SPECIAL EDITION

CANADIAN ANIMAL HEALTH NETWORK

CAHNet Bulletin

...linking animal disease surveillance partners in Canada

WINTER 2004

AVIAN INFLUENZA

EDITORIAL

Houses Made of Brick

Dr. John Kellar
CAHNet Support Group

In the wake of Charley, Francis and their ilk, we found ourselves inundated this past hurricane season with predictable footage of the devastation they had wreaked on Florida's urban communities. Trailer park residents would appear to have suffered beyond the limits of human endurance - again. The critical side of human nature might prompt the question as to whether some people ever learn from such experiences. At least in part, the response may depend as much on the political, as the climatic, environment within which they reside.

In London's Guardian Newspaper in 1995, Martin Woollacott's daily comment entitled Pitfalls of the Risk Society observed: We are the "Risk Society" in the notable phrase of the German sociologist Ulrich Beck - composed of people constantly calibrating and re-calibrating risks in our personal lives and with a deeply established expectation that the main job of the political class is the avoidance or minimization of risk and danger, and the provision of compensation when this fails. His comments derived from an era and socialistic governance arguably poles apart from the 2004 Floridian model. On the other hand, there were those tempted in the last century to describe Canadian livestock producers, when faced with contagious diseases, as firm adherents to Beck's philosophy.

Were the observations true a decade ago, developments would challenge them today. What were once "government" disease control programs have yielded to the award-winning collaborative, multi-disciplinary, multi-jurisdictional model currently addressing sylvatic tuberculosis in the Riding Mountain National Park area of Manitoba. A decade of commitment to disease mitigation has culminated in a portfolio of industry-driven infrastructural initiatives. They encompass animal identification and traceability, GIS-enabled demographics and zoning, complementing government efforts in surveillance and risk assessment. Fact-finding missions abroad guide evolutionary steps within, as industry creates a shadow infrastructure to complement that of government in foreign animal disease response, extending the latter's capacity into unfamiliar logistical areas with which the sectors are conversant.

In July, 2004 the Farm Foundation (www.farmfoundation.org) released the findings of an eighteen month panel of American industry leaders and USDA representatives charged with assessing the forces motivating adoption of traceability and assurance protocols within the food chains represented. Its observation, concerning the negative events at which such initiatives are ostensibly aimed, is instructive for those preparing for foreign animal disease incursions: Decision makers must consider the financial and technical trade-offs in assessing the probability of a negative event occurring, leading to the strategic objective of preventing the event versus rapidly containing the outcome. Prevention should be the objective if the probability is high, measurable and the technology exists to prevent the event. Containment should be the objective if the probability of an event is low, and there is no viable way to prevent it.

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INTRODUCTION

Dr. John Kellar

In electronic and bookshelf format, throughout the Canadian Food Inspection Agency's integrated network, reside Manuals of Procedures covering virtually all aspects of foreign animal disease response. One section is dedicated exclusively to Avian Influenza. In annual desk top and field simulations, headquarters and regional staff are drilled as to their respective responsibility distributions. In recent years, integration with parallel American and Mexican exercises has become the norm in preparation for events of continental proportions.

The exercises completed, designates return to their ostensible positions. Such is the fiscal reality of National Veterinary Services throughout the world that only a crucial core of staff is continuously dedicated to foreign animal disease preparedness. The balance are usually reserves who occupy other disease control positions until called upon in exercises or in the face of a positive diagnosis. To ease the transition, reservists are assigned outbreak tasks analogous to those which they continuously carry out in their home positions.

The Netherlands has experienced a number of foreign animal disease outbreaks during the last decade in a series of different species, including Avian Influenza in poultry. A Canadian delegation visited in 2003 in an effort to learn from those events. Two observations stand out. The first was the tremendous challenge represented by the need to scale up from the crucial core described above to the level of resources required to quell an

Control Area Declaration

March 11 to August 20, 2004

"WHEREAS, I, Robert Speller, the Minister of Agriculture and Agri-food, believe that the disease, avian influenza-highly pathogenic exists in the area of British Columbia described in the schedule attached hereto;

THEREFORE, I hereby declare, pursuant to subsection 27 (1) of the Health of Animals Act, that the area described in the schedule attached hereto is a control area;

THEREFORE, I hereby designate, pursuant to subsection 80 (1) of the Health of Animals Regulations, the following animals and things:

Any bird that is in captivity, including day-old chicks and hatching eggs, any product or by-product of a bird, and anything that has been exposed to a bird.

SCHEDULE

An area in the province of British Columbia bounded by the following:
On the west, the Georgia Strait;
On the south, the United States Border;
On the north, the North Shore Mountain Range of the Fraser River;
On the east, a line running North South through the Hunter Creek Weigh Scale of the Province of British Columbia.

With those words, movement of captive birds was called to an abrupt halt in a heavily populated 5,000 square kilometre area of the Canada. This powerful piece of legislation had never before been called upon by animal health regulators. It appears to have been a highly successful regulatory tool for outbreak control.

The Control Area could not be declared in isolation. Thousands of birds in homes, pet stores and commercial operations dozens of kilometres from infected flocks posed a negligible disease risk. To allow those birds to conduct limited business, a series of General Permits was immediately developed and signed by the Director of Animal Health and Production Division. The General Permits allowed limited movement within the control area and were immediately made public on the CFIA Website. To ensure the General Permits would come into effect at the moment the Declaration was signed by the Minister, the Limits Committee worked around the clock from the time it was agreed that the Control Area would be declared.

Specific Permits were also granted by CFIA staff, on assessment of the specific risk posed by individual bird movements. For example, birds testing negative in an area surrounding the region posing the highest risk could be sent to a plant slaughter with a specific permit outlining the consignor, destination, test date and route along which the birds would be allowed to travel.

As the outbreak progressed and was contained, both General and Specific Permit movement conditions varied, depending on the risk as assessed by the Policy and Procedures Committee & Limits Committee of the National Emergency Response Team. Permit conditions were developed in concert with the Area Emergency Response team, individuals positioned to determine what was operationally feasible.

By the time the Control Area declaration was revoked August 20th, Agency staff had developed four sets of General Permits covering 5-10 classes of birds, along with 1116 Specific Permits.

The judicious application of this powerful tool taught the Agency valuable lessons that will be incorporated into Section 80 of the Health of Animals Regulations in preparedness for future outbreaks. In general, the regulatory base to control movement withstood the test and contributed to stemming the tide of the outbreak in a timely and expedient manner.

incursion. The second was the oft-proven inability of the unaffected to appreciate the depth of hardship and despair wreaked upon those caught up in the maelstrom of the event.

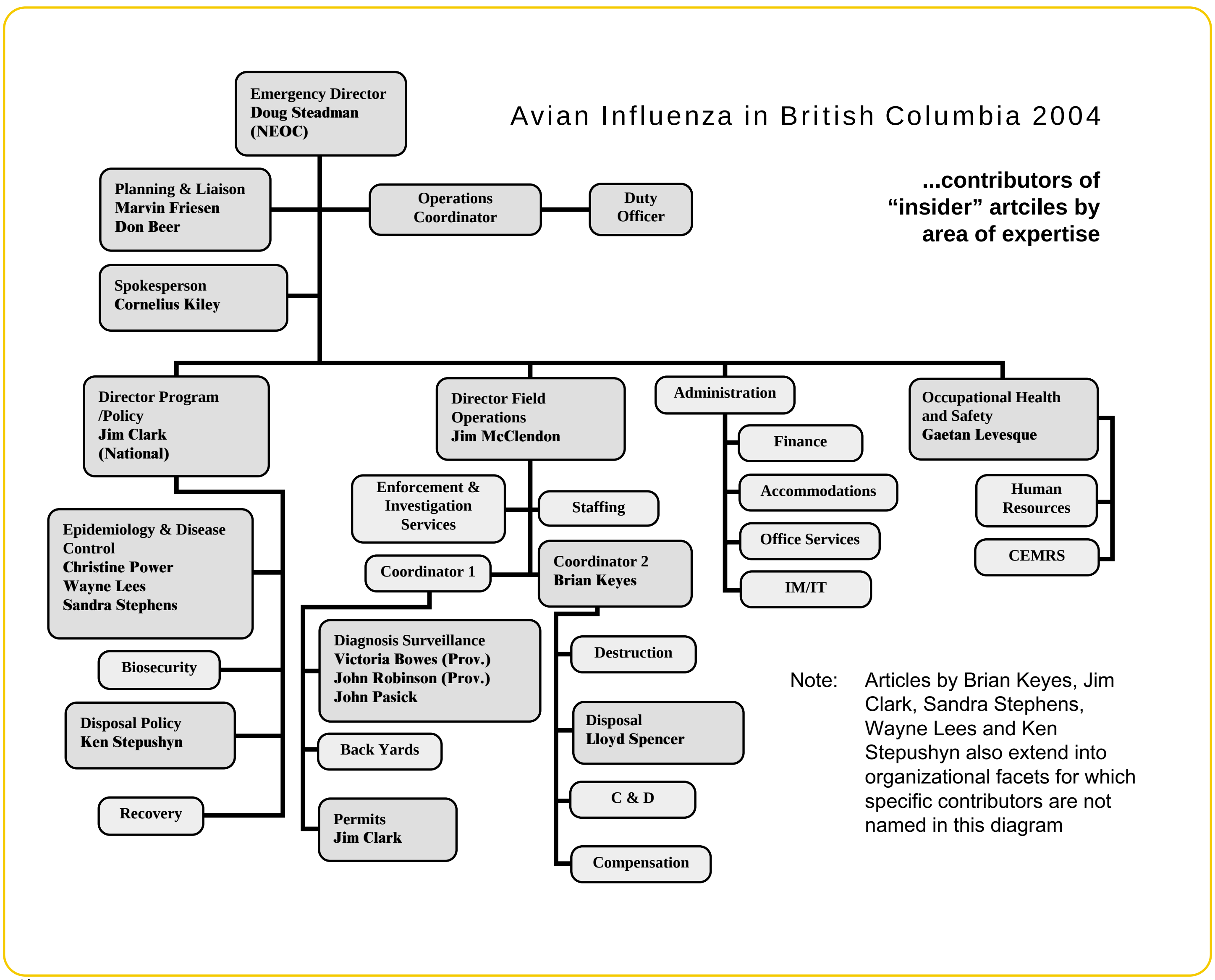
Unless you were intimately associated with the outbreak, your insight may be as limited. Workshops in a number of provinces have since attempted to portray industry's position. The Canadian Animal Health Coalition will chair a related forum during the Canadian Animal Health Consultative Committee meetings in Ottawa in December. This edition of the CAHNet Bulletin seeks to complement those events with the inside story of the eradication effort.

