

An Evaluation of the Usefulness of British Columbia's Guideline in Educating Food Banks Operators

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Abstract

Background: Food Distribution Organizations (FDOs), such as food banks, community kitchen, and meal programs, are essential resources to relieve food insecurity in British Columbia. FDOs collect, process, store, and distribute donated food to the needy population. The BC Centre for Disease Control (BCCDC) published the *Guidelines for Food Distribution Organizations with Grocery or Meal Programs* in 2016 with purpose to educate FDOs on food safety and assist with their operational challenges. The guideline plays an important role especially for food bank operators who are not required to take food safety training. The purpose of this study was to evaluate the extent of the guideline use among food bank operators and assess its usefulness. This study also determines if the guideline use had a statistically significant association with higher knowledge in food safety.

Methods: Self-administered electronic surveys created on *Survey Monkey Canada* were distributed to Foodbanks BC members by weekly online newsletter and email. The survey assessed the extent of usage of the guideline, current issues and knowledge level of FDO operators in BC. The survey response was collected over three weeks long period.

Results: Among 37 FDO operators participated, 30 completed the survey. The majority of the operators was from BC, worked in food banks and had longer than 5 years long experience. 47% of participants did not know about the guideline. Among the guideline users, 83% agreed or strongly agreed that the guideline was useful. While retailers and groceries were the most common food donors, caterers and restaurants were the least common. Assessing each food item for safety was the most commonly encountered issue for FDOs. The least commonly encountered issue was having another FDO taking our donation from the donor. There was no association between the guideline use and level of food safety knowledge according to the Chi-square test ($p= 0.89$). There was no association between the years of experience and level of food safety knowledge ($p= 0.23$). The results did not show a statistically significant result potentially due to small sample size ($n= 30$).

Conclusion: The results indicated while the guideline is useful among the users, the extent of its use should be widened. There is a need to improve accessibility of the guideline by modifying the content to address current practical issues, formatting it in a more user-friendly way, and utilizing better distribution means.

Keywords: Food Distribution Organization, food bank, food donation, food donation guideline, food safety

Introduction

Food insecurity is a serious issue in Canada. It refers to the inaccessibility to a safe, culturally acceptable, nutritionally adequate diet (1). While many low-income individuals are suffering from food insecurity, a large amount of food waste is being buried in landfills each day. Food Distribution Organizations (FDOs), such as food banks, are a vital resource to help alleviate food insecurity. Nutritious but perishable fresh fruit and vegetables, for example, are diverted to waste because of appearance. While FDOs were defined as an emergency and temporary resource for users, these agencies are permanent and necessary institutions due to growing poverty. Among FDOs, Food banks play an important role in collecting, storing and distributing safe and nutritious food to the needy population. With a goal to educate food bank operators, the BC Centre for Disease Control (BCCDC) published *Guidelines for Food Distribution Organizations with Grocery or Meal Programs* in 2016. This guideline was produced in collaboration with the Greater Vancouver food bank, three regional BC health authorities and Food Banks BC. From a conversation with a food safety specialist needs noted for this work included an evaluation of the extent of the guideline use among food bank operators, and assessment of current challenges facing FDO operators, such as relationships with food donors and staffing concerns. This paper discusses the crucial role of this guideline to food bank operators, explains why its evaluation is necessary and presents current concerns of operators.

Literature Review

What are food banks?

Food banks are considered as non-profit organizations that typically distribute food to prevent starvation in food insecure populations. In BC, food banks are one of the categories of Food Distribution Organizations (FDOs). According to the *Industry Food Donation Guidelines*, FDOs are non-profit organizations that utilize donated food to feed hungry people in order to build a healthier community (2). What distinguishes food banks from other FDOs, such as community kitchens, is that they do not process food (3). Processing includes “rinsing, cooking, smoking, salting, canning, freezing, pasteurizing and reprocessing of previously processed food (3).” Food banks’ activities would include receiving, holding, packaging, and distributing donated food (3). They largely rely on donations and volunteers to maintain the quantity and quality of food (4). However, the turnover rate for volunteers is relatively high so it is challenging to ensure their knowledge level on safe food handling procedures.

Why are food banks important?

Food insecurity, which means insufficiency of safe, nutritious food, is a public health concern in BC (5). Prolonged food insecurity has shown a significant association with chronic diseases including coronary heart disease, diabetes and hypertension (6). Between 2011 and 2012, approximately 1.1 million Canadian households (8.3% of all households) experienced moderate to severe food insecurity (7). Food insecurity has also been shown to be associated with health conditions including poor oral health and obesity. (8).

Food banks have been playing a larger role in mediating the food insecurity problem in BC. The number of users has been increasing. According to data from Food Banks Canada, the use of charitable food use in BC has increased by 32.5%(9). Nationally, it has increased by 27.8% (9). In 2016, 103,464 people in BC, which is equivalent to 2% of the BC population, were supported by food donations 32.2% of which were children. Nationally, in 2016, 4,170 food banks and meal programs assisted 863,492 people (2.40% of national population) in Canada were assisted, among which 36% of them were children (9). In BC, there were 424 food banks and meal programs in operation (9). Between January 1992 to June 2017, 116,963 people visited food banks at least over 2 million times in Vancouver (10). Of these visits, 65% were made by longer-term episodic or ongoing use for over several years (10).

Legislation involving food banks

Acknowledging the importance of charitable food, Canadian provinces and territories have food donor protection laws to address liability concerns. In BC, the Food Donor Encouragement Act and Good Samaritan Act protect food donors as long as they do not intentionally taint the food (11). To facilitate food donation, similar legislations exist in Ontario and Alberta with Food donation statutes, Nova Scotia with the Volunteer Services Act, and Quebec with Liability under the Civil Code.

In BC, all food premises must be licensed and inspected according to the Food Premises Regulation B.C. Reg. 223/2015 under the *Public Health Act* SBC 2008, c 28. In the case of health hazards in a food premises, Environmental Health Officers (EHOs) can step in to enforce the legislation to protect the public. FDOs that process food, such as soup kitchens, are

regulated under the Food Premises Regulation. However, under section 2 of the Food Premises Regulation, food banks are exempted as they are defined as non-profit organizations that do not process food. Thus, food banks operators do not have to obtain a license or go through routine inspections. In addition, there is no requirement for staffs to acquire food safe training.

