, male, 35-44yrs, NZ Euro, B2]*

There was a recognition that age was a factor in their declining overall health:

> *Because of age, I think the 60s, it has taken me a year to sort of grasp that I really am in my 60s. And so sadly, you know, all of the health stuff, that isn't as good as it was. [Philippa, female, 55-64yrs, NZ Euro, B1]*

In several cases there was a sense of serendipity, where their recent awareness of issues (e.g., high cholesterol/ blood pressure) coincided with a desire to take action and make changes:

> *It was referred by my friend in a We chat group. And then because I have got high blood pressure from my dad and also my cholesterol is quite high. A couple of weeks before I hear about your program, I've done a blood test. My cholesterol was really high. It's kind of to the danger level. So my doctor tells me I have to change my life, otherwise, I'll be having trouble. So yeah, heard about your guys program and I joined up, which came at the perfect timing. [Rodney, male, 35-44yrs, Chinese, B1]*

For Kristina, post-menopausal, and overweight, there was sadness regarding the way the state of her health impacted her life:

> *But I was just feeling really, really down about my health, and suddenly, it was serendipity that I read this on social media. And I thought, Yes, I know that I'm pre diabetic, or, my cholesterol was getting high. I'm on blood pressure pills, all of these things. But I didn't want to feel like my life is... I needed to make changes. [Kristina, female, 55-64yrs, NZ Euro, B2]*

For some, the potential to lose weight was a strong and overt motivation. This was often discussed as a health-related concern but this co-existed with an underlying desire to improve appearance/self-image, especially if going on holiday.

> *It was a friend of mine. She was already on it. And so she told me about it . She has always been commenting about, yeah, how overweight I am. And stuff. Yeah, not eating healthily. And this seemed like as like a great opportunity to just try to change something. [Eva, female, 45-54yrs, Other European, B2]*

The opportunity to receive a supply of healthy food at a time when food was becoming more expensive was a drawcard for study participants. This was overtly discussed as a primary motivator by seven participants, and alluded to as a bonus by several others:

> *And to be completely honest, one of the appealing factors was oh, look, they're going to feed us for three months potentially. Yeah, because at that stage, I hadn't really thought about the dietician access that we now have. [Ben, male, 44-55yrs, NZ Euro, B1]*

Participants were also influenced by the desire to make lifestyle changes with a "*kick start*", "*grabbing the bull by the horns*" in a radical way that they believed they couldn't self-implement. For Len, the motivation was strongly and emotionally felt, and sanctioned by the extended family:

> *We've got a granddaughter that's a year and four months old now. And my younger daughter actually gave me a bit of a dress down and said, Listen, we want you there for XXX in years to come. ……..And I think that also made me realize our lifestyle is not impacting only us. It's impacting other people as well. [Len, male, 55-64yrs, other, A1]*

Jackie [55-64yrs, Māori, A2] was hopeful of losing weight for an upcoming holiday but was mostly searching for the means by which her extended whānau could consistently learn to eat better. Being involved in a research project from a sense of altruism was also expressed by those looking to improve long term poor eating patterns.

> *But I do find research fascinating. And if my bad habits or lifestyle choices can, you know, help others to not be like me and that, then I call it a win. [Mary, female, 25-34ys, NZ Euro, B2]*

3.1.4 Expectations re the study

In general, participants reported both excitement and apprehension at the commencement of the intervention at the opportunity to learn new habits for the entire family. Len was excited about the food and trying new flavoursome recipes and approached the challenge positively. Trent was hopeful that, as an overweight male, there would be more helpful support from likeminded participants he could identify with.

> *Plus, I think the support of the Facebook group that's been set up, and I'm hopeful of that support... I won't be the only guy in there with probably, you know, slightly overweight and needing to do something about this. [Trent, male, 35-44yrs, Other, A2]*

Others expressed their apprehensions about the types and quantity of foods they might receive, and some had complex concerns about their own capability to adhere to the trial requirements.

> *I have hopes, that I'm going to learn to eat properly, and learn good habits. If anything, come out with different ways of doing stuff, but no expectations because it's food, you know!.....I am*

> *worried. I hate seafood. And I I try not to be fussy, but that's why we eat limited….There are a few food phobias. Or I'm worried that because I know it's all about healthy portions and healthy living and stuff. But we eat big, you know, like, I'm so worried that I'll fail it before it starts really. [Wendy, female 35-44yrs, NZ Euro, A2]*

> *The only one only thing that I'm a bit worried about, is actually being able to do the breakfast, lunch, dinner snacks type thing. Because that's not really me. [Jan, female, 35-44yrs, NZ Euro, A1]*

Jan also held concern about the compliance of other family members.

> *I'm not sure. I think they're annoyed that they have to keep filling out these surveys. Trying to get them to do something. So we received another one yesterday as well. But my week has just been so hectic, they haven't done it yet. And the older boys aren't home and my 12 year olds asleep..... [Jan, female, 35-44yrs, NZ Euro, A1]*

The Group A "On hold" Experience

Group A participants provided contrasting insights into the way the randomisation, and the subsequent 12 week wait for delivered foods, affected their experience. For some there was a disappointment about the wait, after the initial excitement of being included, given their poor existing diet and some concern at their initial health results, such as Sue who cited she had been given a 48% fat reading.

> *I can see why, but, you know, it's just, it's just a little bit disappointing. You know, you get all excited about it. And wait for three months. [Sue, female, 55-64yrs, NZ Euro, A1]*

Others saw it as a way to become more mindful before the intervention foods arrived and started preparing, although they had been instructed to eat in the usual manner.

> *Even though I'm in the carry-on-as-normal group, I've been more aware my weights going up. And I'm just like.. you know, just because I'm in a control group doesn't mean I should be not allowing my weight to continually increase. So I've been trying really hard to monitor what I'm eating and just keep on trying to be, being mindful of that [Trent, male, 35-44yrs, Other, A2]*

3.2 Part 2 – The food intervention experience

The food delivery phase was a time of adaptation for participants on multiple dimensions. Overall, there was an early enthusiasm and excitement about the initial deliveries for virtually all participants. However, marked differences between participants emerged in this phase:

3.2.1 Honeymoon phase - The food delivery effect

The weekly food boxes were well received by most participants for several key reasons:

a) Flavour/ food enjoyment

The high quality of the food, the flavours, especially in the My Food Bag™ (MFB) evening meals, were widely commented upon in detail and this added to the desire to adhere to the foods being received.

> *It's a flavor upon flavor upon flavor upon flavor. It's flavorful and I'm also nearly in MasterChef. And this was just to die for. Oh, this one here we had to put a whole grain mustard on the base. Ah, it was delicious. [Freda, female, 55-64yrs, NZ Euro, B2]*

Where some vegetables had been previously termed 'boring', the MFB recipes added excitement from the quality and flavour, and meant the salads were more easily consumed as part of the main essence of the meal. The individual nature of taste meant preferences varied greatly and in cases there were polarised views (e.g., haloumi). Where items were disliked (typically prawns and tofu) there was generally an openness to trying them and to work around the dislikes.

The Sea Dragon Fish Oil inclusion prompted discussion and opinions were very much divided, mainly due to the taste. A small number attributed the product to providing direct health benefits, such as relief of joint pain. Many commented on their dislike of the taste but found ways to incorporate the product into smoothies and salad dressings.

> *Even the cat doesn't want to lick the spoon afterwards. But that's okay. So it's a matter of having a coffee straightaway. [Colin, male, 45-54yrs, NZ Euro, B2]*

> *Yes the fish oil I take regularly every day, and my boy, but you know my parents in law they don't get used to all that stuff. But because I come from South of China, so I quite like fish. [Rodney, male, 35-44yrs, Chinese, B1]*

However, whilst recognising it as a beneficial inclusion, many participants stated that they didn't utilise it.

> *Yeah, we've all kind of had a go and stuff. And I just don't know that there's a way that we can. And it's kind of it's quite disappointing, because I can understand how beneficial they are. But we just couldn't get past the taste. [Grace, female, 45-54yrs, NZ Euro, B2]*

b) Stress reduction around mealtimes

Another benefit of the intervention boxes was convenience and having the immediate availability of the meal ingredients. This took away the need to think about what to have, which made planning healthy meals easier, shortened time frames (often less than 20 minutes) and also added engagement. Family members across generations could be involved in the preparation and decision making.

