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Have Agri-Food Institutions Learned from the Bovine Spongiform Encephalopathy (BSE)?

by

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ABSTRACT

In this study, representatives (n=18) from Alberta agri-food institutions were interviewed to understand the institutional learning practices that were employed following the outbreak of bovine spongiform encephalopathy (BSE) in May, 2003. Based on theoretical frameworks derived from reflexive modernization and transformative learning, this research reviewed the learning practices among different agri-food institutions in government and industry and concluded that one aspect of transformative learning, instrumental learning took place in most institutions. However, the other aspect of transformative learning, communicative learning did not occur in agri-food institutions. The study concluded the absence of communicative learning can be attributed to a lack of a rational discourse and inadequate institutional reflexivity. Based on these findings, several recommendations are offered to enhance aspects of communicative learning within agri-food institutions.

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1 INTRODUCTION

1.1 Statement of the Problem

In May 2003, the first indigenous case of bovine spongiform encephalopathy (BSE) was identified in Alberta, Canada. After the case was announced by the Canadian Food Inspection Agency (CFIA), the rest of the world immediately closed its borders to Canadian beef. The closure of the export market significantly affected the Canadian beef industry, particularly, the Alberta beef industry. Economically, Canadian beef producers estimated that they lost $ 11 million per day after the export ban.

In responding to the "unexpected" crisis, agri-food institutions, in both government and industry, initiated or implemented new policies and programs to minimize the impact from BSE. Gradually, the beef industry began to recover. Beef consumption in Canada increased after the first case of BSE whereas in Britain it had decreased significantly by 40% (Peng et al, 2004), and more and more countries re-open their borders to Canadian beef (Agriculture and Agri-Food Canada, [AAFC], 2012).

Even so, we still cannot conclude that the responses from institutions to BSE were successful. In theory, BSE is considered as a symptom of a risk society which means food safety issues such as BSE may be "just the beginning" (Canadian Health Coalition, 2001; Beck, 2006). Furthermore, BSE is not simply an animal disease, but is rather a consequence of simple modernization

characterized by a push for efficiency and profit based scientific rationality (Miller, 1999). As a result, institutions faced with a BSE outbreak would encounter challenges that they had not met before. Learning to adapt to the new circumstances becomes considerably important for agri-food institutions in a risk society.

In this study, members of agri-food institutions considered “the lessons learned” from the BSE crisis, and they felt they were relatively confident in their ability to address similar food safety issues in the future. Learning, however, is relatively complicated in theory and in practice. According to transformative learning theory, learning is comprised of two aspects: instrumental learning and communicative learning. Instrumental learning emphasizes the enhancement of technical skills that are able to address current problems, while communicative learning focuses on constructing meaning through communication of values, intentions, feelings and moral decisions through social interactions (Mezirow, 1995). Both parts of learning are necessary to activate a transformative change which involves a profound change in the socio-political dimensions of a person’s perspective (Mezirow and Associates, 2000). Therefore, this study not only focuses on changes in response to BSE that may be led by learning, but also pays attentions to what institutions learned and to what extent learning took place.

Additionally, another theoretical framework, institutional reflexivity, is also included to evaluate institutional learning practice in this context. Giddens (1991) demonstrates that institutional reflexivity is a prerequisite of institutional learning. A reflexive institution should create a space for self-criticism and

discussion in which a learning environment is able to be nourished. Institutional reflexivity is derived from reflexive modernization theory, which also pays attentions to the critique of scientific rationality and the importance of alternative knowledge (Giddens, 1991). In this research, we examine institutional behaviors in relation to institutional reflexivity. By doing so, we assess whether Alberta-based agri-food institutions are reflexive and therefore more likely to experience and benefit from institutional learning.

In summary, the outbreak of BSE in Alberta resulted in unprecedented challenges for agri-food institutions within the province. These challenges also served as an opportunity for institutions to learn from past experience in terms of adjusting institutional behavior in response to a new circumstance. Admittedly, the reoccurrence of a BSE crisis in Canada may not be likely now because of various policies and technical responses. However, another food safety issue is likely to occur in the future. Thus, we evaluate institutional learning in agri-food institutions and assess whether these institutions are more prepared to deal with a future crisis after the experience with BSE.

1.2 Research Objectives

The overall aim of this research is to determine if institutional learning has taken place in the Canadian agri-food system, including governmental and industry organizations, in response to the BSE crisis. In particular, the investigation sheds light on aspects and dimensions of learning with a particular

focus on communicative learning and institutional reflexivity. The followings are the research objectives that guide this study:

Objectives:

1. To clarify attitudes and experiences with BSE among various stakeholders;

2. To evaluate institutional learning practices through various learning channels;

3. To determine which aspects of institutional learning (instrumental and/or communicative) occur, and to explore the likelihood of transformative learning.

1.3 Significance of the Study

This study contributes both to the research literature and to empirical practice. In the literature, BSE- related research has been done by many scholars; however, most of the research is focused on the British context. This research, which focused on the BSE crisis in Alberta, Canada offers another perspective to understand the issue. Additionally, this study includes in-depth interviews with individuals within agri-food institutions both from government and industry. By doing so, this research provides insight into institutional behaviors during the BSE crisis.

Another potential benefit of this study relates to the enhancement of institutional practices. The core question of this research is to evaluate whether institutions learned from the BSE crisis from the perspective of a transformative

learning framework. Institutional learning, as an effective and efficient approach to enhance institutional adaptive capacity, has been discussed both in theory and in empirical studies. Therefore, an understanding of agri-food institutions' practices in responding to agricultural crises such as BSE may provide them with an opportunity to learn or to improve their learning practice.

1.4 Study Limitations

This research was limited by a number of factors. The number of respondents we interviewed in the research was limited due to time and funding constraints. To fully understand issue of institutional responses to BSE crisis, a more comprehensive sample of research participants may be necessary.

Another restrictive factor was the methodology applied in the research. In a qualitative case study, the reliability of data is unavoidably questioned by other researchers. Since most of our interviews involved employees of government and industry institutions, in some cases, they were probably unlikely to disclose certain information. Although we applied several methods to increase the reliability of data, a lack of full disclosure and openness is a likely limitation of this study.

Finally, the geographic location of sampling may have also constrained the research. As Alberta has been affected by BSE significantly, most of our participants were from Alberta-based institutions closely related to the beef industry. Although some respondents work in the federal government, the scope of their work focuses on Alberta. Therefore, in order to generalize the results for a

larger group, the study would need to have involved respondents in other locations.

1.5 Organization of the Thesis

In the present chapter, I outline the main research questions of this study. In Chapter 2, the Literature Review, I review the theories of risk society, reflexive modernization and transformative learning, which are the theoretical frameworks for this research. I then describe my research background in Chapter 3. In the Research Setting section, industrial agriculture is my starting point, since the BSE outbreak happened in this broad context. I also consider Canadian agriculture, the Alberta beef industry, the BSE cases in the beef industry, and Canadian agri-food institutions and their responses to BSE as important parts of the research setting. In the following chapter, on methodology, I outline the reasons for applying a qualitative case study as my research method and describe the process of data collection and analysis. In chapter 5, Research Results, I delineate the main findings in this research. Then, I combine the research results with theoretical frameworks to generate my discussion in Chapter 6. Finally, I summarize my research and make some recommendations for policy and future study in Chapter 7.

2 LITERATURE REVIEW

2.1 Risk Society

The outbreak of BSE is considered as a new form of risk to our modern society. The new risk not only emerges in the food system as a food safety issue, but is emblematic of the modern risk society and ongoing threats from nuclear power, global warming and so on. The common feature of this new risk is its close association with significant human achievements. These achievements, on one hand, provide people with a more “efficient” life, but on the other hand, they also advance our society into a new phase of societal evolution—that of a risk society (Beck, 1992; Giddens, 1991). As Beck argues in his paper, there are three periodizations of social change: pre-modernity, which is associated with traditional culture; a simple modernity marked by the domination of science discourses and unilinear technocratic decision making; and, finally, reflexive modernity, which exists in the risk society (Beck, 1992). Unlike industrial society where social status has been established by material wealth as it is in simple modernity, risk society redefines society with the distribution of risk. As Beck (1992) elaborates in his paper, “the driving force in the class society can be summarized in the phase: I am hungry! The collective disposition of the risk society is expressed in the statement: I am afraid!”(p.44)Hence, risk, which is the core component of the risk society theory, has relative unique characteristics (Beck, 1992). These are as follows:

1. De-localization: The risks are omnipresent and they are no longer limited to one geographical location or space. Omnipresence may involve three dimensions: the spatial, the temporal and the social. In the case of BSE, the risks are not limited to its origin country (Britain); it has affected about 30 countries worldwide. Hence, borders can no longer keep the risk out of the state. As for the temporal dimension, the first case of BSE was identified in 1986 in the United Kingdom (World Health Organization [WHO], 2002); nevertheless, we are still uncertain about the causes of BSE, and the disease is still incurable. Furthermore, because of the complexity and length of chains of effect, the BSE, which was originally an animal health issue, has a crucial impact on human health, politics and economics.

2. Incalculableness: Another characteristic of risk is its consequences are incalculable. The incalculableness is due to incompatible and incomplete knowledge. At the early stage of BSE, no one knew the disease could be transferred via prion, hence, society was "sure" that consumption of beef production was safe. However, many people died because of the consumption of infected beef. Furthermore, our knowledge of BSE is still full of uncertainties. So far, society has failed to conceptualize the consequences of BSE and new variant Creutzfeldt - Jakob disease (vCJD) as uncertain numbers of infected cattle entered the food system with its five to ten year latency before disease onset (Belay & Schonberger, 2002). Thus, exact calculation becomes impossible.

3. Non-compensability: In the first modernity, compensability was achievable due the availability of knowledge, e.g. historic data, which could aid in predicting the occurrence of hazard and the scale of impact. However, we no longer have the benefit of such predictability for the unprecedented crises in facing a risk society. The other aspect of non-compensability derives from the scale of hazard. The premise underlying the principle of compensation is based on the economic capacity of institutions to pay for a crisis. However, compensation for a large-scale accident such as a nuclear power leakage is far beyond any institutions' economic capacity. Hence, the compensability seems to be unrealistic.

Under the threat from new risks, the basic institutions that were the actors of first modernity, for example, science and expert systems, the state, commerce and international systems, are inefficient in addressing those risks since they are unable to calculate and control them precisely. The institutions' actions may even be counter-productive since they are becoming part of the problem they are supposed to solve (Beck, 1992). In such cases, Beck predicts a relatively negative future for a risk society. He argues that if a society continues to privilege the scientific-political control system that was dominant in the first modernity, the opportunity for democratic governance may slip away since the scientific community has a reductionist approach to problem solving that estranges perspectives and sources of knowledge that are derived from the lay public. In such circumstances, the scientific community and political institutions would struggle to preserve their legitimacy with each periodic catastrophe. However, if

the society recognizes the shortcomings of science and facilitates the democratization of technical knowledge, it may create a space which includes the opinions and experiences of the lay public. With the emergence of a more holistic approach to science, it becomes feasible to envision a brighter society that is built on humane technology (Beck, 1992). This process, in Beck's terminology, is referred as reflexive modernization.

2.2 Reflexive Modernization

In Beck's periodization of social change, reflexive modernization is society's response to living in a risk society. There are three crucial issues intertwining within a risk society: the liabilities of economic growth, the pervasiveness of hazardous technology, and the inadequacies of reductionist scientific research (Beck, 1992). Any of these issues may lead society into a gloomy future. Reflexive modernization, a term devised by Ulrich Beck, is conceived as a way to advance the society into a better phase of evolution. When modernization reaches a certain stage, then modernization becomes reflexive, meaning it radicalizes itself: it begins to transform, not only its key institutions but also its fundamental principles (Beck, 1992).

Understandably, reflexivity is the core component of reflexive modernization. It does not simply imply "reflection." Rather it comprises relatively complicated elements. Firstly, as the society evolves into the risk society, the traditional certainties that are fundamental to the first modernity reach their ending point. We can no longer rely on traditional approaches to make

complex decisions. Instead, we have to take on more risks that complicate our decision-making with more negotiations (Beck, 1992). As we do so, the boundaries among various social spheres that constrain dialogue are multiplied: *"*the boundaries between society and nature, between knowledge and superstition, between life and death and between Us and Others*"* (Beck et al, 2003, p. 19).

Secondly, reflexivity also refers to a critical attitude towards science. Science established its authority during the first modernity by providing solid evidences for political and economic institutions making "rational" decisions. However, in a world where the uncertainties associated with risks are constantly increasing and where scientific solutions become a part of the problem, e.g. in the case of nuclear power plants, the potential threats to the scientific discourse are greatly increased (Beck & Van Loon, 2000). Society is more reflexive about the consequences of scientific development and becomes focused on identifying and critically reflecting on the purpose of modernization. As Table 1 shows, reflexive modernization is not an abstract hypothesis but an operational definition that implies a critical viewpoint regarding the boundaries of science.

Table 1.*General Criteria of Reflexive Modernization*

	Reflexive modern society
The nature of boundaries	A multiplicity of boundaries and fundamental distinctions Recognition of this multiplicity The necessity of institutionalizing self-consciously fictive boundaries New problems of institutionalized decision-making (conflicts of responsibility and boundary conflicts)
The function, nature and position of science in society	Growth of contradictory scientific camps Recognition of extra-scientific justifications Increased account taken of unexpected side-effects Debate ended through ad hoc institutional means of reaching a decision

Note. Adapted from Beck et al. (2003)

Therefore, as an approach to advancing the evolution of a society, reflective modernization has acquired empirical features based on its critique of boundary and science.

2.3 Complements to Scientific Knowledge

As described above, for many observers, science no longer serves as a panacea that fixes disorders in our society. The assurance that science can provide for our decision-makers and publics is weathering and decaying in the face of cumulative risks and complexities. Furthermore, science becomes a part of the problem to some extent rather than a solution, e.g. nuclear power plants pose potential threats, and intensive chemical application threatens food safety and so on. Although the functions and contributions of science cannot be ignored, public appreciation and public utility of science extends only to a certain point (Bauer et al, 1994).

As stated in Funtowicz and Ravetz's work (1990), the reasons for this critical stance toward science are twofold. First, as society develops, members gain the ability of independent critical thinking as educational opportunities become more available. Science is no longer restricted to a certain group, but becomes more open. In this manner, even the lay public can gain specific knowledge and question the authority of science. Second, the proliferation of risk cases, such as BSE and climate change erodes the authority of science since it cannot provide certainty as it once did. For example, according to the British House of Lords Select Committee report, the credibility of expertise has been devastatingly lost after the BSE crisis (House of Lords, 2000). Therefore, as a risk society develops, bringing forward more uncertainties and complexities, scientific knowledge is needed; however, this knowledge is not adequate to fully understand or address the unprecedented challenges of a risk society. Nevertheless, if we hold

a critical perspective toward science (while still recognizing that it provides us with valuable knowledge), how can we make reasonable decisions about risk issues while also recognizing the limits of scientific evidence?

