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Impacts from Opening and Closing Meatpacking Plants

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Economic theory suggests adding a buyer to a market consisting of few buyers should increase competition and prices, while losing a competitive buyer should decrease competition and prices. This Extension fact sheet reports research findings from a study examining perceptions and estimated impacts from opening a porkpacking plant and closing a beefpacking plant. The research objective was to better understand how livestock markets react to structural change events. In doing that, it was important to understand the perceptions of affected producers as well as to estimate the impacts on market prices.

Plant Events

The first meatpacking plant event examined was the opening of a hog slaughtering and processing plant in Brandon, Manitoba, Canada, by Maple Leaf Foods in August 1999. The plant opened during a time of expansion in the Canadian hog industry, in an area of relatively high concentration in porkpacking, and at a time of little excess capacity in the U.S. hog slaughter industry. The second event was the closing of a fed cattle slaughtering and fabricating plant in Garden City, Kansas by ConAgra, after it sustained extensive fire damage in December 2000. This plant was located in the geographic heart of cattle feeding, an area of concentrated beef production and beefpacking, and where slaughter capacity was not an issue.

The first event was anticipated several months before the plant opened, while in the second case, the fire was an unexpected event. This makes for an important contrast from a market perspective. The market for slaughter hogs may have had time to adjust to the anticipated plant opening. However, the market for fed cattle had to adjust immediately to the unexpected plant closing.

Producer and Feeder Perceptions

The perceptions of hog producers and cattle feedlot managers were sought in a survey of each group to determine the underlying competition and buyer behavior impacts associated with each of the two plant events. Producers and feedlots surveyed were identified with assistance of producer and feedlot organizations (Hornung).

Producers of market hogs in western Manitoba (within 400 km of Brandon, Manitoba) were asked a few basic questions about their hog finishing business and the competitive environment. These included size of operation, distance and direction from Brandon, extent of marketings to various packers, and extent of cash-market use in 1999-2000. In addition, they were asked to rate their extent of agreement or disagreement with several statements about market impacts from the plant opening. Cattle feedlot managers within 200 miles of Garden City, Kansas, were asked comparable questions about their cattle feedlots and competitive conditions in the southwest Kansas area.

Findings are for the 80 useable surveys returned regarding the Manitoba plant opening, a response rate of 29.3%; and for the 100 useable surveys returned regarding the Kansas plant closing, a response rate of 53.8%.

Pork producers and cattle feedlot managers agreed in some cases on the market and competition effects resulting from the two events, but disagreed in others. Figures 1-5 show the percentage response to agreement or disagreement with five statements given to those surveyed. Each of the five statements is discussed here.

The addition (loss) of the Maple Leaf Foods (ConAgra) plant caused higher hog (lower fed cattle) prices in the region. – Respondents differed regarding the impacts on regional livestock prices. Recall that a plant opening is expected to increase prices and the loss of a plant is expected to decrease prices. Nearly three-fourths (74%) of pork producers did not perceive the added plant increased hog prices in the region (Figure 1). In contrast, 60% of feedlot managers thought the loss of the beefpacking plant reduced fed cattle prices in the region.

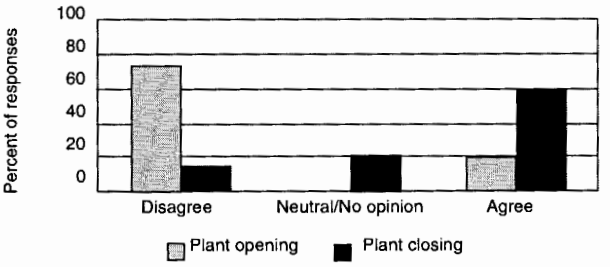

Figure 1. Degree of agreement that regional prices increased (decreased) with the meatpacking plant opening (closing).

