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A NAFTA APPROACH TO ANIMAL HEALTH AND BIOSECURITY: PIPE DREAM OR POSSIBILITY

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INTRODUCTION

Animal health issues used to be primarily a concern for farmers and veterinarians. That has changed dramatically in the last decade. The boundary between diseases that affect animal health and those affecting humans is more permeable than we once thought it to be. Diseases like bovine spongiform encephalopathy (BSE) and avian influenza have heightened public perceptions of the relationship between animal and human health and, in doing so, dramatically raised the stakes for animal health systems. Not only have boundaries between disease hosts and carriers become blurred, boundaries between trading nations are becoming increasingly open and agrifood trade is an essential part of the day-to-day operation of national food systems.

Under the North American Free Trade Agreement (NAFTA), agrifood markets in Canada, Mexico, and the United States have become tightly integrated. NAFTA countries are dependent on the smooth flow of food products across national borders to keep their food production and distribution systems supplied with the mix of products demanded by consumers. In the animal industries, particularly pork and beef, the degree of integration has increased steadily since the introduction of the Canada-United States Free Trade Agreement (CUSTA) and NAFTA. Each year about eight million hogs, or eight percent of the US slaughter, enter the United States from Canada, two-thirds as feeder pigs and the rest destined for slaughter plants (Haley). Prior to the BSE cases in Canada and the United States in 2003, over two million head of cattle and one billion pounds of beef cuts were being traded between NAFTA partners (Caswell and Sparling).

The BSE cases in Canada and the United States in 2003 revealed the extent to which an animal health issue can disrupt trade and markets. However, the disruption went far beyond what was necessary to truly protect human and animal populations, at least according to international standards (Caswell and Sparling). The disruption and the time to recovery could have been shortened if the NAFTA nations had more integrated animal health and regulatory systems. Integrated international markets truly do need to be managed differently. Independent national approaches are no longer adequate to protect animal or human health and have been shown to be incapable of minimizing the trade impacts of animal health related challenges to the system. The External Advisory Committee on Smart Regulation highlights the issue from a Canadian perspective, "It is no longer possible to protect Canadians' health and safety and provide access to innovative products – and do it all ourselves." This statement clearly applies to all NAFTA partners and the question is, "What can we do to move a NAFTA approach to animal health and biosecurity from being a pipe dream to a reality?"

We begin our discussion with a review of the scope of the issues then turn to a framework for examining the relationships between animal health, biosecurity, regulation, and trade. We note that many of the issues raised in this paper may require an approach that will eventually extend beyond NAFTA; here we limit our discussion to the NAFTA situation.

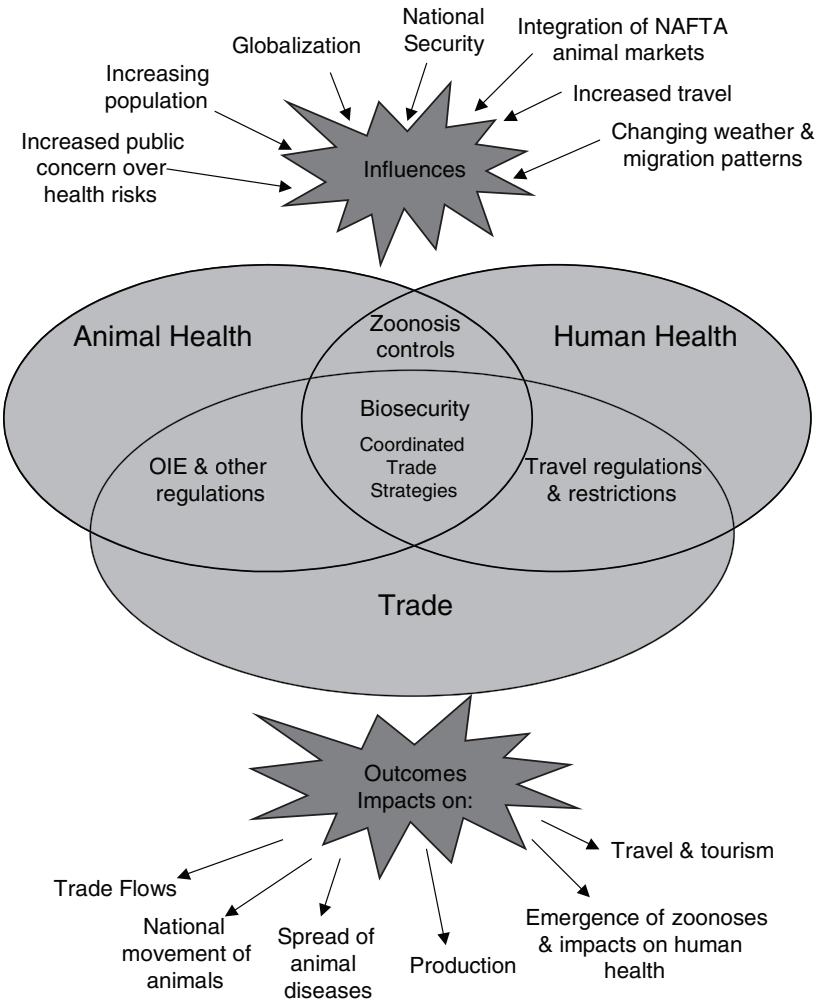
SCOPE OF THE ISSUES

Animal health management is no longer only a matter of disease prevention, diagnosis, and treatment. Each disease has its own economic and health implications, and designing a management system requires consideration of the influence and impacts of the disease and different management strategies. Figure 5.1 illustrates the interactions among animal health, human health, and trade. The greatest management challenges lie at the intersection shown in the center of Figure 5.1. The World Organization for Animal Health (hereafter referred to by its original acronym, OIE, Office International des Epizooties) oversees the intersection between animal health and trade. OIE currently has 167 member countries. It lists over 125 animal diseases in its world animal health information system (OIE). These are diseases that are transmissible, have an impact on international trade in animals and animal products, and must be reported to the OIE when they occur within a country. A NAFTA approach to animal health would require managing the subset of these diseases that occur or could be introduced into NAFTA countries. Some animal diseases, called zoonoses, are also human health risks because they can be transmitted to people by animals. Human health interacts directly with trade through travel

by individuals. Travel can also affect animal health, for example when travelers import diseased animals or animal products.