In response to these recognized challenges of risk and uncertainty within contemporary society, scholars have contributed a number of ideas and approaches to risk management that extend beyond a purely technical and scientific approach. One of these contributions is the idea of "post-normal science" by Funtowicz and Ravetz (1993). According to these authors, all risk situations are characterized by two key factors: decision stakes and uncertainty. When decision stakes are low and uncertainties are low, then normal science provides the dominant mode of scientific activity. These scientific activities are described by the authors as problem-solving, applied sciences, and professional consultancy. When decision stakes are high and uncertainties are high, then a post-normal science is required. In the circumstances of post-normal science, it requires an "extended peer community" to ensure the quality of scientific inputs to the policy process. In an interactive dialogue within an extended peer community, "uncertainty is not banished but is managed, and values are not presupposed but are made explicit" (Funtowicz & Ravetz, 1993, p. 752). This new model is considered as a pathway forward to address uncertain and complex challenges in this risk society.

Another perspective on the limitations of scientific knowledge for risk management is based on the idea of socially robust knowledge (Nowotny, Scott & Gibbons, 2002). These authors argue that, in a modern society, categories of the

state, market, culture and science become increasingly fuzzy as each of these components is highly intertwined. Consequently, the distinct demarcations between science and non-science and the notion of professional identity and non-professional expertise also become problematic. Hence, they state that “scientists must now take external factors into account” to make a decision (Nowotny et al, 2002, p. 166) and these factors are often derived in ways that extend beyond traditional scientific approaches. A key concept here is contextualization. According to Nowotny et al (2002), “the more strongly contextualized a scientific field or research domain is, the more socially robust knowledge is likely to produce” (p. 167). In this sense, the crisis of scientific knowledge in relation to risk management is the inability of science alone to provide certainty in a more complex circumstance. Therefore, socially robust knowledge is valuable in a risk management context that is characterized by uncertainty and complexity.

The idea of alternative knowledge is yet another perspective that can be explored in relation to the limits of scientific knowledge. Within the sociological literature, a source of alternative knowledge derives from discussions of Beck’s boundary theory (Beck, 1992). In the phase of simple modernity, boundaries are explicitly displayed as an approach to delineate responsibility and to establish authority. On the contrary, drawing a boundary is optional in a risk society, as Beck points out in his paper (2006). Risk does not respect physical boundaries as it does in industrial society; hence, climate change, food safety crises and other potential risks are no longer limited to one area. In this sense, every component in a society is highly intertwined, which erodes the existence of boundaries.

As mentioned above, the purpose of drawing a boundary is to establish a certain barrier which establishes an authority within an area. Meanwhile, the action of drawing a boundary also excludes alternative players, which prevents diverse and creative interactions. Hence, the existence of boundary inhibits the appearance of alternative knowledge. If boundary becomes multiplied, however, alternative knowledge may be generated through the interactions that take place across various boundaries.

There are several sources of alternative knowledge in contrast with scientific knowledge; one source is the lay public, which is often thought to hold as "irrational opinions" by scientists and experts. However, it is too arbitrary and too easy to label public knowledge as irrational. A more complex view of rationality requires investigations into the diverse forms of rationality that include scientific rationality and social rationality.

As Flyvbjerg (2001) notes in his work, scientific rationality is based on a strong analysis of epistemic qualities, e.g. counting cases and cost, while social rationality takes advantage on "reflexive analysis and discussion of values and interests, which is a prerequisite for an enlightened political, economic and cultural development in any society" (Flyvbjerg, 2001, p.3), asking questions such as: *where are we going*, *is this desirable*, and *what should be done*? As a result, the same issue may be viewed differently by lay publics and experts since they are operating under different rationalities.

A number of scholars have contributed empirical research that elaborates this difference between experts' and public opinion (Slovic, 1993; Sjöberg, 1999). The perception of risk is one example of a belief that is rarely the same for experts and the public, even if they may occasionally be in rough agreement (Sjöberg, 1999). A study by the US EPA found little agreement between the experts' rankings of important environmental risks and public risk perceptions. A similar study carried out in Sweden compared the risk perception of experts and the public with regard to nuclear power and nuclear waste (Sjöberg & Drottz-Sjöberg, 1994). It found virtually the same results, reporting that a dramatic difference exists between experts and the public. Investigating perception of food safety, moreover, Nestle (2003) demonstrated the differences between science and value rationality. Table 2, an excerpt from Nestle's study, suggests the differences between the public and experts on the food crisis issue.

Table 2 *Comparison of "Science- based" and "Value-based" Approaches to Evaluating the Acceptability of Food Safety Risks*

Science-based	Value-based
Counts and calculates:	Assesses whether risk is:
- Cases	- Voluntary or imposed
- Severity of illnesses	- Visible or hidden
- Hospitalization	- Understood or uncertain
- Deaths	- Familiar or foreign
- Costs of risk	- Natural or technological
- Benefits of risk	- Controllable or uncontrollable

- Costs of reducing the risk	- Mild or severe
- Balancing of risk to benefits	- Fairly or unfairly distributed
Balances risk against benefit and cost	Balances risk against dread and outrage

Note. From *Safe Food*, By M. Nestle, 2003, p. 17.

Apparently, science and technology that are based on scientific rationality have dominated social discourse since first modernity. To some extents, the imbalanced use of scientific knowledge has resulted in numerous threats to the society (Beck, 2006). Knowledge that is derived from social rationality, called "*common sense knowledge or local knowledge*", is also valuable for the development of our society (Sjöberg, 1999). Common sense knowledge is gained through daily interaction between people. For example, people may sense the abnormality about their environment by talking to other people and by observing nature through the filter of their intuitions and perceptions and of things they have experienced (Sjöberg, 1999). These intuitions and perceptions are based on value positions that are often ignored or presumed to not exist within rationality strictly scientific approach to inquiry. Rather than considering an issue from a reductionist, technical perspective, the public often cares more about trust, credibility, competence, fairness, and empathy (Aakko, 2004).They take into consideration qualitative factors such as fairness and equity instead of statistics and details. They think about community cohesion and about future generations and about their personal lives (Slovic, 1993). According to this knowledge, BSE is not simply a technical problem, but a problem that encompasses deep value positions, including social and political dimensions (Beck et al, 2003).

In summary, given the critique of science as described in concepts like post-normal science, socially robust knowledge and alternative knowledge in a risk society, we consider the discussion around BSE as much more than a technical and scientific problem; it is a problem that requires more robust interactions between regulators, scientists and citizens. This approach to BSE involves a process of authentic communication where experts bring in technical data and citizens bring in local, value based, and contextualized knowledge. The process is sensitive to the fact that "a science-based problem is not free of values" (Nestle, 2003, p.17), and a consideration of values is an important component of risk management under conditions of high decision stakes and high uncertainty. In this thesis, although I draw primarily from Sjöberg's notion of social rationality (Sjöberg, 1999), I see a close connection between this concept and related concepts in the risk literature (e.g., post-normal science and socially robust knowledge). These conceptual frameworks offer a way to democratize and strengthen risk decisions, and provide an important conceptual basis for this thesis.

2.4 Concept of Learning

Change is inevitable and omnipresent in our society. In the environmental, social and technological areas, the pace of change is accelerating with recognition of more complexities and risks. This change in turn has major implications for decision-making and institutional behaviors. Within institutions, prediction of the future becomes a big challenge for many decision makers since numerous uncertainties affect their decisions. They realize that the necessary skills and

capabilities should be developed to ensure their organizations' successes under a changing and uncertain circumstance (Watt et al, 2003).

Learning, therefore, is not only an activity embedded within the routine of an institution, but it also to some extent sustains an organization. Understandably, in a changing society as described above, institutional learning is just one approach to address risk issues, and one that often involves complex organizations and difficult choices that are made under conditions of imperfect information. In this research, we shed lights on institutional learning as a significant approach for enhancing institutional capacity to address risk issues. Depending on the learning and enhancement of capacity, an institution is able to become more adaptive and responsive in an increasingly complex environment (Watt et al, 2003). In the context of the BSE crisis in Canada, the questions of whether institutional learning happens and what institutions learn from this crisis are therefore valuable in my research. Before we explore the behavior of agri-food institutional in Canada, it is necessary to review the learning literature to gain an understanding of this theoretical framework.

Learning is commonly defined as a process that synthesizes information and experiences for acquiring new or modifying existing knowledge, behaviors, skills and values (Illeris, 2004). It is not compulsory, but rather contextual. Learning usually takes place when learners detect changes in signals from the environment or are motivated by an inner impetus. One result of learning is a change in behavior or perspective. Depending on the level of learning, it is categorized by authors as either instrumental or communicative learning

(Mezirow, 1995; Sinclair et al, 2008). Mezirow's theory derives in part from Habermas's (1987) ideas about this distinction. Instrumental learning is about acquiring technical knowledge through interaction with various sources so as to sustain a certain competitive capacity in the learner. Instrumental learning seeks to control and manipulate the environment, and is focused on improving prediction and performance. This learning is highly goal-oriented, and the result of learning is explicitly presented as a solution to a problem. Some scholars also describe this type of learning as "cognitive learning" (Hassink, R., & Lagendijk, A., 2001). The focus of this learning is characterized in terms of four aspects (Sinclair et al, 2008, p. 420):

- Scientific and technical knowledge
- Legal/administrative/political procedure
- Social and economic knowledge
- Potential risks and impacts

The knowledge of instrumental learning is also denoted as "explicit knowledge" which can be articulated and stored in certain media (Collins, 2010). Polanyi introduced the notion of tacit knowledge in 1958 and he describes the fact that "we can know more than we can tell" (Zhenhua, 1952). Tacit knowledge is more about personal, context specific and subjective knowledge which requires extensive social interactions and trust (Goffin & Koner, 2011). This type of knowledge can be acquired through communicative learning. Depending on social interactions, communicative learning involves the construction of new meanings in learners through the communication of values, feelings and normative

concepts. Mezirow elaborates communicative learning, "involves in understanding the meaning of what others communicate concerning values, ideals, feelings, moral decisions, and such concepts as freedom, justice, love, labor, autonomy, commitment and democracy" (Mezirow 1991, p. 8).To do this, we must become critically reflective of the assumptions underlying intentions, values, beliefs, and feelings, so that we may assess the beliefs of others. Therefore, we attempt to judge claims to rightness, sincerity, authenticity, and appropriateness. This process, according to Mezirow, takes place in a discourse. Another scholar Sinclair et al (2008) states that communicative learning includes (Sinclair et al, 2008, p. 420):

- Insights into one's own interests
- Insight into the interests of others
- Communication strategies and methods
- Social mobilization

  (Social Mobilization, as defined by UNICEF, is a broad scale movement to engage people's participation in achieving a specific development goal through self-reliant efforts.)

Instrumental and communicative learning are two basic aspects of transformative learning theory (Mezirow, 1991). In this theory, learning is considered as a tool to re-build learners' meaning structures (including perspectives and schemes), which enables more profound or significant change in the learners' behaviors profoundly. However, this learning theory departs from education theory (adult education, to be exactly). Although in this study our

interview data comes from individual interviews, we intent to understand learning at an institutional level. Hence, it is necessary to distinguish the difference between individual learning and institutional learning.

2.5 Institutional Learning and Individual Learning

In the academic literature, some authors claim that learning starts with individuals, and ends with individuals. Institutions actually cannot learn, but individual can. The outcome of learning is the change of individuals' behavior, and then the accumulation of change from individual that may alter the institution's actions (Onias & Virkkala, 1997). Building on that, institutional learning can be simplified as involving the interaction between individual learning and institutional action (Edwards, 1997; Van Brabant, 1997). Therefore, some authors argue that "organizational learning occurs when individuals within an organization experience a problematic situation and inquire into it on the organization's behalf" (Argyris & Schön, 1978, p16).

However, some scholars privilege institutions over individuals in the learning scenario (Healey, 1997; North, 1990; Senge 1990; Watt et al, 2003). Watt et al (2003) considers institutional learning as a process that may change an organization's behaviour and eventually improve its performance through reflecting on and reframing lessons from past experience. In this definition of institutional learning, an individual's efforts are ignored to some extent. Some other scholars also interpret institutional learning as being an interactive process which cannot happen through the efforts of actors alone. It is a mutual procedure

set in a specific social cultural arrangement guided by institutions through routines, rules and conferences (Healey, 1997; North, 1990).

In this view, an institution plays a significant role in providing various structures and means for sharing information and creating organizational memory. In this sense, institutions may facilitate or hinder learning through the arrangement of institutional settings (Argyris & Schön, 1978). The factors that are behind the institutional arrangement are closely related with power relations and interest groups. Some scholars argue, "Individual learning, at some level is irrelevant for organizational learning. Individuals learn all the time and yet there is no organizational learning" (Senge 1990, p.236). The reasons can be summarized as follows. The source of learning has been pre-decided, enabling the outcome of the learning to be predictable. Even though discretionary principle could be applied within a source of learning, the outcome of the learning may not be implemented within an institution since powerful players already have set certain barriers. Hence, those scholars consider the analysis of institutional mechanisms to be more important than individual learning practices.

From my perspective, I favor a combination of the different opinions above. Learning by individual is relatively important since the individual is actually the initiator and facilitator of any institutional practice. However, institutional learning is not simply the sum of all individual learning. Institutional learning is more about actively capturing, transferring and mobilizing individual learning into an institutional level (Kim, 1993). Therefore, individual learning is only a prerequisite for organizational learning. In my research, I argue that

institutional learning is an ongoing, collective and interactive social process, involving interactions among deliberately well-informed individuals and that it can lead to well-informed decision-makings (Van Brabant, 1997).

2.6 Effective Approaches for Institutional Learning

2.6.1 Institutional Reflexivity

In the discussion above, I depicted the risk society and learning frameworks to place our case study within this broader theoretical scenario. In the following sections, I explored the approaches to enhancing learning (especially, communicative learning) in a risk society.

Depending on the discussion of reflexive modernization, every component within a risk society requires a degree of reflexivity in order to adapt and survive. Hence, it is also necessary for institutions to become reflexive. Furthermore, the relation between institutional reflexivity and institutional learning is considered to be very close (Dierkes et al, 2003; Moldaschl, 2007). Scholars argue that institutional reflexivity activates the liberation of institutional practice, in which space is created for the institution to self-monitor or self-interpret uncertainty and risk. New knowledge may be generated through this process (Dierkes et al, 2003). In the context of self-monitoring and the institutionalization of knowledge, change can take place as a result of this learning process. As Giddens (1991) notes in his research, the subjects of reflexive modernization are organizations, institutions, and individuals, and its medium is knowledge that is presented in various forms: scientific knowledge, expert knowledge, everyday knowledge.

