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In The Cattle Markets

Elliott Dennis, Assistant Professor & Livestock Extension Economist
Department of Agricultural Economics, University of Nebraska – Lincoln

Potential Impacts of Brazilian BSE on the U.S. Meat Complex

Last week the Brazilian government announced the discovery of several atypical cases of bovine spongiform encephalopathy (BSE), commonly referred to as "mad-cow" disease. The potential trade impacts due to this announcement remains to be seen. The US and Canada have experienced the impact that such an announcement can have on beef exports. Pre-BSE, the U.S. exported 0.9 million tons to 112 countries. Post-BSE beef exports were 0.3 million tons. It was not until the mid-2010's that beef export volume equaled pre-BSE levels.

Atypical vs. Classical

Brazil is not the first country to identify an atypical case of BSE. As of 2017, the U.S. had detected six BSE cases – one classical case from a cow imported from Canada in 2003 and five other "atypical" cases. So, defining the case as "atypical BSE" has important market distinctions relative to a "classical BSE" case. BSE is classified as either classical or atypical. Atypical BSE is thought to arise spontaneously in all cattle populations, particularly cattle greater than six years old. Most importantly, there are no known human health diseases associated with "atypical BSE". Classical BSE is primarily the result of contaminated feed, such as meat-and-bone meal containing protein derived from rendered infected cattle and is linked to the variant Creutzfeldt-Jakob disease (vCJD) in people. As such, human health precautions prescribe the limiting of exported/imported until classical BSE cases can be identified and resolved.

Brazilian Traceability Program

If the Brazilian beef export market does shutdown, their animal ID and traceability program could impact the length of the shutdown (Murphy et al. 2008). Systems that can accurately identify and isolate problematic cases and verify that cases have not spread throughout the system can reducing the long run impacts and restore confidence in the export system. Brazil has an animal traceability system, first introduced in 2002, that it mandatory for all export animals and provides national individual animal ID, is able to trace animals back to their origin, tracks animal movements, verifies age and diet, and tracks animal health records (Schroder and Tonsor 2012). While the system was originally designed as a better way to monitor and control food-and-month disease, a major issue in some parts of Brazil, cases such as these and overall better food safety are also benefits.

The location of the "Atypical BSE" case matters

Where the "atypical BSE" case occurred is also of importance because it could directly explain why China chose to temporarily stop imports from Brazil. Figure 1 shows origin of live cattle, source of processing, and the Brazilian state beef was exported from. Most of the

beef imports into China from Brazil come from the Sao Paulo and Minas Gerais area and nearly all of it leaves through the port of Santos, SP (Erasmus 2020). The "atypical BSE" cases were found in Minas Gerais and Mato Grosso. Given that the beef exports to Mainland China are much more consolidated in these areas relative to beef exports to Hong Kong, there is some explanation on why China temporarily discontinued beef exports from Brazil.

Resulting Impacts on U.S. Beef Complex

As noted in the OIE guidelines for determining disease free status, an "atypical BSE" case does not impact its official BSE risk status since recognition as this form of the disease is believed to occur spontaneously in all cattle populations at a very low rate. Thus, while there are current trade stops between the Brazil and China, it is unlikely to become a major trade issue in the coming weeks. As such, additional pounds of beef would not leave the U.S., thus not significantly benefiting the U.S. beef complex in either the short- or long-run.

Chinese Beef Imports vs. Brazilian Beef Exports

This situation has elevated the discussion on how sensitive China beef imports are to trade distributions. The Herfindahl-Hirschman Index (HHI) is one way we can measure market concentration or how much another country relies on another. The lower the value, the less concentrated an industry segment is whereas higher values indicate more concentration. A value of 1 reflects that a country solely relies upon another country. While a heavy reliance on another country is in some cases acceptable, it does expose the relying country to increased risks due to market shocks.

