Delivering on Sustainable FOOD SYSTEMS

A mixed-methods evaluation of the
Nanaimo Foodshare Good Food Box program

Nanaimo Foodshare
"Local Food Matters"

Public Health Agency of Canada
Agence de la santé publique du Canada

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EXECUTIVE SUMMARY

Food insecurity is an urgent public health concern in Canada, defined as the lack of physical and economic access to sufficient, safe, culturally appropriate, and nutritious food to meet dietary needs and preferences. Food insecurity is associated with poorer physiological, mental, and social health. In particular, food-insecure individuals are more likely to suffer from nutrition-related chronic diseases, including hypertension, coronary heart disease, stroke, and diabetes. Seniors (aged 55 and older) are a fast-growing population in the Island Health Region, particularly at risk for food insecurity and associated adverse health outcomes.

This Good Food Box (GFB) evaluation was an initiative facilitated by Nanaimo Foodshare in partnership with the University of Victoria. The GFB program aims to provide access to fresh fruits and vegetables at a low cost to households in the greater Nanaimo area. The GFB uses a pay-what-you-can model ($5, $10 and $15) for a weekly box of fresh produce to improve the health of seniors in the region. The evaluation program consisted of a pre-and posttests completed by program participants, interviews with GFB recipients, volunteers and staff working on the program. Descriptive statistics were used to characterize the data collected from study participants. The pre- and posttest results were analyzed using paired t-tests; Wilcoxon Sign Rank was used for nonparametric continuous variables, and McNemar's test for the binary variables collected. An iterative inductive-deductive thematic analysis was performed for the qualitative data.

Key findings: During the evaluation period, 65 participants completed baseline surveys, and 54 completed follow-up surveys (posttests) 12 weeks later, an 83% follow-up rate. Data analysis indicated statistically significant improvements in self-reported physical health, social relationships, food literacy, and fruit consumption after 12 weeks in the GFB program. The research team also noted that self-reported food insecurity dropped from 61% at baseline to 48% at follow-up, representing a 25% improvement for participants. The qualitative interviews revealed that the GFB improved mental and physical health by making fresh fruit and vegetables more affordable. Many participants praised the convenience of the delivery service for the GFB, the program's flexibility, and the high quality of the produce.

Limitations of the GFB included difficulties with the sign-up and payment process and inconvenient pickup locations. Further, program partners expressed concerns about staffing challenges, food price inflation, and financial sustainability as long-term challenges. These challenges were supported by the interviewees' recommendations, reinforcing suggestions to improve the accessibility, accommodation, duration, and sustainability of the GFB program. Further suggestions for improvement included ensuring more flexibility in the box's contents, allowing for personal choice, dietary and cultural requirements. Finally, participants, volunteers and staff echoed the importance of the overall program, a commitment to enhancing community connection through the continued program and providing more opportunities for community activities to complement the GFB.

Table of Contents

Page N°

List of Abbreviations..... 4

Acknowledgements..... 4

Production..... 4

Citation..... 4

Background..... 5

Evaluation Methods..... 7

Results..... 9

Discussion and Conclusion..... 14

References..... 15

Appendix 1: Baseline Survey..... 17

Appendix 2: Interview Guide..... 30

Appendix 3: Flow Chart of Activities..... 31

Appendix 4: Thematic Analysis..... 32

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This report was authored and produced by Matthew Little, with additional contributions from Ashmita Grewal, Angus Naylor, Carrie-Anne Cyre, and Catriona Addleton.

For enquiries or questions, please contact:

Matthew Little
Assistant Professor
School of Public Health and Social Policy
University of Victoria
Victoria
British Columbia
(matthewlittle@uvic.ca)

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LIST OF ABBREVIATIONS

CCHS	Canadian Community Health Survey
GFB	Good Food Boxes
PWD	Person with Disabilities

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BACKGROUND

Food insecurity, defined as the lack of physical and economic access to sufficient, safe, culturally appropriate, and nutritious food to meet dietary needs and preferences, is a serious public health concern in Canada, especially among low-income households [1]. In British Columbia, 14.9% of all households are food insecure [2]. Food insecurity is closely associated with poverty and disproportionately affects racialized and other marginalized communities, including newcomers and unhoused populations. In addition to compromising dietary adequacy, food insecurity is associated with poorer physical, mental, and social health [3,4]. In particular, food insecure individuals are more likely to suffer from nutrition-related chronic diseases, including hypertension, coronary heart disease, stroke, and diabetes [5,6]. Food insecurity is also burdensome to the healthcare system. Compared to food secure households, annual healthcare costs for marginally, moderately, and severely food insecure households are higher by 23%, 49%, and 121%, respectively [7]. Furthermore, the current COVID-19 public health crisis is further exacerbating food insecurity in many Canadian households [8].

Seniors (adults aged 65+ years) are at particularly high risk of food insecurity, dietary inadequacy, and nutrition-related chronic conditions, including diabetes, heart disease, hypertension, osteoporosis and sarcopenia. The aged population is increasingly vulnerable to health inequities and face challenges of physical disability, social isolation, mental health, poverty and restricted income, and escalating costs of maintaining independence. All of these processes challenge nutritional literacy and accessibility/affordability of healthy foods, reducing the ability of seniors to pursue a healthy diet. Food security and nutrition among seniors is therefore a public health priority in the Island Health region, which is characterized by a large and growing senior population. Approximately 10% of the 794,000 residents in the Island Health region are aged over 75 years and by 2040, the over 75 population is expected to reach 20% [9]. British Columbia has the highest poverty rate among seniors in Canada, and low income is the most important risk factor in predicting food insecurity. Indeed, 11.7% of seniors in the Island Health region were determined to have low income in 2015 based on their after-tax income [10].

Despite increasing recognition of the important role of food in determining health, there are relatively few evaluations of community-based initiatives to improve diet and nutrition that align with a sustainable food systems approach. Programs such as food banks and food coupons are widely promoted by provincial and municipal public health bodies, but such programs rarely incorporate an explicit focus on sustainable food systems [11]. Consequently, there is growing interest in innovative models – such as good food box programs, which typically comprise weekly delivery of fruits and vegetables, often from local producers – and their promotion of health, food security, and sustainable food systems. Such programs may play a crucial role in shortening the food supply chain and re-connecting producers and consumers in a way that centralizes food security and nutrition, community relationships, and sustainability within the food system [12]. Widespread implementation and promotion of accessible food box programs may therefore simultaneously promote the health of people and the health of the planet.

