CANADA REPORT FOR 2005

Additional information received from Dr Brian Evans,
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I. ACTIVITIES OF THE VETERINARY SERVICES

Health Canada (HC) / Public Health Agency of Canada (PHAC) / CFIA agreement

Health Canada (HC), the Public Health Agency of Canada (PHAC), and the Canadian Food Inspection Agency (CFIA) are three major federal organizations with national accountabilities which directly or indirectly impact the health of Canadians. Recognizing the increasing importance of improved collaboration, these organizations have initiated the development of a Memorandum of Understanding (MOU) to provide the foundation for building clear understanding of their respective roles and responsibilities as they relate to human health and to provide substantive links across the organizations to improve the design and delivery of integrated health-related solutions. This MOU provides an approach for supporting collaboration and coordination amongst HC, PHAC, and CFIA in areas of common concern where there is a direct or indirect impact on human health as often encountered with zoonotic diseases.

FMD cross border emergency simulation

The CFIA continued its ongoing efforts to protect livestock populations by participating in Equinox 2005 - a foot and mouth disease (FMD) cross border emergency exercise. The emergency simulation took place with the United States between 21 and 23 March 2005, as part of a series of tripartite exercises of the North American Animal Health Committee established under the North American Free Trade Agreement with Canada, U.S. and Mexico. An essential part of the committee’s work is to test emergency preparedness for foreign animal diseases and the effectiveness of the North American FMD Vaccine Bank. Equinox 2005 included emergency operations centres in the states of Maine, New Hampshire and Vermont in the U.S., along with the provinces of New Brunswick and Quebec and the CFIA headquarters in Ottawa, Canada. The CFIA and the USDA managed the activities of the emergency exercise which focused on operational or "area level" communications and the integration of outbreak data within and between countries.

Aquatic Animal Health Division, CFIA

Canada is undertaking the development of a new comprehensive National Aquatic Animal Health Program (NAAHP) which will be developed and implemented jointly by the Canadian Food Inspection Agency (CFIA) and Fisheries and Oceans Canada (DFO). The CFIA will be providing the overall program lead for the NAAHP under the authority of its Health of Animals Act and Regulations. The Agency is responsible for the disease surveillance/monitoring protocols and control measures for the reportable diseases. DFO will deliver and oversee the National Aquatic Animal Health Diagnostic and Research Laboratory System (NAALS) providing the scientific underpinnings for the NAAHP.

This new program is designed to meet domestic and international aquatic animal health management standards to protect Canadian aquatic resources (wild and cultured) from serious infectious diseases and to continue to provide appropriate sanitary certification in support of trade. The NAAHP is modelled after Canada's internationally recognized terrestrial animal health program and is being established on the health measures of the Aquatic Animal Health Code of the OIE. Key elements of the program will include, but not inclusively, the listing and mandatory reporting of aquatic animal diseases, surveillance and monitoring, zoning, effective import and export controls, disease controls and eradication plans, good record keeping and quarantine measures.
II. CANADIAN LEGISLATION REGARDING ANIMAL DISEASES

In Canada, most of the diseases listed on the WOAH/OIE List of diseases need to be reported to the authorities under various regulations (see also annual written report for 2003).

1. “Reportable” diseases

These diseases are listed in the Health of Animals Act and Regulations and are usually of significant importance to human or animal health or to the Canadian economy. Animal owners, veterinarians and laboratories are required to immediately report, to the Canadian Food Inspection Agency (CFIA) through a district (federal) veterinarian, the presence of an animal that is contaminated or suspected of being contaminated with one of these diseases. For these diseases, control or eradication measures are applied immediately. The list of “reportable” diseases includes all of the previously called OIE List A diseases (foot and mouth disease, vesicular stomatitis, swine vesicular disease, rinderpest, peste des petits ruminants, contagious bovine pleuropneumonia, lumpy skin disease, Rift valley fever, bluetongue, sheep and goat pox, African horse sickness, African swine fever, classical swine fever, highly pathogenic avian influenza and Newcastle disease) and the additional following ones: anthrax, bovine brucellosis (*B. abortus*), bovine spongiform encephalopathy, bovine tuberculosis (*M. bovis*), chronic wasting disease, contagious equine metritis, cysticercosis (*C. bovis*), equine infectious anemia, equine piroplasmosis (*B. equi, B. caballi*), fowl typhoid (*Salmonella gallinarum*), pseudorabies (Aujeszky’s disease), pullorum disease (*S. pullorum*), rabies, scrapie, trichinellosis and Venezuelan equine encephalomyelitis. Many of these diseases have never been reported in Canada, or have been eradicated, and strict measures are in place at the border to prevent their introduction.