Institutions as indispensable parts of a society continue to play an important role in a risk society. Giddens thus defines “institutional reflexivity” as “the procedure of institutionalization of the ‘continuous filtering-back’ of expert theories, concepts and findings to the lay population” (Giddens, 1994, p. 91) since the industrial society’s ways of life is dis-embedding and re-embedding by the new conditions in risk society.

Another scholar, Moldaschl (2007) argues that the core concept of institutional reflexivity is to assess whether institutions are open to revising their procedures and premises. Based on his observation, he suggests that institutions are interested in investing time and money to change their projects; however, they are not inclined to evaluate their experiences and outcomes without reservations- a fact that he interprets as reflecting of *institutional inertia* (Moldaschl, 2007). In his understanding of enhancing institutional reflexivity, self-reference, secondary consequences and knowledge dependence need to be considered.

1. Self-reference: An institution as a part of society observes and creates itself. In the other words, institutions require a degree of self-criticism. As another scholar, Jones (2010), demonstrates, it is important for institutions to critically reflect on their actions and behavior in such a way that learning can also take place. Additionally, critical reflection involves questioning the integrity of assumptions and beliefs based on prior experience. It often occurs in response to an awareness of a contradiction between our thoughts, feelings, and actions. Those elements are also necessary for communicative learning practice.

2. Secondary consequences: It is also necessary for institution to be aware of the side-effects of goal-oriental actions. According to Beck's perspective, every solution is also potentially concurrently considered as a problem (Moldaschl, 2007). Hence, institutions should be conscious of unintentional and possibly undesirable consequences of institutional activities.
3. Knowledge dependency: This characteristic is closely linked to the concept of reflexive modernization. As in the theory of modernization, scholars considering these questions take a critical perspective on scientific knowledge. Though a risk society is based on a growing complexity of issues and technologies, and scientific knowledge is needed, the latter is not adequate to address or understand the complexity. Hence, re-thinking knowledge dependency is necessary. This includes two dimensions: 1) experts are willing to criticize themselves; 2) alternative knowledge from the public is acknowledged. Hence, institutions should be aware of knowledge dependency to enhance institutional reflexivity.

In a risk society, institutional reflexivity plays a significant role in the process of institutional adaptation. Meanwhile, it also nourishes a positive environment for institutional learning. Besides the requirement of institutional reflexivity, another component for activating institutional learning is also necessary to explore; rational discourse, especially for communicative learning. Therefore, in the following section, my research sheds light on rational discourse to understand the communicative learning framework.

2.6.2 Rational Discourse

Rational discourse is the essential medium for promoting and developing transformative change. In contrast with everyday discussions, however, it is used "when we have reason to question the comprehensibility, truth, appropriateness, (in relation to norms), or authenticity (in relation to feelings) of what is being asserted or to question the credibility of the person making the statement" (Mezirow 1991, p. 77).According to Mezirow, communicative learning requires discourse (Mezirow, 2000).Mezirow sets the following seven ideal conditions for rational discourse:

(a) have accurate and complete information; (b) be free from coercion and distorting self-deception; (c) be able to weigh evidence and assess arguments as objectively as possible; (d) be open to alternative perspectives; (e) be able to critically reflect upon presuppositions and their consequences; (f) have equal opportunity to (including the opportunity to challenge) question, refute, and reflect and to hear others do the same; and (g) be able to accept an informed, objective, and rational consensus as a legitimate test of validity (Mezirow 1996, p.171).

Mezirow defines these conditions in the language of adult education and this study combines ideas from individual learning with institutional learning to understand learning practice in the context of BSE in Alberta. Hence, I have modified Mezirow's ideal rational discourse with institutional learning as described below.

1. All actions and statements of institutions are open to question and discussion. In other words, institutions maintain an appropriate level of transparency. Not only decision-making process accessible to institutional members, but the public also has certain channels to acquire institutional information.
2. Equal opportunities for participation are numerous at the institutional level. To ensure this, an institution is able to appreciate the value of alternative perspectives and support a culture of shared responsibilities (Van Brabant, 1997; Jones, 2010). In this process, empowerment is necessary. The institution not only allows but actively encourages questions from employees at all levels. Furthermore, empowered individuals can share learning without it being devalued and ignored; thus more people can benefit from their knowledge (O'Keeffe, 2002).
3. Institutions are able to critically reflect on previous experiences. There is a tendency for institutions to rely on institutional memory to initiate institutional practices (Van Brabant, 1997). However, forgetting or critically evaluating previous experience can enhance learning activities (Van Brabant, 1997)because institutional structures sometimes have not only lagged behind technological change, but have (to a large extent)hindered technological change and industrial restructuring processes(Hassink & Lagendijk, 2001). Hence, it is necessary for institutions to become critically reflective on previous experiences.

In summary, approaches to enhance learning practices have been discussed by many scholars. However, research on learning practices at the institutional level is less well developed within a theory of risk society, especially considering the specific case of food safety risk. In this case, I apply the frameworks of institutional reflexivity and communicative learning to understand the learning practices among agri-food institutions in Alberta after the outbreak of BSE. The following section describes the research setting in order to provide a background of this study.

3 RESEARCH SETTING

3.1 Industrial Agriculture

The roots and nature of industrial farming/agriculture coincide with those of the Industrial Revolution more generally. Industrial agriculture views a farm as a factory with *inputs*, which include pesticides, feed and fertilizer, and *outputs* which include the yield of corn, cattle and so on (Union of Concerned Scientists, 2012).Given this scenario, more players are now a part of the industrial farming system, which extends well beyond the farmer's barns. Machinery, chemicals, genetic technology, export market and political power are common factors in industrial agriculture.

The goal of industrial agriculture is to increase yields and decrease costs, usually by applying new technology and creating new markets for consumptions (Union of Concerned Scientists, 2012). These methods are widespread in developed nations and are becoming increasingly prevalent worldwide, not only because they increase food production, but because, on a more meaningful level, they make agriculture profitable **(**Barlett, 1989). Since industrial agriculture is propelled by constant innovations, --unlike its counterparts, tribal and peasant food-production systems, which have maintained stable economic and ecological adaptations for hundreds of years, -- industrial agriculture has created social change in an effective way (Barlett, 1989). Until now, most of the meat, dairy, eggs, fruits, and vegetables available in supermarkets are produced using these methods of industrial agriculture.

The characteristics of industrial agriculture are very distinctive from those of traditional agriculture. Barlett (1989) summarizes:

- Increased use of complex technology and the technology treadmill
- Increased substitution of capital for labour
- Increased energy use
- Increased influence of state
- A tendency toward competition, specialization, and overproduction
- Increased interdependence between farm units and agribusinesses that control inputs, machinery, product sales, processing, and transport (p. 34)

In light of these characteristics, industrial agriculture is viewed as an example of productivism by many scholars (Ilbery and Bowler 1998; Lowe et al, 1993; Ward, 1993). In the debate over productivism, scholars have argued that industrial agriculture is embedded in a commitment which is intensive and industrial driven with support from the state focusing on increased productivity (Lowe et al, 1993). By applying intensive farming techniques and biochemical inputs, according to some scholars, industrial agriculture has maximized its production at the expense of environmental quality and has trapped the industrial food system in a *production treadmill* (Ilbery and Bowler 1998; Ward, 1993).However, this intensification of production arguably reflects societal values and has been considered as a great leap forward in human history (Potter, 1998). The reasons are relatively clear. First, industrial agriculture can now provide people with more and more affordable food. In the U.S., for example, corn yields soared 206 percent, from about 36.9 bushel/acre in 1951 to about 113 bushel/acre

in 1982, and those rates are still increasing, with current yields of about 147 bushels per acre (National Agricultural Statistics Service, 2012). This significant increase is attributed to improved plant varieties, fertilizers, pesticides, and mechanization. This remarkable increase in staple production has contributed to maintaining food prices at relatively low levels. The portion of income spent on food is one measure to evaluate the cost of food. In 1961, 19.1% of Canadian household income was spent on food and non-alcoholic beverages; however, in 2005, this percentage had been decreased to 9.3% (Statistics Canada, 2006), signaling the highly productive and efficient outcomes of productivism in agriculture.

Another advantage of industrial agriculture is the liberation of farming labour. In 1862, 50% of Americans lived on farms and 60% of all jobs in the U.S. were directly connected to agriculture. However, the growing industrial economy and increased urbanization resulted in a shift of labor and knowledge into new commitments. Therefore, with dramatic development of agriculture production, fewer and fewer people were needed to support basic food production. By 2008, only approximately 2-3 percent of the population was directly employed in agriculture (United States Department of Agriculture [USDA], 2011).

Yet even though industrial agriculture has made great contributions to our modern society, it has also come under serious scrutiny from many scholars (Adam, 1999; Barlett, 1989; Morris &Winter, 1999; Wiilson, 2002). First and foremost, food safety is widely discussed within the literature on industrial agriculture. Salmonella in eggs and chickens, scrapie in lamb, BSE in beef and

beef products, pesticide residues in fruit and vegetables, hormone-disrupting chemicals in baby milk, and many more new food hazards that are associated with industrial agriculture have been brought to the attention of the public(Adam, 1999). Consumers are more uncertain about the food they eat every day. Scholar argue that the efforts to simulate *pure and untainted* condition in food, and the principle of *safe until proven harmful*, both of which are generated by political and scientific factors may have attributed to those food safety issues (Adam, 1999).

Second, since industrial agriculture no longer relies as heavily on intensive labor and seasonal variations in the weather, it is connected with industrial applications that are challenged by many scholars (Adam, 1999). One feature of industrial agriculture is the heavy use of non-renewable resources, such as soil and fossil fuels, to maintain productivity. For example, for each calorie of food the U.S. system harvests, it burned about 10 calories of fossil-fuel energy in machines, fertilizers, and other inputs (Pollan, 2008). In addition, our food system is high specification, therefore, transportation and food packing and processing are needed to bring food to the place where it is consumed (Adam, 1999). According to data from the U.S. Department of Commerce, Food packaging and processing industries are the fourth- largest consumer of energy of all industrial groupings. Currently, our productivist food system benefits from cheap and abundant petroleum; however, when those resources become depleted and scarce in the future, modern farming practices may not be as promising as they now appear (Barlett, 1989).

The last concern stems from the spread of industrial agriculture worldwide. More and more countries are accepting and applying this innovative approach to producing their food; however, in the intertwined global agriculture system, a governmental food policy that is beneficial in one country may cause a food disaster for another country (Barlett, 1989).

In response to these challenges within industrial agriculture, a post-productivist mode of agriculture has emerged. Even though a clear definition of post-productivism is not forthcoming, its popularity began at the turn of the twenty-first century (Wiilson, 2002). One of the characteristics of post-productivist agriculture is its use of novel farming techniques. As opposed to the technological and input-driven *treadmill* of the productivist era (Ward, 1993), new farming adaptations have emphasized reducing the intensity of farming and reducing the use of or abandoning biochemical inputs (Morris et al, 1999). Many supporters of these new farming techniques are in favor of environmental conservation farming and the reestablishment of lost or damaged habitats as opposed to single-minded production maximization (Adams et al 1992, 1994; Tovey, 1997).

However, alternative agriculture has also faced serious critiques from some scholars. One of the main criticisms is that alternative agriculture cannot produce as much food per acre as intensive agriculture. In that sense, if alternative agriculture intends to feed as many people as industrial agriculture does, it needs more land to be farmed, which increases environmental degradation (Avery & Abernethy, 1995). On the contrary, a study by a group of scholars estimates that

“organic methods could produce enough food on a global per capita basis to sustain the current human population, and potentially an even larger population, without increasing the agricultural land base” (Badgley et al, 2007, p.86). Hence, some scholars consider post-productivist agriculture to be feasible as an alternative approach for agriculture. In spite of these ongoing debates, industrial agriculture remains prevalent worldwide due to the efforts of international agencies and corporate actors. The dominance of productivist agriculture is at the heart of this case study, and in the next section I explore these aspects of agriculture in Canada.

3.2 Agriculture in Canada

Canada is one of the largest agricultural producers and exporters in the world. Although the proportion of the population and GDP related to agriculture fell dramatically over the 20th century, agriculture still remains as an important element of the Canadian economy (Agriculture and Agri-food Canada [AAFC], 2012).As AAFC (2012) reports, Canadian agriculture accounted for 8.2% of total Canadian Gross Domestic Product (GDP) in 2009, with a value of $98 billion, down slightly from $ 99 billion in 2008. Over 2 million people are employed indirectly and directly in the Canadian agriculture and agri-food system, accounting on one in eight jobs in 2009 (AAFC, 2012). Agriculture and agri-food systems include farm input market, primary agriculture, food, beverage and the sectors of packaging and processing food (AAFC, 2012).

Over-production for export markets is a feature of industrial agriculture, especially in Canada, with its relatively small domestic market. In 2009, Canada exported $35.2 billion agricultural products, accounting for 3.4% of the total value of world agriculture and agri-food exports in that year (AAFC, 2012).Even though Canada was the world's fourth-largest agricultural exporter after the EU, the U.S. and Brazil, the main export market of Canadian agricultural production is the U.S. In 2009, the U.S. purchased 61.4%of all Canadian agricultural exports. Canada's dependence on the U.S. was below its peak of 67% in 2002, but well above 31% recorded in1988 (Alberta Beef Producer [ABF], 2012). Hence, market diversification is also a major topic in the Canadian agricultural system.

Science and technology are also the indispensable components of industrial agriculture. Contributions from science and technology are achieved through investments in research and development (R&D) in agriculture and food processing. With improvements in technology, agricultural productivity and competitiveness are enhanced, and the sector is able to adjust to changing consumer demands in both global and domestic markets (AAFC, 2012). In Canada, the return rates, the measure to evaluate investment in R&D, is very impressive in both crop and livestock sectors. For example, the rate of return for wheat has been estimated at between 43% and 53%. For other crops such as pulses, these rates have been estimated at around 40% over study period (AAFC, 2012). Motivated by the high rate of return, Canadian agriculture is reasonable to maintain and increase the investment in R & D.

Although several food safety issues, such BES, listeriosis, and E-coli, have occurred in Canada, the Canadian agricultural system still maintains the confidence of Canadian consumers. According to a 2010 study commissioned by AAFC, almost 60% of respondents were “very” or “somewhat” confident in the Canadian food system’s management of animal diseases (e.g. BSE) (AAFC, 2010). A relatively large percentage was also highly confident (50.4%) in the management of bacterial contamination for food processing (e.g. listeriosis) (AAFC, 2012). Therefore, this confidence from consumers may explain the increase of beef consumption in the domestic market even after BSE was identified in Alberta.