In the case of beef exports between China and Brazil, it is important to appreciate how Brazil and China have grown to rely upon each over time – China through beef imports from Brazil and Brazil through exports to China. The HHI for Brazilian beef exports is derived here by squaring the market share of each country importing Brazilian fresh, chilled, or frozen beef and summing the squares. The HHI for Chinese beef imports is derived here by squaring the market share of each country exporting fresh, chilled, or frozen beef to China and summing the squares. Figure 2 illustrates the HHI for both Brazilian beef exports and Chinese (Mainland China excluding Hong Kong) beef imports since 1990. It indicates that Brazil has been increasing its reliance on China. However, China has been steadily increasing its diversity of countries it trades with while exponentially increasing the amount of fresh, chilled, or frozen beef it imports. For example, in 2005 China had an HHI of 0.95 to import 1,142,916 kg. of beef whereas in 2020 they had an HHI of 0.25 to import 2,118,293,343 kg. of beef.

Since 2014, China has exponentially increased the amount of beef it imports and at the same time Brazil has increased the beef it exports. Figure 3 shows Brazil share of China imports HHI and China's share of Brazil's export HHI. This shows that Brazil relies more on exporting its beef to China then China relies on importing beef from Brazil suggesting that Brazil has a greater incentive to keep the export relationship going after a "atypical BSE" announcement.

The Markets

A packing plant fire occurred at the JBS meat processing plant in Grand Island, Nebraska on Sunday, September 13, 2021, having an eerie similarity to the Tyson meat processing plant fire in Holcomb, Kansas (Nepveux 2019). Both plants processed about 6,000 head per day or approximately 6 percent of total daily beef slaughter. We learned several lessons from the Holcomb, KS fire that could apply to the Grand Island, NE fire. First, live cattle prices are likely to fall given the now over supply of harvest ready cattle relative to processing capacity.

Second, wholesale cutouts are likely to increase as retailers seek to make advance purchases on beef. Combined, these will likely widen beef processing margins – something that has been curiously and intensely watched since 2019. The market will look for two signals to regulate this margin – 1) will the damaged plant be rebuilt, and 2) how long will the plant be shut down before it will be fully operational. In the case of the Holcomb Fire, it was about 1 month before plant damage was fully assessed and announced to be rebuilt and four months (Dec 2019) before it became fully operational. Examining the fed cattle price differentials between the major cattle feeding areas, showed that all areas experienced decreased prices within the first month, about a 10% decline in price relative to prices the Friday before the fire, and were at prices equal to prices the Friday before the fire two months after the fire (see Table 1; Dennis 2020). A similar situation across the different cattle feeding regions could play out for the Grand Island, NE plant fire as well.

The point of differentiation between the two fires likely lies in available processing capacity pre-fire and the day in which the fire occurred. After the Holcomb Fire, Tyson diverted committed cattle (< 14 days) to other plants that had excess capacity. This showed up in increased Saturday harvest levels as plants ran additional shifts. This was in a pre-COVID era where absenteeism was lower, labor relations were better, and there were not increased OSHA protocols in plants due to COVID and its derivatives. JBS will most likely try to do the same in the short run. However, given that the processing industry was already running at strained levels of labor levels, how much they will be able to increase Saturday and Sunday kills without losing more labor is left to be seen. One positive is that JBS recently reached a new labor contract at their Greeley, CO plant which could help lessen concerns about potential labor shortages. Second, the fire also occurred AFTER Labor Day where retailers had already started to back off beef purchases. This should work to lessen the severity of any price jump in the wholesale cutout value as there are fewer concerns about wanting to capture consumers grilling preferences.

The biggest loser in the fire could be feeder cattle producers. The fire occurring after Labor Day should lessen the upward price movement in the cutout, but it puts greater pressure on market ready cattle to be moved out of pens to provide space for weaned feeder cattle to enter pens. Figure 4 shows the combined price movements from the Holcomb Fire. Although the plant fire primarily affected fed cattle, it did influence feeder cattle prices. Feeder cattle have already started to enter feedlots earlier than in previous years as drought and reduced forage production has forced some feeder cattle producers to market feeder cattle earlier. If pens continue to stay full, this could reduce the price feedlots would be willing to pay for feeder cattle. This combined with potentially higher feed grain prices both have the potential for increased downside price movements.

