Economic Considerations of Agricultural Diseases

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The U.S. livestock industry is among the most economically viable in the world, largely as a result of consistently excellent health status. This is due in no small measure to concerted efforts to exclude diseases present in many other areas of the world. The United States is free of most Office International des Epizooties "List A" diseases, all of which are so classified based on their potential for rapid spread and resulting socioeconomic consequences. The paucity of disease in the United States translates into increased productivity of our national herds, which in turn means lower prices for the consumer and greater profits for the producer. The American consumer pays the lowest percentage for food of any country in the world, approximately 12 cents/dollar[1] earned whereas in many other countries, the cost is as high as 50 or 60 cents/dollar. Another index of economic viability is the value of American livestock in the international marketplace. Many sectors of agriculture are driven by their ability to export and because of the general lack of disease, U.S. animals and animal-product export markets are very attractive and generate considerable economic transactions.

All of this economic vitality is dependent on freedom from disease. A bioterrorist event could change the disease status of our national herd in a precipitous way with devastating results. The American public is generally unaware of this potential for economic ruin. To raise awareness in our public-policy makers on this issue will require a concerted and targeted effort.

Whenever an unexpected disease enters the United States, both consumer and export markets are negatively affected. That is, a spreading disease increases prices at the supermarket, resulting in a pinch for the consumer and a simultaneous drop in export-market transactions. A brief examination of some of the literature concerning economics of foreign animal diseases provides insight into how a bioterrorism event could hit us square in the pocketbook and cause losses exponentially greater than what the general public might expect.[2]

The last major foreign animal disease outbreak in the United States was a highly pathogenic avian influenza in 1983–1984. This outbreak was confined to a relatively small area encompassing parts of Pennsylvania and neighboring states, but nevertheless was the most costly and extensive eradication effort in our history. In six months, all infected chickens were depopulated and premises decontaminated, with a price tag of US$63 million paid by the federal government. Despite the seemingly exorbitant cost, the decision to carry out the eradication was made easily, as economic analyses demonstrated that in the absence of eradication, the final cost of living with highly pathogenic avian influenza would have been US$5.6 billion, all passed

on to American consumers in the form of increased meat and egg prices.[3] As it was, during the six months of the outbreak, poultry prices increased by US$349 million.[3]

Similarly, a study done on the cost of maintaining a hog population with African swine fever, a disease that is endemic in Africa and has been present periodically in the Caribbean, revealed surprising hidden costs. The cost, over a ten-year period, would be US$5.4 billion, with the bulk of this being consumer losses.[4]

The disease that causes the greatest concern among producers and regulators is foot-and-mouth disease. This is an extremely contagious viral disease affecting a wide range of animals, including pigs, cattle, sheep, goats, and many species of wildlife. Spread by aerosol, the virus is capable of almost uncontrollable spread. The virus grows in epithelium of the oral cavity and the feet where, in both cases, it causes painful blisters, which make the animal unwilling to eat or move around to forage. As a result, there is a tremendous, albeit temporary, drop in production. Such a drop, however brief, would be enough to wipe out profits in our current systems of intensive agriculture. A study done almost twenty years ago still provides good data for analysis of economic impact of this disease.[5] In this study, it was hypothesized that foot-and-mouth disease entered the United States and became endemic. Efforts to control the disease were unsuccessful. Export losses were the largest negative consequence, with numbers adjusted for inflation registering US$27 billion in lost trade. Recent outbreaks of foot-and-mouth disease around the world have underscored the potential of this disease to hamper economic development. Foot-and-mouth disease was transported to Italy in 1993, at which time Italy had been free of the disease for four years. To control the outbreak, 8,000 animals were slaughtered and eradication costs were estimated at US$8.3 million for indemnity funds and US$3.2 million for cleaning, disinfection, and carcass disposal. However, indirect costs, as measured by disruption of international trade, were estimated at US$120 million, or approximately ten times the cost of depopulation and decontamination.[6] Another sobering example exists with the outbreak of foot-and-mouth disease in Taiwan in 1996. To date, more than 3.8 million hogs have been slaughtered and early estimates of losses to the swine-related industries in Taiwan are approximately US$7 billion.[7]

A disease with zoonotic potential will have an even greater impact. Economic figures released by Great Britain regarding impact of bovine spongiform encephalopathy (BSE) are staggering. The value of British beef and beef products, estimated at US$880 million, fell considerably when, in 1988, BSE was declared as a newly emerging disease problem of cattle. However, the value fell fully to zero in March of 1996 when it was announced that there was a probable link between consumption of BSE-affected meat and new variant Creutzfeldt-Jakob in humans. The direct costs of dealing with the outbreak are staggering. A regulatory decision mandated slaughter of all cattle over the age of 30 months. As a result, approximately 1.35 million were destroyed and all of the carcasses disposed of by incineration. This depopulation cost surpassed US$4.2 billion and continued to climb.[8] Even a threat of placing prions in our food supply would send a staggering negative ripple through the beef and dairy industries.

The possibilities of obtaining and transporting infectious materials such as those listed above are relatively straightforward. Visiting an area where one of these dreaded diseases is endemic, coupled with a rudimentary knowledge of microbiology, could be enough to allow for production of a bioterrorist weapon that could then be

released in naive populations in the United States. Our only defense against such an episode is to increase awareness to a point where such an incursion is detected as early as possible and deleterious spread effectively intercepted.

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