Rooted in an academic-community partnership that included Nanaimo Foodshare and the University of Victoria School of Public Health and Social Policy, our research team conducted a program evaluation of the Good Food Box (GFB) initiative administered by Nanaimo Foodshare. We employed a community-engaged mixed-methods program evaluation study design. Baseline and post-intervention surveys and in-depth interviews with recipients, staff, volunteers, and community partners were used to assess the effectiveness of the GFB intervention. Specific objectives of this research were:

1. To evaluate the impacts of GFB on household food security, dietary patterns, health, and food literacy

2. To conduct a process evaluation of the GFB model, including its reach, adoption by partner agencies, implementation challenges and facilitators, and long-term feasibility

THE GOOD FOOD BOX PROGRAM

The Good Food Box (GFB) is an initiative facilitated by Nanaimo Foodshare that provides Nanaimo and surrounding communities access to fresh fruits and vegetables. The GFB operates using a pay-what-you-can model, in which individuals can choose to pay $10 or $15 for food that has a retail value of approximately $26.50 (as of May 2023). Nanaimo Foodshare purchases produce from wholesale distributors. Customers may order a one-time GFB or a weekly or bi-weekly subscription. At the time of this evaluation, Nanaimo Foodshare offered the GFB program at the price of $5, $10 or $15. The $5 choice is no longer an option as of January 2023.

The GFB program uses three implementation models:

1. Nanaimo Foodshare directly implements delivery (only in Nanaimo) and pick-up, facilitated by volunteers.

2. Community partners can order from Nanaimo Foodshare on behalf of their clientele and subsequently distribute the food boxes. Examples of such agencies include the Tillicum

Lelum Aboriginal Friendship Centre, the Munu Learning Centre, Nanoose Community Services, AIDS Vancouver Island, and Nanaimo Affordable Housing Society.

3. Nanaimo Foodshare partners with community agencies that solely act as a pick-up depot. There are five pick-up locations involved in the GFB, including the Centennial building at Beban Park, Generations Church, Departure Bay Church, Oceanside Community Church, and Vancouver Island University (VIU).

EVALUATION METHODS

We undertook a pretest-posttest (i.e., baseline and follow-up) outcome evaluation, qualitative interviews with participants, and a retroactive process evaluation (survey and interview) with the project team and community partners.

Recruitment and consent

Recruitment efforts were incorporated into the normal promotional activities of the Good Food Box program and included: (1) contacting potential participants through Nanaimo Foodshare and partner community organization listservs; (2) advertisements of the Good Food Box program through social media, radio, print media, and flyers; and (3) direct contact with potential participants at community food events organized by the Nanaimo Foodshare and partner community organizations. Recruitment efforts targeted seniors aged 55+.

If a potential participant expressed interest in the program, an assigned staff researcher contacted the participant to obtain consent by either: (1) emailing the consent form to the potential participant to sign and return; or (2) running through the consent script over the telephone and seeking verbal consent to participate. In either case, the participant was informed of the risks, benefits, and incentives of participating in the intervention and the evaluation. They were also informed of the purpose of the evaluation, data storage and sharing information, and assured that their data would remain confidential. Details on data storage and reporting, as well as contact information for the principal investigator were provided. While all participants in the intervention were asked to participate in the pretest and posttest activities, refusal to participate in the evaluation activities did not preclude eligibility for the intervention activities.

Pretest (baseline) survey

The pretest included a short baseline survey through Qualtrics. According to the preference of the participant, this survey was conducted by either: (1) emailing the participant a link to the survey; or (2) conducting the survey over the telephone, which the staff researcher conducted in real-time and input responses through the Qualtrics system. The survey includes questions on demographics, medical history, barriers to cooking, food security, self-reported health, a food frequency questionnaire or fruits and vegetables, and relationships within the community. Surveys were generated by combining relevant questions from the Canadian Community Health Survey (CCHS) Food Security Module, the CCHS Fruit and Vegetable Consumption Module, and the Food Literacy Assessment Tool for Community-Dwelling Elderly People. See Appendix 1 for the baseline survey.

Running the intervention

Following completion of the consent and pretest survey, the participants were enrolled in the Good Food Box program for a minimum of 12 weeks.

Posttest (follow-up) survey

Any participant who conducted a baseline survey and was enrolled in the GFB for a minimum of 12 weeks was eligible to participate in a follow-up survey through Qualtrics. Research staff contacted participants to conduct the follow-up survey. According to the preference of the participant, this survey was conducted by either: (1) emailing the participant a link to the survey; or (2) conducting the survey over the telephone, which the staff researcher conducted in real-time and input responses through the Qualtrics system. The follow-up survey was the same as the baseline survey.

Follow-up interviews

A sub-sample of participants were contacted by an MPH practicum student for a recorded semi-structured interview over the phone or in-person using an interview guide (Appendix 2). This interview solicited participants' perceptions of the program, its effectiveness, and its structure. Specifically, questions explored the perceived effects of the GFB related to food security, health, social connectivity, connections to community programs, and facilitators and barriers to accessibility.

Interviews with volunteers, staff, and program partners

The GFB coordinator provided a list of volunteers, staff, and community members from partner organizations for additional semi-structured interviews. An MPH practicum student contacted individuals on this list and conducted interviews over the phone or videoconference using an interview guide (Appendix 3). This interview solicited respondents' perceptions on the reach, effectiveness, adoption, implementation, and maintenance of the GFB program.

DATA ANALYSIS

Descriptive statistics were used to characterize the study participants. For nonparametric continuous variables, a paired t-test was used to evaluate differences between pre- and post-intervention measurements. For parametric continuous variables, a Wilcoxon Sign Rank test as used. For binary variables, a McNemar's test was used to evaluate differences between pre- and post-intervention measurements.