In the direct center of Figure 5.1 is the intersection of animal health, human health, and trade. This intersection represents a significant biosecurity risk and the actions needed to produce biosecurity include coordinated animal health management and trade strategies. The term biosecurity has been undergoing an evolution as it is applied to a broader range of risk sources. In the animal health field, biosecurity

Figure 5.1: Relationships among animal health, human health, and trade.



Source: authors.

refers to the exclusion, eradication, or effective management of risks posed by animal diseases. More recently, the term is being used to refer to preventing the intentional introduction of risks into agricultural and food systems, e.g., by terrorists (Government Accountability Office or GAO). Our use of the term biosecurity for this chapter encompasses the management of animal diseases regardless of source of introduction but with an emphasis on potential transmission through normal commercial and consumer activities. A defining element of biosecurity risks is the evaluation of whether they are significant enough in animal health, human health, and/or trade terms to merit active management.

A NAFTA approach to animal health and biosecurity would be developed within an already existing, multilayered trade environment. The NAFTA countries have bilateral arrangements on these issues with each other and with other trading partners, and have developed some trilateral arrangements. The nations interact through OIE and also are members of the larger trading framework of the World Trade Organization (WTO) and its Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement). The economic integration of agricultural and food markets between Canada, Mexico, and the United States has moved forward rapidly on several fronts since the NAFTA agreement went into effect in 1994. Regulatory integration, or at minimum, coordination, has not kept pace leaving the integrated market vulnerable to disintegration when animal health outbreaks or cases occur, such as the BSE cases confirmed in 2003 and 2005.

As noted in Figure 5.1, there are several factors influencing the relationships among animal health, human health, and trade. These include higher trade levels, globalization, more market integration, national security concerns, changing weather and migration patterns, increasing population, and heightened public concern about human health risks. The success of management strategies then has impacts on the spread of animal diseases, production systems, the emergence of zoonoses, restrictions on trade flows of animals and food products, and travel and tourism.

Issues for a NAFTA Approach to Animal Health Management and Biosecurity

The stakes associated with a lack of NAFTA regulatory integration for animal health management and biosecurity issues are getting higher. The reasons why it is imperative that we move toward a NAFTA approach to animal health may be summed up in a few words: the problems are getting worse, the stakes are getting higher, and the current systems are not working as well as they should. The Institute for Animal Health summed up the best motivations for taking a NAFTA approach to animal health, "Infectious diseases do not respect national

borders….the battle against infectious diseases is not restricted by frontier (p. 24).” Particularly with increased trade and travel, borders are not effective disease barriers.

There are several reasons why a NAFTA approach to animal health management is not only logical but also necessary. They relate to the current and potential relationships that animal health has with both human health and trade as illustrated in Figure 5.1. Animal health management has always been important at the national level but the vulnerability of animal production systems to such diseases, and the economic impact of occurrences, increases rapidly with market integration across national borders. Unfortunately, as the number of countries involved increases, the number of relationships and potential interactions also multiply rapidly. Management of a NAFTA animal health system boils down to answering the question: can we improve animal health management on a NAFTA basis while maintaining the integrity of our national systems?

Several recent events have highlighted the need for a broader approach to animal health. The concern over the relationship between animal and human health has been around for years. It was initially heightened with the spread of bovine spongiform encephalopathy, which became popularly known as mad cow disease, and the presumption of a relationship later established between BSE and the human disease, variant Creutzfeldt-Jacob Disease (vCJD). The World Health Organization defines zoonoses as diseases that can naturally move between animals and humans. Newly emerging zoonoses are responsible for 75 percent of emerging human diseases (Marano and Pappaioanou,). More recently, the spread of diseases like avian influenza and SARS have raised concerns among the general public. Marano and Pappaioanou identify global trade and new animal management practices as significant risk factors in the spread of zoonoses. Brown identifies increasing human population and increased trade as the main reasons why the rate of emergence of new zoonoses will likely increase.

Humans are a major risk factor for animal health. Increased demand for meat and cost competition is resulting in larger production units with greater stress on animals and higher animal density. Movement of humans around the world speeds up the spread of animal as well as human diseases. Trade in exotic animals increases the risks associated with the emergence of new zoonoses as well as the spread of existing animal and zoonotic diseases.

The economic importance of animal health management has increased as a result of the market integration that has occurred between Canada, Mexico, and the United States under NAFTA. As a result of this integration, the uninterrupted movement of animals across borders

is necessary for industry operations to function on a daily basis. For example, after the Canadian BSE case closed its export market for animals in 2003, while some markets for beef products were relatively rapidly restored, Canadian producers found that processing capacity in Canada was grossly inadequate to handle the volume of animals ready for slaughter (Standing Committee on Agriculture). At the same time, processing plants in the United States experienced significant shortfalls in animals available for slaughter, while backgrounders and feedlots scrambled to get adequate supplies of animals. The economic impact of BSE was greatly magnified by the integration of the NAFTA market, the border closings that were implemented, and the long period of time that has passed without full restoration of trade. It appears that producers, companies, and countries did not adequately understand the risks generated from market integration in the absence of regulatory integration (Caswell and Sparling).

Animal health management poses clear challenges for producers, companies, countries, and trading partners. The scope of these problems in the trade arena has reached a level that very likely makes ad hoc regulatory coordination, followed by crisis responses when problems occur, more costly than comprehensive approaches to management. Can we learn from recent experience with animal health events within NAFTA in order to move forward?

