

Easing Tensions

Concept Mapping of Food Safety and Food Security



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Table of Contents

Table of Figures 3

Executive Summary..... 4

 Recommendations 5

Introduction 6

 Food Safety 6

 Food Security 7

 Tensions 8

Concept Mapping Methodology 9

 Phase 1 – Preparing 9

 Phase 2 – Brainstorming 9

 Phase 3 – Sorting and Ranking 10

 Phase 4 – Data Analysis..... 10

 Phase 5 – Interpretation 11

 Phase 6 – Utilization..... 11

Results..... 12

 Demographics 12

 Point Map..... 13

 Cluster Map..... 14

 Ratings map 16

 Cluster Ratings Map and Ladder Graphs 19

 Go Zone Maps 25

Discussion..... 35

Conclusion..... 37

References 38

Table of Figures

Figure 1 Point Map..... 13

Figure 2 Cluster Map..... 14

Figure 3 Point Rating Importance 16

Figure 4 Point Rating Feasibility..... 17

Figure 5 Overall Importance 19

Figure 6 Overall Feasibility..... 19

Figure 7 Overall Importance by Feasibility 20

Figure 8 Importance for Food Safety 21

Figure 9 Importance for Food Security 21

Figure 10 Importance of Clusters between Groups..... 22

Figure 11 Feasibility for Food Safety..... 23

Figure 12 Feasibility for Food Security..... 23

Figure 13 Feasibility of Clusters between Groups 24

Figure 14 Overall..... 25

Figure 15 Communicating..... 25

Figure 16 Understanding Intent..... 28

Figure 17 Educating..... 29

Figure 18 Understanding Risk and Regulation 31

Figure 19 Enhancing Partnerships..... 32

Figure 20 Recognizing Scale 33

Executive Summary

Tensions between those working in food security and those working in food safety in British Columbia surfaced due to policy changes that highlighted different perspectives on safe food production (e.g., meat inspection regulation). I used Concept Mapping to explore those tensions. The objective of the exercise was to solicit ideas from those working in these areas with regard to the best approaches for easing tensions and enhancing intersectoral collaboration.

Food safety is highly regulated under the Public Health Act, with the food safety core program focused on inspection, education and surveillance. The food security core program is community-based with a Food Security Coordinator providing resources, advocacy, and leadership support. These two programs share a common goal of access to a safe food supply, but finding the right balance between full access and full safety is challenging due to the different disciplinary perspectives operating across subsectors within the public health system.

Concept mapping is a participatory mixed methodology that can contribute to the exploration of reframing the relationship between those working in food security and those in food safety. It is a type of structured conceptualization that consists of six phases (Trochim, 1989). This method enables a group to describe ideas in response to a focused question, which translates to maps for visual representation (Trochim, et al., 2006). I found 6 clusters identifying the best ways to ease tensions.

“Communicating” emphasizes the importance of finding common ground and language and recognizing the interdependence of the groups.

“Understanding Intent” refers to understanding the intention of providing food security initiatives in an urban versus a rural or isolated setting. Additionally, the intention of food safety regulations in promoting safe food handling is important with regard to understanding how to apply food safety principles across food security initiatives.

“Educating” stresses the need to have a balanced understanding of what constitutes a safe and secure food supply. An example from a participant was for reader-friendly information on regulatory environments.

“Understanding Risk and Regulation” suggests that a better understanding of the benefits and limitations of broad-based regulations intended for health protection could be one way forward to ease tensions.

“Enhancing Partnerships” refers to the need to work collectively to develop policy, programs and guidelines that apply to food activities, and to create working models illustrating common goals and objectives.

“Recognizing Scale” is the primary concern that the same regulations are applied to both large and small producers and processors; the suggestion is to consider appropriate regulations for non-industrial food production/processing and to sort out issues of locality and size.

The most important and feasible statements recommend that food security and food safety groups meet face to face to discuss common goals and how conflicts can be resolved. The range of statements highlighted the diverse views, and that only by building relationships will tensions ease and the value of intersectoral collaboration be recognized.

Recommendations

1. Form a provincial level collaborative group that has authority between food security activist groups, agriculture sector, and health sector.
2. Include an environmental health officer or food safety specialist along with community nutritionists and food security activists on food policy councils at the municipal level.
3. Encourage relationships in a systematic way locally, regionally and provincially. This requires dedicated time to be allocated from the health authority.
4. Provide reader-friendly information on regulatory environments. Creating easy-to-understand messaging is essential to food procurement decision making.
5. Increase food safety system capacity to allow for flexibility in regulations to match the context of the small food producer.

Introduction

Public Health renewal in British Columbia (BC) involved the introduction of evidence-based and comprehensive core programs to be delivered by the health authorities (HAs). The majority of the programs were not new, but some programs offered an opportunity for HAs to link various public health programs to ensure a comprehensive delivery of public health services. Food safety is a long-standing health protection service offered by HAs, while the food security program was formed in 2005 as part of the public health renewal process.

The food safety core program is highly regulated under the Public Health Act, with Environmental Health Officer's (EHO's) focused on inspection, education, and surveillance. The food security core program is community-based with a Food Security Coordinator providing community support through resources, advocacy, and leadership, with the help of community nutritionists. The food programs share a common goal of access to a safe food supply, but finding the right balance between full access and full safety is challenging due to the different disciplinary perspectives operating across sub-sectors within the public health system and policies in one area may not support policies in the other.

Food Safety

The purpose of food safety systems is to prevent the consumption of microbial or chemical contaminated food in order to prevent foodborne illness (Serapiglia, Kennedy, Thompson, & de Burger, 2007). Foodborne illness has a larger impact on the lives of those in "developing" countries with weaker public health infrastructure, but still affects post-industrial countries. The extent of the impact is unknown but the World Health Organization (WHO) is working on an initiative to estimate the global burden of foodborne disease (Kuchenmuller et al., 2009). A recent report from the United States estimates that each year 31 major pathogens causes 9.4 million episodes of foodborne illness, over 55 thousand hospitalizations, and 1,351 deaths (Scallan, Griffin, Angulo, Tauxe, & Hoekstra, 2011). Although great improvements have been made to reduce the risk, new pathogens are emerging challenging the food system (Baines, Ryan, & Davies, 2004; Scallan, Griffin, et al., 2011). There is some suggestion that in spite of efforts to reduce foodborne illness, the rates have risen over the past ten years or at least there is no evidence of sustained improvement (Morris, 2011). The largest class of emerging infectious diseases in Canada is foodborne illness (Weatherill, 2009). Foodborne illness can be inconvenient at the least and deadly at worst. It has economic implications for affected individuals, for the establishments linked to contaminated food, and for society in terms of health care costs and lost productivity (Copeland & Wilcott, 2006).

The origins of foodborne illnesses are not easily detected because unspecified agents are major contributors of acute gastroenteritis (Scallan et al., 2011). Additionally, resources are not necessarily available to pursue food vehicle and origin of contamination. As reported by Jones et al, (2004), the food vehicle was only identified in 54% of the 336 outbreaks under study, and of those outbreaks, 66% of sources were in restaurants, 9% involved catered food, and 7% were in private homes. It is not surprising, therefore, that the majority of the food safety effort tends toward food service

establishments and public education, which comprises the traditional work of EHOs related to food (Copeland & Wilcott, 2006).

Food Security

A commonly cited definition of food security comes from the World Health Summit held in Rome in 1996 and states “food security exists when all people, at all times, have physical and economic access to sufficient safe and nutritious food to meet their dietary needs and food preferences for a healthy and active life” (FAO, 1996) . There are other similar descriptions (Cook, 2008; Hamm & Bellows, 2003), but generally food security definitions revolve around access, affordability, and nutrition. Some definitions, however, include environmental sustainability and the economic livelihood of producers, harvesters, and processors as important elements (Epp, 2009). For the purpose of this project, the focus is community food security as defined by the BC MoH adopted from Bellows and Hamm (Bellows & Hamm, 2003) who define food security as “... a situation in which all community residents obtain a safe, culturally acceptable, nutritionally adequate diet through a sustainable food system that maximizes community self-reliance and social justice” (p. 37). This definition of food security requires a community approach to ensure everyone is fed and resources are used appropriately and are protected for future use (Hamm, 2009).

Community food security initiatives in the Victoria Capital Regional District include a number of broad areas as identified by the Capital Region-Food and Agriculture Initiatives Round Table (CR-FAIR), an organization identified as a food security hub in Victoria (Anonymous, 2011) . CR-FAIR has identified food security initiatives to include activities involving urban agriculture, food processing, farmlands and farming, access to healthy diets, education and training, food distribution, and policy and planning, as well as others (Anonymous, 2008). As an example, urban agriculture involves backyard, balcony, rooftop, community and school food gardens, edible landscapes and urban forests, shared fruit tree picking, sharing backyards program, city farms, pocket and farmers markets, education, training and demonstration gardens, and raising small animals and chickens in the city. Processing includes activities such as community kitchens, and processing collectives and cooperatives. Activities involving access to healthy diets include campaigns for a guaranteed liveable Income and other advocacy, food recovery and distribution programs, Good Food Box programs, urban gardens, commons and community gardens, and food buying clubs. Distribution activities include pocket markets, distributors’ cooperatives, emergency food distribution agencies and networks, Good Food Box and other food box programs, school fruit and vegetable programs, and neighbourhood based retail food outlets. Finally, policy and planning food security activities include activities such as local food purchasing policies; agriculture advisory bodies and agriculture area plans, regional food and health action plans, regional food charter, food and nutrition policies, and comprehensive school health policies. The broad list of food security activities includes a range of professionals and lay people who generally share a passion or strong affinity with food production, processing, procurement or distribution.

Many types of lay people and professionals work on food security. The scope of food security covers fulfilling the immediate needs of those who are hungry (i.e. food banks and soup kitchens), to redesign or radical restructuring at the roots of the problem (Cook, 2008). Those working on individual and community capacity-building activities may include community developers, nurses, nutritionists,

farmers, and active lay people who have a vision for an improved way of meeting nutritional needs for everyone. Many people who are interested in food security activities participate in networks. There is at least one food security network in every province in Canada and there are approximately 100 food security and policy groups throughout Canada (Egbers, 2009). The majority of these grassroots movements have two primary intents: they focus on issues of hunger and nutrition from a systems perspective, and they bring people together to influence policy. Food-based social movements have been instrumental in evolving policy debates on topics such as fair trade foods and animal welfare standards, for example (Lang, 2009). Broad reaching networks of actively engaged lay people and professionals help to create synergy where new ideas emerge.

Tensions

There has been a slight shift in the day-to-day work of EHOs with the introduction of the food security core program. For example, there has been an increase in temporary food markets and a rising awareness of the value of local food production and consumption. This activity may have opened new or additional areas of concern or focus for prevention of foodborne illness. Given the challenges in identifying agents and origins of foodborne illness, EHO's and those involved in food safety at the BC Centre of Disease Control appear to have proceeded, justifiably, with caution during the rapid growth of food security awareness in addressing increased food security activity. However, some could perceive this caution as interfering with the progress of community food security. The identification of such tensions is the driver for this study.

Those working in food safety are in a very regulatory environment where guidelines and policies are set to maximize safety for the majority of the population at the provincial or federal level. For those working in food security, the emphasis is on food access, and local responses to challenges to the food system. Tensions between food security and food safety in BC surfaced due to policy changes that highlighted different perspectives on safe food production (e.g. meat inspection regulation). The provincial policies for abattoirs in BC resulted in reduced meat production for small-scale producers, and therefore, lack of local access. Additional challenges have been the production and distribution of raw milk, home-produced products for sale, and the increase in temporary markets. In these cases, it is the small-scale producers for the local market that are affected by policies meant to encompass the provincial context.