Data Source: USDA-AMS Market News		**Week of 9/10/21**	**Week of 9/3/21**	**Week of 9/11/20**
5-Area Fed Steer	all grades, live weight, $/cwt	$124.79	$125.61	$101.21
	all grades, dressed weight, $/cwt	$200.82	$201.79	$160.66
Boxed Beef	Choice Price, 600-900 lb., $/cwt	$332.46	$339.54	$222.12
	Choice-Select Spread, $/cwt	$34.99	$31.29	$14.53
700-800 lb. Feeder Steer	Montana 3-market, $/cwt	$169.73	$167.51	$140.85
	Nebraska 7-market, $/cwt	$163.96	$167.75	$151.84
	Oklahoma 8-market, $/cwt	$151.63	$157.49	$137.17
500-600 lb. Feeder Steer	Montana 3-market, $/cwt	--	--	--
	Nebraska 7-market, $/cwt	$175.63	$186.60	$164.47
	Oklahoma 8-market, $/cwt	$162.36	$170.63	$148.42
Feed Grains	Corn, Omaha, NE, $/bu (Thursday)	$5.65	$5.86	$3.54
	DDGS, Nebraska, $/ton	$207.50	$212.50	$154.50

Supporting Tables

Table 1. Percent Change in Fat Cattle Prices Pre and Post Holcomb Fire by Area Relative to Prices the Week of the Fire (USDA-AMS 2020)

Date	Kansas	Nebraska	IA/Minn.	5-Area
Jul 7, '19	-0.50	0.27	-0.92	-0.36
Jul 14, '19	2.24	1.26	0.52	1.13
Jul 21, '19	1.36	0.55	0.78	0.81
Jul 28, '19	2.27	1.73	1.47	1.47
Aug 4, '19	1.34	0.95	1.20	1.40
Aug 11, '19	**0.00**	**0.00**	**0.00**	**0.00**
Aug 18, '19	-4.12	-5.59	-4.87	-4.96
Aug 25, '19	-3.32	-4.32	-3.66	-4.54
Sep 1, '19	-6.04	-6.56	-5.19	-5.98
Sep 8, '19	-8.82	-11.17	-8.85	-9.62
Sep 15, '19	-9.13	-11.40	-11.24	-10.90
Sep 22, '19	-7.51	-9.36	-10.06	-9.38
Sep 29, '19	-4.38	-6.15	-8.07	-6.56
Oct 6, '19	-2.27	-3.90	-5.77	-4.33
Oct 13, '19	-0.12	-2.65	-4.38	-2.99
Oct 20, '19	-1.38	-2.68	-3.18	-2.36
Oct 27, '19	0.42	-2.06	-3.24	-2.16
Nov 3, '19	2.38	1.28	-0.83	0.66
Nov 10, '19	4.20	1.59	0.80	1.67
Nov 17, '19	5.01	2.21	1.11	2.21
Nov 24, '19	5.88	2.99	1.62	2.86
Dec 1, '19	8.10	5.42	3.02	4.85
Dec 8, '19	8.69	5.11	4.14	5.31
Dec 15, '19	8.65	5.84	4.64	5.79
Dec 22, '19	9.57	6.95	5.58	6.73
Dec 29, '19	11.40	8.15	7.54	8.47

Source: Dennis (2020)

Notes: Red numbers indicate that the price declined from the previous weeks price and green numbers indicate that the price increased from the previous week's price.