> *My parents in law do the majority of cooking, in the morning we just tell them what kind of ingredients you need. What kind of process, and they just do it in the afternoon and then when we get home we can have meals straightaway. [Rodney, male, 35-44yrs, Chinese, B1]*

Several busy mothers commented on the peace of mind that this brought, the savings on food spending, and the avoidance of the hassle and the unhealthy temptations found in the supermarket.

> *I was.. utterly confused in my repertoire that used to be very basic, and …..my food was getting boring, but even I think the biggest bit was the fatigue and it's like….get something ordered in. …So there has been a big, big change for us, I knew within a few days that, that I will be continuing with it because it just has just taken so much mental energy. [Grace, female, 45-54yrs, -, B2]*

Maureen with a large, older teenage family, valued the flexibility of the evening meal boxes.

We have partners turning up or other people coming. I just added a little bit of extra chicken mostly because it's what it is, or extra vegetables. And it's going really well. Most of our meals used to be rice pasta or potato, the main bulk of it, and meat and it's so good to change that and having our main bulk being vegetables. [Maureen, female, 45-54yrs, NZ Euro, B2]

c) The awakening of possibilities

Participants were often surprised by the variety and large amount of food available. They were encouraged that their overall intake would not be as restricted as expected from their previous beliefs about dieting. Examples of new, previously untried, but now well received additions were discussed such as tinned lentils, chickpeas, quinoa and bulgur wheat, which were appreciated as new ways to include staples for adding bulk to meals:

The bulgur wheat, the things that I haven't tried before. Just all the super grains and things which you don't see a lot of in the supermarket. You walk down an aisle you see the white spaghetti or white rice. So yeah, that has changed our view on really what has filled yourself up, and we will be using them in the future for sure. [Tess, female, 55-64yrs, Other, B2]

Excitement about preparing and cooking vegetables that weren't previously considered, was common.

But I mean, for example, bok choy, I never would have bought a bok choy we wouldn't have known what to do with it. [Owen, male, 45-54yrs, NZ Euro, B2]

The smaller amount of meat than habitual consumption was frequently mentioned but, in the main, participants adapted well because of the overall flavours obtained throughout the meal. The re-introduction of breakfast was seen as a beneficial way of starting the day for several participants and was equated with better satiety through the day. Mary summarised the big change from her previous diet and the 'holistic' nature of the experience for herself and her partner:

So actually, there's a lot of food that we've never tried before that we've have had the opportunity to try because it's hard for us, so yeah, I really enjoyed that. It's actually quite good that my husband's actually eating breakfast, because he doesn't have breakfast. [Mary, female, 25-34ys, NZ Euro, B2]

Many participants were laying down completely new eating patterns and thinking about the composition of their meals. For Oscar, who had a deprived background with low food security and limited foundational food education, there was an immediate learning and strong engagement with the programme. He was excited by the many options now open to him and forged a new relationship with food.

I absolutely love it……I love hummus now, I've never touched the stuff before but now I love it like hummus with garlic. So before, back in the old days ..Weetbix or just toast with butter, peanut butter, like four to six slices because it's just trying to fill me up, coffee about four to six cups of coffee. So I'm down to two coffees a day now. [Oscar, male, 35-44yrs, NZ Euro, B2]

Now, it's completely different. …..before I think having a salad would have felt like an obligation, whereas now it just seems like a really smart tasting thing to do. So I look forward to having a big bowl of salad with tuna on it. [Katy, female, 45-54yrs, Samoan, B1]

Greater family involvement in cooking processes and at mealtimes was frequently mentioned, with family members of all ages engaged in many cases and trying new foods such as tofu.

> *I'm delighted every week getting out our boxes and what's inside them. And I think it's, it's certainly for my husband, he's really learning how to cook. [Kristina, female, 55-64yrs, NZ Euro, B2]*

d) Feeling healthier - positive reinforcement

The observation about the way the foods positively impacted on feelings of wellbeing even after only a few weeks gave positive reinforcement to continue.

> *Okay, so the food is great. At the moment the progress for me is quite amazing. I'm quite surprised, when the food comes I totally changed my diet. I've become more healthier. I'm eating more fruit and I'm actually starting gradually losing weight in a healthy way. I don't feel hungry I don't feel tired now so I have more energy during the days which is quite amazing. [Rodney, male, 35-44yrs, Chinese, B1]*

Weight loss was frequently used as a heuristic judgement for how one was progressing. Donna, who had chronic fatigue, found positive benefits of weight loss and muscle development.

> *So, I lost weight straightaway. Like within the first week, I lost a kg and I keep losing weight. But now my weight loss isn't as much, but I'm assuming I'm probably gaining more muscle because I'm walking more now. [Donna, female, 45-54 years, NZ Euro, B2]*

Better satiety was observed as a strong positive advantage, and the body was described as sending different signals. Sue overall felt "*lighter and freer*", noting that, the clinical team were impressed with her replacement of 3kg of fat with muscle. This fat to muscle conversion was also observed by several other participants, who indicated their surprise in the change despite not doing additional exercise.

3.2.2 Conscious cognitive elaboration

Revealed in these interviews were the changes in conscious and extended thinking about consumption, and what it meant in terms of promoting potential, longer-term changes for some participants. Described often as a reset, participants described a new and more constant and informed engagement with healthy choices and decision-making rather holding a diet focus.

> *It just kind of made a shift. ……When I walk around the supermarket, it's just not just grabbing everything I like, which I have done in the past. I think oh, is this healthier? And, could I make a meal out of this? So it's changed my conscious thinking about foods…….... Yes, having a reason behind it that's going to be more healthy. [Pamela, female, 45-54years, NZ Euro, B1]*

For others, the deliveries were a chance for a reset in thinking from a stale repertoire, or a confirmation that their existing way of eating was on the right path. There was a recognition that a balanced approach meant the occasional treat rather than a restrictive approach.

> *And we've also given ourselves permission to have those things we do enjoy, but we can have occasionally. And I think that is kind of makes things a bit more, easier. [Philippa, female, 55-64yrs, NZ Euro, B1]*

Jackie's extended whānau were shocked at how much meat they used to eat and were now reducing portion size and per week consumption considerably. It was a revelation that delicious meals did not have to take hours to prepare.

The thinking was often highly elaborated in terms of seeking cause and effect relationships and justifications for which foods suited an individual. There was an awareness that the new pattern was affecting the body physiologically (e.g., digestive processes), and participants wanted to more fully understand this with correlations made usually from within 24 hours. Several female participants discussed their experience-based approach to how they were changing internally.

> *Something's happened. My body's obviously much happier. I feel more energetic. I'm certainly size wise going down. And it just feels all very sustainable. …..Like I'm just not hungry. [Katy, female, 45-54yrs, Samoan, B1]*

3.2.3 Challenges faced during the intervention

However, participants indicated different levels of adherence to the delivered food over time and experienced challenges, yet there were differences in the way in which they responded. The most impactful challenges were:

a) The Christmas/ Holiday period

Depending on the allocated 12-week period of the delivery, festivities interrupted the flow for many participants. Christmas was described as a special "once-a-year" occasion, often revolving around family gatherings, eating out, abundant food, gifts and a time for relaxed attitudes and greater indulgence. Most indicated this period was a significant challenge, and strategies were needed, but not always adhered to. The length of the surrounding time period, and the addition of more alcohol, added complexity to difficulties in maintaining resolve. In particular, this led to feelings of unwelcome "guilt".

> *And I felt guilty for eating the Christmas food and I don't ever want I do not ever want myself or my children to have guilt associated with food. [Jan, female, 35-44yrs, NZ Euro, A1]*

A five-week holiday period disrupted the larger whānau's plans, and despite being highly motivated to stay with the intervention foods, a sense of freedom and lack of structure was seen to impact on the commitment. Nevertheless, there were several who conveyed that Christmas was not a substantial hurdle, and effectively minimised the disruptions, and gained pride from this.

