



Fact Sheet

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Export Market Recovery Post Livestock Disease Outbreak – Swine¹

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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 14 years, Canada, the United States, and several countries in Asia and Europe have experienced disease outbreaks that affect swine. The World Organization for Animal Health (OIE) guidelines suggest a country regain classical swine fever (CSF) or African swine fever (ASF) free status three months after utilizing a stamping-out policy (OIE).ⁱⁱ Foot and mouth disease (FMD) guidelines suggest a three to six month waiting period after utilizing a stamping-out policy, depending on the usage of emergency vaccination.ⁱⁱⁱ OIE does not have guidelines for regaining disease free status for porcine reproductive and respiratory syndrome (PRRS) and novel influenza A (H1N1).

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

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six months for export revenues to return to pre-outbreak levels. In some cases export markets may not recover.

Methods

The export market recovery after seven livestock disease outbreaks during 1997 - 2009 was determined by analyzing monthly export data for six countries (Canada, China, Russia, Taiwan, United Kingdom, and United States). Historical monthly trade data were collected from the Global Trade Atlas database^{iv}. Swine disease outbreaks of Foot and mouth disease (FMD), classical swine fever (CSF), African swine fever (ASF), porcine reproductive and respiratory syndrome (PRRS), and novel H1N1 influenza A (H1N1) were explored.

Disease outbreak situations were graphed (Figures 1-7) for each country and include monthly export revenues for live hogs and pork products, as well as an indicator for 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. Canada recovered from novel H1N1 in 10 months, while the United States' export market recovered in three months. Due to a lack of historical monthly data, it is difficult to measure the months for export market recovery in Europe for the two CSF outbreaks because export revenues could not be forecasted. However, it was noted that export markets have taken years to reach pre-outbreak revenue levels. Export markets for Russia (ASF) and China (PRRS) did not show any noticeable trade reaction to the outbreaks. Taiwan's export market has yet to recover from their FMD outbreak in swine given the massive slaughter of affected animals.

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 over \$342 million, while the US was \$54.6 million. Calculating the percentage difference in these levels allows for direct comparison across countries. Canada experienced an average percent difference in export revenues after an outbreak of negative 13.7 percent, while the United States experienced negative 9.4 percent. The range of the percent

difference for Canada was 28 percentage points difference, while the range for the United States was 6.5 percentage points difference.

Table 1: Comparison of Swine Disease Outbreaks

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 Novel H1N1	05/2009	10	\$342.5	\$32.5	\$1.9 to \$71.1	-13.7%	-29% to -1%	
United States Novel H1N1	04/2009	3	\$54.6	\$27.3	\$17.1 to \$37.5	-8.4%	-11.7% to -5.2%	
Belgium, Germany, Netherlands, Spain CSF	02/1997	Unclear						
United Kingdom CSF	08/2000	Unclear						
Russia ASF	11/2007	0	Not Applicable					
China PRRS	06/2006	0	Not Applicable					
Taiwan FMD	03/1997	Never Recovered						

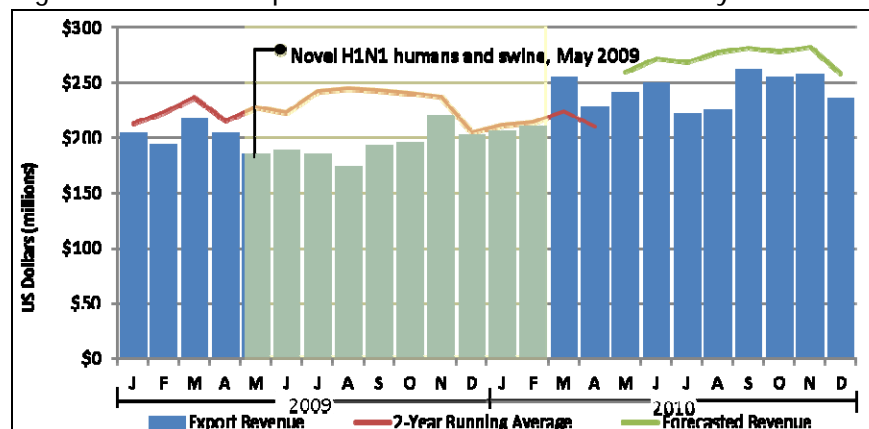
Analysis by Country

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 novel H1N1 flu in May 2009 in humans and swine. Canada’s export market for live swine and pork products comes close to recovering in December 2009, but does not reach the two year running average until March 2010 (Figure 1). This is 10 months after the outbreak announcement.