There is a great need for knowledge on intersectoral coordination and collaboration, given the broad spectrum of individuals who are engaged in food security activities. Therefore, to better understand and describe the interface between food security and food safety, particularly related to coordination and collaboration efforts among sectors, I chose a web-based approach to reach a national representation of those working in and across both sectors. The objective of the concept mapping exercise was to solicit ideas on how to ease the tensions to enhance intersectoral collaboration and communication between those working in food safety and in food security. A strong theme throughout the public health core programs is maximizing collaboration and communication. If that were effectively put into practice, then there would be fewer tensions between these two groups.

Concept Mapping Methodology

Concept mapping is a participatory mixed methodology that can contribute to the exploration of redesigning the relationship between those working in food security and in food safety. It can provide insight to practical approaches from the participant's perspective on a focused issue. Participants not only contribute their responses to the research question, but also add to the analysis by sorting and ranking the responses provided by the group.

Concept Systems software was designed specifically for concept mapping and provides a framework for a structured conceptualization consisting of six phases (Trochim, 1989). This method enables a group to describe ideas in response to a focused question, which translates to maps for visual representation (Trochim, et al., 2006). The group that was chosen to participate was a national representation of those working in food security and in food safety. The invitation to participate in the concept mapping exercise was sent to food security networks in each province, academic institutions providing food related courses, and to food safety contacts including the Canadian Institute of Public Health Inspectors. E-mail recipients were asked to forward the invitation on to anyone who they thought might be interested, so there is no way of knowing how many people could potentially have received the invitation. The Concept Systems software student license permitted a maximum of 50 people to log onto the system to participate in this project (see Table 1). The methodology technically does not have any limit to the number of participants, but it was initially developed for 40 people or less to be done face-to-face (Kane & Trochim, 2007). According to Trochim (1993) with a greater number of participants, while potentially adding greater clarity to the results, there are likely to be diminishing returns as the number grows. Therefore, the response rate is not of great concern with this methodology.

Prior to inviting the participants to log-in, the website needed to be prepared. Overall, there are six phases to the method from preparing the question to utilization of the maps.

Phase 1 – Preparing

Phase 1 consists of establishing a focused question and choosing participants (Trochim, 1989). For this preparatory phase, I specifically sought input from people who are less affected by day-to-day operations, but more engaged in policy formation and decision-making, thinking they would have experienced the tensions, and in positions to resolving challenging issues that may have surfaced between food safety and food security. This included national representation of managers for food inspectors, food security activists, and interested academics. The purpose here was to engage the people who could best use the results to improve communication and collaboration. The focus prompt is a statement or question that participants completed in Phase 2 and provides the concepts for mapping. The statement used for generating concepts was “A way to maximize understanding and collaboration between those working in food safety and food security is...”.

Phase 2 – Brainstorming

Phase 2 involves asking participants to generate as many ideas as possible to answer the focus prompt (Trochim, 1989). There were 43 participants in this phase. This brainstorming stage occurred on-line using a secure site. Throughout the phase, all ideas generated were visible to all participants in order allow one person's ideas to spark another's ideas. A benefit of on-line participation is that everyone was

free to make their statement without fear of criticism or controversy (Trochim, 1989). There was potential for participants to generate an unlimited number of statements but Trochim recommends no more than 100 statements for phase 3, to avoid serious practical constraints. There were 73 statements generated and this was reduced to 60 once duplicated statements were deleted.

Phase 3 – Sorting and Ranking

In Phase 3, statements were distilled and clarified by the researcher and a colleague so that all the participants could understand their essential meaning. In this phase, I reconnected with all 43 participants, asking them to log on to the website where they were then able to sort the statements into themes or categories based on the similarity of ideas (Trochim, 1989). They also ranked the statements on a Likert-type scale from 1 to 5, according to the dimensions of importance and feasibility, with 1 being less and 5 being more important and feasible. An additional 7 participants joined for this phase, for a total of 50 who could do the sorting and ranking. The software provided space for five demographic questions in this phase that could be used to generate sub-group analyses. I chose 1) province participants are from, 2) occupation or professional designation, 3) whether primary work is in food safety or food security, 4) type of organization they work for or are involved with regarding food, and 5) gender.

Phase 4 – Data Analysis

The fourth phase involves the processing of data and production of the concept map, point-rating map, ladder graph, and go-zone map. The Concept System software does all the statistics and creates the maps. Starting with the information from the sorting of statements, the program identifies two statements clustered together in the same category. On a matrix of NxN statements, the program assigns a 1 if the statements are placed together and 0 if not placed together, allowing for the total across all participants for each statement pair to have a number between one and the total number of participants (Trochim, 1989). The total similarity matrix is analyzed using non-metric multidimensional scaling (MDS) analysis on two dimensions, allowing for representation on an XY axis that is called a point map (Trochim, 1989). Statements piled together most often are closer together on the map. The program then uses the point map output in hierarchical cluster analysis that partitions the configuration into non-overlapping clusters in two-dimensional space (called a cluster map) (Trochim, 1989). The number of clusters is decided by the researcher. Starting with any number of clusters, the researcher considers the statements in each cluster to decide if they are better grouped together or make more sense if divided. One concept per cluster contributes to the overall framework to answer the focused question. Additionally, the importance and feasibility ratings were averaged across participants for each item and for each cluster. This produces a point-rating map, which was generated for the entire set of statements and for each cluster. It is also possible to examine any differences between two groups as set up in the demographic questions. A ladder graph shows the extent of consensus on the importance of statements between group A and group B, giving a Pearson's r to suggest the extent of the correlation (Trochim, 1989). When there is strong agreement between the groups, the graph looks like a ladder. Given the distinct differences between those working in food safety and food security, this map has the potential to identify common ground and highlight areas where more effort could have a positive effect.

The go-zone map uses the importance and feasibility ratings to produce a 2x2 table with the most important and most feasible statements or clusters in the top right hand quadrant.

Phase 5 – Interpretation

Phase 5 is the interpretation of maps. The software program shows the top ten cluster names assigned by the participants. I reviewed those names, and along with reading the set of statements for each cluster, I assigned a name or short phrase to describe the set. The closer statements are located on the map, the closer they are conceptually. In other words clusters of statements are used to structure ideas, producing what could be a conceptual framework for the issue or problem. The point-rating and cluster-rating maps show the height of a point or cluster, representing the average rating for that statement or cluster of statements (Trochim, 1989). Intuitively, it makes sense that the higher rated statements or clusters are the most important concepts on the map.

Phase 6 – Utilization

The final phase, Phase 6, is the utilization of the maps. Evaluation and planning are common areas for the use of concept maps because they are the result of collective thinking on a specific question. Strategic direction and action planning can occur with the use of Go-Zone maps. Specifically, each identified cluster is mapped to identify statements that have the highest importance and feasibility (Kane & Trochim, 2007). The statements that sit within the green area, or the Go-Zone, are the statements that many of the participants agree on as both important and feasible. These are the first issues to think about for action planning (Kane & Trochim, 2007). This could be a particular area of interest for the BC Ministry of Health as they work toward closer alignment of the two programs. That is not to suggest that other statements should not be considered. The statements that are ranked as most important but less feasible offer areas of reflection and deliberation on ways they could be achieved.

Results

Demographics

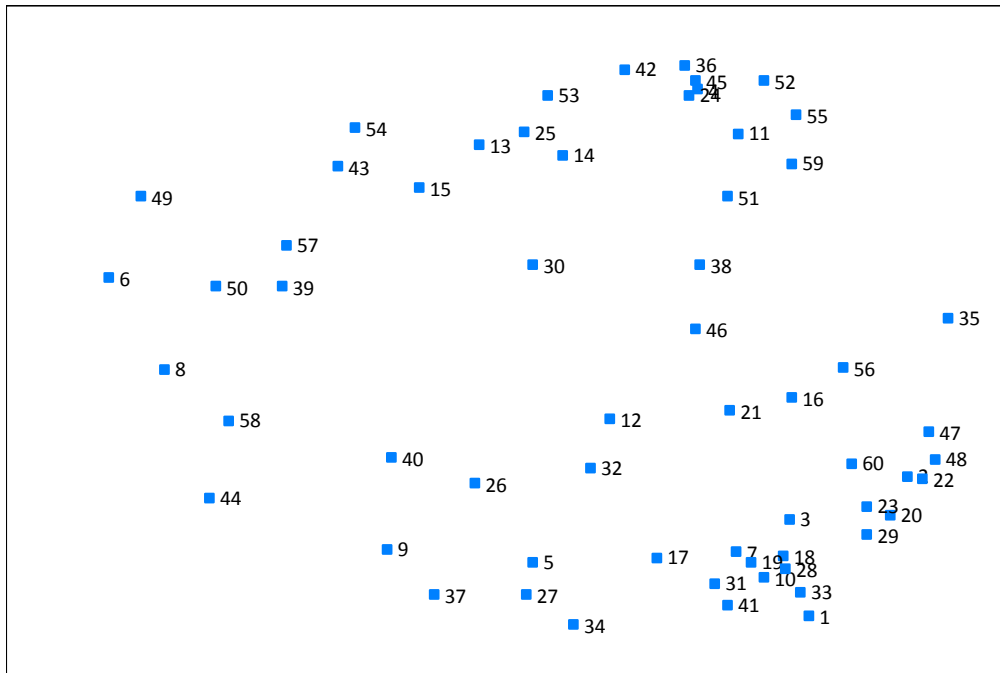
The invitation to participate was sent via E-mail to list serves and personal contacts in every province along with a request for forward to anyone who might be interested. The student license for Concept Systems software permits a maximum of 50 people to log onto the system. Therefore, people who may be curious and log on but not interested in completing the exercise reduce the opportunity for others to participate. Initially, 43 people completed the brainstorming session. Once brainstorming was closed, I removed access for those who stated they were no longer interested and added the remaining 7 who had expressed interest to participate in the sorting and rating phases of the project but were unable to log on initially. Thirty of the 50 participants started the sorting process, but some contacted me to say the process was too involved for them, and stopped. A total of 23 participants completed the sorting, 22 completed the rating on importance, and 21 completed the rating on feasibility. The majority of participants were from British Columbia (BC), with two-thirds stating food security as their primary area of work. There is an active provincial food security network in BC, and my previous research work in the area of food safety allowed for more personal connections in this province than in others. Also, the tensions created due to the meat inspection regulations in BC meant this topic area was of particular interest to those working in the area. Most participants were engaged in advocacy work or public health practice in government or non-governmental organizations at the municipal or provincial level.