A FRAMEWORK FOR EXAMINING INTERNATIONAL ANIMAL HEALTH AND BIOSECURITY ISSUES

We consider the interactions between market integration and regulatory integration using the framework presented in Figure 5.2. Market integration, the central box, is the main goal of trade agreements, under the assumption that such integration enhances economic welfare. Trade is the result of firm level decisions made within a regulatory and policy environment. Under market integration, firms extend supply chains across national borders to capitalize on opportunities or to minimize perceived risks. Private incentives for market integration include opportunities to build firm-level competitive advantage and take advantage of market opportunities through selling into new international markets, accessing skills and capabilities not available to the firm in current markets, and reducing sourcing costs or being able to source materials not available in current markets. In the case of the animal and meat industries, NAFTA and changes to Canadian grain policy allowed Canadian pork and beef producers to capitalize on their comparative cost advantages and expand their trade with US producers and processing plants. Mexico was able to capitalize on a similar cost advantage and shipped live cattle to US feedlots. US firms used their quality capabilities to export high-end cuts to both Canada and Mexico. Firms also expand their supply chains internationally to reduce private

risks, including those associated with political instability, price and supply variability due to weather, supplier reliability, and supplier or customer market power. These private incentives have a strong impact on the speed and extent of market integration.

The degree of market integration is also very strongly affected by international trade agreements that either promote or constrain trade. In recent years, trade agreements have included provisions, most notably the SPS Agreement of the WTO, that establish disciplines for national level animal health, plant health, and food safety regulations. The SPS Agreement recognizes OIE as the international standards setting body for animal health and trade restrictions related to animal health. However, countries exercise discretion, sometimes wide, in interpreting OIE standards and trade guidelines in national level regulation (for details in the case of BSE, see Caswell and Sparling). Thus the degree of regulatory integration between trading partners depends on their interpretation and application of international standards, in the context of the SPS Agreement. It also depends crucially on the degree to which they establish mechanisms to coordinate policy.

The degree and type of regulatory integration affects market integration then generates a risk level for the trading system associated with the shipment of plants and animals across borders. For animal health, these risks can be classified as private or public in their impact. The impact of private events tends to be contained within an individual supply chain or localized in a geographic region with few country-to-country-level trade implications. These events feed back into private risks and affect companies' pursuit of market integration options. Other risks, like BSE, become public in scope; if they occur they can affect all industry supply chains in a country and its trading partners. Public risks are viewed as major threats to animal health and result in immediate border closings and trade disruptions, while also stimulating industry supply chain risk management activity. The ultimate level of animal health integration across borders is determined by the interaction of public and private activities.

Animal health events, such as new outbreaks and cases, or changed risk levels trigger reevaluation by national-level regulators in order to adjust policy in light of new information, feeding back into the level of regulatory and, ultimately, market integration. As we have seen with BSE, market integration can be disrupted and reversed as a result of a disease. The extent of the disruption depends on the degree of regulatory integration, particularly on the regulatory mechanisms set up in advance to handle all aspects of an event. Animal diseases can only be effectively prevented and managed through joint industry and government programs involving all stakeholders.

Animal health integration as focused on here is a subset of regulatory integration, one mainly motivated by the public risks associated with trade. One important component of animal health integration is the involvement of industry supply chains. Our focus here is on the animal health systems in NAFTA and their role in supporting market integration while protecting human health, animal health, and biosecurity. We examine the need for integration of these systems across NAFTA and the degree to which they are or could be coordinated and integrated. A NAFTA approach to animal health and biosecurity would involve a system of coordinated trade policies that would protect animal and human health while facilitating maintenance, and possible extension, of market integration. This requires strategies for:

- Prevention;
- Initial response to outbreaks and cases of animal disease; and
- Trade resumption after disruption.

Although the goal may be integration, integration will not succeed unless the animal health programs take into account the unique characteristics of each disease, country, and industry. Programs must be coordinated but flexible and tailored to individual situations.

DOES A NAFTA APPROACH MAKE SENSE?

Whether a NAFTA approach to animal health and biosecurity makes sense depends most directly on the net benefits of instituting such an approach compared to not doing so. We have argued that the risks of not having a NAFTA approach to regulatory integration are increasing. To assess the net benefits of regulatory integration, we look at the objectives of a NAFTA approach, assess where the current level of regulatory integration stands, and explore three animal health management case studies as examples.

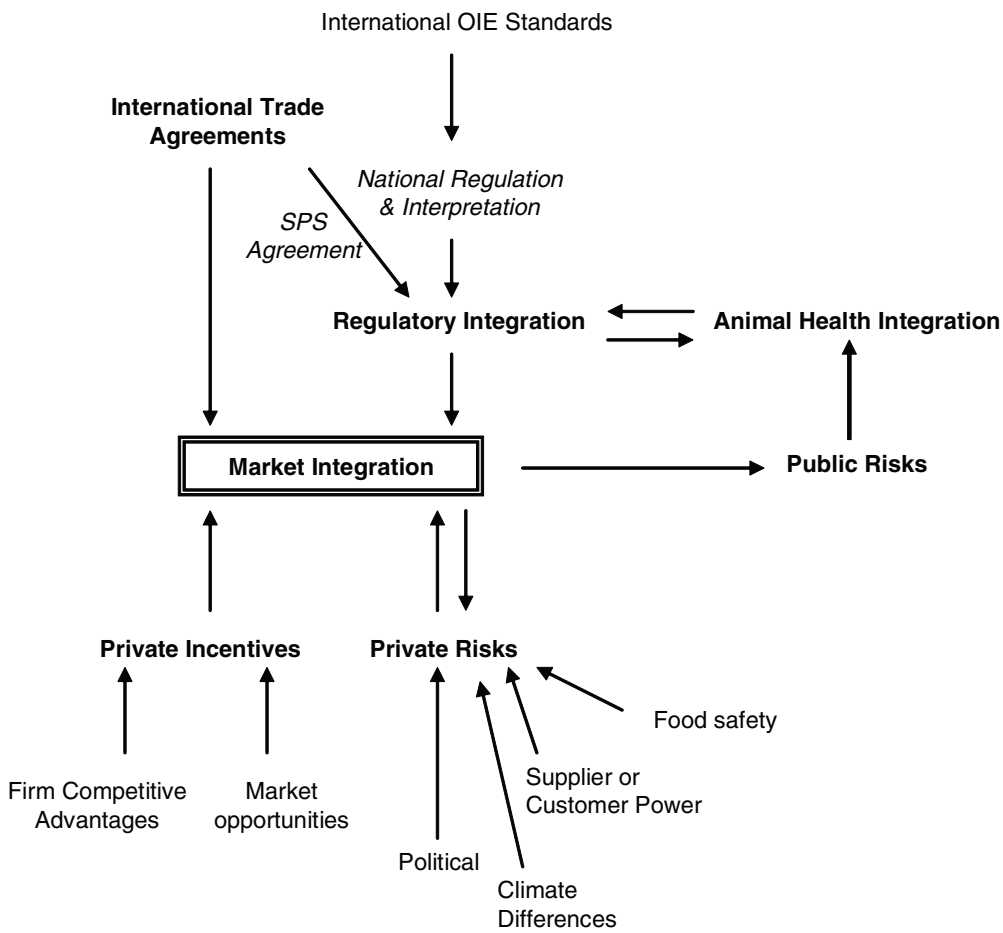
What Would Be the Objectives of a NAFTA Approach to Animal Health Management?