The plant opening (closing) had no noticeable effect on marketing or pricing hogs (fed cattle) from my finishing unit (feedlot). – This statement addressed the potential impact of the plant event where the respondent was located. Here, there was a bit more agreement. Sixty percent of feedlot managers and 44% of pork producers disagreed with the statement that there were no market effects where they were located (Figure 2). Pork producers were less sure about the impacts than were feedlot managers. While the two groups disagreed over the regional price impacts, they agreed more closely that the plant opening (closing) affected them in some manner. In fact, the farther the pork producer or feedlot manager was located from the plant, the more likely the respondent was to believe there was a noticeable market effect. This effect could be related to buyer competition, market access, or some other related effect. Pork producers located farther from the plant opening also were more likely to believe there was a positive impact on regional slaughter hog prices after the plant opened.

Fed cattle slaughter capacity in western Manitoba (Kansas) became less (more) of a problem when the plant opened (closed). – The addition of a slaughter plant is expected to reduce capacity problems and the loss of a plant is expected to tighten slaughter capacity. Pork producers and feedlot managers perceived the changes in capacity in accordance with expectations (Figure 3). For pork producers, 45%, and for feedlot managers, 70%, agreed that slaughter capacity problems were reduced with the plant opening or increased with the plant closing.

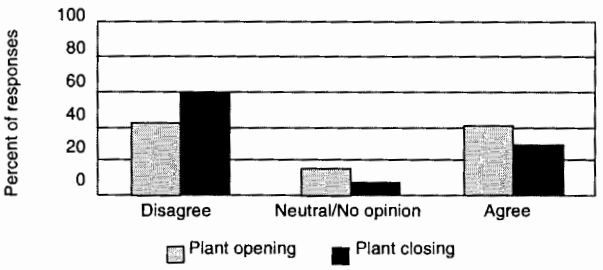

Figure 2. Degree of agreement that the meatpacking plant opening (closing) had no noticeable effect for my operation.

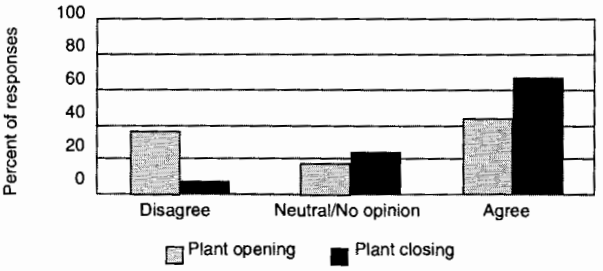

Figure 3. Degree of agreement that the meatpacking plant opening (closing) decreased (increased) capacity problems in the region.

The number of buyers regularly bidding for cash market hogs (cattle) from my finishing unit (feedlot) increased (decreased) when the plant opened (closed). – Respondents were split on their perception of bidding activity after the plant event. In theory, the plant opening should have meant one additional buyer, and the plant closing, one fewer buyer. However, producer and feeder perceptions did not match what may seem obvious. Three-fourths of pork producer respondents (75%) disagreed that the plant opening increased the number of buyers for their hogs (Figure 4). Feedlot managers were evenly divided; 40% perceived a reduction in buyers and 40% did not perceive a reduction in buyer numbers.

Other packers lost (gained) a psychological advantage from having one more (fewer) plant in the region when the plant opened (closed). – Respondents were more in agreement on this statement than most others. One-half of the pork producers (50%) who responded agreed that the plant opening reduced the competitive advantage of rival packers (Figure 5). For cattle feedlots, 82% thought the loss of a plant increased the competitive advantage for rival packers

Overall, respondent perceptions differed more than expected. One reason might be that pork producers who responded to the survey may not have limited their perceived impacts to the months immediately after the plant opening. For example, since the Brandon plant opened, Maple Leaf Foods acquired rival packers in Manitoba, and in the time since the plant opened, the percentage of hogs owned by or contracted by Maple Leaf Foods increased. These two factors may explain why some pork producers did not perceive plant opening effects to be as much like what is typically expected and more nearly like what cattle feeders perceived.