Table 1: Demographics

Question	Answer	Total 50
Province	Ontario	6
	Saskatchewan	4
	Alberta	2
	British Columbia	36
	USA	2
Work Area	Food Safety	17
	Food Security	33
Work level	Federal/National	3
	Provincial/Territorial	18
	Municipal/Regional	21
	Student	2
	Other	6
Work sector	Government	16
	Non-governmental organization	17
	Private sector	3
	Academic/University	4
	Health service delivery	10
Work Type	Public Health Practice	18
	Policy	1
	Administrative/ Management	5
	Advocacy	11
	Student	2
	Research	3
	Other	10

Point Map

Figure 1 Point Map

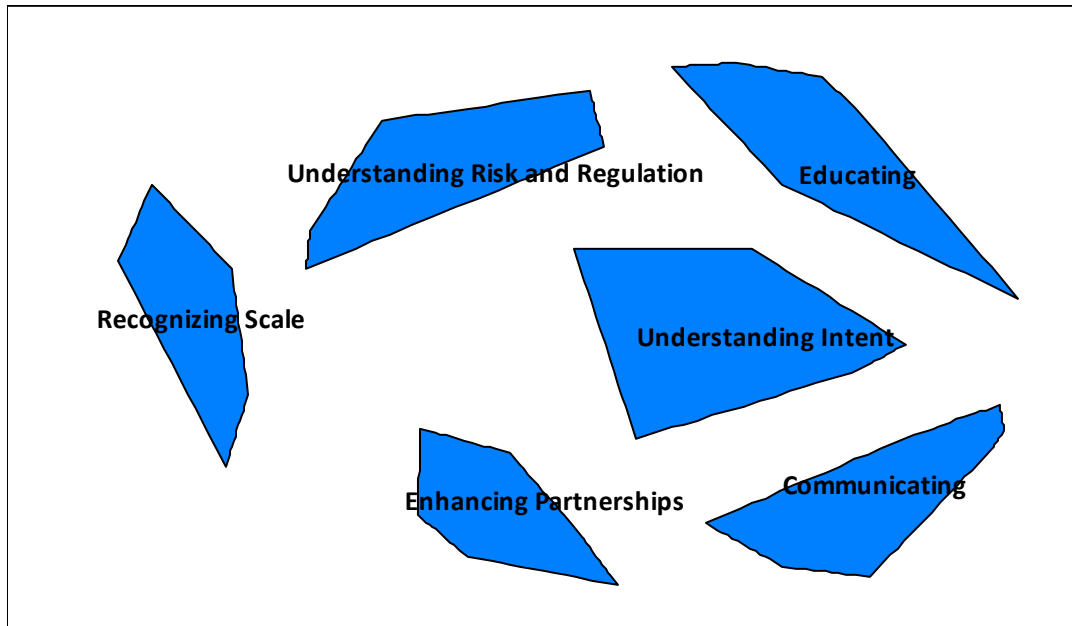


Phase 2 consisted of brainstorming answers to the focus prompt “A way to maximize understanding and collaboration between those working in food safety and food security is...” Seventy-three statements were generated from 43 participants (statements are listed in “Go Zone” section of this report). A colleague and I went through the statements to remove duplicates and to edit statements for clarity and applicability to addressing the focus prompt. The 60 remaining statements were sorted in phase 3 by 23 participants, and the computer software plotted the statements on the point map with MDS using two dimensions in a basic X,Y value configuration. Statements that were most often sorted together by the participants appear closer together on the map (Figure 1). Statements that were not consistently sorted together are situated more centrally on the map. We are interested in seeing the relationship between statements in terms of distance or proximity. Figure 1 shows a larger number of statements together in the bottom right-hand corner, indicating a number of participants agreed to placing these statements together. The rather dispersed nature of statements seen in the top left-hand corner indicates less agreement between those statements being placed together in the same category. I will explain this in greater detail in the following sections.

The statistic that is reported in MDS analysis to indicate goodness-of-fit of the two-dimensional configuration to the original similarity matrix is the stress index (Kane & Trochim, 2007). A low stress value suggests a better fit. The stress value here is 0.239. Trochim (2006) showed an average stress value of 0.285 across 33 studies, and approximately 95% of concepts mapping projects have a stress value between 0.205 and 0.365. The stress value for this study fits in the lower range and therefore indicates the statistics produced was well within the expected range.

Cluster Map

Figure 2 Cluster Map



The Concept Systems program uses the point map output in hierarchical cluster analysis that partitions the configuration into non-overlapping clusters in two-dimensional space, called a cluster map (Trochim, 1989). I started with 15 clusters as a random choice to begin, and examined each group of statements to make sense of the grouping. At 15 clusters, I found there was similarity in the concepts of that statements in a number of the groups, so I continually reduced and re-examined the statements in the clusters until two clusters join that are better interpreted if kept apart. For example, when the current map was reduced to 5 clusters, Enhancing Partnerships and Communicating became one group, but I felt the statements offered a better conceptual understanding of the issue when kept in separate groups. In Figure 2, I reduced the clusters to 6. Each cluster of statements is labeled according to the shared meaning of the statements. I reviewed the top ten cluster names assigned by the participants that were produced by the software program, and along with reading the set of statements for each cluster, I assigned a name or short phrase to describe the set. This provides an easy to follow conceptual framework that addresses the research question.

“Communicating” cluster consisted of 19 statements emphasizing the importance of finding common ground and language. The participants expressed the value of both groups meeting face to face, starting on a regional level within the health authorities, and then broadening the discussion to include farmers and food security activists. Recognizing the interdependence of the groups was considered an important and feasible way to move forward.

“Understanding Intent” cluster consisted of 8 statements. It is a more centralized and broadly dispersed cluster, and therefore the statements do not hang together as tightly as the others. Some statements in this cluster could easily fit with another cluster, but reducing the overall number of clusters did not make sense when examining all the clusters together. The results, however, suggest there is a lack of

common understanding of what "food safety" and "food security" mean, or that one group feels the other group does not fully understand the scope and purpose of the work. Participants suggest that understanding the intention of food security in an urban versus a rural or isolated setting, for example, would help to ease tensions. The statements suggested there is a lack of understanding about what it means to be food secure in rural or remote setting. Additionally, the intention of food safety regulations in promoting safe food handling is important to understand to apply across food security initiatives. There may be unique challenges in applying a safety standard across a vast geographical area with different climate zones and population densities. Understanding the intention of each area toward health protection and promotion could help to find a balance and ease tensions.

"Educating" cluster has 11 statements stressing the need to educate people so they have a balanced understanding of what constitutes a safe and secure food supply. Participants expressed a need to recognize that there is no food situation that is totally without risk, and food security is about having enough food, local is not necessarily safer than imported, and canned or frozen are acceptable alternatives to fresh. This cluster, more than others, reflects the divide in the two cultures with some statements clearly focused on the need to educate for safety, while others clearly show a preference toward security. A very practical statement calls for more reader-friendly information on regulatory environments.

"Understanding Risk and Regulation" has 9 statements. A main emphasis in this grouping is on the protection of broader public health and the role of government. There are tensions between individual choice and protection of the general public, a classic public health tension. There is an expressed concern that food safety will trump right to eat issues. The problem, it seems, is how to ensure an efficient and economically sound safe food system across multiple contexts. If, as a society, we proceed with broad-based provincial regulations, we provide the same safety standard across the province. The implication, then, is that every part of the province has the same access and the same set of needs. The suggestion of removing the word "regulation" from the discussion suggests negative connotations to the word, while still appreciating the need for broader health protection. This group of statements suggest that a better understanding of the benefits and limitations of broad-based regulations intended for health protection could be one way forward to ease tensions.

"Enhancing Partnerships" is very close to "Communicating" but separated out with 7 statements specific to partnerships. The suggestions in this cluster are to work collectively to develop policy, programs, and guidelines that apply to food activities, and to create working models illustrating common goals and objectives. A collaborative group, such as a provincial level food policy council consisting of people from agriculture sector, health sector and grassroots food security activists can help to identify needs and reduce tensions. Representatives from food safety should be on municipal food policy councils. It is important to have integrated, multidisciplinary working teams developing policies, recommendations and strategies for the food system.

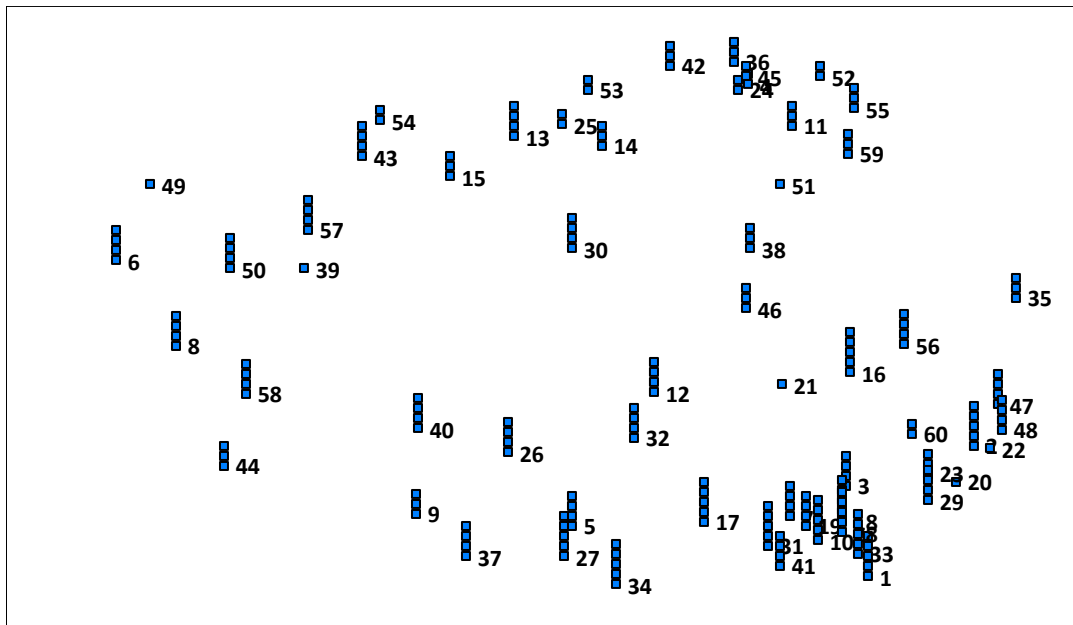
"Recognizing Scale" is the smallest cluster consisting of 6 statements. It is the farthest to the left of the map, loosely joined and well separated from the other clusters, suggesting these statements were rarely, if ever, piled with other statements in the set. The primary concern with this cluster is that the

same regulations are applied to both large and small producers and processors and the suggestion is to consider appropriate regulations for non-industrial food production/processing and to sort out issues of locality and size.

Ratings map

Further to generating and clustering statements, participants rated each statement against the set in terms of importance and feasibility. The ratings were averaged across participants for each item and for each cluster. This produces two maps: a point-rating map (Figure 3) produced for the entire set of statements; and a cluster rating map (Figure 4) to identify the most important and feasible cluster. The following two maps identify the relative importance and feasibility of each statement. The greater number of squares at each point on the map represents greater importance or feasibility of each statement.

Figure 3 Point Rating Importance



In terms of statements that are most important in maximizing understanding and collaboration between those working in food safety and food security, 18 statements were rated at 4 or higher on a scale from 1 to 5. The top 10 statements are:

- 1** To find the common ground. Both are essential and mutually compatible, but this requires open communication and flexibility (versus strict rules).
- 2** To ensure a common language for communication so that true dialogue can occur. As someone with some involvement in both sectors, I have seen situations in which both 'sides' are essentially in agreement, but not necessarily realizing it.
- 16** To come to a common understanding of what "food safety" and "food security" mean.

18 To strengthen the relationship by recognizing common goals and values to create an image of what the future can look like if they work together, then those working in food safety and food security can make a plan to work toward specific goals.

27 To form a collaborative group that has authority between food security activist, agriculture sector and health sector that can move this forward rather than the current ad hoc community/regional voluntary groups.

