



Food Recall System Effectiveness: Industry and Government Perspectives within Canada

ABSTRACT

This study was conducted to explore what constitutes an effective food recall within the Canadian context. In-depth, semi-structured interviews were created based on the literature and the pretesting of questions. Nine interviews were conducted by telephone or Skype video call, and all were tape-recorded, transcribed, and analyzed with the NVivo 11 Pro software. The research findings — a collection of personal opinions and experiences — represent the perceived strengths and shortcomings of various aspects of the Canadian and industry-specific food recall systems, as well as suggestions for improvement. All participants expressed overall confidence in Canada's food recall system and reiterated the importance of factors that lead to recall effectiveness, such as preparation (training, mock recalls, updated documentation), clear roles and responsibilities of the core recall team, implementing of recall tools and systems, fostering a food safety culture, building communication

systems, and educating the consumer. Limitations and suggestions for improving the current recall system include improved transparency and knowledge mobilization among manufacturers, suppliers, and regulators, specifically regarding risk assessments and traceability systems.

INTRODUCTION

Each year, the Canadian Food Inspection Agency (CFIA) handles approximately 250 food recalls (3). A food recall is an act “to remove potentially unsafe food products or products from the market that do not comply with relevant laws” (4). A recall is also described as “the removal from sale, use, or correction, of a marketed product that poses a risk and/or contravenes a statute” (21). Upon identification of a potential health risk, a health risk assessment (HRA) is performed by Health Canada to determine the level of risk posed to the Canadian population by the specific food (4). To do so, the likelihood, potential duration, and potential severity of illness are considered (20). The CFIA decides, based on the HRA, whether or not a food recall is necessary; if it is, the CFIA also decides the class of

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recall (4). Within Canada, food recalls can be voluntary – initiated and carried out by the company – or mandatory – fulfilled by Ministerial order when the company is unwilling or unable to do so (2).

Food recalls can occur for a variety of reasons, including microbial, chemical, or physical hazards, as well as mislabeling or misrepresentation of a food product (3). Between April 2012 and March 2013, the majority of food recalls – over 40% – were a result of undeclared allergens (3). The fast and effective identification and retrieval of recalled products is vital to protecting public health and safety. Greater food recall effectiveness may help to save company time, resources, and/or money, prevent or lessen avoidable human suffering and associated healthcare costs, and reduce negative effects on customer loyalty.

The food industry faces several challenges regarding food recalls. It has been estimated that about 60% of American consumers ignore product recall messages, failing to check their homes for recalled food (11). Rutgers University Food Policy Institute surveyed over 1000 consumers following a 2008 *Salmonella* contamination of tomatoes and found that 38% of consumers ate the tomatoes included in the recall (11). Consumer disregard of recall messages remains to be better understood, despite investigation of product recall communications beginning as early as the 1980s.

In 2009, a study by Souiden and Pons examined product recall crisis management, specifically in the automobile industry (23). They found that consumers developed a more negative image of, and were less loyal to, a manufacturer when that manufacturer opposed a recall (23). On the other hand, when consumers perceive companies to be acting in a responsible manner, they tend to hold more favorable feelings toward them (14). Voluntary recalls had significant positive effects on consumer loyalty and future purchase intent (23). An assessment of American food recall messages found that the way a recall message is framed will affect consumers' beliefs in their capacity to carry out a response to a high-risk food recall (6). Furthermore, higher levels of recall satisfaction occur when a product defect is the responsibility of the supplier and not the recalling firm, when failures are uncontrollable (i.e., out of the control of the recall firm or supplier), or when the recalling firm provides the consumer with the corrective actions that address the underlying recall issue (13). A focus on consumer preferences during food recalls has revealed that receiving recall information from inside the store or retail setting, especially at the point-of-purchase, is considered ideal (5). Additionally, the most trusted source of recall information is federal agencies, while information sourced from online social networks lacks similar trust and reliability (5). As the food industry, society, and technology change, it is important to consider new models of recall communication to improve the effectiveness of recalls. The crafting and presentation of the recall message impact consumer risk perception and behavior (18) and, thus, the effectiveness of a recall.

