Management of animal health emergencies in North America: prevention, preparedness, response and recovery

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Summary

Animal health emergency management (AHEM) is one of the most important issues confronting the world today and is the key to both food security (safety, quality, wholesomeness, affordability and abundance) and economic stability for many countries. Although the primary objective of emergency management in each of the countries of North America (Canada, Mexico and the United States of America [USA]) is implemented through individual AHEM systems, North America shares four common goals, as follows:

- preventing the introduction of foreign animal pathogens into North America
- being prepared to manage the outbreak of a foreign animal disease
- developing appropriate response strategies for control and eradication of disease
- taking active measures to recover from the animal health emergency in question.

In the course of this paper, the authors provide an introduction to, and overview of, AHEM in North America. Furthermore, they outline the general infrastructure of prevention, preparedness, response and recovery strategies for Canada, Mexico and the USA. Finally, the authors discuss the future of AHEM in North America, concluding with a review of some of the joint activities currently being conducted with regard to AHEM.

Keywords


Overview of animal health emergency management systems in countries in North America

Canada

When the Canadian Food Inspection Agency (CFIA) was created, all Federal food inspection and animal and plant health inspection activities were consolidated into one organisation. The CFIA is still undergoing a major reorganisation. During this reorganisation, the six regions into which Canada was divided became four new areas. Originally, these six regions were further divided into districts (two administrative tiers). However, the new areas are also divided into regions and districts (three tiers).

Canada defines a foreign animal disease (FAD) emergency or animal health emergency as: 'a situation of an outbreak of an FAD requiring immediate action to contain, control and
and animal diseases.

The responsibility for managing FADs lies within the Animal Health and Production Division of the Animal Products Directorate. The Canadian animal health emergency management (AHEM) system functions on two levels, on the national level and the regional level. Under the previous organisational structure, the basic components of the Canadian system included a National Emergency Management Team (NEMT) based in Ottawa, and six Regional Emergency Response Teams (RERTs). The ten provinces and two territories in Canada were subdivided into six administrative regions but, as mentioned above, these six regions have recently been reduced to four areas, necessitating proposed changes in AHEM organisation.

The Federal government regulates those diseases, including FADs, which appear on a reportable disease list appended to the regulations of the Health of Animals Act. The Minister of Agriculture may also designate other diseases which are not on that list for Federal control. Remaining diseases may be managed by Provincial governments, with or without Federal assistance. Regional activities are co-ordinated through the Foreign Animal Disease Eradication Support (FADES) plan. Each region adapts the FADES plan to suit its own regional characteristics.

Canada also has eradication programmes for ‘programme diseases’. Programme diseases include bovine brucellosis, which has been eradicated from Canada, and tuberculosis, which occurs only at a very low incidence.

The mission of the Canadian Animal Health Division is to develop national policies and standards which enhance trade and also protect both animal and veterinary public health and the environment. The Division must ensure that these policies are practicable and that they are adhered to, while also addressing the changing needs and circumstances of Canada within the global economy. The mission of the Canadian AHEM system is to eliminate diseases, to limit their impact domestically and internationally and to restore or maintain international markets. Work toward this goal is accomplished through partnership with the Canadian Animal Health Consultative Committee, which is an industry body, and also with Emergency Preparedness Canada, which is the Federal emergency disaster-management organisation in Canada.

Mexico defines an animal health emergency as: ‘an enzootic or exotic disease that exceeds the number of expected cases, that has significant effects on national livestock production and that affects public health, economic or socio-political conditions or national or international commerce’ (C. Villarreal Chavez, personal communication).

The AHEM system in Mexico is managed by the National Animal Health Emergency Mechanism (DINESA), whose primary mission is to prevent, control and eradicate exotic animal diseases when they occur in Mexico. For practical purposes, Mexico is divided into eight regions. Each region has a DINESA co-ordinator, who is usually assisted by zone co-ordinators. These co-ordinators must investigate every suspicion of an exotic disease outbreak and promote awareness of the importance of FAD surveillance and reporting among private and official veterinarians and producers. The goal is to create, through training, Grupo Estatal de Emergencia en Salud Animal (GEESA) (State Animal Health Emergency Groups), composed of government veterinarians and private practitioners, to work in emergency field operations.

DINESA initiates action when an animal health emergency, as defined above, has been identified. The agreement which expresses this was signed by the Secretary of the Mexican Secretariat for Agriculture, Livestock and Rural Development (SAGAR), and is published in the official Federal Gazette (7).

The General Directorate for Animal Health in Mexico identifies three categories of diseases which must be compulsorily notified to the animal health control authorities, as follows:

a) exotic diseases which, if suspected or confirmed, require immediate notification
b) enzootic diseases which require immediate notification
c) enzootic diseases of relative importance for which notification is conducted every month (10).

These disease categories determine the course of action taken in response.

Mexico also has National Campaign Disease Eradication Programs, which are included in the second disease category. These programmes have official standards which outline the objectives and scope of the programme to eradicate the disease. These standards include specific details on epizootiological surveillance, quarantine measures and control measures to manage the outbreak of disease and activate the emergency response plan. These campaigns generally have three phases, as follows:

- control of the disease
- eradication of the disease
- recovering disease-free status.
The CPA works in partnership with many organisations to achieve effective AHEM in Mexico. Some of these partners are as follows:

- animal producers
- academics
- animal health practitioners
- the police
- the military
- diagnostic laboratories
- slaughter facilities
- the public health service.

Together their mission is to achieve the following:

- secure disease-free status
- increase productivity
- ensure food safety
- decrease zoonoses
- decrease the risk to public health
- increase access to international markets.

**United States of America**

One of the primary responsibilities of the United States Department of Agriculture (USDA) is to protect American agriculture and livestock from the consequences of disease, thus preventing any degradation in the quality and quantity of the public food supply. The responsibility for AHEM in the USA lies with the Veterinary Services (VS) unit of the Animal and Plant Health Inspection Service (APHIS), an agency within USDA. The VS unit has established an AHEM system to prevent the introduction of FADs into the USA and to control and eradicate such diseases if they do gain entry. Import regulations are strictly enforced to protect animal industries. However, if an FAD does enter the USA, VS would immediately take action, in cooperation with the States and agriculture industry, to bring the situation under control and to eradicate the disease.

AHEM is co-ordinated by the Emergency Management Coordination Center unit of VS. The mission of the Emergency Management Coordination Center is to prevent destructive and harmful effects on the health of animals and human populations in the USA from an epizootic of a foreign or emerging animal disease or from technological and natural disasters. To accomplish this, the Emergency Management Coordination Center has developed and maintained a high level of expertise and preparedness. It leads and co-ordinates rapid response efforts to safeguard the well-being of animal populations and to enhance public health. The primary responsibility of the Emergency Management Coordination Center is to ensure prompt evaluation of suspected FAD outbreaks, and, when an FAD is diagnosed, to co-ordinate a prompt and thorough response to eradicate the disease.

The USA has expanded the definition of an animal health emergency to include more than FADs. The expanded definition is as follows: 'any sudden, negative economic impact related to the appearance of a disease which could have a direct impact upon productivity, present a real or perceived risk to public health, or present a real or perceived risk to a foreign country which imports from the United States' (16).

The general structure of the AHEM system in the USA comprises three levels: local, regional and national. The emergency response is organised through the Regional Emergency Animal Disease Eradication Organization (READEO), although there are other response structures. In accordance with the overall USDA objective of reviewing and evaluating the placement, organisational structure and provision of staff and other resources throughout government organisations, APHIS is consolidating the four regions of VS into two. In anticipation of this consolidation, VS took a proactive role and immediately restructured the four organisations of the READEO into two, an eastern READEO and a western READEO. This enables VS to maintain a stable emergency response capability during this restructuring in the event of the appearance of an exotic or newly emerging domestic animal disease.

The USA is in the process of reinforcing the AHEM system. All partners are very involved in this effort and they include the following:

- national industry groups
- State governments
- academia
- professional animal health organisations
- veterinary diagnostic laboratories
- the Department of Defense
- other Federal agencies.

These bodies work together in partnership to ensure an appropriate response to any potential threats to the animal population of the USA. Part of the process of reinforcing and strengthening the AHEM system involves the close evaluation of emerging issues and other disease conditions, in addition to FADs, which may have a significant negative impact on agriculture. The objective is, through these partnerships, effectively to prevent, detect, respond to and recover from animal health emergencies which may have a sudden negative impact of economic significance.

Co-ordination of the AHEM system, with timely and effective communication and reporting, will help to achieve the broad goals of the programme. These goals are as follows:

- to develop partnerships which enable effective AHEM
- to help the agricultural industry of the USA to provide an abundant, safe and inexpensive food supply (food security)
- to ensure that the animal production industries of the USA operate as efficiently as possible.
Tasks (functions and responsibilities)

AHEM is divided into four parts or phases, all of which are interrelated, as follows:

- prevention
- preparedness
- response
- recovery.

Prevention

The prevention phase involves actions taken to avert the incursion of an FAD or of a foreign pest into the country. Prevention encompasses international surveillance, risk assessments and research. Inspection systems at 'points of entry' into North America are paramount in preventing diseased animals or infected animal products from entering the country. Each country in North America sets its own policy on imports. This enhances the prevention process by establishing standards followed by each country for animals or animal products imported from other parts of the world. Through research, scientists can develop state-of-the-art technologies which can be implemented through the policies which each nation sets.

Preparedness

The preparedness phase involves the actions taken to equip each country with the tools to deal with animal health emergencies. Preparedness includes the following:

- domestic monitoring and surveillance
- development and enhancement of response plans
- maintaining networks of experts or key contacts in relation to emergency management
- education and training
- conducting various test exercises or simulations.