33 Within public health, create opportunities for inspectors and nutritionists to dialogue and collaborate.

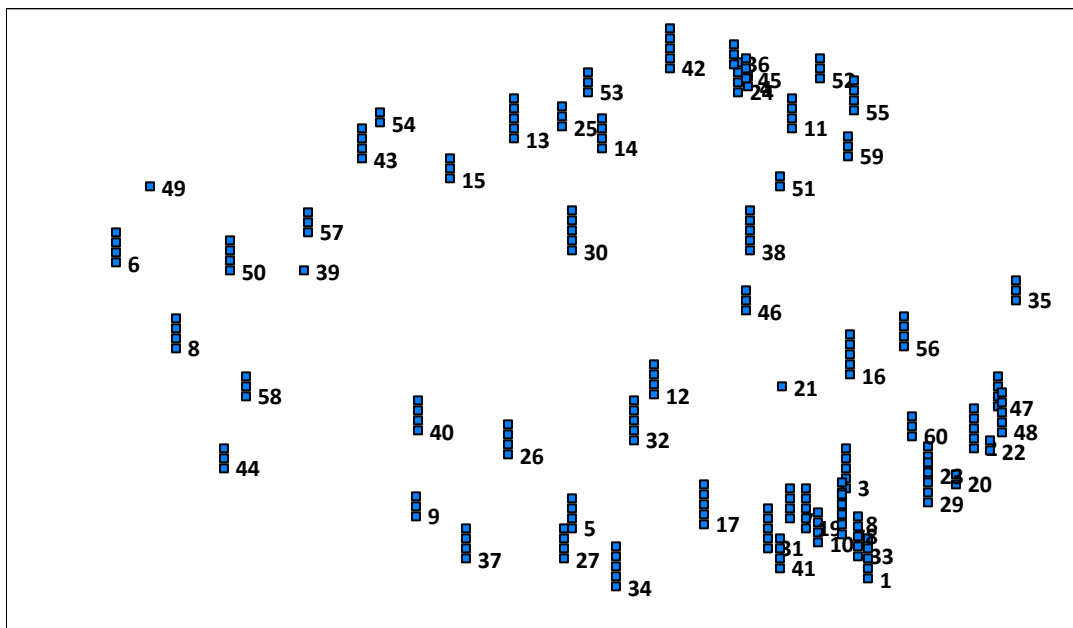
17 To work on regional or community basis. Begin with facilitated dialogue between public health food safety staff and food security staff, reach a shared understanding, and then broaden the discussion to include local farmers and community advocates. Document outcomes.

10 To talk and really listen to each other so as to gain an understanding of the different perspectives from each field, then to come to an area of common ground and an agreement about where the two groups can work together.

28 To have an opportunity to share expertise and decide where they intersect and where the 'common'ness is, and also the gaps that create issues in the community.

31 To examine what each other are doing and show the interdependence of one on the other. Knowing that one's work is dependent on another area strengthens the need to understand, appreciate, and want to be involved in the other area.

Figure 4 Point Rating Feasibility



Thirteen statements were rated by participants as 4 or higher on a feasibility scale ranging from 1 to 5. The most feasible statements are those identified as being the easiest to address. The 10 most feasible statements are:

3 For the employer (e.g. regional health authority) to host a meeting/conference so public health inspectors and nutritionists and/or dieticians can talk face-to-face and discuss common goals and how conflicts can be resolved.

33 Within public health, create opportunities for inspectors and nutritionists to dialogue and collaborate.

1 To find the common ground. Both are essential and mutually compatible, but this requires open communication and flexibility (versus strict rules).

31 To examine what each other are doing and show the interdependence of one on the other. Knowing that one's work is dependent on another area strengthens the need to understand, appreciate, and want to be involved in the other area.

30 To understand the intents of food safety regulations and safe food handling practices, so that the principles can be applied to food security initiatives; and such initiatives can be achieved.

2 To ensure a common language for communication so that true dialogue can occur. As someone with some involvement in both sectors, I have seen situations in which both 'sides' are essentially in agreement, but not necessarily realizing it.

28 To have an opportunity to share expertise and decide where they intersect and where the 'common'ness is, and also the gaps that create issues in the community.

16 To come to a common understanding of what "food safety" and "food security" mean.

18 To strengthen the relationship by recognizing common goals and values to create an image of what the future can look like if they work together, then those working in food safety and food security can make a plan to work toward specific goals.

17 To work on regional or community basis. Begin with facilitated dialogue between public health food safety staff and food security staff, reach a shared understanding, and then broaden the discussion to include local farmers and community advocates. Document outcomes.

Cluster Ratings Map and Ladder Graphs

The cluster rating map shows how important and feasible the clusters are in comparison to each other by producing layers as the visual cue to map interpretation. Similar to the point map, where greater number of squares at each point on the map represents greater importance or feasibility of each statement, the cluster ratings average the ranking for statements in the cluster. In Figure 5, you can see the greater number of layers representing how “communicating”, “enhancing partnerships” and “understanding intent” are most important to all participants. The only difference in Figure 6 on overall feasibility, from Figure 5, is that “educating” is more feasible than “recognizing scale”, but “recognizing scale” is consider more important than “educating”.

Figure 5 Overall Importance

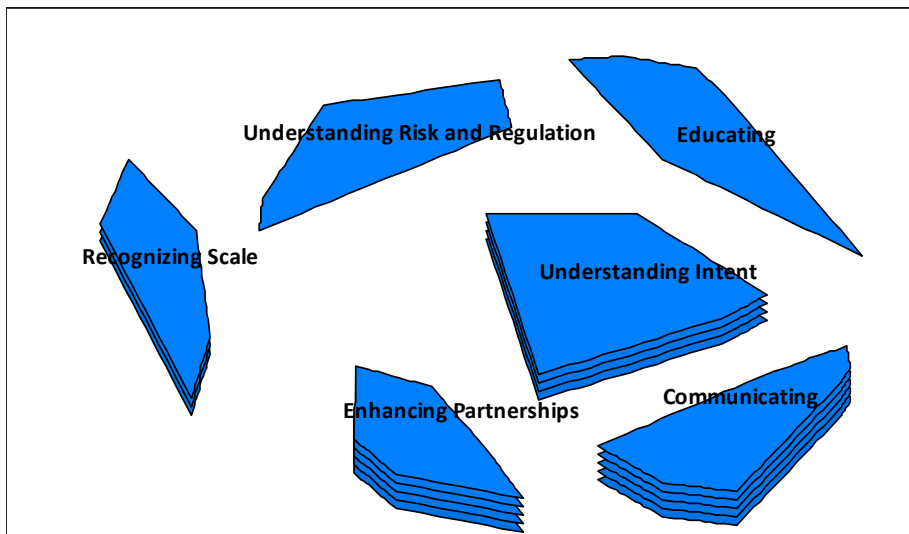
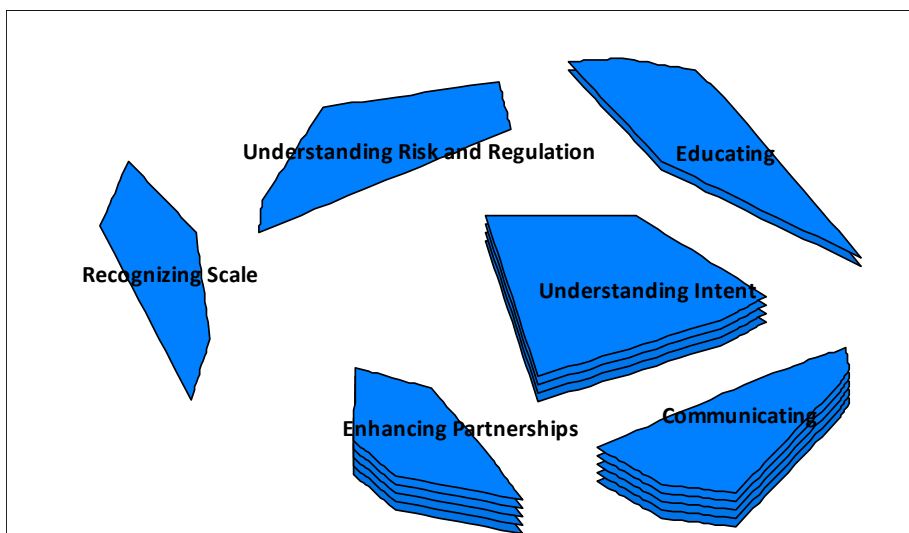
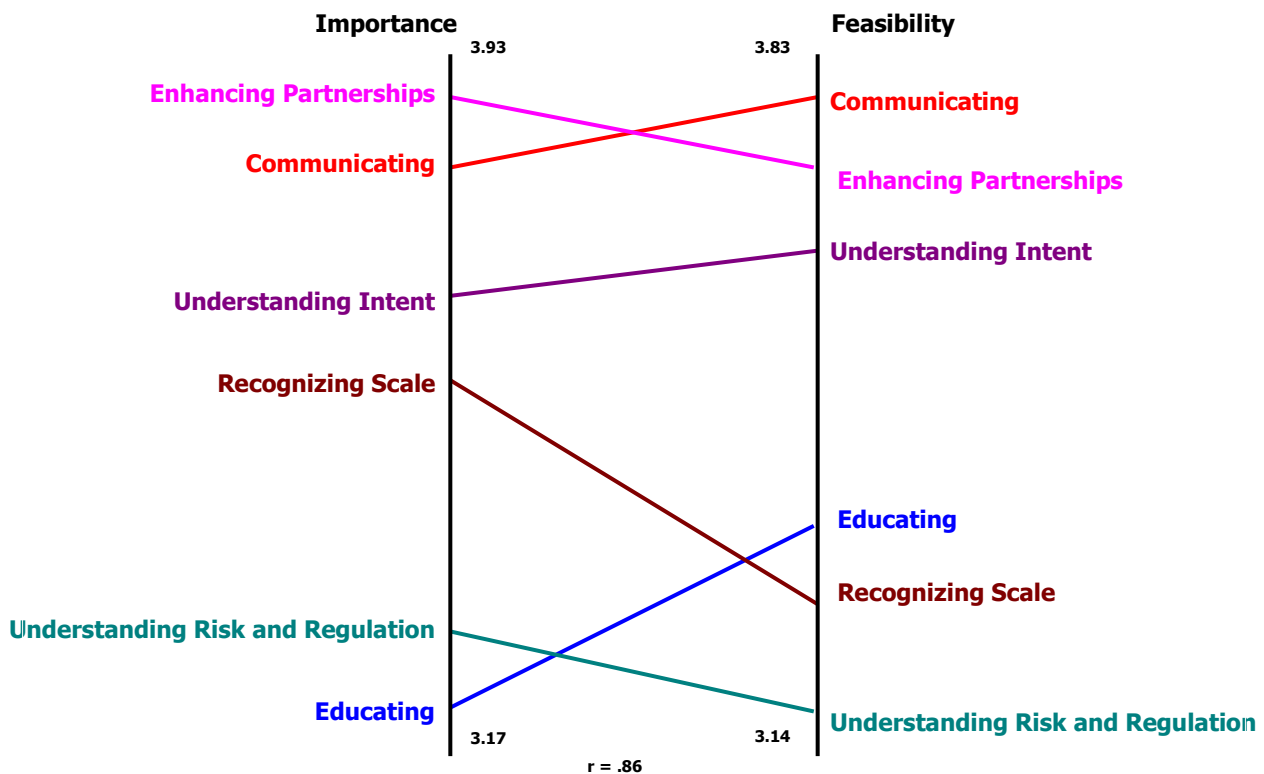


Figure 6 Overall Feasibility



A ladder graph offers a different view of the cluster ratings maps shown above and more detail for the way the clusters relate to each other in terms of their ranking. Figure 7 displays the differences in clusters by what is considered important and by what is considered feasible for the entire set of participants. In this graph, we are not as concerned with the actual rating numbers, as we are with the ranking order. Clusters of “communicating” and “enhancing partnerships” are both considered most important and most feasible, while “educating” is least important, perhaps because many participants feel well informed already. “Understanding risk and regulation” is the least feasible overall, compared to the others, perhaps due to the challenges of balancing between individual choice and broader protection of the public. The differences noted above in the cluster map are shown here by the greater slope seen for “recognizing scale” and for “educating”.