Several studies have shown that serious recalls can negatively impact company profits; for instance, shareholder wealth can decrease by 1.5% to 3% in the most serious of recalls (9). Even in a crisis, effective communication, as mentioned earlier, and a cohesive crisis communication strategy can help to mitigate the effect on a company's reputation (12). The response of Maple Leaf Foods' leadership team to its *L. monocytogenes* outbreak in 2008 serves as a prime example (12).

One way to assess the effectiveness of a recall is the time required to recall. External detection (i.e., when defects are detected by a consumer or regulatory agency rather than the supplier or recalling firm) and the quantity of impacted product are directly linked to a longer time to recall (13). Another factor in the effectiveness of a food recall is traceability. A simulated recall study in Norway assessed 30 different products within five major food sectors and determined that only 53% of the products purchased throughout the supply chains could be traced to their origin (9). Although traceability systems are likely to differ among countries, this study highlights the challenge presented to companies in product traceability during food recalls, especially with globalization and evolving consumer preferences. For example, the study found that the internal attitude of the company, as well as customer demands, are important components for forming the conditions of a successful tracing event (9). Successful tracing and tracking have the ability to improve recall speed and accuracy (9).

Few studies have analyzed recall effectiveness by comparing product recovery rates over time. One study done by Teratanavat and Hooker in 2004 (24) looked at U.S. meat and poultry recalls from 1994 to 2002 and found that both the number of recalls and the total amount of recalled product by weight continuously increased from 1997. This finding may be the result of improved consumer awareness or better foodborne illness surveillance methods (24). This study also showed that the average recovery rates (i.e., the percentage of recall volume recovered by manufacturers) remained relatively constant over these years (24). This raises questions about current recovery rates in all areas of the food industry, and if they have significantly improved since the early 2000s. Another study, in 2005, that examined past U.S. Department of Agriculture (USDA) recalls within the meat and poultry industry stated that deficiencies of the recall system included the lack of authority to initiate recalls, requesting recalls based on presumptive data or epidemiological data alone, and miscommunication among federal agencies (15).

Despite hundreds of food recalls occurring in Canada each year (3), recall-focused studies frequently consider products and companies outside the food industry, are largely performed in other countries (namely the United States and China), and are typically conducted with a consumer-based focus. Consequently, the main objective of this study was to glean information from members of the

Canadian food industry and governmental organizations on the current food recall system. Understanding what does and does not make our food recall system effective is important for establishing, maintaining, and improving practices and procedures. Ultimately, the collection of personal accounts and suggestions may help to generate new streams of thought within the food industry and inspire the modification of current recall procedures of food manufacturers and/or shape future government processes and regulations.

MATERIALS AND METHODS

Prior to the beginning of data collection, this project was approved by the Research Ethics Board at the University of Guelph.

Instrumentation

To determine what makes a food recall effective from industry and government perspectives, in-depth, semi-structured interview guides were created. The interview guide for industry members was similar to that for government officials. The in-depth interview questions were created based on the literature, in conjunction with suggested changes from the pretesting process.

To pretest, two individuals (one industry, one government) of similar background to that of the target population (i.e., those involved in the semi-structured interviews) were interviewed with the interview draft guide, which had been adjusted to a grade six readability level. The pretesting was carried out in a manner similar to that of the regular interviews, with the pretesting participants answering each question. During a debriefing session immediately following the interview, the respondent and the interviewer discussed each question, as well as the process of data collection. This process was used to help detect and reduce any issues regarding sensitive or offensive questions, misinterpretation of questions, ambiguity of wording, double-barreled questions, or leading questions (i.e., questions that reflect the researcher's personal values, blind spots, or biases) (1).

Minor changes were suggested for both the government and industry interview guides, and were made accordingly prior to the interviews being conducted. The final interview guide used for participants in industry roles differs slightly from that used for government officials. The semi-structured interviews involved the pre-determined questions but also allowed the interviewer to digress with unscheduled probes (1). The interview schedule consisted of essential questions that concerned the purpose of the study, extra questions that were worded slightly different to the essential questions but were roughly equivalent, "throw-away questions" that helped develop rapport between the interviewer and interviewee, and probing questions that helped elicit more information (1).