Supporting Figures

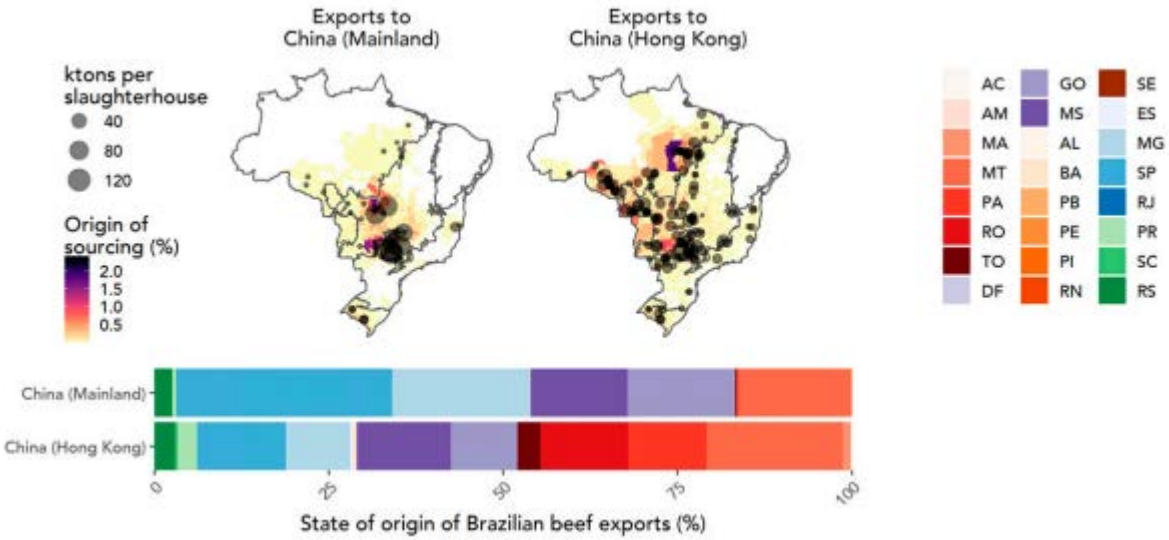

Figure 1. The origin of Brazilian beef exports to Mainland China and Hong Kong.
Notes: Slaughterhouses are shown as points scaled by the volumes exported, with the percentage of exports originating per municipality in the background. (B) The state of origin of cattle supplying each market
Source: Erasmus et al. (2020)