> *I carried on with the deliveries, but there were two days where I cheated, and I indulged. But other than that, yeah, I didn't. I didn't, I didn't feel a need to, to go overboard with Christmas with it. So I felt content with what I had. [Oscar, male, 35-44yrs, NZ Euro, B2]*

b) Situations/ life pressures/ illness

Additionally, there were instances of exceptionally busy periods/ unexpected events that disrupted routines. During these periods there was little control over adherence to the delivered food. The administration of the amount of food that arrived in bulk added to this stress in some cases. Several participants shared that they had contracted COVID, other illnesses, or injuries over the period, and this strongly impacted on their personal resources for being able to adapt to the new pattern.

c) Adaptation to new foods

Adapting to an unfamiliar array of foods was sometimes challenging, especially for two Asian participants.

> *Exactly, Yeah. Well, sometimes we just feel some ingredients, they taste a little bit alien. Foreign to us, so we will just taste it – but not really using. Yeah, with my wife, she doesn't really like the smell of the beetroot…. I believe. I'm okay. But she doesn't really like it. Yeah. [Charles, 35-44yrs, Chinese,B1]*

For Rodney, there were generational differences regarding the appeal of the foods. Whilst his young son was positive and encouraged, and Rodney himself liked the fast preparation time, it was difficult for his parents-in-law to adapt to the 'cold' aspect of raw salads, wanting all vegetables to be cooked, so the family produced different meals which ultimately took more time. Others with more traditional western-style habits claimed vegetarian meals didn't appeal as they weren't a real meal. When foods were not liked, pro-active participants persevered from a sense of diligence to the trial and avoiding waste, whilst others disposed of them.

d) Non-compliance from family members

Different and unique family dynamics existed, and the tastes of the younger family members and teenagers tended to dominate and interfere with adherence. This was dealt with in different ways such as preparing separate meals or making compromises to encourage more of a family team effort.

> *Certainly a big change. So much so that the daughter is resisting a little bit. So, but I'm just gonna stick to my guns in saying, well, we're not having the, you know, the 10 packs of biscuits that we used to buy, and so we do buy crackers. Yes. And that same girl is now eating crackers, hummus and cheese, slivers of cheese…..And I'm not sure I could have done it without the whole help [Philippa, female, 55-64yrs, NZ Euro, B1]*

e) Absence of weight loss

Participants who had not experienced change, or had added weight, projected a sense of disappointment that they had not reached their goal, which some had expected as an integral part of the trial. Nikki, of Mediterranean heritage, had followed a similar eating pattern all her life. She expressed her 'weight loss envy' at her husband losing 15 kg on the intervention in contrast to her own reported 1 kg. Because of this she was looking at other possible diet patterns, other than her traditional pattern, to help lose weight.

f) Slipping resolve

Across the participants there was a clear indication of the slipping of resolve as time receiving the food deliveries progressed, and this prompted disappointment. Instances of "cheating" were described but there was also a desire to get back to the better pattern after these lapses. In these situations, participants often blamed themselves and their fundamental conflict between what they thought they should do, and what they desired.

> *I just don't know what it is with me. What's wrong with me?.....I feel I'm trying to be good during the day and then for some reason, that seems to give me license to think, wow. so I think that's where my frustration comes in. [Philippa, female, 55-64yrs, NZ Euro, B1]*

3.2.4 Looking ahead - planning and strategies

As participants neared the end of the 12-week delivery period there was variance regarding how the introduced eating pattern had changed previous daily habits, and the degree to which continuation

was possible using one's own resources. Emotional engagement was an underlying feature of positive plans.

a) Optimistically planning

The degree of self-efficacy gained from the "hands-on" experience led several participants to be proactive in self-organisation processes and forward planning strategies. For several, the extent of changes made from habitual diets had been substantial, and they wanted to put their own stamp on the pattern.

> *So we've got a big planning sheet up on the fridge now [Katy, female, 45-54yrs, Samoan, B1]*

The different continuation strategies included purchasing MFB deliveries in some form (i.e., three meals per week) due to convenience and further reinforcement. They compared brands/ prices and time periods, trying where possible to replicate menus. However, mainly for cost reasons the continuation wasn't always appropriate. Other negative factors for subscription to meal delivery kits included the amount of packaging waste, fit with family size and delivery issues.

b) Something gained - emotional engagement

At the end of the delivery phase, many exhibited excitement, gratitude and optimism about what they had received in the intervention phase.

> *It's like, wow, it's yummy. I'm not missing fat. But you know, sugar. That's gone from my life. Well, sugar appears occasionally. But I've got it under control. And it's like, wow, flavor, flavor. Who said healthy food cannot be flavorful. And I didn't understand that. [Freda, female, 55-64yrs, NZ Euro, B2]*

For Oscar, a substantial increase in his food literacy, directly from the intervention foods, was a revelation leading to improved self-confidence.

> *Like for me, I didn't have any food prep knowledge growing up. Especially during school. I think the best thing I ever made was scones. So just to know that, hey, this is a cucumber…. Now I know what to do with it. It's not scary. It tastes fantastic……. Like, damn, this is good food. Why did I stick all my life with macaroni and cheese? [Oscar, male, 35-44yrs, NZ Euro, B2]*

Oscar was addressing past personal trauma positively, making positive changes in other parts of his life, and he appreciated the need for self-initiative.

> *I think realistically the whole purpose of the study was to be put on this, and then take your initiative to learn where you can and then go from there. Yeah. I, I guess I didn't have any expectation of like, hey…I didn't expect them to chase me up and make sure I had it every day [Oscar, male, 35-44yrs, NZ Euro, B2]*

c) Something lost - dependence on the intervention

In contrast, some participants had built up a dependence on the deliveries and their structure. For example, Brenda had relished the change in her life through having positive guidelines. She had conducted extensive forward planning, printing out many recipes, but was worried about falling back into bad habits, claiming that good intentions had not previously worked for her.

I think both my daughter and I, we both voiced the fact that we're going to miss it. You're going to miss being part of a group we're going to miss, …I can't think of the correct word, because control is not the right word, but it's about structure, that structure. [Brenda, female, 55-64yrs, Other, B2]

3.3 Part 3: What underpinned ongoing adoption vs non-adoption?

The final part of the findings covers the final interviews conducted at approximately 24 weeks, when participants were operating under their own decision-making strategies. Four different thematic groups emerged from the in-depth interviews. These are contrasted below based on common underlying themes to explain why perceived adoption of the eating pattern differed markedly.

NB: Participants in each thematic group were from both treatments (Group A/B), and support levels (continued support/no support). Demographic differences were not a strong influencer apart from the greater likelihood for females to be in the less engaged groupings, with those with young families being in the least engaged.

3.3.1 Group 1: Passionate and empowered

Six participants were notable for their strong commitment and adherence to the eating pattern. Holding a proactive attitude, they recognised the long-term benefits they could now achieve and stressed their ongoing future interest in improving their health.

a) Motivation – ongoing and personal

In common, these participants were identified as having strongly held, longer-term guiding motivations, which were emotionally derived and well-articulated. All built a strong initial vision aligned to the principles/ trial itself. For example, Len was seeking improved longevity to be present for his new grandchild. Oscar, who had discussed his previous low food security and poor cooking skills, was motivated to build self-belief in an area in which he could be in control and positively learn. He described himself as being on an ongoing journey, wanting to find healthy food as a “relaxed place” he could inhabit.

b) Cognitive elaboration and adaptation strategies

These engaged participants discussed in detail their constant, conscious focus on their eating decision-making. Throughout the day they had a set pattern of processes, incorporated foods, sought a balanced composition of meals, and made sensible snacking choices. For example, Kristina was thinking about changes coming into winter and had sought out ways to keep incorporating ingredients. There was also the ability to self-moderate with an occasional “treats” mentality for favourite items.

Health and wellness were prioritised. For example, Katy was seeking a holistic health transformation of her life and wanted to understand the effects of her eating pattern on her own microbiome.