The Department of Agriculture and Agri-Food, also referred to as Agriculture and Agri-Food Canada (AAFC), is the department of the federal government responsible for agricultural oversight in Canada; it sets policies in agriculture production, farming income, research and development, inspection, and the regulation of animals and plants. Government expenditures (federal and provincial) in agricultural sector support expected to increase in 2009-10. Program payments made up the largest portion of government expenditures to the sector (AAFC, 2012).

In April 1997, the Canadian Food Inspection Agency Act established the Canadian Food Inspection Agency (or CFIA) as a science-based regulatory agency (Canadian Food Inspection [CFIA], 2003). The agency is dedicated to the safeguarding of food, animals, and plants, which bolster economic prosperity, protect environment and contribute to the health of Canadian. Under the Act,

CFIA combines and integrates the related inspection services of three separate federal government departments; Agriculture and Agri-Food Canada, Fisheries and Oceans Canada, and Health Canada. Even so, the President of the CFIA, who is the leader of this agency, reports to the Minister of Agriculture and Agri-Food. Therefore, the Minister of Agriculture and Agri-Food is responsible for the CFIA (CFIA, 2003).

3.3 Alberta Economy and Beef Industry

Primarily supported by the petroleum industry, Alberta's economy is the strongest in Canada and it has led national growth over the past 20 years (Highlights of Alberta Economy [HOAE], 2011).According to a Provincial Outlook report released by Royal Bank of Canada (RBC), Alberta's economic momentum is expected to continue and the forecast of real GDP growth is 3.9 per cent in both 2012 and 2013 (Calgary Herald, 2012). The per capita GDP in 2007 was by far the highest of any province in Canada at C$74,825; that was higher than all US states, and one of the highest figures in the world. Alberta's per capita GDP in 2007 was 61% higher than the Canadian average of C$46,441 and more than twice that of all of the Maritime Provinces (Statistics Canada, 2006).

As mentioned above, Alberta's economic growth is primarily driven by oil and gas production. In 2010, Alberta's crude oil accounted for about three-quarters of Canada's total crude oil production and 74 per cent of natural gas. In 2010, gross revenues from all hydrocarbons were $73.2 billion, with revenues

from crude oil including the oil sands, accounting for almost two-thirds of the total (HOAE, 2011).

Although energy is most often credited with this economy growth, agriculture also has a very important position in Alberta's economy (HOAE, 2011). Alberta has one of the world's most productive agricultural economies with more than 51 million acres or 20 million hectares used for crop and livestock production. In 2010, total farm cash receipts reached just under $9.0 billion. Alberta represented 20.2 per cent of the value of Canada's total agricultural production and posted the country's highest cattle and second highest grains and oilseeds receipts (HOAE, 2011).

Alberta's and Canada's largest agricultural sector is beef cattle production. As of July 1, 2010, about 5.5 million head cattle, or nearly 40% of the national total (14.0 million head) were produced in Alberta (Alberta Beef Producers, [ABP], 2012). 2009 statistics show that 53% (approximately 26,500 farms) of Alberta farms raise cattle (ABP, 2012). Of the total about 20,500 or 41.5% ,were considered to be beef cattle ranching, farming and feedlot operations; these earn over 34% of the total agricultural revenue receipts from beef cattle, which was 3.07 billion in 2010 (HOAE, 2011). Annual exports of Alberta beef and cattle were valued at approximately $1.4 billion, mainly to the United States (82%) (ABP, 2012). Therefore, the beef industry is extremely significant to Alberta agriculture.

3.4 Bovine Spongiform Encephalopathy

Bovine Spongiform Encephalopathy (BSE) or "Mad Cow Disease" is a fatal, progressive disease of the central nervous system found in cattle. It belongs to the transmissible spongiform encephalopathy (TSE) family of diseases characterized by spongy degeneration of the brain with severe and fatal neurological signs and symptoms (World Health Organization [WHO], 2002). Other TSEs are also found in sheep with scrapie, deer and elk with chronic wasting disease and humans with variant Creutzfeldt-Jakob Disease (vCJD). The infection may result from the consumption of cattle meat and bone meal (MBM) that contained BSE-infected products (Centers for Disease Control and Prevention [CDC], 2011). In industrial cattle farming, producers apply various commercial feeds including antibiotics, hormones, pesticides, fertilizers, and protein supplements to increase productivity, even though cattle are normally herbivores (CDC, 2011). In addition, researchers strongly believe a self-replicating protein, called prion, plays as a transmissible agent of BSE disease (CDC, 2011). Through the consumption of BSE contaminated beef humans can be infected with vCJD, but with their limited knowledge of BSE, scientists are unable to cure this disease (CDC, 2011).

3.5 BSE in Britain

The history of BSE in Britain is more than a simple accounting of an animal disease. It is a story with important interactions between science, politics and publics. The first case of BSE was reported in England in 1986 by scientists at the Central Veterinary Laboratory (CVL) of the UK Ministry of Agriculture,

Fisheries and Food (MAFF) (Millstone & van Zwanenberg, 2001). At that time, scientific knowledge about BSE was fragmentary and inconclusive. Uncertainty about the disease placed policy-makers in a challenging position to make a conclusive decision about how to manage this outbreak. However, scientists did know there was a possibility that BSE could be transmitted from cows to humans (Jones, 2004). Driven by ideological and political orientations toward market mechanisms and industrial deregulation, coupled with a desired to provide assurances and secure favour with voters, Ministers frequently argued that British beef was safe (Millstone & van Zwanenberg, 2001; Miller, 1999). As a result, effective regulation and management of the BSE outbreak lagged far behind what was needed to protect the public. In 1996, the government announced that scientists had recognized variant Creutzfeldt-Jakob disease which was linked with BSE in humans. After the announcement, the public was furious about government and scientists behaviors during the BSE crisis. This experience with British government and scientific authorities not only lead to a downfall of the British livestock industry, but it also caused a legitimacy crisis in relation to the British government (Jones, 2004). Under increasing pressure from the public, the government spent decades attempting to restore faith in British industry and in government institutions.

3.6 Canada's BSE and Responses

The first BSE –inflected animal that had been imported from Britain in 1987was identified in Canada in 1993.Canada's first domestic case of BSE was discovered in Alberta in May 2003. Since then, BSE surveillance has identified 22

cases in North America: three BSE cases in the U.S. and 19 in Canada (CDC, 2011). There has been one case of vCJD in Canada. However, it was linked to the United Kingdom, as the infected person had lived there for an extended period of time during the peak of their BSE epidemic. There have been no cases of vCJD linked to eating Canadian beef.

After the announcement of the first non-imported case of BSE in Canada by the CFIA, the rest of the world immediately closed its borders to live cattle and beef imports from Canada, including Canada's largest customers—the U.S, Mexico and Japan (Loppacheret al, 2009). In 2002, the value of export market was about $ 4.1 billion, immediately after the worldwide ban, the value of the exports had dropped to virtually zero within three months (Poulin & Boame, 2009). The Canadian beef industry is highly dependent on its export market, as it accounts for 15% of the world beef market, ranking in third place (CANFAX, 2003). Prior the worldwide ban, almost half of the cattle sold in Canada was exported as either live animals or meat. Among all of the Canadian provinces, Alberta's beef industry was hit most significantly with the loss of about $160 million per month after May 2003 (Statistics Canada, 2006). In response to this BSE disease, federal and provincial governments implemented a series of policies and programs to supervise and control the spread of BSE (CBC news, 2006; CFIA, 2005):

- In 1982, a monitoring system was initiated for the remaining animals that had been imported from the U.K. into Canada.

- Since 1990, BSE has been a reportable disease in Canada. This means that, by law, all suspected cases of BSE must be reported to the Canadian Food Inspection Agency.
- In 1990, based on the dramatic increase of BSE in the U.K., Canada banned the importation of cattle from the United Kingdom and Republic of Ireland.
- In 1991, Canada introduced passive surveillance, initiating a program to test rabies-negative mature cattle for BSE.
- In 1991, beef products from European countries not free of BSE were also officially banned. Over the following years, Canada continued to bolster its BSE safeguards, expanding the regions from which animals, certain feeds and ruminant products were restricted.
- In 1992, Canada began actively monitoring the national cattle herd for animals with clinical signs consistent with BSE. This surveillance program is intended to monitor the level of BSE in the national cattle herd. Over the years, surveillance levels have been regularly enhanced.
- Since 1993, Canada has consistently met and exceeded its OIE surveillance requirements for all years except 1995 when 90% of the annual target was met.
- In 1997, acting on the recommendations of the World Health Organization, Canada and the United States introduced preemptive feed bans. Canada banned the feeding of rendered protein products from

ruminant animals (cattle, sheep, goats, bison, elk or deer) to other ruminants.

- In December 2000, the CFIA suspended the importation of rendered animal material of any species from any country that Canada did not recognize as being free of BSE. Canada only allows the importation of live ruminants and their meat and meat products from countries that Canada considers to be free of BSE. Canada also has additional import controls for animal products and by-products from countries that have confirmed BSE in native animals. Their animal products are assessed on a case-by-case basis and may be permitted entry if they are judged not to present a risk of introducing BSE.
- In 2001, Canada created the Canadian Cattle Identification Program for cattle and bison, in order to trace individual animal movements from the herd of origin to slaughter.
- Since the beginning of 2003, the small number of BSE cases detected through intensive testing of these high-risk populations provides further evidence that the level of BSE in Canada is extremely low. Canada encourages the nation-wide submitting of eligible samples through a reimbursement program for producers and veterinarians, and various awareness and education materials. All animals tested are held pending final results.
- In July 2003, Agriculture and Agri-Food Canada began to require the removal of certain cattle tissues, known as specified risk material (SRM),

from carcasses of cattle older than 30 months. SRM are tissues that, in BSE-infected cattle, contain the agent that may transmit the disease. In diseased animals, the infective agent is concentrated in certain tissues such as the brain and spinal cord. These tissues are removed from all cattle slaughtered for human consumption. This measure is internationally recognized as the most effective way to protect human from BSE. Removing SRM means that even if an infected animal enters the slaughter system the resulting meat and meat products do not contain those tissues known to contain BSE.

- Effective June 29, 2005, for humane reasons it is illegal to load and transport downer cattle in Canada. If some animals displaying neurological signs were presented for slaughter, they would be screened out during pre-slaughter inspection. In Canada, the majority of cattle are slaughtered between 18 and 22 months of age. Considering the long incubation period of BSE, these animals, if infected, would be considerably less likely to develop infective levels of the disease.
- In July 2007, the CFIA introduced enhancements to the feed ban. SRM are now banned from all animal feeds, pet foods and fertilizers. These measures accelerate our progress toward eradicating the disease from the national cattle herd by preventing more than 99% of any potential BSE infectivity from entering the Canadian feed system.

With these efforts by government and industry, Canada is unlikely to experience a BSE flare-up such as occurred in U.K. and successfully reopening

part of export market (the recent one is South Korea). However, a return to "normal" trade condition is still up in the air, and Canada's cattle industry still has to restructure itself to adapt to a new challenging reality (Forge et al, 2005).

Embedded in the context of industrial agriculture, the Canadian beef industry has experienced the dividends associated with high productivity and export market. However, the outbreak of BSE has changed the industry significantly. Although we cannot suggest that industrial agriculture is the only cause of BSE, we might agree that such food safety issues position the industry within a risk society where uncertainty and complexity are consistent features within the food system. Despite the fact that Canadian governments have implemented a series of policies and programs to control BSE, and that to some extent, their efforts have been rewarded with some successful re-opened export markets, nevertheless, BSE seems to be an ongoing challenge for the industry. The newest BSE case was detected in February 2011 in Alberta, and a new case of Chronic Wasting Disease (CWD), which is also from TSE disease family, was confirmed in an elk in Saskatchewan in April 2012.

In contrast to industrial agriculture, which faces such challenges, alternative agriculture, e.g. organic farms and local food harvesting, offers a different perspective on food production. As a small component of food production in this country, alternative agriculture may not have a powerful voice in the existing agri-food system. However, the growth in alternative agriculture implies disquiet about the industrial model as individuals and institutions seek solutions to some underlying problems that industrial agriculture remains unable

to resolve. Therefore, in this scenario of uncertain animal diseases and the possibilities that are afforded by post-productivist modes of agriculture, new ideas and debates are emerging about how we grow our food and how our food systems can become more diverse, robust, and capable of withstanding threats from disease, changing weather conditions and other uncertainties. Given this complex situation, the reminder of my thesis emphasizes institutional learning as a crucial component of institutional adaptation and a healthy agri-food system in Canada.

4 METHODOLOGY

4.1 Qualitative Case Study

A phenomenological philosophy provides theoretical support for qualitative methods. From the perspective of this philosophy, “reality is constructed by individuals interacting with their social worlds” (Merriam, 1988). Qualitative research, in a sense, thus involves studying things “in their natural setting, attempting to make sense of, or interpret phenomena in terms of the meaning people bring to them”(Denzin & Lincoln, 2005, p.6). Additionally, this methodology can help to verify theories rather than generalizing a phenomenon (Patton, 1990). Compared with quantitative research, e.g. survey-based studies, qualitative research is able to treat experience holistically rather than considering data as discrete facts (Moustakas, 1994). By this means, a relatively deep and comprehensive analysis can be undertaken. Among the different qualitative methods, Creswell (2007) summarized five kinds of study: biography, phenomenology, grounded theory, ethnography, and case study. Within this study, a case study is most appropriate for the following reasons.

In a biographical study, the researcher’s goal is to present a particular person with both interviews and documents (Creswell, 2007); however, the objective of my research is to explore the agri-food system in Canada, so it was necessary to involve more than one participant.

As concerns phenomenology as a specific method of research, “everyday human experiences, human behavior, and human relations” are the core aspects of

study, which is not very related to my study (Moustakas, 1994, p. xiv). Because the purpose of my research is to gain a deep understanding of phenomena based on participants' responses, a phenomenological method is not a suitable approach.

In an ethnographic study, a researcher is required to sustain contact with the group under study by observing and interviewing key informants in the fieldwork for a relatively long time. Since my study is focused on a snapshot of the BSE instead of a long time observation, ethnography was not useful as other approach.

The purpose of a grounded theory study is to generate a theory that is able to explain the phenomena in the context of the experiences of participants which are under investigation (Moustakas, 1994). Even though a new theory is important from the perspective of its contribution to the literature, the purpose of my research is rather to test the effectiveness of an existing theory on new phenomena.