Health risks associated with food banks

As the number of food bank users increases, potential public health issues can arise. Firstly, nutritional quality may not be adequate. Food recipients' health status is largely dependent on the quantity and quality of donated food. Traditionally, due to food safety concerns, lowest risk non-perishable foods, such as canned foods, crackers, and flour, were mostly donated. The limited nutrition value of these foods can result in the development of nutrition-related chronic diseases for prolonged users of food banks.

The negative impact of malnutrition can be even more critical for food bank members with health issues. In Vancouver, approximately 65% of food bank users are smokers (12). Around 55% of these users reported to have a low physical activity level and 80% reported that they consume less than five servings of fruit and vegetables daily (12). Furthermore, 13% and 29% of food bank users reported that they have diabetes and hypertension respectively (12). A previous study concluded that "food bank members were at elevated risk for cardiovascular disease compared with the general population."(12) Therefore, maintaining quality and quantity of donated food is even more essential for users in BC lower mainland.

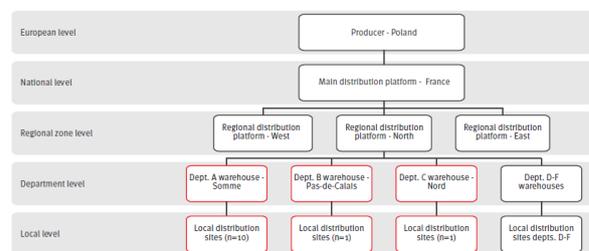
In order to address this problem, BC *Industry Food Donation Guidelines* identify healthy and in-demand food and beverages

for donation. Vegetables, fruits, grain products, meat, other high protein foods (eg. eggs and soy products), milk and dairy products are in-demand for donation (2). Currently, unprepared ingredients such as fresh produce, raw meat and dairy products constitute most of perishable food donations in BC (13). Food banks have their own protocols to distribute perishable food safely. For instance, the Greater Vancouver Food Bank utilizes a warehouse with large cooling units to store perishable food such as fresh produce, raw meat, and dairy products (13). The donations are picked up by cooler trucks or delivered to them by making arrangements with the donors in advance. On the other hand, FDOs such as Goodly Foods™ develop relationships directly with growers, re-packers and distributors to collect produce (fruits and vegetables) (14). They do not distribute these foods, but rather process them into soups, stews and sauces which is then distributed through food bank channels or sold to buyers to recover costs.

The perishable foods, although nutritious, are not necessarily non-perishable food so it has more food safety issues associated with them. Perishable foods, which include dairy, eggs, tofu, meat, fish, and poultry, need to be refrigerated (15). In particular, chicken, beef, pork, and turkey are a common cause of *Salmonella*, *E. coli* O157:H7, and *Yersinia* foodborne illnesses (16). Consumption of these products can cause foodborne illnesses if the growth inhibition temperature is not properly maintained.

For example, there was the case of *Salmonella enteritidis* outbreak in northern France linked to frozen beef burgers from a food bank. This prolonged outbreak investigation occurred between December 2014 and April 2015. There were 44 cases of Salmonellosis. Through microbiological

and food trace-back investigations, the health authority found out that all of the victims received frozen beef burgers originated in Poland and distributed by the same food bank (17). Various levels of distribution networks were involved in this outbreak (Figure 1). The distribution network included the European Union, national, regional, and departmental levels. This case showed how food banks can contribute in spread of foodborne illness outbreaks and how they can complicate the investigation. Thus, food bank staffs should be educated on methods to track food and how to respond in the case of a food recall to minimize victims.



Dept: department.
Red boxes show the warehouses and local distribution sites at department level where the lots of beefburgers linked to confirmed, probable or possible *Salmonella enteritidis* cases were identified.

Figure 2. Diagram showing the distribution network of frozen beef burgers originating in Poland and distributed by food bank A in northern France, December 2014 to April 2015 (17)

How are the risks mediated?

Provinces and territories in Canada attempt to minimize the health risks by developing guidelines to educate donors and food bank operators. A national guideline called the *Guidelines to Minimize Wasted Food and Facilitate Food Donations* was published in 2018 by National Zero Waste Council to assist food donors on legal aspects and summarize potential food safety concerns.

Alberta Health Services developed the *Guidelines for the Distribution of Donated Foods* in 2010. It briefly summarizes food facility requirements, shipping tips, transportation requirements and proper food handling procedures (1).

In BC, BCCDC published two guidelines called the *Industry Food Donation Guidelines* to assist donors and the *Guidelines for Food Distribution Organizations with Grocery or Meal Programs* to assist FDOs. Target audience for the former guideline is the food industry. It focuses on introducing types of FDOs and which types of food the industry should choose to donate (2). The latter guideline is for FDOs and it provides comprehensive information on donor relations, safe food handling, proper training methods, tips on food storage, traceability, transportation, and food waste reduction and disposal methods (3). This guideline emphasizes the food safety aspect of donated foods which is crucial to public health. It is particularly important for the food banks because currently they are not regulated under any legislation. Therefore, the guideline is the main source of information for food bank operators. This guideline is available only on BCCDC websites. Hard copies have not been printed and distributed to FDOs since it was developed.

Although guidelines can be informative, they have a limitation. The guidelines are non-enforceable recommendations. Currently, BC *Guidelines for Food Distribution Organizations with Grocery or Meal Programs* is the only piece of departmental document that food bank operators can rely on to make correct decisions to keep the food safe for all the users. There is a knowledge gap here because BC government can rely only on operators' voluntary effort on using the guideline. Further, because food banks are

exempted from the Food Premises Regulation, even though they do often receive, store and distribute perishable and potentially hazardous foods, health inspection and opportunity for education with operators and food bank staff may be absent. There has not been research that studied the actual usefulness of the guideline to the operators.

The result from this survey study can be translated to revise the guideline for the future. Also, the result can be used to devise means to promote its wider use.

Purpose of the Study

The purpose of this study is to evaluate the usefulness of the *Guidelines for Food Distribution Organizations with Grocery or Meal Programs* for food bank operators. A survey study will be done to answer the following three questions: 1) Is this guideline being used by food bank managers in BC?; 2) Does the guideline meet their needs?; and 3) Is the guideline sufficient to educate them on essential information?"