2. “Notifiable” diseases

In Canada, there is a second list of diseases called “notifiable” which also need to be reported to the veterinary administration (CFIA) on an immediate or annual basis. In general, immediately notifiable diseases are diseases exotic to Canada for which there are no control or eradication programs. The list also includes some rare indigenous diseases for which a herd or flock of origin must be certified free in order to meet the import requirements of trading partners. The CFIA may undertake control measures for such diseases when notified of their presence in Canada. Under the Health of Animal Regulations, only laboratories are required to contact the CFIA regarding the suspicion or diagnosis of one of these diseases. In this category of “notifiable” diseases, there is also a list of annually notifiable diseases for which Canada must submit an annual report to the World Organization of Animal Health (WOAH/OIE). In general, these are diseases that are present in Canada at various levels of prevalence.

Information regarding the Canadian legislation on reportable and notifiable diseases is available at the following address: http://www.inspection.gc.ca/english/anima/heasan/disemala/guidee.shtml

WOAH/OIE listed diseases absent in Canada during the reporting period or never reported

1. List of diseases

The following diseases are absent from Canada and no outbreak occurred during 2005 in domestic animals. Many of these diseases have never been reported in Canada, or have been eradicated.

Multiple species diseases: foot and mouth disease, vesicular stomatitis, Rift Valley fever, bluetongue, Aujesky’s disease (pseudorabies), heartwater, new world screwworm, old world screwworm, trichinellosis (in domestic swine and horse).

Cattle diseases: rinderpest, contagious bovine pleuropneumonia, lumpy skin disease, bovine anaplasmosis, bovine babesiosis, bovine brucellosis, haemorrhagic septicaemia, theileriosis, trypanosomosis (tsetse transmitted).
Sheep/goat diseases: peste des petits ruminants, sheep and goat pox, caprine and ovine brucellosis (excluding B. ovis), contagious agalactia, contagious caprine pleuropneumonia, Nairobi sheep disease, salmonellosis (S. abortusovis).

Swine diseases: swine vesicular disease, African swine fever, classical swine fever, porcine cysticercosis, porcine brucellosis (Brucella suis), enterovirus encephalomyelitis.

Equidæ diseases: African horse sickness, contagious equine metritis, dourine, epizootic lymphangitis, equine piroplasmosis (B. equi, B. caballi), glanders, horse pox, Japanese encephalitis, horse mange, Surra (Trypanosoma evansi), Venezuelan equine encephalomyelitis.

Lagomorphs diseases: myxomatosis, viral haemorrhagic disease.

Birds diseases: highly pathogenic notifiable avian influenza, Newcastle disease, duck virus hepatitis, fowl typhoid (Salmonella gallinarum), pullorum disease (S. pullorum).

Bees diseases: Tropilaelaps infestation of honey bees.

Other disease: leishmaniosis.

Fish diseases: spring viremia of carp, Channel catfish virus disease (herpesvirus of Ictaluridae type 1), epizootic haematopoietic necrosis, enteric septicemia of catfish (Edwardsiella ictaluri), Oncorhynchus masou virus disease, epizootic ulcerative syndrome, piscirickettsiosis (Piscirickettsia salmonis), gyroactylosis (Gyroactylus salaris), Red sea bream iridoviral disease, white sturgeon iridoviral disease.

Molluscas diseases: infection with Bonamia exitosus, Mikrocytos roughleyi, Marteilia refringens, Marteilia sydneyi, Perkinsus marinus, Perkinsus olseni/atlanticus, Candidatus Xenohaliotis californiensis.