Managing animal health is a complex task that involves considering multiple stakeholders and the relationships among animal health, human health, and trade illustrated in Figure 5.1. It is no longer adequate to develop purely national strategies for animal health management when both the risks and potential impacts are international. Developing international strategies can minimize both the risks and impacts for trading partners. In the case of NAFTA, the coordination of animal health management would require coordination between all bodies involved in the three key areas shown in Table 5.1. The broad objectives for an integrated NAFTA animal health system can be organized along these lines.

What is the Current State of Regulatory Integration within NAFTA?

The individual NAFTA countries have highly developed and complex systems of animal health management that integrate federal level regulatory systems, state or provincial level activity, and non-governmental as well as private organization activity. The organizations with national-level responsibilities in each NAFTA country in the areas of animal health and its impact on human health and trade in animals and food products are shown in Table 5.2.

Figure 5.2: Market integration and animal health.



Source: authors.

Table 5.1: Objectives and activities for a NAFTA approach to animal health management.

Area	Overall Objectives	Activities
Animal Health	To ensure the health of NAFTA animal production systems, to eliminate diseases from the system, and to isolate the system from outside risks. To protect the animals within each NAFTA country.	Coordinated services concerning disease notification, epidemiological information, certification for international trade, and management of animal health emergencies.
Human Health	To minimize risks associated with zoonotic diseases, both in terms of the transmission of existing zoonoses or the emergence of a new zoonosis.	Coordination of risk analyses related to zoonotic diseases. Development of coordinated notification and response strategies.
Trade	To protect the flow of trade in animals and food products within NAFTA, consistent with achieving the objectives of the first two areas.	Agreement on application of OIE recommendations for notification, border closings, and trade resumption.

Source: Authors.

Actual systems are much more complex than the table suggests because responsibility also resides at the state or provincial levels particularly for outbreak management and containment. At the international level, OIE standards form the backdrop for regulatory decisions within countries. However, as noted earlier, countries interpret these guidelines in the process of setting standards and programs.

The NAFTA countries can pursue regulatory integration among themselves in three ways (Caswell and Sparling):

- **Policy Coordination:** gradually reducing differences in policy, frequently based on voluntary adherence to international codes of practice.
- **Equivalence Agreements:** agreeing to accept the regulatory program of the trading partner as achieving the same standard (i.e., being equivalent), although the regulatory program used to achieve the standard may differ. This is a strong form of mutual recognition.
- **Harmonization:** adopting identical standards and enforcement mechanisms.

Nearly all of the regulatory integration activities among the NAFTA countries on sanitary and phytosanitary standards fall into the category of policy coordination. The overarching coordination mechanism is the NAFTA Committee on Sanitary and Phytosanitary Measures (SPS Committee), which has a mandate under the agreement to facilitate the enhancement of food safety and the improvement of sanitary and

Table 5.2: Federal agencies responsible for animal health diseases, human health, and trade impacts in the NAFTA countries.

	US	Canada	Mexico
Animal Health	US Department of Agriculture, Animal and Plant Health Inspection Service (APHIS); US Food and Drug Administration (FDA), Center for Veterinary Medicine (CVM)	Canadian Food Inspection Agency (CFIA)	Secretaría de Agricultura, Ganadería, Desarrollo Rural, Pesca, y Alimentacíon (SAGARPA-SENASICA)
Human Health	Centers for Disease Control and Prevention (CDC), FDA; USDA	Health Canada	Secretaría de Salud (SSA)
Food Safety	FDA; USDA, Food Safety Inspection Service (FSIS)	Health Canada and CFIA	SAGARPA and SSA
Biosecurity	USDA-APHIS; USDA-FSIS; FDA; US Department of Homeland Security	CFIA	Mexican Association of Secretaries of Agricultural Development (AMSDA)
Trade in Animals and Food	USDA; FDA	CFIA	SAGARPA

Source: Authors.

phytosanitary conditions in the NAFTA countries; the adoption of international standards and use of equivalence agreements; technical cooperation in the development, application, and enforcement of sanitary and phytosanitary standards; and consultations on specific matters relating to sanitary and phytosanitary measures. The agreement mandates that the committee meet at least once each year. Over time, the committee has used several technical working groups to address particular issues, including one on animal health. The activities of the committee are clearly limited to consultation and coordination.

The North American Animal Health Committee, led by the chief veterinary officers (CVOs) of each of the countries, is the key forum for activities regarding regulatory integration in the area of animal health. Here, too, the activity is of a policy coordination nature. This group has been developing a North American BSE strategy and issued a report on this harmonized strategy on 17 March 2005 (USDA-APHIS 2005b). From

a regulatory integration perspective, calling the plan harmonization is a bit of a misnomer. The CVOs state that they have developed "a set of minimum standards for BSE measures in North America. These minimum standards will be presented to the appropriate animal health and public health officials in each country for consideration within the respective regulatory processes, and therefore should be considered pre-decisional (p. 1)."

Thus the harmonized strategy represents policy coordination. Our intent is not to denigrate the hard effort that went into reaching this agreement but to highlight that the regulatory integration level represented is yet well short of full harmonization.