Methods and Materials

Materials

The materials used were a laptop computer, Microsoft Excel 2014, NCSS 12 (18), and Survey Monkey software (19). Two prizes were also available (\$50 worth prizes from BCIT Inventory) through random draw, for those participants who entered their email into the draw.

Standard Methods

In this survey, data was collected via an online self-administered survey that was opened from January 24th until February 17th, 2019. The survey was created using Survey Monkey, an online tool that can be used to create online surveys

(19). The survey was disseminated to FDO operators using contact information an executive director of Food Bank BC and a food safety specialist at the BCCDC. A reminder email was sent each week to encourage more FDO operators to participate.

The survey consisted of three sections. A series of questions were asked on demographic factors, followed by issues encountered in FDOs. Knowledge questions were also asked to determine FDO operator's knowledge level on proper operating protocols. In the end, the survey provided the option for participants to submit their contact information into a draw to win a prize.

Justification for Methods Selected

An online survey is the most cost effective method to reach all food bank operators across Canada. Online self-administered surveys are standardized for every participant and are known to result in higher response rates than telephone surveys or in-person interviews (20). Previous research has shown that more questions are likely to be answered in web surveys than on paper questionnaires (21). Furthermore, mailing surveys would be more costly and time consuming as the surveys need to be printed, placed into envelopes, stamped, sent off to the participants and then returned to the research. Survey Monkey Canada was chosen because it stores data in Canada, unlike Google Forms which stores it in the United States of America and would be subject to the US Patriots Act thereby limiting confidentiality. Moreover, the participants had an option to enter a prize draw at the end of the survey since lottery incentive has been shown to increase web survey response rate (22). The questions were designed so that the respondents could complete the survey within a short time

period (less than 10 minutes) as previous research has shown that shorter length survey results in higher response rates (23).

Inclusion and Exclusion Criteria

All managers or operators of Food Distribution Organizations in Canada were included in the study. The participants were informed about this by the phrase at the beginning of the survey; "If you are not an operator of FDO(s), please refer this survey to the operator." If the participants were from outside Canada, their data were excluded from analysis. This exclusion criterion was determined based on their responses to the first question of the survey. Participants were excluded if they responded "Outside Canada" to the following question:

- What geographic region do you work in? (a. Within BC, b. Within Canada but not in BC, c. Outside Canada)

Reliability and Validity of Measures

Validity refers to the ability of a measuring instrument to measure an accurate value (24). Validity was optimized by consulting with experts in the field including a consultant, manager and executive director of Food Bank BC in order for the survey to reflect operators' actual needs. Reliability is the ability of an instrument to take consistent measurements (24). Reliability was enhanced by using the same survey method for all participants. Also, a pilot study was done to identify if respondents could interpret the questions in the same way. Based on feedback from the pilot study, the survey was revised before being disseminated to the FDO operators and managers.

The standard p-value of 0.05 was used, so there was less than 5% chance of

Alpha error occurring (rejecting a true null hypothesis). Beta error would have been present if the sample size was small due to a low response rate. The researcher attempted to minimize beta error by encouraging more FDO operators to participate via sending them a reminder email each week.

Ethical Considerations

As survey studies involve human participants, ethical consideration was addressed through a consent form and a cover letter. The consent form (Appendix A) and cover letter (Appendix B) outlined the purpose, inclusion and exclusion criteria, risks and benefits of the survey study. Participants were given the choice on whether to participate or not in the survey. They were given an option to accept or reject the terms of the consent form. Also, the survey indicated that they did not have to answer every question if they wished not to do so. The contact email information of the researcher was provided in case the participants had any questions. Participant confidentiality and anonymity were guaranteed. The participants were assured that participation is voluntary and the data would be only used to make the guideline more helpful for FDO operators.

Prior to the study, survey questions were reviewed and approved by the researcher's instructor and BCIT Research Ethics Board to ensure the questions would not cause any harm to participants.

- Survey Cover letter: See Appendix A
- Consent Forms: See Appendix B
- Survey Questions: See Appendix C

Pilot study

Prior to disseminating the survey, a pilot study was distributed in the third week of January to ensure the survey questions

were logical and understandable. The pilot study involved providing the survey questions to a food safety specialist at BCCDC, and experts from Food Bank BC. Completion time was measured and recorded. Feedback received after the pilot study was used to revise the questionnaire.

Statistical Analysis

Description of Data

In this survey, multichotomous nominal data and multichotomous ordinal data were collected. A few questions allowed the participants to add in a qualitative response in "other" option. There was one open-ended question to collect suggestions or comments on the operators' opinion on the guideline. For the knowledge section, twelve multiple choice questions were scored out of 12. A score of 0 to 4 was categorized as "Not Knowledgeable" level, 5 to 8 as "Adequately Knowledgeable" level, and 9 to 12 as "Very Knowledgeable" level respectively.

Descriptive statistics were presented as percentages in bar charts format. The survey results from the demographic and issue sections were mainly analyzed using a descriptive method.

Inferential statistical analyses included chi-square tests to assess associations between two types of nominal data. Pearson's chi-square test is widely used in testing for association between two categorical responses (25). The first analysis was done to test for an association between knowledge levels on proper operating procedures for BC FDO operators and length of guideline use with a purpose to analyze the usefulness of the guideline in educating the operators. The second analysis was done to test for an association between the knowledge levels of FDO operators and their work period in the field. Results from

these two statistical tests were compared to see which aspect had a higher association with the knowledge level.

Statistical Package Used

After the survey was closed, data from the questionnaires was manually tabulated into a Microsoft Excel Spreadsheet for descriptive statistical analysis. The data was then exported to NCSS statistical software for inferential statistical analysis (18). The Chi-Square tests were performed through NCSS to determine whether or not statistical associations exist between demographic factors and knowledge levels of FDO operators.

Results

A total of 37 respondents participated while 30 of them completed the survey. Descriptive statistics included responses from all 37 participants. Statistical analyses on knowledge level used data of 30 individuals who completed the knowledge section of the survey.

Descriptive Statistics

The descriptive statistical results from demographic questions appear below. Among 37 respondents, 36 of them were FDO operators from BC, and one of them was from outside BC in Canada (Figure 2).