Crustaceans diseases: Taura syndrome, white spot disease, yellowhead disease, spherical baculoviroisis (Penaeus monodon-type baculovirus), Tetrahedral baculoviroisis (Baculovirus penaei), infectious hypodermal and haematopoietic necrosis, spawner-isolated mortality virus disease.

III. COMMENTS ON SELECTED OIE-LISTED DISEASES

Multiple species diseases

1. Anthrax

   In 2005, the disease was diagnosed on twelve (12) livestock premises in the province of Manitoba. Confirmed laboratory and field diagnoses included thirty-seven (37) animals (27 cattle and 10 horses). The infected premises were placed under federal quarantine and indemnity paid to the owner for anthrax confirmed, dead animals. Infected carcasses were controlled by burning and deep burial while remaining animals in the herd were vaccinated. No cases of anthrax were reported in Canadian wildlife in 2005.

2. Bluetongue

   There is a program in place for the monitoring of sentinel cattle herds in the Okanagan Valley in the province of British Columbia. Each year, and monthly, from May to October, six herds at various locations in the Valley are sampled for the detection of the infection. In 2005, all of the 252 tests conducted in this program were negative. The year of last outbreak in the bovine species is 1988 and 1987 for the ovine species.
3. **Rabies**

Canada reported 248 laboratory confirmed cases of rabies in domestic and wild animals in 2005. This represents a decrease of 5% from the 261 rabies cases reported in 2004. The decrease can be attributed to lower numbers of reported cases in skunks (116 in 2004 vs. 94 in 2005) and raccoons (5 in 2004 vs. 3 in 2005). However, there was an increase in the number of rabies positive bats (83 in 2004 vs. 94 in 2005) and foxes (14 in 2004 vs. 18 in 2005). Four wolves and one bear were confirmed positive.

In 2005, wild animals accounted for approximately 86% of all positive cases (skunks: 37.90%; bats: 37.90%; foxes: 7.26%; raccoons: 1.21%; wolves: 1.61% and bears: 0.41%). Among domestic species, rabies was most often found in cattle (6.45%), followed by dogs (4.84%), cats (1.61%) and equines (0.81%).

The rabid animals were reported in the provinces of Ontario (96), Manitoba (73), Saskatchewan (24), Quebec (21), British Columbia (18), Newfoundland and Labrador (4) and Alberta and New Brunswick with one case each. The North West territories and Nunavut contributed 10, while no cases were reported from Nova Scotia, Prince Edward Island and the Yukon Territories. Only one case of raccoon variant strain of rabies in the Ontario raccoon was reported in 2005. In 2005, there were no reported human deaths due to rabies in Canada.

**Cattle diseases**

4. **Bovine brucellosis**

During 2005, Canada remained free of bovine brucellosis. No cases of the disease have been identified in livestock in Canada since 1988 (farmed bison) and 1989 (cattle). The disease has never been reported in farmed cervidae in Canada. Vaccination for brucellosis has not been practised in Canada since April 2000.

Routine serological testing of market and slaughter cattle and routine milk ring testing of dairy cattle was discontinued in 1999. However, auction market testing of cattle and farmed bison 24 months and older continues in five markets in northern Alberta and British Columbia, in response to the presence of the disease in free-roaming bison herds in and around Wood Buffalo National Park.

A statistically-based national bovine serum survey was conducted in 2002-2003. Of the 15,105 samples screened using the fluorescent polarization assay, 24 samples were found to be positive. These 24 samples underwent confirmatory testing using a competitive ELISA and all were found to be negative. These results demonstrate that the Canadian cattle population remains free of bovine brucellosis at or above a prevalence of 0.02% (2/10,000) with 95% confidence.

In 2005, 40,417 cattle, farmed bison and farmed cervidae, were tested for brucellosis in conjunction with modified market and slaughter testing (22,700), on-farm surveillance testing (5,492), export and artificial insemination centre testing (8,472), investigatory testing (2,843), and for other reasons (910). Twenty-one suspect animals (11 cattle, 3 farmed bison and 7 farmed cervidae) were detected and investigated with negative results.