In the animal health area, the NAFTA countries also interact through a plethora of trilateral and bilateral arrangements, some of which are focused on particular animal diseases. There are reasons to be cautiously optimistic about the willingness and ability of the NAFTA countries to move toward coordinated systems coming out of bilateral arrangements. For example, in the area of drug residues, officials from the Veterinary Drugs Directorate (VDD) of Health Canada and the Center for Veterinary Medicine (CVM) of the US Food and Drug Administration have been working toward a veterinary drug side-by-side table and harmonizing maximum residue limits/tolerances in food. The Canada-US Consultative Committee on Agriculture has been working to identify and rectify areas that result in trade irritants.

However, the overall effect of NAFTA moves toward regulatory integration to date is a fairly nontransparent system. The NAFTA countries have put significant effort into moving toward coordinated policy and a higher level of readiness to respond to crisis situations. An example of the latter effort was the Tripartite Exercise 2000 between Canada, Mexico, and the United States titled Foreign Animal Disease Response Simulation Exercise (Humanitarian Resource Institute, Canadian Animal Health Coalition). The countries have expressed a commitment to staging exercises of this nature on a regular basis over time. Despite this effort at coordinated policy and crisis response, substantial progress has not been made toward regulatory integration. This is particularly clear when NAFTA is compared to the pattern of regulatory interaction being pursued within the European Union or between Australia and New Zealand.

CASE STUDIES OF ANIMAL HEALTH DISEASES

The single most important factor in radical and unpredictable changes in animal and food product trade patterns in recent years has been animal health. Trade impacts are significant and often instantaneous, coinciding with the announcement of an outbreak. For many diseases the discovery

of a single infected animal results in the immediate cessation of exports to many, if not all, export markets. Reopening those markets depends on the measures taken to ensure the safety of exports, the continuing disease experience of the country affected, and the degree to which regulations and regulators in the trading countries are in agreement about how to proceed with trade resumption—in other words, whether coordinated trade strategies are in place to effectively manage animal health and biosecurity.

In this section we further examine NAFTA animal health integration using three diseases of economic importance: BSE, highly pathogenic avian influenza (AI) and foot and mouth disease (FMD). We consider how the diseases differ, how this affects animal health management strategies, and the complexity of and issues related to implementing a NAFTA approach for managing each disease.

Table 5.3 highlights some key characteristics of the three diseases: BSE, AI, and FMD. All are dangerous for animals but only BSE and AI are a threat to humans. AI and FMD are highly contagious in animal-to-animal transmission and can be spread easily, while BSE can only be spread through consumption of central nervous system tissue from infected animals. AI and FMD are identified as potential Homeland Security threats (GAO). All three diseases are notifiable to the OIE when exceptional epidemiological events occur, for example at the first occurrence of an OIE-listed disease in a country or zone/compartment, the reoccurrence of a listed disease or infection in a country or zone/compartment following a report by the Delegate of a Member Country declaring the previous outbreak(s) eradicated; or the first occurrence of a new strain of a pathogen of a listed disease in a country or zone/compartment (OIE).

Case Study: Highly Pathogenic Avian Influenza in the United States (Texas Case Identified 17 February 2004)

In this case study, we examine the impacts of an outbreak of H5N2 AI in Texas on animals, humans, and trade.

Animal Health Management – Combined Response of USDA/Texas Animal Health Commission (TAHC) The strategy for managing the animal health risks associated with AI is one of containment and elimination. Two agencies were responsible for the animal health management strategies for this case in Texas, USDA and TAHC. Their actions included (USDA-APHIS 2004):

Table 5.3: Characteristics of animal diseases in case studies.

Disease	Species	Animal to Animal Transmission	Tracking/ Reporting	Management	Animal to Human Transmission	Bio-security Risk
BSE	Cattle, related disease in other species	Through nervous system tissue in feed, incubation several years	Testing of high risk animals, notifiable to OIE	Feed regulations and surveillance	Consumption of BSE beef products, incubation several years	Low risk
Avian Influenza	Poultry and fowl	In exudates from infected or reservoir birds	On farm through vets, notifiable to OIE	Containment and flock elimination	High path AI H5 and H7 – incubation several days	High personal and economic risk
Foot and Mouth Disease	Cattle, hogs, goats, sheep	Contact with virus from infected animals – airborne or carried	Testing on farm, notifiable to OIE	Containment and herd elimination, vaccination	No risk to humans	High economic but no personal risk

Source: Authors.

- **Depopulation.** Infected flocks were quarantined and then depopulated once the H5N2 AI was identified.
- **Track and Trace.** Attempts were made to trace back to sources in order to depopulate those flocks, as well as forward to other potentially infected flocks that are monitored. Birds from infected flocks were sold into other live bird markets (LBMs). As a precaution, five LBMs which received or might have received infected birds were also depopulated and quarantined.
- **Surveillance.** Surveillance zones were established around infected areas using standards developed jointly by TAHC and USDA. The zones were classified as: 1) affected zone – within 8 km (5 miles), 2) surveillance zone – 8 to 16 km (5 to 10 miles), and 3) buffer zone – 16 to 50 km (10 to 31 miles).

Human Health Management – USDA and Centers for Disease Control and Prevention The H5N2 strain is much less likely to transmit to humans than the H7 strains and the more dangerous H5N1 strain found in Asia. No humans were reported infected in this outbreak.

Trade Implications Trade bans were imposed by several trading partners, but the imposition of the bans varied greatly from country to country and changed over time (USDA-APHIS 2005a). Mexico began with a ban on poultry from the entire US and later reduced it to several states and ultimately to 11 counties in Texas. Canada banned US poultry products for a very short period of time and then recommenced importing from the US.

Around the world, trade bans varied from no ban, to bans on products from several states, to complete bans on US poultry products. Regionalization was being considered in many countries, which imposed bans only on product from specific states. Whether the bans were justified is a separate question. We note that US poultry received far better treatment from its NAFTA partners than it did from many of the other countries to which the US exports.

