



Fact Sheet

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Export Market Recovery Post Livestock Disease Outbreak – Cattle¹

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Background

In some countries, the livestock sector is heavily dependent on income generated from exports. During or after disease outbreaks, trade bans may be imposed by trading partners. In addition, some countries may self-impose export bans.

The process of regaining market share is complicated. The longer a country is out of the market, the harder it may be to recover due to importers finding new sources for products. Other factors such as disease type, previously-exported product type and value, competing countries' supply available for export, disease management timeline, outbreak size and duration, and country credibility may all influence the length of market recovery. In addition, political changes (e.g. changes in ruling party), domestic price changes for inputs and products, weather changes that impact productivity, consumer response, prices for competing protein products, and many other factors can have an impact on the length of export market recovery.ⁱ

In the last decade, Canada, Japan, and the United States have experienced BSE outbreaks and Uruguay, Brazil, Argentina, and the United Kingdom experienced FMD outbreaks. The World Organization for Animal Health (OIE) guidelines suggest a country regain foot and mouth disease (FMD) free status with a three to six month waiting period after utilizing a stamping-out policy, depending on the usage of emergency vaccination.ⁱⁱ OIE guidelines for regaining disease free status for bovine spongiform encephalopathy (BSE) are based on the outcome of an extensive risk assessment, with no suggested timelines.ⁱⁱⁱ

An analysis of time elapsed from the announcement of a livestock disease outbreak until a country regains its international market can inform other countries of the potential impacts following an outbreak. This analysis shows that export markets can take longer than three to six months for export revenues to return to pre-outbreak levels. In some

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cases export markets may not recover.

Methods

The export market recovery after ten livestock disease outbreaks during 2000 - 2007 was determined by analyzing monthly export data for seven countries (Argentina, Brazil, Canada, Japan, United Kingdom, United States, and Uruguay). Historical monthly trade data were collected from the Global Trade Atlas database^{iv}. Foot and mouth disease (FMD) and bovine spongiform encephalopathy (BSE) were the two diseases explored.

Disease outbreak situations were graphed (Figures 1-7) for each country and include monthly export revenues for cattle, swine, sheep and products, as well as an indicator of the beginning of the outbreak. A two year running average and a forecasted trend line were included in the graphs to illustrate the differences between actual export revenues and expected levels if market conditions had remained consistent over the period of the disease outbreak.

The two year running average is defined as the average of the same month in the prior two years. For example, in September 2003, the two year running average is the average of export revenues for September 2001 and 2002. A two year running average was chosen because export revenues will include historical market conditions prior to the outbreak, and variability from more than 2 years can wash out the effects. The two year running average is calculated and graphed for the months prior to the outbreak to show if export revenues were following previous trends. The two year running average is also calculated and graphed for 11 months after the beginning of the outbreak because the 12th month would include the changes in exports during the disease outbreak. When adequate historical monthly data were available, a trend line forecasted export revenues to further illustrate where export revenues could have been in the time period after the outbreak announcement. "Export market recovery" is defined as the amount of time required for export revenue levels to reach or exceed the two year running average or forecasted export revenues after a disease outbreak.

Results

Table 1 allows for a comparison of export market recovery times across countries. Organized by country and disease, the table includes the start of an outbreak date, the months required for the export market to recover, and averages and ranges of the difference between the pre-outbreak and post-outbreak export revenue levels.

Overall recovery times range from 0 months to an indefinite amount of time. The time to export market recovery for Canada after BSE is 31 months, while the United States' export market recovered in 50 months, and Japan never recovered. Due to a lack of historical monthly data it is difficult to measure the months to export market recovery in the United Kingdom for the two FMD outbreaks because export revenues could not be forecasted. However it was noted that export markets have taken years to reach pre-outbreak revenue levels. Interestingly, the United Kingdom export market did not show any noticeable reaction to the 2007 FMD outbreak. Also, Uruguay recovered a year or two after their outbreak of FMD began, while Argentina recovered a year after its 2000 outbreak and a few months after its 2006 outbreak. It is difficult to determine when Brazil recovered from their 1996 outbreak, but the export market recovered less than a year after their outbreak in 2005.

The monthly difference in export levels is calculated by subtracting actual export revenues from the two year running average or forecasted export revenues. The cumulative monthly difference between export revenue levels for Canada was almost \$2.6 billion, while the US was \$7.7 billion. Calculating the percentage difference in these levels allows for direct comparison across countries.