The case study approach that I employed is considered as "an empirical inquiry that investigates a contemporary phenomenon with its real-life context, when the boundaries between phenomenon and context are not clearly evident, and in which multiple sources of evidence are used" (Yin, 2003, p. 23).Furthermore, a case study is expected to comprehend the complexity of a single case, "coming to understand its activity within important circumstances" (Stake, 1995, p. xi). In this study, I was interested in studying the implications of BSE crisis on agri-food systems in terms of institutional learning, reflexive

modernization and policy implementation. Those intertwined questions are embedded within our uncertain society. In this sense, a case study approach is most appropriate.

A case study, furthermore, does not only represent a sample, but it also expands and generalizes the themes to probe the depth of an issue. As noted by Flyvbjerg, researchers are able to understand “the deeper causes behind a problem and its consequences [rather] than to describe the symptoms of the problem and how frequently they occur” (Flyvbjerg, 2006, p. 425).Regarding my research, the explanation of BSE in Canada does not only offer a description of the outbreak of the disease, but also explores institutional learning through a theoretical lens of modern reflectivity theory. Hence, a case study is more appropriate for my research.

4.2 Research Questions

The overall research question was to assess whether agri-food intuitions learned from the BSE crisis and in which aspect learning took place. These questions below were modified or adjusted from the original list of interview questions with research participants in order to integrate emergent themes during the interview (also see Appendix).However, the core questions have been explored through various questions during the interviewees.

Core research questions:

- When did you first encounter concerns about BSE?

- What was your experience and knowledge of the disease?
- What other organizations did you engage with in developing an institutional response strategy? In which aspects did your organization learn from these organizations?
- Did this engagement include international relations? What did your organization learn from them?
- Did you have any involvement with members of the public, or social and community organizations in your role? Did you learn anything from them?
- What types of individual, or institutional learning, have been promoted by your experiences of BSE and food safety issues?

4.3 Data Collection and Analysis

This research is a part of a project called *Improving TSE Mitigation through Institutional Analysis of Response Strategies: a Comparative Study of Alberta and Ontario, Canada* funded by the Alberta Prion Research Institute (APRI). The purpose of the project was to understand the strategic responses from institutions that maintain social, economic and environmental order when unexpected events occur. It did so by examining the institutional contexts, cultures and relationships created and reinforced in response to the pressing need to manage and to mitigate against the risks posed by prion diseases. A significant aspect of this work involved identifying instances of institutional adaptation and change in response to risk scenarios, with the further aim of developing a research basis to encourage and support these activities.

This research consisted of three stages. The first stage was to investigate institutional responses and adaptation to food risks in Canada, with particular focus on the provinces of Ontario and Alberta--the two largest beef-producing regions in the country. This part of research was completed with 25 in-depth interviews with institutional actors. These participants were drawn from three primary areas: i) federal and provincial government departments and agencies; ii) livestock and feed industry associations; ii) public groups and consumer advocacy groups. However, the latter category of participants was the least engaged, partly as a consequence of BSE being a decreasing priority amongst these communities, and further reflecting a lack of any organized public response to BSE food risks in Canada.

The second part of the project was to understand how the agricultural community had adapted to BSE and other food safety issues. In particular, it focused on those communities of small and medium sized agricultural businesses in Alberta that were significantly impacted by the occurrences of BSE in Canada since 2003. We investigated this question by conducting 50 interviews with representatives from small, alternative and local market sectors.

The last component of this research was a quantitative survey with institutional actors to extend our understanding of institutional responses and adaptation in a risk scenario. However, the response rate of the survey was not adequate to conduct rigorous analysis, and was therefore not utilized in this thesis.

My thesis research was based on interview data from the first stage of this project. These interviews involved lead institutional actors and senior officials in both the Alberta and Federal Government and lead representatives from industry organizations, including Alberta Agriculture and Rural Development, the Canadian Food and Inspection Agency, Agriculture Canada, the Canadian Cattlemen's Association, and Alberta Beef Producers. I selected 18 interviews from this dataset based on the relevance of interview content to my specific research objectives. Among those participants, eight representatives were from federal government, six representatives from provincial government and four representatives from industry groups. All the interviews were guided by a semi-structured open-ended questionnaire and were audio-recorded and then transcribed.

Data from the interviews were entered and coded into the Nvivo software which is designed for qualitative analysis. Coding in qualitative research is a way of "classifying and then 'tagging' text with codes, or of indexing it, in order to facilitate later retrieval" (Bazeley, 2007, p.66). Codes are not strictly descriptive but also encode interpretive or analytical concepts (Richards, 2009). There are two common types of coding approaches: broad-brush coding and coding in detail (Bazeley, 2007). Broad-brush coding simply assigns the text into broad topic areas, while code in detail tends to *merge codes*, to cluster like things together under a *tree node*, or to gather related concepts in a *set* (Bazeley, 2007). However, most of coding work ends up with some combination of the two approaches (Bazeley, 2007). In the case of my research, the data were broadly classified by

conceptual categories into numbers of nodes (Miles & Huberman, 1994). Then, similar nodes were merged into tree nodes (those are groups of certain responses to specific questions which are set under the semi-structure questionnaire). Additionally, the emerging topics were also clustered under a separate section for further theoretical thinking and analyses. The results of the research are found in Chapter 5.

4.4 Reliability and Validity

Reliability and validity are essential components in this type of study. Validity is “the appropriateness, meaningfulness, correctness, and usefulness of the inferences a researcher makes” (Fraenkel & Wallen, 2006, p. 150) or “how well a measure actually assesses what you want it to do” (Light, Singer, & Willett, 1990, p. 150). Regarding the reliability, it can be described as “the consistency of scores or answers from one administration of an instrument to another, and from one set of items to another” (Fraenkel & Wallen, 2006, p. 150) or “the extent to which two sets of measurements of the same characteristic on the same people duplicate each other” (Light, Singer, & Willett, 1990, p. 150).

To maintain a level of validity and reliability is crucial at almost every turn in the research process. The most popular approach used in qualitative research is the triangulation methods. Triangulation is typically a strategy (test) for improving the validity and reliability of research or evaluation of findings. Mathison (1988) elaborates on this by saying:

Triangulation has raised an important methodological issue in naturalistic and qualitative approaches to evaluation [in order to] control bias and establishing valid propositions because traditional scientific techniques are incompatible with this alternate epistemology (p. 13).

Another scholar, Denzin (2009, p.301), has identified four basic types of triangulation:

- Data triangulation: involves time, space, and persons
- Investigator triangulation: involves multiple researchers in an investigation
- Theory triangulation: involves using more than one theoretical scheme in the interpretation of the phenomenon
- Methodological triangulation: involves using more than one method to gather data, such as interviews, observations, questionnaires, and documents.

In the case of my research, a combination of triangulation methods has been implemented in order to enhance validity and reliability. First, concepts and framework in the interview were checked and verified against external sources such as a literature review and, preview research. Second, the interview schedule was reviewed by four other researchers who are familiar with social science study. Third, the interview interpretations were checked with respondents during and after interviews. Although not every respondent was checked due to time

restrictions in the field, member checks were conducted if respondents' answers were contradicted by previous statements. These efforts contributed to a higher degree of reliability and validity.

5 RESEARCH RESULTS

The research results were generated from interviews with 18 participants. As noted before, all participants are from agri-food institutions in Canada, either in government or in the industry. Their jobs are closely related to the beef industry, and most of them experienced the outbreak of BSE in 2003. Guided by the core research questions, the interviews provided several insights that were particularly significant. Based on deductive methods, three areas were summarized from interviews: participants' opinions on BSE, institutional learning practices, and the outcomes of learning. Furthermore, the results were complemented with quotations cited from transcriptions. All participants' names were redacted in accordance with the ethics requirement; however, an identification system was created in the following way. Participants were divided into three main categories, Industrial Organization (IO), Federal Government (FG) and Provincial Government (PG). In each category, a respondent's title or position may be specified depending on the relevance of these positions to the quotations.

5.1 Attitude towards BSE

The majority of participants considered the domestic case of BSE as a surprise within the Canadian agriculture system. Some respondents even used the words "shocked" or "gobsmacked" or said it felt a "bit like winning the lottery" in describing their encounter with BSE. What caused this reaction in Canada was a combination of underestimating the potential for BSE to take hold in this part of

the world and confidence in the agriculture system as a whole. One respondent pointed out “BSE is a Europe thing, it unlikely happens in Canada”. Although the first imported BSE case had been identified in 1997, participants were still confident in the system and in the government. As one respondents said,

> Since 1997, when the Canadian Food Inspection Agency put on the feed ban, we thought, "well, we should be okay," because we didn't import meat and bone meal from Britain after that (PG#12, 2012).

To some extent, the actions after the 1997 case even reinforced their confidence in the agriculture system, “we felt that we'd dodged a bullet, and life was going to move on” (PG#18, 2012). In addition to this feeling of surprise, another attitude towards BSE was related to economic concern. The majority of participants viewed BSE as an economic issue rather than a human or animal health risk. Even though at the very beginning of this issue they considered the health and safety aspects of the crisis, government and industry officials shifted the crisis to economic impacts of BSE very quickly: “It started, they first reacted, "What's happening? What are we doing regarding the health and safety aspects?" And then they quickly switched to economic impacts of BSE” (FG#14, 2012).

This reaction can be explained in two ways. First, only one Canadian had died from vCJD after exposure to BSE in the U.K; this may have eased the concern over the health aspect. Second, key trading partners closed their borders to Canadian beef, which had a huge impact on the beef industry. According to one participant, the beef industry is extremely dependant on export market, and so the

risk that the ban would “affect the Canadian livestock economy was great.” Hence, addressing export market was easily the top priority on the agenda.

Therefore, the attitude towards BSE was a mixture of *surprise* and *economic concern*. In light of those elements, it would not be difficult to comprehend the policies and actions that institutions have undertaken in addressing BSE disease in Canada’s agri-food system.

5.2 Institutional Learning Practices

Within an institutional context, learning can be accomplished through interaction with other institutions. Extended networking among different institutions is considered to be a crucial channel for institutional learning, since information and knowledge can be exchanged through those avenues. In this sense, my research also sheds light on the relations among institutions in Canada’s agri-food system. In the following section, I present two relationships that are prevalent in this BSE scenario: international networks and domestic networks. In terms of the international networks, the relationship between World Organization for Animal Health (OIE) and Canadian institutions was explored, and with respect to the domestic networks, Beef Value Chain Roundtable was observed to be a key institutional relationship within the Canadian agri-food system.

5.2.1 International network

5.2.1.1 Learning Practices with World Organization for Animal Health (OIE)

In response to animal diseases around the globe, and through worldwide cooperation, the Office International des Epizooties was created on January 25th, 1924 based on an International Agreement. Although the office has changed its name to the World Organization for Animal Health, the historical acronym has been kept as OIE since that time. Being responsible for improving animal health globally, OIE is recognized as a reference organization by the World Trade Organization (WTO), which is especially important for beef export countries like Canada, which produces more than half of its beef for the international market. With 178 member countries and permanent relations with 45 international and regional organizations, and with regional and sub-regional offices on every continent, OIE makes a significant impact on the animal health globally. Therefore, it is fair to conclude that OIE is an indispensable player in the control and eradication of BSE disease.

The OIE has established the official recognition of the sanitary status for countries and zones in terms of BSE disease. The science-based standards, guidelines and recommendations issued by the OIE are designated as the international reference for policy advice, strategy design and technical assistance. These standards and recommendations make a substantial contribution to controlling and eradicating BSE worldwide. The OIE has defined a transparent, science-based and impartial procedure for the recognition of BSE disease status of

Member Countries and Territories in their entirety or defined zones. Categories for BSE disease status include negligible risk, controlled risk and undetermined risk. Currently, Canada is in the controlled risk category with 17 BSE cases and 1 vCJD case (Centers for Disease Control and Prevention, 2008). This result is attributed to the "the large number of surveillance that we did all over Canada … enough to determine prevalence" (FG #3, 2012).

After the first indigenous BSE case was reported in 2003, the federal and provincial governments took a series of approaches to control BSE disease under the guidance from OIE:

> [The] first case was detected, so then federal and provincial authorities got together because of the recommendations from the OIE, there was the need to actually increase and enhance surveillance, in order to find out the incidence of BSE in Canada (FG #2, 2012).

The Canadian government's actions were compatible with OIE's requirements. First, adapting the surveillance standards from OIE is reasonable since the OIE has much more experience dealing with food safety issues than the Canada government, which faced a relatively new crisis. Additionally, the institutions of the Canadian agri-food system tended to consider the BSE case as an economic crisis rather than a food safety issue. In addition, based on the interview data, we can infer that both the federal and provincial governments regarded meeting OIE's requirements as the major weapon in rebuilding confidence globally. As a reference organization recognized by WTO, OIE's

standard may also be considered as a market access license for highly export-based Canadian beef industry. As one of the participants emphasized in the interview:

> The OIE actually it is part of the World Trade Organization. So, the World Trade Organization, as part of their trade commitments, they created a specific chapter for animal health. So then, the World Animal Health Organization, or OIE, they were created to establish a series of rules and regulation for countries to trade and have market access, and actually to defend themselves in case of animal disease or outbreak somewhere else (PG #11, 2012).

In the Canadian beef industry, about 40% beef production is intended for consumers abroad. Only with a risk-free reputation from OIE could Canadian beef re-open the export market. One participant puts it in a more straightforward way, "if you want to do exports – you have to follow their (OIE) guidelines. That's what it is" (PG #5, 2012).

The last challenging part of learning from OIE may relate to the structure of the system, which results in some differential treatment and inequities between regions of the globe. As an intergovernmental organization with a strong relationship with Europe because of its history, the OIE places special value on two components, European countries and federal governments. One of the participants emphasized this inequality.

> The OIE is so Euro-centric that a lot of the rules that get codified in the OIE code are driven by Europe. And Europe feels that they did it this way and therefore either they want the rest of the world to suffer what they had to go through, or they cannot imagine, they cannot perceive that there are situations so different that there may actually be reason to do things differently (FG #1, 2012).

Another participant argues that networking with the OIE is primarily at the federal level, and that the provincial government barely has voice at that decision-making table, even though the province has a large portion of the cattle within the Canadian industry.

> I understand that there are conversations (with OIE) as well. There are conversations, however, as I said, that it is up to CFIA….It happens at the federal level, we don't have any deals with them. Our role, as a province, is to support CFIA on this, and try to actually implement things as requested. And that's what we did (PG# 3, 2012).

The controversies underlying the structure of the OIE system and even the federal system have hindered the institutional learning process. Interaction is very important to enhance learning, especially as regards the opinions from the very bottom which could challenge the existing structure. Restrictions to participation by representatives of the provincial level may cut off the channel for grassroots input.