Follow-up interview data with participants and program staff and partners were transcribed verbatim and analyzed using a thematic analysis in NVivo 12 [13]. A combined iterative deductive and inductive process was used. Analysis of participant interviews aimed to establish qualitative understanding of facilitators and barriers to usefulness of the program, cultural acceptability of the program, ease of use and accessibility, and self-perceived impacts on social health, isolation, cooking skills, food knowledge, food intake, and health. Analysis of community partner, staff, and volunteer interviews aimed to identify avenues and barriers used to reach participants, effectiveness of the program at achieving its stated objectives, facilitators and challenges to adoption and implementation, and program sustainability.

RESULTS

65 participants completed baseline surveys. Of these, 54 completed follow-up surveys (83.0% follow-up rate). A comparison of characteristics and various measures at baseline and follow-up are provided in Table 2. We saw an improvement in self-reported physical health, social relationships, food literacy, and fruit consumption from baseline to follow-up following 12 weeks in the GFB program. Improvements were also noted in food security score and food security status, although these findings were not statistically significant. Food insecurity declined from 61% at baseline to 48% at follow-up, representing a 25% improvement in food insecurity.

Results from interviews with participants, staff, volunteers, and community partners

We conducted semi-structured interviews conducted with 10 GFB participants, five staff members and volunteers, and five community partners (including individuals working with Oceanside Community Church, the Tillicum Lelum Aboriginal Friendship Centre, the Munu Learning Centre, Nanoose Community Services, AIDS Vancouver Island, and Nanaimo Affordable Housing Society). We identified themes that described participants' and coordinators' experiences with the program. For a full list of themes, key quotes, and recommendations, see Appendices 4 and 5. Here we expand on four prominent themes: (1) facilitators of participation; (2) barriers to participation; (3) perceived effectiveness of the programs; (4) program adoption, implementation, and maintenance; and (5) recommendations for improvements.

- Facilitators of participation

Program **coordinators recruited participants via social media, word of mouth, and at community events** (e.g., farmers markets). **Convenience was one of the major drivers of participation** in the GFB program. Participants appreciated delivery and convenient pick-up locations to reduce or eliminate the need to travel to access the program. The **cost effectiveness of interventions was also cited as a major facilitator** of participation; many participants received the GFB for free or low (e.g., $5/week) prices, and many stated that they would not participate in the GFB program if they had to pay retail prices for the goods. Participants appreciated the **flexibility of the programs and accommodating staff and volunteers** who regularly reminded participants of pick-up days. Finally, the **quality of produce** was a driver of program participation. Participants appreciated fresh, high-quality fruits and vegetables that were provided.

> "It's been wonderful that we don't have to go downtown and lug a bunch of groceries home."

> "With the price of vegetables, especially now, it's really helpful. Because of my complicated [situation], low income. And this gives me a variety of foods. And I wouldn't be able to go to the grocery store and get what I have in that [good food box] for five bucks. [...]"

Table 1: Characteristics of GFB evaluation participants at baseline and follow-up

Characteristic	Baseline no. (%), proportion, or mean (95% confidence interval)	Follow-up no. (%), proportion, or mean (95% confidence interval)
Gender		
Man	11 (16.9%)	9 (16.7%)
Woman	54 (83.1%)	45 (83.3%)
Age at in years	67 (65.2, 69.3)	67 (64.8, 69.0)
Age group at enrolment		
55 – 64 years	27 (41.5%)	22 (40.7%)
65 – 74 years	23 (35.4%)	21 (38.9%)
75+ years	15 (23.1%)	11 (20.4%)
Race/ethnicity		
White	55 (84.9%)	48 (88.9%)
Indigenous	9 (13.9%)	6 (11.1%)
Chose not to respond	1 (1.5%)	0 (0%)
Self-reported health outcomes		
Prediabetes or diabetes	15 (23.4%)	15 (27.8%)
Hypertension	24 (37.5%)	19 (35.2%)
Dyslipidemia	14 (21.9%)	14 (25.9%)
Chron's disease, irritable bowel syndrome, or Celiac disease	8 (12.5%)	8 (14.8%)
Depression and/or anxiety	16 (25.0%)	15 (27.8%)
Iron deficiency anemia	11 (17.2%)	10 (18.5%)
Other vitamin deficiency	8 (12.5%)	8 (14.9%)
Osteoporosis	9 (14.1%)	9 (16.7%)
Food security score (higher indicates worse food insecurity)	1.4 (1.1, 1.7)	1.2 (0.8, 1.5)
Food security categories		
Food secure	23 (39.0%)	26 (52.0%)
Food insecure	36 (61.0%)	24 (48.0%)
Physical health score (1=excellent; 5=terrible)	2.9 (2.7, 3.1)	2.7 (2.5, 2.9)*
Mental health score (1=excellent; 5=terrible)	2.3 (2.1, 2.6)	2.3 (2.1, 2.6)
Social relationships score (1=excellent; 5=terrible)	2.3 (2.0, 2.6)	2.1 (1.9, 2.4)*
Food literacy score (higher score = greater food literacy)	13.8 (12.6, 14.9)	19.3 (18.1, 20.4)**
Physical literacy score (higher score = greater physical literacy)	12.4 (11.5, 13.3)	12.8 (11.9, 13.7)
Food consumption (frequency per week)		
Fruit	5.0 (3.7, 6.4)	7.4 (4.3, 10.4)*
Fruit juice	1.4 (0.8, 2.1)	1.4 (0.8, 2.0)
Dark green vegetables	6.6 (4.3, 8.8)	6.4 (4.5, 8.1)
Orange vegetables	4.5 (3.2, 5.9)	3.7 (3.0, 4.5)
Potatoes	6.9 (4.6, 9.2)	7.8 (5.1, 10.4)
Other vegetables	4.8 (4.1, 5.6)	5.8 (4.5, 7.1)
Total fruit and vegetables	31.4 (23.1, 40.1)	33.9 (23.6, 44.3)

N/R: not reported

*p-value<0.05 based on paired two-tailed t-test

*p-value<0.001 based on paired two-tailed t-test

- Barriers to participation

Some interviewees described barriers to accessing and participating in the GFB program. Participants and coordinators complained that the program had **confusing or inaccessible sign-up and/or ordering processes** requiring computer access, which participants (or prospective participants) did not always have. Two participants lived far from GFB pick-up locations and found the programs to be **inconvenient**.