Figure 7 Overall Importance by Feasibility



By dividing the statement sets by those more closely aligned with food safety (Figure 8) and those aligned with food security (Figure 9), you can see that “understanding risk and regulation” is more important for food safety participants compared to food security, while “recognizing scale” is more important for food security participants compared to food safety.

Figure 8 Importance for Food Safety

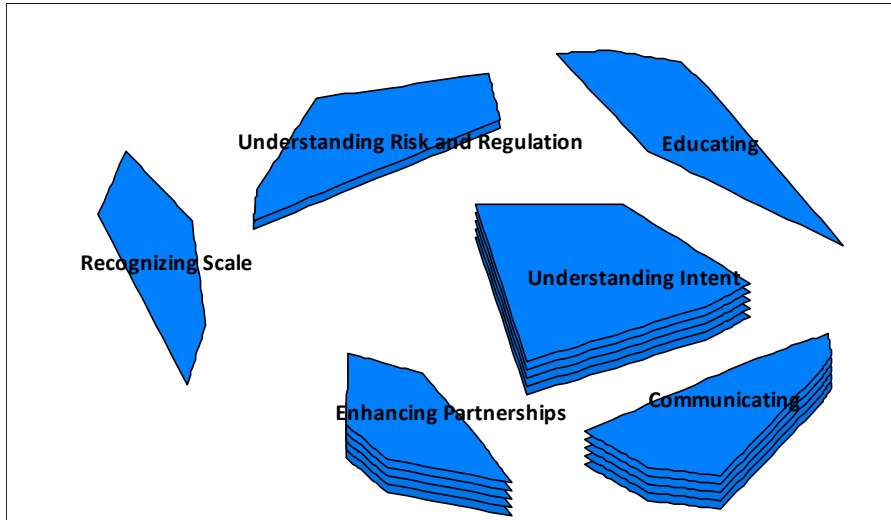


Figure 9 Importance for Food Security

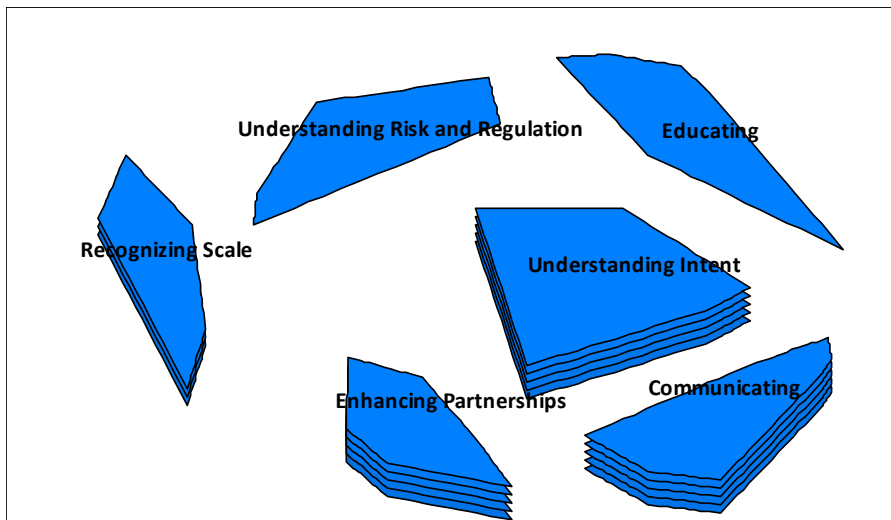
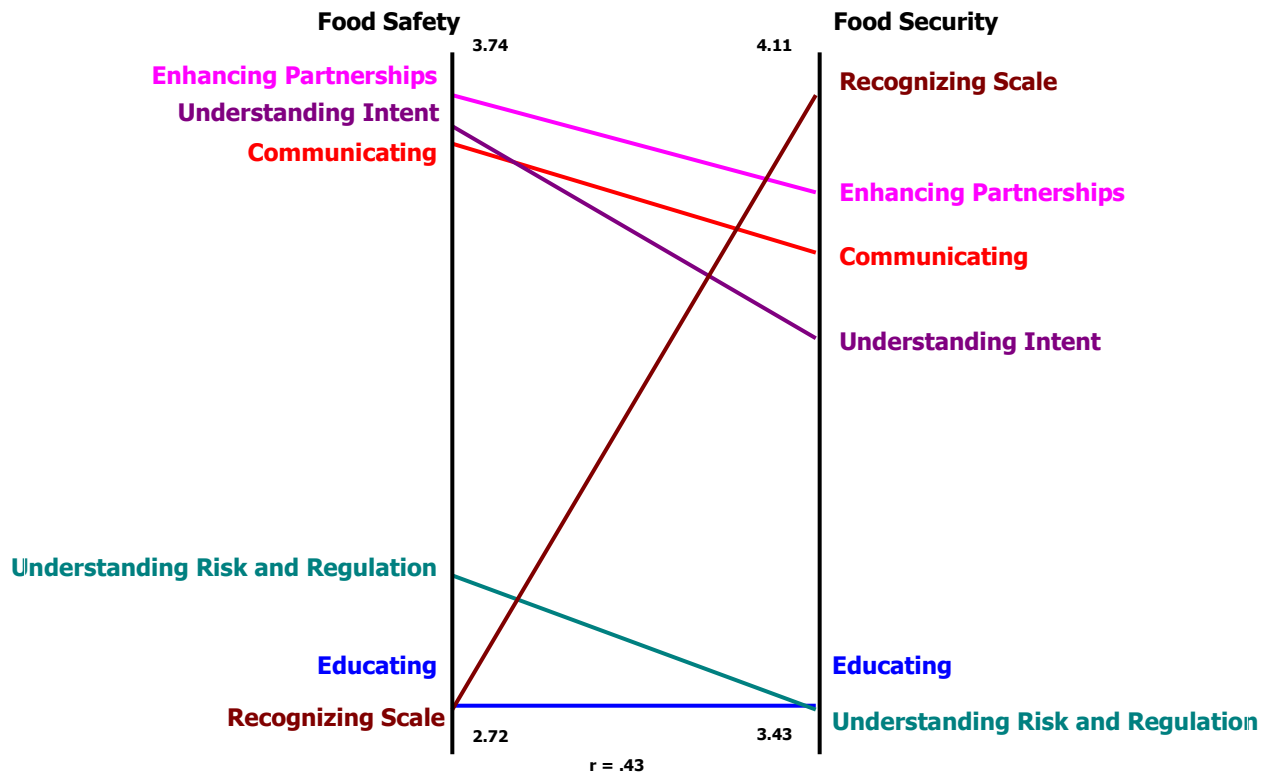


Figure 10 ladder graphs shows the ranking of important clusters between the food safety and food security groups and makes the comparison between the groups easier to see. The greater the slope of the line between the same cluster name, the greater the difference on the scale. Clusters “Recognizing Scale” and “understanding risk and regulation” illustrates the greatest difference in importance between food safety and food security. There is a more marked difference between groups rating the importance of “recognizing scale”.

Figure 10 Importance of Clusters between Groups



In the feasibility cluster maps for the two groups (Figures 11 & 12), “educating” is showing as more feasible from a food safety perspective, having three layers, versus two for food security, while both groups identify “recognizing scale” as the least feasible option. Overall, “recognizing scale” is considered important but most challenging to obtain.

The ladder graph representation of feasibility is shown in Figure 13. Here you can see that even the participants from food security rank “recognizing scale” as moderately feasible within the set of clusters, even though the same group ranked it is most important. This may be a key area to focus on because it is surfacing here as the greatest point of difference and therefore, may offer the greatest opportunity for easing tensions. In terms of the slope of the line in the feasibility ladder graph, “understanding risk and regulation” matches the slope for “recognizing scale”, but in opposite directions. This would also be an area worth exploring between the two groups. Both of these clusters rank relatively low, compared to “communicating”, so if that were set in place first, the other clusters could be explored more fully.