Challenges for NAFTA Coordination for Avian Influenza There are three essential components to a NAFTA AI approach to animal health management strategy, namely, prevention, outbreak management, and trade recovery:

- **Prevention.** Overall approaches to prevention, particularly with respect to biosecurity provisions, should be developed jointly, but then plans and strategies must be developed with industry on a regional basis to allow for consideration of local industry and environmental characteristics.
- **Outbreak Management.** The speed of transmission and the ability to regionalize and contain the disease means that state/pro-

vincial agencies are heavily involved in outbreak control. Since AI involves a situation that changes rapidly, the outbreak is still best managed as a joint federal and state/provincial initiative. From a NAFTA perspective, this has several implications. Regional outbreak management plans must be developed ahead of time by the national and state/provincial governments working with industry stakeholders. NAFTA agreement on outbreak management must include acceptance of these regional management plans although not a review of each plan by all participants. Note that the plans should be defined on a regional basis. States/provinces must have plans for managing outbreaks within their jurisdiction but also for coordinating with neighboring jurisdictions, which may be in different states or countries. Outbreak management plans must also include plans for interfacing with the appropriate human health authorities to ensure maximum human health protection as well as optimal animal health management.

- **Trade Management.** From a NAFTA perspective, important aspects of outbreak management relate to the trade restrictions that are implemented on initial reporting as well as the plans for reestablishing trade with affected regions.
  - **Initial Response Strategies.** Initial responses to outbreaks are often a complete ban on a nation's exports. Given that both AI disease outbreaks and poultry production and trade tend to be highly regional, it would seem entirely reasonable to limit bans to broad regions encompassing the known outbreak and not include all exports from an entire country. The initial phase would include prescribed monitoring and reporting to allow the true extent of the outbreak to be evaluated during the initial phase. Such a strategy would avoid the excessive and unnecessary disruption of production and trade.
  - **Resumption of Trade with Affected Regions.** The second component would include procedures for reviewing and either extending or reducing trade restrictions as the outbreak evolves and more information becomes available. Such a strategy would require agreement in advance on the conditions necessary for a region to be declared free of AI, as well as on the timing and conditions for reducing the size of a banned region.

Reaching a NAFTA AI Management Plan A NAFTA approach would require the development of NAFTA initial response and trade resumption strategies. This would effectively be a NAFTA-wide approach to regionalizing the management of AI. Both the plan and the oversight of outbreaks would take place under the guidance of a joint NAFTA management committee with representatives from all NAFTA countries in the areas of animal health, human health, and trade. Such a committee would be able to coordinate responses, and modify bans and surveillance strategies through the life of an outbreak.

Since AI is extremely contagious but has a relatively short life cycle, regions could be declared free of AI relatively quickly and bans could be narrowed and lifted in relatively short periods of time. We note that this happened in the Texas case; Canada lifted its ban quite quickly, and Mexico progressively narrowed its ban in preparation for lifting it. The concept of regionalization is not new in the management of AI. A scan down the list of bans on US poultry by trading partner reveals that regionalization for AI seems to have been accepted by many trading partners (USDA-APHIS 2005a).

Case Study: BSE in Canada (Case Identified in May 2003)

On 31 January 2003, a single downed animal was removed from the slaughter system and tested for BSE in Canada. The tests were not completed and reported until 16 May 2003. Canada reported a positive BSE test result to the OIE and its trading partners.

Animal Health Management The CFIA followed OIE recommendations regarding the detection and eradication of BSE infected herds (CFIA 2003).

- **Track and Trace Animals.** The infected animal was removed from the food chain and rendered in January and the head was sent for testing. Records regarding the infected animal were poor and there were problems in identifying the animal and its herd. Detection of BSE and identification of the animal occurred several months after the carcass was sent to rendering. With some difficulty, the movement of the animal was traced and 15 herds were quarantined and 2700 animals eradicated. Animals older than 24 months were tested and all were negative. The investigation revealed serious deficiencies in Canada's capability to trace animals.
- **Track and Trace Feed.** The possible feed sources were identified and potential feed contaminations were tracked to assess risks to other herds and animals. An additional 83 animals were culled and all tested negative.
- **Surveillance.** Canada increased its monitoring and testing for BSE. In 2004, approximately 21,000 high risk animals were tested.

Human Health Management – Health Canada Health Canada initiated a surveillance program for Variant Creutzfeldt-Jakob Disease in 1998. Because the 2003 case did not enter the food chain, it was not a significant concern for Health Canada. Health Canada and CFIA cooperated to create a new policy to keep Specified Risk Materials (SRMs) out of the food chain. In July 2003, the new policy banning SRMs from entering the food chain was implemented.

Trade Implications The trade implications were immediate and disastrous for Canada and Canadian producers. NAFTA partners closed their borders, as did all other importing countries. All exports were stopped immediately, effectively sending 48 percent of production back into the Canadian market. Prices plummeted, particularly at the farm level.[1]

Challenges for NAFTA Coordination for BSE BSE has created a significant problem for NAFTA primarily in the area of trade redemption.

- **Prevention.** The main preventative measure for keeping BSE out of North American herds is the elimination of SRMs from cattle feed and keeping high risk material out of the food chain. Feed bans on feeding rendered material from ruminants to other ruminants have been in place since the late 1990s in the NAFTA nations. The ban on SRMs in the food chain was implemented in Canada in 2003.
- **Outbreak Management.** One of the significant challenges for managing BSE cases is the inadequacy of the North American cattle tracing systems and the resistance of industry to developing them. Management is severely hampered without proper track and trace capabilities.[2]
- **Trade Management.** NAFTA partners were the first to reopen trade. In September 2003, the United States reopened its border to boneless beef cuts from Canadian animals younger than 24 months, followed shortly afterward by Mexico. The USDA proposed that the border be reopened to live cattle in March 2005 but legal actions by opponents in the US cattle industry delayed the reopening. Trade resumption has stopped being an animal and human health issue and is now an economic and political issue. NAFTA trade in Canadian beef and live animals is complicated by bans on US beef by Japan and Korea in response to the US BSE case in December 2003. Canada was able to reopen trade with Hong Kong in December 2004, but not with Japan and Korea.