5. **Bovine cysticercosis**

In September 2004 a single cow presented for slaughter at a federally inspected facility was identified as infected with *Cysticercus bovis* during routine post mortem inspection. A farm in the province of Ontario was identified as the source of infection. All cattle that reached market weight were licenced to slaughter at a federally-inspected abattoir where they were subject to enhanced postmortem inspection. In addition to the index case submitted in September 2004, five subsequent cases were laboratory confirmed *C. bovis* positive in February 2005. Infested carcasses were either condemned or frozen to kill the parasites, depending on the parasitic load. All the cattle of concern, from the contaminated pasture, have now been slaughtered and quarantine released.

6. **Bovine tuberculosis**

Canada continues to near the complete eradication of bovine tuberculosis from cattle, farmed bison, and farmed cervidae. No cases of *Mycobacterium bovis* infection was identified in farmed animals in Canada in 2005.
Surveillance for bovine tuberculosis in livestock is based on the routine post mortem inspection of animals at slaughter and the submission of granulomatous lesions for laboratory examination. In 2005, 612,012 mature cattle, 24,521 bison and 7,712 elk and deer were inspected at slaughter in Canada, resulting in the submission of 605 granulomatous lesions to the laboratory for microscopic (histopathology) and microbiological (culture) examination.

The slaughter monitoring program is augmented by targeted on-farm tuberculin testing of cattle and farmed bison and the routine on-farm testing of farmed cervid herds. Targeted on-farm testing of cattle and farmed bison is conducted in a special eradication area established around Riding Mountain National Park in the province of Manitoba, where 37 infected wild cervids have been found since 1997. Five infected cattle herds have been detected in this area between 1997 and 2003, and are believed to have acquired *M. bovis* from diseased wild cervids. The area encompasses approximately 55,000 breeding animals, representing approximately 10% of Manitoba’s cattle herds and 1% of Canadian cattle herds. In 2005 in Canada, 38,283 cattle were tuberculin tested in relation to the investigation of suspect disease (383), targeted area testing (29,790), export and artificial insemination centre testing (7,841), or for other reasons (269). In 2005, 2,760 farmed bison and 24,898 farmed cervidae were also tuberculin tested in Canada.

At the end of 2005, all regions of Canada are officially free from bovine tuberculosis except the special eradication area around Riding Mountain National Park in Manitoba, which is classified as tuberculosis-accredited-advanced, indicating a very low prevalence of infection.

Bovine tuberculosis is present in free-roaming bison herds in and around Wood Buffalo National Park in northern Canada and free-roaming elk and deer in and around Riding Mountain National Park in Manitoba. Information on these occurrences is found in Canada's report to the OIE Wildlife Diseases Working Group (2005). The diseased wild bison in the Wood Buffalo area pose their greatest threat to adjacent disease-free wild bison herds. A bison management plan is in place that includes no-bison buffer zones, the killing of stray bison, and other measures to minimize the risk of disease spread to wild bison or livestock. The infected free-roaming elk and deer in the Riding Mountain area represent a risk of spread of bovine tuberculosis to surrounding livestock. A multi-agency Bovine Tuberculosis Management Program has been implemented to prevent the spread of the disease to livestock and eliminate the infection in the wild cervidae.

In 2005, six cases of bovine tuberculosis were confirmed in a wild bison conservation project which had been established in 1996 through the capture of neonatal wild calves from an infected wild bison herd in the vicinity of Wood Buffalo National Park. The disease surfaced in the project herd despite numerous negative tests for bovine tuberculosis during the preceding eight years. The entire project herd, which had been isolated and under movement restrictions since its inception, was destroyed.

7. **Bovine spongiform encephalopathy**

Bovine spongiform encephalopathy (BSE) was named a reportable disease in 1990, and a national BSE surveillance program was implemented in 1992.