It's a raised consciousness around everything food. [Katy, female, 45-54yrs, Samoan, B1]

c) Resilience to challenges

Although these participants did face common challenges, they exhibited a keenness to resume the intervention deliveries/ eating pattern and tended to minimise challenges. They instead wanted a relief from heavy, “unhealthy food”. For example, Oscar provided examples of his new cooking expertise in response to not being able to receive MFB when he moved to a more rural area. Grace viewed the HRWP intervention as a stepping stone to the power of diet alone to assist her with chronic auto-immunity health challenges. Kristina, although disappointed to be in the B2 group where support would not be continuing, claimed this made her more determined to succeed under her own regime.

d) Empowerment from the study

Overall, these participants held high trust and faith in the philosophy of the study. They expressed their gratitude and positive interactions with support clinical staff. They demonstrated a high level of self-empowerment and personal agency, remained positive, willingly made sacrifices, and enjoyed the physical and mental discipline. This gave an emotional “snowballing” effect. The link with personal wellbeing was a strong one:

> *I think after time you start to realize how much better you're feeling and it's almost, like, it's just part of your life now. [Kristina, female, 55-64yrs, NZ Euro, B2]*

Len, a self-professed food lover, was pleased and surprised that he was able to maintain his enjoyment of food and flavours. After health improvements, including a return to normal blood pressure and significant weight loss for the family, he was hugely appreciative.

> *We are all chuffed to have been chosen to partake and what we've got out of it and what we are still getting out of it, and I'm sure we will, for years to come, reap the benefits of the decision that we made to go on this plan. Yes. [Len, male, 55-64yrs, other, A1]*

3.3.2 Group 2: Capable and resourceful

A further 21 participants were interpreted as having experienced cognitive learning, continuing to work at making behavioural changes to adopt and integrate the pattern into the future. They claimed to have made mindset adjustments, learnt new skills and new ingredient inclusion, and exhibited adherence to the main principles most of the time, but often using their own adaptations. All seven Māori participants were interpreted to be in this group and their experiences are further detailed in Section 3.3.5.

a) Pragmatic motivations

This group typically joined the trial because of new health conditions (e.g., blood pressure increases) and wanting a refreshment of their current eating behaviours. Habitual unhealthy patterns had developed over time and an impetus to change, new education, guidance, confirmation and boundary setting were sought.

b) Conscious learnings and integration – process focus

These participants claimed new “ways of thinking” and perspectives from the intervention experience.

> *I'd call it practicing the skills that we've been shown and getting used to actually using that knowledge [Ben, male, 55-64 yrs, NZ Euro, B1]*

Although often described as small changes, they found it meaningful and achievable to maintain the basic principles of the new eating style and to integrate new foods directly from the trial experience.

> *So yes, I'll carry on doing this and, because I think after a time you just get used to eating in a different way. I didn't think I ate that badly before but in hindsight, I probably did. But I just didn't know anything different. [Pamela, female, 45-54years, NZ Euro, B1]*

Daily consumption changes such as red meat reduction, increased vegetables, and different snacking were widely claimed across this group, and a new interest was forged:

> *And also we make a lot of soup. Because we enjoy it. So yeah, it's so easy to make, and also to use up leftover veggies or, you know, whatever we've got. Yeah, sort of a financial thing, but kind of like a hobby as well. [Trudi, female, 45-54yrs, Samoan, A1]*

Robert of Indian heritage, previously with a heavy reliance on white rice, made his own substantial changes to his family meal composition, always now including leafy greens, and had moved his focus to exercise using an Apple Watch to help monitor physical progress. Pamela, who was a busy health worker, commented that she was no longer "*shoving food in*" and was trying to learn to eat more slowly and mindfully to include fruit and vegetables. Several discussed the conscious process of making affirmations, and creating policies, such as "*we don't eat takeaways*". Consistency was crucial.

> *Well, I have learnt that my health just doesn't happen. I think it takes, like time and work in a plan. You have to be more mindful, and focused on it, rather than the sliding situation, I think it's sort of taught me that, you really have to be consistent and focused. [Philippa, female, 55-64yrs, NZ Euro, B1]*

Donna, on a modest income, felt she had gained detailed knowledge and a simple plan for going forward by covering the basic pattern, making an effort to source cheaper fruit and vegies as well as growing her own, adhering to a strict list (i.e., no alcohol) and checking labels.

> *I'm now thinking of it as different options. I don't have to starve myself. And I don't have to count my calories. If I just pick the right options that don't have added sugars don't have the bad oils. I'm going to be better off you know, just without even worrying about anything else. I'm finding, just have non processed food or little processed as possible. Right. [Donna, female, 45-54 years, NZ Euro, B2]*

She was, however, critical of the MFB meals, viewing them as too gourmet, designed by chefs, and not practical for people like her. She was able to overcome this identity conflict because she felt the benefits and was able to adapt and develop her own resources. When situations, doubts or lapses occurred these participants were able to resume intentions and held an impetus to regather.

c) Family support

In common, these participants were assisted by family/whānau and there was typically a mutual, iterative conversation about commitment to the study. Philippa's daughter joined the interview to voice support for helping her mother, whose blood pressure issues had been picked up by the clinical team and were being managed.

> *Like my (daughter) sitting here. She's saying that she's tried new foods and probably wouldn't have done that before. Yeah, that's been kind of eye opening for her. Cooking as well, she's enjoying. So helping mum. And the balance of it all, what you need and what you don't need. I*

> *don't eat nearly as many biscuits either. No. Oh, man. She's saying that she's cut down the biscuits as well. [Philippa, female, 55-64yrs, NZ Euro, B1]*

For Jackie's large whānau, things had 'drastically' changed in meal planning. Joint decision making continued, and there was high excitement in what was being prepared each evening for the shared table. Family members took turns in selecting two meat and three vegetarian meals from their saved recipes.

3.3.3 Group 3: Challenged – emotionally and situationally

A further seven participants were interpreted as introducing subtle changes to their overall eating patterns. However, notably, they were now oscillating and reverting to their original pre-intervention patterns. On a roller coaster ride, they found challenges harder to respond to in making the leap to self-maintenance. Conflicted between good intentions and actual behaviour, they often became overburdened with their existing life situations/ personal difficulties, and in some cases the HRWP intervention provided additional stress.

a) Motivations or hopes – outcome focus

Initial motivations to join the intervention tended to be vague, sometimes centred around obtaining "free food" and "giving it a go". Underlying these overt motivations was a desire for weight loss as an outcome. There was often a hope for something to happen, combined with self-doubts and a fear of failing.

b) Lowered resilience and resources

Many different situational challenges and pressures to ongoing adherence were discussed and in common they were not always able to resolve them using their own, often drained resources. The busy nature of their regular work routine meant some found it hard to plan and organise. For Mary, the intervention deliveries had been a time of reprieve for having to think about meals, but now life was challenging. Without the convenience of the deliveries, there was now a desire to return to what was easier and liked, such as Chinese Takeaways.

> *And then not having delivery is just like, well, I don't know what I want to eat….It's probably definitely time but it's also like a stress thing and motivation. At the end of the day, I just want to like, chill for a couple hours before I go to bed and I wake up and start the whole routine again. [Mary, female, 25-34ys, NZ Euro, B2]*

For Brenda, who described herself as "*exhausted*", meal preparation was an effort after a busy day, and despite extensive planning, she found the implementation caused too much emotional effort. She missed the control she had found earlier and struggled with self-accountability.

> *To me, it was almost like a set of rules. We've given you this, we'd like you to do this. So therefore could you stick to it? So we did. That's gone. The set of rules have gone. Although I know the rules. Now I call them rules, because I think that's the best way I can relate to them. And I can do what I like. [Brenda, female, 55-64yrs, Other, B2]*

Lack of family commitment was the reason Maureen had trouble maintaining the pattern. The busy household of teenagers had 'endured' the intervention period and were now glad that the food delivery phase had ended so that they could get "back to normal". This meant cooking separate meals for herself and given time pressures this proved difficult. Similarly, for Eva, the intervention had been a

nice interval, but she was lacking motivation to keep going, reverting to previous patterns of meals that the family liked.