The United States experienced an average percent difference in export revenues after an outbreak of negative 54.3 percent, while Canada experienced negative 36.6 percent. The range of the percent difference for the United States was 85.7 percentage points difference, while the range for Canada was 91.9 percentage points difference.

Table 1: Comparison of Disease Outbreaks Affecting Cattle

Country Disease	Start of Outbreak	Market Recovery Time (months)	Cumulative Monthly Difference (\$US million)	Average Monthly Difference (\$US million)	Range of Monthly Difference (\$US million)	Average Monthly Difference (percent)	Range of Monthly Difference (percent)
Canada BSE	05/2003	31	\$2,597.9	\$83.8	\$-44.9 to \$231.8	-36.6%	-98.6% to -6.7%
United States BSE	12/2003	50	\$7,703.4	\$157.2	\$15.7 to \$252	-54.3%	-92% to -6.3%
Japan BSE	09/2001	Never Recovered					
Uruguay FMD	10/2000	Recovered in 2002					
Brazil FMD	1996	Unclear					
Brazil FMD	10/2005	Recovered in less than a year					
Argentina FMD	08/2000	Recovered in a year					
Argentina FMD	02/2006	Recovered in a few months					
United Kingdom FMD	02/2001	Unclear					
United Kingdom FMD	11/2007	0	Not Applicable				

Analysis by Country

The blue columns represent the export revenue for each month, the red line on the left side of the graph is the two year running average, and the green on the right side of the graph is the forecasted revenue. Market recovery is achieved when the blue column reaches or exceeds the red or green lines post outbreak announcement. The time to export market recovery is highlighted in the yellow on some graphs.

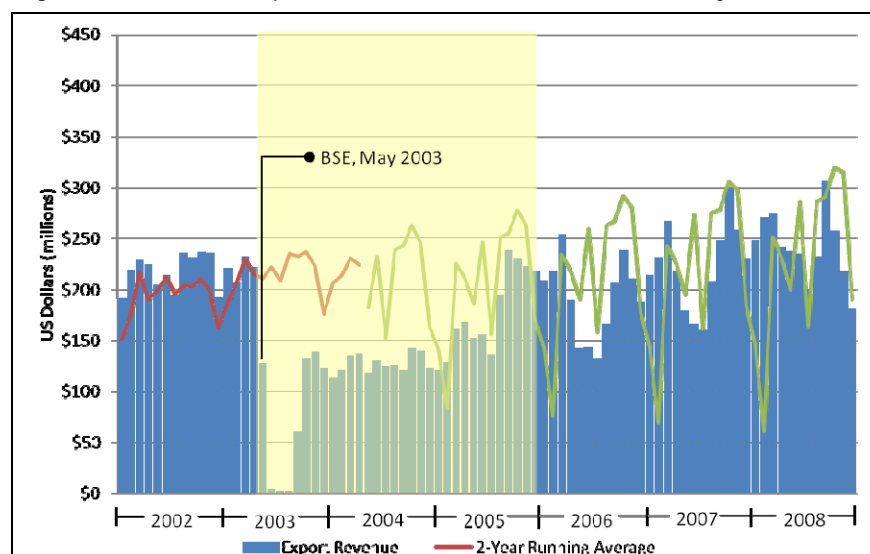
Canada

Canada reported its first case of BSE in May 2003. Canada's 19th BSE case was reported in February 2011. Canada's market began to return to historical levels faster than the United States (US) market. Canada's cattle and beef export markets had been steadily increasing for the eight years prior to the first BSE case in 2003. Canada's export market for live cattle and beef 'recovers' in February 2005 according to our definition of market recovery (export revenue levels reach or exceed the two year running average or forecasted export revenues). However, recovery is not stable until December 2005, 31 months after the announcement of the first case (Figure 1).