Response

The response phase involves the actions taken to ensure the control and containment of the disease situation or outbreak. The first task in the response phase is to identify the emergency. This includes analysing the situation to determine the level of response necessary to control the disease, and the implementation of this response.

Regionalisation may need to occur for the affected area or location. Regionalisation refers to the division of areas into regions or zones. Regions may be countries or States, part(s) of a country or State, groups of countries or States, or groups of parts of countries or States. This concept is founded on the premise that disease control restrictions on the movement of animals and animal products are biologically and ecologically sound when enforced in areas which are geographically similar in terms of disease distribution and livestock health control infrastructures.

Recovery

The recovery phase involves the process of recuperation which comes when the emergency is no longer a threat or has been brought under control during the eradication process. Recovery represents a largely unexplored area of animal health emergency management. Assistance given to those affected by the emergency has typically revolved around the concept of indemnification: that is, monetary compensation for losses incurred when animals are slaughtered or equipment destroyed in the process of containing the outbreak. During the recovery phase, export protocols may need to be renegotiated with trading partners, consumer expectations must be met and reassurances provided and a review and evaluation of the emergency response should occur. This review should identify areas within the system that may be improved so appropriate changes can be made.

Animal health emergency management future vision

The countries of North America expect that the future will bring a more harmonious system which will enable all three countries to interact in a prompt and effective partnership on matters involving AHEM. The Canadian system looks toward a single agency-wide programme within Canada, with more industry involvement in the four areas of AHEM. The Mexican system is considering future projects to enhance electronic systems of information and epidemiological surveillance. The USA is working to build a dynamic AHEM system which includes evaluating the entire system from infrastructure to implementation.

Current systems: animal health emergency management infrastructure

Canada

The principal authority of the AHEM system in Canada is held by the Minister of Agriculture and Agri-Food Canada, followed by the President of the CFIA, the Vice-president of Programs and the Executive Director of the Animal Products Directorate, successively. Responsibility for AHEM is centred in the Animal Health and Production Division of the Animal Products Directorate. The infrastructure for the Canadian AHEM system is provided by the Foreign Animal Disease Eradication Organization (FADEO) (Fig. 1). The eradication of FAD outbreaks is the responsibility of FADEO, which is managed by the Animal Health and Production Division. Specifically, FADEO consists of the following:

- the President of the CFIA
- the National Emergency Director
An organisational chart of the Foreign Animal Disease Emergency Organization (FADEO), Canada

- the National Emergency Manager
- the Regional Emergency Manager.

As mentioned above, NEMT is a pre-determined emergency organisation which is located in Ottawa, at CFIA Headquarters. This team is responsible for the overall management, co-ordination and direction of the emergency response. The NEMT team is also responsible for providing policy and resources. The purpose of the RERT is to respond rapidly to the first evidence of an FAD outbreak and then to organise and direct eradication operations in the field until the emergency is successfully resolved.

There are seven animal and plant health laboratories within the Laboratories Directorate of the CFIA in Canada. These laboratories comprise sixteen centres of expertise in animal and plant health. The centres undertake technology development projects and provide diagnostic services and scientific support for the programmes. All activities in the laboratories are managed centrally by the Laboratories Directorate. The centres of expertise are located in the seven laboratories, as follows:

a) the Animal Disease Research Institute, Nepean, Ontario, has six centres of expertise, as follows:
   - avian diseases
   - biological evaluation
   - brucella germplasm (semen and embryos)
   - mycobacteria
   - plant quarantine pests
   - rabies.

b) the Center for Animal and Plant Health, Charlottetown, Prince Edward Island, has two centres of expertise, as follows:
   - retroviruses
   - regulated potato diseases

c) the Health of Animals and Food Laboratory, Ste. Hyacinthe, Quebec, has one centre of expertise, as follows:
   - indigenous porcine diseases

d) the Health of Animals Laboratory, Saskatoon, Saskatchewan, has one centre of expertise, as follows:
   - parasitology

e) the Animal Diseases Research Institute, Lethbridge, Alberta, has three centres of expertise, as follows:
   - diseases of non-traditional livestock
   - indigenous bovine and equine viral diseases
   - leptospirosis

f) the National Center for Foreign Animal Diseases, Winnipeg, Manitoba, has one centre of expertise, as follows:
   - FADs

gh) the Center for Plant Health, Sidney, British Columbia, has two centres of expertise, as follows:
   - plant viral diseases
   - phytoplastmal diseases.
Information on the CFIA can be accessed on the following worldwide website: [http://www.cfia-acia.agr.ca/](http://www.cfia-acia.agr.ca/).

In the spring of 1998, the three-tiered veterinary infrastructure which exists in Canada included a total of 3,269 veterinarians, as follows:

- 164 provincial veterinarians
- 527 Federal veterinarians
- 861 large animal practitioners
- 1,717 mixed animal practitioners

**Mexico**

Principal responsibility for the Mexican AHEM system begins with the Secretary of SAGAR, followed by the Sub-secretary of Agriculture and Livestock and the National Commission for Animal and Plant Health, successively. This Commission has three components, as follows:

- the General Directorate for Animal Health
- the General Directorate for Plant Health
- the General Directorate for Phytozoosanitary Inspection in Ports, Borders and Airports.

The CPA falls under the General Directorate for Animal Health. The Mexican AHEM system includes the DINESA, which is managed by CPA (Fig. 2). The DINESA is responsible for conducting and co-ordinating all activities for the control and eradication of exotic diseases when it has been activated by the Government.

The laboratory structure in Mexico centres around the primary diagnostic laboratory for exotic diseases, the CPA laboratory. This facility has level 3 biocontainment capability (11). The National Centre of Diagnosis in Animal Health Services (CENASA) laboratory is the national laboratory which performs all other testing. There are 136 official laboratories, 48 private laboratories and 33 university and research laboratories (A. Heneidi Zeckua, personal communication). The CPA and CENASA laboratories are reference laboratories for Mexico and approve all other laboratories in the country.

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![An organisational chart of the National Animal Health Emergency Mechanism (DINESA), Mexico](Fig. 2)
The resources of Mexico include 4,259 certifications in specific disease categories given to approved veterinarians (one veterinarian may be certified in more than one specific disease category). The numbers of veterinarians in Mexico are as follows:
- 9,090 official veterinarians
- 6,599 laboratory, university and training institution veterinarians
- 15,612 private practitioners
- 1,722 veterinarians in other categories (A. Heneidi Zeckua, personal communication).

An approved veterinarian is a professional veterinarian authorised by SAGAR to verify compliance with official Mexican standards and to issue sanitary certificates (animal health certificates) for animal movement, which notify the presence of a serious disease through a certifying body or deal with specific health matters (8). Prior to 1998, approved veterinarians were certified for a two-year period; however, this has been modified to a one-year period.

**United States of America**

The chain of command in the USA system begins with the Secretary of Agriculture (the head official of the USDA), followed by the Under Secretary for Marketing and Regulatory Programs.APHIS, which includes VS, is a part of Marketing and Regulatory Programs. The AHEM infrastructure in the USA has two major components: headquarters and the field. The Associate Deputy Administrator for VS directs both components to ensure consistent and rapid decisions and information flow. The Emergency Management Coordination Center unit, which is a part of headquarters, is organised into sections to optimise functions in both emergency and non-emergency situations. These sections include the following:
- investigation
- co-ordination in the field
- disaster management and co-ordination
- planning
- training (personnel development, technical training)
- technical support
- special project management.

During an emergency, various functions performed by headquarters would be centralised in the 'Emergency Response Center' (ERC), in Riverdale, Maryland, USA, where the Associate Deputy Administrator would oversee operations. The ERC would be staffed with personnel from several different entities, including, as follows:
- APHIS (staff from Legislative and Public Affairs, the Emergency Management Coordination Center unit, Plant Protection and Quarantine, International Services and Import and Export unit)
- industry representatives
- the military
- disease experts.

These individuals will make up the 'emergency response round table'.

The READEO provides the field structure for AHEM (Fig. 3). Functional areas within READEO include the following:
- the office of the Director
- administrative support
- field operations
- technical support.

The National Veterinary Services Laboratories (NVSL), located in Ames, Iowa, and Plum Island, New York, combine to make up the Federal facility in the USA which diagnoses animal diseases, both domestic and foreign. These are the USA reference laboratories for FADs. The NVSL also support the Center for Veterinary Biologics Laboratory and its mission to evaluate veterinary biologics. Administered under VS, NVSL are a key element in the support of Federal animal health programmes. The NVSL are reference laboratories which aid many bodies in the diagnosis of animal diseases, as follows:
- State and Federal agencies and laboratories
- private laboratories
- educational institutions
- foreign governments.

These NVSL provide many services, as follows:
- analytical services
- scientific information
- developmental activities
- guidance for quality assurance
- training for foreign animal disease diagnosticians (FADDs)
- training for VS programmes.

They also work closely with the International Services of APHIS, providing consultation, reagents and training for foreign governments. The NVSL are recognised by the World Health Organization (WHO), the Food and Agriculture Organization (FAO) and the Office International des Epizooties (OIE) as the reference laboratories for more than 25 diseases of livestock and poultry.

The NVSL were established as an OIE Collaborating Centre for the Americas in 1996 and support the mission of the OIE to improve and harmonise laboratory capabilities among Member Countries. In their capacity as OIE Collaborating Centres, the NVSL operate as centres of diagnostic expertise, standardisation and dissemination of techniques. In addition, they develop procedures which aid in the harmonisation of
International regulations for the surveillance and control of animal diseases. They also perform the following:

- place expert consultants at the disposal of the OIE
- provide scientific and technical training to personnel of Member Countries
- organise scientific meetings
- co-ordinate scientific and technical studies in collaboration with other laboratories
- publish and disseminate useful information to Member Countries.