On 4 January 2005, the surveillance program detected a third case of BSE in Canada, which was subsequently confirmed on 11 January 2005 at Canada’s National BSE Reference Laboratory at the National Centre for Foreign Animal Diseases, Winnipeg, Manitoba. The subsequent epidemiological investigation confirmed the index case to be a beef cow, aged 6 years 9 months, born in the province of Alberta on 21 March 1998. Consistent with OIE recommended guidelines the birth cohort, feed cohort and all progeny born within two years of the onset of clinical signs were identified, traced, and when found to be alive were quarantined, and subsequently ordered destroyed and tested for BSE. A total of 41 cohort animals were subsequently ordered destroyed and tested for BSE (all with negative results), in addition a single progeny was destroyed, but its age precluded testing. Under federal legislation the owners of animals ordered destroyed are eligible for financial compensation.

Canada implemented a ruminant feeding ban in August 1997. This latest case represents the first detection of BSE in an animal born after the ban was introduced. The investigation concluded that exposure to contaminated feedstuffs manufactured before the feed ban was implemented and carried over within the animal feed system is the most probable source of the agent in this case. Since the feed ban was introduced in 1997, the Canadian Food
Inspection Agency has progressively increased the frequency of its inspection activities to assure compliance with the requirements of the feed ban.

Canada’s National BSE Surveillance program targets high risk adult cattle, consistent with the recommended guidelines of the OIE. In 2005 the program was responsible for the evaluation of 57,766 samples, representative of all regions of the country and reflecting the demographics of the adult cattle population in Canada. Preliminary screening is performed by rapid test technologies within the Transmissible Spongiform Encephalopathy Laboratory Network, and all confirmatory testing is the responsibility of the National BSE Reference Laboratory.

The detection of this third case of BSE by Canada is the fourth case attributed to the country and is further impetus for the ongoing epidemiological investigation respecting the apparent geographical and temporal clustering of what is believed to be the second indigenous generation of BSE in North America. The common age of expression (average 82 months) suggests an underlying epidemiological situation in contrast to that experienced in the EU and UK, and reflecting the considerable mitigation efforts that have been implemented within the feed and food chains.

Sheep and goat diseases

8. Scrapie

Scrapie continues to be endemic in Canada at a very low level with the identification of four (4) index flocks in 2005. To date no atypical cases of scrapie have been diagnosed in Canada. Extensive changes have been made to the measures applied in response to a confirmed case of scrapie. Sheep on the index premises and trace-out premises are genotyped. Risk level is assigned accordingly. Subsequently destruction and definitive testing for scrapie is undertaken in the subpopulation of highest risk. Test results determine if further subpopulations must be ordered destroyed and tested or not. As the assignment of relative risk to the genotyped subpopulations is based on the genotype of the index animal and strain of scrapie involved, this approach permits the flexibility of response should an atypical strain of scrapie be diagnosed. Potential source flocks are screened for the presence of infection utilizing the 3rd eyelid biopsy. This test is only applied to animals over 14 months that are homozygous for QQ at codon 171 to increase the sensitivity.

Building on provincial projects already undertaken in the provinces of Nova Scotia, Quebec and British Columbia, the Canadian sheep industry initiated a national project to determine the genotype of all purebred sheep in Canada. The results are documented in a database associated with registration. Producers can utilize built-in software to predict the genotype of offspring of various matings of registered purebred animals.

The existing offer of testing on farm mortalities by the province of Quebec was augmented to include testing mature condemnations at provincially inspected abattoirs. A combination genotyping and on farm mature dead stock testing project involving approximately 50 sheep flocks was initiated in the province of Alberta. The national sheep and goat industries launched the Canadian voluntary scrapie flock certification program. All flocks / herds enrolling on this program must submit all mature deadstock for testing.

Using Canada’s national mandatory sheep identification program, the CFIA undertook a pilot surveillance project in abattoirs subject to provincial inspection in the province of Ontario. This project traced back the origin of the sampled sheep and confirmed that the kill population processed through these abattoirs directly reflects the provincial distribution of the national sheep flock. In addition, the CFIA commenced sampling of dead on arrivals at the major marketing assembly point for sheep in Ontario. These initiatives have influenced the subsequent development of a national surveillance program for scrapie in Canada.