To summarize, the relation with OIE is somewhat intertwined with various conflicting interest. Certain Canadian institutions consider the policies that OIE make to be relatively Europe-centred, and are too strict in the North America context. However, as a whole, the practices of the North American beef industry practice are not very different from those of the European one, as both are forms of industrial agriculture. The deeper reason for this assertion is that certain Canadian institutions hope to increase their influence in the international market from their perspectives. Moreover, agri-food institutions in Canada approach learning in a technical way rather than taking a more comprehensive approach to learning that might facilitate reflexivity and more significant change.

5.2.1.2 Learning Practices with Other Countries

The Canadian institutions' international learning practices were not limited to contacts with international organizations like OIE, but they also extended their linkages with other countries such as the United Kingdom and the United States. According to interviews, most participants admitted that the British experience of controlling BSE provided a significant lesson for Canadian institutions. As one participant emphasized, "we benefited, or any country benefited from the experiences of the U.K., and what they lived and breathed" (FG # 17, 2012). Although the experiences of the U.K. were crucial, Canadian agri-food institutions prioritized their relation with North American governments, specifically, that of the United States, over Britain. One respondent put in this way, "we needed to ensure that we had a well-informed ally in the U.S. and that was our counter-part, basically" (IO #1, 2012). The reasons behind this difference

can be summarized as follows: first, there was an economic concern. The major importer of Canadian beef was the U.S.; hence, most participants agree an effective relationship with the U.S. is necessary to ensure ongoing access to this market. “That was mostly to the U.S., at the moment of the 2003 first BSE outbreak, that was... pretty much it! We were exporting pretty much to the States and probably maybe, I don't know, maybe five or six countries, but in minimal amounts” (PG #2, 2012).

Another reason was a political concern. BSE is to some extent a highly politicized issue, and the Canadian communication mechanism with Europe was not as open as that with the U.S. As one participant commented,

> Even though you can say it doesn't rationally, from a scientific point of view, make sense, because BSE is such a highly politicized disease, especially because you have the European Union and when a EU rule goes through, it has to be mandatory for all the EU countries whether they like it or not, they're forced into it. They have a very difficult time understanding a North American situation, where you have the ability to act as one country, where we have things like geography, which is a continual challenge (FG # 15, 2012).

The interviews with respondents suggest that efforts to network with other countries took place during the BSE crisis, and that institutions benefited from their previous experiences. However, the focus of relation building process was largely directed toward the U.S. because of an economic incentive. Furthermore, linkages with Europe were relatively influenced by political concerns. The rules

and policies that had been favored in Europe were viewed as hindrances from the perspective of North America.

5.2.2 Domestic Learning Practices

5.2.2.1 Institutional Learning between Government and Industry

Extending networks and bringing in more stakeholders are also encouraged in order to enhance learning. In the interviews, we explored this potential opportunities for relation-building between regulators and industry in the BSE discourses. The Beef Value Chain Roundtable (BVCRT) was highlighted in our conversations with participants as evidence of the widening dialogue.

The Beef Value Chain Roundtable (BVCRT) was established in January 2003 to enhance cooperation between industry and government in terms of securing a competitive advantage for Canadian beef in international markets. After only a few months, the first indigenous case of Bovine Spongiform Encephalopathy was detected. An improved BVCRT was subsequently activated to respond to this beef crisis through government-industry collaboration. Relying on conversations and dialogues, the BVCRT advocated for improvements to Canada’s regulatory processes including the enhancement of animal health products, in response to BSE. As a result, domestic demand for Canadian beef increased, ranchers' financial losses were minimized, feed safety improved, and key markets reopened. Together with 30 members, including the federal government, provincial government and industry associations whose duties are closely related with beef productions, the BVCRT focuses on five objectives, 1) Competitive Environment, 2) Market Access/Market Development, 3) Innovation

and Research, 4) Information Transfer/Traceability and 5) Regulatory Environment.

However, given the initial purpose of the BVCRT is to foster marketing and to explore growth opportunities, the outbreak of BSE immediately became an urgent topic in the Roundtable. “The original mandate – of the Roundtables were to discuss either marketing and sustainability opportunities, or growth opportunities for the industry, and almost immediately it became the BSE Roundtable” (IO #2, 2012).

In the opinion of most participants’, the BSE crisis was more an economic issue “focused on how we get back into markets” than an animal health and human health matter. Admittedly, one participant also commented on this issue; however, this voice was not representative of most of the powerful players who were eager to re-open the export market: “I think the predominant thrust in Canada has been to deal with it as an economic issue and a trade issue. CFIA folks (think) that human health matters are a distraction from the real issue, and/or there is no human health issue” (IO #7, 2012).

Therefore, given this economic impulse by underestimating the human health issue, the BVCRT succeeded in restoring the collapsing beef industry.

Even though the Canadian government and beef industry had the failed experience from the U.K. to learn from, there remained unanswered questions about the safety of the Canadian beef industry. Consequently, the relatively new Beef Value Chain Roundtable offered an approach to communication in response to the BSE disease. For most of the research participants, the Beef Value Chain

Roundtable was a productive place to enhance their programs. By bringing together different opinions from various interest groups, it helped the major components, federal and provincial governments to adjust their policies and programs for a better implementation.

In this platform, more and more stakeholders were encouraged to contribute their opinions on beef- related issues, especially on marketing and value added initiatives. Even though BVCRT was highlighted after the BSE crisis, its original purpose was still to enhance the competitive capacity of the beef industry. As one participant said, “because their markets were... were temporarily removed…it was necessary to bring in all these players (for opening markets” (IO #6, 2012).Motivated by economic pressure, more and more players were brought into this roundtable to seek a better marketing solution.

> But also comments in from cattle industry, comments in from individual producers, comments in from individual veterinarians. Well, Alberta Beef producers were certainly consulted as representing the cattle industry, Alberta Milk…The Alberta Veterinary Medical Association would be another one that we talked about, bounced ideas off …(PG #6, 2012).

Especially after the border closures following the BSE report, “a lot of these auxiliary groups” which were “renders and feed or that type of supply or service to the main body” were also brought in. However, more players did not equal success. There are a couple of obvious barriers to this participation.

First, consensus seemed to be hard to achieve from many participants' perspective. In the Beef Value Chain Roundtable, as more players were invited into the dialogue, inevitably, the various voices could not be easily combined into a united one, and sometimes it was impossible.

> And essentially, there's thirty-six, thirty-seven organizations that like to have a voice that is often fractured and splintered. And so, on one hand it makes it extremely difficult to have a unified vision, a unified voice – which is used as a crutch by the federal government that says, "Well, when you get a unified voice, then we'll respond." Versus a position that we've recently taken with the feds that says, "No, you as a government listen to your stakeholders, and then you government makes a decision (FG #4, 2012).

Another concern with the BVCRT relates to participant fatigue, which appeared in some discussions with research participants. As one participant mentioned, "consultation is the formal process for that, but we have been told -- I mean, industry is consulted on everything, and they not only quite frankly get a little tired of it after a while, you know, they (Industry) want to see action" (PG #5, 2012). The disconnection between discussion and action is commonly identified in various situations that are described within the interviews.

The last criticism relates to the structure and culture of this roundtable. Having been initiated by governments, the BVRT was naturally marked with political willingness. Without a doubt, governments are the main and most

influential players in this conversation table. As one participant mentioned, “We try to be very inclusive, but, again, it was CFIA, it was Environment, it was our department. We're kind of the main organizers of it.” However, this dialogue excludes the voice outside governments, such as that of the public. Dominated by governments, the culture of BVCRT still emphasizes control over the problem. As one respondent comment, “government should recognize that it's okay to say that you are part of something and it's not yours entirely.” Interestingly, the tendency of sharing responsibilities also presents other problems, as one participant states "Somebody else makes it food, not me. You know, who owns e-coli? My animal is perfectly healthy. I sell it to some guy. How he feeds it after he buys it from me, not my problem.” In the other words, as the system is so inter-dependent, everyone is responsible and thus no one is actually responsible.

Therefore, to some extent, the BVCRT is not only a place for stakeholders to discuss their concerns on beef industry, but it is also a place for sharing responsibility and balancing power of different interest groups. The tendency to control from a government perspective may not be the theme in the future of this roundtable framework. Collaboration and shared responsibility may be the main themes as a reflection of greater interaction between institutions. Again, in this more uncertain society, every component is highly connected; no one can walk away without a burden of responsibility. Meanwhile, it is also necessary to be aware of the possibility that everyone could be responsible while no one takes responsibility.

5.2.2.2 Learning from the Public

In a risk society, learning from publics is a favorable approach to bring social rationality into a decision-making process. In fact, some participants highlighted “public engagement” in our conversations and in some cases; they valued the opinions from the consumers. The following exchange offers an example.

> Interviewer: What did you do with that information you received from the public? How did it shape your response strategy or even your definition of the problem?
>
> Participant: We were careful not to take it for granted. And we were careful to acknowledge it, as well as continue providing information to the best of our ability (PG # 5, 2012).

This positive attitude towards public engagement results in part from unpleasant institutional memories of the past. As one interviewee reflects, “It was not quite the circumstance that occurred with the Listeriosis circumstance two years ago, where in fact government was strongly criticized for not having been more transparent. But I think government re-learned the lesson during the Listeria reality.”Although participants valued opinions from the public, however, actions they took were limited to informing publics about the latest information on BSE rather than including consumers more directly in dialogue. To be fair, institutions made great efforts to update consumers with information in various ways,

> We informed the public through conference- news conferences, We also would put out news releases to make sure that the print media also picked up on this information, and as such, we would often follow up with one-on-one interviews, either by phone or we'd often run down to either CBC or CTV here in Calgary…What we did as far as getting feedback on the effectiveness of our messages was that our Beef Information Centre (FG # 2, 2012).

However, this one-way communication with the public is not considered as public participation. Besides these few cases of supporting public engagement, more instances are relatively easy to cite from the interviews of excluding publics from the BSE story. Another exchange is recounted below.

> Interviewer: Did it go wider than industry, government? Did it include, say, consumer groups or...?
>
> Participant: No. The consumer groups were... Effectively, they weren't a problem…. And so the consumer reaction really wasn't a problem(PG #9, 2012).

Wider communities were overlooked as a result of these confident or perhaps even naïve, assumptions. To explore the reasons for excluding consumers groups, some participants provided their opinions on this point. First, they thought that U.K. experience had unveiled BSE to some extent, which makes it less unfamiliar to the public. As one participant commented, “One, they'd kind of seen

BSE a little bit. We're twenty years after the U.K., so they'd seen it and they kind of sort of knew what it was about" (FG #4, 2012).

Moreover, daily communication from CFIA increased their confidence in gaining trust from consumers, "Dr. Evans did a marvelous job of communications from CFIA …And that communication was daily. And there was lots of it, it was transparent, it was continuous" (FG # 1, 2012).

Additionally, some participants did not feel that consumers, or public representations, could produce valuable inputs for their decisions. One participant was confident in his statement:

> Well, similarly for consultation on broad policy matters big picture policy kinds of questions, of course you do a consultation, but for decision making, in the regulatory field, this is... (chuckles) you just don't have the luxury of that. ….But you don't have the luxury of (sarcastic) "well, why don't I call the cattlemen, and I'll call the Canadian Health Coalition, only known subsidiary of the Labor Congress" (mumbles) -- I can tell you already what they're gonna say, you need more inspectors you're jeopardizing Canadians and blah, blah, you can hear that whole sort of stuff (PG #2, 2012).

Furthermore, other participants approached this question from a different perspective. They argued that the nature of government and governance around risk issues in particular, is at the heart of the matter. As one participant stated,

> I think the discomfort comes from the fact that, by its very nature, it's difficult for government to say, "We don't have the answer." And in many of these cases, we don't have the answer yet. I think a lot of the concern in government is, by its very nature, government wants to be seen as in control. The maintaining of public confidence is usually built around the fact that "we're on top of this, so... this is something you don't have to worry about." But, again, I think the world is increasingly a place where society doesn't expect the government's got it all under control, and there is an expectation out there that there will be a debate and a dialogue that people are entitled to be a part of (PG #7, 2012).

Hence, they argue that institutions should be aware of “a period of time of working horizontally, working on multi-jurisdictional issues and making sure that, there are clear accountabilities for what everybody brings to the table, whether it's your legal authority and your resources or your surveillance system and your response system” (PG # 3, 2012).

Another participant viewed the issue from the perspective of the whole BSE crisis, “We didn't really have to worry about consumer groups at that point. Because it becomes an economic issue” (FG # 6, 2012).

In a nutshell, institutions made several efforts to improve interaction with publics, however, in most cases, meaningful learning was absent. As mentioned above, the reasons are relatively obvious from interview data. First, agri-food institutions had a strong preference to regard BSE as an economic issue rather

than a consumer issue. Particularly, the dialogue with domestic consumers was not a priority as the industry focused on improving the export situation. Furthermore, the philosophy that governance was about control was deeply implanted within these institutions. By nature, institutions are afraid of confrontations and discussions with a wider public, which may undermine their power. Therefore, public engagement was rare in this BSE scenario.

5.3 Outcomes of Learning

In the literature on institutional learning, external sources of knowledge that institutions gain through various networks is crucial, but institutional adaptation should also be examined for a better evaluation of learning practice. Even though some scholars argue that Canadian institutions did not learn a valuable lesson from BSE since reflexive development was limited or absent, from the perspectives of many research participants, agri-food institutions did change their institutional behaviors in the aftermath of the BSE crisis. From the interview data, we assess the outcomes of learning practice in four aspects.

5.3.1 Inadequate Critical Reflection

As a crucial process of learning, critical reflection is indispensable for institutional learning, especially for communicative learning practice. In this case study, critical reflection on the consequences of institutional action was absent.

> Interviewer: Have there been kind of really conscious attempts to think actually “What did we learn from this?" or, you know, "How might we

have done it differently?" or "What did we do right and where we might go when the next event arises?

Participant: Not that I'm aware of, to be honest (FG # 17, 2012).

Although one speaker commented that post-reflection took place during the BSE crisis, the experience of this reflection was not satisfactory.

To be a learning organization alright, but this doesn't help you. This actually hurts you. It demoralizes people, they feel angry, and they work night and day to do this right. We tried to do a post-mortem to identify what we could – do things better and all that kind of business, and the result was we got a sh**-kicking (FG # 3, 2011).

5.3.2 A Change in Culture?

Institutional culture acts as an indispensable component in the process of institutional learning and adaptation (Watt, 2003). A positive, encouraging learning culture promotes institutional performance. However, a negative one may hinder learning actions. In the interviews, the question of whether the institution had a supportive internal culture elicited different opinions from different interviewees. One participant considers “we've learned a big deal”, consequently, a culture towards change and innovation was created with more “strategic planning, strategic thinking”. He argues,

Because some of these lessons, we've learned in dealing with these things are we've got to look a little bit farther. Rather than being reactive, why don't we look using some of the foresight principles and looking a little

> farther out in the world, you know, five, ten, fifteen, twenty years...We've participated in the development of a National Farm Animal Health and Welfare Strategy and we've also developed a Farm Animal Health and Welfare Strategic Framework (PG # 4, 2012).