There are four laboratories within the NVSL, as follows:

a) the Diagnostic Bacteriology Laboratory (DBL). The DBL provides diagnostic support for APHIS programmes and assistance to State, Federal, university and foreign laboratories. It does this through the isolation and identification of pathogenic bacteria from animal tissues and fluids, and through serological examinations to find evidence of exposure to diseases caused by bacteria, fungi and protozoa.

b) the Diagnostic Virology Laboratory (DVL). The DVL provides diagnostic support for APHIS programmes and in the identification of FADs, as well as diagnosing domestic diseases through virus isolation and identification and through serological tests.

c) the Foreign Animal Disease Diagnostic Laboratory (FADDL). The responsibilities of FADDL are to diagnose animal diseases foreign to the USA. Tests are conducted on animals and animal products for the presence of exotic animal disease agents. This laboratory also manages and maintains the North American Foot and Mouth Disease Vaccine Bank.

d) the Pathobiology Laboratory (PL). The PL provides differential diagnostic studies of animal diseases. This laboratory is the national reference centre for confirmation and/or diagnosis of various VS programme diseases (e.g. transmissible spongiform encephalopathies, bovine tuberculosis, screwworm myiasis and cattle fever ticks).

Information on the NVSL can be accessed on the following worldwide website: http://www.aphis.usda.gov/vs/nvsl.
The VS Centers for Epidemiology and Animal Health (CEAH) in Fort Collins, Colorado, received endorsement as the OIE Collaborating Centre for Animal Disease Surveillance Systems and Risk Analysis at the 1998 OIE General Session. These CEAH were recognised for their international leadership in establishing approaches for national monitoring of animal health, alternative animal disease surveillance systems and methodologies for trade risk analysis. In their role as a global collaborating centre, CEAH will develop a formal training schedule to perform the following:

- extend the benefits of their experience and expertise to other OIE Member Countries
- respond, as appropriate, to requests for assistance from individual countries
- continue in their efforts to achieve new levels of expertise, despite rapidly changing animal health issues
- co-operate with the initiatives of other OIE Collaborating Centres.

The USA uses an epidemiological delivery system as the basis for its veterinary infrastructure. There are a group of over 400 trained FADDs, including Federal, State and military veterinarians, who conduct FAD investigations (J. Belfrage, personal communication), as well as more than 58,000 accredited veterinarians who report new or unusual disease conditions and suspected exotic or emerging diseases. Figure 4 illustrates the distribution of FADDs in the USA. More than one FADD may be represented by each symbol used in the figure.

The field veterinary structure includes an Area Veterinarian-in-Charge (AVIC) for each State in the USA, with veterinary medical officers and animal health technicians assigned to ensure coverage of each county within every State. Each State also has its own government veterinary infrastructure, including a State Veterinarian or State Animal Health Official, with field veterinarians assigned to cover the State territory. In addition, there are many Federal veterinarians working at headquarters who develop policy and provide support for VS.

The following information gives examples of the types of activities in which the countries of North America are engaged, in relation to prevention, preparedness, response and recovery for AHEM. It is not intended to be all inclusive.

Fig. 4
Distribution of military, Federal and State foreign animal disease diagnosticians in the United States of America, April 1998
Prevention activities in North America

Canada

The CFIA works to protect Canada from the incursion of FADs and pests through various activities, as follows:

- international surveillance
- import-export policies
- border security
- risk assessment
- a biologics programme.

International surveillance enables Canada to assess the disease status of other countries. This influences the policies developed by the import-export staff, to ensure that contaminated animals or animal products do not enter Canada. These policies are then used to set conditions for imports and the issuing of permits for the entry of animals or animal products into the country. There are also three Import Service Centers, unique to Canada, which handle documents and reduce the number of necessary border stations. Canada also monitors the movements of pathogens between laboratories by means of permits. This aids in the prevention of exposure to disease agents.

Risk assessments are performed by the Animal Plant Health Risk Assessment Network (APHRAN). More precisely, APHRAN conducts risk assessments on imports and other sources of risk, both domestic and international, which may have an impact on Canada.

Canada has collaborated with the USA on the North West Pilot Cattle Project. This project facilitates the movement of cattle between the two countries while ensuring that the risk of introducing diseases associated with cattle into either country is minimised.

The biologics programme in Canada evaluates animal vaccines to ensure that they are not contaminated with organisms which could cause FADs or other notifiable diseases in the animal population. Canada is also involved in the technical development of diagnostic tests for disease detection to prevent the entry of animals which may transmit pathogens.

Mexico also monitors the international disease situation to minimise the risk of disease entry into the country.

The Mexican government has a very strong border security system which monitors the internal borders between regions as well as regulating their external borders. The General Director for Phytosanitary Inspection (DIGIF) of the National Commission for Animal and Plant Health is responsible for preventing the introduction of and controlling exotic animal diseases at airports and seaports and on land within Mexico. The mission of the DIGIF is to minimise the risk of introduction of diseases or pests which affect agriculture and livestock (both plants and animals) in Mexico, as well as to control their dissemination within the country itself. There are a total of 380 inspection check-points in the country for international and domestic inspection. There are 104 international phytosanitary inspection sites, including 47 satellite inspection check-points and 57 full-time inspection check-points (F. Contreras Domínguez, personal communication).

Mexican officials use different types of inspection protocols to help prevent problems at the borders. There are pre-clearance protocols as well as specific work plans. These plans detail the standards for imports from other countries in advance, to minimise difficulties at borders and reduce risk. Mexico issues documents outlining the minimum requirements with which importers must comply. These are available electronically and are called Hoja de Requisitos Zootécnicos (E. Serrano Pérez, personal communication).

Mexico has established a risk analysis office to assess importation and exportation procedures to ensure safer trade of animals and animal products. Some inspectors from Mexico are stationed at the ports of origin in other countries, to ensure that the agricultural product or livestock meets the appropriate standards and will not present a risk.

Mexico has divided its country into six regions, protected by five Federal quarantine sanitary and phytosanitary lines (Fig. 5). The inspection control points on these borders constitute the national surveillance system. The objective is to isolate and protect the six different regions having similar sanitary and phytosanitary characteristics. A total of 323 technical personnel, including veterinarians, biologists and agronomists, staff these inspection bases (F. Contreras Domínguez, personal communication).

Mexico generally accepts imports from countries free from exotic diseases or imports consisting of low-risk animals or animal products. The General Directorate for Animal Health sets import policies for Mexico. Risk analyses are performed to assess the level of risk involved in the particular issue before the Directorate.
Research is conducted primarily by the National Institute for Research in Agriculture and Livestock and Forestry. At present, research is being performed on vaccine use in avian influenza and Venezuelan equine encephalomyelitis and on the behaviour of these viruses in the field. The School of Veterinary Medicine at the National University of Mexico is also researching the avian influenza virus.

Through regional co-ordinators, the CPA holds promotions to educate the public on the effects of exotic diseases, their transmission and the role of the consumer in their prevention.

**United States of America**

In regard to the USA, prevention activities concentrate on the following areas:
- international surveillance and risk assessment
- inspections and quarantine at points of entry into the country
- import and export policies
- diagnostic testing
- research.

The USA is involved in the international surveillance of FADs, as well as in risk assessments to determine the potential impact of specific FADs on the country. The VS continually monitors the animal disease status of those countries exporting animals and animal products to the USA. This is conducted with the assistance of International Services (APHIS), to safeguard the health of the USA livestock, poultry, wildlife and human populations, while simultaneously promoting safe international trade. This task is performed on a region-by-region, commodity-by-commodity, disease-by-disease basis, and requires satisfactory risk-mitigation procedures to ensure that animal health risks are negligible when animals and animal products are exported to the USA. Some of the risk factors evaluated are as follows:
- compliance with international standards for each specific risk
- compliance with the provisions of the Agreement on the Application of Sanitary and Phytosanitary Measures of the WTO
- compliance with the provisions of the North American Free Trade Agreement (NAFTA).

Experts in animal health risk analysis at CEAH and at the National Center for Import and Export in Riverdale, Maryland, conduct risk assessments and cost-benefit analyses in response to specific requests to import animals and animal products. When considering regional approaches to import requirements, the USA employs the regionalisation regulation published in the *Federal Register* on 28 October 1997. Country-by-country import requirements can be considered in conjunction with regional approaches when assessing importations from parts of one or more countries or from groups of countries. Importations from both disease-affected and disease-free regions present variable levels of risk, according to various factors, as follows:
- trade practices
- closeness to disease-affected areas
influenza H5N1 in Hong Kong. Finally, ARS also supports the pathies. Moreover, ARS is researching control methods for ARS are collaborating on the development of a 'pre-clinical' level. Nationwide implementation of these guidelines will also health officials have developed their own State AHEM plans to protect the animals within their jurisdiction. The VS is involved in the importation of a particular type of commodity from a particular region.

Border security is another issue of concern for AHEM in the USA. Port inspections ensure that no high-risk animals or animal products enter the country. Veterinarians conduct point-of-entry inspections and quarantine live animal and bird imports. More than 1,800 APHIS inspectors deployed at ports of entry restrict the introduction of exotic diseases by inspecting passenger baggage, controlling aircraft and ship garbage and checking animal products and germplasm certificates. There are fifty canine teams working from the airports and assisting in baggage inspection (J. Smith, personal communication).

