Producer Adaptive Responses to BSE

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Introduction

The negative consequences of the trade ban for the livestock industry following the discovery of Bovine Spongiform Encephalopathy (BSE) in Alberta were significant and widespread. Although generally underemphasized in subsequent media attention, the loss of these beef export markets caused livestock values to plummet and significantly eroded the equity of many producers (McLachlan and Stozek 2006). While the impacts of BSE are important in of themselves, they are especially significant when compounded with coinciding stressors including drought, grasshopper infestation and the continuous rise of input costs (Stozek and McLachlan 2007). Yet producers have long been accustomed to adversity. Indeed, many are finding ways of adapting to the added challenges associated with the BSE crisis. Both the impacts and these responses to BSE have implications that will continue to threaten the livelihoods of Canadian producers long into the future.

Figure 1 - Producers have become accustomed to adversity and find ways to adapt to new challenges posed by BSE

Objective

Our objective in this study was to assess the methods by which producers have been adapting to the BSE crisis, and to identify what factors characterized these adaptive responses.

Methods

On March 14th 2006, a questionnaire incorporating both Likert-scaled and open-ended questions was mailed to 9,713 producers in Alberta, Saskatchewan and Manitoba. It was designed to evaluate the impacts, adaptive responses and risks associated with BSE. In each prairie province, census districts (CDs) having some agricultural production were identified with one of four strata (i.e. cattle production density (low, high) and proximity to the nearest federally inspected slaughterhouse (low, high). Two CDs were randomly selected from each stratum for each province resulting in 12 sampling regions. A total of 1,470 completed surveys were returned, resulting in a 33.3% adjusted response rate. A telephone survey was subsequently conducted with recipients and no non-response bias was found. This study focused on a subset of the survey data (n=828) that focused on adaptation. Factors underlying responses were identified using Factor Analysis, and logistic regression was subsequently conducted using SAS and models built using AIC (Burnham and Anderson 2002). Outcomes from quantitative data analyses were matched with qualitative responses to open-ended questions in the survey.

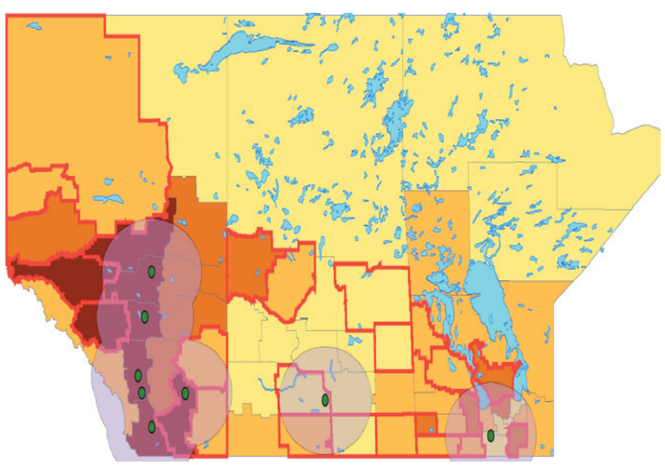

Figure 1 – Location of census districts and federally inspected packing plants that were used to locate postal outlets and communities that received the mail-out questionnaire

		Variance	Eigen values	Factor Loading	Mean[a] (SE)
Factor	**Innovating**	20.68%	3.309		
	Marketing directly to consumers			74	4.42 (.08)
	More rotational grazing			66	4.73 (.07)
	Practice holistic management			64	4.00 (.07)
	Shifting to organic production			62	3.03 (.07)
	Fattening more cattle to finish			60	3.51 (.08)
	Finding other markets for livestock			58	4.92 (.07)
	Custom feeding at feedlots			42	5.08 (.07)
Factor	**Enduring**	11.45%	1.831		
	Taking out more loans			71	4.07 (.09)
	Over-grazing some paddocks			65	3.59 (.08)
	Reducing vet visits			55	5.12 (.07)
	Not changing anything			42	3.42 (.08)
	Euthanizing cattle more			41	4.97 (.08)
Factor	**Exiting**	9.96%	1.593		
	Downsizing Herd			79	3.64 (.08)
	Leaving cattle industry			72	3.01 (.08)
	Using low calf prices to expand			-51	3.36 (.08)

Table 1 - Variable reduction of producer adaptive response using factor analysis

[a] Mean scores were derived from a 7-point scale, with 1 indicating strongly disagree and 7 indicating strongly agree

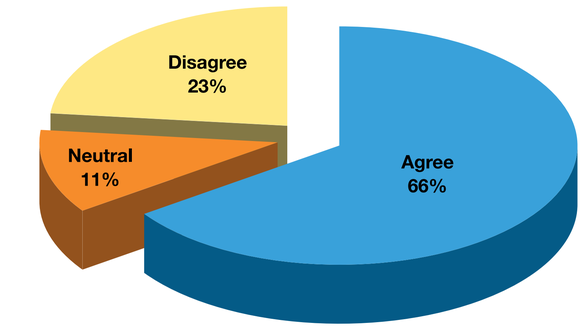

Figure 3 - Loss in equity will affect my ability to respond to future crisis (N=601)