Subject recruitment

Participants were sought from the network of professional connections of the research team. Those who had a current or significant past role involving food recalls, either in a government or industry position, were sent the Letter of Information and consent form by email and were asked to participate. Twenty-one email invitations were sent from the research team to members of industry (n = 17) and government (n = 4).

Conducting and analyzing interviews

Of the 21 direct invitations, 9 led to interviews, which were conducted between July and November 2015. According to McCracken, interviewing 8 respondents is "perfectly sufficient"; it is better to work for a longer amount of time with a few people than superficially with many (19). The demographic profiles of the 9 interviewees, 6 from industry and 3 from government, are presented in *Table 1*.

Because of the range of geographical locations of participants, interviews were conducted over the telephone or via Skype video call. The interviews, which ranged from 25 to 65 minutes, were audio-recorded and transcribed. A second party verified the verbatim transcripts, and the transcripts were then qualitatively content-analyzed using the NVivo 11 Pro software, which helps to organize, store, and retrieve unstructured data and to uncover any trends existing within the data.

The credibility of the data was assessed through confirmation of the interpretation of the data with the interview participants and through discussion with the food safety specialists involved during the pretesting stage. The combination of in-depth interviews from both industry and government, as well as the inclusion of a detailed methodology, improves the dependability of the findings (22). Additionally, individuals with food safety experience or knowledge assessed the confirmability/objectivity of the findings by reviewing the methodology and the interpretation of data. The completed manuscript was sent to each of the interviewees for review and comment, which further validated the interpretation of the transcripts.

RESULTS

The broadness of the interview questions allowed for open-ended and varied participant responses, which led to a number of recurring topics.

Internal preparation

Many of the industry participants (4 of 6) stressed the importance of having a trained and prepared core recall team. One participant (IND-6) expressed that the biggest mistake that the participant's company had made in past recalls is not engaging the core recall team right from the trigger of a recall. Upon correction of this issue, the participant believed the company's recall response time was improved dramatically.

TABLE 1. Detailed profiles of in-depth interviewees

	Interviewee Code	Industry/Government Agency	Organization Size*
Industry	IND-1	Director of Quality and Food Safety	Large
	IND-2	Vice President of Quality Assurance, Product Compliance and Nutrition	Large
	IND-3	Consultant	-
	IND-4	Senior Vice President of Operations and Human Resources	Medium
	IND-5	Food Safety Quality Assurance Team Lead	Large
	IND-6	Director of Regulatory and Technical Services	Large
Government	GOV-1	Industry (Former Senior Federal Official)	-
	GOV-2	Federal	-
	GOV-3	Provincial	-

*Organization size based on Canadian Industry Statistics (CIS) criteria

Using mock recalls as a training tool provides newcomers with a hands-on learning opportunity and is perceived to be the most effective manner to teach accountability and authority in recall situations.

“If we have new people coming in, depending on where they’re working, generally if the core team gets affected, then quite honestly, the mock recalls are the best training ground ever... And what we’ll do is hold mock recalls, or info sessions, to walk them through what their responsibilities are, what our needs are from them, who they can reach out to... So generally, it’s quite honestly, ‘learn by doing.’” (IND-6)

Recalls – whether mock or real – can uncover shortcomings in a company’s recall systems, and when followed by a postmortem, allow for a root cause analysis and corrective actions. Measuring product recovery is one way of analyzing recall effectiveness. Another is investing resources into creating and maintaining “Key Lessons Learned.” This will allow the core recall team to reflect on time: the time it took to gather together, to make a decision, to implement the decision, and to complete the recall. It will also encourage adjustments or additions to be made to current plans and procedures.