To that end, we have obtained input from sixteen diverse response team members whose lives were consumed for months by events in the Lower Fraser Valley. From the face that dominated nightly newscasts to the sweating brows of the disposal corps, they share their first hand experiences.

Should you seek only an overview, I suggest you read the article entitled ASummary@. Wayne Lees. As one of several epidemiologists involved, he has provided insight into most aspects of the eradication effort. The additional contributors complement his coverage in greater depth from their respective areas of expertise. You may wish to refer to the accompanying flow diagram to identify areas of interest.

Avian Influenza (AI) is a worldwide concern. To place the Canadian experience in perspective and characterize the environment within which it occurred, we have included a number of news items which characterize events which continue to unfold elsewhere.

For more than a decade, Canada has been engaged in improving the infrastructural elements essential to combating disease incursions. We include a brief article as a reference to activities in progress when Highly Pathogenic Avian Influenza was diagnosed in British Columbia. The outbreak, of course, was not without its own influence. A number of actions, launched in its wake, are similarly reviewed.



The 2004 Outbreak of Highly Pathogenic Avian Influenza (H7N3) in British Columbia

Dr. Wayne Lees

Dr. Wayne Lees participated as veterinary epidemiologist in the field response, giving direction on data management and mapping to assist disease control decisions. He acted as the backup for and replaced Dr. Christine Power in this role. Both are members of the CFIA's Animal Disease Surveillance Unit.

Editor's Note:

1. The following is a summary of the report prepared by Dr. Wayne Lees, Lawana Chown (Atlantic Veterinary College veterinary student working with the Canadian Food Inspection Agency), Dr. Carolyn Inch and a series of other collaborators acknowledged in the original article. The full report is available at: www.inspection.gc.ca. Other articles within this edition complement this overview in greater detail by specific subject areas.

2. Influenza strains, irrespective of the species from which they are isolated, are characterized by virologists and epidemiologists by reference to two constituent genetic components which influence their virulence. The first is their haemagglutinin factor, referred to in the literature as "H". The second is their neuraminidase, referenced as "N". Particular H and N subtypes are assigned numbers to distinguish them, as in this article. An isolate's H and N subtypes, along with particular amino acid sequences, serve as epidemiologic "fingerprints" for investigators.

Summary

Highly pathogenic avian influenza (HPAI) of type H7N3 was discovered in poultry flocks in the Fraser Valley of British Columbia in the spring of 2004. This was the first report of HPAI of any type in Canada in recent history. By the end of the outbreak, 42 commercial flocks and 11 backyard flocks had tested positive for the infection and nearly 17 million birds (90% of the commercial poultry industry in BC) had been slaughtered or destroyed. The last infected flocks were found approximately 3 months after the first flock was reported. Following within 1 year of the discovery of BSE, this outbreak tested Canada's ability to detect and respond to outbreaks of foreign animal diseases.

Avian Influenza: Canadian Experience

Canada has not previously reported a case of HPAI to the World Organization for Animal Health (OIE). However, lowly pathogenic avian influenza (LPAI) was recognized in turkeys during the 1960's, when it was common for them to be raised in outdoor ranges. An avian influenza virus, isolated from two extensive turkey breeding establishments with common ownership in Ontario in 1966, was later found to meet the modern criteria of an HPAI virus. Since 1975, three cases of LPAI (haemagglutinin types H5 and H7) have been discovered in domestic poultry - the latest being an H7N1 strain isolated from turkeys in Ontario in November 2000. This flock experienced a drop in egg production, along with a slight increase in mortality.

The Fraser Valley poultry industry

The poultry industry in the Fraser Valley of British Columbia is typical of the national poultry production and marketing system. Chickens and turkeys are grown to produce meat and eggs under a supply-managed quota administered by the province. The poultry industry in the Fraser Valley is self-contained with 11 hatcheries and 10 abattoirs (8 under federal inspection, 2 under provincial inspection) and supplies a large local consumer market (the city of Vancouver).

Progression of the outbreak

Infected premises 1

Highly pathogenic avian influenza (H7N3) was confirmed from samples collected on a broiler breeder farm north of Abbotsford, British Columbia. Two flocks were on the farm when the disease first appeared. An older one of 9200 birds (52 weeks of age) occupied one barn, while a younger flock of 9030 birds (24 weeks of age) was housed in another.

The first signs of illness were a mild drop in egg production and feed consumption, and a slight increase in mortality (6 birds per day) in the older flock. The farm's veterinarian and the feed company representative investigated the case and samples were submitted to the British Columbia Ministry of Agriculture, Food and Fisheries (BCMAFF) diagnostic laboratory for routine post-mortem examination on February 9. Pathologic signs included meaty lungs and inflamed tracheas.

The clinical illness in the older flock appeared to resolve slightly over the next few days but on February 16, BCMAFF reported to CFIA that avian influenza antigen had been detected on a polymerase chain reaction (PCR) test. Within a day of this report, mortality in the younger flock began to climb dramatically - from 25 dead birds one day, to 930 the next, and over

Avian Influenza is....

Avian influenza is a contagious viral infection that can affect all species of birds (chickens, turkeys, guinea fowl, pet birds and wild birds). In intensive poultry rearing systems, young fattening turkeys and laying hens are usually the most affected species. Wild birds may carry influenza viruses without becoming ill due to a natural resistance. Wild waterfowl present a natural reservoir for these viruses and can be responsible for the primary introduction of infection into domestic poultry. Signs of the disease range from a mild infection with no symptoms to a severe epidemic that can kill all infected birds.

The diagnosis of avian influenza may be made on the basis of symptoms and events leading to the disease. However, since the symptoms and course of avian influenza are similar to other diseases, laboratory diagnosis is essential.

Several virus types exist-the strain that causes the greatest number of deaths is HPAI. Low pathogenic strains-H5 and H7 subtypes-of avian influenza have the potential to rapidly become highly pathogenic, and some countries, including Canada, have adopted an eradication policy for low pathogenic strains of avian influenza due to that risk.

1500 on the third. Allantoic fluid specimens from both flocks were forwarded for further testing to the Canadian reference laboratory, the National Centre for Foreign Animal Disease (NCFAD) in Winnipeg, and on February 19 the H7 subtype of avian influenza was confirmed. All remaining birds on the farm were destroyed and a surveillance program, based on oropharyngeal and cloacal swabs and blood samples, was initiated on commercial farms within a 5 km radius.

Ongoing work at NCFAD characterized the virus from the older flock as belonging to the H7N3 subtype on February 23, 2004. On March 1st it was reported to be an LPAI strain with an intravenous pathologenicity index (IVPI) of 0. On March 4th, as further confirmed on March 8th, the isolate from the younger flock was found to be highly pathogenic, with an IVPI index of 2.96. Gene sequencing analysis demonstrated the presence of a seven amino acid insertion within the cleavage site of this isolate.

Infected premises 2

On March 11th, a second flock approximately 3 km west of the first infected premises was confirmed as infected with H7N3 avian influenza. The only clinical sign observed had been increasing mortality in one barn, beginning at 5-10 dead birds per day, peaking at 150 on March 9th and then dropping back to 10 dead birds on the day before depopulation. On March 9th additional samples had been collected and the farm was then placed under quarantine. The birds were destroyed March 12, within a day of receipt of the laboratory confirmation of the diagnosis.

This second broiler breeder premises had four barns. Two held pullets and two housed laying birds. Only one barn of 13 week old pullets showed clinical signs and virus was isolated only from that flock. IVPI and sequencing analysis demonstrated the same seven amino acid insertion as the first infected premises, confirming that this isolate was also highly pathogenic.

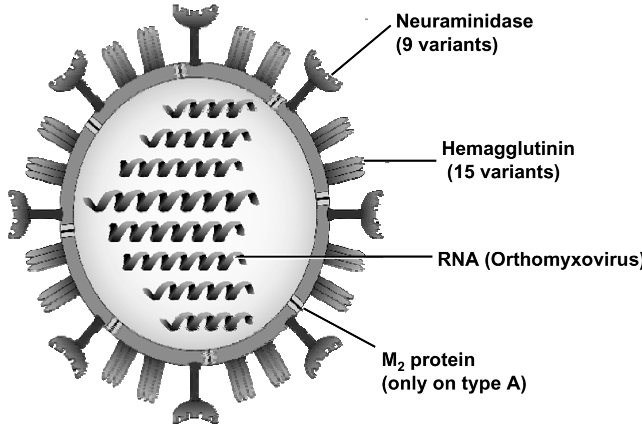
Declaration of a Control Area

On March 11th, the Minister of Agriculture and Agri-food made a declaration, pursuant to subsection 27(1) of the Health of Animals Act, implementing a Control Area in the Fraser Valley of British Columbia. The Order restricted the movement of captive birds, including day-old chicks and hatching eggs, their products and by-products along with anything (ie. equipment) that had been exposed to a bird.

At the same time, the CFIA implemented 3 disease control zones. The 5 km zone around the original index case was designated as the High Risk Region (HRR). This was surrounded by a larger Surveillance Region (SR), and the Fraser Valley south of the Fraser River was designated as the Control Area (CA). Movement controls were established to prohibit removal of birds or infected material from the High Risk Region. Cleaning and disinfection (C&D) stations were established at its perimeter.

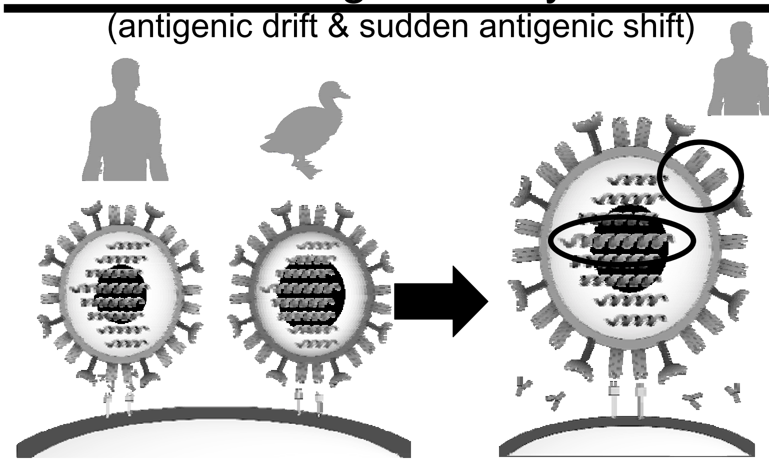
Commercial and backyard flocks within the High Risk Region and commercial flocks within the Surveillance Region that were designated as high risk

The Influenza Virus



Influenza A is genetically unstable

(antigenic drift & sudden antigenic shift)



http://www.tamiflu.com

Courtesy Dr. D Skowronski, BCCDC

contacts were targeted for regular active surveillance. A serologically or PCR-based sampling plan was implemented to enable detection if disease prevalence on a farm was 5% or higher as reflected by the tissues employed in those methods. The owners of other commercial flocks in the Surveillance Region were interviewed by telephone and dead birds were collected and swabbed weekly. In addition, all birds intended for slaughter were tested (pre-slaughter) according to the same protocol.