Figure 11 Feasibility for Food Safety

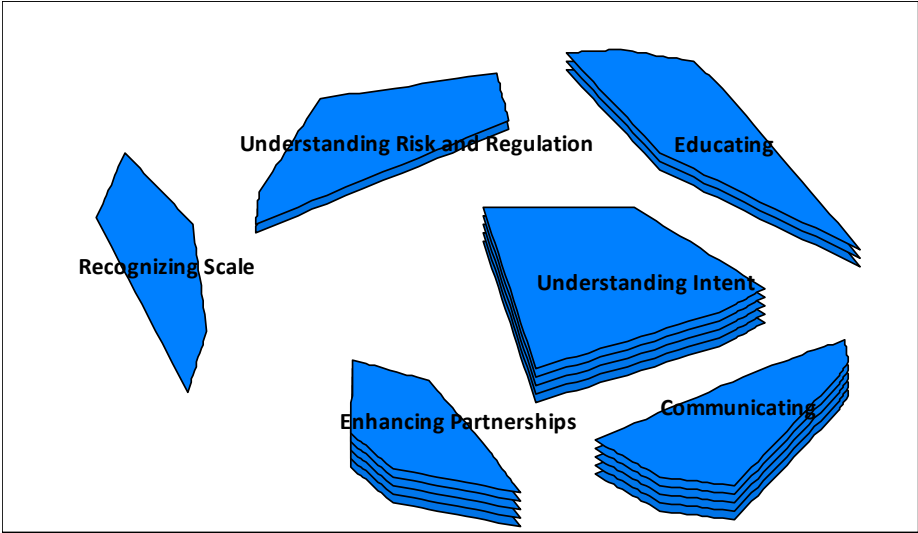


Figure 12 Feasibility for Food Security

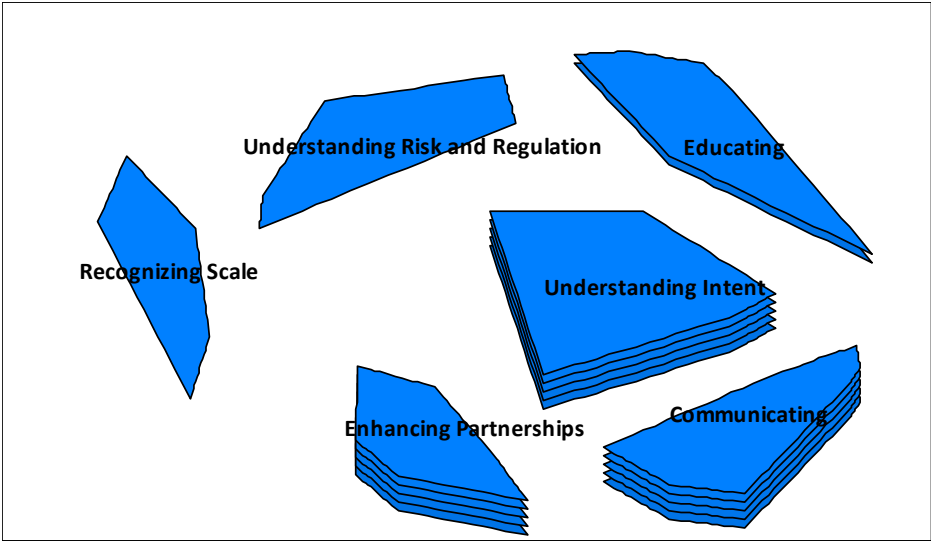
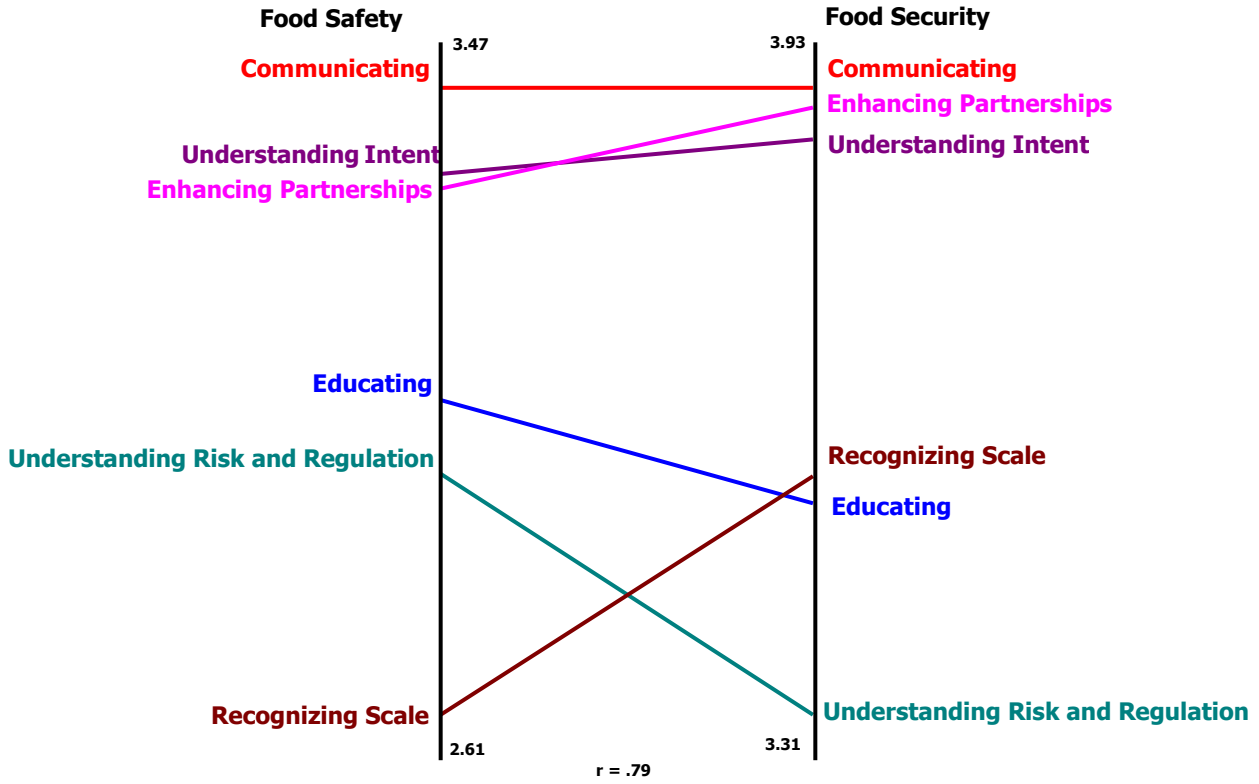


Figure 13 Feasibility of Clusters between Groups



Go Zone Maps

Go Zone maps are a bivariate visualization of the relationship between statements that are most important and most feasible. Quadrants are created based on the mean importance and feasibility calculations. The size of the quadrants is based on the range of ratings and where the mean of the ratings lie within that range. For example, in Figure 14, the importance ratings range from 2.24 to 4.57 (participants were asked to rate statements on a scale of 1-5), the feasibility ratings range from 2.00 to 4.36. Statements in to top right quadrant were ranked above average for both importance and feasibility. These may be areas of action to focus on first, but all statements important to consider. Figure 14 is the overall ratings of importance and feasibility showing statements 1, 3 and 33 as the top rated responses to easing tension.

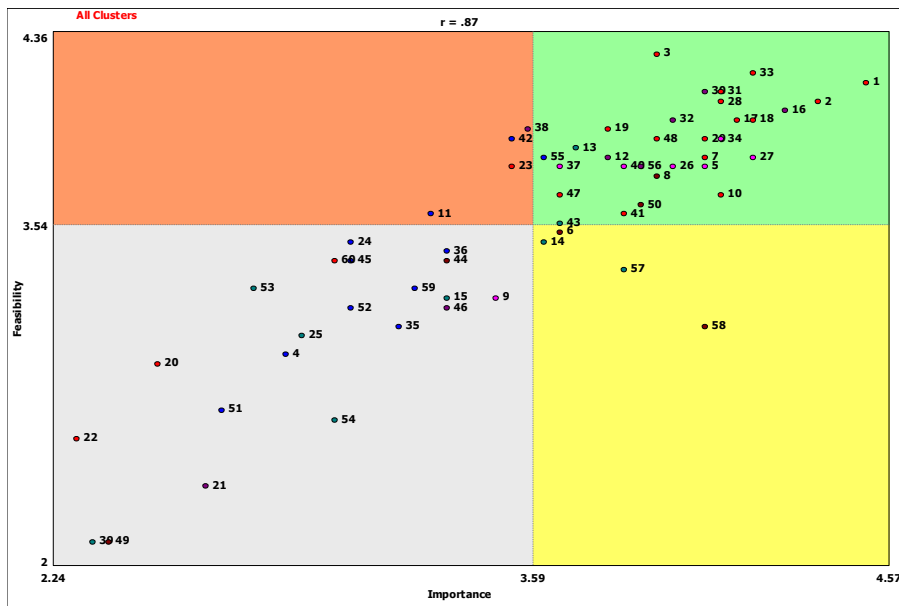
1 To find the common ground. Both are essential and mutually compatible, but this requires open communication and flexibility (versus strict rules).

3 For the employer (e.g. regional health authority) to host a meeting/conference so public health inspectors and nutritionists and/or dieticians can talk face-to-face and discuss common goals and how conflicts can be resolved.

33 Within public health, create opportunities for inspectors and nutritionists to dialogue and collaborate.

The majority of participants recognize the importance of communication and collaboration. Moving that into action can help ease tensions between these two sectors.

Figure 14 Overall

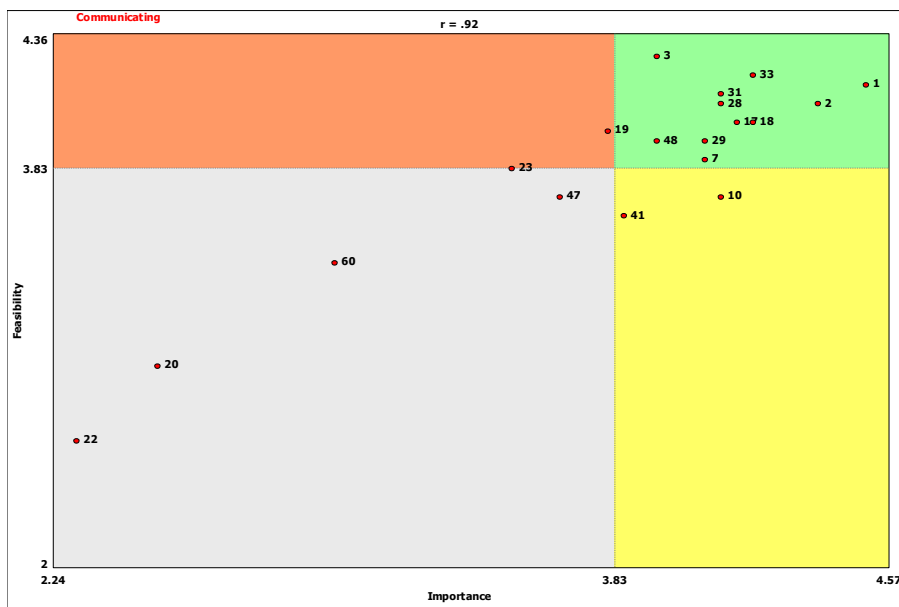


There are four statements that are not in the Go Zone but rank higher than average as important. Statements 14 and 57 are clearly above the mean in the overall map. When the maps are reproduced as

clusters, you can see that these two statements are in the Go Zone for that set (“understanding risk and regulation”). Similarly with statement 6 which is in the cluster “regulating scale”, while on the border here in the overall map, it shows as more important in the cluster group. The only statement that is considered very important, but not very feasible in the overall map and in the cluster group, is statement 58: “To make food safety and security part of all areas of government... making food first in all decisions will increase peoples understanding and collaboration.” This statement sits in the cluster “recognizing scale”. This may be an interesting area for further study, to sort out why it is considered so important, and what it would take to make it a more feasible.

The remainder of the graphs are detailed views of each cluster, organized according to the number of statements each cluster contains. The statements are listed numerically, according to what is in the Go Zone or ranked as both most important and most feasible, and then the remainder of the statements for that cluster.

Figure 15 Communicating



Focus prompt: A way to maximize understanding and collaboration between those working in food safety and food security is...

Go zone statements:

1. To find the common ground. Both are essential and mutually compatible, but this requires open communication and flexibility (versus strict rules).
2. To ensure a common language for communication so that true dialogue can occur. As someone with some involvement in both sectors, I have seen situations in which both 'sides' are essentially in agreement, but not necessarily realizing it.

3. For the employer (e.g. regional health authority) to host a meeting/conference so public health inspectors and nutritionists and/or dieticians can talk face-to-face and discuss common goals and how conflicts can be resolved.

7. To foster dialogue amongst the sectors, exploring the commonalities and differences and clarifying the rationale and evidence behind each.

17. To work on regional or community basis. Begin with facilitated dialogue between public health food safety staff and food security staff, reach a shared understanding, and then broaden the discussion to include local farmers and community advocates. Document agreements.

18. To strengthen the relationship by recognizing common goals and values to create an image of what the future can look like if they work together, then those working in food safety and food security can make a plan to work toward specific goals.

28. To have an opportunity to share expertise and decide where they intersect and where the 'common'ness is, and also the gaps that create issues in the community.

29. For local food security activists to meet local food safety experts and build a relationships.

31. To examine what each other are doing and show the interdependence of one on the other. Knowing that one's work is dependent on another area strengthens the need to understand, appreciate, and want to be involved in the other area.

33. Within public health, create opportunities for inspectors and nutritionists to dialogue and collaborate.

48. By bringing people to work together - food literacy, food skills capacity building, and food safety go hand in hand. The silos should be broken down.

Statements not in the Go Zone

10. To talk and really listen to each other so as to gain an understanding of the different perspectives from each field, then to come to an area of common ground and an agreement about where the two groups can work together.

19. To schedule a meeting to build relationships and explore common goals and values to imagine what the future would look like if those working in food safety and food security worked together (this method is called scenario thinking).

20. By building the relationship with each other by going for a walk together and enjoying a meal together then schedule a more formal meeting with those working in food safety and food security to explore their common goals and values around food.

22. To enjoy a meal together (specifically a picnic, outdoors, with the families of those working in food safety and food security present). After/during the meal talk about food safety and food security issues in an informal way.