Variable	Cumulative AIC_c weight[a]
Cattle Herd Size	1.00
Farm Size	0.63
Age	0.57
Family Farming	0.30
Gender	0.19
Work Situation	0.16
Economic	0.14
Edu	0.12

Table 2 - Cumulative AICc weight of Variables

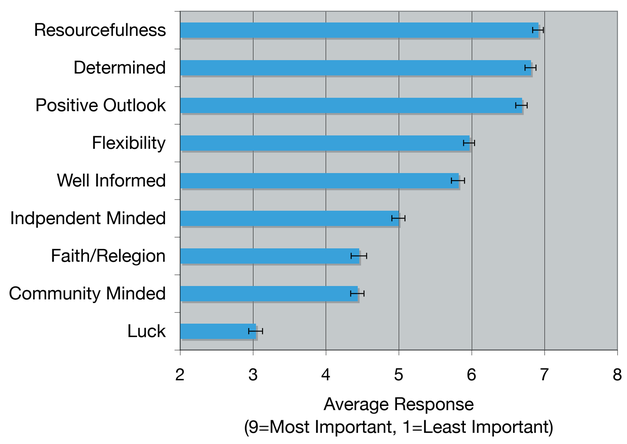

Figure 4 - Characteristics that Enabled People to Cope with BSE (n=748)

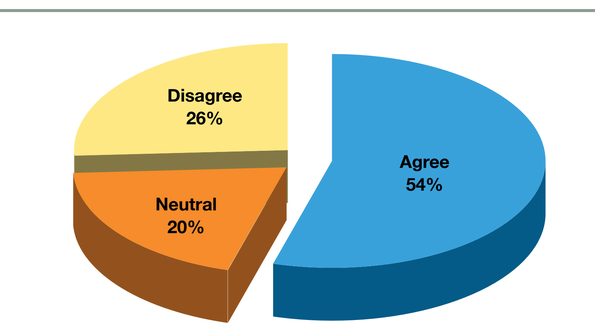

Figure 5 - Marketing Directly to Consumers Helped to Cope with BSE (n=491)

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Results and Discussion

Factor analysis identified three factors that underlay producer responses to BSE (Table 1). The first factor was characterized by those who undertook novel adaptive measures ("innovated"), the second factor by those who operationally maintained the status quo to survive the crisis ("endured") and the third factor by those who either downsized or left the industry ("exited"). For many, and perhaps especially for those who "endured", the reduction in producer equity caused by BSE has been significant and will undoubtedly play a role in the future ability of producers to respond to other crisis in the future (Figure 3). However, those who "innovated" have explored new markets or otherwise altered their operations which may increase their ability to adapt to future crisis. As one "innovator" from central-eastern Manitoba stated,

> *"When the value of cattle dropped we responded by direct marketing beef. Our income from beef returned to normal and then increased above pre-BSE levels."*

Binary logistic regression conducted to identify the influence of underlying independent variables indicated that cattle herd size and farm size (Table 2) were most strongly associated with innovating (Factor 1). Producers with medium sized herds and farms were least likely to have been characterized as innovators. Conversely, those with small or large farm and herd sizes were most likely to have innovative responses to BSE.

Respondents were asked to rank eight characteristics that might have better enabled producers to cope with the effects of BSE (Figure 4). Resourcefulness, determination and flexibility were all ranked as most important and arguably characterize producers who are willing to take chances when confronted with adversity.

Direct marketing and the need for alternative markets were both strongly associated with innovators (Factor 1), allowing producers to better cope with BSE (Figure 5). Although farm cash receipts for cattle were substantially lower during the heat of the BSE crisis (Dunn, 2004), wholesale and retail prices for beef remained substantially unchanged. By avoiding a volatile beef commodity market and by reducing the role of intermediaries, producers who find a niche in the local market can hypothetically extract more profitability out of the value-chain.

We are now exploring the role of direct marketing by working with a group of livestock producers meeting as part of the Harvest Moon Society, a rural NGO that promotes the importance of rural adaptation and farming as a whole. We are in the process of establishing a local distribution network in Southern Manitoba (Figure 6). One participating producer, Arvid Dalzel, responded to the BSE crisis by reducing the size of his own cattle herd and by developing his own processing facility. He now successfully markets his products to 8 stores and 5 restaurants in his local area and connects directly to consumers by delivering to depots in over 14 nearby rural communities. This case study will be part of a broader research project that explores the potential for local food networks to increase profitability for producers and to reduce risks associated with future rural crises.

Figure 6 - Harvest Moon Society collective marketing meetings.

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