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# **Economic Impact of Reducing Bovine Respiratory Disease in United States Beef Cattle Feedlots**

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## INTRODUCTION and OBJECTIVE

- Bovine Respiratory Disease (BRD) is the most common cause of mortality and morbidity in U.S. cattle feedlots (NAHMS, 2011).
- The National Animal Health Monitoring System (NAHMS) conducted the Feedlot 2011 study, and found an estimated 21.2 percent of beef cattle placed in feedlots are affected with respiratory disease.
- The objective is to estimate the economic impacts of a reduction in BRD in U.S. beef cattle feedlots.

## DATA and METHODS

- This research utilized data collected by USDA-NASS and USDA-APHIS-VS as part of the NAHMS Feedlot 2011 study related to BRD (Figure 1). Pen level data, coupled with previous literature, were used to determine the production impact of BRD on affected cattle in U.S. feedlots.
- Exogenous shocks were developed and introduced into the partial equilibrium economic model developed by Paarlberg et al. (2008) for quarter 1 of 2015 through quarter 4 of 2018.

## SCENARIO

The scenario presented here includes:

- A linear reduction in the prevalence of BRD by 50%, achieved in 12 quarters (3 years).
- A positive production shock for cattle that previously would have died from BRD, but are now unaffected and enter the food chain.
- A positive production shock for cattle that previously were ill from BRD, but are now unaffected and either go to market at a heavier weight or go to market earlier. Cattle previously considered chronic with BRD but are now unaffected were assumed to go to market 400 lbs heavier.
- A positive shock for feedstuffs as the net change is an increase in demand for feed grains, wheat, soybean meal, and forage. The changes in feed consumption vary by each category of affected cattle (Table 1).

Figure 1: U.S. feedlot cattle affected by BRD (%)