> "There are a lot of people like, I know this one lady, she just found out she's diabetic. And there are certain guidelines: eat more fruit and veggies, and watch what she has to eat. And she said, things are expensive. And she doesn't have a computer, or a cell phone to get on and even apply [for GFB], you know what I mean?."

> "A lot of our elderly, you know, they don't have a computer, and they don't have a means of doing e-transfers of signing their credit card up online. It's just not an option for them.

- Perceived effectiveness of the program

Most coordinators and participants expressed positive sentiments regarding the benefits of the GFB program, underscoring its effectiveness at achieving its stated goals. Interviewees felt that **the GFB provided access to healthier foods at a reduced cost**. Coordinators believed that **participants consumed more (and new) fruits and vegetables** due to the GFB. Two participants reported they increased their intake of fruits and vegetables as a result of the program, but all participants agreed that the program increased their food access, which alleviated their financial stress. The **program fostered social connection** by facilitating friendly chats between recipients and volunteers, staff, and other participants. Some participants shared the contents of GFBs with their neighbours, and two participants specifically mentioned that the program reduced their isolation and supported their mental health. Participants also felt the GFB program **increased their knowledge of healthy foods and improved their ability to effectively manage their chronic diseases**. Some interviewees believed the **GFB program was less stigmatizing** than other food access programs like the food bank.

> “Everybody's just so wonderful. [...] Yeah, I've really enjoyed it. It gives me a little bit of an outlet with this COVID thing [...]. I'm there about maybe five, ten minutes, talking but if it's really busy, I don't stay longer. If it's not busy, they're quite willing to visit a little bit and share with us.”

> "I'm supposed to be on a special diet because I got high cholesterol and I got COPD that is acting up today. And so it's been a lot of fruit and vegetables that and because of [the cost of them] them these days is unreal. So I can't always afford it. Like I can afford it maybe a little bit -- a couple of times a month. But when I get my check, but I can't afford it weekly. And this [GFB] really helps me.”

> “It’s available to everybody. So there’s less of a stigma with the program as opposed to accessing the local food bank, and that type of thing.”

- Program adoption, implementation, and maintenance

Staff, volunteers, and program partners commented on the adoption and implementation of the GFB. As the GFB program grows, several **positive implementation adaptations** have been instituted, including: (1) recruitment of community partners; (2) improving the online sign-up process; and (3) requiring participants to pay when signing up for the GFB to eliminate non-payments. **Strong communication between Nanaimo Foodshare and partner community organizations** facilitated

- Program adoption, implementation, and maintenance (con't)

program adoption and ensured seamless implementation. Interviewees **stressed the importance of program flexibility and back-up plans, as staff illnesses and other challenges** may affect GFB logistics, and program interruptions would negatively affect recipients. **Challenges** to adoption, implementation, and maintenance included **limited staff capacity**, **price inflation** (especially rising costs of food and fuel for deliveries), and **limited refrigerated space** for overnight storage of GFBs. Interviewees also expressed concerns about the financial sustainability of the program and stressed the **necessity to recruit loyal customers paying higher prices for GFBs** to subsidize recipients paying the lower prices on the sliding scale.

> "[Participants] make [payments] directly to Nanaimo Foodshare, which is what made this program so appealing to us as a church community. Because it meant that with five volunteers and a little operational effort, we were able to support his program."

> "When you're dealing with a demographic that's typically low income, there's lots of different barriers that pop up along the way that you can't really plan for."

- Recommendations from interviewees

Several interviewees who identified barriers to participation and other challenges of GFB program provided recommendations for improvement. Consistent recommendations included:

1. Staff should take suggestions from participants regarding the types of produce to include in GFBs and/or allow recipients to choose the contents of their boxes
2. Ensure foods provided in the GFB are responsive to those with dietary needs and are culturally acceptable
3. Staff should incorporate flexibility in ordering, receiving (e.g., by offering delivery), and paying (e.g., paying on delivery or pick-up) to ensure that participants who experience challenges related to mobility, technology, and financial liquidity are still able to access the GFB
4. GFBs should support local farms and include local produce in the boxes whenever possible
5. Seek out partnerships through which GFB programs can complement existing community social supports (e.g., food banks) to target specific sub-populations, including low income, newcomers, and Indigenous households
6. Hold community events to increase the social aspects of GFB programming
7. Support individuals to sign up online (e.g., provide a tutorial) or over the telephone
8. Increase higher-income GFB recipients to subsidize lower-income users

DISCUSSION AND CONLUSION

The Good Food Box evaluation was an initiative coordinated by researchers at the University of Victoria in coordination with Nanaimo Foodshare. Despite challenges to the program, including the COVID-19 pandemic, evaluation activities took place from February to December 2022.

Results of this evaluation show the GFB program had several benefits to participants. Survey data showed an improvement in self-reported physical health, social relationships, food literacy, fruit consumption, and total fruit and vegetable consumption from baseline to follow-up after 12 weeks enrolment in the GFB program. While food security increased and those classified as food insecure dropped by 25%, these changes did not reach statistical significance. Survey results were largely validated by semi-structured interviews. We interviewed 10 GFB recipients and 10 staff, volunteers, and representatives from partner community organizations. Overall, interviewees perceived the program as beneficial and recognized its effectiveness at providing access to healthy foods at a low cost, improving food literacy, promoting health, and fostering social connections. Our findings echo those elsewhere in the research literature that indicate the benefits of good food box programs [14-15].

Interviewees also provided insight into the functioning of the GFB, including facilitators and barriers to access. Cost effectiveness, flexibility, and convenience were seen as important program characteristics that encouraged participation. Staff, volunteers, and program partners noted that strong communication between Nanaimo Foodshare and partner organizations encouraged them to adopt and maintain the program for their service populations. Meanwhile, some interviewees found the sign-up and payment process challenging and the pick-up locations to be inconvenient. Some program partners expressed concerns around limited staff capacity, staff illnesses and departures, price inflation, and financial sustainability as long-term challenges. These challenges were echoed in interviewees' recommendations, which mainly comprised suggestions to improve the accessibility, accommodation, duration, and sustainability of the GFB program.