The US published the Minimal-Risk Region (MMR) rule on January 4, 2005 establishing regions that presented minimal risk of introducing BSE into the US. This rule allowed imports of limited categories of animals and products, and listed Canada as a BSE minimal-risk region. This rule was

affirmed on April 8, 2005 and went into full effect. A second Minimal-Risk Region (MMR) rule was published on September 18, 2007, effective on November 19, 2007, that updated the existing rule to expand the categories of animals and products allowed entry into the US to include slaughter cattle and meat from cattle over 30 months of age, as well as breeding cattle. The quick recovery of a large portion of Canada's export market was due to the fact that the US serves as Canada's major export market and Animal Plant Health Inspection Service's (APHIS) Minimal-Risk Region (MMR) rules allowed for cattle and beef product trade to continue. Another possible reason that Canada's live cattle and beef export markets partially recovered so quickly after their BSE announcement is that it was difficult to distinguish exactly which products were banned and which products were still traded.

Figure 1. Canada Export Revenue and Market Recovery after BSE

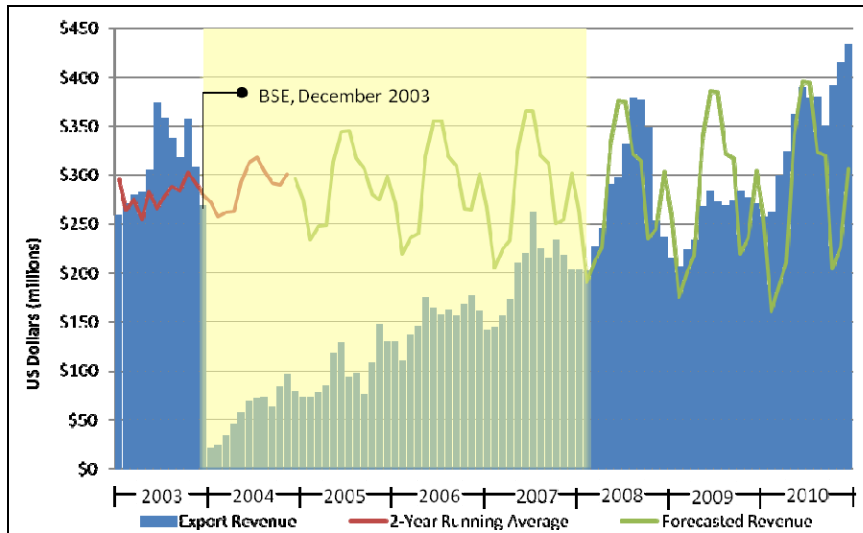


United States

The magnitude and duration for United States (US) export market recovery when compared to Canada is quite different. After Canada's first BSE case in May 2003, US domestic beef and cattle prices increased significantly. Export revenues also increased until the US had its first BSE case in December 2003. The US reported its third BSE case in March 2006. Due to the increase in domestic prices from June through December 2003, the two year running average and forecasted revenues are likely higher than historical prices would have dictated. However, this would not have markedly changed the amount of time to US export market recovery as defined in this analysis.

The US begins to recover Asian markets in 2006 when both Japan and Korea reopened markets on a limited basis (Figure 2). However, the US beef industry continued to encounter some issues due to specified risk material being included in beef shipments to these markets. Unlike Canada, whose main export market was the US, the US had a much broader export market and political forces delayed export market recovery. This was especially true with US trading partners in Asia. While the US exports of cattle and beef recovered after 50 months they have yet to regain the market share they once had outside of North American Free Trade Agreement (NAFTA) countries, in particular in Asia.

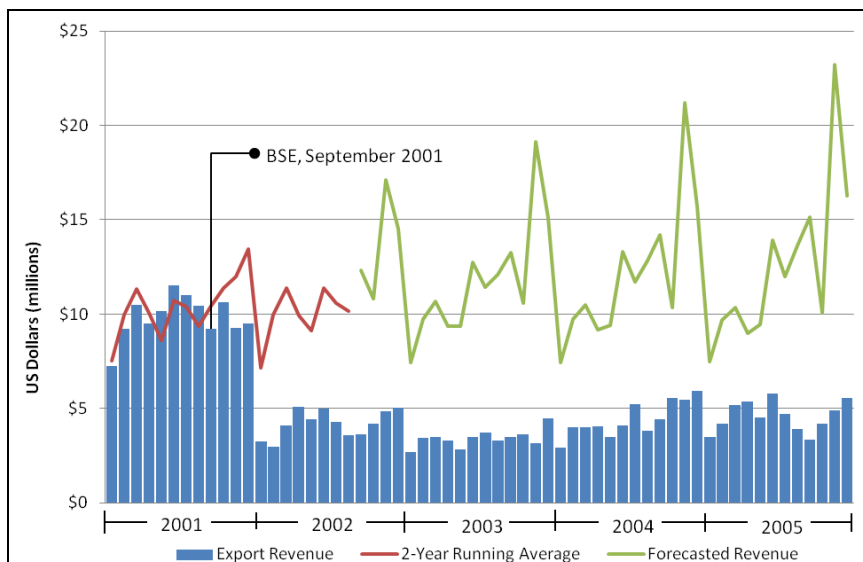
Figure 2. US Export Revenue and Market Recovery after BSE