Recall preparation involves keeping up-to-date documents for recall plans, such as contact lists and drafts for public communication. However, some participants from industry (3 of 6) mentioned the challenge of changing roles, especially when new members are introduced who lack knowledge and/or experience. Not surprisingly, mock recalls may result in the training or re-training of staff. Updating contact lists at a fixed frequency and sending out supplier questionnaires may assist with that challenge. Furthermore, it is vital to have back-ups

for each core recall team member and to test those members in mock recalls, ensuring that the necessary documents and information are readily accessible to both the immediate and back-up persons.

A point of reflection for some participants (2 of 6) was that mock recalls typically do not include the notification process (notifying regulatory bodies, suppliers, the public, etc.). One suggestion was that the CFIA should consider triggering unplanned mock recalls for industry, rather than industry holding mock recalls when it chooses to, in order to meet internal and customer requirements.

Risk assessment

A number of participants (3 of 9) expressed the belief that there is a lack of transparency, among other issues, with the Health Risk Assessments (HRAs) performed by Health Canada. According to some industry interviewees (2 of 6), the food manufacturer is not given access to the decision-making criteria or the algorithm that Health Canada uses to perform its HRA. Furthermore, the participants (3 of 9) feel that there needs to be more openness with regard to how these risk assessments are performed. This could be particularly important when the risk assessment performed by Health Canada does not agree with that performed by the company.

“I think the more openness [between government and industry] there is on what each side has done in regard to their own risk assessments and investigations, one – the more timely – and two, in some cases, may actually limit the scope of the recall or limit the need for a recall as well.” (IND-3)

One participant (IND-3) expressed the need for greater transparency when Health Canada's HRA does not indicate the need to do a recall, but the CFIA still conducts one. The participant also believes that it should be an expectation that when a company requests a phone call with Health Canada and/or the CFIA regarding the risk assessment, regardless of the time, it is scheduled immediately, at least under certain circumstances. Instead of being made to feel that this is a new, unusual request, it should be part of the regular process in order to facilitate easier and faster sharing of science and risk assessment decisions.

Traceability

Traceability concerns were a common point of discussion. As Canada starts sourcing more ingredients and products from other countries such as Turkey, India, and Russia, some of the greatest risks may be associated with the ability to trace back and understand how those products were procured or managed. The smaller "players" – the medium-sized companies – are especially concerning to some, as a lack of money and capability hinders traceability efforts. Inefficient traceability systems impact what is known (e.g., what product and lot codes are affected), making it difficult to control the scope of a recall.

Some industry interviewees (2 of 6) expressed worry and frustration regarding current traceability systems; specifically, the lack of cohesiveness in traceability programs amongst companies.

"I would say probably the one area for improvement would be around lot codes, specifically around ingredients, and raw materials/packaging. There's no consistent lot code or reference, and that can be definitely difficult to manage... It leaves opportunity for error in the picking of material number versus lot number, so I would say that is the biggest gap." (IND-5)

A manufacturer can use its own identification system, which leaves opportunity for error in record-keeping. This may manifest as a documentation issue, especially when dealing with hundreds of ingredients and raw materials/packaging with different lot styles, and this could lead to a decrease in the efficiency of a recall. If a supplier and manufacturer used the same traceability program(s), a recall would be a more time-efficient process. It would be ideal for a manufacturer to be given the lot numbers of its ingredients from suppliers, as well as the supplier names and lot numbers of any raw ingredients within those inputs, at the point of purchase/exchange. Thus, the manufacturer would not have to wait for the supplier to complete its trace at the time of a recall.

One participant (IND-4) suggested that the Canadian traceability systems also have the ability to improve through scientific advancement. Specifically, the use of genetic fingerprinting could allow for piece lot identification rather than case lot identification. New product identification systems could help limit the scope of a recall.

Resources

Although it is understood that increasing investment in human resources is not always feasible, a desire for such investment and subsequent improvements was mentioned. First, there was mention of the need for increased staff at the CFIA's Office of Food Safety and Recall (OFSR) in Ottawa. According to one participant (IND-3), when the OFSR is dealing with several cases, the notice for recalls that involve less hazardous situations are not issued as quickly. It was suggested that when a company says, "We have all of this information and want to do this recall," the OFSR have a more streamlined process in place to handle those requests.