The disease was detected 2 km south and west in a cluster of three farms within the High Risk Region that tested positive between March 13th and 19th. In the face of the outbreak, depopulation decisions were based on a positive PCR result regardless of whether or not clinical signs had been expressed or virus had been isolated.
On March 24th, after 5 commercial farms and 2 backyard flocks had tested positive for avian influenza, the outbreak was declared an emergency and the CFIA activated its National Emergency Operations Centre in Ottawa. A decision was made to pre-emptively slaughter all poultry (275,000 birds) within the High Risk Region and active surveillance activities were redirected to dead bird pickup within the Surveillance Region.

Sporadic cases were diagnosed over the next few days among a few outlying farms outside the High Risk Region and within a second small cluster of farms 7 km to the west, along north Mt. Lehman Road. These did not exhibit the dramatic clinical signs that may be seen in cases of HPAI, but were discovered during the course of routine surveillance testing of dead birds.

By the end of March, a total of 20 commercial farms had been found positive by PCR testing - 13 within the High Risk Region, 5 within the surrounding Surveillance Region and 2 outside the Surveillance Region but within the Control Area. In addition to these, there were 6 positive backyard flocks - 4 within the High Risk Region and 2 within the Surveillance Region.

Depopulation of the Control Area

On April 5th, a decision was made to depopulate the entire Control Area of poultry - an estimated 19 million birds. Further movement restrictions were imposed to stop the movement of poultry, poultry products and contaminated equipment within the Control Area. Legal steps were taken to require poultry owners to control access to their properties to prevent unauthorized entry.

By mid-April, a third cluster of positive farms had emerged 5 km away from the index flock, on south Mt. Lehman Road and along Columbia Street. These were located in a very high density poultry area south of Abbotsford. Barns were often located very close to each other and once introduced to an area the disease appeared to spread locally from one farm to the next. Rapid depopulation of poultry barns within 3 km of infected premises became a primary focus of the disease control efforts.

The progression of the outbreak slowed towards the end of April, approximately 2 months after confirmation of infection on the index farm. It appears that movement controls and pre-emptive slaughter of all birds within 3 km of an infected farm were effective in limiting spread. In a number of cases, surveillance conducted during pre-emptive depopulation revealed flocks positive to the polymerase chain reaction (PCR) test but not showing clinical signs.

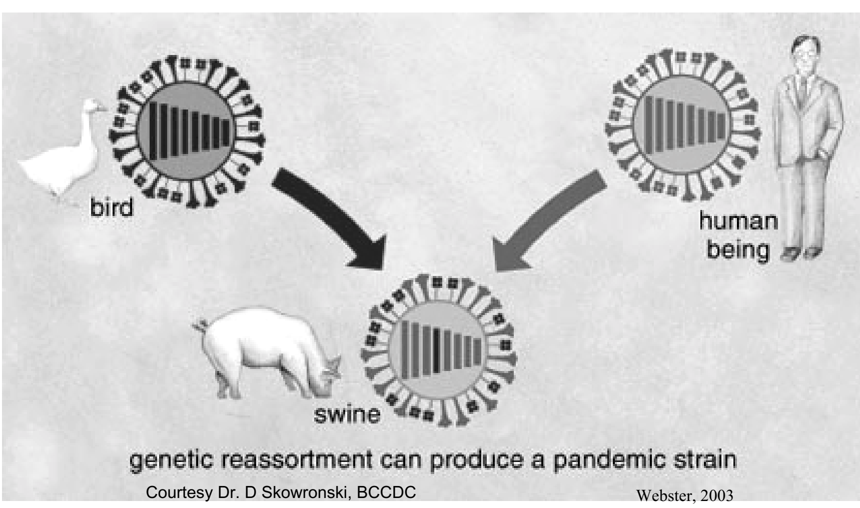
Samples taken May 13th identified the last infected commercial premises. The last positive backyard flock was sampled and destroyed on May 18th. Of the 42 commercial farms depopulated on the basis of a positive PCR test, 11 had been found during the course of surveillance for pre-emptive slaughter or depopulation. No clinical signs were seen in these flocks, and further work was undertaken to determine if active infection with H7N3 was present. As of publication date, HPAI (H7) virus had been isolated from 28 of the 42 commercial premises and 2 of the 11 backyard flocks deemed infected on the basis of a positive PCR test. Incidental findings included 1 flock of meat ducks that tested positive for H11N9 and a flock of geese that were serologically positive for the H6 strain of the virus.

By May 21st, 2004, the last of the farms within 3 km of all infected premises had been depopulated. During the week of May 23rd, the last commercial flock was slaughtered. By then, approximately 17 million commercial poultry (90% of the captive birds within the Control Area) had been slaughtered.

Repopulation begins

On June 3rd, twenty-one days had elapsed since the last infected farm was discovered, giving additional confidence that the outbreak had been contained. On June 4th all depopulation actions were officially suspended and on June 10th a new High Risk Region (HRR)was named -

Swine are a "mixing vessel"



the municipal boundary of the City of Abbotsford. This allowed for orderly repopulation of farms located within the Control Area, but outside the new HRR. Surveillance continued on 12 layer and breeder farms within the new High Risk Region.

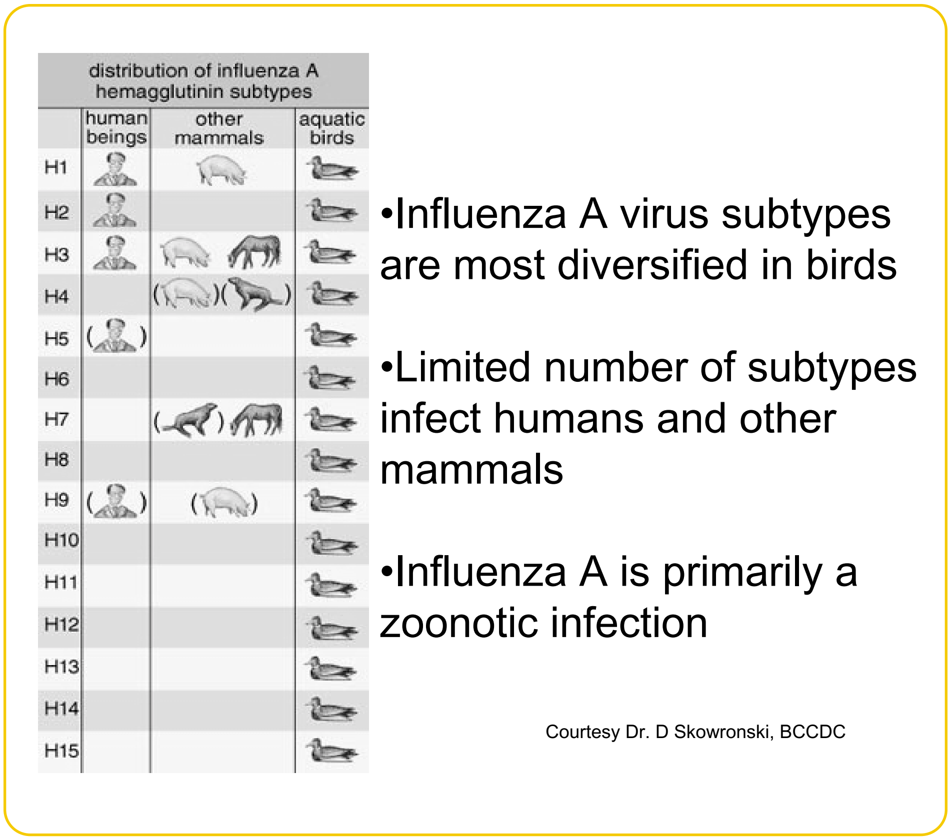
By June 11th, all sites where dead birds and/or manure were composted had achieved the minimum time and temperature requirements to be deemed virus-free. Compost piles containing dead birds were maintained until complete carcass breakdown had occurred. Cleaning and disinfection procedures were concluded on 41 of the infected premises by June 18th. The remaining farm, outside the HRR, remained under quarantine until the cleaning and disinfection was completed.

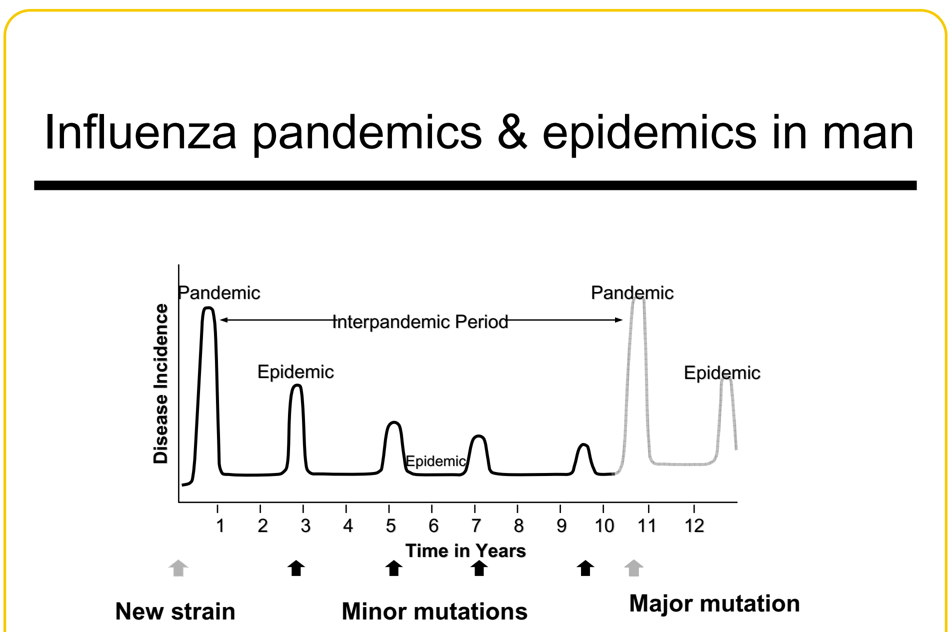
Laboratory findings

NCFAD's role in the B.C. avian influenza outbreak initially involved the characterization of the virus isolated by the Animal Health Centre, BCMAFF that originated from an older flock located on the index premise. It was complemented by isolation of virus from tissue specimens sampled from a younger flock located on the index premises.