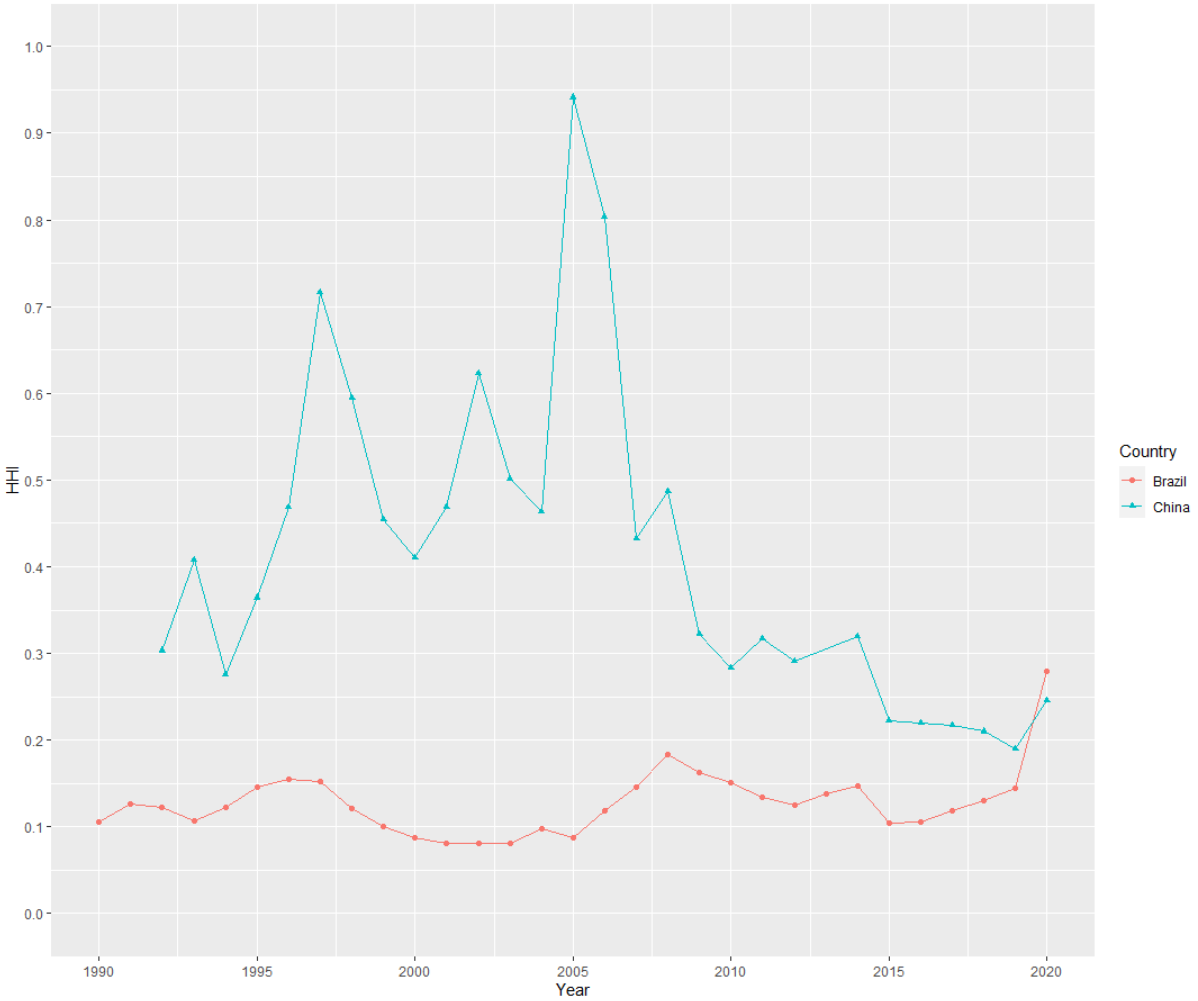

Figure 2. HHI of Brazilian fresh, chilled, or frozen beef exports and Chinese fresh, chilled, or frozen beef imports, 1990-2020
Source: UN Comtrade (2021), authors calculations