Japan

Japan reported its first BSE case in September 2001, and its 36th case in January 2009. Japan’s export market, which constitutes a mere fraction of United States and Canadian export markets, had been steadily declining from 1994 to 2000 and leveled off in 2001. Japan’s export market never recovered after its first BSE case (Figure 3). This can likely be explained more by the size of Japan’s export market, political forces, and economic conditions during that time. As reflected in Figure 3, Japan’s export market for cattle and beef is very small, especially when compared to the United States and Canada.

Figure 3. Japan Export Revenue and Market Recovery after BSE



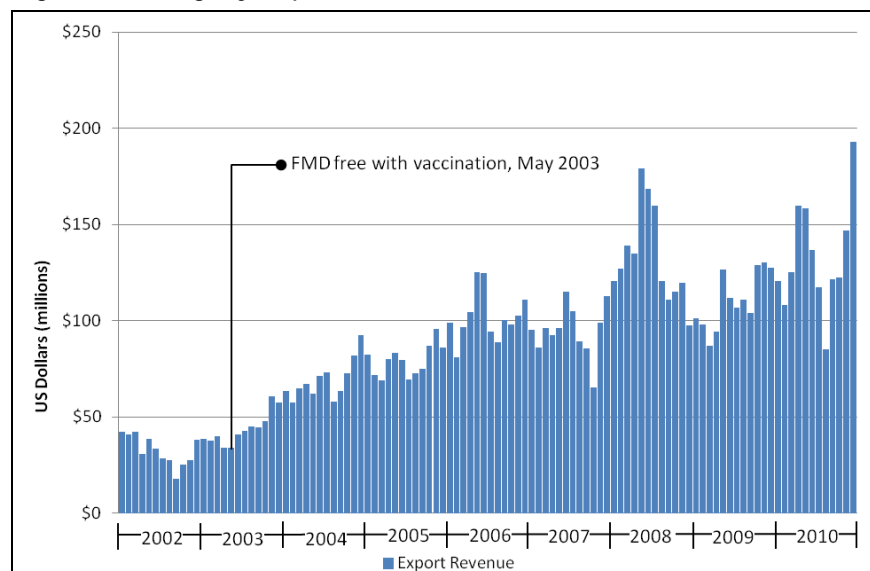
Uruguay

Uruguay was recognized as FMD free where vaccination is practiced in May 1994, then suspended vaccination against FMD in June 1994. The OIE updated Uruguay’s status to free of FMD without

vaccination in May 1996. Uruguay then had a FMD outbreak in October 2000, responded using a stamping-out strategy, and the OIE re-established their free status in January 2001. Another FMD outbreak surfaced in April 2001, costing Uruguay their free status, and Veterinary Services attempted a stamping-out strategy. The Government decided to shift to a total cattle population vaccination strategy because FMD was rapidly spreading to other departments in the country. After the second round of vaccinations was completed on July 22, 2001, and the last reported case on August 21, 2001, Uruguay regained their status as FMD free where vaccination is practiced in May 2003.^v

Due to a lack of availability of historical monthly data, the two year running average and the forecasted revenue could not be used to measure export market recovery. However, Uruguay began exporting to the EU in November 2001 and United States in June 2003.^{vi} While, export revenues in 2000 and 2001 were lower than the previous 5 years where Uruguay's FMD status was free without vaccination, 2002 export revenues were back to a level comparable to those experienced in the late 1990's. Another interesting note is that Uruguay's increases in export revenues after regaining FMD free with vaccination status (Figure 4) coincides with losses of export market revenue for both Canada and the United States after their BSE outbreaks.