Characterization of the original allantoic fluid specimen obtained from BCMAFF employed real-time reverse transcriptase-polymerase chain reaction (RT-PCR) assays specific for H5 and H7 hemagglutinin sub-types; H-typing by hemagglutination-inhibition assay; N-typing by neuraminidase-inhibition assay; conventional RT-PCR and cycle-sequencing to determine the amino acid sequence of the hemagglutinin cleavage site; and intravenous pathogenicity indexing.

The isolate derived from the older flock on the index premises was an H7N3 virus that possessed the typical waterfowl cleavage sequence PENPKTR*GLF. This isolate was predicted to be of low pathogenicity based on the cleavage site, and was subsequently shown to have an IVPI of 0.0. Tissue specimens derived from the younger flock were processed and inoculated into 9 day old embryonating chicken eggs. The virus isolated was also H7N3. However, the cleavage site differed by possessing a 21 nucleotide/7 amino acid insert. It had an IVPI of 2.96 and produced plaques on QT-35 cell monolayers in the absence of exogenously added trypsin. During the course of the outbreak the laboratory employed a number of diagnostic assays. The majority of samples submitted for analysis were oropharyngeal and cloacal swab specimens stored in avian transport medium. In the early part of the investigation these were processed for





Adapted from *Mandell, Douglas and Bennett's Principles and Practice of Infectious Diseases*, 5th ed. 2000:1829. Modified from Kilbourne ED. *Influenza*. 1987:274, with permission.

inoculation of 9 day old embryonating chicken eggs and testing by RT-PCR assay targeting the matrix gene. Submissions that tested positive by the matrix RT-PCR assay were tested using the H7 type-specific PCR assay. Virus isolates were H-typed and N-typed, the hemagglutin cleavage site sequenced, and the pathogenicity confirmed by IVPI. As the investigation progressed, the matrix RT-PCR was used as a screening assay. Positive reactors were subsequently processed for virus isolation, H-typing, and nucleic acid sequencing of the H gene segment.

By June 23rd, H7 viruses had been isolated from 28 of the 42 commercial premises and 2 of the 11 backyard flocks previously deemed infected on the basis of positive PRC results. All of the highly pathogenic isolates possessed a 21 nucleic acid/7 amino acid insert at the cleavage site. To date, six PENPK variants have been identified that have arisen by point mutations within the insert. An additional isolate, a PENPR variant, contains a point mutation at the cleavage site outside of the insertion. The majority of isolates possess IVPIs in the 2.9 to 3.0 range, but one isolate had a slightly lower IVPI of 2.17.

Epidemiological investigation

Because the first two cases involved broiler breeder farms, the movement of their hatching eggs was traced to a single hatchery located within the Control Area. Chicks hatched from eggs laid from January 12 through to February 16 were tested at hatch or, for chicks already in broiler barns, monitored and tested in the barns. In the light of the uniformly negative results of testing of eggs hatched from these two flocks, it was concluded that the movement of chicks and hatching eggs did not pose a significant risk for disease transmission. It is generally agreed that if influenza virus is present in the egg, the embryo will be killed by the virus. If the virus is on the surface of the egg, it will be killed during commercial incubation.

Tracing forward investigations were also conducted on infected farms for the movement of products, birds, equipment and people within 21 days preceding the onset of clinical signs or a positive test. Farm owners and operators were interviewed and time line diagrams were constructed to identify epidemiologically significant contacts on 12 farms infected in the critical period between January 12th and March 31st. This encompassed an interval extending form 3 weeks in advance of the index flock's clinical signs until three weeks following the imposition of movement controls.

Transmission considerations

Wild birds, especially waterfowl, can act as asymptomatic reservoirs of avian influenza virus and may be the initial source of infection for domestic birds, through direct contact or via fecal contamination of feed or water. Through passage in susceptible species, low pathogenic viruses can acquire virulence due to antigenic drift (small, evolutionary mutations) or sudden antigenic shift (dramatic genetic recombination that occurs when an animal or human is infected with two types of influenza virus.) Avian influenza is highly contagious, spreading rapidly through a confined commercial poultry flock and producing high concentrations of virus in both the respiratory and digestive tracts of infected birds. Fecal material from infected birds may contain up to 16×10^6 virions per gram of feces. One gram contains enough virus to infect one million

Influenza pandemics in the 20th century

Years	Flu	Virus	Mortality
1918-1919	"Spanish"	Type A (H1N1)	20-50 million worldwide 550,000 US
1957-1958*	"Asian"	Type A (H2N2)	70,000 US
1968-1969*	"Hong Kong"	Type A (H3N2)	34,000 US

*Known reassortments of avian and human influenza viruses

Glezen WP. *Epidemiol Rev*. 1996;18:65.
Centers for Disease Control and Prevention. Influenza Prevention and Control. Influenza. Available at: http://www.cdc.gov/ncidod/diseases/flu/fluinfo.htm.

Recent avian influenza outbreaks

SE Asia (10)	**1997-98** **2003-04**	**H5N1** **(from HK H9N2 or H6N2 ?)**	**43 cases/ 30 deaths in humans**
Italy	**1999-2000** **2003**	**H7N1** **H7N3**	
Chile	**2002**	**H7N3**	
Netherlands	**2003** **2004**	**H7N7** **H5 / H7 (LP)**	**89 cases/ 1 death (est. 1000 ILI) in humans**
Pakistan	**2004**	**H7 / H9**	
S Africa	**2004**	**H5N2**	
USA **(15 outbreaks of LPAI since 1997)**	**2003 & 2004 PA** **2004 DE, MD** **2004 TX**	**H2N2** **H7N2 (LP)** **H5N2/H7N3**	
Canada	**2004**	**H7N3**	**2 cases in humans**

birds. Swine may act as a "mixing vessel", facilitating the conditions for antigenic shift, as their respiratory tracts contain receptors that can bind both avian and mammalian influenza viruses.

Infected farms appeared in three clusters, each of which had a diameter of 5-6 km. In a few cases, outlying farms were positive on PCR tests but did not show clinical signs or appear to contribute to local spread. In this outbreak, it appears that once a farm within a densely populated poultry area became infected, nearby farms (often within several hundred meters of each other) also become infected. Ninety-five percent of Fraser Valley poultry producers use wood shavings and the remainder use sawdust for bedding material. Although wood shavings are mainly coarse, they often contain extremely fine and light sawdust particles, which can readily become airborne if the bedding is disturbed. The large exhaust fans on modern poultry barns can evacuate high volumes of air and airborne dust could readily be drawn into the intakes of adjacent barns. Further studies are underway on the role of local, airborne spread of the virus on feathers or dust particles.

The working hypothesis of transmission in this outbreak is that LPAI was initially introduced into the older flock on the index farm. The virus then mutated into HPAI and infected the younger flock on the same farm. Transmission from farm to farm over large distances was likely due to the movement of infected birds (early in the outbreak) or the result of mechanical spread by movement of people and contaminated equipment. However infected, a flock of 8-10 thousand birds essentially becomes a "virus factory". If located in a densely populated area, it may produce enough virus to infect nearby flocks through airborne transmission of virus on dust particles or feather debris.

Control actions

CFIA controls were based on three major disease control principles comprising rapid detection of infected flocks (surveillance); rapid destruction of infected flocks, high risk contact flocks and proximal flocks (within 3 km) and; effective biocontainment of infective material (carcasses, manure and feed).

Surveillance

Initially, a surveillance plan was developed for all commercial farms within 5 km of the index premises, but once the High Risk and Surveillance Regions were designated, the surveillance protocol was expanded to include all commercial farms within these regions. After the plan to depopulate the entire Control Area was announced, active surveillance was targeted towards commercial farms within 3 km of each infected premises.

Active surveillance initially employed serological methods, but this was found to be operationally difficult and was considered relatively ineffective in detecting recently acquired infections. Swabbing the oropharynx and cloaca was adopted as the method of choice since PCR-based tests can be performed quickly and are epidemiologically sensitive.

In addition to these active surveillance sampling strategies, a heightened level of passive surveillance was implemented throughout the area during the entire outbreak. Public information campaigns were used to educate poultry owners on the signs of avian influenza and to encourage prompt reporting of sick birds or increased mortality.

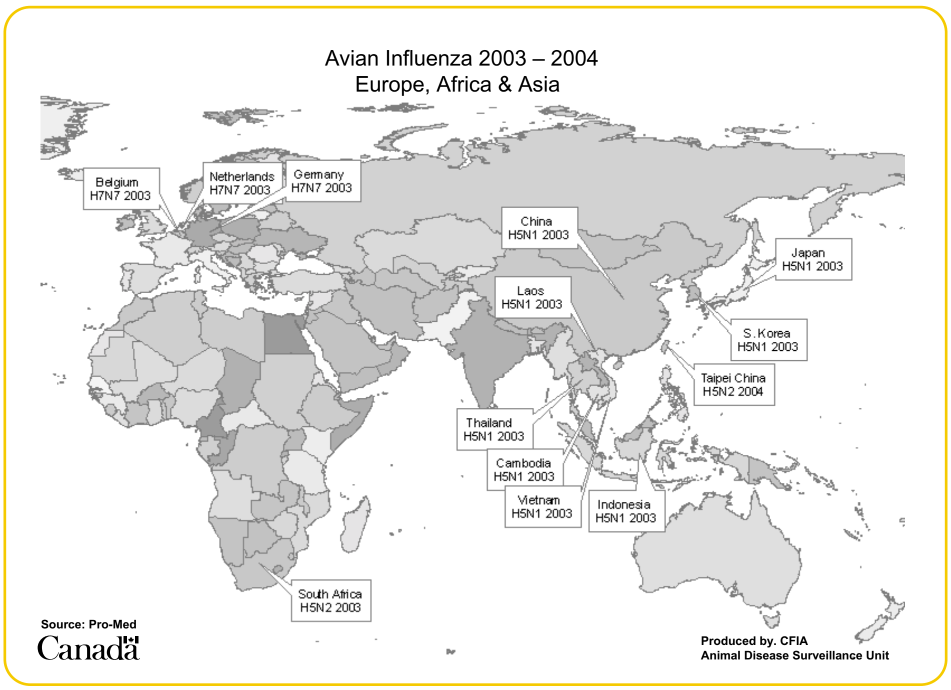
The poultry industry throughout Canada was also on the alert for AI, as evidenced by the marked increase in submissions to the NCFAD from flocks outside the Control Area. In the period March 16th to April 22nd, NCFAD received 13 AI suspect submissions from Manitoba and Alberta, as compared to 15 submissions during the interval 1997-2002.

