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ABSTRACT CMD-05

Effects of a Traceability System on the Economic Impacts of a Foot-and-Mouth Disease Outbreak

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The primary objective of this research is to determine the short-run economic impacts of a livestock traceability system on a foot-and-mouth disease (FMD) outbreak in Ontario. The economic value of a livestock identification and recording system during a contagious disease outbreak is of extreme importance to both livestock producers and policy makers. Saatkamp et al. (1995) state the control and eradication of foot-and-mouth disease is the primary benefit of a livestock identification and recording system. Zhao, Wahl, and Marsh (2006) affirm that from an economic perspective, FMD is the most devastating type of disease outbreak in the livestock sector. A secondary objective of the research is to compare the overall benefits of the existing traceability system to its costs.

A spatial, stochastic disease simulation model is employed to generate disease outbreak statistics for several livestock traceability system scenarios. Included in the model is the derivation of exogenous shocks to the cattle and beef market caused by an Ontario FMD outbreak. A negative supply shock to feeder and fed cattle markets is computed for each scenario, dependent on the direct disease control costs and the fraction of animals slaughtered as a result of the disease containment strategy. In addition, a negative demand shock is included in the economic model to incorporate the loss of wholesale beef and cattle export markets. Feeder cattle, fed cattle, wholesale beef and retail beef market welfare changes are determined and compared for each livestock traceability scenario.

An epidemiological livestock disease spread model is required to generate estimates of the scale and duration of a FMD outbreak in Ontario. Epidemiological modeling of contagious livestock disease is conducted globally using a wide range of modeling techniques. The North American Animal Disease Spread Model (NAADSM) is generally used to model FMD outbreaks at the regional level, due to the challenge of obtaining herd demographic information and NAADSM's inability to randomize disease introduction scenarios.NAADSM is widely used by the USDA and Canadian Food Inspection Agency (CFIA) to determine the relative importance of regional disease control strategies, biosecurity and farm related government policy. The NAADSM framework requires extensive herd demographic, disease attribute, and livestock movement data. In addition, parameter estimates are also needed to model disease detection, disease control strategies and animal tracing capabilities. Further details on data sources will be included in the presentation.

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