For Wendy, the central justification for not following on was the price of fruit and vegetables which made it hard to adapt to the new pattern due to her limited resources. However, Wendy also revealed her complex and negative relationship with food including impulsivity and preference for eating a narrow range of options.

Although participants in this group appeared to know what healthy eating meant, and held good intentions, a dependence on the intervention phase had occurred. There was a desire to replicate exactly the tastes of the MFB meals. For those with limited cooking skills, failure to achieve this gave a sense of giving up and procrastination.

> *That's definitely part of it. Yeah. Having to figure out how to make this stuff ourselves. We've, tried to emulate it. ….we don't have quite the right ingredients to make it. Like you know, the little packets of spices that you're getting, for instance, trying to like make something similar that's it's coming okay, but just not as good. [Warren, male, 35-44 yrs, NZ Euro, B2]*

Across this group, most of whom were women of menopausal age, there was disappointment expressed at oneself for not being able to sustain progress.

> *Yeah, I mean, I am a little bit disappointed in myself that I'm not continuing. Except for a few little changes. But yeah, I sort of expected that that would. Yeah. [Eva, female, 45-54yrs, Other European, B2]*

For Tess, with complex health issues, the intervention was not the lifesaver she had hoped for. Her descriptions of the daily activities often showed a vague, hoping for the best.

> *Yeah, we just don't know from one day what we're going to do, so we've never really, like we had to plan because of obviously the menus that we would get with us with the boxes. But no, we don't really plan anything…… Like I'm pretty good at not eating breakfast. So I go all day really and then have my dinner. [Tess, female, 54-65 yrs, Other, B2]*

There had been a large weight gain over lockdown, and this was proving very difficult to shift. Despite following the 12-week plan, Tess felt that the intervention eating plan meant they were eating too much, and weight had stabilised. The disappointment was projected onto the design of the HRWP study with negative views about support not available when needed once the delivery phase ended, stating "You *can't just feed people and then not help them*".

3.3.4 Group 4: Disengaged and disappointed

Two younger female participants with young families did not engage well and were unable to integrate the delivery intervention foods into their lives. (NB: although both were booked in for the final post intervention interviews, these were not attended)

For Jan, there was an initial optimism, desire for change, and an interest in being in a research study. However, with a large and complex family and multiple health issues, there was a perceived mismatch between the intervention deliveries and her hectic lifestyle.

> *It really doesn't really fit into such a busy lifestyle. Because I've got such a limited time by the time I finish work to kind of get dinner on the table so it's nine or 10 o'clock when we're having dinner. [Jan, female, 35-44yrs, NZ Euro, A1]*

She observed that the meals required a considerable number of processes and preparation time compared with her habitual cooking style. This put an onus on her.

> *There are a lot of steps in comparison to what we would do for you know you make spaghetti bolognese and it's you fry the mince add some garlic out of the jar. [Jan, female, 35-44yrs, NZ Euro, A1]*

Being randomised in Group A, Jan had keenly awaited the delivery phase but was disappointed with the fundamental style of the food pattern, which she did not consider to be Mediterranean apart from the olive oil. She noted there were limited vegetarian offerings, and was surprised at the number of refined foods, (e.g., white bread). The disappointment stemmed from receiving the Bargain Box variant rather than the MFB delivery, which led to her interpretation that larger families were disadvantaged. She felt the deliveries were not suited to large families and her situation was not like those of other people:

> *I'm the wrong person for this diet [Jan, female, 35-44yrs, NZ Euro, A1]*

For Lyn, who had spontaneously signed up to obtain food, but without buy-in from her husband, who preferred his traditional meals, there was low involvement from the outset.

> *So I'm not gonna lie. It's a big war with the kids. Yeah. I think my partner and I struggle with it in general, just because he's a big foodie. So he likes lots of flavor, and all sorts of things. [Lyn, female, 25-34yrs, NZ Euro, B2]*

Consequently, they found themselves opting for takeout meals instead of preparing the intervention meals. The intervention had become a stressful event in a stressful life.

> *So it's just trying to work it around. Yeah, I think it's a good idea. Just, I think that was some of the meals like you need to be able to cater to what we what people generally like because me and XXX hate fish as a rule. Okay. Yes. So there's been a few and then like tofu and stuff like that. That's a no, [Lyn, female, 25-34yrs, NZ Euro, B2]*

3.3.5 Māori Participants – "fresher and cleaner kai"

All seven Māori participants demonstrated they were generally maintaining on-going changes, learning to incorporate a wider variety of healthy foods and reducing bad snacking habits. For example, where bacon and eggs had been a typical breakfast, now it would include cereal and yoghurt. New types of grains such as couscous and bulgur wheat were loved as an easy alternative to the habitual mashed potatoes, and once again, it was the variety of flavours and ease of creating meals which excited the whānau most of all.

Tane, 25-34years with young children, felt the intervention had made a '*fantastic difference'*, not only from his weight loss of 20 kg, but because of the opportunity for socialising his young daughter about healthy choices from a whole range of foods she wouldn't otherwise have experienced.

Across the interviews, more confidence with salads and vegetables and new favourites such as stir fry rice noodles, meant the recipes had become easily embedded into the daily routines instead of

previous unhealthy staples. There was also the opportunity to experiment with new foods which they weren't financially invested in. From a health perspective, there was a will to continue as the body had got used to eating in this way. Colin (45-54 years), who had loved new types of deep-sea fish, stated: "*It is amazing how vital kai is to your health*".

The financial challenge impacted once the deliveries stopped, but most were proactively looking to grow their own vegetables, be involved in hunting, seek out other channels such as Wonky boxes, and planning weekly meals to avoid waste.

There was a very strong sense of family involvement in planning, anticipating the new flavours, cooking activities and shared meal experiences. The ease of the preparation/ time frame to achieve great tasting meals was a game-changer. Although the larger extended whānau was known to still "*go rogue in the weekend'*, this was now far more moderated and fizzy drinks were no longer purchased. The main realisation was the importance of fully stocking the household each week with more variety, which enabled money to be saved. The family were new lovers of vegetarian meals, now served at least three times a week, including to family visitors.

> *Never in my wildest dreams would have thought I would have loved pea and feta fritters. [Jackie, female, 55-64yrs, Māori, A2]*

However, for Jake, although committed to seeing the programme through to its conclusion and having something to work towards, success was numbers driven and would depend on his long-term physiological results. He was unsure why changes weren't occurring faster.

> *if you don't get the feedback you do wonder what you are doing it for [Jake, male 45-54yrs, Maori, B2]*

The Māori participants were pragmatic when it came to the Facebook and other support offered, recognising it was there if needed, but engagement was not evident. Overall, the gift of kai they had received was interlinked with a greater hope that many other whānau were benefiting from the programme.

> *It's been a win win for our whānau [Jackie, female, 55-64yrs, Māori, A2]*

3.4 Part 4: External study implementation factors

Interspersed across the interviews was feedback particular to the study, including the supply of food deliveries, support resources (including Facebook), clinic visits, and the study design itself.

3.4.1 Food delivery issues

a) Logistical issues

In the early weeks of the delivery roll-out there were instances of difficulties in the timing of deliveries and when to expect them.

> *The only thing is some of the deliveries have been a little bit unreliable. And not knowing what to do. Like, the first week, our Supie box didn't arrive. So I thought I had to go and buy food. So I did. And then it arrived. I mean, okay. Yeah, we've got too much. [Brenda, female, 55-64yrs, Other, B2]*

Being informed about what items would be arriving in the Supie boxes was put forward as a suggestion to help planning, rather than dealing with the random nature of inclusion, such as two or more loaves of bread one week, and then none in the following week.

In the early part of 2023, difficulties with food delivery logistics, mainly for Supie deliveries, were common, such as boxes not arriving, or notifications not received. In most cases, these logistical issues were understood as attributable to the supply chain disruption occurring at the time, and participants acknowledged as they were not paying for them, they did not want to be seen to be complaining.