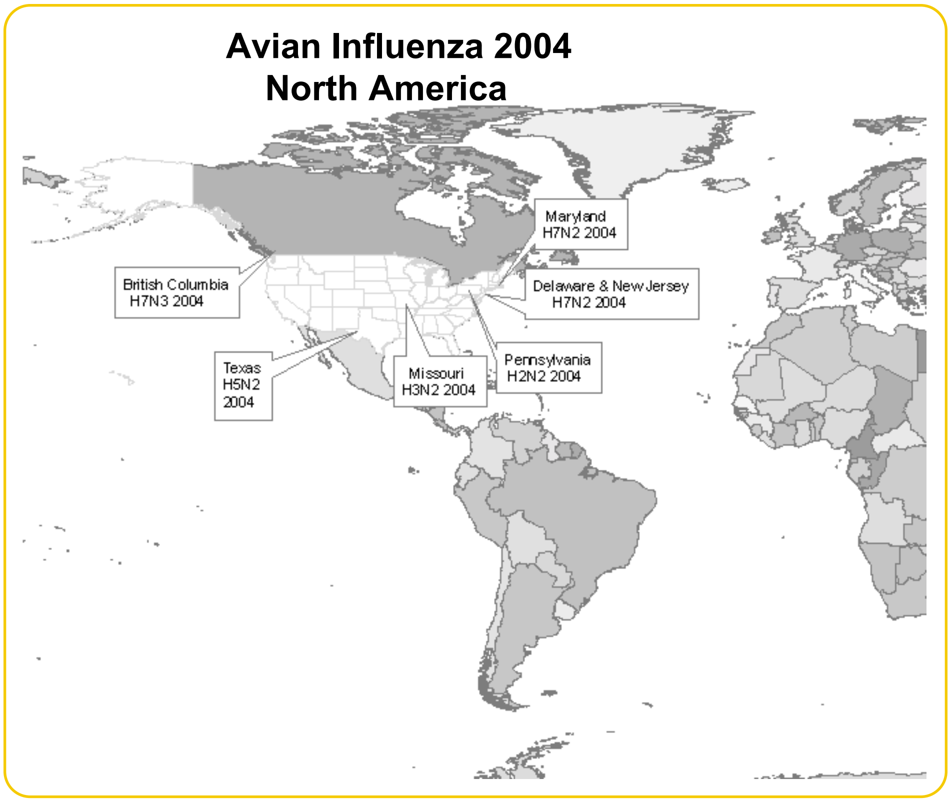
Flock destruction

Rapid destruction of high risk flocks was essential in controlling the spread of disease. High risk flocks included those with common ownership or shared equipment and those within a 3 km radius of an infected flock. The goal was to destroy these birds within 24-48 hours of finding a positive flock.

Disposal

Carcasses of infected birds were disposed of via incineration, landfill and composting. Some carcasses, most often those of layer hens, were removed from the barns and placed in biosecure containers for transport to incineration or landfill. Wherever possible, birds, eggs, litter and manure were composted inside the original barn. Once the compost had been held at 30 degrees Celsius for a minimum of 3 consecutive days (to inactivate the virus), additional composting could take place outside the barn.





Where practical, flocks that tested negative were processed at designated slaughter facilities within the Control Area. The meat was consigned directly to retail outlets within Canada. Poultry products processed within the Control Area could not be certified for export. If slaughter was not practicable, the negative flocks were euthanized on site and carcasses removed to rendering, landfill or communal composting.

Cleaning and disinfection

Infected premises and equipment had to be cleaned and disinfected before restocking was allowed. All cleaning and disinfecting protocols were monitored by CFIA Inspectors.

Repopulation provisions

After positive premises were satisfactorily cleaned and disinfected, repopulation began on June 10th , with the establishment of the new High Risk Region (municipal boundaries of the City of Abbotsford) and the lifting of some movement restrictions. Farms within the Control Area, but outside the new HRR were to be repopulated first (June 10th). Farms inside the new HRR were restocked next (beginning July 9th), 21 days after the last infected premises had satisfactorily completed cleaning and disinfection on June 18th. All infected premises remained under quarantine following depopulation, cleaning and disinfection. A surveillance plan was developed such that if poultry were restocked less than 60 days later then sampling for testing would be required. Surveillance testing was not required on negative premises and on those positive premises where the barns had been empty for more than 60 days after the farm's cleaning and disinfection was approved. Similarly, surveillance testing would not be required on unifected farms that were being repopulated.

Ongoing investigations

In conjunction with other agencies, the CFIA continues to study topics relevant to the outbreak. They include: airborne transmission; the role of hatcheries, wild birds and service providers; disposal methods; database management and integration within a Geographic Information System (GIS).

Both during and after the outbreak, international contacts were maintained with representatives from the United States, Japan and the European Union as well as an international review panel of experts.

Acknowledgments:

Sincere thanks are extended to Drs Ken Moll, Peter Brassel and Tong Wu. Information on laboratory analysis was contributed by Dr John Pasick (NCFAD).

The Avian Influenza Outbreak: NCFAD's Perspective

Drs. John Pasick and Kathleen Hooper-McGrevy

Dr. John Pasick is the Head of the Classical Swine Fever & Avian Diseases Section at the National Centre for Foreign Animal Diseases (NCFAD). His section dealt with characterization of the original and all subsequent viruses isolated during the outbreak. Characterization included hemagglutinin and neuraminidase typing, and pathotyping by nucleic acid sequencing. He also conducted intravenous pathotyping in collaboration with Dr. John Copp's Animal Care group. During the outbreak he carried out all virus isolation and real-time PCR assays.

Kathleen Hooper-McGrevy is Head of the Serology and Immunology Section at NCFAD. Her group carried out all the serologic testing during the outbreak. This included ELISA and AGID assays.

On the afternoon of February 18, 2004, Dr. Cornelius Kiley, a CFIA regional veterinary officer based in Burnaby, B.C., alerted the National Centre for Foreign Animal Disease of an avian influenza virus that had been isolated by the BCMAFF. The affected farm was a broiler breeder operation located just north of Abbotsford comprised of two flocks 52 and 24 weeks of age. Because of a sudden and dramatic increase in mortalities involving the younger flock, it was decided that the isolate be characterized as quickly as possible to rule out the possibility that it was highly pathogenic.

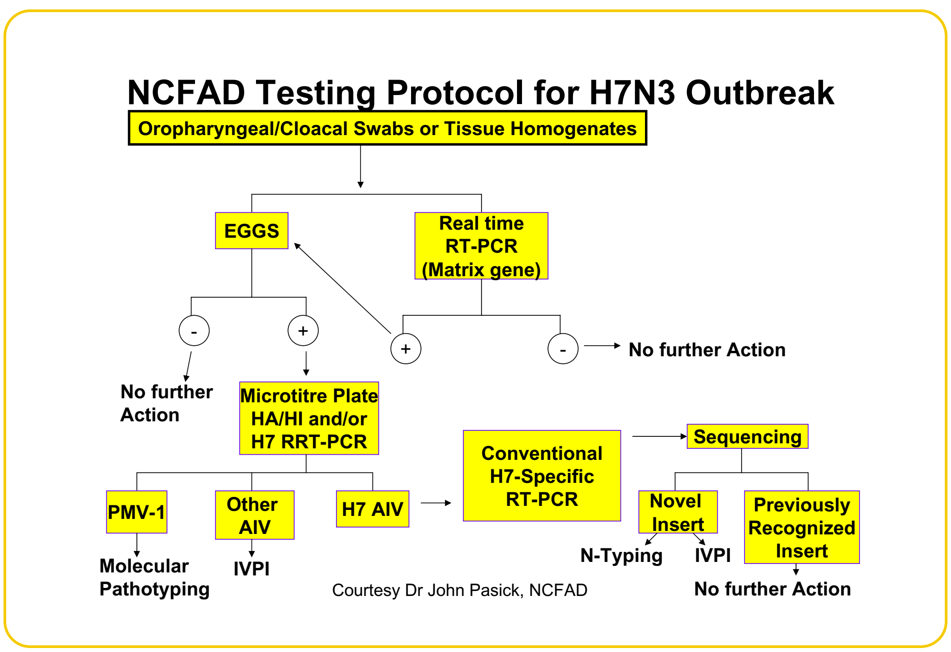
Allantoic fluid samples derived from the older flock, along with tissue specimens originating from birds of the younger flock were shipped to Winnipeg and arrived late the evening of February 18. Processing of the submission began immediately and continued into the early hours of February 19. On the morning of February 19 it was confirmed that an avian influenza virus of H7 hemagglutinin sub-type had infected a poultry farm in the lower mainland of B.C. This conclusion was reached on the basis of hemmaglutination-inhibition, real-time RT-PCR and conventional RT-PCR assays.

During the following 2 weeks, laboratory efforts focused on characterizing the viruses which had been isolated from the young and old flocks of this broiler breeder operation. Within 3 days of receipt of allantoic fluid samples from BCMAFF, a clearer picture began to emerge regarding the character of the virus that had been isolated from the older flock. It was found to possess an N3 neuraminidase sub-type, and nucleotide sequencing of the hemagglutinin gene revealed that the hemagglutinin cleavage site was typical for that of low pathogenic viruses. This tentative low pathogenic designation was subsequently confirmed by intravenous pathogenicity indexing (IVPI ‘ 0) on March 1.

The virus isolated from tissues originating from birds of the younger flock was also shown to be an H7N3, and initial nucleotide sequencing of the hemagglutinin gene suggested a cleavage site not unlike that seen in the virus isolated from the older flock. However, the sequencing electropherogram also suggested the presence of more than one template and additional tests were undertaken to ensure correct pathotype designation. Inoculation of QT-35 (quail fibrosarcoma) cells showed that the virus isolated from the young flock was capable of producing a cytopathic effect in the absence of trypsin, while the virus isolated from the old flock did not. Following the intravenous inoculation of 4 to 6 week old leghorn chickens, deaths were observed within the first 24 hours resulting in an IVPI value of 2.96.