However, another participant held a different opinion on the supportive culture within institution. He believed the stress and pressure from upper management and "the constant barrage of the public" pushed the institution to the point of explosion. The reason is

> People like at the working level, not being protected as far as having the space and time to do the mental work behind the scenes …and only upper management and important people are allowed to do(FG #3, 2012).

Therefore, he felt "the environment, the institution in the federal government is about to explode from being under so much stress." The conflicting opinions regarding the supportiveness of institutional culture may be partly attributed to the fact that respondents came from different institutions, but the underlying analysis is also given more attention in the next section.

5.3.3 Developing and Enhancing Individuals' Knowledge and Skills

In the context of institutional learning, scholars note although an institution can change and adjust itself into a new environment, however, the institution cannot learn. It is the people who are in the institution who can improve its behaviors. Consequently, people in the institutions were another focus in our interviews. Basically, training is an important approach to developing

individual's capacity to a changing environment. As one participant emphasizes "We have focused on getting people trained to do things that need to do. So training is another thing that we've done to adapt" (PG #7, 2012).

In the sense of individual improvement, institutions have made a great effort to enhance the capacity of personnel by training employees. Those strategies reveal a positive signal that institutions are eager to learn. However, there are two critical questions that need to be considered as well. First, even if an individual attended the training sections, whether they learned or not is still in question. Furthermore, supposing that the individual acquired new knowledge after training, have they applied the new knowledge into new task? These are important questions but I cannot find answers to those questions in the interviews.

5.3.4 Development of Scientific Authority

When asked about science, a majority of participants indicated the importance of scientific development in understanding the BSE problem. As one commented,

> I mean in '95, uh, '96, '97, they were predicting millions of animals affected. They were also predicting hundreds of thousands of people being impacted by it, and of course, that never happened, so, you know, I think certainly the – as the science improved, as more information came forward, the anxiety level, you know, came down somewhat" (FG #1, 2012).

Additionally, scientific evidence had a great impact on political decisions, especially in the early stages of BSE crisis. " So calling in different experts that we had on the disease and what we knew at the time and trying to make the best, or most scientific decisions, based on the information we had (to make decisions)", as one interviewee put it, was the agreed-upon approach of most participants. To a certain degree, science has successfully legitimatized its authority in supporting a better policy.

Furthermore, science has established its privileged position through its networks and the use of certificates and licensing to reinforce its authority, and for the most part scientific experts and institutional representatives considered other forms of knowledge as "irrational". The learning that happens in a scientific community normally comes from another highly homogenized scientific community, in the BSE case, were international experts and university researchers are a key component of collaboration, learning and change. However, in most cases, such sources offer more compliments than criticism since they tend to apply similar standard to evaluate "success." As one participant describes:

> (We)got a very positive reinforcement from those who were viewed as being international experts at the time, to say, " There are things that we recommend you do further, i.e. further enhance your feed ban," which led to the 2006 adjustments in the feed ban, but again, "Stay the course, focus your surveillance on targeted populations, you know, continue to monitor the effectiveness of your feed ban through your surveillance activities, make sure you are auditing the SRM removal both from human and

> animal on a continuous basis." So, a number of things that they came forward with were already in the mill and being done, and they advocated that "You're on the right path" (PG #7, 2012).

Beyond this positive feedback from peers, the Canadian government also set a threshold, the veterinary certification program, to advance scientific participation. Admittedly, part of reason for this certification program is "we needed to have good quality of data to improve the credibility of our program with the OIE," however, the need for a professionalized testing procedure and excluded other, less trusted individuals from BSE testing was the other motivation.

> So we agreed –, as CFIA and Alberta Agriculture – we agreed to make a number of changes, and only to leave the program under the hands of professionals – veterinarians (FG #3, 2012).

The above examples were an important part of the Canadian effort to respond to BSE; however, they reflect the importance of science in the whole BSE context. Nevertheless, some participants also voiced certain concerns about science. Especially in the early stage of BSE, science seemed to be incapable of addressing basic technical questions. One participant put it this way, "Actually, in the first three or four years, because we had a – first of all, we didn't have clearly defined the target animal population that we were looking after."(PG #7, 2012)

Moreover, the mutation of disease is so quick that science could not keep pace with it. As one participant described, "this is an atypical BSE. This is not the classical BSE. And nobody knows what are the implications"(FG #3, 2012).

Finally, in the scientific area, a deviant thought could be ignored or considered with contempt, which implies the uneven power distribution within this area. Leaders in the scientific community may not consider it as a learning opportunity, and may prefer to regard it as a meaningless trial.

> Prions were still seen to be something that was sort of impossible… Remember that the guy that invented the prion, umm, was seen as an absolute wacko. Right up until the mid-90s. He won a Nobel Prize eventually (PG #7, 2012).

Therefore, as regards the main approaches that institutions apply to address BSE disease, on one hand, science has become a reliable resource to legitimize their policies; on the other hand, institutions have established a system that protects and privileges science's authority within decision-making processes. To some extent, institutions and science are intertwined with each other so closely that other components, e.g. local knowledge, and public perspectives, have a difficult time finding an effective voice within this arena of decisions-making.

6 DISCUSSION

6.1 Have institutions learned from BSE?

As described in the section above, many interviewees insisted that learning took place after the BSE crisis and they supported their opinions with solid evidence: qualified staff were hired, decisions were made with scientific support, and training was implemented through various channels. If we defined learning as a procedural and technical process, we can conclude *lessons learned* during and after the BSE crisis. However, learning through a critical reflection in nature as Charlesbois (2006) notes, did not happen during the Canadian BSE crisis.

This lack of learning is part of the discussion we intend to emphasize here. In the literature review section of this thesis, we reviewed the learning framework from Mezirow (1991). He argued that transformative learning can be categorized into two aspects: instrumental learning and communicative learning. Instrumental learning focuses on how to address a problem through a technical enhancement, e.g. mastering tasks, problem solving, manipulating the environment, in the other words by addressing questions of “how” and “what”. In contrast, communicative learning emphasizes why the problem happens in first place and seeks to explore the perspectives and experiences of practitioners more deeply through the learning process. Each aspect of learning is equally important to transformative learning.

As we reviewed the case of the Canadian BSE crisis, we found that instrumental learning may be a major part of the learning practice within the agri-

food institutions. Considering that instrumental learning includes four aspects: 1) scientific and technical knowledge; 2) legal/administrative/political procedure; 3) social and economic knowledge; 4) potential risks and impacts (Sinclair et al, 2008), we examined this proposition by studying several examples found during the research.

Table 3. *Evidence of Instrumental Learning*

Instrumental Learning	Evidence in Case Study
Scientific and technical knowledge:	Three cases of BSE were linked to an atypical BSE strain that were different from the Typical BSE strain in U.K. have been tested in Canada;
Legal/administrative/political procedure:	It was illegal to load and transport downer cattle in Canada; Agriculture and Agri-Food Canada required the removal of certain cattle tissues, referred to as specified risk material (SRM), from carcasses of cattle older than 30 months;
Social and economic knowledge:	Agri-food institutions realized the huge losses of beef industry after the outbreak of BSE and provided financial support;
Potential risks and impacts	Institutions remained unsure about potential risks of BSE in the long term.

As the facts in Table 3 show, it is not difficult to understand participants in this case study claiming “lessons learned”. It is quite clear from this analysis that, instrumental learning did take place during and after the BSE crisis. However, the other type of learning, communicative learning, seems to have been absent in the agri-food institutions after the outbreak of BSE.As noted in the literature review, communicative learning pertains to 1) insights into one’s own interests; 2) insights into the interests of others; 3) communication strategies and methods; 4) social mobilization. In the review of the interviews with institutional representatives, we failed to find adequate evidence that supported communicative learning (See Table 4).

Table 4. *Evidence of Communicative Learning*

Communicative Learning	Evidence in Case Study
Insight into one’s own interests	Institutional reflection is absent: “Participant: Not that I'm aware of (a reflective meeting).”
Insight into the interest of others	Discussion with other stakeholders restricted to technocratic enhancement, e.g. enhancement of surveillance system, age identification system

Communication strategies and methods	One-way communication through website, press and certain agencies, e.g. beef information centre; Connection with OIE; Network between government and industry, BVRT
Social mobilization	Broader public participation was absent in the BSE discussion, e.g. consumer groups did not have a chance to make a contribution to this discussion.

Hence, institutions with agri-food system stayed on the level of instrumental learning while communicative learning was largely absent throughout our analysis. As described in the literature review, transformative learning involves two aspects of learning that together contribute to transformative change. One aspect of learning practice cannot represent the full spectrum of institutional learning, specifically as it relates to a deeper level of learning and change. In light of this situation, I next explore the reasons why only one of these two types of learning occurred.

6.2 Why did instrumental learning take place?

As described in the literature review, instrumental learning confines a problem within a relatively narrow spectrum and seeks to address the problem through technical enhancements. This single loop type of learning is derived from scientific rationality. Scientific rationality established its authority via the industrial development in the phase of first modernity; however, it still dominates in most institutions, even as we have advanced into a risk society where the legitimacy of science is under question. Based on scientific rationality, agri-food institutions continue to be the believers in control and social quietism. As one participant mentioned, institutions provided confidence to the public that "everything is under control". Alberta Premier Ralph Klein also advised farmers, after the first BSE case in Alberta, to "shoot, shovel and shut up." The tendency toward control and social quietism creates an environment for instrumental learning, because the purpose of instrumental learning is to manipulate or control the environment or other people to enhance efficacy in improving performance (Habermas, 1981).Hence, instrumental learning is well suited to the scenario of BSE in Alberta.

6.3 Why was communicative learning absent?

Institutions in a risk society encounter unprecedented challenges. A food crisis such as the BSE problem was one example of such a challenge, rather than being an anomaly. On one hand, as was the case with BSE in Britain, uncertainty and complexity has pushed institutions to the edge of a legitimacy crisis; on the

other hand, uncertainty and complexity offers a learning opportunity for institutions to respond, adjust and adapt in ways that strengthen our risk management institutions. As mentioned in the literature review, communicative learning emphasizes acquiring values, feelings and interests through various interactions, focusing on the question of "why this problem occurs". To some extent, communicative learning is more difficult to develop, as it requires the re-construction of underlying assumptions and meanings, which in this case may include challenging some basic assumptions and precious truths about the source of the BSE problem and how to solve it. In this case study, communicative learning was not well developed within institutions which had responded to the BSE crisis (See Table 4). The reasons for this lack of deeper learning are discussion in some detail within the following sections.

6.3.1 Lack of understanding on the values of social rationality / citizen engagement to the process of communicative learning

In the interviews, institutional representatives struggled to see the value of public information, public knowledge, and public perspectives with regard to BSE. Communicative learning requires social rationality and if this form of rationality is not understood or appreciated, then it is ignored. As one participant commented, "consumer groups are not a problem". In this way, agri-food institutions have not appreciated the importance of alternative knowledge, choosing to understand issues primarily in terms of technical / scientific terms. Even though representatives claimed they learned a lot from the BSE crisis, the presentation of knowledge was limited to the scientific arena and was acquired through instrumental learning.

This lack of understanding might be based on previous experience with citizen groups that are well known to these institutions and there is a general understanding that citizen groups provide little benefit or additional insight that is not already at the table for consideration. As one representative stated in the interview, “we know what they (consumer groups) are going to say”. This perspective about citizens is partly a reflection of how citizen engagement takes place, and the predictable stakeholder-based processes that are commonly a part of the agriculture sector. There is little experience within this sector when it comes to more robust forms of citizen engagement. Therefore, institutional representatives see little value in creating a larger role for citizen engagement in risk management.

6.3.2 Limited political willingness

Communicative learning also requires a political willingness to ask deep and sometimes challenging questions about the sustainability of our food systems. Yet, opening up these types of conversations to public scrutiny can be very challenging and politically risky. The political system requires certainty, control, and confidence in decisions that relate to public policy. As a matter of course, conventional wisdom would suggestion that uncertainties are not good for politics or for stable market development. However, the requirement of communicative learning requires public institutions to open themselves up to questions of uncertainty and complexity. Therefore, learning is often directly in conflict with the requirements for successful politics. As mentioned by some respondents, they considered critical reflection to be risky, especially when this information escaped

into the public, “it would demoralize (our) people.” For anyone who intended to criticize the current regulations, the consequence was to exclude them from the discussion. As an example, former Health Canada scientist Dr. Haydon was fired for critiquing inadequate BSE regulations. Given these challenges associated with frank and open discussions about risks and uncertainties in the food system, coupled with a highly charged political environment, one of the factors contributing to a lack of communicative learning has to do with a lack of political willingness to engage in this level of institutional learning. This relationship between politics and communicative learning can be expressed as a tension between transparency and reflexivity. On one hand, reflexive practices of social learning require a degree of transparency about risks and uncertainties. Although desirable from communicative learning perspective, transparency about risks and uncertainties within public institutions can be very challenging, especially when the public is highly focused on a particular issue, citizens are expecting leadership, and elected politicians are concerned about the implications on party politics. For these reasons, the additional limitations associated with a lack of transparency can also lead to limitations on communicative learning.

6.3.3 Lack of institutional capacity to activate a communicative learning environment

Even if managers recognized the value of citizen engagement and wanted to pursue more meaningful forms of engagement, there are serious limitations to this form of engagement. First, management institutions are struggling with capacities to meet everyday demands of the job. These institutions have limited human and financial resources, and often struggle to achieve everyday regulatory

activities. As one participant noted in our interview, “we are so busy with everyday routine and don’t have time to do a reflection meeting.”

Furthermore, the BSE crisis added additional pressures well beyond these everyday challenges. Admittedly, a certain degree of pressure is important to improve the efficiency of an institution; however, if pressure has reached an unbearable point, it may cause institutional dysfunction. In this case study, institutions encountered an unprecedented crisis in addressing the BSE outbreak. On one hand, those pressures succeeded in pushing agri-food institutions to adjust their institutional practices; however, on the other hand, excessive pressures impeded the opportunity for institutional learning, e.g., one representative from government believed that the pressures from the media and the public actually inhibited their critical reflection practice. Thus, deficient institutional capacity is also counterproductive to the development of a communicative learning practice.

6.3.4 Hindrance from interested groups

Key stakeholder such as large producers, distributors, and other actors in the existing beef industry may be uninterested and unwilling to facilitate discussions / reflexivity about the current food system. These discussions are likely to include critical ideas about industrial agriculture, conversations about alternatives, diversity, and other views that can threaten the interests of these key stakeholders. Therefore, even if public institutions, managers, policy makers recognize the value of communicative learning, desire a more socially robust form

of citizen engagement, have capacities and political willingness to foster communicative learning, vested interests may also limit these possibilities.