Whilst most participants were very positive and complimentary about the overall nature of the foods, especially for MFB, mentions were made of sub-standard food, which on delivery was not fresh/ rotten. In one case shellfish foods were delivered where a family member was allergic. Typically, again our participants appeared to try to overlook these as inconveniences but were personally affected by wastage and needing to replace food items. Some did vicariously observe others complaining on the Facebook chat groups and wondered at the extent of the difficulty and how others were coping.

b) Over generous supply

Another commonly observed aspect of the delivery service was the very generous amount provided. Virtually all participants agreed they received more than enough to cover their weekly requirements and were not needing to supplement at all. Leftovers from the evening meals tended to be used as lunch options. Where possible, extra food (e.g., tinned lentils, chickpeas) was stored in the pantry for future use, or otherwise given away or thrown away with some regret noted.

> *Don't get me wrong. It's great that, you know, having food supplied…if we don't like certain things, we just won't eat it. And or there's previous from the previous week. So, we're found a surplus every single week. Yeah, it's kind of building up in the fridge…and we've only got like a small tiny fridge like a little two person...[Mary, female, 25-34ys, NZ Euro, B2]*

Many participants also noted the repetitive nature of foods received, especially in the Supie Box, and mostly concerning the fruit (e.g., gold kiwifruit) received. This lack of variety surprised and lowered the excitement over time for others.

3.4.2 Study design / support

The interviews showed some divergence in views about the support received across the phases of the intervention. Most participants were very complimentary about the overall support experience, including staff interactions, agreeing that it was compatible with expectations for a trial of this type.

a) Support expectations

Those with greater personal resources who had been successful in adopting the new patterns had found the wrap around level of support good when needed but had acknowledged that it was really about the need for self-responsibility.

However, several others commented that they had wanted to see the support increasing once the food deliveries had stopped, rather than stopping during this phase, as this is when they most needed it. Some appeared worried about how they and other participants with lower resources would cope, and that support had only been superficial. They were uncertain how ongoing tracking might work and felt they had not had enough feedback, motivation, or moral support and encouragement.

> *They've given you food to keep you going and then from then on, it's all up to you, it's all down to you. And good luck sort of thing. I was under the impression someone would check in weekly and see how things were going. But there was none of that. So it's been like sort of left your own devices.. But there's no real talk about how it's making people feel or, you know, yeah, or encouragement or support from each other. I don't feel any of that. [Tess, female, 55-64yrs, Other, B2]*

Details about healthy snacks and drinks was not thought to be available.

> *I think it would have been good to have some more information about what we should be eating in day to day life when we're off the diet….. Like they've never told us what drinks to have or what to swap anything out for. We have Coke Zero, but we're not cutting out the alcohol completely. Right. So you know, probably advice around that would have been good. [Donna, female, 45-54yrs, NZ Euro, B2].*

> *And not everybody wants to have fruit at every snack. So, I mean, again, me buy the wheat crackers something and Okay. Okay. Brown rice crackers. wish we'd had ideas on that. [Freda, female, 55-64yrs, NZ Euro, B2]*

The “one size fits all” generic approach bothered some, and Sue wanted to see more cutting edge advanced personalised science and detail about her own progress to guide her in the future. Several participants indicated they would have liked more direct face to face contact such as personalised emails and phone calls to be able to ask questions and to discuss changes with someone.

b) The Facebook experience

Many differences were evident in engagement and ways of interacting with the Facebook/ Messenger chat group. This was dependent on general familiarity with Facebook as a social media platform, ability to access the chat group itself, and the dynamics of the particular chat group encountered.

On one hand the chat group was a highly engaging communal part of the experience, where one could follow different people at different stages and see them gaining from the experience.

> *Yeah, those things are really affirming and, and you think you're part of something bigger, you know, that we're all going through this together …….with people coming, joining the group and then dropping out of the group, as time went on, you were aware of certain personalities And it was really lovely. When people would say, that tried something new. And it was it became the new favorite or something. [Kristina, female, 55-64yrs, NZ Euro, B2]*

Many participants commented on the helpfulness and responsiveness of the facilitator. Some participants became actively involved and wanted to constantly share, and genuinely missed the community when the support finished, one even trying to avoid being “unfriended” by staying in the background.

Most of the participants commented that they felt well supported and whilst they were aware of the additional support from the platform, and found it helpful to look at it, they were passive users and gave the impression that it was not a major source of support, often commenting they were “*not a Facebook person*”.

For several there was an initial confusion about the Facebook page and the Messenger chat group, and it was only towards the middle or end of the intervention when they found the resource and were

subsequently overwhelmed by the comments. The negative valence of some chat groups was observed:

> *I can't be bothered with people who are moaning about the food. I mean, for God's sake. But there's nothing Oh, they moan if it's bruised, or if it's a day late or a fall, right? Yes. I just I can't be doing that. So I have to go on there and say nice things. [Philippa, female, 55-64yrs, NZ Euro, B1]*

However, there wasn't always time for a full commitment to all aspects of the Facebook support.

> *But for somebody like me, I'm often just quickly scrolling through and I don't have time to sit and watch a YouTube video. So having other ways that link into rather than videos to watch that you can read something. Yeah. [Philippa, female, 55-64yrs, NZ Euro, B1]*

A very common observation was the way Facebook support ended for those in the "No-support" group and that this was unexpected. It was discussed as being "chucked out/ "unfriended". This was observed by those in both groups, and it appeared different messages were spread across the Facebook chats about what support or non-support meant.

c) Clinical staff interactions

Many positive comments were provided about the interactions with the clinical team and their helpfulness. Māori participants commented on the friendliness and genuine commitment to helping whānau on their journey and that this was empowering for them.

However, participants, both male and female, cited embarrassing accounts due to body image problems associated with the DEXA scan procedure, with some not prepared to repeat the scan ordeal again as they felt demoralised.

> *It was like, you know, strip off, put a hospital gown on lie down, get this done. And then, do you want to see what it looks like? you get shown a picture. And then you've got this 20 year old who goes to gym pointing out how much fat you've got on your body I felt really embarrassed. I'm not into body shaming or anything like that. I just think, yeah, people will have different sizes and shapes. But I kind of felt really quite embarrassed. [Pamela, female, 45-54years, NZ Euro, B1]*

Regarding testing results, there did appear to be different amounts of information shared which was often due to the pro-activeness of the participant in requesting details. In common, there was a desire to receive results if possible as an indicator of progress and positive reinforcement, but many appreciated that the design of the study meant these would not be available until the conclusion of the trial.

3.5 Focus groups at 40 weeks

The seven focus groups, held at approximately week 40, enabled insight into participants' reflections within shared discussions about longer term adoption several months post the delivery phase.

As found in the interviews, the ease with which the intervention foods were integrated into differing family situations and existing routines, varied. Participants agreed with and enjoyed the general philosophy of the plant-based eating pattern. For some it was a considerable step change, but mostly

one with which they were able to cope. The MFB experience was generally very positive and the convenience of having a delivered meal service was a very successful method of inducing changes towards the new eating pattern.

However, there were also several who had issues with the food intervention phase itself. For one younger female participant who had received the Bargain Box meals, there was disappointment with the refined white rice, lack of quality seafood apart from tuna pouches, which might contain mercury. She was *"a bit gutted"* to receive Sanitarium peanut butter when others were being sent "*superior*" brands. Another participant, who had family members who were very tall, (e.g., over 6 feet), felt the calorie allowance was too standardised, and the approach was a "*one-size fits all*". She couldn't satisfy the hunger of other large family members but wasn't sure who to contact to rectify this situation.

Views on the Supie box deliveries were mixed due to the randomness of contents, and participants wanted more instructions about how and when to use the foods. Supply issues with deliveries such as lack of freshness, food close to expiry dates, the unevenness of supply, and overabundance of some items were reiterated. There was sometimes guilt expressed if, for example, the fruit could not be eaten. Many focus group participants discussed how they were still using stored pantry items, such as tinned lentils, which they had received in the Supie deliveries. Once again, the response to the Sea Dragon Fish Oil was highly polarised, being very enthusiastically received or disliked strongly.