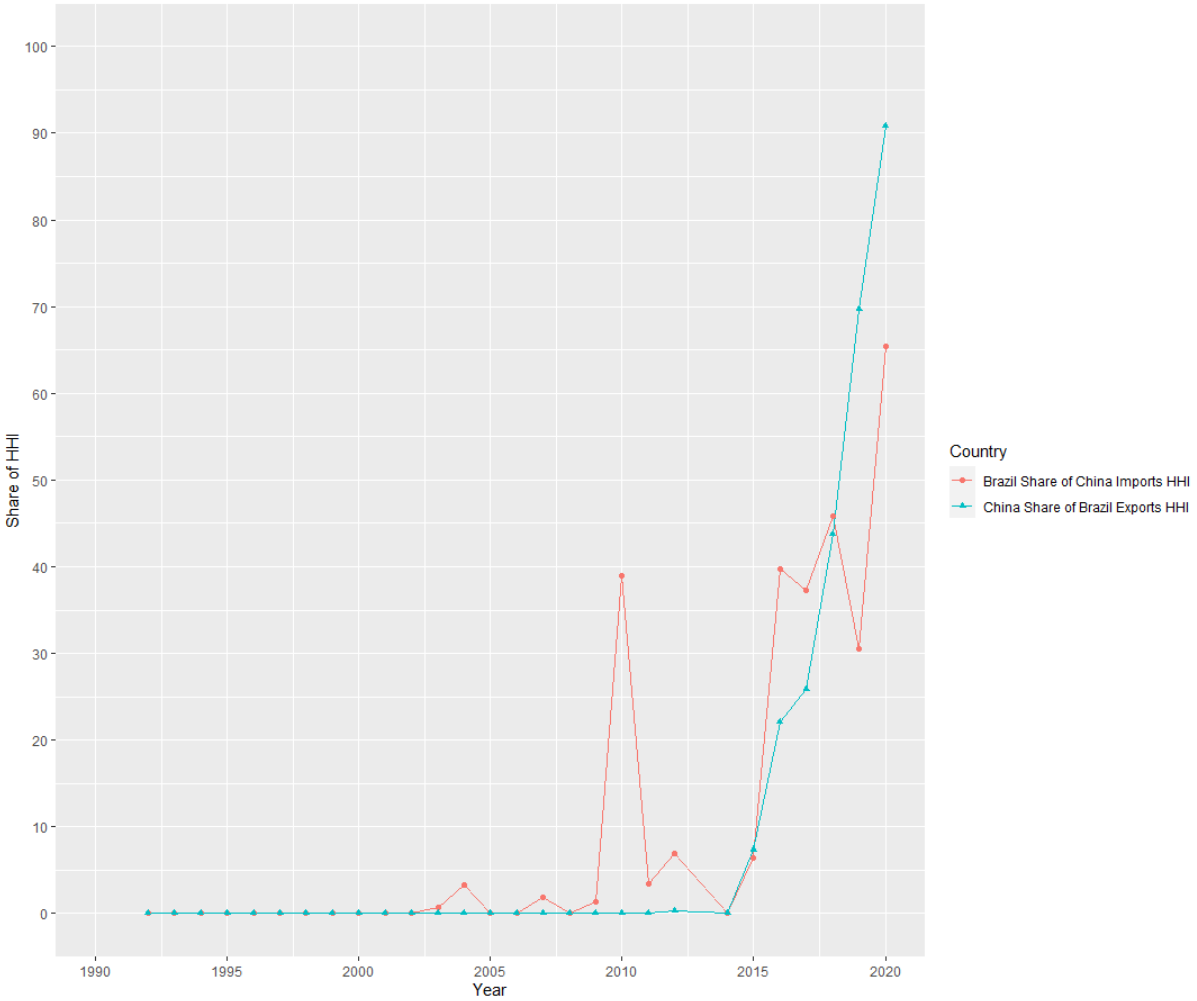

Figure 3. Brazilian share of China fresh, chilled, or frozen beef imports HHI and Chinese share of fresh, chilled, or frozen beef Brazilian exports, 1990-2020
Source: UN Comtrade (2021), authors calculations

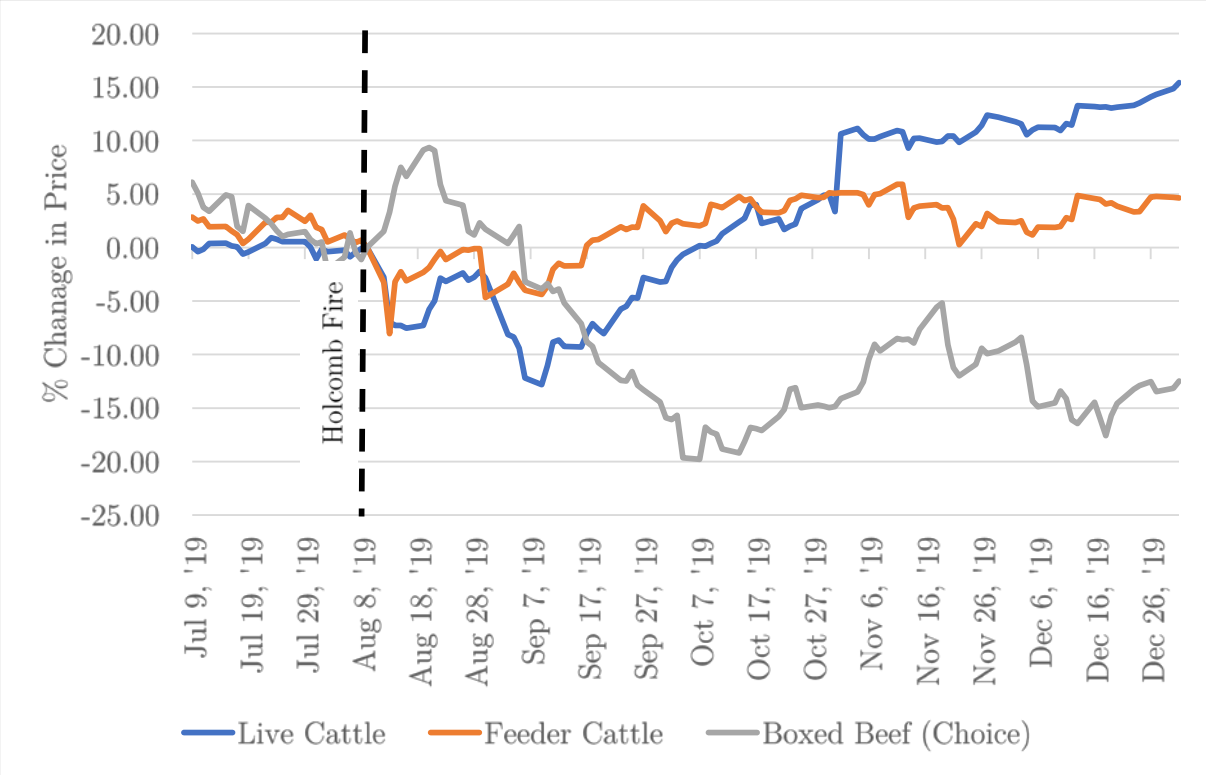

Figure 4. Percent Change in Live Cattle Futures, Feeder Cattle Futures, and Choice 600-900 lb. Boxed beef Prices Relative to Prices the Day of the Fire on August 9, 2019.
Source: Dennis (2020)

Sources

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