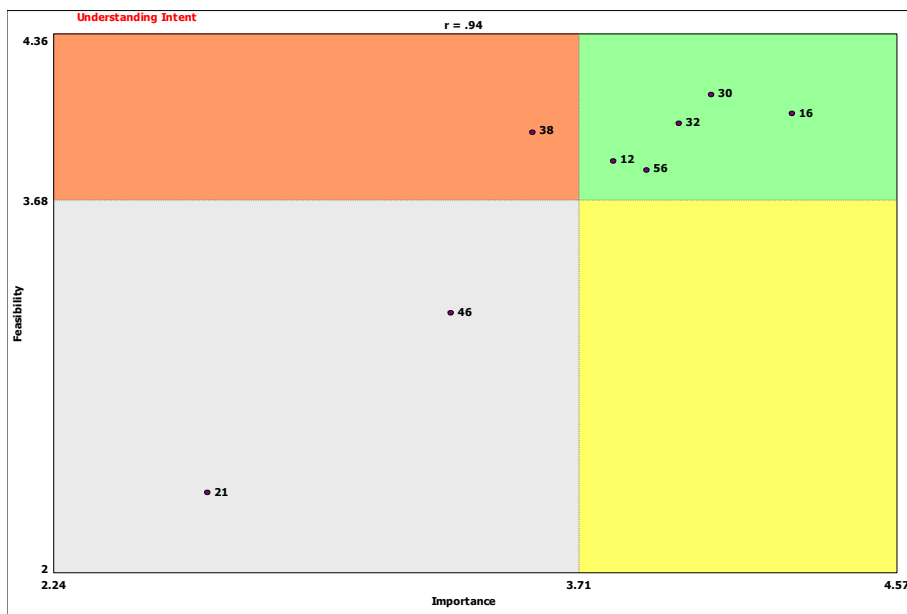
23. To organize collaborative workshops and field-days where information and ideas are shared and a sense of common purpose can be developed.

41. To secure shared goals and priorities between the two groups whereby the responsibilities of both interests are achieved.

47. Bring people together to explore the mandates of food safety and the advocacy entailed in food security.

60. To establish or promote existing central interface on the internet, and yearly in person events, that allows for continued permanent conversations between individuals and organizations from different levels of involvement and different sectors.

Figure 16 Understanding Intent



Focus prompt: A way to maximize understanding and collaboration between those working in food safety and food security is...

Go Zone Statements

12. For food safety and food security professionals to understand the intent of and the perceived need for a focus on food security in various contexts (e.g. urban vs rural/isolated, developed vs developing areas, moderate climate vs long-winter areas).

16. To come to a common understanding of what "food safety" and "food security" mean.

30. To understand the intents of food safety regulations and safe food handling practices, so that the principles can be applied to food security initiatives; and such initiatives can be achieved.

32. To identify where inspectors and nutritionist converge and diverge. Is food access as central to public health inspectors as it is to nutritionists when we talk about food security?

Not in the Go Zone

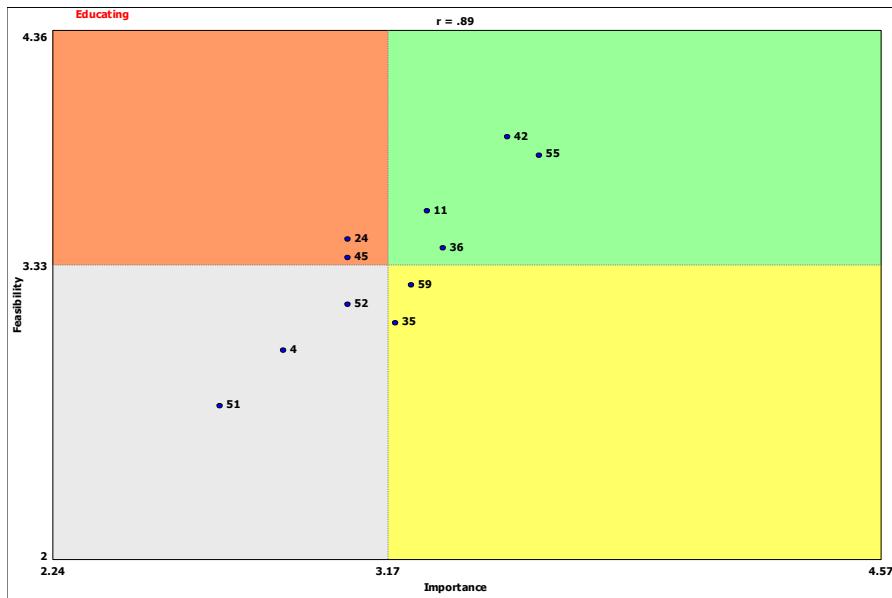
21. To go for a walk together in a low income neighbourhood. During or after walking, talk informally about what they see or observed related to food while walking.

38. To emphasize that food safety and food security are not mutually exclusive.

46. To have discussions about the relationship of food safety to food security/sovereignty so we can figure out the best balance. Paid service providers (inspectors) are the judge of local food events, processing and growing, and we need to discuss the separation that judgement creates between people and food.

56. To have a forum for food security initiatives to be discussed with food safety staff and public groups to assist with overcoming barriers rather than halting projects due to lack of regulatory compliance.

Figure 17 Educating



Focus prompt: A way to maximize understanding and collaboration between those working in food safety and food security is...

Statements in the Go Zone

11. For everyone to remember that local does not guarantee safety nor does greater than 100 miles, that neither home prepared nor commercially prepared guarantees safety, that neither raw nor cooked guarantees safety, that neither inspected nor uninspected guarantees safety.

36. To engage all levels of populations around the importance of healthy accessible foods, and education around the benefits of eating, cooking, growing, and producing natural foods.

42. By providing more reader-friendly information on regulatory environments, especially meat processing. Creating easy-to-understand messaging around the differences between provincially and federally inspected abattoirs is key to food procurement decision making.

55. By holding public information sessions to inform on the value of food security initiatives, the need for food safety to be in place, and what constitutes food safety.

Not in the Go Zone

4. To educate the public that local food is not any safer than imported food. It feels better to have local food but safety should be the priority.

24. By realizing that enough food doesn't necessarily mean 150 different types of items from the produce section of the grocery store in winter. Frozen and canned foods are also acceptable.

35. To use everyone's available resources to reach out to everyone, to meet them where they are currently in the food culture and help them along with resources, info and support, to improve the culture for themselves.

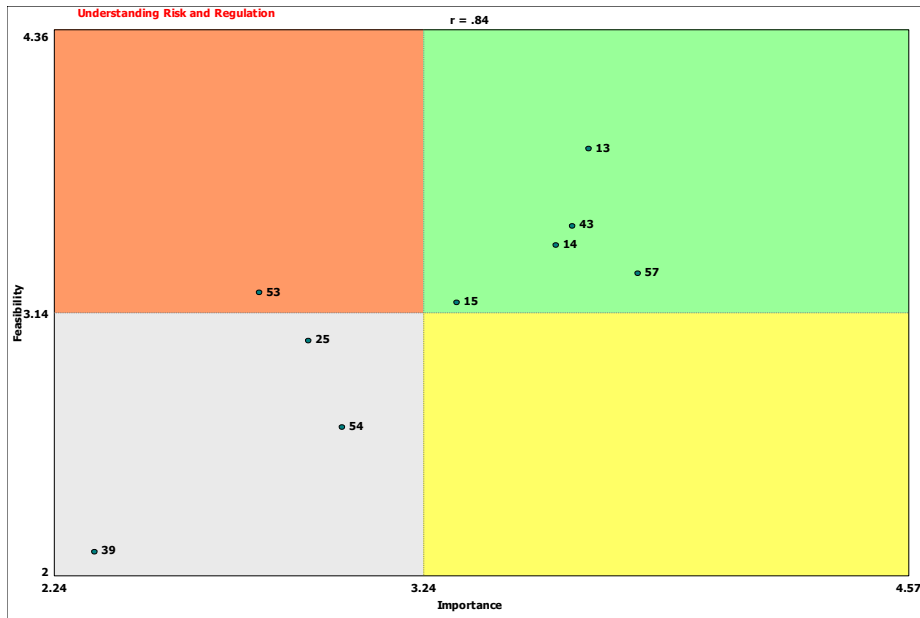
45. To educate and empower people to be responsible to research where their food comes from and decide for themselves if they will eat it - e.g. - label things that are genetically altered.

51. To communicate that without food, "safety" is meaningless; that safety is subservient to security.

52. To improve public understanding of their personal role in food safety, so they understand that the safest food comes from someone you know and trust.

59. To create a public awareness campaign that is directed at people in power and within administration of different organizations across sectors so that their knowledge of this issue is enhanced and they are able to identify the need to support initiatives.

Figure 18 Understanding Risk and Regulation



Focus prompt: A way to maximize understanding and collaboration between those working in food safety and food security is...

Statements in the Go Zone

13. For food security professionals to understand the inherent food safety risks in some foods (e.g. raw sprouts, raw milk, dried and/or fermented meats, home canned) and that food regulations are intended to protect broader public health not limit individual choice.

14. For food security advocates to understand that broader public health is a priority for governments and food safety agencies, and that legislation to protect the general public from food related health risks may be unacceptable to people focused on choice.

15. For food safety professionals to accept that some individuals want to take risks for themselves with respect to food choices and that these risks may be unacceptable when considering broader public health implications.

43. Emphasize the economic reality of farm business. Both food safety and security folks make demands that require huge capital, knowledge, time, and liability risks from farmers, ignoring many of the business realities and underestimating market demand.

57. To develop awareness of potential by-laws, policies, legislation, bills, and international trade agreements which affect producers and processors - e.g. liability insurance for community gardens, irradiation of produce before selling, or genetically engineered foods.

Not in the Go Zone

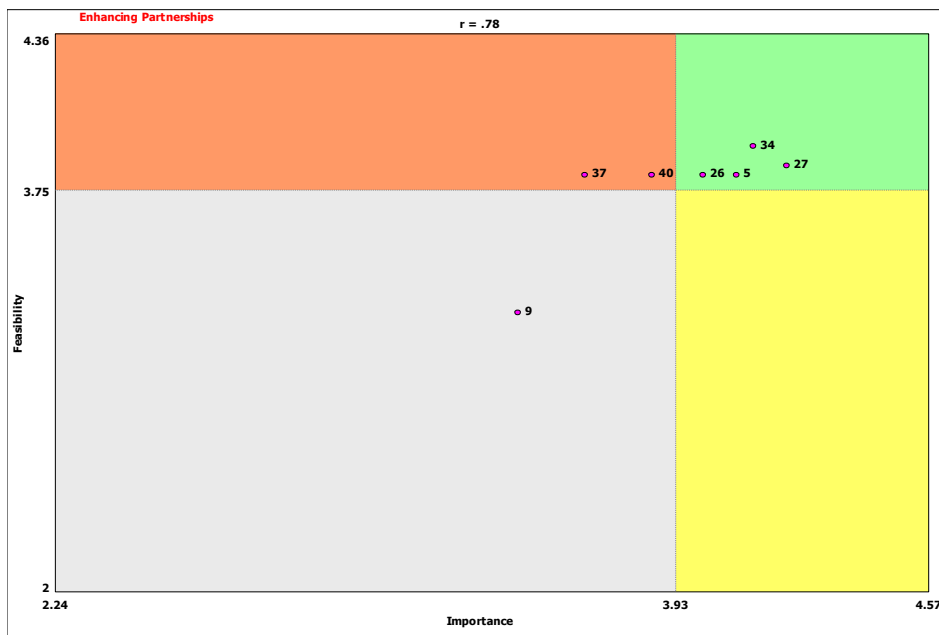
53. To engage the public in education that ultimately, food safety issues rest with the consumer, NOT the government.