Figure 1. Canada Export Revenue and Market Recovery after Novel H1N1

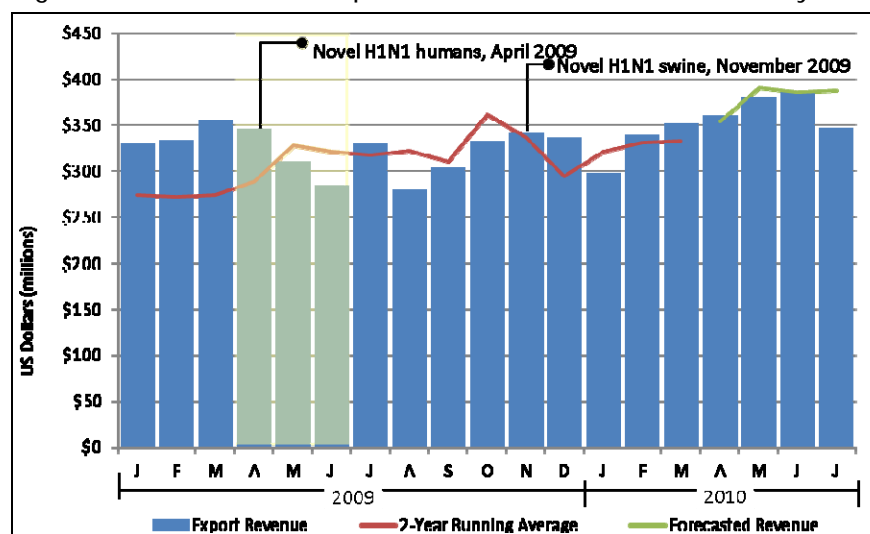


United States

The first case of novel influenza A H1N1 was reported in the United States (US) in a human in April 2009. The first human case caused concern among consumers and trading partners. Several trading partners responded with a ban on the importation of live swine, pork, and pork products of US origin. However, this reaction was short-lived as most trade bans were removed the following month. Several international organizations, including the OIE, advised that there is no scientific basis to restrict trade in pork and pork products with countries that have positive swine H1N1 cases.

In the few months prior to the outbreak, the value of US export revenues of live swine, pork, and pork products were higher than the average of the previous two years. In addition, export revenues near the end of 2009 were slightly higher than the average of the previous two years (Figure 2).

Figure 2. United States Export Revenue and Market Recovery after Novel H1N1



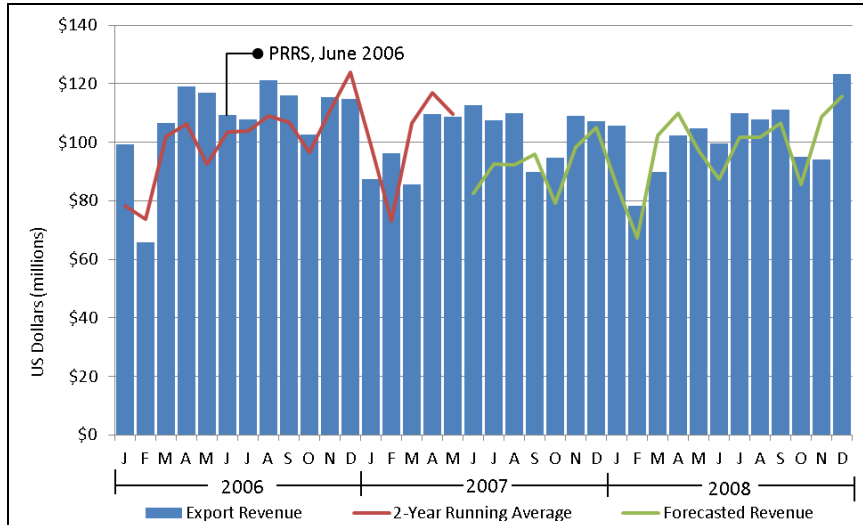
The US pork export market had begun to decrease prior to 2008. However, in 2008, exports of pork increased substantially, partially due to the increased demand from China hosting the 2008 Olympic Games. Domestic production also decreased in China because of an outbreak of PRRS, also known as “blue ear disease” and “high fever disease,” a couple of years prior the 2008 Olympic Games. As a result, China relied on increased imports to meet the higher demand in 2008. China imported more pork during the first nine months of 2008, when compared with previous years. China’s imports were lower in the last three months of 2008 due to an improvement in the country’s swine herd health and the culmination of the Olympic Games.^v Figure 2 illustrates US export revenue levels for a portion of 2009 as lower than the two year running average, partially because of increased exports to China in 2008. The US export market recovered in 3 months. The decrease in export revenues from April through June 2009 is partially attributable to the responses of US trading partners to novel H1N1, but other factors likely contributed to these results.