The hemmaglutinin gene of the virus isolated from these birds was sequenced and shown to posses a novel 7 amino acid insert at the hemagglutinin cleavage site. Analysis of the nucleotide sequence of this insert demonstrated that it most likely derived from the influenza A matrix gene as a result of a non-homologous recombination event. This in turn imparted the ability of the hemagglutinin precursor to be cleaved by intracellular proteases, an important determinant of pathogenicity. The situation had suddenly changed with the realization that we were faced with a highly pathogenic H7 avian influenza virus (HPAI).

In early March, BCMAFF isolated an avian influenza virus from a second premises located just 3 kilometres from the first. On March 11, NCFAD confirmed the presence of an H7 avian influenza virus on this farm. A surveillance zone was set up and testing was directed at detecting viral antibodies against influenza A group specific antigen using a competitive ELISA, and virus using isolation and PCR assays. It soon became apparent that because of the inherent lag time in seroconversion, serology was not the best means of identifying recently infected farms.



Courtesy Dr John Pasick, NCFAD

As the outbreak progressed the emphasis of laboratory activities shifted toward large scale testing for the direct presence of virus on farms situated within the high risk and surrounding surveillance regions. Pooled cloacal and oropharyngeal swab specimens were processed for virus isolation in embryonating chicken eggs and detection of influenza A specific nucleic acids using a real-time RT-PCR assay which targeted the matrix gene. Sample management and reporting quickly became an issue. During the early stages of the outbreak the decision to eradicate a flock was dependent on the results of a number of tests - the hemagglutinin and neuraminidase sub-type of virus, its molecular pathotype, and the IVPI.

As the outbreak continued, real-time RT-PCR targeting the matrix gene became the screening test with all positive reactors going into eggs for virus isolation. By early April the decision was made to eradicate flocks on the basis of a positive PCR result without waiting for results of hemagglutinin sub-typing. At the peak of the outbreak, NCFAD was testing 300 to 400 swab specimens per day by real-time RT-PCR with a capacity to handle as many as 600 specimens per day. The laboratory was also receiving requests to test environmental samples like surface water and compost.

Additional personnel from CFIA laboratories in Sidney, Burnaby, Lethbridge, and Saskatoon were rotated through NCFAD to deal with our markedly increased workloads. As the volume of submissions increased so did the complexity of tracking them. To address this problem, a programmer was employed to assist in the development of a database to be used in the management and reporting of test results. Countless other examples of ingenuity demonstrated by laboratory staff were also instrumental in maintaining testing integrity and efficiency.

As the outbreak drew to a close, serologic testing was re-introduced as a tool to demonstrate freedom from infection. In the end, NCFAD had received approximately 2800 submissions over the course of 5 months; 2,400 of these were for virology, with the balance for serology. This translates into approximately 42,000 specimens for virologic testing and 17,000 specimens for serologic testing, numbers we aren't soon to forget.

The District Veterinarian's Burden

Dr. Jim McClendon as interviewed by Dr. Rosemary Hood

Dr. Jim McClendon was the CFIA District Veterinarian, Abbotsford & Surrey BC, when the outbreak occurred. He became Field Operations Manager of the BC Emergency Operations Centre.

Jim lives in Abbotsford. It is his home turf. The outbreak occurred literally in his back yard, and involved people he knows. Operations Manager from the beginning of the outbreak announced on February 17th until September, Jim now calls himself "the last man standing ". It's a fitting description, in that he remains alone to deal with many ongoing issues long after the recruits have gone home. It did not end for Jim on the official end date of the outbreak, given the aftermath for an industry that will not be back to normal for a year.

Jim's place in the outbreak response was an interesting one. We asked him to give us a small insight into his role as supervisor of incoming new arrivals from across the country. It was his task to create the overall management structure for the disease control response. He created divisions to manage the multitude of tasks identified and the outbreak response itself as it unfolded. Like a man facing the storm, he gathered resources and directed people, delineating and assigning tasks in the emergency, in a role that sounds overwhelming.

At the beginning, he had to establish a humane depopulation method and a safe way to dispose of the first 16,000 birds. As the outbreak grew it became necessary to expand the divisions to carry out the eradication plans. He had to choose supervisors and guide the plans for each of the divisions, including the daily scaling up of euthanasia and disposal. He answered a myriad of associated questions that flowed to his desk.

Disposal itself became a huge undertaking: identifying who would be assigned to pick up the birds, determining the appropriate container for safe transport, the kind of transport and the locations for incineration or pit burial. Other options consisted of on-farm and central composting. Each required consultation with industry and provincial government to establish costs, availability and capacity.

The list of divisions initially comprised: eradication and euthanasia; movement permits; media relations; depopulation; disposal including composting;, OSH-HC; compensation; C & D (cleaning and disinfection); epidemiology and surveillance; biosecurity training; lab services including submissions; human resources; enforcement; back yard flock destruction; procurement; CFIA management and administration; and emergency preparedness at the municipal and provincial levels. Biosecurity measures for handling infected birds punctuated all activities.

Jim recounts one Kodak moment as something to remember from the fray. Two weeks into the outbreak, they had just managed to get protocols on board and get organized when a small group travelled 2 hours up to Princeton to access a curtain incineration unit on a beautiful snowy night. Cold and clad in rubber boots, the team gathered amid reflected shadows around the glow of the pit fire below, unloading combo boxes of birds (1 cubic metre of double bagged bird carcasses), talking and sipping hot chocolate, a special moment, with no illusions of the task ahead. Jim recounted "I did not have a clue when I said to the curtain operator 'I hope you can handle 4 million'. We had just killed 2 flocks."

Jim described each day of the outbreak as starting at 7:00 am with a meeting for 8 or more supervisors. First on the order was going over the events of the previous day, followed by strategizing to overcome problems. The day's work, based on these reports, followed with the dispatch of crews. As the

Influenza Type A (H5N1)

- First appeared in humans in Hong Kong, 1997
- Primarily associated with avian species
- Fatal epidemic among Hong Kong poultry in 1997
- 43 total confirmed cases, with 30 deaths

Lee, Mak, Saw. *Public Health and Epidemiology Bulletin*. 1999;8:1-7.

Risk factors in the Fraser Valley

- High density of poultry operations
- Shared people, birds and equipment
- Co-location of pigs and poultry
- Waterbird migratory route
- High density of people
- Travel to SE Asia (exposure to H5N1)

Lee, Mak, Saw. *Public Health and Epidemiology Bulletin*. 1999;8:1-7.

outbreak progressed, it became necessary to relocate into larger headquarters to include the growing numbers of provincial and municipal representatives and crew members. The supervisors' meetings merged into daily information sharing session with 30-40 present, followed by individual divisional meetings to problem solve.

Growing pains were felt as the workload grew. Section heads had to remain in situ and make ad hoc decisions without delay. It was difficult to build and scale up processes needed to deal with the many facets of the outbreak as it expanded. The winding down was more easily arranged.

Key things Jim learned as supervisor - Important in an outbreak -

1. Strong organizational structure is needed

The BC disease control response demanded creation and adjustment of the organizational structure to meet the changing demands of an exponentially expanding outbreak.

2. Management skills are challenged

Jim called upon all his management skills to the extreme. He had to choose each new division director and then also field their questions on many issues, interacting with dozens of people with big problems to solve.

3. Space requirements change

By mid-March operations had moved out of the District Office of 1.5 thousand sq ft and into a vacant office building near the airport, a three fold increase in space. Within a month it had expanded ten fold beyond that, reflecting an exponential expansion of the human and material resources needed to deal with the epidemic.

4. Replacement staff is necessary

Taking time off was difficult. Once off, it was just as difficult to catch up because so much had happened in the one day away. The stress of uncertainty, long 12-14 hour days including weekends, on a continuous schedule, non-stop and with no end in sight made replacement a necessity for everyone in all positions. Calling in colleagues and alternates to provide relief was essential as a coping strategy.

A Call to Arms

Dr. Brian Keyes

Dr. Brian Keyes was Director of Field Operations - Ontario Area Disease Control, CFIA Program Specialist, Brian recently took a position in CFIA Operations in Ontario and coordinated an emergency response exercise in late October with the Ontario Ministry of Agriculture and Food (OMAF).

Recently, I spoke to a retired federal veterinarian, 80+ years of age. He recalled his involvement in the Foot and Mouth Disease (FMD) response the winter of 1952 in Saskatchewan. Many of the veterinarians of that day were veterans of WW II. "A call to battle" for this horrific foreign animal disease (FAD) seemed logical under the military model of emergency management. Now, 52 years later a comparable situation has taken the form of the 2004 Avian Influenza (AI) virus outbreak. After the detection, confirmation and ministerial declaration in February-March of this year, the call came from British Columbia to Ontario for operational support. The following looks at three phases of the Ontario reply: deployment, response and stand down, from late March through mid June with mobilization of over 60 staff.

The deployment phase brings special challenges. You want to send the best possible staff to meet the needs of the operations team at the Emergency Operations Centre (EOC). Needs vary depending on where you are on the epizootic curve. In the beginning, in the face of the disease's zoonotic reputation, BC EOC had health and safety issues which prevented the hiring of non-CFIA personnel as general labourers (GL's). During latter phases, GL's placed under the employ of CFIA, held these support roles superbly, performing many of the basic activities. Six Groups of 8 Ontario staff each were deployed for a three week rotational stay at the EOC. The first groups filled roles of GL's in the field while those who attended towards the end of the outbreak were able to provide expertise in supervision or support for specific unit activities of the EOC. When considering who to send, it is important to understand the needs of the EOC manager, consider the physical and training requirements (eg. extreme heat with heavy lifting or machine operations) and the personal suitability of the individuals (eg. compassion for backyard owners if depopulating family pets or knowledge skill sets for specialized units such as compensation).