There were several limitations of this evaluation. Surveys were either self-administered or administered by a Nanaimo Foodshare staff member, which may have introduced bias. All measures of food security, health, and food consumption were self-reported. We did not capture participants from sufficiently diverse backgrounds (e.g., in age, gender, and race) to conduct sub-analyses examining peoples' differential experiences with the program based on these social identities. Finally, we were only able to conduct interviews with a limited sub-sample of program participants, staff/volunteers, and community partners, so their feedback may not capture the entirety of participants' and coordinators' experiences with the GFB.

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APPENDIX 1: BASELINE SURVEY

Start of block: Baseline survey

Please provide the following information:

- ○ Name of Participant _____
- ○ Household address _____
- ○ Phone number _____
- ○ Email address _____
- ○ Participant number (if known) _____
- ○ Name of interviewer (if relevant) _____
- ○ Date _____

Have you agreed to the consent form?

- ○ Yes
- ○ No

Skip To: End of Survey If Have you agreed to the consent form? = No

End of Block: Baseline Survey

Start of Block: Demographic Information

The following questions are to collect general information about you and your household.

How many people in total live in your household?

_____

What is your age?

_____

What is your gender?

- ○ Male
- ○ Female
- ○ Other _____
- ○ Prefer not to say

Household annual income

- ○ 50,000+
- ○ $40,000-49,000
- ○ $30,000-39,000
- ○ $20,000-29,999
- ○ $10,000-19,999
- ○ $0-9,999
- ○ Don't know / Prefer not to answer

Do you receive BC Disability Payments (PWD)

- ○ Yes
- ○ No
- ○ Don't know / rather not say

We are collecting information on age, gender, and race to help us identify any people we could do better at offering the program to. Are you comfortable answering 2 questions about your race?

- ○ Yes
- ○ No

(If yes to Q3) Which of these do you identify with? Check all tha apply. We recognize that these identity questions are imperfect. Please select the option(s) that best fits at this time. The options are listed in alphabetical order.

- ☐ African (Central, East, Southern, West)
- ☐ Arab, West Asian (e.g. Iranian, Afghan), North African (e.g. Egypt, Morocco, Algeria)
- ☐ Black
- ☐ Caribbean
- ☐ East Asian (e.g. Chinese, Japanese, Korean)
- ☐ Indigenous (e.g. First Nations, Metis, Inuit)
- ☐ Latin American
- ☐ Hispanic
- ☐ South Asian (e.g. East Indian, Pakistani, Sri Lankan)
- ☐ Southeast Asian (e.g Filipino, Vietnamese, Thai)
- ☐ White
- ☐ None of the above/I prefer to use another term

(If checked "I prefer to use another term" above) Which term to you prefer to use?

_____

End of Block: Demographic Information

Start of Block: Access and Barriers

We're now going to ask you some questions about the appliances in your home.

Would you say that the appliances that you have in your home for food storage (e..g. fridge) are:

- ○ Very inadequate
- ○ Inadequate
- ○ Somewhat inadequate
- ○ Adequate
- ○ Very adequate

Would you say that the appliances that you have in your home for food preparation (e.g. stove) are:

- ○ Very inadequate
- ○ Inadequate
- ○ Somewhat inadequate
- ○ Adequate
- ○ Very adequate

What is the main place that you get your groceries from?

- ○ Grocery store
- ○ Farmer's Market
- ○ Food Bank
- ○ Convenience store
- ○ Other _____

Would you say that the availability of healthy food at this location is:

- ○ Very inadequate
- ○ Inadequate
- ○ Somewhat inadequate
- ○ Adequate
- ○ Very adequate

What food access services have you used in the past year (e.g. food bank, drop-in centre meals etc.)?

_____

_____

_____

_____

_____

End of Block: Access and Barriers

Start of Block: Food Security

FOOD SECURITY 1
Now I'm going to read you several statements that may be used to describe the food situation for a household. Please tell me if the statement was often true, sometimes true, or never true for you and other household members in the past 12 months. Also, let me know if you're unsure, or if you'd rather not answer the question.

Questions for participants with children begin with a (C), if you do not have children please leave these blank.

You and other household members worried that food would run out before you were financially able to buy more. Was that often true, sometimes true, or never true in the past 12 months?

- ○ Often true
- ○ Sometimes true
- ○ Never true
- ○ Don't know / rather not say

The food that you and other household members bought just didn't last (wasn't enough food or it spoiled), and there wasn't any money to get more. Was that often true, sometimes true, or never true in the past 12 months?

- ○ Often true
- ○ Sometimes true
- ○ Never true
- ○ Don't know / rather not say

You and other household members couldn’t afford to eat balanced meals. In the past 12 months was that often true, sometimes true, or never true?

- ○ Often true
- ○ Sometimes true
- ○ Never true
- ○ Don't know / rather not say

End of Block: Food Security

Start of Block: Food Consumption

I will now ask you some questions about what you've been eating and drinking over the past month.

Not counting juice, in the last month how many times per week, did you eat fruit? Please remember to include frozen, dried or canned fruit.

_____

In the last month, how many times per week did you drink 100% PURE fruit juices, such as pure orange juice, apple juice or pure juice blends? Exclude fruit-flavored drinks with added sugar or fruit punch.

_____

In the last month, how many times per week did you eat dark green vegetables such as broccoli, green beans, peas and green peppers or dark leafy greens including romaine or spinach? Please remember to include frozen or canned vegetables and vegetables that were cooked in soups or mixed in salad.

_____

In the last month, how many times per week did you eat orange-coloured vegetables such as carrots, orange bell pepper, sweet potatoes, pumpkin or squash? (Please remember to include frozen or canned vegetables and vegetables that were cooked in soups or mixed in salad).

_____

In the last month, how many times per week did you eat potatoes that are not deep fried (baked, mashed, roasted)?

_____

Excluding the green and orange vegetables as well as the potatoes you have already reported, in the last month, how many times per week did you eat OTHER vegetables? Examples include cucumber, celery, corn, cabbage and vegetable juice.

_____

Are you currently taking any micronutrient supplements?

_____

End of Block: Food Consumption

Start of Block: Food Literacy

Where do you get information on food and nutrition (check all that apply)?

