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THE ECONOMICS OF ANIMAL DISEASE: SYNOPSIS OF CONFERENCE PRESENTATIONS AND DISCUSSION

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An animal disease outbreak has serious economic implications that stretch beyond the farm gate: a diverse set of industries including meat processors, wholesalers, retailers and allied input and marketing industries have a stake in maintaining a healthy animal products sector.

The potential for economic loss from animal disease, placed in the context of an increased emphasis on homeland security and the recent Canadian outbreak of bovine spongiform encephalopathy (BSE), has encouraged research across many disciplines including epidemiology, veterinary services, and economics. Public officials and private individuals are beginning to weigh the benefits, costs and consequences of animal disease prevention and mitigation strategies.

The following summary is from a one-day conference held on July 11th, 2003 in Denver, Colorado exploring the potential impacts of a disease outbreak with particular emphasis on business beyond the farm gate. Conference participants included members of producer groups, academics, industry professionals and government officials. Discussion centered on the epidemiological and economic impacts of animal disease, and the role of public and private resources in animal disease research and education. A synopsis of the conference's discussion points follows, and conference presentations may be viewed at: http://dare.agsci.colostate.edu/animalhealth/conf.htm

The conference opened with a challenge to participants: to increase the public dialogue on animal health issues in agriculture, and more specifically, to focus attention on agribusiness and allied industry. This public dialogue encourages future collaboration among researchers, industry professionals and government specialists by encouraging joint research projects using multifaceted approaches.

Public and Private Economic Incentives for Animal Disease Management

The conference's initial presentation and discussion centered on the role of public and private institutions in disease prevention and mitigation. While it is true that animal health management is a private decision for producers, public intervention is needed when confronting disease outbreaks because impacts spill across political and geographic boundaries necessitating the adoption of multilateral disease policies. Beyond

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public involvement, private producer groups and individuals are working collectively to prevent and eradicate disease thus extending a public good to society. An important issue is who bears the economic burden in an outbreak, especially when the disease jurisdiction crosses political and geographic boundaries. As an example, import bans on meat from infected countries result in a welfare loss to domestic consumers who can no longer buy imported products that may be of higher quality and/or may be available at a lower price. The same ban may be a boon for domestic producers who no longer face competition from imports.

Public institutions such as federal, state and local governments influence the behavior of private individuals using regulations, mandates, and economic incentives. The extent of public involvement hinges importantly on whether the disease is a human health risk; if the disease exhibits overt, clinical symptoms; how easily the disease is transmitted, and whether the disease is a safety threat to the food supply.

Public institutions may offer indemnity payments or other incentives to influence the animal health decisions of individuals Livestock producers seldom need such external incentives to manage diseases that directly impact productivity. However, producers have little reason to manage diseases that are not easily observed, even though these diseases may cause severe losses to society; that is, it need not be the case that public and private incentives for disease management are aligned. Indemnity payments may be used to align incentives as deemed appropriate, and structuring the payments to cover both livestock replacement cost and business interruption losses should be considered.

Ensuring that private agents act in society's interest requires that comprehensive disease information be conveyed to producers; that producer subsidies for eradication and control be aligned with public disease prevention goals; and that indemnity payments for disease prevention include funds both for lost animals and business interruption costs.

Government Response to Animal Disease Prevention and Control

Public institutions and private groups are working collectively to assist individuals in addressing society's stake in disease prevention and control. Current research conducted by USDA's Animal and Plant Health Inspection Service (APHIS) addresses three emerging issues: defining the economic loss threshold for particular disease prevention strategies; identifying new biosecurity concerns; and investigating the efficacy of required vaccinations as a preventative measure. Private groups are focused on creating awareness about endemic diseases and suggesting best management practices. Engaging producers in this discussion can be challenging, especially when symptoms (and incentives) are not clear, as is the case with Johne's disease. Commodity groups support indemnities for producers who must cease business because it helps control the overall costs of production and improves consumer confidence through quality assurance. These groups value consistent regulations and policy processes as regulators develop programs to manage animal health.