Reaching a NAFTA BSE Management Plan The recent agreement by the NAFTA Chief Veterinary Officers on minimum standards for a harmonized approach to managing BSE is a definite step in the right direction. The key will be to push this forward through the respective regulatory processes in the three countries and minimize the disruption caused by interest groups. Actually making the plan work will require changes within the industry to improve track and trace capabilities and to ensure the integrity of the feed bans and SRM restrictions. It will also require continued investment in research into the disease and into new

[1] Caswell and Sparling discuss the impacts of BSE on trade in more detail.

[2] Tracing refers to following an animal or product trail back to its source while tracking is the process of identifying the path from a point in the chain forward toward the consumer.

testing/screening technologies. Finally it will require agreement on the actions to be taken in the event of additional cases. To some extent this is being done; Canada's NAFTA partners did not change their acceptance of Canadian beef cuts after the discovery of subsequent cases in 2005.

Case Study: Foot and Mouth Disease

Foot and mouth disease is different from the previous two diseases in that it is not a threat to humans and the last North American cases were more than fifty years ago.[3] However, FMD still represents a significant risk to the animal populations of North America. Harmonization efforts with FMD would focus on plans for excluding FMD from North America, emergency response in the event of an outbreak, and vaccination programs and efforts to regain FMD free status and resume trade in the event of an outbreak in one of the countries.

Animal Health Management For FMD, the emphasis is on maintaining biosecurity through prevention by keeping FMD away from North American animal herds. This includes prohibiting exports from countries where FMD is present or countries that are not on the OIE FMD free list, as well as establishing import monitoring and testing programs. Plans for outbreak management employ a strategy of eradication and containment. Infected herds are eliminated. Movement is traced for 14 days prior to the outbreak for unvaccinated animals and 21 days for vaccinated animals. For high risk herds, a program of preemptive slaughter will be employed to halt the spread of the disease. If immediate eradication is unlikely to be successful, a program of vaccinating animals in a high-risk region may be implemented to limit the spread of the disease. As with other diseases, regionalization plays a major role in response strategies and state and local officials will be involved in any outbreaks.

Human Health Management Human health concerns with FMD are limited since the disease is not a risk for humans. Minor risks relate to disposal and stress on farm families involved in eradication situations. Compensation programs address the economic impacts of eradication.

Trade Implications The OIE specifies a list of FMD free countries without vaccination programs. All NAFTA countries are on the list. Cases of FMD cause an immediate halt for exports from the country involved. Once the outbreak is controlled trade may be resumed under OIE guidelines.

Challenges for NAFTA Coordination for Foot and Mouth Disease All NAFTA countries have active FMD programs. The challenges for adopting a NAFTA approach are:

[3] The last case in the United States was in 1929, in Canada in 1952 and in Mexico in 1954 (CFIA 2000).

- **Prevention.** All three NAFTA countries take an aggressive approach toward keeping FMD out of their animal populations. Because of the serious nature of the disease, no nation is likely willing to accept any program or policy that it feels will weaken its national protection. However, there are advantages to taking a North American exclusion approach since there are only a limited number of entry points.
- **Outbreak Management.** Since outbreak management is a regional event, the challenges for a coordinated NAFTA approach involve managing outbreaks in areas where logical control regions span national borders.
- **Trade Management.** The OIE specifies two conditions for declaring a country FMD free. Where vaccination has not been employed, a country is FMD free without vaccination if three months have passed since the last known case. In the case where vaccination has been employed and vaccinates have been slaughtered, the limit is three months since the last vaccinated animal was slaughtered. Where vaccinated animals are not slaughtered, the time limits are much longer (CFIA 2000). Trade resumptions under FMD seem to occur relatively quickly. For example, in 2001, the US reopened the border to French pork and pork products only eight months after cases were reported in France.

Reaching a NAFTA Foot and Mouth Disease Management Plan Since NAFTA countries have been successful in keeping FMD out for more than 50 years, and all countries have FMD plans in place, a significant reorganization of NAFTA's approach to FMD does not appear to be a high priority. The only area where there would be merit in more attention is in ensuring that regional strategies for outbreaks that cross borders are developed. Given the flow of live animals and products through NAFTA, an outbreak could easily affect a fairly significant area. Effective track and trace capabilities would be an important capability. A NAFTA strategy would also require the further development of emergency working groups that can be brought into play in the event of an outbreak.

Case Study Summary: What Are Possible Paths to a NAFTA Approach? The first lesson that comes out of an examination of the three case studies and the systems in general, is that national animal health systems are not as fully effective as they could be. There appears to be a great deal of room for better federal/state/provincial planning and coordination internally, as well as internationally. Undoubtedly, changes are being made to the plans and systems involved but the logical question to ask is, "If regional outbreaks challenged the systems, what would happen if there were a serious outbreak that spanned the Mexico/US or Canada/US border?" Are plans in place that would minimize the impact and speed recovery?

Another lesson that emerges clearly from the case studies is the importance of regionalization in dealing with many animal disease management situations. There is one fact about NAFTA animal health that is irrefutable: diseases neither follow nor respect national borders. While attempts to control product at national borders is a risk strategy that can work with diseases like BSE, for others a more relevant strategy is to consider natural boundaries where the spread of a disease might be halted (Willis). In most cases, these would not coincide with national boundaries but would span regions of control, which could transcend national borders. Regionalization is both a control strategy and a strategy for minimizing trade disruptions. It can play a larger role within NAFTA particularly in the cases of highly contagious diseases like avian influenza and foot and mouth disease.

The analysis also leads to the conclusion that even with important and devastating diseases, change in NAFTA-wide policies moves at a glacial pace. The NAFTA partners all use the same OIE principles and have adopted many of the same testing procedures and policies related to prevention, management, and trade recovery. Even so, reaching an agreement on relatively straightforward harmonized principles is highly political and consumes significant time and resources. The recent agreement on harmonizing BSE minimum standards provided by NAFTA Chief Veterinary Officers is an example. The Chief Veterinary Officers were able to reach an agreement on minimum standards but those are now going to be returned to each country to be reviewed by all industry, health, and government stakeholders before they are accepted across NAFTA. It is impossible to be optimistic that agreement will be reached quickly or that the ultimate level of coordination achieved in approaches across the NAFTA countries after this process plays out in the individual countries will amount to harmonization. If agreement is so difficult where the practices and standards are so similar, how difficult will it be for more controversial projects?