- ☐ Healthcare practitioner (physician, nurse, dietitian)
- ☐ Community organization
- ☐ Friends and/or family
- ☐ Books and pamphlets
- ☐ Television and movies
- ☐ Other _____

How frequently do you:

	Never	Rarely	Sometimes	Often	Always
Consider the Canada Food Guide when purchasing and preparing food	○	○	○	○	○
Consult the nutritional information (food labels) on food products	○	○	○	○	○
Consider advice from healthcare professionals when purchasing and preparing food	○	○	○	○	○
Prepare healthy food at home	○	○	○	○	○
Purchase prepared healthy foods outside the home	○	○	○	○	○
Seek out additional information on food and nutrition	○	○	○	○	○

End of Block: Food Literacy

Start of Block: Health Outcomes

The next set of questions are going to be about your health.

Have you ever been told by a health care provider (e.g., a doctor, nurse, social worker, etc.) that you have any of the following illnesses? Mark any that apply.

- ☐ High cholesterol, triglycerides, or lipids
- ☐ Hypertension (high blood pressure)
- ☐ Hypothyroidism
- ☐ Migraines
- ☐ Asthma
- ☐ Gallstones/ Kidney stones
- ☐ Ulcerative colitis/Crohn's disease
- ☐ Irritable bowel syndrome
- ☐ Celiac disease
- ☐ Melanoma
- ☐ Prediabetes
- ☐ Arthritis
- ☐ Osteopenia/osteoporosis
- ☐ Peripheral neuropathy, Concussion, or other head injury
- ☐ Depression

- [ ] Anxiety disorder
- [ ] Anorexia nervosa
- [ ] Bulimia nervosa
- [ ] Binge eating disorder
- [ ] Other eating disorder
- [ ] Iron deficiency anemia
- [ ] Vitamin b12 deficiency
- [ ] Vitamin D deficiency
- [ ] Other micronutrient deficiency _____
- [ ] Diabetes (high blood sugar)
- [ ] Cancer, other than melanoma
- [ ] Other (specific below) _____

If participant said 'yes' to diabetes, ask the following:

What type of diabetes do you have?

- ○ Type 1
- ○ Type 2
- ○ Don't know

If participant said 'yes' to cancer, other than melanoma, ask the following:

What was the location / type of cancer?

_____

How would you rate your physical health in general? (consider how healthy you feel, mobility, and pain)

- ○ Excellent
- ○ Good
- ○ Average
- ○ Poor
- ○ Terrible
- ○ Don't know / prefer not to answer

How would you rate your psychological and emotional health in general? (Unwanted emotions like anxiety, anger, and sadness versus positive ones like joy and excitement)

- ○ Excellent
- ○ Good
- ○ Average
- ○ Poor
- ○ Terrible
- ○ Don't know / prefer not to answer

How would you rate the social relationships in your life in general? (Family, friends)

- ○ Excellent
- ○ Good
- ○ Average
- ○ Poor
- ○ Terrible
- ○ Don't know / prefer not to answer

End of Block: Health Outcomes

APPENDIX 2: INTERVIEW GUIDE

For interview after the follow-up survey. Will be audio recorded

1. Did you find the [name] program was helpful for you (and your family)?

2. If the [name] program does continue, what could be improved on? Were there any barriers you encountered to accessing the program?

3. Did you feel supported during the program in making healthy food decisions? Were the program staff helpful?

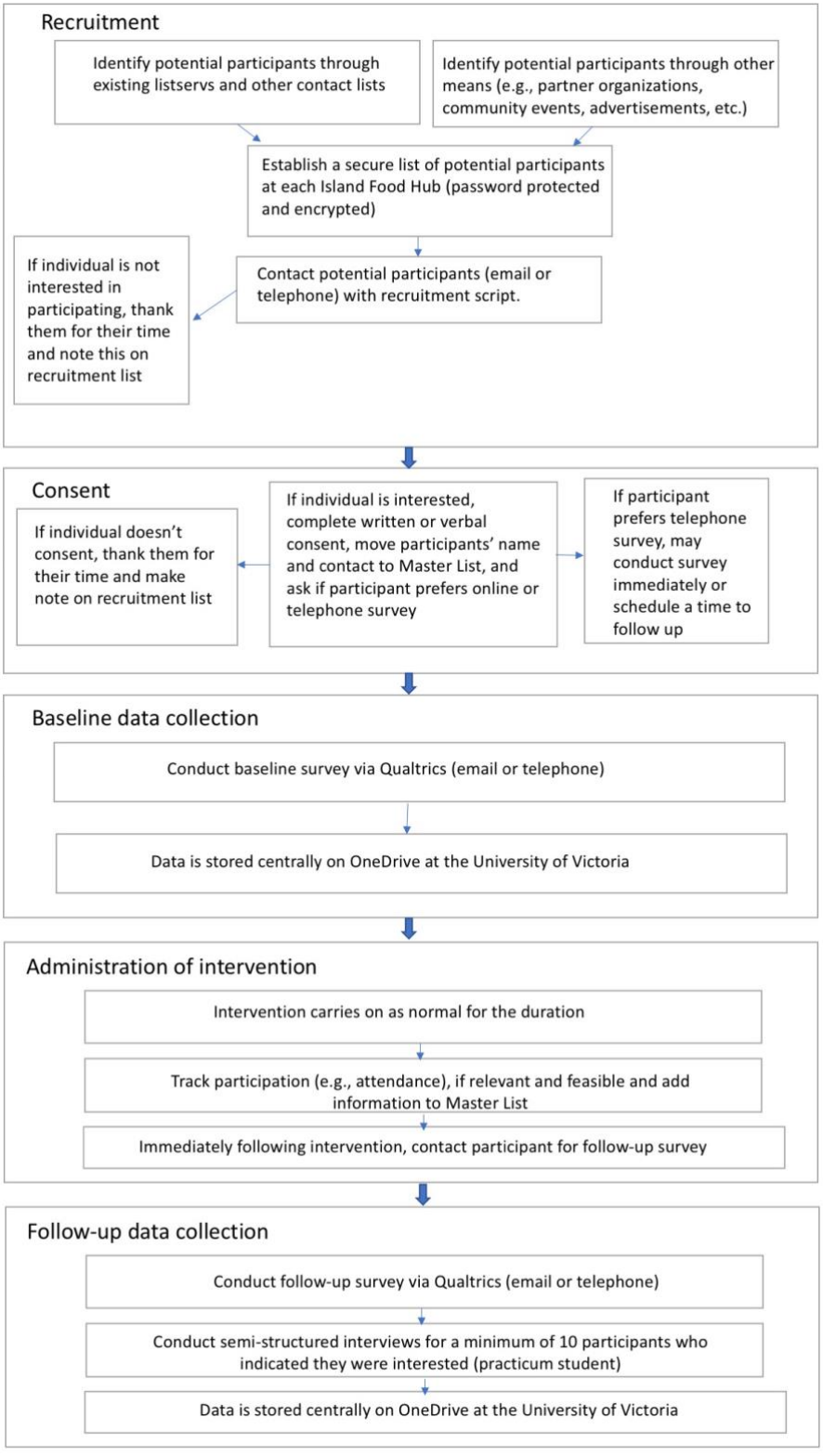
4. Do you feel like the program was welcoming? Did you feel judgement/stigma while participating?