Figure 4. Uruguay Export Revenue after FMD



Brazil

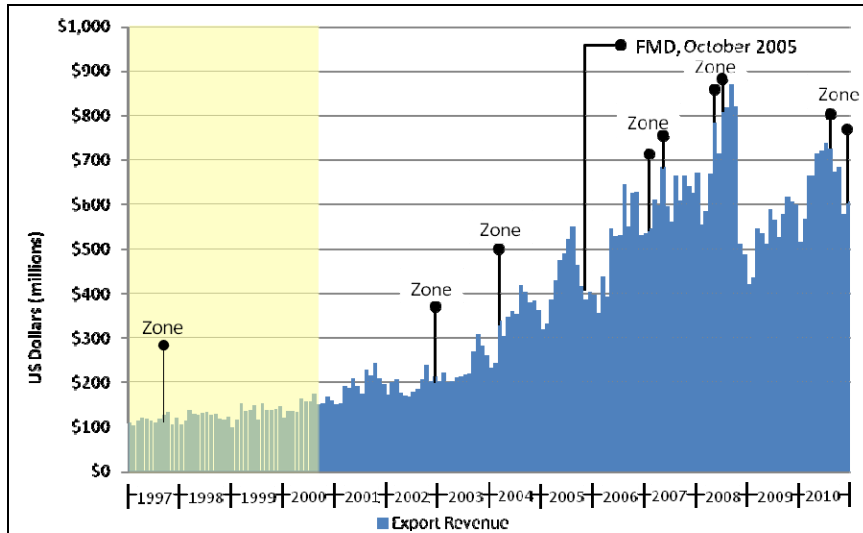
Foot and mouth disease (FMD) was present in Brazil from 1996, with the last case reported in August 2001. Their next outbreak occurred from October 2005 through April 2006. These outbreak periods are indicated by gray boxes in Figure 5.

Brazil has 5 zones recognized by the OIE as FMD free with vaccination with documentation dated September 1997, December 2002, March 2004, February 2007, May 2008, July 2008, August 2010, and December 2010. In May 2007, the OIE recognized Brazil's State of Santa Catarina as a FMD-free zone where vaccination is not practiced. The dates of zone recognition are indicated in Figure 5.

Due to a lack of sufficient historical monthly data, the two year running average and the forecasted revenue could not be used to measure export market recovery. Again, it is interesting to note how Brazil's increase in export revenue coincide with losses of export market revenue for both Canada and the United States after their BSE outbreaks. The addition of each OIE recognized FMD free zone in Brazil also may have attributed to the increase in export revenues over this time.

Brazil's value of exports fell in 2009 as demand decreased due to the global economic recession, depreciation of Brazilian real, increased domestic consumption, and restricted access to the European Union.^{vii}

Figure 5. Brazil Export Revenue after FMD



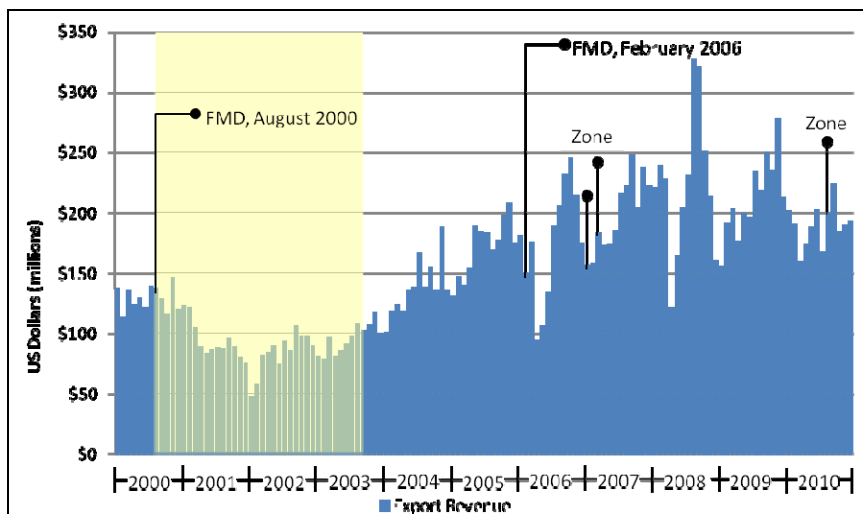
Argentina

Argentina reported several FMD outbreaks spanning the period from August 2000 through August 2003, indicated by a gray box in Figure 6. Their last reported outbreak was in February 2006.

The OIE recognized one zone in Argentina as FMD free where vaccination is not practiced in January 2007, and two zones as FMD free where vaccination is practiced in March 2007 and August 2010.