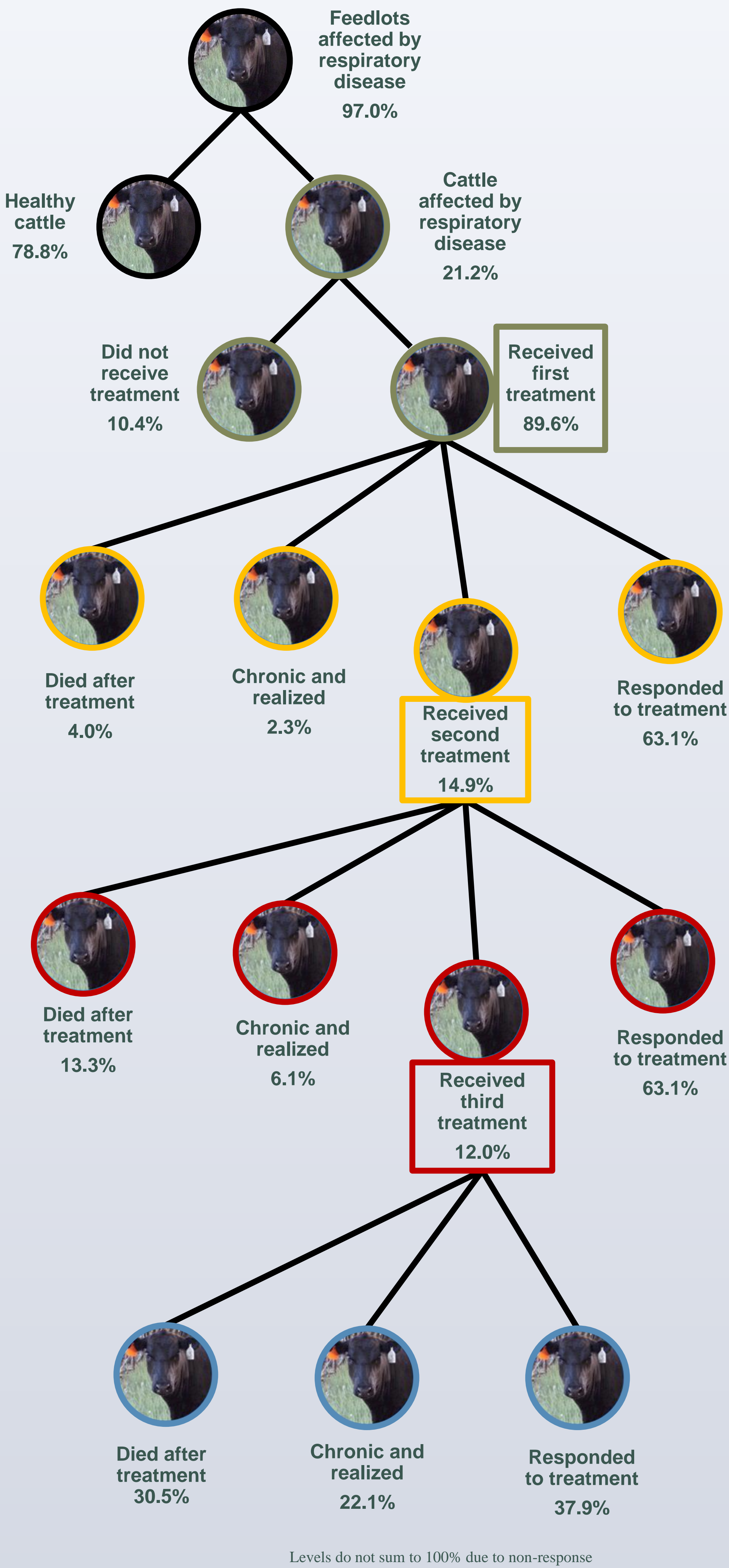


Table 1: Changes in feed consumption

Affected cattle categories	Change in feed consumed (lbs)
Treated once and recovered	-234
Treated twice and recovered	-362
Treated 3 times and recovered	-489
Chronic	2,448

## RESULTS

- Beef cattle producers lose \$1.67 billion over 16 quarters due to lower beef cattle prices (Figure 2) and higher feedstuffs costs.
- Meat processing and grain and forage producers benefit by \$1.98 billion and \$0.46 billion over 16 quarters due to lower beef cattle prices and increased demand for feedstuffs, respectively.
- Net impact to all producers over 16 quarters is \$871 million.