China

China’s export revenues followed the pattern of the previous two year average after its outbreak of PRRS in June 2006. China still continues to have cases of PRRS. Similarly, export revenues were close to the two year running average and forecasted levels through 2008 (Figure 3). While China had decreased domestic production due to the PRRS outbreak, they may have maintained their export revenues based on the types of pork products they were exporting. In addition, export

revenues may have also been maintained through historical relationships with trading partners (one third of China’s exports are destined for Hong Kong).

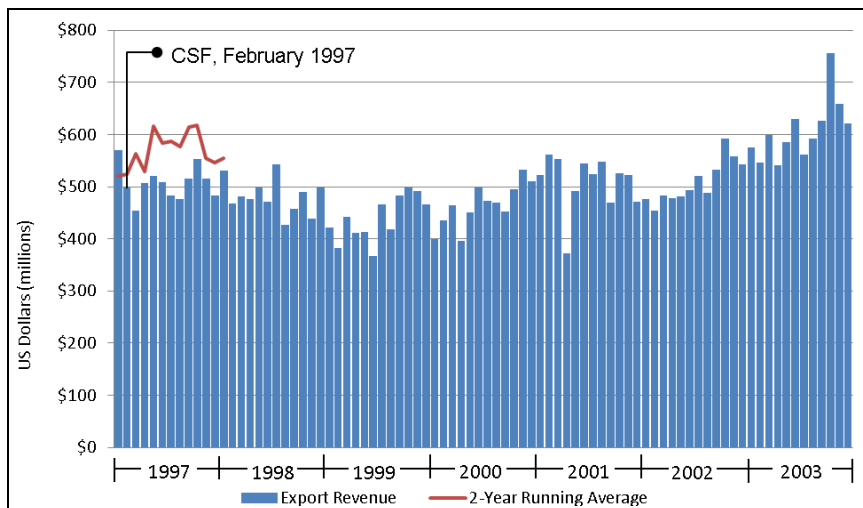
Figure 3 China Export Revenue and Market Recovery after PRRS



Belgium, Germany, Netherlands, Spain

Belgium, Germany, Netherlands, and Spain all experienced an outbreak of CSF that started in February 1997. Due to a lack of availability of historical monthly data, export revenues could not be forecasted and used to measure export market recovery. However, during 2003 export markets reached pre-outbreak revenue levels.

Figure 4. Belgium, Germany, Netherlands, Spain Export Revenue and Market Recovery after CSF

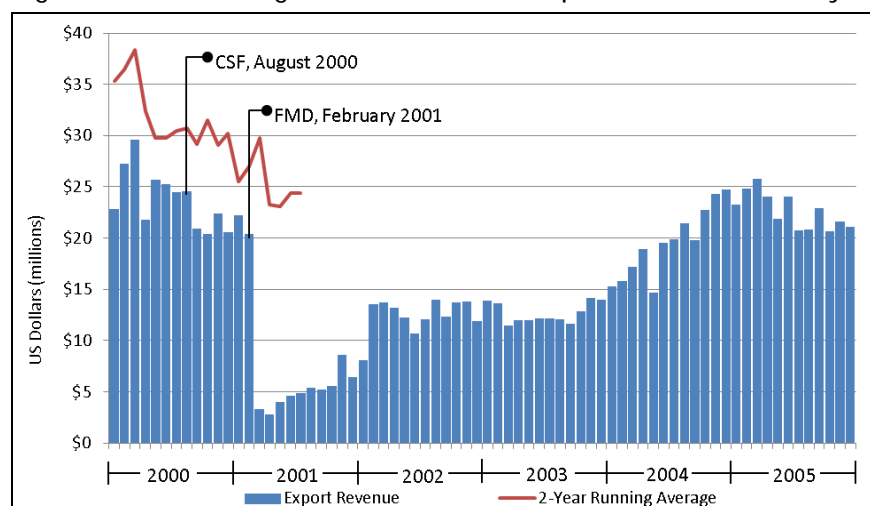


United Kingdom

Swine and pork export revenues for the United Kingdom had steadily decreased from 1997 through 1999, and were below the average of the two previous years when the United Kingdom had an outbreak of CSF starting in August 2000. This outbreak ended in November 2000. To complicate the animal health situation in the United Kingdom, a FMD outbreak was announced in late February

of 2001, which prompted more trading partners to respond with trade bans. The trade bans due to the FMD outbreak make it more difficult to distinguish the possible export market effects due to the CSF outbreak. 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 5, it appears that the United Kingdom export market reached pre-outbreak export revenue levels several years after the FMD outbreak.