Homeland security involves preparing for bioterrorism, and the introduction of an invasive animal disease is a potential bioterrorist weapon. Recent emphasis on homeland security has encouraged state veterinary services to shift focus from disease prevention to emerging disease response strategies. State and county animal disease response teams are being formed, and livestock tracking will be important. Animal identification systems, perhaps based on global positioning technology, and electronic health certificates are being developed. A clear need for economic analysis of these alternatives exists, with analysis delineating who bears the costs and receives the benefits of the tracking system.

Improved information and data resources are important for managing diseases. The US has rich data resources relative to other countries, but noticeable flaws do exist. In particular, animal movement data, consumer response to disease outbreaks and the costs of health management need to be collected and made accessible.

Impact on Domestic and International Consumers

Food safety may be threatened by an animal disease outbreak, and managing consumer fears during an outbreak is important. Recent cases of Foot and Mouth Disease (FMD) and the Canadian outbreak of BSE provide examples of how public institutions, private groups, and the media may work together to maintain the free flow of scientifically based information and to ensure consumer confidence.

During an animal disease outbreak, the media must report on a complex issue quickly. The animal products industry will bear the brunt of providing this information. The message from industry must be truthful, transparent and repeated often. Third party collaboration is important, therefore, industry should partner

with USDA and other stakeholders when addressing the public. Successful collaboration was apparent during the Canadian BSE outbreak in which consumer awareness of BSE was high, and consumer confidence in the food supply remained high. Keys to managing consumer uncertainty include maintaining a flow of science-based information and reemphasizing the goal of a safe food supply to consumers.

Because significant revenues are generated from animal product exports, trading partners' confidence in products must be maintained during an animal disease outbreak. The confidence extends not only to food safety, but also to the partner's desire to keep disease from entering their country. Animal disease policies and partners will change as trade flows increase to fast developing countries (i.e. China), and as other major livestock producers solve animal disease problems such as those found in South America.

Phytosanitary trade barriers can be based on the relative risk of outbreaks. Outbreaks involve a welfare loss, and the stochastic nature of this loss can be used to set the level of tariff rate equivalent quotas or outright barriers. When quantifying economic loss, it's important to designate groups that benefit from an outbreak (unaffected producers, unaffected consumers) and those that bear the loss.

Broader Impacts on the Agribusiness Sector

The economic impact on agribusiness is a neglected area of research. Even though livestock producers suffer direct impacts from disease, shocks from the outbreak extend to agribusiness and allied industries throughout the supply chain. In this context, economic research should adopt a systems framework that traces the impact of outbreaks to all stages of the animal product sector. Central to the framework are technical relationships and economic relationships. Technical relationships embody the growth, development and slaughter of livestock as well as relationships underlying the fabrication of meat products. Economic relationships link the stages of the meat-marketing channel by allocating supplies of meat products in response to relative scarcity via prices.

Within the systems framework, hidden costs or indirect costs need to be quantified. Environmental waste, business and alliance disruption, product labeling and processing control cost, as well as increased communication, public relations and research costs may occur during an outbreak. Interestingly, simple heightened awareness of disease risk, rather than actual occurrence of disease incidents, can create indirect costs. For example, traceability, feed controls, new cleaning and sanitizing standards, and verification testing costs may have to be absorbed by the industry due to heightened consumer awareness and regulation.

In sum, consistent themes relating to incentives, information and animal identification were considered during the conference. The private and social incentives to manage and eradicate diseases were discussed, and market signals for disease prevention were examined at the production, consumer and international trade levels. Indirect costs such as business interruption losses and higher consumer prices due to international trade bans were also presented.

Summary

Participants felt information holds an important role in the study of animal disease. As an example, discussants posited that producers may not have enough information concerning best management practices for disease eradication and prevention. Researchers questioned whether adequate data is available to weigh the economic tradeoffs in disease prevention strategies. Finally, participants sought to clarify the role that the media and private groups have when informing the public about disease outbreaks.

Animal tracking and identification will play an important role in evaluating the scale and importance of a disease outbreak, as well as suggesting a prevention strategy. A tracking system is needed to improve public agents' ability to manage outbreaks, but left unresolved was who would pay for the tracking system, and how sophisticated a tracking system might be.

The recurrent themes of incentives, information an animal identification succinctly summarize the issues considered during the conference and also suggest foci for future research, outreach and policy analysis. These issues are an opportunity elements to motivate the need for multidisciplinary collaboration among government officials, academics, private individuals and animal product industry stakeholders.