

Economic Implications of a Foot and Mouth Disease Free Latin American Beef Sector

Foot and mouth disease (FMD) has caused significant damage to Latin America's beef sector through both production losses and limits to international market access. Using a base year of 2001, we utilize historical outbreak data and estimated production losses in select Latin American countries in tandem with a global economic modeling framework to understand what the domestic and international price effects as well as trade effects could have been, had FMD outbreaks in 2001 been prevented. Relatively little research exists to fully examine the economic effects of FMD on the beef sector in a general equilibrium framework and this work aims to fill this gap.

Foot-and-mouth disease (FMD) is considered one the most dangerous livestock diseases in the world based on its highly infectious nature; moreover, it is also considered one of the most dangerous *economic* diseases for its implications on long term animal productivity and on international market access. The motivations behind FMD control and the pathway of control/eradication programs for LDCs versus developed countries are marked. Some see the eradication of FMD as a major development milestone in the globalized environment (Perry and Rich 2007), especially given the fact that FMD is ranked within the top 10 diseases constraining poverty alleviation (Perry et al. 2002). The beef sector in Latin America, excluding Mexico, comprised eleven percent of the value of world beef exports in 2001 (GTAP Database Version 6). Within Latin America, Brazil is the largest single country exporter of beef, followed by Argentina and Uruguay (GTAP Database Version 6). It is without question that the region has been limited in its ability to compete in the global beef market as a result of FMD and the various trade restrictions that have been put in place to protect against the spread of the disease.

When dealing with multiple, simultaneous outbreaks in multiple countries, the modeling framework employed must account for domestic production adjustments as well as changes in domestic consumption and trade flows. In this study, we focus on the changes in domestic and international prices, as well as trade effects that would have prevailed in a scenario that eliminates the production losses associated with FMD outbreaks in Latin America. We utilize historical data accounting for beef production losses in Latin American countries in tandem with a computable general equilibrium model to understand what the economic effects would have

been, had FMD outbreaks in 2001 been prevented. The motivation for using differences from observed outbreak is to determine: (1) how much FMD presence in Latin America distorted world beef prices in an environment that controls for other events impacting world meat markets at the same time and (2) how well a modeling framework such as this can be used to assess the value of FMD eradication in a region that may significantly impact the world beef market.

FMD occurrences in Latin America began to be reported to the World Organization for Animal Health (OIE) with increased frequency in the early 2000s. We therefore chose 2001 as our base year for consideration and begin our analytical framework with a modified application of the standard Global Trade Analysis Production (GTAP) model and database¹ (Hertel 1997) that focuses on the structural features representative of agricultural markets—GTAP-AGR, which is an established model used to investigate economic impacts on agricultural sectors (Keeney, Hertel 2005, Hertel et al. 2007). A positive production shock is imposed on cattle meat in each Latin American country, as shifts in the supply curve, by actual values of historically observed decreases in herd sizes from actual FMD outbreaks in each region that have been converted to meat equivalents. This allows for the analysis of changes in domestic and international prices along with trade impacts that would have potentially occurred had the production losses from FMD been prevented. Preliminary results show that of the Latin American countries considered, Uruguay would have benefited most if production losses resulting from FMD would have been mitigated.

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¹ GTAP Database, Version 6

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