6.3.5 Lack of public interest

Notwithstanding all the reasons give above, there remains a question here about public interest. The reasons given above are based on the premise that public groups would actively participate in citizen engagement processes if opportunities were made available. However, this is a large assumption given that evidence from this study indicates that active citizens groups with a focus on food systems and food safety in Canada are quite small and underdeveloped. It is also the case that in Alberta, consumption of beef increased immediately following the first indigenous of BSE outbreak in 2003. Therefore a lack of public concern and a lack of public pressure from citizens may also limit the possibilities for meaningful public dialogue and communicative learning.

Although this study does not explore the perspectives from citizen groups and motivations associated with citizen engagement in the BSE crisis, it is important to note that other scholars caution against associating a lack of public interest with trust in expert systems of risk regulation (Wynne 1992). Moreover, research by Blue (2009), examining the beef industry in Alberta following the BSE-inspired trade ban, indicates a concerted effort by industry and government to blur the lines between consumer preferences for safe beef and the complex processes of industrialization and globalization within the industry. For these reasons, although a lack of public pressure for access to risk information and risk

decision making in the beef industry is evident, this situation calls for more attention and research to understand public interests within this context.

6.4 Contribution to the literature

Communicative learning is derived from adult education theory (Mezirow, 1995). In this research, I applied this theoretical framework to understand learning practice at the institutional level. As in adult education, communicative learning is focused on the individual or group dynamics in order to influence and transform individual beliefs and behaviors. However, institutional learning is often much more complex than is the case within an educational context as it is intertwined with economic, political and cultural issues. Therefore, communicative learning may be more challenging in this environment. This research contributes knowledge of communicative learning in a more complex context with a new understanding of public engagement, social rationality, and reflexivity.

Another contribution of this research provides an empirical study of BSE in Alberta. While many studies have been accomplished in U.K. on the BSE crisis, my research offers another perspective to understand this food safety issue in the Canadian context. As an unexpected crisis in the beef industry, the UK had little prior experience to learn or to anticipate the challenges of BSE. Fortunately, Alberta had the experience of the UK and other countries to address this crisis. Nevertheless, surprising to some degree, institutional responses in Alberta were not substantially different from what were observed and documented in the UK.

Learning was limited as it was based on scientific and technical knowledge, and communicative learning was largely absent during this crisis.

The reasons of this learning deficiency were discovered in this research. First, institutions did not appreciate the value of social rationality and their previous experience with stakeholder engagement constrains their understanding of public engagement. Second, the essence of political systems and current interest groups also inhibit their willingness to activate a communicative learning practice. Furthermore, even if institutions are likely to initiate a communicative learning practice, there are two obstacles that need to be addressed; deficient institutional capacity and lack of public interest. Currently, institutions are occupied with everyday demands which drawn most if not all of their capacities. Moreover, interested public groups are invisible in this research. If public groups were more organized and mobilized, the possibilities for communicative learning would be enhanced. Through these insights, we learn more about the possibilities for communicative learning within complex institutions. These difficulties associated with communicative learning were based primarily within public institutions, and emphasize the challenges of achieving a high level of learning (toward a culture of learning) within this context. The identification of these challenges is a key contribution to the risk literature.

7 CONCLUSION

7.1 Summary

The outbreak of the BSE has affected modern society in a serious way. It did not only affect its economic performance, but also it threatened its fundamental structure. As we continue to experience the challenges of a risk society, the BSE problem represents one such challenge within the industrialized agri-food system. However, this problem can also serve as an opportunity for learning and changes (Beck, 1992; Elliot et al., 2000). In this case study, our research shows that agri-food institutions considered the outbreak of the BSE as an opportunity for institutional learning.

From the perspective of the transformative learning theory, institutional learning that occurred among agri-food institutions is characterized by instrumental learning. This type of learning considered the implementation of scientific technology to address current problems. Among the programs and policies that institutions implemented in response to the BSE crisis, feed bans, the removal of SRM, the enhancement of surveillance system, and traceability systems offered examples of instrumental learning. Admittedly, controlling the spread of the BSE and succeeding in ensuring that several export borders were reopened can be described as outcomes from instrumental learning. However, if we claim agri-food institutions were successful in responding to the BSE crisis, we may be too easily satisfied. By definition, instrumental learning focuses on "how to solve" problems; however, it is deficient in exploring "why this problem

happens". Furthermore, building on scientific rationality, instrumental learning has a tendency to control and exclude alternative perspectives. Nevertheless, as in a risk society, control becomes impossible and alternative knowledge is also needed for a holistic evaluation of a crisis. As a result, the balance between scientific rationality and social rationality should be highlighted. Instrumental learning alone cannot build an adaptive institution in a risk society. Therefore, the other part of transformative learning, communicative learning needed to be explored in the learning practices of agri-food instructions.

In this research, we found little evidence of communicative learning amongst agri-food institutions. Communicative learning explores the deep-rooted reasons for a crisis; by attending to them, institutions can become more adaptive at addressing future challenges. The approaches of acquiring communicative learning are based on rational discourse and institutional reflexivity. Rational discourse emphasizes the establishment a transparent and friendly channel for learning in which opportunities for participation are equally distributed. Although agri-food institutions have initiated several communicative channels, they failed to build a rational discourse; for example, limited transparency, too much pressure and a lack of public participation in decision-making process. Additionally, institutional reflexivity is derived from reflexive modernization theory; hence, it focuses on self-reflection and on holding a critical perspective toward scientific rationality. In the case of this study, reflections on the consequences of actions were limited, and agri-food institutions still considered BSE as an economic issue rather than an animal and human health issue. Therefore, the industrial agriculture

model which is considered the fundamental cause of the BSE outbreak in Britain was not criticized in this context. Furthermore, agri-food institutions remained deeply favorable toward scientific rationality with intensive inputs into scientific control. Admittedly, the scientific community contributed to efforts to address the disease; however, alternative perspectives based on social rationality are also necessary in a risk society. Unfortunately, agri-food institutions have not made significant progress in this arena.

In summary, the outbreak of the BSE served as a learning opportunity for agri-food institutions. This opportunity activated learning practices within the institutions through policy changes. However, those learning practices only emphasized the instrumental learning aspect and failed to extend to communicative learning. Although BSE is not likely to happen again given the policies now in place, nevertheless, a similar food safety crisis is likely to appear as we evolve into a risk society. In the case of BSE in Canada, we may conclude that we just fixed the problem but were unable to recognize its deep-rooted causes. Therefore, we may be trapped in a crisis-temporary-fix-crisis circle if we continue in our "traditional" behaviors rather than undertaking critical reflection on the whole system.

7.2 Recommendations

The recommendations emerging from this study are based on the interviewees' responses, literature review and researchers' analysis. The following suggestions are built on Moldashl's (2007) criteria for improving

institutional behaviors in relation to institutional reflexivity and Meirow's (1978) transformative learning theory in terms of enhancement of communicative learning practice.

7.2.1 Institutionalization of self-observation and self-criticism

This concerns whether an institution has devices that can aid in reflexive monitoring within. As noted in the Literature Review, it is essential for learners to become critically reflective of the assumptions underlying intentions, values, beliefs, and feelings in communicative learning. Nevertheless, critical reflection was deficient among agri-food institutions in the context of the BSE crisis. Moldaschl (2007) writes that institutions may design departments that can examine and criticize the institution's strategic orientation. However, agri-food institutions in our research have not devised similar functional mechanisms that can be applied as a channel for self-observation and self-criticism. Therefore, it is necessary for agri-food institutions to design departments and processes for self-reflection.

7.2.2 Open evaluation of the consequences of action

Evaluation includes the behaviours of all players in various activities and the "environment" in which all events take place. The evaluation not only is about the efficiency or effectiveness of institutional practices, but also directs its focus to certain "soft factors." The first recommendation should be related to the means of critical reflection, this recommendation focuses on the content of reflection. Ideally, agri-food institutions will not only review the policies related with the BSE, but they will also examine institutional culture and structure, power and

interest relations within institutions and within the agri-food system. Additionally, this evaluation should be accessible to a broader public.

7.2.3 Accentuating "not-knowing" and outlining alternative presents and futures:

Since uncertainty is one of major characteristics of risk society, institutions admit uncertain challenges and systematically change duties, and roles in adjusting to a contextual scenario. In our research, we found that agri-food institutions had not admitted to the uncertainty around BSE disease; on the contrary, they reassured the public that "everything is under the control" in order to eliminate any potential threats that may have resulted from the unknown facts. Against this air of certainty and the whole scenario of BSE, the model of industrial agriculture attracted significant concern within some areas of society. This concern was reflected in the growing interest and presence of alternative agriculture models, e.g. local farm, organic farm, seems to be marginalized as it used to be. Therefore, agri-food institutions should admit not-knowing facts and create an opportunity for better institutional performance in the future.

7.2.4 Promoting the balancing of scientific rationality and social rationality by bringing public debate in to the decision-making process.

This study reveals some of the limits of scientific knowledge, which can then provide openings for alternative knowledge to become a part of institutional discourses and decision making. In a risk society, scientific knowledge is no longer adequate on its own (and perhaps never was) to ensure the reasonableness of a decision. Hence, alternative knowledge needs to be explored as a complement to decision-making. In instrumental learning, scientific knowledge based on

scientific rationality dominates the learning practice. On the contrary, as we described in the Literature Review, social rationality, as opposed to scientific rationality, focuses on people's perspectives on their values, feelings and interests, and it may facilitate communicative learning. This type of rationality is not evaluated by counting gains and losses mathematically as in scientific rationality. Instead, it focuses on people's subjective feelings and their own understandings and experiences, which are exactly what communicative learning requires. Knowledge deriving from social rationality, also called *common sense knowledge or local knowledge,* is also important for shaping a better future for our society (Sjöberg, 1999). Common-sense knowledge is gained through daily interaction among people. Public participation is an effective means of developing social rationality; however, some groups, such as consumers, were not involved in the decision-making process in this case.

In a risk society, the value of social rationality is relatively significant, given the limits of scientific rationality. Hence, it is necessary for agri-food institutions to bring public debate into decision-making, in order to generate a scientific and socially rational decision.

7.3 Further Research

In this case study, we shed light on institutional learning in the scenario of a food safety crisis in a risk society. We found that agri-food institutions were dominated by a form of thinking that is dominant within first modernity, e.g. scientific control, economic development and downplaying the value of public

input. Yet this study did not go deeply into the reasons behind this dominant mode of thinking and action. Hence, future research may examine the explanations for this institutional behavior by reviewing institutional structure and culture that offers new insights into this reasoning.

Another aspect of future research may focus on the opportunities for and barriers to public participation in food safety decision-making. As we observed in this research, public debate around BSE was curtailed and often prohibited. The challenges to public participation are thus another feasible subject for further study.

Finally, we selected the outbreak of the BSE as our empirical case of research; however, chronic wasting disease (CWD), another disease also from the TSE disease family, is worth studying in comparisons with the BSE in terms of institutional behaviors.

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9 APPENDICES

9.1 Appendix A: Confidentiality Agreement for Transcribers

PROJECT TITLE:

Understanding Institutional Response Strategies to TSEs and Food Safety

Individuals participating in this research project have been promised anonymity and confidentiality in line with principles of good ethical conduct in social research. It is essential that these promises be upheld in order to protect participants, as well as the integrity of the research process. You are thus requested to complete the following confidentiality agreement.

I, _____, as a transcriber for the project *Understanding Institutional Response Strategies to TSEs and Food Safety*, agree to not repeat any of the content of the interviews I transcribe, and neither myself, nor my associates, will retain recorded interviews, or copies of transcripts following completion of this work.

Signature of the Transcribers	Date	Printed Name
_____	_____	

Signature of the Researcher	Date	Printed Name
_____	_____	

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9.2 Appendix B: Consent Form

TITLE: Understanding Institutional Response Strategies to TSEs and Food Safety: A Preliminary Investigation

Do you understand you have been asked to participate in a research study?
Yes No

Do you consent to being audio-taped? Yes No

Have you read and received the information sheet for this study? Yes No

Do you understand the benefits and risks for taking part in this research? Yes No

Have you had an opportunity to ask questions and discuss this study? Yes No

Do you understand that you can quit taking part in this study at any time?
Yes No

Do you understand that you can withdraw your interview up to two weeks after the study? Yes No

Have the issues of confidentiality and anonymity been explained to you?
Yes No

Would you like to be identified by name in written documents generated from these interviews? Yes No

Do you understand who will have access to the interview data? Yes No

Would you be willing to participate in further research associated with this project? Yes No

Do you understand that this interview will be used in preparing presentations, scholarly publications, and publicly available reports? Yes No
Are you aware that material from this interview may be retained and used to inform future research activities? Yes No

This study was explained to me by: _____

Signature of Research Participant Date Printed Name

_____ _____

Signature of Investigator Date

_____ _____

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9.3 Appendix C: Interview Tool

TITLE: Understanding Institutional Response Strategies to TSEs and Food Safety: A Preliminary Investigation

Pre-Interview Checklist

- Introduction to the research team
- Introduction to project
- Walk through the consent form
- If permission is given begin recording.

Interview

Participant Experiences with TSEs and Food Safety

When did you first encounter concerns about TSEs?

What was your experience and knowledge of the disease, or wider food risks, prior to learning about TSEs?

Could you please discuss your roles and responsibilities within your organisation in relation to responding to TSEs, or other potential food risks?

Have these roles changed following your involvement in this area? How has this experience informed your current work?

Institutional Relations

What other organizations did you, or your wider organization, engage with in developing an institutional response strategy?

Did this engagement include international relations, or draw on the experience of other nations in managing the disease and its potential risks?

How would you characterize the inter-institutional relations you were involved with? Did they positively contribute to your organizations aims? Were they sufficient?

Communication and Public Engagement

Did you have any involvement with members of the public, or social and community organizations, in your roles?

If yes, how did this engagement contribute to your institutional response strategy?

What was your perception of the public interest around issues of food safety, and BSE / CWD in particular?

Innovation and Adaptation

What types of individual, or institutional learning, have been prompted by your experiences of TSEs and food safety issues?

Would you feel better prepared to contend with similar issues in the future? If yes, how so? If not, why?

What other long term implications has the disease had on your institution, and your role in it?

Post-Interview Checklist

- Ask participation, if they have anything further that they would like to contribute, that was not already addressed in the interview.
- Thank the participant for their time.
- If appropriate, restate the intention of the research team to potentially follow-up on the interview with a further discussion in the future.
- Restate conditions of participation as described in the consent form.