Second, it was suggested that the recall guidance documents created by the CFIA and posted on its web site – although praised on more than one occasion – be revisited for frequent updates (e.g., every 5 years), with both government and industry representatives present.

Third, criticism arose regarding the assignment of CFIA's recall coordinators to a recall situation. One participant (IND-1) stated that rather than assigning recall coordinators by "whoever is next on the list," it should be based on capability and understanding of the organization and its dynamics. The reasoning was based on the perception that CFIA's recall coordinators have different degrees of industry experience. The belief is that all coordinators should have industry experience and should understand basic terminology of manufacturing and how the supply chain works.

Lastly, input from a Provincial Government Agency official (GOV-3) revealed that getting an up-to-date distribution list from the CFIA (which is initially collected from the company involved) at an early stage is one of the two biggest challenges when dealing with recall situations. The second biggest challenge is that when the Provincial Government Agency receives a request to assist with a recall effectiveness check, it is very often on a Friday afternoon. There is often less capability at this time, as fewer staff members are working on weekends.

Technology

Within industry (IND-2), it was mentioned that a more sophisticated, user-friendly warehouse management system, whereby distribution and sales information are easier to access, would be beneficial. Additionally, it was explained that the responsibility to adopt more sophisticated technology will fall on the larger companies, and only after it is more robust will it be adopted by the smaller companies.

A federal participant (GOV-2) shared that its information technology (IT) infrastructure has a volume restriction in that there is a restriction on the number of megabytes of information that can be received via email. This limitation can hinder the ability of government to obtain information in a timely manner.

“Our ability to retain information, obtain them in a timely manner — they’re all impacted by information technology ... there’s IT issues from Health Canada’s side. Certainly efficiency can be improved if we have more information management systems that allow us to manage that information.” (GOV-2)

One suggestion was that both the CFIA and Health Canada could have a common management information system to allow for more timely and integrated information sharing and improved risk management.

Communication

In a recall, there is an urgency to recover the affected product and notify the customer/consumer. Internal communication may be neglected. Within a global company, an escalation of communication is required, and the food recall system must be designed from a global viewpoint. In order for all senior quality managers within a global company to be aware of, and knowledgeable about, issues in one region, cross-regional communication must exist. It is suggested that global companies create a forum whereby all senior quality managers of each region decide on communication responsibilities, i.e., the nature of the information to forward and who communicates to whom, and add that to their regional responsibility checklist.

Communication forums were discussed in a different context as well. One recommendation by IND-2 was that a forum be created to facilitate greater transparency through the sharing of information and resources across companies. This could include, but would not be limited to, sharing best practices, what did and did not work from past recalls, and providing suppliers with the tools to enable them to build stronger recall programs. One participant explicitly shared that there is currently apprehension about speaking out regarding what went wrong in a recall, out of fear of punitive action by the CFIA. However, a company sharing its recall mistakes allows for other companies to learn from them, rather than waiting for others to make similar mistakes.

The majority of industry interviewees (5 of 6) discussed the importance of a company having a personal contact within OFSR, as well as with their local inspector and regional office. Importantly, the relationship with CFIA should be treated as a partnership rather than viewing it as adversarial. As one participant (IND-2) attested, asking for CFIA’s opinion on what can be done to prevent a given issue – even if those recommendations that are sought are based on best practices and not regulations – can create an even stronger shared accountability. Communicating with CFIA that there is a desire to be better, and that the company believes CFIA has a responsibility to provide them with that input, may provide industry with more learning opportunities.

As part of CFIA’s modernization initiatives, there have been recent changes to the communication flow, whereby

an individual company deals with the CFIA regional office rather than directly with OFSR in Ottawa. The participant who mentioned this (IND-3) perceived direct contact with the Ottawa office to be more effective and timely. This is because being asked questions by someone at the regional office who may not have the most relevant background, and who is always going to go to Ottawa to make a final decision, leads to a great deal of unnecessary communication.