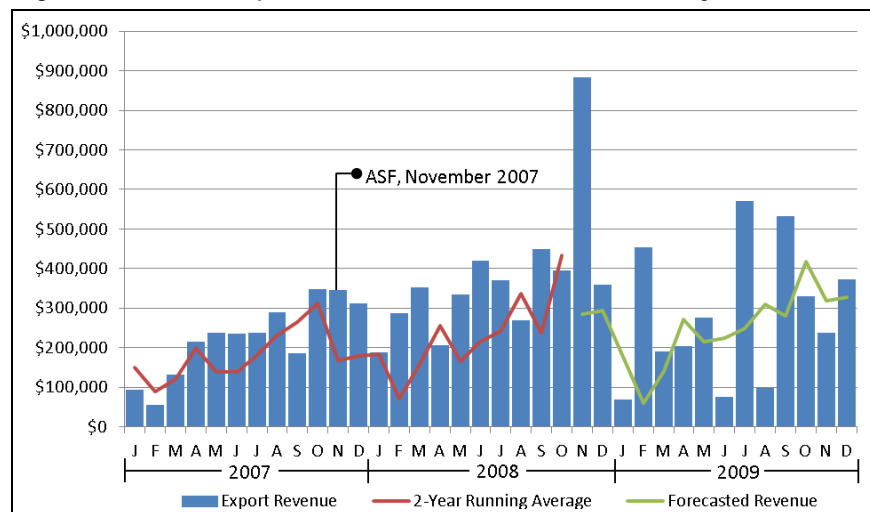
Figure 5. United Kingdom Revenue and Export Market Recovery after CSF



Russia

African swine fever (ASF) was introduced into Georgia in 2007 and spread across Georgia, Armenia, Azerbaijan, Abkhazia and Nagorno- Karabakh. In November 2007, ASF was first reported in southern Russia, and Russia continues to have cases of ASF. There was no accompanying decline in export revenues, and one reason for this could be that Russia's main trading partners are former Soviet republics (Figure 6). Also, in November 2008 Russia's export revenues doubled due to Italy's imports of additional leather. However, it is important to note that in comparison to other exporting countries, Russia's export revenues are very small for live swine and pork products.

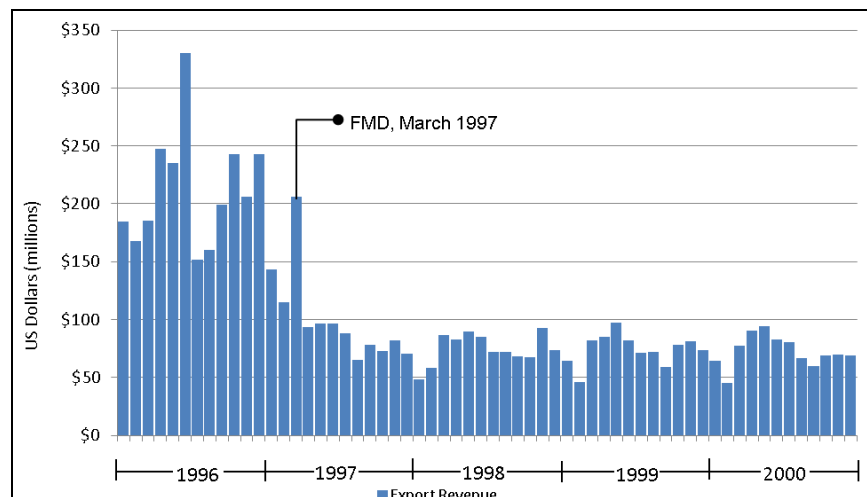
Figure 6. Russia Export Revenue and Market Recovery after ASF



Taiwan

Taiwan had been a major exporter of pork during 1996. In response to the 1997 FMD outbreak, Taiwan slaughtered nearly 4 million pigs, which represented almost 40 percent of their hog inventory.^{vi,vii} 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. The country never built their domestic herd to pre-outbreak levels, and Figure 7 illustrates how Taiwan never regained its export revenues.

Figure 7. Taiwan 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. Some export markets did not decrease after disease outbreaks, while others took years to recover. This illustrates that the perceived level of disease risk is different for different countries. 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 15.2.4 accessed at http://www.oie.int/eng/normes/Mcode/en_chapitre_1.15.2.htm#rubrique_pestes_porcines_classiques_controlées and Article 15.1.3 accessed at http://www.oie.int/eng/normes/Mcode/en_chapitre_1.15.1.htm#rubrique_pestes_porcines_africaines on September 13, 2010.

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

^{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 USDA ERS. "After Strong Exports for Most of 2008, a Weaker 4th Quarter Is Expected," *Livestock, Dairy, and Poultry Outlook*, December 18, 2008.

^{vi} Livestock and Poultry World Markets and Trade, October 1997. Accessed at <http://www.fas.usda.gov/dlp2/circular/1997/97-10LP/taiwanfmd.htm> on May 5, 2011.

^{vii} Accessed at <https://www.fas.usda.gov/dlp2/circular/1997/97-03/pork.htm> on May 5, 2011.

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