Figure 2: Change in live steer price

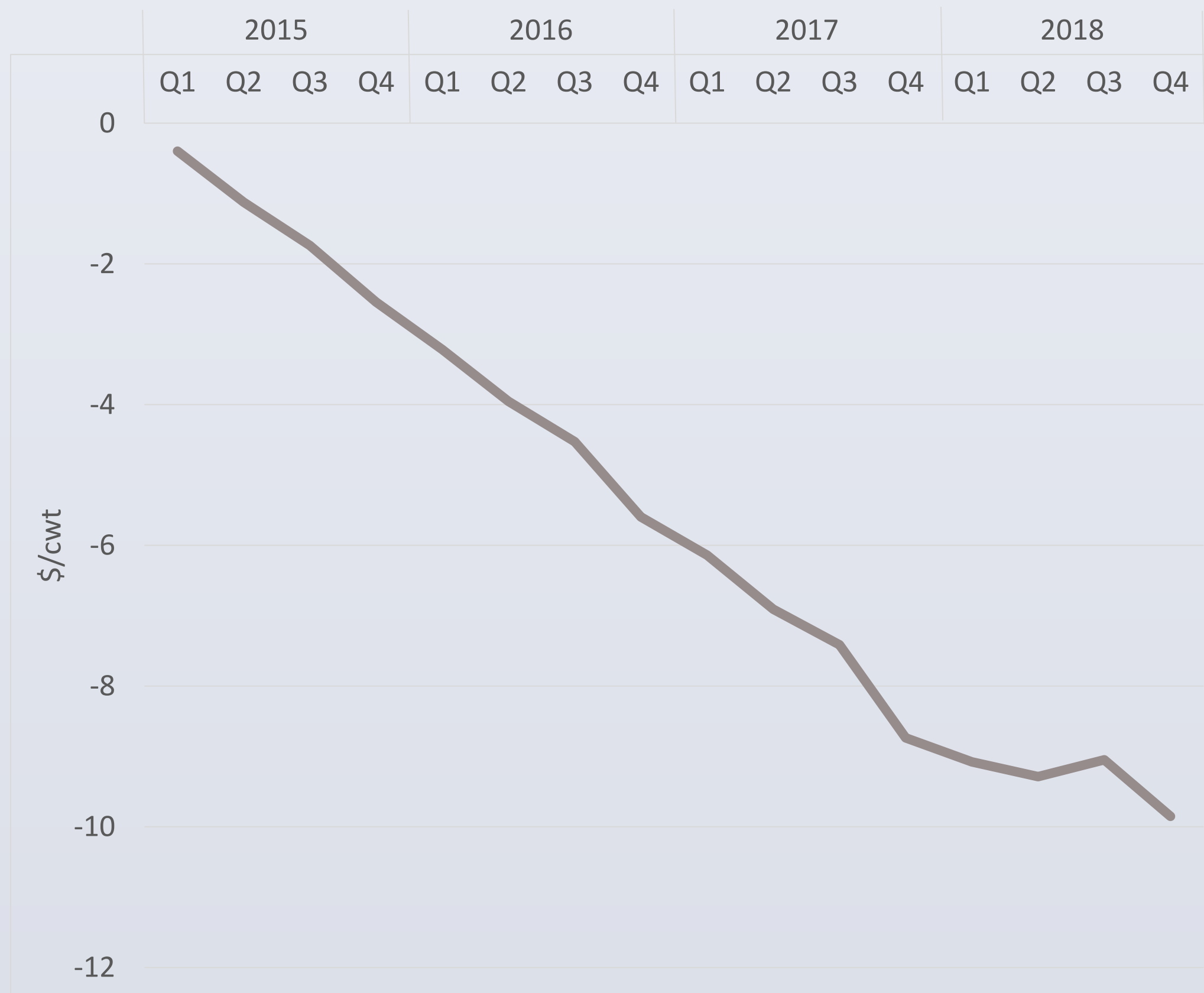
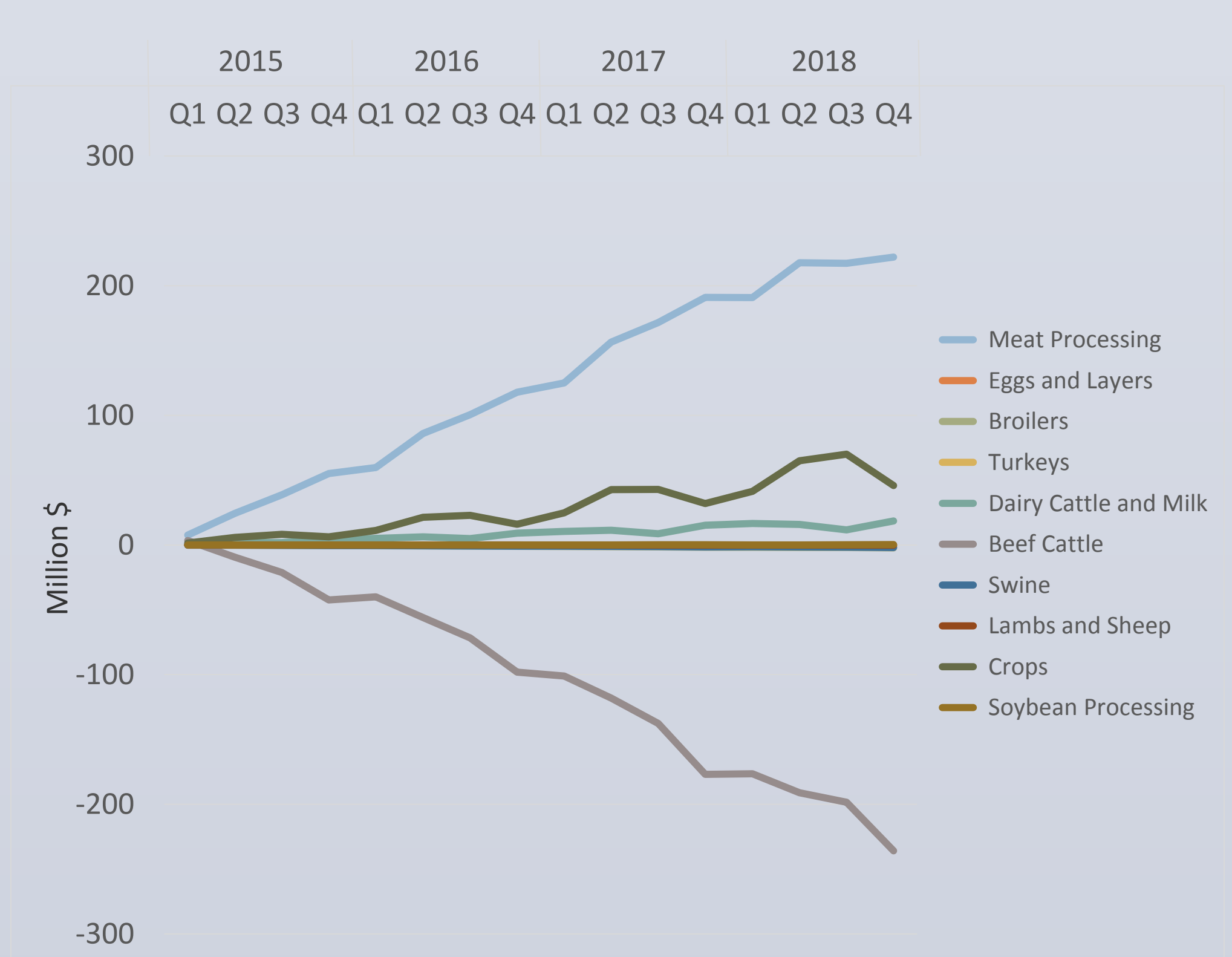


Figure 3: Change in producer returns to capital and management across quarters



## CONCLUSIONS

- BRD is the one of the most common and costly diseases in commercial North American feedlots (Griffin, 1997). With technological advances (e.g., vaccines, genomics) and better management strategies, reducing the prevalence of endemic diseases in cattle would not only impacts the cattle industry, but other related industries.
- The introduction of these beef cattle production and feed use consumption shocks is a unique application of the partial equilibrium model. This is an extension of previous work and serves as an example for other livestock disease reduction efforts that are being explored.
- Future research will:
  - Examine different BRD prevalence reduction strategies based on possible mitigations such as new vaccines, the use of a model that predicts a calf's probability of being affected by BRD, and genomics.
  - Compare results against the cost savings of not treating sick cattle.

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