Due to a lack of availability of historical monthly data, the two year running average and the forecasted revenue could not be used to measure export market recovery. However, along with Uruguay and Brazil, Argentina's increase in export revenue coincides with losses of export market revenue for both Canada and the United States after their BSE outbreaks.

Figure 6. Argentina Export Revenue after FMD

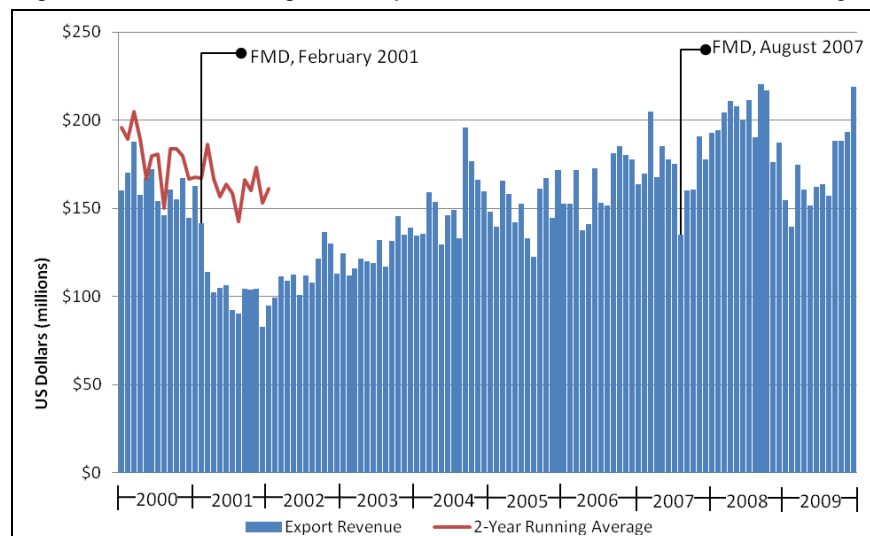


Argentina's export market does react to their February 2006 outbreak, but seems to recover in a few months. Many factors influenced the decline in Argentina's beef exports in 2009, including; the global economic recession, production decreases in response to a severe drought, and depreciation of various currencies. Beef exports were also affected by President Néstor Kirchner's decision to ban all exports of beef for about 6 months starting in March of the same year in order to stop domestic beef prices from rising.^{viii} The addition of each OIE recognized FMD free zone in Argentina also may have attributed to the increase in export revenues after the 2006 outbreak. Argentina's beef export bans to suppress domestic prices have informally continued through 2010 with very few export permits granted for Argentine beef. This has caused job losses and increased the risk of losing trading partners as they look to other international suppliers.^{ix}

United Kingdom

The United Kingdom has had two FMD outbreaks in the last decade. The last cases in each outbreak were reported in September 2001 and 2007. While all cloven hoof animals are susceptible to FMD, this situation serves as an example of what can happen to export markets, including cattle and beef, as a result of an outbreak of a disease that can affect more than one species. The United Kingdom cattle and beef export markets had been trending downward from 1997 through 1999 and export revenues in 2000 were following the same trend prior to the 2001 FMD outbreak. A portion of the decrease in export revenues is likely due to the ongoing BSE situation in the United Kingdom throughout the 1990s.^x Due to a lack of availability of historical monthly data, export revenues could not be forecasted and used to measure export market recovery. However, in Figure 4, it appears that the United Kingdom export market reached pre-outbreak export revenue levels several years after the FMD outbreak.

Figure 7. United Kingdom Export Revenue and Market Recovery after FMD



Limitations

The data used in this analysis include all animals and products that may be susceptible to the disease of concern. It is unlikely that all products included in export revenues were banned in response to disease outbreaks in respective countries. However, determining with certainty all products included in a ban is not possible as this information is not consistently reported.

While this research focuses on changes in export revenue levels, there can be significant differences between export revenue levels and the quantities of goods exported. The assortment of products exported post disease outbreaks can vary from the assortment offered to the international market prior to a disease outbreak. Importing countries may accept products that receive additional processing to mitigate disease risk. International consumers may also shift to consuming higher quantities of products they perceive as less risky, and demand less of the products they perceive as presenting a higher disease risk.