At the State level, there are specific controls on the movement of animals within State borders and when entering a State. These standards are set by the agricultural divisions of the individual State governments and help to decrease or prevent the spread of disease across the USA. Many State animal health officials have developed their own State AHEM plans to protect the animals within their jurisdiction. The VS is currently developing guidelines for AHEM plans at the State level. Nationwide implementation of these guidelines will also help to strengthen the AHEM system at the national level.

The USA is currently involved in research that will enhance AHEM disease prevention activities. Examples include the efforts by the USDA Agricultural Research Service (ARS) and APHIS. The Plum Island Animal Disease Center is a joint facility shared by ARS and FADDL (APHIS). At the Plum Island Animal Disease Center, FADDL is in the process of evaluating technology developed by the University of Florida for the detection of heartwater disease, using polymerase chain reaction techniques. On Plum Island, ARS is working on a new diagnostic test for classical swine fever (hog cholera) and a diagnostic test to distinguish a natural foot and mouth disease (FMD) infection from the immune response in an animal which has been vaccinated with FMD. The NVSL and ARS are collaborating on the development of a 'pre-clinical' diagnostic test for transmissible spongiform encephalopathies. Moreover, ARS is researching control methods for avian influenza and, more recently, has assisted with the development of a vaccine to protect poultry against avian influenza H5N1 in Hong Kong. Finally, ARS also supports the USA Cattle Fever Tick Program by testing acaricides to prevent vector-transmitted diseases. The NVSL are also developing diagnostic tests to assist in this disease prevention process.

Preparedness activities in North America

Canada

Preparedness in Canada revolves around the concept of contingency planning. Preparation in advance prevents delays and confusion during an actual emergency operation. The principal concept in contingency planning is rapid and effective organisation, which is the key to successful FAD eradication. Canada has developed a generic response manual, entitled Manual of Procedures for Foreign Animal Diseases, which contains the contingency plans for FAD eradication, the specific duties of each member of every team which is involved in the emergency operations and the disease policies for specific diseases (3). This Manual was developed and is maintained by the Animal Health and Production Division. However, the disease strategies or policies are developed by the Policy and Epidemiology Team (PET) at the new National Center for Foreign Animal Diseases in Winnipeg. Once approved, these policies become a component of the Manual of Procedures. Canada has also developed a 'Go-Kit', maintained at field offices, which contains all the equipment needed by the diagnostic teams who conduct FAD investigations on-site. The contents of the Go-Kit are also specified in the Manual of Procedures.

The Manual also contains the FADES plan. The purpose of this plan is to identify the arrangements whereby Federal, Provincial and local agencies will provide the regional assistance required by the CFIA during the eradication of an FAD outbreak. Each Province has its own FADES plan to assist CFIA in the eradication process.

Disease surveillance in Canada is co-ordinated by the Disease Surveillance Unit of the Science Division, whose major programmes comprise the Canadian Animal Health Network (CAHNet) and the National Surveillance Programs for Bovine and Porcine Diseases. In general, this involves active surveillance, such as outbreak investigations which describe the aetiology, risk factors involved in and significance of an outbreak. These investigations help Canadian officials to prepare for animal health emergencies in the future. Surveillance also helps to identify national trends. The Disease Surveillance Unit co-ordinates and designs national surveys and post-outbreak surveys. In addition, CAHNet collects and disseminates information and the National Surveillance Programs conduct regular surveys on bovine and porcine diseases. In the spring of 1998, CAHNet published the first edition of the CAHNet Bulletin, providing information to all animal disease surveillance partners in Canada. For the
purposes of the *CAHNet Bulletin*, surveillance comprises three broad categories, as follows:
- data gathering
- data evaluation
- communication of knowledge (2).

Figure 6 illustrates the CAHNet organisation.

The Canadians conduct simulations or test exercises to assess the preparedness of the country. The simulations are generally complete, full-mobilisation exercises in which the NEMT and RERT are relocated to the actual field sites which would be used during a potential emergency and the mock exercise is conducted. These simulations usually involve one or more regions and are managed by the organisation headquarters.

The staff veterinarian for FADs at the Animal Health and Production Division audits the emergency response teams to assess preparedness.

Education and training are another aspect of preparedness on which Canada concentrates. Education and training exercises are conducted annually and, in the future, the focus for these activities will be the new National Center for Foreign Animal Diseases in Winnipeg. The target audiences for FAD training are the Federal field veterinarians in the regions and the veterinarians in the Food Inspection division. Annual training is also conducted for other field employees, as are workshops for the RERTs. In one example of the international involvement of Canada in education and training, 34 Federal veterinarians were sent to the Netherlands to assist with a...
classical swine fever outbreak. This event gave the veterinarians practical, ‘hands-on’ experience in managing an actual FAD outbreak.

The National Center for Foreign Animal Diseases in Winnipeg will offer major support for the Canadian AHEM system. The Center focuses on diagnostic testing to identify devastating foreign diseases which could threaten Canadian livestock. This high-security laboratory (containing biosecurity capabilities up to and including level 4) also provides analysis and scientific advice for Canadian policy-makers. The laboratory works to achieve preparedness by ensuring that diagnostic regimens are up-to-date, by conducting validation tests on every new procedure and by performing annual ‘blind’ testing to check the readiness of the technicians. Blind panels (that is, samples which are of unknown origin to the technicians) are conducted to check the level of preparedness of the staff. This laboratory is independently audited to ensure that the highest standards for techniques and biosecurity are maintained.

Mexico

A major component in preparedness activities in Mexico is CPA surveillance. The National System of Surveillance and Epidemiology (SIVE), a section of CPA, manages the Mexican surveillance system. The purpose is to obtain timely, consistent, complete and reliable information regarding diseases in animal populations. This surveillance system is based on the notification given by various animal health services at the operational, intermediate and central levels, or by their institutional equivalent (e.g. other government agencies, such as the Secretariat of Human Health, or international agencies, such as the Pan American Health Organization). Such information is then used in planning, implementing and evaluating diagnostic activities, as well as in disease prevention, control and eradication programmes.

Five types of surveillance are used by CPA, as follows:
- general disease surveillance
- emergency outbreak surveillance
- specific disease surveillance
- complementary surveillance
- disease control measure surveillance.

General disease surveillance serves two purposes, as follows:
- it is a source of epidemiological information
- it is an evaluation tool for the activities of CPA.

Emergency outbreak surveillance is used during an outbreak and has a completely different database, specifically designed to meet the information requirements of the emergency. Specific disease surveillance gathers specific information, such as seasonality, strain predominance over time, and locations or States of higher incidence. Complementary surveillance fills in information gaps from the initial collection of data, and disease control measure surveillance evaluates the effectiveness of actions taken to prevent the spread of the disease. All of these types of surveillance are supported by SIVE information.

These surveillance models assist Mexico in preparing to deal with an animal health emergency. They perform a wide range of functions, as follows:
- aid in the development of strategies for the future
- provide guidelines for monthly reporting requirements
- identify trends
- evaluate disease control efforts
- assist with economic impact studies
- identify emerging and re-emerging diseases
- rank disease campaigns in order of priority
- help in identifying domestic and international disease-free zones.

This information is placed on the electronic database Epi-Info for evaluation and dissemination (17).

Education and training efforts in Mexico are aimed at many groups, including the following:
- research centres
- laboratory workers
- GEESAs (State Animal Health Emergency Groups)
- zoo workers
- official veterinarians
- veterinary medical students
- representatives of the agricultural industry.

CPA offers various formal courses, as follows:
- Autosim I (a foot and mouth disease exercise)
- Autosim II (a swine pest exercise)
- Avian Influenza Autosim (exercise)
- external quarantine
- internal quarantine
- Autozoo
- a course for veterinary medical students.

Mexico also promotes public awareness of FADs through a range of activities, as follows:
- promotional visits
- the Exotic Diseases Book
- the DINESA Bulletin
- conferences
- illustrated manuals, brochures and written materials.

In addition, SIVE gives both general and advanced courses on epidemiology and risk analysis. Test exercises are conducted on a regional basis.

The official laboratories of Mexico participate in preparedness training by ensuring that reagents are available for testing, training laboratory personnel in new techniques and evaluating reports from SIVE, among other tasks.
United States of America

At present, in the USA, preparedness activities are concentrated in the following areas:
- surveillance and reporting
- education and training
- test exercises
- reviewing the overall AHEM system.

Surveillance traditionally involves investigations of suspected FADs, focused studies, investigations of disease outbreaks and surveillance of endemic diseases, such as bluetongue. When the aetiology is known, surveillance is centred around the incidence and the economics of the disease. When an outbreak is of unknown aetiology, identification of the causative agent and its significance are the priority. The USA is developing a surveillance system for identifying emerging disease conditions.

Reporting of investigations is important as it documents these epidemiological investigations, helping to provide an overall 'picture' for AHEM and to identify national trends. Reporting also allows the country to notify its trading partners of disease occurrences and to meet the OIE reporting requirements, as well as providing justification for the allocation of resources and expenses. The USA uses the Field Epidemiologic Data System for tracking disease conditions which clinically mimic FADs.

Test exercises are conducted at various intervals at the national and State levels. These exercises may take the form of complete, multi-level exercises, incorporating all levels and branches of the emergency response structure, or they may be in the form of table-top (i.e. planning) exercises. One State or group of States will call together both Federal and State animal health officials and incorporate other partners into the test exercise, such as industry, academics and the military. There may be telephone exercises to assess the list of key contacts of the responsible AHEM personnel, such as their State contact for cleaning and disinfection or carcass disposal. The major purpose of a test exercise is to help maintain proficiency in disease eradication and an effective AHEM system.