5. Was the program helpful in accessing more healthy food? Did you (and your family) change your food preferences now?

6. Did the program give you access to any new foods?

7. Did you see any change in your social connections to others and your community because of this program? If so, what changes did you experience?

APPENDIX 3: FLOW CHART OF ACTIVITIES



APPENDIX 4: THEMATIC ANALYSIS

EFFECTIVENESS	**REACH**		
THEME	**OVERVIEW** **[Based on: 20 qualitative interviews (10 in Nanaimo, 7 in Victoria, 1 in Port Hardy, 1 in Courtenay/Lush Valley, 1 in Campbell River) and up to 73 participants in quantitative interviews (53 in Nanaimo, 6 in Port Hardy, 10 in Courtenay, 3 in Campbell River, 1 in Duncan),]**	**KEY QUOTE(S)**
Facilitators for participation among the target population	While nine participants stated they received the delivery option, two participants - one in Nanaimo and one in Victoria - elaborated on how delivery facilitated their participation as they would otherwise have to navigate public transport to access the GFB. During COVID, participants liked the delivery option to maintain social distancing. However, at least one participant mentioned delivery limits the possibility for social connections. Two participants in Nanaimo also commented on the ease of accessing pick-up depots, reducing travel time to access the GFB. Lastly, some participants also referenced the cost-effectiveness as a key point for participation.	"it's been wonderful that we don't have to go downtown and lug a bunch of groceries home." "I really liked the fact that there was that sliding scale [...] for those that have maybe more financial barriers."
Barriers to participation among the target population	Four participants mentioned barriers that impacted their participation, while two participants suggested suspected barriers for others based on their knowledge of the target community. Barriers included: access to required technology such as a computer or internet, mobility if delivery was not an option, long distances to pick-up locations, and navigating a confusing sign up process. Despite these barriers, there was one participant that acknowledged some of the recent improvements at the Nanaimo location, such as a new sign-up system, while another participant (also part of the Nanaimo location) recommended automatic payment options to reduce confusion. There was also one participant at the Victoria location who stated a volunteer helped her navigate the online sign-up process. *Note:* 3 participants explicitly stated they did not face any barriers to participation.	"There are a lot of people like, I know this one lady, she just found out she's diabetic. And there are certain guidelines: eat more fruit and veggies, and watch what she has to eat. And she said, things are expensive. And she doesn't have a computer, or a cell phone to get on and even apply [for GFB], you know what I mean?"
Facilitates access to healthy foods at a reduced cost	One of the goals of the GFB program is to increase fruit and vegetable intake. While a few participants believe their fruit and vegetable intake increased due to the program, the majority of participants stated the program provided access to healthier foods at a reduced cost. The GFB encouraged some participants to eat the provided fruit and vegetables as they do not want to waste food; this may have increased their fruit and vegetable intake. However, others stated they give away the food items they do not like or would not normally purchase, suggesting this would not necessarily increase fruit and vegetable intake. Despite a lack of clarity on the impact of fruit and vegetable intake, reducing the financial burden to purchase healthier foods has supported the mental health of participants as it reduces stress. Interestingly, though, there was no significant difference between the mean baseline (M=2.35) and follow-up (M=2.43) quantitative survey samples, where participants were asked to rate how often they or their household members could not afford to eat balanced meals (paired t-test: t = -1.30, df = 64, p = 0.20).	"With the price of vegetables, especially now, it's really helpful. Because for me, I pay the $5 per week. Because of my complicated [situation], low income. And this gives me a variety of foods. And I wouldn't be able to go to the grocery store and get what I have in that bag for five bucks. [...] So if I get something in there that I don't like to have, I am, I'm not a big big lover of vegetables," They go on to say that they give items from the GFB away to others.