With several factors influencing the amount of time to export market recovery it is difficult to isolate the impact due to disease outbreaks. Impacts from political pressures, relationships with trading partners, global economic conditions, seasonality, and subsequent disease outbreaks are often intertwined with impacts due to a certain disease outbreak.

Conclusions and Comments

As evidenced in this analysis, the time to export market recovery is not solely a factor of disease. Many times political factors play a much more important role in export market recovery. For example, on May 22, 2007 the OIE adopted a resolution that recognized both the United States and Canada as countries with a “controlled risk” status for BSE.^{xi} As of this date, Canada’s export market had already recovered, and the United States export market would recover several months after. This illustrates that the perceived level of disease risk is different for different countries. Several factors acting simultaneously likely contribute to the differing recovery times between countries. One of these factors may be the type of production system, i.e. intensive versus grass-fed. As evidenced by the graphs presented in this analysis, impacts to the export market were mitigated in Argentina, Brazil, and Uruguay which typically support less intensive grass-fed systems.^{xii,xiii} Future research in this area should focus on the specific factors that lengthen or shorten export market recovery times.

Information from this analysis can be used to support economic modeling by providing a better estimate of the depth and duration of a trade shock. Estimates of the potential impacts of future outbreaks can be made and used to inform scenario development, emergency management planning, and surveillance planning. In addition, developing countries may find this methodology useful for budgeting and prioritizing limited funds on mitigation and control strategies that would decrease the time to market recovery.

ⁱ Food and Agriculture Organization (FAO) of the United Nations. (2006). Impacts of Animal Disease outbreaks on Livestock Markets. Introductory paper on Animal Disease outbreaks prepared by Committee on Commodity Problems for 21st Session of the Inter-Governmental Group on Meat and Dairy Products. Rome, Italy.

ⁱⁱ World Organization for Animal Health (OIE). (2010) Terrestrial Animal Health Code Article 8.5.9 accessed at http://www.oie.int/eng/normes/Mcode/en_chapitre_1.8.5.htm#rubrique_fievre_aphteuse_controle on September 13, 2010.

ⁱⁱⁱ World Organization for Animal Health (OIE). (2010) Terrestrial Animal Health Code Chapter 11.5 accessed at http://www.oie.int/index.php?id=169&L=0&htmfile=chapitre_1.11.5.htm on May 19, 2011.

^{iv} Global Trade Atlas, by Global Trade Information Services, Inc. from Statistics Canada, China Customs, Customs Committee of Russia, EuroStat, U.S. Department of Commerce, Bureau of Census accessed at <http://www.gtis.com/gta> on September 13, 2010 and April 27, 2011.

^v URUGUAY. FOOT-AND-MOUTH DISEASE IN 2000-2001 PERIOD accessed at [http://bvs1.panaftosa.org.br/local/file/textoc/FMD%20Uruguay\(Casas\).doc](http://bvs1.panaftosa.org.br/local/file/textoc/FMD%20Uruguay(Casas).doc) on August 31, 2011.

^{vi} NZ Farming Systems in Uruguay accessed at <http://www.nzfsu.co.nz/page.pasp?pageid=77> on September 1, 2011.

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- ^{vii} Beef Issues Quarterly accessed online at <http://beefissuesquarterly.com/southamericatheworldleaderinbeefexports.aspx> on August 30, 2011.
- ^{viii} USDA Foreign Agricultural Service Global Agriculture Information Network (GAIN) Report accessed online at <http://www.fas.usda.gov/gainfiles/200903/146327387.pdf> on September 8, 2011.
- ^{ix} The Mendoza Sun accessed online at <http://www.mendozasun.com/business-a-finance/national/1126-argentina-where-the-beef> on September 8, 2011.
- ^x UK BSE Timeline by BBC News accessed at http://news.bbc.co.uk/2/hi/uk_news/218676.stm on July 13, 2011.
- ^{xi} OIE RESOLUTION No. XXIV Recognition of the Bovine Spongiform Encephalopathy Status of Member Countries accessed at http://web.oie.int/eng/ressources/RESOLUTION_GS75.pdf on June 22, 2011.
- ^{xii} Beef Magazine accessed online at <http://beefmagazine.com/foreign-trade/0401-south-america-beef-production-systems/> on September 9, 2011.
- ^{xiii} A classification of livestock production systems accessed online at <http://www.fao.org/DOCREP/V8180T/v8180T0y.htm> on September 9, 2011.

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