Many individuals must work unsupervised and under considerable pressure, amid high visibility. This requires selection of pragmatic, diligent staff. It is prudent to catalogue the skill sets of employees for quick reference during this phase. The critical control point is the coordination mechanism to streamline deployment. The manager who is freeing up the employee to join in the outbreak response must also make sure another employee is available for backfilling the "peacetime"

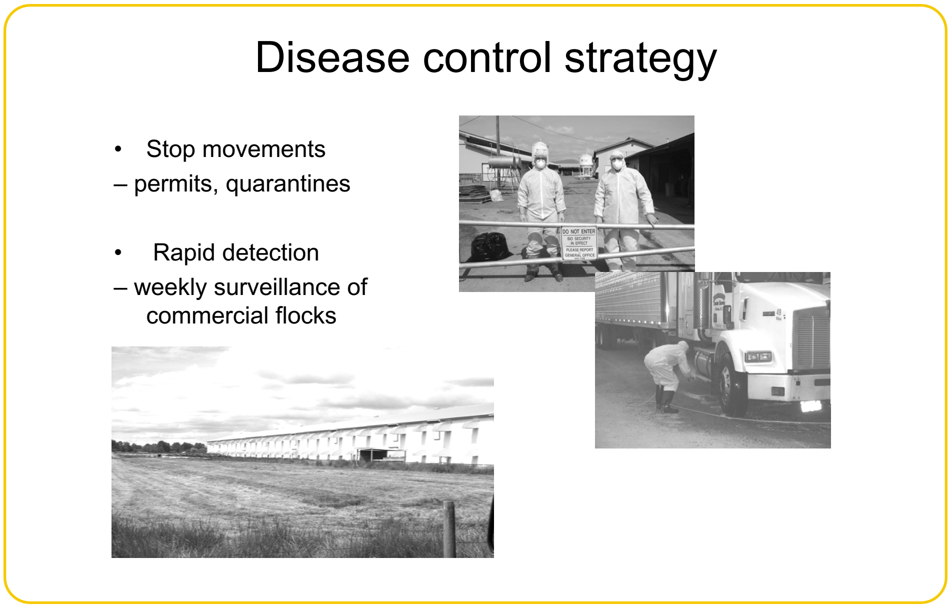
Epidemiological observations

- Commercial flocks were 5.6 times more likely to be infected than were backyard flocks
- Infected backyard flocks were discovered after nearby commercial flocks were infected
- Odds Ratio = 5.6

95% CI (2.9,11.1)

$p<.0001$

	Infected	Not infected	*Total Tested*
Commercial flocks	**42**	**368**	***410***
Backyard flocks	**11**	**542**	***553***
Totals	***53***	***910***	***963***



substantive duties. Making sure that teams are balanced, that an individual's personal schedule and the needs of the EOC manager are satisfied, is a challenge. It is not always just veterinarians and inspectors who are needed in an EOC and a wider involvement of non-Animal Health staff is recommended. Travel and tracking of employees is part of deployment coordination.

The response phase of any emergency management requires structure, regardless of the size. The reporting structure must be clear, expandable and sustainable. The success of fighting a major animal disease outbreak today relies on partnerships with the public and private sector. As the default national structure evolved to meet regional needs during the outbreak, the CFIA staff saw the emergence of important partnerships. These formed with the provincial government of BC, municipalities (eg. the City of Abbotsford) and industry groups inside and outside the poultry industry, to help solidify emergency management structure. The Ontario Area - CFIA has adopted the Incident Management System (IMS) as a structural tool, based on previous experiences as well as those gained in BC. The IMS gives the basis of emergency management structure in five areas: Command, Operations, Planning, Logistics and Finance/Administration.

The command component clearly identifies a line structure which is important for our partners and those working at the EOC . The command structure provides an orientation for new employees. It is valuable to overlap the deployments by more than 1 day (as in BC) to provide a smoother transition. The orientation package was well prepared in BC. It contained EOC photo passports, as well as Health & Safety, bio-security, EOC security, enforcement and unit briefings. Suggested changes include: time-line briefing from the EOC director; photos of supervisors, with a uniform which would help identify these folks, and inclusion of an EOC map.

Operational successes were multiple. The use of carbon dioxide gas for humane euthanasia in large poultry operations was not only remarkable from my viewpoint but also that of colleagues visiting from New Zealand and the US. This truly showed the success of partnerships - in this case a private gas company and government. The success of the bio-heat treatment for disposal of carcasses, animal products (eggs) and by-products (litter) proved another enormous success. The disposal issue has always been a bottleneck in eradication procedures. Although this was apparent in the beginning of the outbreak, this new solution was implemented well by the end of the ordeal. Poultry industry leaders along with cleaning/disinfection supervisors assisted in advancing the completion of the enhanced cleaning and disinfection stage, which once again proves that partnerships are critical and efficient. The role of the bio-security and bio-containment unit brought a new reality to the emergency management structure not previously considered.

The area of compensation highlights the need to have early intervention by specialized employees, who bring a comprehensive knowledge of the industry and are able to determine fair value. Ontario provided significant staff to support this complex issue. Dealing with non-commercial backyard flocks was, without a doubt, the biggest challenge. The Geographical Information Systems (GIS) grid approach to finding and eradication of these flocks in the designated control areas was a key element in the outbreak response. The perseverance and dedication of staff in the face of public anger and resentment was outstanding.

Planning and intelligence is another key pillar of any response. Epidemiology can clearly be separated into applied and analytical. The applied epidemiologist becomes a "hands on technical advisor " to the operations chief. The analytical epidemiologist can take a wider, long term approach to the outbreak and function within the planning section. These roles evolved over time at the BC EOC. Critical to any outbreak is the use of a reliable data management tool. Although the Canadian Emergency Management Response System (CEMRS) was not deployed at the outset of the outbreak, it is critical that all activities be supported with an inter-operable system such as CEMRS and that central records be maintained. Many believe that we need Geographical Information Systems (GIS). Before BC many were not sure if we could deliver a GIS system. The GIS unit provided excellent support and demonstrated the value of our partners at the Prairie Farm Rehabilitation Agency (PFRA) who provided prepared maps of the Matsqui Prairie. We were fortunate that these maps were available, the result of earlier work. Whether for communications or operational decision making, the GIS unit delivered.

The final phase, or "stand down" may seem the easiest. What we discovered in returning Ontario staff however, was a Post Emergency Response Syndrome (PERS). Many employees experienced physical and or psychological exhaustion. There is a need to track employees individually when dealing with multiple groups deployed far from home during a FAD response, to ensure their safety and follow up once they return home. Full debriefing gives value to the employee - allowing each person to give feedback. This also provides the Agency an opportunity to capturing important "lessons learned". Over the past few years CFIA-Ontario has provided support to other areas across Canada (AI & Bovine Spongiform Encephalopathy (BSE)) and around the world (Foot and Mouth Disease (FMD) - UK; Classical Swine Fever (CSF) - The Netherlands). This keeps the preparedness of our troops at a higher level.

My thanks to all Ontario staff, in addition to those from the Quebec and Atlantic Areas, who participated in the response, along with those who supported the effort at home. Keep your cellular phone batteries charged. I regret that in today's global village, one cannot rely upon another 52 year respite before the next major epizootic.

National Emergency Centre

Dr. Doug Steadman

In January, 2004, Doug Steadman arrived in Ottawa to act as the Executive Director, Operations Coordination, while the incumbent of the position was finishing up the BSE file. What started as a 6-week assignment ended up as 4 busy months of serving as the manager of the National Emergency Operations Centre (NEOC) dedicated to the avian influenza (AI) outbreak in British Columbia.

As most of you now know, the first inkling that something was amiss in the Fraser Valley of BC occurred on February 16, 2004, when th British Columbia provincial laboratory advised the Canadian Food Inspection Agency (CFIA) that avian influenza had been detected in a routine PCR test. Although the initial sample was determined to be of low pathogenicity, a few weeks later a second flock on this index premises was found to harbour a highly pathogenic AI. As events unfolded, it became increasingly clear that this highly infectious disease was not under control. On March 24, 2004, an emergency was declared by the CFIA and the NEOC was activated. I was asked to be the NEOC Manager. My prior experience comprised only simulation exercises.

The NEOC is located on the first floor of the CFIA's headquarters in Ottawa. The nerve centre of the NEOC is a large room containing a sizable table surrounded along the outside walls by workstations equipped with computers and telephones. Integrated into the table are microphones for use during conference calls, with speakers located in the ceiling. Two large plasma television screens are located along one wall for monitoring news channels. Other equipment in the room includes a map plotter, projection equipment and other electronic bells and whistles. Access is limited to authorized staff. As a secure area within a secure facility, all very impressive.

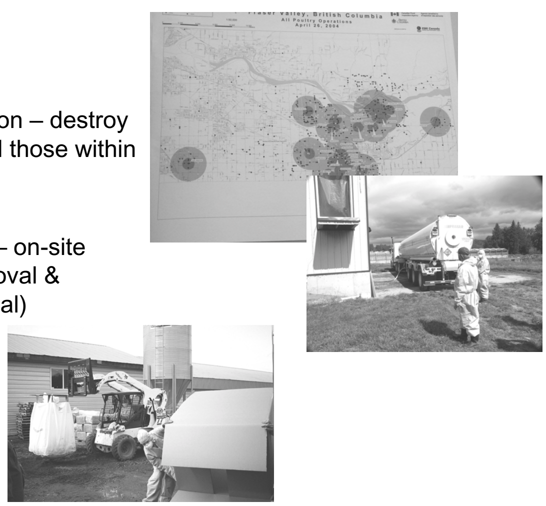
During the AI emergency, the NEOC was staffed with representatives from all the implicated CFIA branches, including Operations, Programs (Animal Health and Meat Hygiene), Science (Laboratories), International Affairs, Public Affairs (Communications), Legal Services, our Emergency Preparedness section and a duty desk. During the height of the emergency, these positions were staffed 12 hours a day, with various people attending on a rotating basis. As the NEOC Manager, my job was to oversee the work these people were doing and try to resolve problems as they arose. As the emergency response developed, a real camaraderie developed. I quickly learned to stay out of the way of these professionals and let them do their jobs.

A number of challenges faced the NEOC staff. Long hours began to take their toll as the weeks rolled by. Several key staff did not rotate with others, but manned their workstations all day long, beginning the day on Eastern Standard Time and saying good night on Pacific Standard Time. The need to stay in constant touch with colleagues in BC to provide them with scientific and logistical support was crucial, as was the need to keep the President and the Minister's office briefed on developments. Added to this were the complexities of dealing with other federal and provincial departments, industry and the international community. Communications, both internally and externally, required constant preparation.

The zoonotic nature of the avian influenza virus introduced an entirely

Disease control strategy

- Rapid depopulation – destroy infected flock and those within 3 K
- Secure disposal – on-site composting, removal & incineration, (burial)



new dimension to our response, which became extremely important when some people on the ground in BC were found to have contracted conjunctivitis from contact with infected poultry. At one point, the World Health Organization (WHO) declared this region of BC to be at the same health alert status as Toronto during the SARS crisis. Health Canada, the BC Centre for Disease Control and the BC Department of Health swung into action, requiring any people in direct contact with potentially infected poultry to be both vaccinated and taking oral anti-virals. Much time was and is being spent with human health authorities, developing policies and protocols to improve our response to this kind of situation.

Although there were more than a few tough moments, the dedication and good humour of my NEOC colleagues allowed all of us to persevere. In the end, through the efforts of the CFIA and our partners, the disease was eradicated. Domestic markets were largely maintained; international markets continue to open as a result of our effective emergency response.