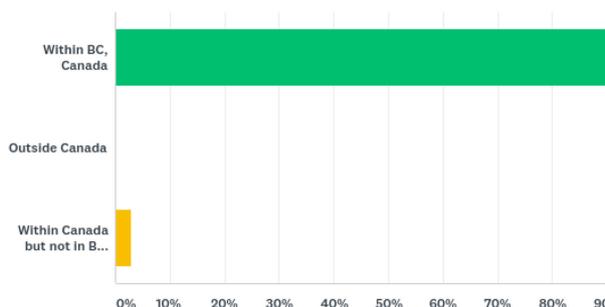


Figure 2 Geographic profile of Respondents

Among 37 respondents, the proportion of operators from food banks, community kitchens, meal programs, community enterprises were 86%, 17%, 31%, and 3% respectively (Figure 3). 3 other participants were from a food referral center or community outreach.

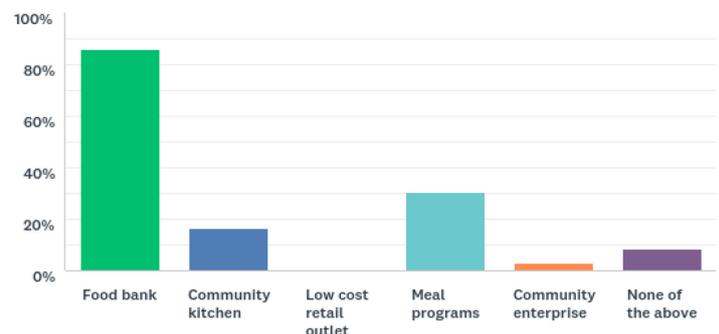


Figure 3 Type of FDO of Participants

In term of years of work as FDO operators, 47% of the respondents had more than 5 years, 8% had 4 to 5 years, 33% had 2 to 3 years, and 11% had less than a year long experience (Figure 4).

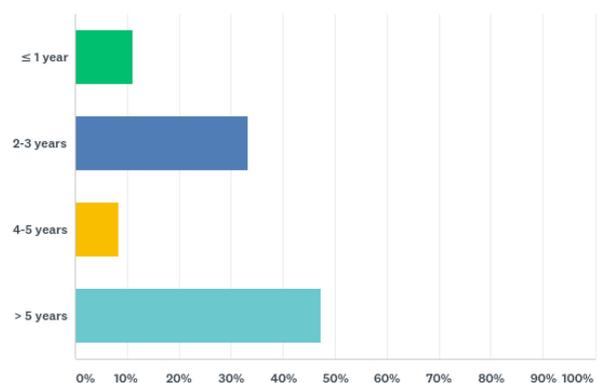


Figure 4 Years of Work as FDO operator

In terms of guideline use, 47% (17 respondents) did not know about the guideline and 3% (1 respondent) chose not to use the guideline. 11% (4 respondents)

used it less than a year and 11% (4 respondents) used it for 1 to 2 years. 28% (10 respondents) used it for more than 2 years (Figure 5). The one individual who chose not to use the guideline indicated that the reason was due to its long length.

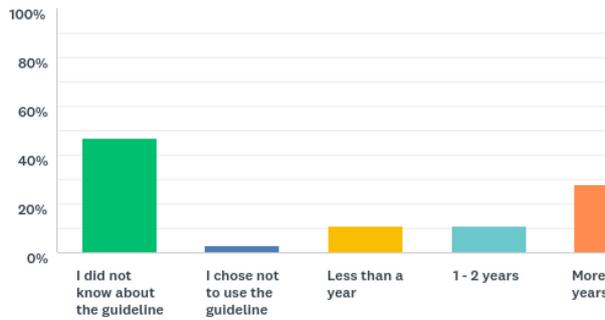


Figure 5 Length of Guideline Use

Among of respondents who used the guideline, 24% (4 individuals) strongly agreed, 59% (10 individuals) agreed and 18% (3 individuals) neither agreed nor disagreed that the guideline is useful (Figure 6).

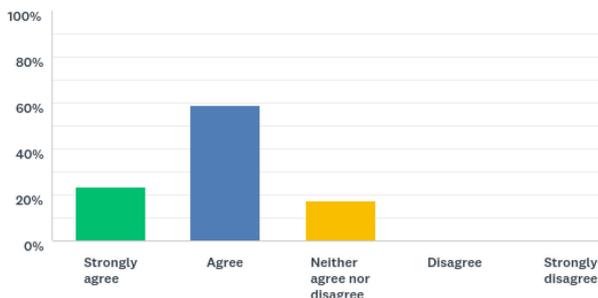


Figure 6 Usefulness of the Guideline

The following are the descriptive statistical analyses from “Issue” sections of the survey. The majority of the respondents (50%) indicated that they have never required food donor registration forms and a Memorandum of Understanding (MOU). 23% stated that they did not know these forms existed (Figure 7).

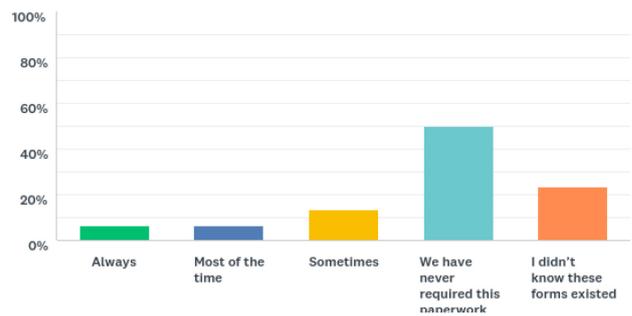


Figure 7 Frequency of MOU Submission

42% of FDO operators stated that they scheduled pick-up times at food donor premises with some of their donors (Figure 8). 26% of them stated that they do the same with most of their donors. 19% of them indicated they schedule pick-up times when donors tell them they have food available.

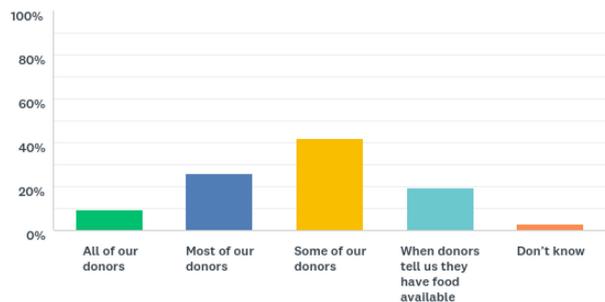


Figure 8 Frequency of Scheduled Food Pick-up

Retailers and groceries were the most common source of donated food. Caterer and restaurants were the least common source of donated food (Figure 9).