Food safety culture

Food manufacturers that are successful at empowering employees and foster an environment where speaking out about issues is encouraged are much more likely to embody a culture of food safety. When employees are comfortable outwardly sharing the problems that they have recognized rather than turning a blind eye, and are given the power to stop the production line if needed, issues are resolved in production rather than during distribution or sale. Team members can be trained and coached, but if they do not feel safe, they will not verbalize issues or look for continuous improvement opportunities. As one participant stated,

“We in most companies, I think, developed in this industry long before we actually had recall needs. Right, so, the recall processes are add-ons, or bolt-ons, that are external to our core business. And realistically, we really need to come back and make it an absolute part of the core that that information, that traceability, that responsiveness, is a core part. And I know it sounds airy, and fluffy, and too philosophical, but it really comes down to everyone in the chain knowing this is the most important thing they can do at this moment.” (IND-4)

A true culture of food safety will act as a driver of effectiveness in recall prevention. There are, obviously, challenges with this. Everyone within the organization must have defined roles and responsibilities, especially in dynamic organizations where positions are frequently changing, and there must be a leader.

“You need to have a definitive leader that is seen as a recall coordinator within the organization that can deal with all aspects of a recall.” (IND-1)

To help employees understand their responsibilities, an organization could invest resources into holding a Kaizen event for recall process mapping and for responsibility checklist development. A Kaizen event, or Kaizen blitz, is an intense and short-term improvement project held by a team or department (17). Creating the proper documentation will clearly show each person/function/role what information he/she needs to collect, what questions to ask, and what information he/she needs to forward to others at the time of a recall.

As one participant (IND-4) mentioned, it is a challenge to inspire minimum-wage employees doing hands-on work to recognize that food safety and recalls are an issue. This participant suggested that when an issue or a non-conformity presents itself, the product should be brought into the staff room, kept there for the day, and then discussed as to whether staff would bring the product home for their family to eat. The key is presenting the issue to employees in a way that makes sense to them and is most impactful.

Consumer education

A frequent area of discussion for participants was consumers and the role that they play in ensuring recall effectiveness. A few participants (3 of 9) mentioned that no matter how strong recall systems are – even if we completely remove the product from stores and foodservice operations – taking the appropriate action on products that have passed the point of sale becomes the responsibility of consumers. Consumers must actively check their kitchens for recalled products.

Several participants (4 of 9) mentioned the power of social media in increasing the consumer's ability to access information. However, there is no filtering or verification of the accuracy of many information sources on the Internet. The food industry has the opportunity to continue to educate the consumer on how to best handle its products. The current mass of information could be simplified and emphasized more often. One suggestion (IND-4) was to go into the school system – a kindergarten classroom, perhaps – and explain the importance of and demonstrate washing of fruit and vegetables, for example. Another suggestion was to demonstrate symptoms of foodborne illness (e.g., vomiting or diarrhea) on food packaging or advertisements, similar to what is done for tobacco products; the consumer would see how he/she could be affected if and when a food product is not prepared properly. The company supplying the product has the ultimate responsibility for promoting the way its product should be used. This is a difficult situation, however, because if this type of safety labeling existed, it could mislead the consumer into thinking, "I am not buying this product because it is dirty."

DISCUSSION

Canada's food safety system is one of the best in the world (16), but of course, no food safety system can guarantee zero risk, and in reality, there is no such thing as zero risk. The underlying and unique characteristics of the Canadian food recall system are effective, in the sense that the regulatory bodies work with the entire food chain and have the power to perform mandatory recalls (7, 8).

Participants shared a number of minor criticisms regarding their own food safety systems, as well as those of the CFIA. From these criticisms, it became clear that for food manufacturers to believe that they are doing the best

job they can do in a food recall, they must have personal relationships and contacts with employees at OFSR. Some companies may have a better relationship with the CFIA than others, and the industry's communication effectiveness is partially conditional on connection-making. Those who have personal contacts within OFSR may have access to resources that do not otherwise exist in a more systemic framework. A balance may still need to be found in the food safety world where alignment and standardization exist, yet aren't too prescriptive.