The case studies all reveal the need for track and trace capabilities to support the identification and isolation of potentially infected animals and products. They also reveal that current track and trace capabilities are inadequate to meet the needs of an effective animal health management system. Since the NAFTA trade in animals is significant, it would seem logical that traceability standards be coordinated across the three countries to allow for seamless tracking through the food chains. Where possible, consistency in technology and processes will ease the flow of information and products. Since this capability will be employed by industry and greatly affect their operations, industry stakeholders must be involved in standards and systems development. The joint traceability initiative in the produce sector is an example of Canadian and US industries cooperating together and with other government stakeholders to develop international standards (Canadian Produce

Marketing Association). There are systems under development in every animal business but they are not yet capable of fully tracing an animal, its movement, and the products created from it.

A final conclusion from these cases is that, in reality, "there is no there there" with respect to infrastructure for moving regulatory integration forward within NAFTA. The effort has no central bureaucracy, has no one in charge, and is severely undercapitalized. For NAFTA, the regulatory integration box shown in Figure 5.2 is made up of occasional committee work by representatives from the three NAFTA countries. While the individuals involved are making heroic efforts, they cannot devote the time, energy, and institutional resources required to engineer a true NAFTA approach to animal health management. A March 2005 trilateral meeting between the leaders of the three countries produced a statement on safety issues in the agricultural and food industries that shows no movement toward a NAFTA approach to these issues (Food Chemical News). The result, in terms of our framework, is a negative feedback loop between current levels of regulatory integration, market integration (or disintegration), public risks, animal health integration, and back to regulatory integration.

The major question as we go forward is whether the lack of a central, integrated regulatory core will be a significant hindrance to markets and welfare within the NAFTA countries over time. There is no doubt that painful trade disruptions have occurred because this core is lacking. But has the pain been strong enough to give impetus to the development of a NAFTA approach to regulatory integration?

A NAFTA APPROACH: PIPE DREAM OR POSSIBILITY?

To date there is little evidence that the net benefits of a NAFTA approach to animal health management are perceived to be large enough in the NAFTA countries to give real momentum to such an approach. This perception both feeds into and is a result of an apparent lack of political will to pursue stronger regulatory integration within NAFTA. Countries are unwilling to share control on issues that are critical to their sense of biosecurity and ability to protect the health of their human and/or animal populations. The complexity of the management issues involved also contributes to the inertia within NAFTA on regulatory integration. The challenges of managing national systems with both federal and state/provincial standards and institutions are a significant issue within a national context. The idea of managing the same relationships at a supranational level is daunting.

At the present time, an integrated NAFTA animal health management system that insures biosecurity is far from a reality. Looking back at the handling of the BSE cases and avian influenza outbreaks, we see

a system that was stressed and took longer to react and regain control than it should have. Lack of coordination was evident everywhere, between federal and state/provincial agencies managing events and between national governments trying to return to more normal trade patterns. Plans for managing the initial outbreaks and trade resumption seemed to be developed on the fly, and in the case of BSE, interest groups were heavily involved in the process. Overall, animal health systems did not appear to be completely developed within countries, much less between them. We are also concerned that fully two years after the first North American BSE case, there appears to have been little progress in developing a NAFTA BSE strategy in spite of numerous meetings and attempts to do so. We note that effective national strategies still remain elusive; the beef industries in Canada and the US appear to have made relatively little progress toward regaining the pre-2003 level of integration.

Is an integrated NAFTA animal health management system a pipedream? The answer is probably yes if we think of it as one unified system. However, we are more hopeful if we envision a series of coordinated systems designed to deal with a single industry or focused on a single problem. There are terrific economic and social advantages to working together to create a system to address individual diseases like avian influenza. Dealing with a single disease is an infinitely more manageable task. One can reasonably assess costs and benefits, the limits of the integration can be defined, and individual steps can be taken to gradually build a coordinated approach. When this is done with one disease it will build a process that can be used for developing similar programs for other diseases.

There are several conditions that must be in place to allow regulators to move ahead:

- A clear understanding and statement of where integration will bring benefits. This implies an awareness of where integration is not necessary and national strategies remain optimal. Benefits should be grouped into:
  - risk reduction: human, animal, and economic;
  - improved outbreak management; and
  - economic: cost reductions, reduced losses, and reduced trade impacts.
- An understanding of what must be achieved and what must change to capture the benefits. This will also include an analysis of who will gain the benefits and who will have to take actions and make changes to make the benefits possible.
- Enumeration of the costs of the different actions and systems and where they will be borne in the system.

- Development/implementation costs.
- On-going operating costs for both governments and industry.

• Development of a realistic, staged plan for moving ahead.
  - Stages should be clearly defined with definite outcomes and timeframes. As with most complex long-term projects involving several partners, it is important to build trust and momentum. That is best achieved by building on success through a series of achievable projects.
  - Industry involvement and participation is a key element in any animal health system in both planning and implementation.

Where should we start on a NAFTA approach to animal health management? Working through steps one through three above would provide the information needed for determining where to start. Avian influenza appears to be a likely candidate. The disease is highly contagious and a serious threat to humans as well as to industry. The course of the disease is rapid and the situation changes quickly, both in terms of the spread of the disease and the ability to eliminate it from a region, so regional bans and trade resumption can occur relatively quickly if plans are in place to do so. The concept of regionalization of the disease appears to be accepted within the NAFTA partners, which makes developing regional strategies possible.

One of the impacts of the BSE and AI outbreaks has been a growing awareness of the need to move toward a more harmonized NAFTA animal health system and an apparent willingness to move the agenda forward. Although it is impossible to leap ahead into an integrated NAFTA-wide animal health system, now is the time to take the first small steps to turn this pipedream into a reality.

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