Key additional findings regarding longer term adoption were:

- As time increased from the delivery phase it became harder for some participants to stay as closely as they would have liked to the pattern. One couple indicated this was just due to their laziness/ lack of motivation rather than any aspect of the trial. Several others had decided to take their own paths. A female participant, who had adopted the Optifast diet for 5 weeks, was recording rapid weight loss, and saw this as a superior method for her, versus the intervention eating pattern where she had struggled to lose weight.

- Other participants had embraced the HRWP pattern fully and as time went on had become evangelical about the ongoing improvements they experienced, making substantial changes, and maintaining them with passion. These included older couples without children, but also those who strongly desired personal change, where the trial intervention was a revelation in making them now predominantly plant based.

    - "*But really, this whole program as I intuitively thought has been instrumental in a huge change in my lifestyle and the health benefits and the mental health benefits are ongoing. Like just the way you live and eat is really amazing….Its been incredible I knew it would be good, but it's actually been really great!" [Female, 45-54yrs, Māori, A1*]

- Ongoing challenges, such as the continuing increases in the price of fruit and vegetables, the winter lull, where salads were not desired, and missing the convenience and high-quality components of MFB continued. However, these were able to be worked around by many with their new strategies. When lapses did occur, participants continued to look forward to "getting back into the pattern" again because of the improved feelings of wellbeing they had experienced. Sadly, some participants faced life situations, such as the death of a spouse or hospitalisation, but were still indicating their underlying desire to make some lasting changes.

- A substantial group of participants felt they were adhering to some degree, but it was not a linear progression (e.g., they maintained 50/50 or 60–70% of the time, with oscillations). They

often regarded changes as “small tweaks” but acknowledged them as important for feeling better overall. Smaller portions and a greater simplicity in meal planning were observed. Most commonly adapted strategies still being implemented were:

  - Higher proportion of vegetables in meals (more salads, more raw vegetables), inclusion of more vegetarian meals, addition of lentils. Increase in fruit consumption (for snacking)
  - Less red meat (frequency and quantity), more chicken meals
  - Regular breakfasts (Just right)
  - Healthy snacks, eliminating sugar, less (or no) takeaways,

- Reflecting on the way long-term changes could be made, several participants noted that the important element was self-motivation and total personal commitment to following the recommendations of the trial. The programme was seen as a long-term adventure:
  - *“You’ve got to be on the bus, you’ve got to buy into this…it’s like golf, if you are going to cheat, you are only cheating yourself” [Male, 55-64yrs, NZ Euro, A2]*
- Observations were made in the focus groups about the overall “customer experience” of being on the trial. Whilst participants were fully aware that it was a large intervention study with different components, and they were trialists, there was a sense that some parts felt dis-jointed. For example, a greater cohesiveness in communication would help.

  “Like the surveys go through one portal, you are meeting a different person at the clinic each week, different people email.” [Male, 35-44yrs, NZ Euro, A2]

- Other frequent comments were:
  - The surveys appeared to be from international universities/studies not tailored for New Zealand, which made them more time consuming to complete.
  - Unavailability of tests/ difficulties in bookings (such as the Dexa scan). Several participants were disappointed in not being able to be scheduled for the follow-up DEXA scan to confirm progress.
  - Interactions with clinical staff members were viewed as very favourable. There were, however, different experiences across the sites regarding the way test results were made available, but this appeared to be due to some participants being more pro-active in asking for updates
  - In terms of personal progress, weight loss remained a target and re-enforcer to keep going and was most proudly conveyed to others as a measure of success. Many focus group participants also commented that they would like to have seen results and get more direct feedback on how they were tracking, for example cholesterol readings. This would give them motivation to stay on track.
- The Facebook chat group support was viewed as interesting to look at and mainly female participants enjoyed the experience, the videos and especially the specific sessions given by the nutritionist, such as how to replicate the spice blends. However, for others engagement

appeared to be relatively low. This was due to the "tone" of some of the chat groups where the conversations were more about supply issues and the chats had become a vehicle for 'negative' commentary by others. Live events were well liked, but sometimes the timing didn't coincide with family commitments. Different experiences across chat groups occurred, but participants liked hearing the experiences of others. Several participants commented that the rolling nature, with different people coming and going, meant they were building a relationship, but it was hard to establish continuity and they wanted to share the experience with a cohort. Once again, the process of being "cut-off", without more explanation, was seen as a negative.

- Several participants couldn't join Facebook due to technical issues, and unfamiliarity with the platform. For example, "*I'm not on social media, not on Facebook, I did ask if there was an alternative, can I email a dietician? Or can they ring me, for support, but they pretty much said, "No, you are encouraged to use Facebook" so I do feel I missed out on their support" [Female, 45-54yrs, Samoan, B1].* This would have been useful for understanding how to use unfamiliar items such as the lentils and Supie Box items. There also did appear to be confusion about the invitation to joining the Messenger group and the role of private messaging.

- Because of the feeling of a lack of connection for some participants, a more personalised, human centred experience via emails or other personal contact was suggested as a means of being updated across the weeks of the food intervention and beyond. Several participants indicated that they had reached out via emails to the dietitians, after the food deliveries had finished, and had *"a fantastic response*". It was suggested that at the start of the intervention a starter pack be given in one centralised place about the resources available, as there were different experiences obtained in this respect, obtained from searching across multiple places.

- Overall, in summarising their experiences, virtually all participants were very positive about the opportunity to be part of a wider health initiative, and greatly valued the opportunity they had been given.

4 Discussion

Existing health intervention studies demonstrate that changing eating behaviour within the family home can be challenging, with differing outcomes for long-term behaviour change (see review by Snuggs et al. 2019). Previous food delivery interventions (Utter et al. 2019; Carman et al. 2021; Vos et al. 2022) have shown participants respond positively to such interventions, and some short-term behavioural changes have been found, although it is often unclear if these are maintained.

Using a social science lens, we obtained insights encompassing individually nuanced psychological factors and broad socio-cultural influences. Whilst change took place for most participants to some extent, and new participant understandings of the healthier eating patterns were widely reported, we uncovered contrasting narratives about their engagement with the HRWP intervention in multiple dimensions.

4.1 What drove successful self-perceived adoption outcomes?

The HRWP intervention took place from very different participant starting points, meaning the experience was absorbed into differing situational 'realities', ranging from those with more abundant resources, through to others with significant life pressures. We interwove these with the key

interlinking themes of self-motivation, emotional connection, cognitive orientation, identity congruence and family support factors.

Positivity breeds success

A full embracement and sense of personal value from the beginning stages provided a snowballing effect for some highly engaged participants. Aligned with self-determination theory (Ryan & Deci 2017; Satia et al. 2001; Teixeira et al. 2012), their motivations for joining the study were often intrinsic, and their involvement brought self-satisfaction and personal pleasure/ self-esteem improvements. These motivations were typically well-articulated and purposeful, and occurred with a sense of trust in the programme and the eating pattern. This led to positive emotions such as excitement interacting with the commitment to ongoing behaviour change. The most ardent participants developed their own favourite recipes, thought processes and new skills, and at the heart of it was a love of flavour. Importantly, the pleasure of food was maintained rather than there being a sense of loss from having to restrict tasty and desired foods.

Having food delivered formed a valuable starting point from which to practice and learn for most participants. Whilst not staying 100% with the recommendations, there was still significant improvement in meal selections, understanding of portion sizes and inclusion of healthful foods, including eating breakfast as a start of the routine. They showed improvements in actively constructing meaning and affirming their healthy eating processes, claiming a new mindfulness or a reset in thinking. Furthermore, in fear of losing the gains already made, sensible strategies allowed realistically for some degree of expected lapse periods.

However, for others reporting lower engagement, motivations tended to be vague and often extrinsic (i.e., outwardly focussed, avoiding guilt, based on negative emotions, or conforming to social pressures). Their cognitive processes were more focussed on an outcome (in many cases weight loss), and their pre-existing situations were more likely to dominate progress and limit engagement. They were more likely to register a sense of loss once the intervention deliveries stopped. When challenges occurred, they were interpreted to experience lowered self-esteem and attribute blame, with less resources available to regulate and stay with the pattern. Having had free access to fresh, high quality nutrient dense food, several participants were unsure if they could maintain this given their budgets, a known barrier to the selection of nutrient dense foods. Interestingly, however, some who had started with very low knowledge, skills and resources were able to claim significant improvements, with the difference being an intrinsic belief in oneself and commitment to change.