Equine diseases

9. Equine infectious anaemia

During 2005, 121 horses were found equine infectious anaemia (EIA) infected, most of them in the provinces of Alberta (106) and British Columbia (14). One positive horse was also found in the province of Ontario. With a few exceptions, all positive animals were ordered destroyed with compensation paid to the owner. A few owners availed themselves of the option to permanently quarantine the reactor in suitable vector-proof facilities. A total of
74,765 serological tests for EIA were performed for routine domestic and international requirements for racing, exhibition, breeding, sale and stabling, as well as in response to suspected or confirmed disease situations. In 2005, the reactor rate was 0.162%, compared to 0.084% reported in 2004.

**Swine diseases**

10. **Porcine brucellosis**

During 2005, Canada remained free of porcine brucellosis. *Brucella suis* has never been identified in Canadian swine.

A statistically-based national swine serum survey was conducted in 2001-2002. Approximately 16,000 samples from slaughter sows and boars were tested with negative results to demonstrate that the Canadian swine population remains free of porcine brucellosis at or above a prevalence of 0.02% (2/10,000) with 95% confidence.

*Br. suis* biovar IV occurs in *Rangifer* species (caribou and reindeer) in the Canadian Arctic. Movement controls within the country prevent these animals from entering the livestock producing areas of Canada.

**Avian diseases**

11. **Highly pathogenic avian influenza**

Canada remained free of highly pathogenic avian influenza in domestic poultry in 2005. However, in November 2005, the Canadian Food Inspection Agency (CFIA) announced the detection of an avian influenza virus in two (2) duck farms located in the Fraser Valley in British Columbia. The virus was confirmed to be a low pathogenic H5 North American strain. This virus was different than the H7N3 strain found during the 2004 Abbotsford outbreak.

The CFIA depopulated both farms as a precautionary measure. All commercial poultry farms within five kilometres of the infected premises were placed under surveillance (two surveillance zones) and birds on each were tested weekly during three weeks to ensure that there were no additional infected farms. Consistent with international guidelines, the zones and all related premises affected by quarantines were declared to be disease free following 21 days of negative test results.


**Lagomorph diseases**

12. **Tularemia**

Tularemia is endemic throughout Canada as a water-borne disease of rodents (muskrat, beaver, vole) in aquatic habitats and tick-borne disease of rodents, rabbits and hares.

**Fish diseases**

13. **Bacterial kidney disease (*renibacterium salmoninarum*)**

**East Coast**

Cultured fish:

Bacterial Kidney Disease continues to occur at private aquaculture sites in New Brunswick and Nova Scotia and one federal hatchery of Atlantic salmon broodstock in New Brunswick

Wild fish:

This bacterium was isolated from a kidney displaying lesions from an adult Atlantic salmon, a suspected aquaculture escapee, in a New Brunswick river.
14. **Infectious salmon anaemia**

   **East Coast**

   **Cultured fish:**

   No change since 2003, however, PCR analysis is revealing both non-pathogenic and pathogenic strains of infectious salmon anaemia virus.

   **Wild fish:**

   The infectious salmon anaemia virus was isolated from healthy brook trout collected in Nova Scotia.

15. **Infectious pancreatic necrosis**

   **East Coast**

   **Cultured fish:**

   The infectious pancreatic necrosis virus (IPNV) is considered as ‘widespread’ throughout the Atlantic zone and continues to be found, generally in carrier state, in all species of salmonids, in a variety of age classes, and predominantly from facilities with surface water influence. However, no significant mortality problems were reported from those facilities testing positive for IPNV.

   **Wild fish:**

   The virus was identified in an adult Atlantic salmon, a suspected aquaculture escapee, captured at a New Brunswick fishway.

16. **Viral haemorrhagic septicaemia**

   **Pacific Coast**

   **Cultured and wild fish:**

   Large numbers of 2-year-old herring (*Clupea pallasi*) were reported dying in Clayoquot Sound on the west coast of Vancouver Island in November 2005. Many of these fish were recovered from inside net pens of Atlantic salmon. A total of 20 herring were examined by viral assay and the North American Viral haemorrhagic septicaemia (VHSV) was recovered from all fish tested. Low level losses were observed in an Atlantic salmon netpen site where 80-90 g fish had been introduced to seawater 1.5 months prior. VHSV was detected in all three Atlantic salmon examined. This was the sixth isolation of VHSV from farmed Atlantic salmon in British Columbia.

