Economic Impacts of Foreign Animal Disease

Philip L. Paarlberg, Ann Hillberg Seitzinger, John G. Lee, and Kenneth H. Mathews, Jr.

Abstract

This report presents a modeling framework in which epidemiological model results are integrated with an economic model of the U.S. agricultural sector to enable estimation of the economic impacts of outbreaks of foreign-source livestock diseases. To demonstrate the model, the study assessed results of a hypothetical outbreak of foot-and-mouth disease (FMD). The modeling framework includes effects of the FMD episode on all major agricultural products and assesses these effects on aggregate supply, demand, and trade over 16 quarters. Model results show a potential for large trade-related losses for beef, beef cattle, hogs, and pork, though relatively few animals are destroyed. The swine and pork sectors recover shortly after assumed export restrictions end, but effects on the beef and cattle sectors last longer due to the longer cattle production cycle. The best control strategies prove to be those that reduce the duration of the outbreak. While export embargoes lead to losses for many agricultural sectors, they also increase domestic supplies and lower prices, benefiting domestic consumers. Total losses to livestock-related enterprises over 16 quarters range between $2,773 million and $4,062 million, depending on disease intensity level, duration of the outbreak, and the response scenario. After seven quarters, production of all commodities returns to pre-disease levels in our hypothesized scenario.

Keywords: Animal disease, epidemiology, foot and mouth disease (FMD), sector model, trade

Acknowledgments

About the Authors

Philip L. Paarlberg and John G. Lee are Professors in the Department of Agricultural Economics, Purdue University. Ann Hillberg Seitzinger is an economist with the U.S. Department of Agriculture's Centers for Epidemiology and Animal Health, Veterinary Services, Animal and Plant Health Inspection Service. Kenneth H. Mathews, Jr., is an Agricultural Economist with the U.S. Department of Agriculture's Economic Research Service.

Recommended citation for this publication:

Contents

List of Figures

List of Appendix Tables