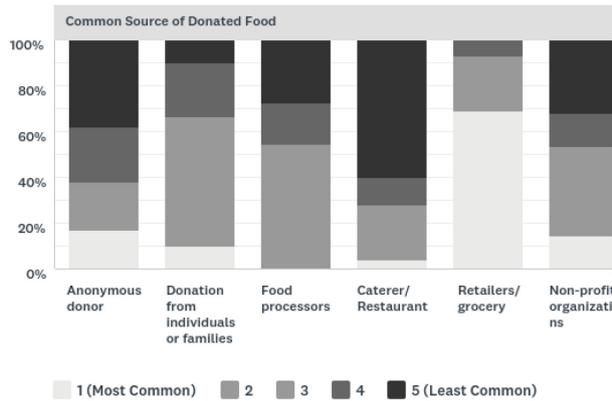


Figure 9 Common Sources for Donated Food

Following figures 10 and 11 represent common issues that FDO operators encounter. “Assessing safety for each item” was an issue which they had to deal with the most frequently. The next commonly encountered problem was “recruiting volunteer drivers for food pick-up”.

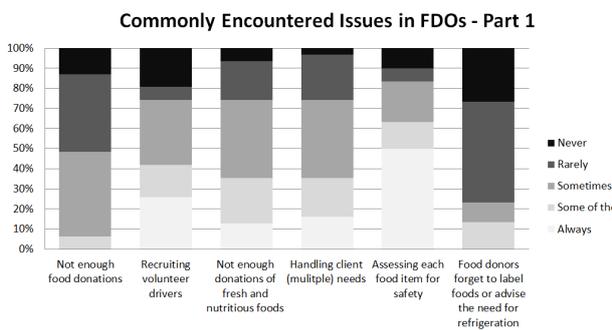


Figure 10 Commonly Encountered Issues in FDOs - Part 1

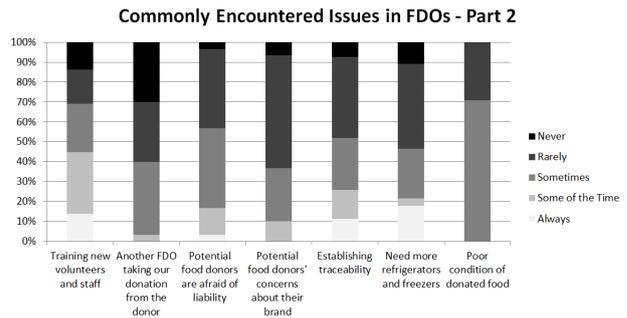


Figure 11 Commonly Encountered Issues in FDOs - Part 2

According to 3 open ended comments on the guideline, 2 participants emphasized the need to having more user friendly format (Appendix G). They indicated the need to have handouts or single pages of highlights for each section so they can post to hand them out to volunteers. One other comment suggest to campaign to raise awareness on the Food Donor Encouragement Act to encourage more donations. One participant stated that the reason for not choosing to use the guideline is because the length is too long.

Inferential Statistics

The summary data sheet for statistical analysis is attached in Appendix D. A chi-square test was used for inferential statistical analysis using NCSS 12. Pearson’s chi-square test is widely used in testing for association between two categorical responses (25). This study assessed associations between the FDO operators’ knowledge level and guideline use. These tests were done to understand if the guideline was useful in educating them. The second test was done to assess associations between the FDO operators’ knowledge level and work period in the field. Following table summarizes the results from statistical analysis of the collected data. Chi-square test does not provide power. P-values were high for both tests so there were no associations with type

I or II errors.

Ho and Ha	Test Used	Results	Interpretation
<p>Ho1: There is <u>NO</u> association between the FDO operators' knowledge level and guideline use.</p> <p>Ha1: There is an association between the FDO operators' knowledge level and guideline use.</p>	Pearson's chi-square Test	P= 0.89	Do not reject the null hypothesis and conclude that there is not a statistically significant association between the FDO operators' knowledge level and guideline use (Appendix E)
<p>Ho2: There is <u>NO</u> association between the BC FDO operators' knowledge level and work period in the field.</p> <p>Ha2: There is an association between the BC FDO operators' knowledge level and work period in the field.</p>	Pearson's chi-square Test	P= 0.23	Do not reject the null hypothesis and conclude that there is not a statistically significant association between the FDO operators' knowledge level and work period in the field (Appendix F)

Discussion

The results from the survey largely represent responses from food banks and meal program operators in BC. There is a need to have the guideline readily available to all FDO operators as 14 out of 18 (78%) guideline users agreed on its usefulness. Among 30 participants who completed the knowledge assessment, 2 were “very knowledgeable”, 25 were “adequately

knowledgeable” and 3 were “not knowledgeable”. This result indicates the general knowledge level of FDO operators on proper operating procedures is on the adequate side, not necessarily sufficient.

Based on open-ended comments, having more single paged highlight pages would allow the guideline to be more user-friendly (Appendix G). Also, as there was a comment on the length, dividing the guideline into separate booklets may be more practical. Accessibility to the guideline has to be improved considering approximately half of the respondents stated that they did not know about the guideline. There is a need to promote wider use.

As the guideline is only available on the BCCDC website, it needs to be distributed more widely by mailing more hard copies or emailing the guideline to FDOs directly. Since the guideline is the only piece of departmental document that FDOs can rely on, its wider use could lead to the better knowledge level of operators.

Since the least common source of donated food was indicated as caterers and restaurants, in order to facilitate food donations, the food donation encouragement effort would have to be targeted toward them. Future health promotion effort focus to educate them about the need to participate of FDOs and

In terms of the content of the guideline, there are suggestions for revision based on the survey result. According to Figure 7 above, 73% of respondents stated that either they have never required or never heard of a Memorandum of Understanding (MOU). Establishing MOU is a valuable way to clarify mutual expectation and maintain a working relationship between FDOs and food donors (3). The guideline indicates that there are templates for these on the BCCDC website but does not provide

actual samples. Including a page long MOU samples form will allow FDO operators to understand the benefit and encourage them to utilize it more readily.