Education and training are the cornerstones of preparedness for the AHEM system. The USA has a professional training staff, Organizational and Professional Development (OPD), APHIS, who develop FAD training and education in partnership with the Emergency Management Coordination Center of VS. The VS is committed to ensuring the highest level of competence of FADs, veterinary medical officers and laboratory diagnosticians in their ability to diagnose FADs. Many educational and training courses are produced by the Emergency Management Coordination Center, as follows:
- a wildlife seminar on FAD preparedness
- an FADs satellite television seminar (which is beamed to over seventy downlink sites throughout the USA and three outside the USA). This seminar incorporates the regional participation of the USDA, many colleges of veterinary medicine, several veterinary science departments and industry colleagues
- an FAD course at FADDL, Plum Island, New York (targeting Federal veterinarians, State animal health officials, the military and veterinary pathologists)
- FAD awareness training as part of continuing education.

In addition, CFAH produce an epidemiology training course and a geographic information systems (GIS) training course in Fort Collins, Colorado. It is essential that the READEO teams maintain competency in their areas of expertise through continuing education and training. This ensures that APHIS can provide effective and efficient units capable of quickly eliminating any FAD.

Other training materials developed and produced by the Emergency Management Coordination Center in conjunction with OPD include the CD-ROMs continuing education tool for FADs, the seven-volume FAD educational kits and the FAD response plans and guidelines, as well as a host of presentations and information fact sheets. The USA also has FAD diagnostic kits prepared for field veterinary use when investigating suspected cases of FADs. These kits contain all the equipment and materials needed to collect specimens in the field for laboratory evaluation.

In addition to the support provided in the area of infrastructure (see 'Animal health emergency management infrastructure', above), the NVSL also aid in preparedness in the USA by providing reference materials, through diagnostic testing and through check testing. Check testing is a validation process for assessing other laboratories and their personnel to evaluate their level of preparedness in diagnostic skills.

In 1997 and 1998, APHIS has also worked diligently to assess the level of preparedness for animal health emergencies in the USA. At the request of the Advisory Committee for Foreign Animal and Poultry Diseases, to the Secretary of Agriculture, VS invited the other quadrilateral countries (Australia, Canada and New Zealand) to participate in a complete review of the USA AHEM system and to advise on the appropriateness of the direction being taken by that programme. Extensive consultation provided opportunities for many parties with direct interests in the USA AHEM system to demonstrate their current activities, explain proposed directions and present issues and concerns to the Quadrilateral Review Team for consideration. This resulted in a formal report by the Quadrilateral Review Team, entitled, Quadrilateral Review of the United States Animal Health Emergency Management System (6), outlining their impressions and recommendations. This has proved helpful to the USA in assessing its level of preparedness, and action has already been taken to implement the necessary modifications to enhance the system, as proposed by the Report.
Response activities in North America

Canada
The initial animal health emergency response in Canada is divided into two levels of activity, as follows:

- phase I: alert
- phase II: mobilisation (3).

Phase I is a preparatory stage, which is initiated when an outbreak is suspected but not confirmed. It begins when a veterinary inspector quarantines premises suspected of being infected and advises the Regional Animal Health Program Manager through his or her supervisor. Phase II commences with the declaration of the positive diagnosis by the Minister of Agriculture and Agri-Food Canada, once the disease has been confirmed by laboratory tests. Representatives of Federal and Provincial agencies will report to the National or Field Operations Center(s), as required, to assist in the preparation, planning and eradication operations.

All notifications of a suspected FAD go through the chain of command to determine the appropriate response, if any, and to alert the appropriate personnel. There are three possible levels of initial response. The first response is for a 'no-risk situation'. In this scenario, it is determined that there is no potential risk of an animal health emergency and no samples are collected. The second level of response is the 'low-risk situation'. In this case, veterinary professionals have determined that there is a slight risk and 'confirmatory negative' samples are collected and sent to the laboratory. 'Confirmatory negative' means that the veterinary professionals do not feel that the clinical picture is likely to present an animal health emergency but a minimal risk may exist so samples are collected and sent to the laboratory. The laboratory does not attach any priority to these samples, which are processed within regular procedures. The last level is that of a 'high-risk situation'. In a high risk situation, samples are collected, a pre-determined sequence of alerts is implemented and samples are then sent under high priority to the laboratory while the premises are quarantined (3). The appropriate risk level is determined by on-site analysis in consultation with the area office.

The AHEM response is centrally managed in Canada under the leadership of the National Emergency Director. During the implementation of and mobilisation for the emergency response, the NEMT and RERT are called into action and mobilised at their operations centre(s). The NEMT operates out of the national headquarters site for disease eradication. The field teams (RERTs) operate out of the field operations centre(s), which are established in a central location near the outbreak.

Other response structures in Canada include the High Visibility Issues Committee, which is called together to address major topics of concern, which may include FADs. Canada may also employ special task forces which have been designed to deal with a specific animal disease.

Mexico
In Mexico, the emergency response is co-ordinated by CPA at headquarters and DINESA in the field. Basically, there are three possible outcomes after the disease agent has been identified, as follows:

a) no action is warranted
b) the identified disease is managed through normal methods
c) DINESA is activated.

When a producer or private veterinarian suspects the presence of an exotic disease (which may present clinically as a disease with a high mortality rate or with unusual clinical signs), he or she can notify a variety of personnel through a pre-determined information flow or can contact CPA headquarters or the regional co-ordinator and SIVE directly.

Once notice of the suspected disease is given, the regional co-ordinator conducts an investigation of the case or an official veterinarian is appointed to perform that task. Samples are collected and sent to the high-security laboratory in Mexico City. Diagnostic results flow in two directions simultaneously (Fig. 7). One direction is toward the investigator, who in turn notifies the producer, and the other is to the Director General of Animal Health. On occasion, samples are sent directly to the laboratory by private veterinarians (17).

The investigation strategy in Mexico has three components, as follows:

- notification of the suspected disease
- follow-up
- closure (10).

Notification of diseases to the General Directorate for Animal Health and SIVE is obligatory for those involved to a greater or lesser extent with animals and animal products. Follow-up refers to the field actions undertaken in the area or zone affected, and requires the close co-ordination of all participants. Closure of outbreaks or reports is the final step in the process and occurs when it becomes certain that there is no further animal health risk.

An emergency response is activated when laboratory test results indicate the presence of a disease condition of concern to Mexico. This triggers the activation of DINESA, which is responsible for conducting and co-ordinating all control and eradication activities in the field.

Campaign diseases are diseases which are endemic or enzootic to Mexico and which have predetermined standard
operating procedures. They are managed separately from the other diseases of concern to Mexico discussed above. This is important, because a disease-free State in which an endemic or enzootic disease re-emerges will be managed as an animal health emergency by DINESA, based on the disease control criteria used in Mexico.

National disease campaigns in Mexico are managed in three general phases, as follows:

- control
- eradication
- disease-free zone.

When Mexico places a State into the control phase, it means that a disease agent is present there. Vaccination is used to control the disease, surveillance is conducted and controlled mobilisation may be employed. In the eradication phase, vaccination is not conducted. Mexico is confident that the agent is not present during this phase because officials monitor the State carefully and increase their surveillance efforts significantly. This is an active and passive surveillance where the process is very focused: in addition to surveillance procedures already in place, a pre-determined number of samples are collected and sent to the CPA laboratory for evaluation. In both the control and eradication phases, a task force is designated to respond. The State(s) must then comply with the response actions proposed and provide organisational and administrative resources, as well as funding for the emergency. This forms part of the normal official procedure for every national campaign disease.
Diseases which are currently under national campaigns in Mexico are as follows:

- bovine tuberculosis
- brucellosis
- rabies
- ticks
- Newcastle disease in poultry
- salmonellosis
- avian influenza
- classical swine fever
- Aujeszky's disease (pseudorabies).

The goal is to eradicate all of these diseases from Mexico. All national disease campaigns undergo a cost analysis, which includes factors such as the impact on Mexican public health and exports.

Generally, there are only three phases in the National Campaign Disease Eradication Programs. However, at present there are two campaigns in which Mexico has decided to manage the eradication process differently. Those two campaigns are for Aujeszky's disease and low pathogenic avian influenza (LPAI).

Appendix I outlines a brief history of the response to the avian influenza outbreak in Mexico, which began in late 1993. This example illustrates some of the steps that were taken to control the disease spread in Mexico, including the formation of DINESA and the development of a control and eradication programme for LPAI.

**United States of America**

In order to minimise the danger of an FAD gaining a foothold or spreading throughout the USA, VS has developed two emergency animal disease eradication organisations. These task forces or teams are organised on a regional basis and are known as READEOs (Fig. 3). They are organised geographically, according to the two existing VS regions.

An emergency response can be activated by one or more of several events, as follows:

- the occurrence of an FAD or foreign pest
- an OIE List A or List B disease of foreign origin
- FAD vectors of foreign origin
- outbreaks of emerging or sporadic disease
- outbreaks of economically significant diseases
- outbreaks of unknown aetiology.

The general investigation strategy in the USA is very basic. The procedures for investigation of a suspected FAD are outlined in the official VS Memorandum 580.4 (15). All suspected FAD investigations are completed within 24 hours of the initial notification (15). A State or Federally employed FADD is assigned to the case immediately and he or she is sent to the suspected premises for clinical evaluation of the suspect animal(s). This evaluation includes collecting specimens for laboratory evaluation, which are immediately sent to the Plum Island Disease Center for diagnosis. The FADD may be assigned to the case by the AVIC or the State Veterinarian.

A situational analysis may be performed. This may include the following participants:

- the veterinary practitioner
- a veterinary medical officer
- the FADD
- an epidemiologist
- a pathologist
- an economist.