   Sardine (*Sardinops sagax*) die-offs were reported at several locations in British Columbia. First reports began in November 2005 near Kitimat BC located on the north mainland coast were VHS virus was recovered from 6/33 fish. Two additional die-offs have been reported in February 2006, one on the west coast of the Queen Charlottes and one the west coast of Vancouver Island. Samples are being obtained for virological analysis from the most recent epizootics. VHS virus isolated from these die-offs will be sequenced and compared to others in the database.

   **Central and Arctic**

   In the spring of 2005, a mass mortality of freshwater drum occurred in the Bay of Quinte, Lake Ontario. A rhabdovirus isolated by researchers at the Atlantic Veterinary College was identified by CEFAS Weymouth Laboratory, as a North American strain of the viral hemorrhagic septicemia virus (VHSV). This detection represents the first occurrence of VHSV in a freshwater source in North America.

   To confirm that the isolates were VHSV, an RT-PCR reaction was performed using VHSV glycoprotein specific primers. Additionally, partial glycoprotein nucleotide sequence analysis on the isolates were conducted, and
sequences were compared to others in our VHSV glycoprotein sequence database set to identify the genetic origins of the viral pathogen. A viral assay was conducted on 10 freshwater drum that were collected from the Bay of Quinte, Lake Ontario on 25 October 2005.

Genetic typing of the virus revealed it to be a unique strain that is evolutionarily more related to strains isolated from marine fishes in New Brunswick. Due to the similarity of these strains it is possible that the Lake Ontario isolate originated from an eastern North American marine reservoir. A virological survey of 10 Lake Ontario freshwater drum, sampled six months after the mass mortality event, revealed all ten fish to be negative for the detection of VHSV. To ensure that VHSV is not endemic to Lake Ontario continual surveys should be conducted at various times and in different fish species.

The lab was unable to confirm that VHSV was the cause of death

16. **Infectious haematopoietic necrosis**

*Pacific Coast*

*Cultured and wild fish:*

The virus can be isolated from most of the wild adult sockeye (*Oncorhynchus nerka*) stocks returning to freshwater. It is also routinely found in surveys of wild and/or enhanced juveniles emerging from the gravel after hatch. In past years, there have been outbreaks in marine farms growing Atlantic salmon (*Salmo salar*), but the virus has not been found on any farms for the last 4 years.

*Mollusc diseases*

13. **Infection with Bonamia ostreae**

*Pacific Coast*

Reported for the first time in Canada (British Columbia but not yet detected in Atlantic Canada) in November 2004. Examination of *Ostrea edulis* from three grow-out facilities in the summer of 2005 revealed a prevalence of infection varying from 0.5 to 11.1%. Re-evaluation of historic *O. edulis* examination results between 1986 and 2000 from 5 location in British Columbia and re-examination of archived samples (n=343) collected from the index site between 1999 and 2004 in conjunction with seed introduction records suggests that *B. ostreae* may have been inadvertently introduced into British Columbia around 2003 with *O. edulis* seed imports from enzootic areas in the State of Washington, USA. There was no outbreak and no significant mortalities reported on the three positive sites. No control measures were imposed. The cost of implementing control measures could not be justified on the basis of the value of the small production (less than 0.5% of all shellfish marketed in BC). However, *O. edulis* seed are no longer allowed to be imported from enzootic areas.

15. **Infection with Haplosporidium nelsoni**

*East Coast*

MSX disease (*Haplosporidium nelsori*) in the Eastern oyster remains contained within the Bras d’Or Lakes, Cape Breton, Nova Scotia.

16. **Infection with Haplosporidium costale**

*East Coast*

Very low levels of SSO infection (*Haplosporidium costale*) continue to be detected in Eastern oysters in Atlantic Canada. No infections have yet been associated with pathology.
17. Mikrocytosis (Mikrocytos mackini)

**Pacific Coast**

Oysters from the same location that experienced an outbreak in the spring of 2004 were again rejected by the processors because of tissue lesions caused by mikrocytosis. Although mortalities were detected in affected stocks, an estimation of the mortalities attributable to mikrocytosis was not possible because of predation on the stocks by sea stars.