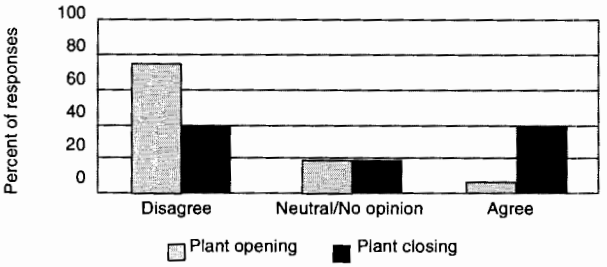

Figure 4. Degree of agreement that the meatpacking plant opening (closing) increased (decreased) the number of buyers for slaughter livestock in the cash market.

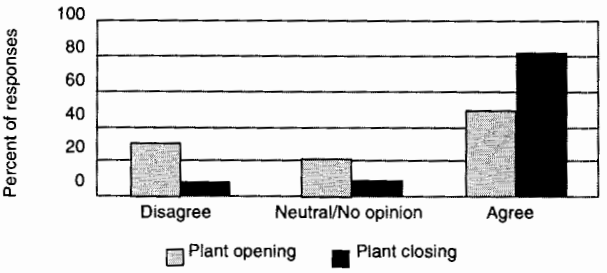

Figure 5. Degree of agreement that the meatpacking plant opening (closing) decreased (increased) the psychological or competitive advantage for rival buyers.

Estimated Price Impacts

Approaches and Data

Two approaches were taken to estimate the price impacts from the two plant events, both following previous research. For both plant cases, estimating price impacts used weekly observations for a little more than one year before (55 weeks) and one year after (55 weeks) the plant opening or closing. Data used were available from U.S. and Canadian governmental agencies and industry organizations.

One approach examined price differences between the market where the plant event occurred and three comparison markets. Thus, for the plant opening, comparisons were made between Manitoba and Saskatchewan, Ontario, and Iowa/S. Minnesota. For the plant closing, comparisons were between Kansas and Nebraska, Colorado, and Texas.

The second approach accomplished two objectives. Besides measuring whether or not there was a price change in a particular market associated with the timing of the plant event, it enabled calculating how long the price adjustment lasted. Again, for the plant opening case, markets considered were Manitoba, Saskatchewan, Ontario, and Iowa/S. Minnesota. For the plant closing, markets were Kansas, Nebraska, Colorado, and Texas.

Table 1 shows the price differences, slaughter volume differences, prices, and slaughter volume for the time before the Manitoba plant opening occurred, afterwards, and for the entire period. Average prices and slaughter numbers differed sharply in some cases during the 110-week period. Average slaughter hog price differences increased from the 55 weeks prior to the plant opening to the 55 weeks after the opening in all three cases. This was consistent with expectations. Manitoba slaughter volume increased relative to all other market areas after the Brandon plant opened. This, too, was consistent with expectations. Hog prices increased in all markets in the 55 weeks following the plant opening. Hog slaughter in Manitoba and Ontario increased, while Saskatchewan and Iowa/Minnesota experienced a decrease in slaughter.

Table 1. Averages for the plant opeining — before, after, and the entire period.

Variable	Mean before opening	Mean after opening	Mean 110 wks
MB-SK price[1]	7.71	10.89	9.30
MB-ON price	-1.50	4.88	1.69
MB-IA/MN price	19.08	29.24	24.11
MB-SK slaughter[2]	36.9	52.2	44.6
MB-ON slaughter	-19.3	-9.0	-14.1
MB-IA/MN slaughter	-502.2	-461.9	-481.9
MB price	111.04	160.26	135.65
SK price	103.34	149.37	126.35
ON Price	112.54	155.38	133.96
IA/MN price	92.08	131.95	111.83
MB slaughter	55.8	69.7	62.8
SK slaughter	18.9	17.4	18.2
ON slaughter	75.1	78.7	76.9
IA/MN slaughter	556.6	531.6	544.1

[1] Prices are $CAN/100kg
[2] Slaughter is 1,000 head

Table 2. Averages for the plant closing — before, after, and the entire period.