According to Figure 10, the most commonly encountered issue in FDO was assessing each food items for safety. This could be due to not enough volunteers or staff or due to lack of knowledge in how to do so. There are decision trees for frozen and refrigerated perishable food and box items in the guideline which will be useful in streamlining assessment process. The guideline's wider use will allow more FDO operators to utilize these tools to help to resolve the issue. Difficulty in recruiting volunteer drivers was the second most commonly encountered issue. Some practical advice on available resources could be useful. For instance, Greater Vancouver Food Bank hires full-time drivers to distribute donated food from 13 food hubs and over 85 community agencies in Vancouver, Burnaby and New Westminster (26). The participants also indicated that one other commonly encountered issue is that they need more refrigerators and freezers. On the Food Banks Canada website, information on a grant to purchase equipment is available (27). The guideline could include information and resources to assist FDO operators in a practical way. Some of the least common issues included "food donors forgetting to label foods or advise the need for refrigeration" and "another FDO taking our donation from the donor". The guideline could focus less on these issues.

According to inferential statistics result, both use of guideline and work length did not have a statistically significant association with FDO operators' knowledge level. P-value (0.23) for the association between BC FDO operators' knowledge level and work period in the field was

smaller than p-value (0.89) between their knowledge level and guideline use. This result implies that work length has a stronger association with knowledge level than the guideline use. This result does not necessarily agree with the literature review because the guideline is the main source of information on food safety for FDO operators. Use of guideline was expected to lead to higher knowledge level. This can be explained by highly skewed proportion (86%) of adequate knowledge level and also the small sample size (n=30).

The results of this study provide valuable input from FDO operators about their use of the guideline and suggestions of how the guideline should be modified in the future. However, the limited sample size makes results from the inferential statistical analysis less relevant.

Limitations

With respect to methodology, an effort to increase the response rate would be beneficial. This could be done by establishing a relationship with Food Bank Canada to devise a way to distribute the survey to a wider demographic of FDO operators. The responses were collected over a three week period. An extended collection period may have increased the participation rate. A longer response collection period and offering more valuable prizes could be other ways to increase the sample size. Since online invitations to survey can be easily ignored, other modes of a survey such as in-person or telephone survey might increase the response rate. A larger sample size may have increased the internal and external validity of the study.

Knowledge Translation

The results from this study can be translated to devising means to make the guideline more useful and accessible for the

users. Based on open-ended feedback, programs to raise awareness on the Food Donor Encouragement Act to industries may be effective in encouraging food donations from industries. Since most of the guideline users agreed on its usefulness, efforts need to be in place to promote its wider use. The result has shown that the current method of having a guideline on the BCCDC website is not necessarily effective in reaching FDO operators of BC. Therefore, other means of distributing the guideline, such as mailing or emailing, would be beneficial. Also, usage of social media pages or groups for FDOs might enhance its visibility.

Future Research

The following research studies are recommended:

- Study of the knowledge level of food bank operators (not all FDOs) in Canada
- Study of the knowledge level of on-site food handlers (volunteers, drivers, and other staffs) of food banks in BC or in Canada
- Study on food donation recipients on their issues with food quality and safety

Conclusion

The *Guidelines for Food Distribution Organizations with Grocery or Meal Programs* is an important source of information for Food Distribution Organizations (FDOs), especially for food bank operators who do not require food safety training. According to the survey results, a large proportion of FDO operators are not utilizing the guideline. As most of them agreed on its usefulness, there is a need to enhance its accessibility by presenting information in a more user-

friendly way and by providing better distribution means. Environmental Health Officers

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Competing Interest

The authors declare that they have no competing interests.

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Appendix A

Cover Letter

Dear operators or managers of Food Distribution Organizations (FDOs),

You are invited to participate in a brief survey regarding the usefulness of the *Guidelines for Food Distribution Organizations with Grocery or Meal Programs*. This survey is part of a school research project in the Environmental Health program at BCIT and is a requirement for graduation. Through your participation, we hope to better understand current issues, and knowledge level on recommended operating procedures in FDOs.

This survey consists of questions on general information about your organization, current issues, and knowledge on recommended operating protocol. Your input will provide valuable guidance in identifying possible improvements to be made to the guidelines and promote its wider use in the future. At the end of the survey, there will be an option to enter your email address to be included in a draw for two prizes.

The survey will take approximately five minutes to complete. Participation is completely voluntary, and your response will be kept anonymous and confidential. Please see the attached research consent form for more details regarding consent and confidentiality.

Any questions or concerns about the survey can be directed to me at [email] or my instructor, Dr. Helen Heacock at [email]

Thank you for participation in this study. Please find the survey attached.

Diane Lee
Environmental Health Student
British Columbia Institute of Technology

Appendix B

Research Consent Form

Appendix C

Survey Questions

Please note that this survey is only open to current operators (managers) of Food Distribution Organizations (FDOs). If you are not an operator of FDO(s), please forward this survey to the operator. You may choose not to answer every question on the survey.

I have read and understand the explanation of the study. I understand that my participation in this study is voluntary, and that I may withdraw at any time for any reason without penalty.

- a. I agree to participate
- b. I do not wish to participate

Please click on the box that corresponds to your answer.

Demographics

1. What geographic region do you work in?
 - A. Within BC
 - B. Within Canada but not in BC (indicate province you are from: _____)
 - C. Outside Canada

2. What type of FDO do you work in?
 - A. Food bank
 - B. Community kitchen

- C. Low cost retail outlet (eg. organization that provides pick-up at a reduced charge or at cost)
- D. Meal programs (eg. soup kitchen)
- E. Community enterprise (eg. culinary training school or non-profit restaurant)
- F. None of the above

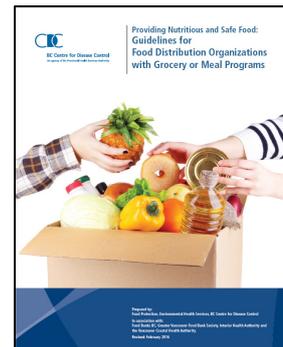
Please state the type of FDO you work in: _____

3. How long have you been working as an operator/ manager of FDOs in general?

- A. ≤ 1 year
- B. 2-3 years
- C. 4-5 years
- C. > 5 years

4. How long have you been utilizing the *Guidelines for Food Distribution Organizations with Grocery or Meal Programs*? (URL link to the guideline: <http://www.bccdc.ca/resource-gallery/Documents/Guidelines%20and%20Forms/Guidelines%20and%20Manuals/EH/FPS/Food/FDO%20Guidelines%20with%20Grocery%20or%20Meal%20Program.pdf>)

- A. I did not know about the guideline
- B. I chose not to use the guideline
- C. Less than a year
- D. 1 - 2 years
- E. More than 2 years



If respondent answers 'I never used the guideline' or 'I chose not to use the guideline' to the question 4, they would proceed to question 5. If respondent answers 'Less than a year' or '1- 2 years' or 'More than 2 years' to question 4, they would be directed to question 5.