54. To ensure that "food safety" issues do NOT intrude in "right to eat" issues.

25. To realize that food, unless it is sterile, is not safe and when it is sterile it is not particularly healthy typically. Food that doesn't rot isn't food so we need to let go of our desire for guaranteed safe food.

39. To remove the word 'regulation' from the discussion.

Figure 19 Enhancing Partnerships



Focus prompt: A way to maximize understanding and collaboration between those working in food safety and food security is...

Statements in the Go Zone

5. Through enhanced partnerships. Both sectors (safety and security) need to work collectively to develop policy, programs, guidelines etc... I have experienced that food security is promoted to community sectors before the safety issues are considered.

26. To list issues and concerns from stakeholders in order to create working models illustrating policies and processes that recognize common goals and objectives. Identify some quick wins to support further action.

27. To form a collaborative group that has authority between food security activist, agriculture sector and health sector that can move this forward rather than the current ad hoc community/regional voluntary groups.

34. To increase opportunities to work together on food policy council and food system initiatives occurring at the municipal level.

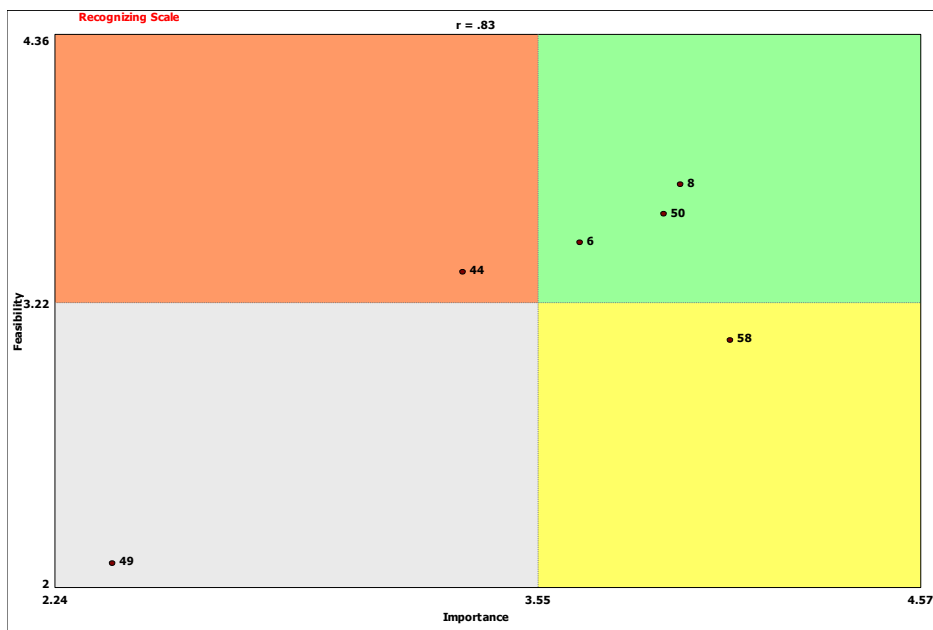
Not in the Go Zone

9. To identify the level of focus for the understanding and collaboration. National level XYZ won't necessarily be able to understand and/or collaborate effectively with local level ABC because constituencies and purposes are so different.

37. To create integrated, multidisciplinary work teams that bring the skills and knowledge from both sets of expertise together when developing outputs (policies, recommendations, strategies).

40. To identify the greatest areas of concern and then to sort through those that have broad implications and those that involve the least risk or the least ties to real food security.

Figure 20 Recognizing Scale



Focus prompt: A way to maximize understanding and collaboration between those working in food safety and food security is...

Statements in the Go Zone

6. To look at the incidence data for small scale food producers/processors as compared to large scale producers/processors - i.e. what proportions of consumers have been sickened by small scale producers vs. large scale producers?

8. To look together at the various scales of food production and distribution and consider their impact on both safety and security. In particular to consider what would be appropriate regulations for non-industrial food production/processing.

50. To sort out issues of locality and size; to come to mutual understanding that small, local food producers have fundamentally different food safety needs than big industrial food producers.

Not in the Go Zone

44. Get government agencies, hospitals, etc. to support local growers and help to strengthen local food growing - by example.

49. To bring an end to draconian food safety actions, such as the arbitrary shutting down of raw dairy herd share operations.

58. To make food safety and security part of all areas of government... making food first in all decisions will increase peoples understanding and collaboration.

Discussion

Concept mapping offers a unique means to involve a cross section of interested individuals in a participatory mixed methodology project focused on a specific question of concern. In the course of this project, concept mapping provided a platform for two diverse groups to share ideas on ways to ease tensions between them. The call for intersectoral coordination and collaboration has been clear from the onset of the core functions framework and core program process in BC, and is also a key health promotion strategy. Putting that call into action requires a deliberate strategy with a focus on action. Intersectoral coordination and collaboration are important aspects to a healthy food system, especially given the broad spectrum of individuals who are engaged in food safety and food security activities.

Intersectoral collaboration is a joint working arrangement through which those working in different sectors unite to address an issue to achieve a common goal (O'Neill, Lemieux, Groleau, Fortin, & Lamarche, 1997; Dowling, Powell, & Glendinning, 2004). Health Canada developed an Intersectoral Action Toolkit (Health Canada, 2000) that describes collaboration as a commitment to a common vision, creating new channels for communication, committing to planning together, determining authority and shared power, contributing both resources and reputation, and jointly sharing all risks, outcomes, and rewards. Lasker, Weiss and Miller (2001) identify collaboration as a means to identify new and better ways of thinking about an issue. Intersectoral collaboration is not new but evidence for successful partnerships is sparse (Dowling et al., 2004; Lawn et al., 2008; Green & Kreuter, 2005). Stern (1990) wrote about the tensions and contradictions of developing alliances stemming from the 'Achieving Health for All' framework. This included competition for resources, competition for leadership between professionals, and mistrust by community groups of professional associations and bureaucrats. Stern advises leaders of alliances to be aware of the need to develop credibility, which takes time. Additionally, she encourages debate about different and similar agendas, noting the need for a combination of skills including political, analytical, mediator, facilitator and communication. Other challenges include cultural differences, risk orientations, and decision-making styles (Alexander et al., 2010). It can take considerable time and effort to develop trust and respect among the group, and there needs to be full awareness of the challenges that an alliance can present.

Hawe and Stickney (1997) report that in forming a new coalition, direction setting and specifying goals can be a long and difficult process involving values clarification. These authors also provide a warning about the tendency of the health sector to slip into a position of assuming others will follow their lead (Hawe & Stickney, 1997). The concern is that the community is working under the direction of the health professionals, rather than everyone is working together. This can result in increased tension between food security activists and regulatory authorities. Food security is a highly community driven program with health authority staff working to support community activities. The food safety program is highly regulatory, with health authority staff more often seen as enforcers, than as professionals working with community members. Forming a new coalition between food security and food safety may help to balance perceived power differentials. Benefits of an alliance or coalition could be increased networking, information sharing, access to resources, participation in decision-making, and experiencing a sense of accomplishment (Cramer, Atwood, & Stoner, 2006). There is an advantage to early identification of problems and developing interventions together.

According to the participants, ways to maximize understanding and collaboration between those working in food safety and food security fall into three broad areas: relationships, education and context.

Relationships: Communicating and enhancing partnerships are about building relationships to be better informed about the work and values of the other group. There is a need for a formal process of working together to recognize common goals and objectives, in which policy, programs and guidelines can be developed. The collaborative group needs to have authority balanced between food security activist, agriculture sector, and health sector rather than the current ad hoc community/regional voluntary groups. At the municipal level, there needs to be an environmental health officer or food safety specialist sitting on food policy councils with community nutritionists and food security activists. The relationships need to be encouraged in a systematic way locally, regionally and provincially; this requires dedicated time to be allocated from the health authority so the relationship building is recognized as important between these groups. It is as important to develop and maintain good working relationships across professions as it is between the professionals and the community clients they work with on a regular basis. The cross professional relationships will only enhance the work done with the community.

Education: Education needs to be focused on surfaced through the clusters of understanding intent, educating, and understanding risk and regulations. The participants identified a lack of understanding of how food security needs are different for those living in an urban versus living in a rural setting in terms of access, and there is a lack of consideration about the intention toward developing a food secure community in rural setting. Physical and social environments impact food access. In rural areas, there is less access, in both a physical and economic sense, to the mainstream food system that supplies urban areas (Smith & Morton, 2009). Food available through a retail market is limited in rural areas. According to Morton, Bitto, Oakland and Sand (2008), rural low-income households have more frequent non-market food exchanges than urban low-income households, and small scale food production is the most economical way to have healthy food available to the community. Understanding the food security needs in different settings is important to for a comprehensive approach to the food system. Similarly, food safety guidelines are intended to prevent and reduce incidents of foodborne illness. It is not just about knowing how to apply rules or guidelines, but understanding the bigger picture of what it takes to create and support a safe food supply.

The regulatory environment is challenging to navigate. Demystifying regulations is one way to bridge the gap between those who enforce regulations and those who work in environments needing to be regulated. There is attention to the idea of food product labels being easy-to-read regarding safety, nutrition, and allergens (Mackey & Metz, 2009; Mills & Valovirta 2004), but there is less concern that food safety regulations be put into plain language. More could be done to describe regulatory documents to assist in better communication between regulators and lay-people.

The final education piece is the role of public health and government in protection of the public as well as the right to food and individual choice. This may be an issue of values. One participant wrote of a concern that food safety would trump right to eat issues. So, on one hand there are those who value the a precautionary approach and focus on the safety aspect of food, while on the other hand there are

those that perceive the risk of foodborne illness as minimal and the restraints on food access as impeding the health and wellbeing of individuals and communities. These are complicated and value-laden issues requiring relationship building, trust and respect to work out a balance.

Context: The final group, which stands alone, is “Recognizing Scale”. This group stands alone as a structural set of statements, and as being most important to those working in food security and least important to those working in food safety. It is related to the regulatory environment because the issue is the same regulations that are applied to large-scale food production are applied to small-scale food production, impacting the ability of small-scale producers to comply with standards that are not completely fitting with the setting. Seed (2011) refers to the issue of scale in terms of standardization of regulations as a subject of power. According to Dahlberg (as cited by Seed 2011), standardization allows for a structurally simple society and therefore, more easily dominated. The tension here is clear, that one group strives for simplicity while the other is seeking flexibility that adds a level of complexity beyond the capacity of the system. Therefore systems change is necessary to operate in terms of what is logical for the smaller context versus blanket regulations that are applied for simplicity sake.

Conclusion

There are no easy or quick means to ease tensions between those working in food safety and food security. There is, however, no mention of distrust between the groups and a general recognition of the value of both safety and security for a healthy food system. Concept mapping has provided a way for food safety and food security stakeholders to have direct input to resolving the problem. Specifically, we identify five priorities to focus on for easing tensions:

- 1) There is a need to form a provincial level collaborative group that shares authority among food security activist sector, agriculture sector, and health sector.
- 2) Food policy councils at the municipal level should include an environmental health officer or food safety specialist along with community nutritionists and food security activists.
- 3) Relationships need to be encouraged in a systematic way locally, regionally and provincially and this requires dedicated time to be allocated from the health authority.
- 4) There is a need to provide reader-friendly information on regulatory environments in order to facilitate food procurement decision-making.
- 5) There is a need to increase food safety system capacity to allow for flexibility in regulations to match the context of the small food producer.

Further exploration into these priorities is necessary to determine their value and success.

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