	Fosters social connections	The GFB program fosters social connection through two primary avenues. First, participants enjoyed friendly chats with volunteers and staff of the GFB program, primarily during the pick-up of boxes. Over half of the participants noted pleasant interactions with the staff and volunteers of the GFB. Second, participants mentioned the ability to share GFB contents with their neighbors and community. Even though participants acknowledged these social connections as short-lived, a couple participants felt the engagement supported their mental health, as they felt lonely as seniors. Lastly, while some participants acknowledged community activities facilitated by organizations, other participants did not necessarily seem interested in the activities. For example, a quarter of participants were not interested in community events, primarily due to their unavailability. However, four participants had attended community events, while another four participants said they had not attended any of the events, but remain interested. For those interested in attending events, a few suggested gardening or cooking activities, with two participants also mentioning activities should be age-inclusive (see recommendations for more information). As outlined here, there were mixed reactions to social connections facilitated through the GFB program. However, quantitative results showed a significant difference between baseline and follow-up survey sample means, where participants were asked to self-rate their social relationships before and after participation in the GFB program (paired t-test: t = 2.52, df = 72, p = 0.01). This means, on average, participants self-rated their social relationships better after participating in the GFB program. Interestingly, though, there was no significant difference in baseline and follow-up samples regarding self-rated mental health (paired t-test: t = 0, df =72, p = 1).	"Everybody's just so wonderful. [...] Yeah, I've really enjoyed it. It gives me a little bit of an outlet with this COVID thing [...]. I'm there about maybe five, ten minutes, talking but if it's really busy, I don't stay longer. If it's not busy, they're quite willing to visit a little bit and share with us." "Well, I haven't made...connections where we go to coffee, or anything, but if I see them, like I saw one of the girls the other day driving the van. As if she sees me she goes [waving]...which is nice."
	Increases resources to support and manage health behaviour	The GFB program enhances knowledge on healthy foods, with each GFB including a pamphlet or newsletter with recipe ideas. Similarly, some participants had access to a cooking workshop. In addition, some participants discuss how the program has been effective in managing chronic diseases, in part because of the affordability. This appears to align with quantitative survey results: there is a significant difference between baseline and follow-up sample means, where participants self-rated their physical health before and after the GFB program (paired t-test: t = 2.66, df = 70, p = 0.01). This means, on average, participants rated their physical health better following their participation in the GFB program.	"I'm supposed to be on a special diet because I got high cholesterol and I got COPD that is acting up today. And so it's been a lot of fruit and vegetables that and because of [the cost of them] them these days is unreal. So I can't always afford it. Like I can afford it maybe a little bit -- a couple of times a month. But when I get my check, but I can't afford it weekly. And this [GFB] really helps me."
ADOPTION	*Note:* This study did not explore the adoption process of the GFB program across sites. As such, this section has been left blank. However, a qualitative study with staff, volunteers, and community partners of Nanaimo Foodshare further explored adoption of the GFB program.		

IMPLEMENTATION	Inconsistent ordering processes across sites (Nanaimo & Victoria) is a barrier	Four participants (3 in Nanaimo, 1 in Victoria) felt the ordering process was simple, although one of these participants mentioned prior to the recent changes in the process in Nanaimo, it was confusing. Two participants (1 in Nanaimo, 1 in Victoria) commented on the difficultly of the process; one of these participants stopped ordering the GFB for a few weeks out of frustration. This implementation challenge intersects with barriers for participation of the target population, primarily accessing and navigating technology, which particularly impacts seniors.	"I found it quite [confusing] and different names. Oh, there's two people by the farm hub and something and I got very confused by it. And it was very frustrating. And I kind of gave up ordering it for about three weeks."
	Primarily good quality produce, with potential differences across locations	Participants described the types of food items they received in a GFB. While the majority listed fruit and vegetables, some also listed canned items or portions of produce. Ten participants felt the GFB items were of good quality (1 in Courtney, 4 in Victoria, and 5 in Nanaimo), although a couple of these participants noted they occasionally receive poor quality items. In one case, a participant declared the produce to be "as good as the farmers". Only two out of twenty participants deemed items were of poor quality (1 in Port Hardy, 1 in Nanaimo). In a couple cases, as evident by the quote, participants felt small portions of produce were demeaning, while others expressed concern about the health benefits of some of the canned food. In addition, one participant felt the value of food items may be the same as the grocery stores, depending on the items within the box. Beyond this perception of participants, various factors impact the ability of agencies to implement the GFB in the same way. For example, geographic location, access to produce, the size of agency and the availability of resources play a role. In a few cases, participants acknowledged they may not know all the constraints implementing agencies face.	"Actually, I found it extremely demeaning. The fruits and vegetables that came well, you get one stalk of celery like not not a whole nother whole celery, but one single stalk. I got a peeled carrot once. Oh, there was lemons! I don't know. I don't know who made the choices for these things." "[The quality is] pretty good. Yesterday, I got really a couple of bad plums but I don't care...I just put them on my compost. No biggie. But I mean, most of the time, it's really good."
	Program flexibility improves accessibility	Six participants mentioned scenarios that highlighted the flexibility of the implementing agencies (2 in Victoria, 3 in Nanaimo, and 1 in Campbell River). Examples ranged from receiving reminders via phone call the day of pick-up to making different arrangements for pick up on alternative days. Participants often felt like staff and volunteers were accommodating or doing their best to support where they could, with one participant stating, "they try to bend over backwards to accommodate".	"A couple of times [I forgot to pick the GFB up]. [But they] let me pick it up later on in the day from the from the [program coordinator's] house. "
MAINTENANCE	Differing opinions on the future of the GFB program	There were mixed responses from participants in terms of continuing to use the GFB program. The majority of participants (11 total: 8 in Nanaimo, 3 in Victoria) were keen to see the GFB initiative continue and succeed, even if they had a few suggestions. It is likely that implementation differences across sites are impacting people's likelihood of continuing the program. For example, a couple participants seem less likely to continue the GFB program where GFBs contain both produce and canned goods or participants find themselves unable to use the assortment or quantity of produce. Similarly, one participant voiced a lack of understanding about the purpose or background of the program. These are factors that can be addressed through consistent implementation across agencies as well as improved information sharing about the program. Lastly, some participants provided recommendations for the future of the program, as seen in column E.	"Well, I just hope that this program keeps going absolutely. Yes. Definitely. Very helpful people in our community. Yeah. Me but the whole community up I was early one day and I was surprised at the amount of food that they made up for people there probably more than their massive amount of bags. You must do all of that. Yeah, so it would be a shame for us to lose it Yes. Yeah. Positive stuff for everyone." "We need to start farming. Yeah. That's what we need to do. So that could be if they want to invest in farming. Yeah, like community gardens, backyard farming, anything we can do."

	Unclear long-term health benefits	As mentioned under the section on effectiveness, the qualitative analysis suggests the GFB increases access to healthy foods by reducing financial constraints. This meant that the majority of participants focused on the budget-friendly nature of the program, rather than crediting it for an increase in fruit and vegetable intake. For this reason, long-term health benefits are unclear. There were a few participants who mentioned they ate lots of fruit and vegetables prior to this program or were already health-savvy. We also heard from individuals who loved to cook or try new recipes. These factors suggest that the participant approach to the program likely plays a role at how it may benefit them, with one participant stating, " You gotta make...this work for you."	“Yes [I would continue to eat the same amount of fruit and vegetables after the program ends] because I make it a priority." "All that is my background and my husband's background. We know everything [about healthy eating]."