The goal is to identify the disease concerned. This can also be accomplished by the Early Response Team (ERT). The ERT is composed of a FADD, an epidemiologist and a pathologist from NVSL. The ERT may be called upon to assist the AVIC and Regional Director when an emergency animal disease situation is being evaluated, and the possibility of activating the READEO may be considered.

As soon as an animal disease emergency is strongly suspected, the Emergency Management Coordination Center notifies the office of the Deputy Administrator, which then alerts the READEO. When an animal disease emergency has been diagnosed anywhere in the USA, the READEO may be activated.

The Assistant Regional Directors for VS serve as the READEO Directors and are responsible to the Associate Deputy Administrator in Washington, DC, for the preparedness of the READEO unit in their region. When a READEO is activated, the Assistant Regional Director is relieved of all other duties and automatically becomes the READEO Task Force Director (14).

Each READEO Director is responsible for communications with their respective State and Federal animal health officials. Each State involved in the emergency disease outbreak may be represented in the READEO by a State official, who has been nominated by the State Veterinarian. This person acts as co-director within the office of the READEO Task Force Director. Since more than one State may be involved in the disease outbreak, a READEO may have one or more State co-directors.

READEOs exemplify the concept that pre-selected, pre-trained animal health specialists can eradicate a disease more rapidly and efficiently than groups of untrained personnel brought together at the time an animal disease emergency is recognised. Initially, READEO personnel are selected from within the regions involved. To complete each team, additional personnel may be requested from the other VS region. Consequently, personnel may be relocated and reassigned, wherever needed throughout the USA, to assist with disease eradication.
In the USA, national policy for eradication of FADs is implemented through a clear line of authority within the VS organisation. The Associate Deputy Administrator provides direction and national policy decisions. The day-to-day decisions are provided by the READEO Director. The READEO teams, which operate in the field, are supported by the expertise of personnel at the Emergency Management Coordination Center unit in Riverdale, Maryland (the headquarters where disease eradication efforts are co-ordinated and policy is developed), as well as by industry representatives and appropriate disease experts, to help ensure that any decisions are based on the best available science.

The USA responds to animal health emergencies with an ‘appropriate measured response’. This simply means matching the level of response to the gravity of the animal disease situation which has been identified. There are four levels of an appropriate measured response which could be initiated, as follows:

a) the activation and mobilisation of the READEO. In this situation, all partners (APHIS, the States, industry, academics, other Federal agencies, etc.) supply resources, and focus entirely and continuously on the disease situation at hand, under a common leadership. This response occurs when the Secretary of Agriculture declares an emergency or an extraordinary emergency or there is a high possibility of an emergency being declared. Resources are drawn from national sources. An example of such an emergency would be an outbreak of a foreign or exotic animal disease, such as foot and mouth disease or classical swine fever.

b) the establishment of a task force or Veterinary Field Investigation Unit. In this situation, a small group of people, drawn from some partners, are withdrawn from normal duties to focus all their time on the animal disease issue, under a common leadership. This can be compared to a scaled-down version of the READEO, in that not all the components of the READEO are needed. Resources may be drawn from local or national sources. An example would be the recognition of an emerging condition of unknown aetiology, such as the 1997 case of equine botulism intoxication in a stable in New Mexico. This case initially presented a high mortality of unknown origin (six horses died within five days).

c) the establishment of a co-ordinated response. In this situation, a group of people address a common issue but this is an added duty and they do not spend all of their time on the issue. This option is not always under a common leadership, but often under a shared leadership. Resources may be drawn from local or national sources. An example is the occurrence of a disease of economic importance to industry, such as the outbreak of LPAI in Pennsylvania between 1997 and 1998.

d) the decision to provide a limited response or no response. If it is determined that the condition is not sufficiently serious to warrant some kind of formal action (as outlined in options a-c), then no response or a limited response is the appropriate measured response. This means only that the emergency response system is not initiated to such a large degree and is not formally activated. Other actions, such as increased surveillance, research or a specific action plan, are initiated. An example: equine infectious anaemia found during routine surveillance would be reported to State animal health officials and appropriate measures would be taken by the State.

It is important that all responses are tracked and reported nationally, regardless of whether the resources used in this response are from local or national sources. The national Emergency Management Coordination Center is responsible for notifying the national partners and the USDA. The OIE would be notified if appropriate. Regionalisation concerns may become relevant, depending on the type of disease, the location and the subsequent export restrictions.

The USA response example (see Appendix II) illustrates the actions taken in an actual animal health emergency during the outbreak of highly pathogenic avian influenza (HPAI) in 1983. This example illustrates how the response mechanism functioned, and includes the activation of the READEO which resulted in the eradication of HPAI in the USA at that time.

Recovery activities in North America

Canada

In Canada, demobilisation occurs when the response phase of an animal health emergency is ended and the recovery phase is beginning. This completes the response structure.

Indemnity and evaluation are the major issues involved in recovery in Canada. Indemnity is the process of compensating producers and/or owners for their losses during depopulation, which is undertaken to contain and control an animal disease emergency. The Evaluation Unit Supervisor in Canada ensures that consideration is given to all animals, animal products, animal by-products and equipment used with infected or diseased animals which may require valuation and disposal if it is not possible to clean and disinfect these items. The indemnity award of compensation is based on a ‘fair market value’ and on current regulations and policy.

Canada also conducts a ‘post-mortem’ on the response system to assess the efficacy of the procedures used in the recent animal disease emergency. In addition, post-outbreak surveys are conducted to try to re-establish exports and to demonstrate the return to disease-free status. A public relations team is responsible for keeping the media and
general public informed of the situation and assisting with consumer concerns about animals and animal products information.

**Mexico**

In general, the Federal government of Mexico does not include indemnity as a part of its strategy. However, the potential for indemnity exists and depends on the specific details of the outbreak. Occasionally, this indemnity can be achieved by replacing depopulated livestock with healthy animals in compensation, as in the last outbreak of viral haemorrhagic disease of rabbits (1989) or through funds dispersed to owners as indemnity compensation, as in the outbreak of classical swine fever in Baja California Sur (1993).

At present, producers have other options for recovery through contingency funds. There are State contingency capital funds for use with certain States which are free from campaign diseases and for some States which are in the process of eradication. These funds are provided by the Federal government, State government and producers. State contingency capital can be used for emergency activities during an outbreak and sometimes for indemnity. Insurance of livestock is also a common practice among major producers (C. Villarreal Chavez, personal communication).

Mexico also works to re-establish export procedures after an outbreak and evaluates the response process to strengthen its overall AHEM system.

**United States of America**

The USA is working to reinforce its animal health emergency recovery activities. The USA has made a commitment to provide assistance to producers and/or owners if depopulation must be conducted to control an animal disease emergency. At present, this assistance is provided in the form of indemnity compensation based on government regulations.

Other recovery-related activities include the following:
- negotiations for the reinstatement of exports
- public relations initiatives to reassure consumers that products continue to be wholesome and affordable
- the review and evaluation of the response phase to assess the need for improvements.

The USA is cultivating relationships with other government agencies, such as the Federal Emergency Management Agency (FEMA), to aid in the recovery phase. For example, FEMA provides assistance with counselling for individuals who are victims of natural disasters and helps them to deal with the loss of their homes, etc. This kind of crisis counselling would also benefit producers and owners. It would help them cope with the loss of their family business or their life's work, and with animal welfare concerns, all of which can be emotionally devastating in many cases. It may also be advisable to liaise with the co-operative extension service to provide producers with relevant information and assistance, including legal advice.

**Special projects for animal health emergency management in North America**

**Canada**

The new Federal Laboratories for Human and Animal Health in Canada are located in Winnipeg, Manitoba. This state-of-the-art laboratory complex, equipped with the best technology currently available, is jointly operated by Health Canada and the CFIA. The Federal Laboratories complex is the first facility in the world to combine laboratories for human and animal disease research (4).

These laboratories will be at the forefront of human and animal disease research. The facilities include new level 2 and level 3 laboratories, as well as the first high-security laboratory in Canada with level 4 biocontainment capability. This will give Canadian scientists new opportunities to work with some of the most serious diseases in the world. Only a small number of countries have this capacity.

The new complex houses the National Center for Foreign Animal Disease of the CFIA, as well as laboratories for the Bureau of Microbiology, Health Canada. Researchers will diagnose human and animal diseases and develop new diagnostic methods. They will also respond to disease outbreaks and train public and animal health officials from other departments and agencies.

**Mexico**

Mexico has the only known formal eradication programme for LPAI. Since the detection of HPAI in December 1994, CPA has commenced a control and eradication programme. Vaccination with inactivated vaccine was authorised for use in farms in the affected States and in other States considered at risk due to the presence of LPAI. In June 1995, HPAI was eradicated from Mexico; since then a control and eradication programme for LPAI has been in place.

In Mexico, LPAI is a national campaign disease. There are four phases or zones in the LPAI eradication programme, as follows:

a) Eradication process with vaccination

This is a defined geographical area in which isolation or serological evidence of the virus may exist. Animal health control measures are directed at eliminating the virus and vaccination is authorised for a specified period of time. The process includes non-vaccinated poultry sentinels.
b) Eradication process
This is a defined geographical area in which isolation or serological evidence of the virus has not occurred. However, disease-control measures are in place to prevent the introduction of the disease agent. Moreover, a system of check-points for the control of animal movement is being installed or modified in this zone, so that it can be incorporated into the eradication zone.

c) Eradication
This is a defined geographical area which has had no isolation or serological evidence of the virus. It is strongly reinforced with disease-control barriers to avoid the introduction or reintroduction of the disease agent and maintains a surveillance system and movement control points. The goal is to be declared disease-free one year after the requirements above have been fulfilled.

d) A disease-free zone
This is a defined geographical area which has had no isolation or serological evidence of the virus, or in which poultry returning positive test results for the presence of antibodies against the virus have been destroyed in a specific period of time. This area maintains a surveillance system and movement control points, and has been declared disease-free by notification published in the daily Federal Gazette (9, 12).