**IV. OTHER DISEASES**

**Multiple species diseases**

1. **West Nile virus disease**

West Nile virus (WNV) was identified for the first time in the Western Hemisphere in the United States of America in 1999. In Canada the first case of WNV was detected through dead wild bird surveillance in 2001. For the last four years, WNV surveillance in Canada has been a collaborative effort, coordinated by Health Canada and since 2004 by the newly named Public Health Agency of Canada (PHAC), federal, provincial/territorial ministries and agencies as well as key national organizations such as the Canadian Cooperative Wildlife Health Centre (CCWHC). Surveillance for WNV in wild birds was carried out across Canada in 2005 through a multi-agency program coordinated by the Canadian Cooperative Wildlife Health Centre, Health Canada, and all provincial governments.

As of November 2005, there have been total of 3,988 wild birds tested in Canada with 447 confirmed positive for WNV (Quebec, 115; Ontario, 300; Manitoba, 12; Saskatchewan, 14 and Alberta, 6). No positive birds were reported from other provinces and territories. The total number of presumptive or confirmed equine cases was 21: five (5) in Ontario, four (4) in Manitoba, ten (10) in Saskatchewan and two (2) in Alberta. Cases in equine are presumed low as a result of the widespread use of vaccination. In 2005, 4 domestic geese farms were reported positive in Manitoba.

**Cattle diseases**

2. **Chronic wasting disease**

In 2005, there were no cases of chronic wasting disease (CWD) in farmed cervids reported. All of the cervids on the one infected farm found in 2004 and all trace-outs of cervids from the farm were destroyed, tested and were found to be negative.

The national control program for CWD was implemented in 2000 and the disease became reportable in 2001. Suspicious cervids are destroyed and tested for CWD. Where an animal has been identified as having CWD, the herd is investigated to determine the entry of CWD into the herd. All cervids exposed to an infected animal in the last 36 months are destroyed, including any that have left the premises. Cervids that have left the premises and were last exposed between 36 and 60 months before are kept under surveillance by federal veterinarians until 60 months after their last exposure.

In 2005, the mandatory provincial CWD surveillance programs continued in Alberta, Saskatchewan, Manitoba and the Yukon. The programs require all farmed cervids more than 12 months that die or are slaughtered be submitted for testing. CWD has been diagnosed in the provinces of Saskatchewan and Alberta in Canada.
**In wild cervids**

Surveillance of free ranging (wild) cervids from hunter shot submissions in the targeted high risk areas continued. A total of 35 positives were detected in 3,677 samples tested from wild cervids in Saskatchewan and, for the first time, 4 positives wild cervids out of 2,276 samples in Alberta. The testing of the 2005 wild cervid samples is incomplete as of 9 March 2006.

**CWD testing**

Approximately 14,371 (0 positive) tests and 6,616 (39 positives) tests were performed on farmed and wild cervids, respectively. After extensive preparation, in conjunction with the Canadian Food Inspection Agency Centre of Expertise for CWD, laboratories in the provinces of Ontario, Quebec, Saskatchewan and Alberta are using the Biorad ELISA test for surveillance purposes.

**Fish and mollusc diseases**

3. **Nervous necrosis virus**

   **East Coast**
   
   **Cultured fish:**
   
   This virus has been isolated from several facilities rearing Atlantic cod (*Gadus morhua*) throughout the Atlantic zone.

4. **Infection with *Yersinia ruckeri* (causative agent of enteric redmouth disease)**

   **Pacific Coast**
   
   **Cultured and wild fish:**
   
   The agent is frequently isolated from wild adults of *Oncorhynchus* sp. when they return to freshwater. It is occasionally recognized as a disease outbreak in coho juveniles reared enhancement facilities. Occurrences of disease are controlled through oral antibiotic treatment.

   **East Coast**
   
   **Cultured fish:**
   
   This bacterium continues to be sporadically isolated in salmonid hosts (Atlantic salmon [*Salmo salar*]) from freshwater facilities in the provinces of New Brunswick and Nova Scotia. No significant mortalities were attributed solely to this bacterium.