Another fundamental theme regarding the dynamics of the recall system is the idea that the food industry is always either "full-on" or "full-off." As one participant states,

"This is a whole industry where either your hair is on fire or you're on holidays... You either get, "I don't have time," "There isn't time enough in the day to include this and to do this as a testing process," or "I'm off – I'm not training when I'm off." (IND-4)

Overall, there is a belief that the large food manufacturers in Canada have strong, sophisticated systems, and a high degree of visibility of their suppliers. How do we hold everyone to the same standards and expectations? The manpower simply does not exist, for example, to integrate smaller operations that are not federally-registered into a food safety system that requires precise electronic record-keeping and traceability. On the other hand, concern may arise with products imported into Canada, as the country of origin may have less stringent food safety standards. These products could potentially lead to recalls and impact domestic producers. Holding everyone to the same standards – giving Canadian inspectors and brokers that level of responsibility – could reduce food safety risks and aid in recall prevention. However, improving consistency would likely require increased availability of resources and more education/training.

Assumptions and limitations

Participants involved in the interviews have unique perspectives, backgrounds, and experiences, and differ in age, gender, culture, and other demographic characteristics. The interviewer did not have any previous connection to or relationship with the participants, and it was assumed that the participants would provide honest and accurate responses.

A number of limitations are associated with this study. Geographical limitations were present; although the industry and government officials were from different parts of Canada, many of them were located in Southwestern Ontario. Thus, the findings of this study are not generalizable across the province, country, or beyond. Conducting interviews primarily over the phone prevented observation of body language from being included in or influencing the interpretation of the results. Another limitation was time; the interviews were conducted

between July and November 2015. Thus, the study findings may have been influenced by conditions at this time, such as recent and current food recalls and/or outbreaks. The number and scope of participants was limited to the contacts available to the researcher. Furthermore, not all of those who were contacted as potential participants responded or were willing to participate. This research also did not include consumer perspectives on food recall effectiveness, which may be a useful area for future research.

SUMMARY

In-depth interviews with 6 members of industry and 3 members of government in Canada explored the components of an effective food recall. Many interviewees expressed the importance of a trained and well-prepared core recall team, for whom up-to-date documentation and accessibility of information are imperative to their success. They also discussed the value of mock recalls to help teach key lessons and act as a useful hands-on training tool.

Some interviewees said that they thought there is a lack of transparency with the risk assessments performed by Health Canada (HC), and that in order to save time and limit the scope and/or frequency of recalls, HC's assessment criteria/questions should be shared more freely with industry. Some interviewees also stated that there is a lack of cohesiveness in traceability systems among companies; different lot code systems lead to challenges in documentation and potential recall implications. Some concerns exist with the capability of traceability systems, especially those of small and medium-sized companies, as global ingredient sourcing expands in Canada.

Recall communication could be improved through industry adopting global cross-region communication forums (where applicable), as well as increasing knowledge mobilization among companies. Having direct personal contact(s) with the Office of Food Safety and Recall in Ottawa was appealing to the majority of industry interviewees. Some participants from both industry and government discussed the increasing role that social media plays in recall communication, and how it improves the consumer's ability to access (good or bad) information. No matter how strong recall systems are, public recalls require consumer action in order to be more effective.

Interviewees expressed individual frustrations with and/or recommendations for limited human resources within certain regulatory bodies, updating recall guidance documents, the method that the CFIA uses to assign recall coordinators, and the information technology infrastructure limitations of HC.

Challenges exist in creating a culture of food safety and inspiring proactive thinking and actions, especially with plant employees. However, doing the latter could potentially reduce the number and size of outbreaks, as well as limit the scope and frequency of recalls. Challenges also exist in maintaining consistency: (i) in the sense of urgency in food safety and recall systems; (ii) across standards for all products consumed in Canada (regardless of whether they are domestic or imported, federally-regulated or not); and (iii) in the relationships formed between members of government and industry.

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