The LPAI control and eradication programme has increased surveillance of and shorter official sampling periods for commercial farms. As of May 1998, seventeen breeder and layer farms in the States of Aguascalientes, Nuevo León and Jalisco returned positive test results for LPAI virus. They were placed under quarantine, in different stages of depopulation. In the State of Morelos, nine farms were placed under quarantine. Vaccination was authorised in Morelos. In Puebla, two farms were scheduled for depopulation and in Hidalgo, one farm was placed under quarantine. In all cases, all poultry in quarantined farms have been vaccinated and surveillance in the perifocal areas has been increased. By May 1998, 4,995 commercial farms had been sampled, some two to three times. The total number of commercial farms in Mexico is 3,863 (12).

As of May 1998, nine States were disease-free, including the Lagunera Region; eight States were in the eradication phase, six States were in the eradication process phase and nine States were in the process of eradication with vaccination (R. Nava Nava, personal communication).

United States of America
In July 1997, a comprehensive quadrilateral review of the AHEM system began in the USA. This process took several weeks to complete and was the result of VS, APHIS, inviting the quadrilateral partners to conduct an independent audit of the USA AHEM system. Representatives from Australia, Canada and New Zealand (two representatives from each country) came to the USA to look objectively at this system. In a very extensive, in-depth examination, the Quadrilateral Review Team reviewed regulations and documentation, visited facilities and interviewed many AHEM personnel from different parts of the country. They travelled quite extensively within the USA to accomplish this, encountering a number of people from widely varying backgrounds. A detailed report of their findings and recommendations has been published. There were more than 40 recommendations, concentrating on the areas of State and Federal co-ordination, central leadership, contingency documentation and the availability of human resources (6). Accordingly, VS has evaluated these recommendations and outlined a strategy for their implementation.

To the knowledge of the authors, no other country has undergone such an extensive independent audit of their AHEM system. Moreover, VS found this process to be most useful and enlightening, and highly recommends this type of unbiased, objective review to other countries. It is an extraordinary tool which will no doubt enhance AHEM in those countries which choose to employ it.

Future vision for animal health emergency management in North America

Canada
Canada is in the midst of a major reorganisation of its agricultural structure. The AHEM system must be adjusted to the new structure to ensure that the system will function at its best. The objective is an integrated system of AHEM, which brings together all the components of agriculture, food, fish, animals and plants into one functional emergency organisation.

The CFIA would like to establish a more formal relationship with the animal industry to encourage its participation in the planning and development of the AHEM system. This activity has already begun with the collaboration of the Canadian Animal Health Consultative Committee, which is working on more effective ways to deal with preparedness and response in AHEM.

Canada also seeks to include an automated component in the information-gathering systems for FAD investigations and in information exchange. One relevant aspect of this may be the re-examination of disease strategies through in-depth evaluations by PET in Winnipeg.
Mexico

Mexico has medium-term and short-term goals for the future of its AHEM system. These goals include the development of a computerised epidemiological surveillance system to enhance the current system in the short term and an electronic agricultural and livestock information system which links interested parties together in the medium term.

The CPA-DINESA is in the process of developing new ventures for its epidemiological surveillance system. This new system will computerise, by modem, the exchange of animal health control information between the major animal health laboratories and SIVE. In addition, this project will computerise the flow of information between central headquarters and the operative field personnel (that is, the regional co-ordinators of CPA-DINESA). The purpose is to improve the communication system and the rate of exchange of technical information.

As stated in the preparedness section, GIS are becoming more accessible and provide a fascinating means of visualising and analysing epidemiological data. Mexico hopes to develop and operate an active integrated computerised database in a GIS, which will include animal census figures and veterinary infrastructure information for each State and region.

Mexico is presently working to design, maintain and update an active Internet home page for CPA, DINESA and SIVE. This will connect the AHEM system in Mexico to the 'information superhighway' of the Internet.

A more long-range goal is the establishment of the Agricultural and Livestock Information System, which is an electronic database of agricultural and livestock information. This will be useful to all individuals or institutions who are interested in these activities in Mexico and can be linked to the database. The database will also include relevant information from outside Mexico, which can help in the planning and development of national agriculture and livestock programmes. This information will be contributed by several institutions involved in supervising, planning, organizing and making projections for the agricultural and livestock industry. The programme is expected to be entirely functional in the fiscal year of 1999.

United States of America

The VS has spent the past two years designing and developing a world-class AHEM system for the USA. This effort has been a collaborative operation between all the partners involved in AHEM. In 1996, the Working Group on National Animal Health Emergency Management was formed. It included representatives from various organisations, as follows:

- APHIS
- the Animal Agriculture Coalition (representing livestock and animal industry associations)
- the United States Animal Health Association (USAHA)
- the American Veterinary Medical Association.

This Group worked to develop a proposed model for national AHEM in the USA (16). The report of the Working Group provided an outline of the roles and responsibilities under the new model for the following:

- Federal government
- State government
- the agricultural industry
- universities
- laboratories
- veterinary practitioners.

Part of the system which is described in that document is already in place and other sections are in various stages of implementation.

The Working Group believes that a partnership approach will provide the best long-term means to develop a world-class AHEM system in the USA. This is envisioned through a sense of shared responsibility among the animal industry, veterinarians and State and Federal government animal health officials. Increased awareness of the need for co-operation is important if each 'stakeholder' group (that is, each interested party) is to share in the responsibility for the development and implementation of a comprehensive national AHEM plan. The partnership approach complements and enhances the emergency management plans of VS and incorporates local, State, regional and Federal efforts into a national plan.

In addition, APHIS is also involved in other activities which will enhance the overall capabilities of the AHEM system. These improvements include the following:

- formal systems for the identification of emerging diseases
- the enhancement of intelligence-gathering systems to detect an emerging disease before it can cause an emergency
- more active strategies in the area of world-wide disease spread
- the revision of the disease-specific Emergency Disease Guidelines (Red Books)
- upgrading the Emergency Response Center in Riverdale, Maryland.

Conclusion

Canada, Mexico and the USA, the three North American countries, are co-operatively involved in several activities relative to AHEM. The tripartite meetings of Chief Veterinary Officers and the North American FMD Vaccine Bank are examples.
The three participating countries are trading partners joined, by geography and by treaty, in a mutually respectful, sharing and learning coalition, the Tripartite. This group seeks to harmonise regional animal disease control standards and practices to facilitate trade among members of a free-trade pact and to serve as a senior forum for consultation regarding animal health issues.

The Tripartite, initiated 28 years ago to expedite communications between the Chief Veterinary Officers of the North American countries, provides an annual opportunity to perform the following:

- discuss respective disease control programmes and other mutual concerns
- assign tasks to bi-national technical working groups
- develop communications networks and trust
- resolve potential animal health policy differences
- discuss mutual approaches for responding to the expectations of international bodies, such as the OIE, WTO and NAFTA.

This tripartite effort is developing further harmonisation and standardisation of diagnostic techniques in FADs and also in some enzootic diseases. There are annual meetings between the representatives of the three countries. The North American countries also share risk analysis data and results.

The North American FMD Vaccine Bank is a collaborative effort of Canada, Mexico and the USA and is administered by the USA. This is an example of the North American countries working together towards animal health emergency preparedness in the event of an incursion of FMD. The purpose of the bank is to store FMD virus antigen concentrates (VACs) from which vaccines can be finished and used during an outbreak.

The USDA began stockpiling concentrated FMD virus antigen in 1980. Canada and Mexico joined the effort in 1982, at which time the bank gained international status (1). The bank is located at the NVSL, FADDL, Plum Island facility in New York.

Canada, Mexico and the USA work together to procure new antigens and to approve the facilities for vaccine production. After inactivated vaccine concentrations have been obtained, they are tested for purity, potency, efficacy and safety before inclusion in the bank. This is done by the personnel at FADDL. Stored VACs are routinely tested by in vitro methods. Finished vaccines are thoroughly tested in vivo, according to the biological guidelines of USDA, prior to inclusion in the bank. There are several million doses of vaccine stored as concentrates in the bank, representing a variety of serotypes and subtypes. The bank has the ability to obtain additional vaccine within a short time-frame in the event of the introduction of an FMD strain which is not currently covered by a vaccine already maintained in the bank (L.A. Thomas, personal communication). The bank is funded by all three countries, according to the size of their animal populations.

The authors believe that AHEM is at a crossroads, where choices must be made which will have a positive effect on the future of agriculture. Systems of AHEM must continue to be a strong, aggressive undertaking of all agricultural countries across the globe. This effort should include active approaches to the four functions and responsibilities of AHEM: prevention, preparedness, response and recovery. AHEM has evolved to include issues surrounding emerging animal diseases, which must also be addressed in emergency situations, as well as traditional FADs.

Leadership and partnership must be strong components of any AHEM system for it to be successful. All countries need to consider broadening their goals to enhance their systems in these areas. Through good communication, co-ordinated leadership and active partnerships, the basic goals of protecting the future of animal health, increasing food security and heightening the efficiency of animal production can be reached by all.