5. Why did you choose not to use the guideline? You may choose multiple reasons.

- Content is complicated

- Information is not applicable
- Length is too long
- The guideline is confusing to navigate
- I already know material on the guideline
- The guideline is text heavy
- Other: _____

6. Do you think the guideline is useful to FDOs?

- A. Strongly disagree
- B. Somewhat disagree
- C. Neutral
- D. Somewhat agree
- E. Strongly agree

7. If you have any suggestions or comments on how the *Guidelines for Food Distribution Organizations with Grocery or Meal Programs* could be more useful to you please leave them below:

(eg. Is there a specific topic that is missing or unnecessary? Is the layout (diagrams, tables) useful?)

Issues in Food Distribution Organizations (FDOs)

8. We require our food donors to fill out and submit food donor registration forms and a Memorandum of Understanding (MOU).

- A. Always

- B. Most of the time
 - C. Some of the time
 - D. We have never required this paperwork
 - E. I didn't know these forms existed
9. We have scheduled pick-up times at food donor premises with
- A. All of our donors
 - B. Most of our donors
 - C. Some of our donors
 - D. We receive donations mostly when donors tell us they have food available
 - E. Don't know
10. On a scale of 1 to 5, with 1 being the MOST common source of donated food, and 5 being the LEAST common source for donated food, please rank each of the 6 sources below.
- A. Anonymous donor
 - B. Donation from individuals or families
 - C. Food processors
 - D. Caterer/ Restaurant
 - E. Retailers/ grocery
 - F. Non-profit organizations
 - G. Others: _____
11. On a scale of 1 to 5, with 1 being the MOST frequent problem or issue, and 5 being the LEAST frequent problem or issue, please rank each of the 13 statements below on a 1-5 scale.
- a. We don't have enough food donations to provide for our clients' need
 - b. Recruiting volunteer drivers for food pick-up is difficult
 - c. We don't have enough donations of fresh and nutritious foods

- d. Handling client needs respectfully particularly clients who have multiple needs in addition to a need for food
- e. Assessing each food item for safety (e.g., packaging, labeling, Best Before Date or checking for recall)
- f. Food donors forget to label foods or advise us it needs refrigeration
- g. Training new volunteers and staff
- h. Sometimes another FDO will take our donation from the donor
- i. Potential food donors don't donate because they are afraid of liability
- j. Potential food donors don't want to donate because they have concerns about their brand and/ or liability
- k. Establishing traceability for the foods we donate is difficult
- l. Pest (e.g., mice or insects) problems
- m. We need more refrigerators and freezers to store perishable foods

Knowledge

Please select one answer for the questions below.

Indicate 'True', 'False' or 'Don't know' for the following ten statements.

12.	Food bank activities include receiving, holding, distributing, and packaging but not processing foods.	T / F / Don't know
13.	All FDOs, including food banks, should obtain an operating permit from a local health authority.	T / F / Don't know
14.	FDOs may be able to accept food products past their Best Before Date.	T / F / Don't know
15.	The Best Before Date is an indicator of food safety for unopened package foods.	T / F / Don't know
16.	Food products distributed by FDOs must not exceed the expiry date.	T / F / Don't know
17.	Hot Ready-To-Eat (RTE) foods must be hot-held at temperature of 60°C (140°F) or hotter.	T / F / Don't know
18.	FDOs may be able to accept leftover hot RTE foods from buffets, which were exposed and offered to public.	T / F / Don't know
19.	RTE Foods not being held hot are acceptable only if the total time held below 60°C to the time of serving is less than 2 hours.	T / F / Don't know
20.	Cold RTE foods must be held refrigerated at temperatures at 4°C (40°F) or colder.	T / F / Don't know

21. What is an example of unacceptable packing damage to FDOs? Select only **one** answer.

- A. Sealed soup stock pack exposed to smoke.
- B. Pallet of lettuce and greens with no covering. Road gravel and dirt are splattered directly onto produce.
- C. Plastic bags of carrots or potatoes with rips or tears with no visible soiling of the product.
- D. Scoring damage to bag of flour and tape is used to cover tear.
- E. Canned goods with moderate dents that do not compromise the seams.
- F. I don't know.

22. When is it **NOT** required to reject donated food? Select only **one** answer.

- A. Damage to packaging affecting safety or suitability of the contents.
- B. Best before dates on packages are exceeded.
- C. The donated food products have been subjected to a recall.
- D. Food has been subjected to poor temperature control.
- E. Outer box or wrapping of foods are damaged by rodents or insects.
- F. I don't know.

23. Choose **one FALSE** statement from the below.

- A. All staff who work in direct contact with food should never work while ill with a disease that is communicable through food.
- B. All staff who work in direct contact with food should wash their hands and exposed portion of their arms thoroughly in an adequate hand-washing facility.
- C. FDOs do not need to keep records of food safety training for staff.
- D. Food handlers should avoid eating or drinking in areas where food for distribution is exposed or in areas used for washing equipment or utensils.
- E. Food banks should keep records on who received the food, who donated it and when the food has been distributed to.
- F. I don't know.

Thank you for your participation. If you wish to be entered into a draw for a prize, please leave an email address that you can be contacted at in the case that you are a winner. If you do not wish to be entered into the draw, simply click on "SUBMIT" to finish the survey

Enter to win a prize

To be entered into a draw to win---prize from BCIT Inventory, please include your e-mail below:

E-mail: _____

Your contact information will remain confidential and will only be used for the purpose of notifying the winner.

- Please click on the box if you wish to receive summary of the study through the email address above.