Variable	Mean before closing	Mean after closing	Mean 110 wks
KS-CO price[1]	0.10	0.01	0.06
KS-NE price	0.16	-0.23	-0.03
KS-TX price	-0.08	0.14	0.03
KS-CO slaughter[2]	105.7	88.7	97.2
KS-NE slaughter	24.9	7.7	16.3
KS-TX slaughter	46.6	31.9	39.2
KS price	69.47	72.13	70.77
CO price	69.36	73.47	71.09
NE Price	69.31	72.22	70.75
TX price	69.66	71.83	70.74
KS slaughter	155.8	138.1	146.9
CO slaughter	50.0	49.4	49.7
NE slaughter	130.9	130.4	130.7
TX slaughter	109.2	106.3	107.7

[1] Prices are $/cwt
[2] Slaughter is 1,000 head

Table 2 shows similar data prior to, after, and for the entire period surrounding the Kansas plant closing. Average prices and slaughter differed less over the 110-week period in this case than for the slaughter hog plant opening. Average fed cattle price differences increased from the 55 weeks prior to the plant closing to the 55 weeks after the closing in one case and decreased in the other two. The increase was not expected. Kansas slaughter volume decreased relative to all other market areas after the Garden City plant closed. This was expected. Fed cattle prices increased in all markets in the 55 weeks following the plant closing. Fed cattle slaughter decreased in all markets after the plant closing.

Price Effects

Estimating effects of the plant opening with a price difference model indicated a significant price difference increase of $6.80 to $10.18 per $CAN/100 kg in two of the three market comparisons (Manitoba-Ontario and Manitoba-Iowa/southern Minnesota). The Manitoba-Saskatchewan price difference increase was not statistically significant. No consistent pattern was found in the three months immediately following the plant opening. However, in the Manitoba-Ontario and Manitoba-Iowa/southern Minnesota models, price differences decreased during the two weeks after the plant opening.

For the plant closing, the price difference results were less clear. The price difference model indicated an unexpected price difference increase of $0.30 per cwt for one market comparison (Kansas-Texas), a significant decrease as hypothesized of $0.37 per cwt for another (Kansas-Nebraska), and no significant difference for the third (Kansas-Colorado). Here, too, no consistent pattern of changes was observed for the three months following the plant closing.

With the second approach, prices increased in three markets from $6.58 to $11.26 per $CAN/100 kg after the plant opening (Manitoba, Saskatchewan, and Iowa/southern Minnesota). The price increase in Ontario was not statistically significant. Ninety-five percent of the price increase effects in the three markets lasted from 3 to 11 weeks.

Fed cattle prices in just one market (Texas) were significantly lower, $0.92 per cwt after the plant closing. Lower prices in this market were not expected but the lower prices were estimated to last only 5 weeks. No significant differences were found for Kansas, (where lower prices were expected) Nebraska, or Colorado.

In summary, models estimated with available public data showed a reasonably consistent price increase with the anticipated opening of the hog slaughter plant in Manitoba. Conversely, however, similar models showed little market price impacts with the unexpected fed cattle slaughter plant in Kansas. These results suggest capacity and other market structure characteristics may influence the market dynamics following significant plant events. In Manitoba, slaughter capacity was tight and producers had relatively few, nearby alternatives to market to large, efficient plants. The plant opening had a positive market effect. In Kansas, there was no capacity problem and more alternative packers, including ConAgra's plants in Texas, Colorado, and Nebraska. There, the plant closing had a lesser price effect.

Summary and Conclusions

Survey data were used to determine pork producer and cattle feeder perceptions of market effects after a meatpacking plant opening and closing. Public data were used to estimate the price effects from the two events.

Pork producers and cattle feeders agreed on some market effects but not on others. Differences were explained in part by their location relative to the plant event. This fact alone may help explain why different producers in a market can experience the same market event and have different perceptions of the potential impacts. Those perceptions sometimes are borne out with formal models intended to measure the price impacts, and sometimes they are not, as was the case with the two meatpacking plant events studied here. In general, the opening of a new porkpacking plant had a positive price effect in the market where the plant was located. Conversely, the unexpected closing of a beefpacking plant had a less measurable effect.

References

Hornung, J. "Market Effect from Opening and Closing Meat Processing Facilities." Unpublished M.S. thesis, Oklahoma State University, May 2004.

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