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Gestion des urgences zoosanitaires en Amérique du Nord : prévention, préparation, réponse et solution

Q.P. Bowman & J.M. Arnoldi

Résumé
La gestion des urgences zoosanitaires est l'une des questions les plus importantes qui se posent dans le monde aujourd'hui et un élément déterminant pour la sécurité alimentaire (innocuité, qualité, salubrité, disponibilité et abondance) comme pour la stabilité économique de nombreux pays. Certes, chaque pays d'Amérique du Nord (Canada, Mexique et États-Unis d'Amérique) a son propre système de gestion des urgences zoosanitaires lui permettant d'atteindre ses principaux objectifs, mais ces pays partagent également quatre objectifs majeurs, à savoir :
- empêcher l'introduction en Amérique du Nord d'agents pathogènes exotiques ;
- être prêts à gérer l'apparition d'un foyer de maladie animale exotique ;
- mettre en place des stratégies appropriées pour lutter contre les maladies et pour les éradiquer ;
- prendre des mesures efficaces pour rétablir la situation sanitaire antérieure à l'urgence.

Les auteurs exposent les grandes lignes de la gestion des urgences zoosanitaires en Amérique du Nord. Ils décrivent, en outre, le cadre général des stratégies de prévention, préparation, réponse et rétablissement mises en œuvre au Canada, au Mexique et aux États-Unis. Enfin, les auteurs examinent les perspectives de ces systèmes de gestion ainsi que quelques-unes des activités menées conjointement dans ce domaine par les trois pays du sous-continent.

Mots-clés

Gestión de emergencias zoosanitarias en América del Norte: prevención, preparación, respuesta y recuperación

Q.P. Bowman & J.M. Arnoldi

Resumen
Además de una cuestión de suma importancia en el mundo contemporáneo, la gestión de emergencias zoosanitarias es, para muchos países, la clave de acceso tanto a la seguridad alimentaria (esto es, higiene, calidad, comestibilidad, precio accesible y abundancia de los alimentos) como a la estabilidad económica. Aunque los distintos países de América del Norte (Canadá, México y los Estados Unidos de América) persiguen su objetivo principal a través de sistemas independientes de gestión de emergencias zoosanitarias, todos ellos comparten cuatro objetivos, a saber:
- prevenir la penetración en América del Norte de patógenos animales exóticos;
- estar preparados para reaccionar ante un brote de una enfermedad animal exótica;
- elaborar estrategias de respuesta adecuadas para controlar y erradicar las enfermedades;
- adoptar medidas activas para recuperarse de la emergencia zoosanitaria en cuestión.
Los autores ofrecen una introducción y una visión general de la gestión de emergencias zoosanitarias en América del Norte. También describen las grandes líneas estructurales de las estrategias de prevención, preparación, respuesta y recuperación de Canadá, México y Estados Unidos. Por último, examinan el futuro de la gestión de emergencias zoosanitarias en América del Norte, y concluyen repasando algunas de las actividades conjuntas actualmente en marcha relacionadas con la gestión de ese tipo de emergencias.

**Palabras clave**

**Appendix I**

**Management of the avian influenza outbreak in Mexico beginning in late 1993** (12, 13)

End of 1993/beginning of 1994

Observation of respiratory problems in commercial birds in several poultry areas.

24 March 1994

Submission to General Directorate for Animal Health (DGSA) of three suspicious allantoic liquid samples, from broilers (from the states of Mexico, Hidalgo and Querétaro). These samples are submitted to the Mexico/USA Commission for the Prevention of Foot and Mouth Disease and Other Exotic Animal Diseases laboratory and the National Veterinary Services Laboratories at Ames, Iowa.

25 May 1994

Positive diagnosis of low pathogenic avian influenza (LPAI) virus.

26 May 1994

Meeting with experts and high governmental officials.

27 May 1994

DGSA informs the president of the National Union of Poultry Producers (UNA) of the situation.

30 May 1994

The Ministry of Agriculture and Water Resources gives UNA representatives the work plan for the control and eradication of avian influenza (AI). Both organisations agree to hold meetings every two weeks.

9 June 1994

The National Program of Serological and Virological Monitoring is initiated. During this month, 23,712 sera are analysed from 23 states. A total of 2,427 return positive test results for the presence of antibodies against AI.

June to December 1994

Certification of AI-free farms and flocks; official authorisation given to laboratories to diagnose AI; accreditation courses given in AI, serological monitoring undertaken throughout the country. Fortnightly reports made through the AI Information Bulletin, publication of the Mexican Regulatory Emergency Standard for the National Campaign against AI.

15 December 1994

Isolation of highly pathogenic avian influenza (HPAI) virus from a sample from commercial layers in Tehuacán, Puebla.

12 January 1995

Report of a suspected diagnosis of HPAI in Querétaro.

January 1995

Outbreak of HPAI in the state of Querétaro in breeders, broilers and commercial table egg layers. Quarantine measures are established.

17 January 1995

Isolation of medium pathogenic avian influenza (MPAI) virus in Zapotlanejo, Jalisco. (Pathogenicity testing demonstrated 3-4 bird mortality. This is classified as 'medium' pathogenic avian influenza in Mexico.) Eventually, the viral amino acids sequence demonstrates LPAI.
23 January 1995 The National Animal Health Emergency Mechanism is activated and this information is published in the official Federal Gazette. Six operatives are established.

2 February 1995 Estimates show 500,000 infected birds in Querétaro.

23 January to April 1995 A total of 2,000 farms from 13 States are sampled and an analysis is conducted; neither HPAI nor MPAI are isolated.

28 April 1995 The ‘Emergency Plan for the Control of Avian Influenza’ is published. This plan includes zoning of the entire country.

6 June 1995 Last isolation of HPAI in the state of Querétaro and in Mexico.

August 1995 Extensive sampling in commercial and backyard poultry in Querétaro; detection of sentinel birds giving positive test results for the presence of antibodies against AI in 32 farms. Quarantine measures and depopulation are initiated.

August 1996 Depopulation is conducted on affected or AI-seropositive farms.


August 1997 Only 700,000 birds giving positive test results for the presence of antibodies against AI are found to exist.

February 1998 A total of 40 farms are quarantined, on which seropositive sentinel birds are found or LPAI virus is isolated.

Appendix II

Management of the highly pathogenic avian influenza outbreak in Pennsylvania, United States of America, 1983 (5)

22 April 1983 A mild form of avian influenza (AI) is diagnosed in two layer flocks in Lancaster County, Pennsylvania.

8 October 1983 Increased mortality (30%) and a drop in egg production are noted. Broilers and layer flocks are involved.

26 October 1983 Laboratory criteria are standardised to meet the criteria established by the International Symposium on Avian Influenza, 22-24 April, 1981.

27 October 1983 The National Veterinary Services Laboratories (NVSL), in Ames, Iowa, find that the mortality criteria for highly pathogenic avian influenza (HPAI) have been met. Re-isolation pending.

31 October 1983 The NVSL find that the mortality criteria for HPAI have been met. Re-isolation is complete.

31 October to 1 November 1983 Meeting of AI experts, brought together as technical collaborators. Emergency research recommended. State regulatory officials make AI a notifiable disease and immediately establish a Federal quarantine around the affected area. State and Federal officials take every step to dispose safely of all dead and diseased birds. In addition, it is recommended that this committee continue to be used as a collaborating body.

3 November 1983 Meeting with Pennsylvania State officials.

4 November 1983 Meeting of industry officials.

Federal quarantine begins in Pennsylvania.

The Northern Regional Emergency Animal Disease Organization (READEO) is activated to enforce Federal quarantine. (At this time [1983] there are still four READEOS.)

9 November 1983 An extraordinary emergency is declared in Pennsylvania.

Office of Management and Budget (OMB) approves funding of US$12.5 million.
The first HPAI-infected flock is depopulated.
Pennsylvania Federal quarantine is expanded.
Pennsylvania Federal quarantine is expanded further.
An extraordinary emergency is declared in New Jersey.
Federal quarantine is imposed in New Jersey, due to a layer flock being declared positive.
An HPAI-infected flock in New Jersey is depopulated.
Technical collaborators meet.
OMB approves additional funding of US$15.2 million, to a total of US$27.7 million.
Regulations are imposed prohibiting the interstate movement of live poultry, hatching eggs and embryonated eggs out of the Federally quarantined area.
Pennsylvania Federal quarantine is expanded further.
New Jersey Federal quarantine is reduced from 400 square miles to approximately 12 square miles. There is no evidence of disease spread from the original flock which gave positive test results for the presence of antibodies against HPAI.
OMB approves additional funding of US$34 million, to a total of US$61.7 million.
The extraordinary emergency in Pennsylvania and New Jersey is amended to include all forms of H5AI (type A) associated with the outbreak (lethal AI).
Code of Federal Regulations (CFR) 9, Part 53, is amended to include AI as a disease which is Federally indemnified at 100% of cost. This is necessary for the disease control programme to be initiated without additional declarations of extraordinary emergency in States other than Pennsylvania and New Jersey.
CFR 9, Part 81, is amended to place parts of Maryland and Virginia under Federal quarantine, as well as to include lethal AI.
A portion of the Pennsylvania Federal quarantine area (Franklin County) is determined to be free of lethal AI and released from quarantine.
Regulations are imposed allowing interstate movement of table eggs only from unaffected flocks, as determined by an organised weekly flock surveillance programme, which includes sampling for the virus and/or antibodies.
The remaining portion of the New Jersey Federal quarantine area is determined to be free of lethal AI and released. In addition, the extraordinary emergency provisions in New Jersey are removed.
Indemnity rates are increased and made retro-active.
The Federal quarantine area in Cecil County, Maryland, is released from restrictions.
The depopulation of flocks returning positive test results for antibodies against LPAI virus is initiated.
Part of the Federal quarantine area in Pennsylvania, west of the Susquehanna River, is released from quarantine.
State and Federal quarantines are lifted in Virginia.
State and Federal quarantines are lifted in Pennsylvania. A six-month surveillance programme is implemented for the previously quarantined areas.
References