Appendix D

Individual	Work Period	Guideline Use	Grade
1	< 5 years	Used the guideline	B - Adequately Knowledgeable
2	< 5 years	Did not use the guideline	B - Adequately Knowledgeable
3	> 5 years	Used the guideline	B - Adequately Knowledgeable
4	< 5 years	Used the guideline	B - Adequately Knowledgeable
5	< 5 years	Did not use the guideline	B - Adequately Knowledgeable
6	< 5 years	Did not use the guideline	A - Very Knowledgeable
7	< 5 years	Did not use the guideline	B - Adequately Knowledgeable
8	> 5 years	Did not use the guideline	B - Adequately Knowledgeable
9	> 5 years	Used the guideline	B - Adequately Knowledgeable
10	< 5 years	Did not use the guideline	B - Adequately Knowledgeable
11	> 5 years	Did not use the guideline	C - Not Knowledgeable
12	> 5 years	Used the guideline	A - Very Knowledgeable
13	> 5 years	Did not use the guideline	B - Adequately Knowledgeable
14	> 5 years	Did not use the guideline	B - Adequately Knowledgeable
15	> 5 years	Did not use the guideline	B - Adequately Knowledgeable
16	> 5 years	Did not use the guideline	B - Adequately Knowledgeable
17	< 5 years	Did not use the guideline	B - Adequately Knowledgeable
18	< 5 years	Used the guideline	B - Adequately Knowledgeable
19	< 5 years	Used the guideline	B - Adequately Knowledgeable
20	< 5 years	Used the guideline	B - Adequately Knowledgeable
21	> 5 years	Did not use the guideline	C - Not Knowledgeable
22	> 5 years	Used the guideline	B - Adequately Knowledgeable
23	> 5 years	Did not use the guideline	B - Adequately Knowledgeable
24	< 5 years	Used the guideline	B - Adequately Knowledgeable
25	> 5 years	Used the guideline	C - Not Knowledgeable
26	< 5 years	Did not use the guideline	B - Adequately Knowledgeable
27	> 5 years	Did not use the guideline	B - Adequately Knowledgeable
28	< 5 years	Used the guideline	B - Adequately Knowledgeable
29	> 5 years	Used the guideline	B - Adequately Knowledgeable
30	> 5 years	Used the guideline	B - Adequately Knowledgeable

Appendix E

Cross Tabulation Report

Dataset Untitled
 Row Variable Knowledge_level
 Column Variable Guideline_Use

Data Summary Report

Guideline_Use	Knowledge_level	Count
Did not use the guideline		A - Very Knowledgeable 1
Did not use the guideline		B - Adaquately Knowledgeable 13
Did not use the guideline		C - Not Knowledgeable 2
Used the guideline	A - Very Knowledgeable	1
Used the guideline	B - Adaquately Knowledgeable	12
Used the guideline	C - Not Knowledgeable	1

Counts Table

<u>Knowledge_level</u>	<u>Guideline_Use</u>		Total
	Did not use the guideline	Used the guideline	
A - Very Knowledgeable	1	1	2
B - Adaquately Knowledgeable	13	12	25
C - Not Knowledgeable	2	1	3
Total	16	14	30

Expected Counts Assuming Independence Table

<u>Knowledge_level</u>	<u>Guideline_Use</u>		Total
	Did not use the guideline	Used the guideline	
A - Very Knowledgeable	1.1	0.9	2.0
B - Adaquately Knowledgeable	13.3	11.7	25.0
C - Not Knowledgeable	1.6	1.4	3.0
Total	16.0	14.0	30.0

Tests for Row-Column Independence

(Knowledge_level by Guideline_Use)

H0: "Knowledge_level" and "Guideline_Use" are independent.

H1: "Knowledge_level" and "Guideline_Use" are associated (not independent).

Chi-Square	Prob	Reject H0
------------	------	-----------

Test	Type	Value	DF	Level	at $\alpha = 0.05$?
Pearson's Chi-Square†	2-Sided	0.2411	2	0.88645	No
Yates' Cont. Correction*					
Likelihood Ratio	2-Sided	0.2464	2	0.88410	No
Fisher's Exact*					

† WARNING: At least one cell had an expected value less than 5.

* Test computed only for 2×2 tables.

Appendix F

Cross Tabulation Report

Dataset Untitled
 Row Variable Knowledge_level
 Column Variable Years_of_experience

Data Summary Report

Years_of_experience	Knowledge_level	Count
< 5 years	A - Very Knowledgeable	1
< 5 years	B - Adaquately Knowledgeable	13
> 5 years	A - Very Knowledgeable	1
> 5 years	B - Adaquately Knowledgeable	12
> 5 years	C - Not Knowledgeable	3

Counts Table

<u>Knowledge_level</u>	<u>Years_of_experience</u>		Total
	< 5 years	> 5 years	
A - Very Knowledgeable	1	1	2
B - Adaquately Knowledgeable	13	12	25
C - Not Knowledgeable	0	3	3
Total	14	16	30

Expected Counts Assuming Independence Table

<u>Knowledge_level</u>	<u>Years_of_experience</u>		Total
	< 5 years	> 5 years	
A - Very Knowledgeable	0.9	1.1	2.0
B - Adaquately Knowledgeable	11.7	13.3	25.0
C - Not Knowledgeable	1.4	1.6	3.0
Total	14.0	16.0	30.0

Tests for Row-Column Independence

(Knowledge_level by Years_of_experience)

H0: "Knowledge_level" and "Years_of_experience" are independent.

H1: "Knowledge_level" and "Years_of_experience" are associated (not independent).

Test	Type	Chi-Square Value	DF	Prob Level	Reject H0 at $\alpha = 0.05$?
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Pearson's Chi-Square†	2-Sided	2.9196	2	0.23228	No
Yates' Cont. Correction*					
Likelihood Ratio	2-Sided	4.0655	2	0.13098	No
Fisher's Exact*					

† WARNING: At least one cell had an expected value less than 5.

* Test computed only for 2×2 tables.

Appendix G

Response	Open-ended suggestions on the guideline
1	More user friendly and available handouts to use within the locations
2	Single pages of highlights for each section that we could easily copy to post or hand out to our volunteers.
3	I think it would be beneficial if companies, grocery stores etc. were to be mailed, or made aware of the food donor encouragement act. When I try to open relationships, often people are apprehensive because they are totally unaware of the act. I have no hesitation in sending it to them, but I think if it were a public campaign of more awareness of this act, people would be more responsive in their donations.