Self-control

The way in which self-control was thought about and managed by participants was also interpreted to influence longer term adoption perceptions. There were differences in views on the degree of personal responsibility needed to stay on the plan, with the more successful recognising the need for personal control of their intervention journey, finding empowerment from within their own ability to learn.

Alternatively, others sought structure externally from others, such as boundaries imposed by the trial itself. This group, often with a focus on past failures and body image issues, found it difficult to integrate changes. Often, they experienced a so-called disconnection or conflict between their ‘mind and body’ and wanted to impose control from an external source due to limited internal resources. It appeared that an emotional dependence had been built upon the food delivery and the way it took away the need to think and plan. For some, not being able to duplicate recipes exactly meant a loss of interest rather than a building of confidence, knowledge and self-efficacy (Bogomolova et al. 2018).

These differences, also found by Young et al. (2020) in a weight loss context, derive from Locus of Control theory (Rotter 1966) where the degree to which a person perceives themselves able to influence life events has a profound effect on behaviour. As noted below, this has implications for the way information about an intervention can be tailored to support different control perceptions.

Identity congruence

Grounded in the established literature on food identity and healthy choice (Bisogni et al. 2012), the changing way participants viewed themselves in relation to food and healthy eating habits emerged within the interviews. Most participants agreed with the overall pattern of plant-based eating and began to enact their newfound identities, such as becoming a vegetarian meal eater and/or a sugar restrictor, and self-esteem was built from being on the HRWP programme.

The types of foods delivered were not always compatible with identities, in some cases being perceived as being too gourmet and not seen as fitting those on lower incomes, or conversely viewed as too basic/ containing too many carbohydrates.

For those from different cultural backgrounds, the concept of eating more “western-style meals” was a major change and several Asian participants, because of the experienced benefits, found a way to bridge their thinking and adapt. This was reinforced by younger children in the family who were leading the family food identity from historic ways of eating to a new pattern. Māori participants appeared confident to integrate the plant-based eating style into their regular intake, with the trial enabling a re-evaluation of the ease of creating healthy food. There was compatibility with their established meanings about kai and its role in fostering whānau togetherness.

Family support is everything

As expected, and consistent with previous research including the HRWP Pilot (Conroy & Young 2022), support from others to make healthy food choices remains a key aspect of behavioural change. Multiple aspects of family systems and interrelationships underpinned many of the experiences and behavioural outcomes (Kerr & Bowen 1988). The positive involvement and excitement of family members helping to unpack, plan and sometimes take the lead, added to the ease of ongoing adoption (Utter et al. 2019). In the more successful interventions there were family role changes, improved social cohesion, communication, and a shared commitment about the importance of healthy eating. The examples from the Māori interviews illustrated this collective nature of decision making.

We also observed parents being encouraged by children, and it was important that the motivations for the family were well aligned. Implicit in this was the family belief that positive health change could occur for the index participant by developing healthier meal practices (Pratt et al. 2020; Rothpletz-Puglia et al. 2022).

Distinct from this were participants who did not feel supported, or where family members were taking different paths. In these cases, family factors worked in the opposite direction and hindered improvement in eating patterns which might have occurred if the participant was able to be more focussed on their own needs.

4.2 Implications for future research and practice

Recognition of the value of qualitative research within health interventions is growing (e.g., Raber et al. 2020), and our study has implications for future research involving family-based dietary interventions.

The intersection of emotionally driven motivations, resources and family cohesion were interpreted to underlie planned adoption. Further transdisciplinary research could quantify these factors and be linked with physical health testing data to connect physiological, psychological and social/cultural factors. Other external structural factors outside the home such as perceived economic position and the food environment could be included in a more holistic model. For example, more research could be undertaken to explore how to overcome perceived cost barriers for healthy eating.

Participants were highly interested in personal health/wellbeing changes and wanted direct, personal feedback about their clinical testing results as they progressed over time. Future research could assess the way differently framed information about the impact of healthy eating on physiological metabolic changes may affect longer term adoption.

Future practice (intervention design)

Our research can inform the design and implementation of future interventions to increase engagement/ resilience for those with lower adoption/greater challenges.

The research highlighted very different intervention experiences for segments of participants. An awareness of participant motivations/ needs at the commencement stage could allow for greater tailoring of information and support procedures to suit different requirements. This includes the content of material and its dissemination. For example, some found the general information and instructions easy to follow, others wanted more precise scientific health information, and others found the communications disjointed. Some were highly engaged and pro-active in seeking interactions and accessing the available support and benefitted from the one-on one care and attention with clinic staff, yet others were unclear of what support was available and where to find it.

A central communication platform could be developed in future interventions to allow for a more structured and signposted participant experience across the period of involvement. This could include all aspects such as expectations of the intervention, appointment bookings, questionnaires, ongoing health results, types of support available (including the rationale behind different group treatments), as well as all other resources such as replication of recipes and snack suggestions. Updates on progress (e.g., graphs of progress) were seen as helpful and feedback on more immediate, short-term benefits from diet changes could lead to more engagement, self-knowledge, and personal confidence for participants, rather than awaiting a long-term result.

The types of food and flavours provided were a strong factor in the acceptance of the eating pattern, although many found an over-abundance of some types of foods. Monitoring stocks is suggested to avoid a backlog of items. If possible, further allowances for food preferences and quantities would help suit those with differing practices and resources.

As found in the HRWP pilot, participants were motivated by weight loss and used this as an indicator of their ongoing progress. If unsuccessful, this appeared to have an impact on self-esteem. This suggests the importance of offering personalised, motivational support for helping these participants stay the course to achieve wellbeing improvement. Sensitivity around weight loss discussions,

including the DEXA scan process, is warranted for some participants with underlying self-esteem issues.

Experiences differed according to the dynamics of the Facebook chat group, and protocols for engaging could be provided (e.g., not an avenue for negativity/ complaint). Whilst some became highly engaged with the Facebook chat groups and live sessions, and were motivated by a shared experience, others showed only vicarious interest, or were confused about accessing the Messenger chat group.

Limitations of this sub-study

A limitation of the recruitment process was the likelihood of a self-selection bias. Participants with greater time/ resources/ interest/ engagement were potentially more likely to be interviewed. The recruitment invitation process, including the request for consent, may have deterred some participants who indicated initial interest but then did not confirm interviews. The self-selection process also resulted in more participants being interviewed in the B2 grouping, which may have biased perceptions.

In retrospect, the pre-designed interview schedule could have included more areas for uncovering Māori perspectives based on how connected participants were with their Māori identity.

The report focuses on self-assessments of behaviour and adherence. Although the researchers attempted to build rapport, the nature of the interviewing process and shared focus group dynamics means socially desirable answers may have been given.

Next steps - HRWP Survey

The HRWP online survey of all index participants, which was informed by the interviews, is underway on a rolling basis. Using a larger sample, it seeks to quantify the various constructs identified in this report and will lead to further understanding of their relationships, with a greater representation across the support groups (B1 vs B2).

4.3 Conclusion

The HRWP programme has the potential to make a significant impact on the lives of many people from the ongoing consumption of a New Zealand sourced plant-based eating pattern. Ongoing research from multiple perspectives can help continue the journey on how best to encourage and enhance personal/ family empowerment in the drive for improved metabolic health and wellbeing outcomes.

Applying a social science perspective to health and wellbeing means the recognition of the importance of influencing structures and pathways on a societal, organizational, and individual level, These were certainly identified in this sub-study, further strengthening the intervention. It is clear that behavioural change depends on a complex set of characteristics, for example, personal attitude (cognitive, emotional, behavioural), and essentially, the desire to succeed. Environmental factors, for example, family resources, cultural, social and situational, need to work together. The importance of family support cannot be overstated.

The participants we interviewed overwhelmingly expressed gratitude for the opportunity afforded by the HRWP intervention trial. The newfound, experiential learning as a family group was in many cases a transforming, positive and lasting experience for whānau/family.

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