WHO Casts Doubt on Indonesia Claim on Bird Flu

AnimalNet
October 7, 2004
Reuters

GENEVA - The World Health Organisation (WHO) was cited as casting doubt Thursday on Indonesia's claim that a bird flu strain that had killed millions of chickens in the country could not be transmitted to humans. WHO spokesman Dick Thompson was quoted as telling Reuters in response to an query that, "We know of no studies that would support that kind of contention."

Tri Satya Putri Naipospos, director of animal health at Indonesia's agriculture ministry, was cited as saying in Jakarta on Wednesday that tests conducted at a laboratory in Hong Kong, a WHO collaborating centre, found the H5N1 bird flu strain in Indonesia was different from in Thailand and Vietnam, adding, "The genetics analysis showed that the DNA chain of our virus is similar to the kind in the Yunan province on mainland China, and different from Vietnam and Thailand. And we've always questioned why there are no human cases in Indonesia." WHO's Thompson was quoted as saying, "A closer reading of the study would indicate that H5N1 can infect humans no matter which strain we are talking about." Naipospos said the possibility lay open for the virus to mutate into a deadlier form that could be transmitted to humans.

The Role of Epidemiologist as Team Leader in the Avian Influenza Outbreak

Dr. Christine Power

Dr. Christine Power is employed by the federal government as a veterinary epidemiologist in the Animal Disease Surveillance Unit, CFIA. Normally her work in Ottawa consists of heady material, calculating disease- related statistics and interpreting these to others. On March 11, 2004 she received a phone call from Dr. Carolyn Inch, National Manager Disease Control, asking her to join the Emergency Operations Center in Abbotsford, BC to assist the outbreak response. The following is her personal story.

Peering out the window before landing and gathering a glimpse of Abbotsford, I was struck by the greenness of the land in mid-March and the patchwork of urban-rural landscape below. I had been sent from Ottawa for >just one week' to investigate an outbreak of highly pathogenic avian influenza on two poultry farms on the Matsqui Prairie of the Lower Fraser Valley of British Columbia.

On that Sunday evening, I shared a cab with a local government geologist. Observing my wide-eyed astonishment at the magnificence of the mountains embracing the Lower Fraser Valley, he explained the ancient events of their formation. While I never saw him again, he became a forerunner to my reliance on the knowledge and expertise of scientists from other government departments.

By mid-week I was linked up with local colleagues, Drs. Nancy De With and Dave Lightfoot of BC Ministry of Agriculture, Food and Fisheries (BCMAFF). They introduced me to the lay of the land of the Matsqui Prairie, pointing out the infected barns from the roadside. Migratory and residential species of wild birds covered farmers' fields and paddled in ditches bordering the roadways. We sighted geese, ducks, seagulls, starlings and even magnificent bald eagles. As Dave steered the Ministry van through this rural neighborhood, we discussed the many routes that the avian influenza virus might have taken to arrive on the first infected farm and from there how the virus moved to the second premise. What were the potential roles of wild birds, ground water, surface water, wind-borne particles, bio-security gaps (people, equipment), hatcheries, feed and feed mills, farm service personnel and, in their eradication efforts even CFIA staff.

Within a week of my arrival, a third farm became infected near the second one. Then another and another. The virus was spreading and "How's it spreading, Doc?" became a daily greeting from colleagues at the BC Emergency Operations Centre (BCEOC). We were less than a few dozen workers when I arrived and before long our numbers grew. We moved from the District Office to a huge, unused office building near the airport. I realized then that I might be staying for a while. The biggest personal challenge I faced, as the sole on-site federal epidemiologist, was moving from the "do it all" mind set to one of recruiting and working with a team of professionals from within and beyond the Agency. Together, we engaged in pursuit of how the virus got here and how it moved from farm to farm.

Normally I work quietly, huddled in my small office space, alone and far away from the crowd. At most I work with a small group depending on the projects of the day. My leap into leadership of a growing bevy of staff at the BC EOC, directing activities of several dozen highly competent professionals and technical staff, was quite "an adjustment" to say the least. I do participate in several collaborative studies with partners, with their associated legal and administrative realities, so I was partially equipped for the job, but delegation to others is hard for independent types. During university years and ossified later in practice, veterinarians mostly work alone. I was no different. Amazingly, through this outbreak and of dire necessity, I learned to delegate. The rewards were nothing short of mind boggling to me.

Looking back over the course of the outbreak, I realize that many professionals from different government departments contributed their expertise

Disease control strategy

- Depopulation of entire Control Area (April 5)
  - 19 M birds (85% of BC poultry industry)
  - Industry –led, based on economics

to the BC EOC Epidemiology Team . We received more than fifteen fully referenced reports on key subjects of concern, each carefully written for us during the outbreak. Each was used to steer a course through this crisis by providing answers to immediate questions. As well, they provided knowledge and information required to ensure we were gathering the right data for the final epidemiological analyses of the Avian Influenza events.

I want to acknowledge BCMAFF for giving us a big “leg up” by offering expertise for a month on site from Drs. Nancy DeWith and Victoria Bowes. Nancy provided her validated poultry bio-security questionnaire for use as the basis of CFIA’s investigative questionnaire of infected premises. It was used throughout the crisis. Vicki, as BC’s poultry pathologist of 16 years experience, supplied us with crucial information through her reports, reviews and immediate presence. BCMAFF staff also worked on ground water and surface water concerns. The Canadian Wildlife Service, the BC Ministry of Wildlife and the BC Center for Disease Control worked on wild bird issues. BC Water Land and Air Protection addressed emissions of dust from poultry barns and wind patterns on the Matsqui Prairie. Defense Research and Development Canada-Suffield (DRDC) conducted aerosol field testing on farms in Abbotsford during the peak of the outbreak, while Health Canada (Winnipeg) provided laboratory testing for this work. Environment Canada positioned a meteorological station on the Matsqui Prairie to gather data for future epidemiological analyses.

The CFIA Risk Assessment Unit provided vital literature reviews, risk assessments and sent epidemiologists Drs. Cheryl James and Pascal Moreau to serve. Drs. Sandra Stephens, Connie Argue and Blaine Thompson contributed significantly to the Epidemiology Team over the ten weeks, over and above their EOC Disease Control duties. It would take a whole page to list the dedicated CFIA staff that served the Epidemiology Team over the course of the outbreak.

The biggest personal lesson I learned was to replace myself early. Drs.Wayne Lees, Cheryl James and Bruce Mc Nab replaced me in succession. This was a long, difficult task and I offer my personal and sincere thanks to each of them. Wayne got more than he bargained for in the end. For his writing of the definitive final report after the fact, I am grateful. As we move into the analytical phase of the outbreak, the collaboration continues. The CFIA will draw support from DRDC, BCMAFF, Health Canada, Environment Canada and a new partner- the University of Montréal at St Hyacinthe, as we strive to answer the perennial disease outbreak questions as to its origin and means of spread.

Disease Control Application

Dr. Sandra Stephens

Dr. Sandra Stephens holds the position of Veterinary Program Specialist in the Canadian Food Inspection Agency's Western Region. She is the person responsible for National Policy/Western Specialist - poultry. Sandra is also the National Policy Representative/Western Specialist - Foreign Animal Disease Eradication System and is responsible for Internal and External Liaison with provincial governments and industry.

The Canadian Food Inspection Agency (CFIA) began its epidemiologic investigation when notified by BC Ministry of Agriculture, Food and Fisheries (BCMAFF) of clinical disease. The index flock was experiencing daily increases in mortality rates. Given that virus had likely spread to other poultry premises by the time of diagnoses, it became important to institute disease control measures immediately. The first steps were quarantine of the premises and investigation into all reported movements on and off the farm.

All people and things associated with the site within 21 days (World Organization for Animal Health (OIE))

Disposal of infected birds

- Health status
  - If positive on any test
  - Biosecurity and worker safety measures in place during destruction and disposal
- Disposal
  - Biosecure incineration
  - Compost on-site (virus inactivated within X days)

Disposal of non-infected birds

- Health status
  - Tested within 3 days prior to destruction
  - Re-inspected just prior to slaughter
- If economic value, then
  - Slaughter and salvage for meat
- If no economic value, then
  - Slaughter and disposal (rendering)
  - Destruction and disposal (composting, landfill)

standard) preceding the first reported signs of illness were recorded. All movements up to the time of quarantine were registered and characterized as high, medium or low in terms of the risk of viral transmission they represented. These were followed up on a prioritized basis as operational capacity allowed. The next step was to identify and locate all commercial poultry operations and backyard poultry flocks within a 5 km radius of the index premises.

The investigation of contacts exposed to the infected premises revealed a high level of traffic to and from poultry operations. Bio-security measures ranged from good to non-existent. Once HPAI was confirmed, the CFIA imposed strict movement controls on poultry and poultry products. Permits were required to move anything related to poultry. Restricting movement was crucial to limiting the inadvertent spread of the virus through daily activities from farm to farm. However, until the industry as a whole realized the severity of the avian influenza problem, inappropriate movements of people and things continued.

The sampling protocol for high risk premises included the random selection of birds. Blood was collected for serology as were cloacal and oro-pharyngeal swabs for Polymerase Chain Reaction (PCR) analysis. Serology was used to detect longstanding influenza A infection. PCR was applied as an indicator of recent infection A detecting virus shed prior to clinical or serological expressions. The PCR test enabled early identification and destruction of flocks before high levels of virus developed in a barn. Where barns were located within meters of each other this greatly reduced the potential for spread from flock to flock via exhaust fans. Serology was applied to surveillance of high risk contacts during the 21 day period before the diagnosis was made. It was also used in surveillance activities to establish the disease status of flocks in the Chilliwack area.

Strict bio-security measures were employed by CFIA personnel entering poultry premises and barns to collect samples. Dead bird surveillance harvests were conducted via biosecure containers at the roadside to avoid premise entry.

Wild aquatic birds are considered the primary reservoir of avian influenza A viruses, with occasional "spill over" into domestic poultry. Outdoor flocks, the most at risk of exposure to influenza A shed by wild birds, have the greatest potential to serve as a point of adaptation to poultry. The backyard poultry flock population was very difficult to estimate and proved to be somewhat of a moving target. Testing backyard collections within 5 km of the index case was used to determine if they harboured the H7 subtype. Laboratory results diagnosed all backyard flocks negative on serology and PCR. The finding suggested that backyard flocks within the 5km area were not implicated

When the federal Minister of Agriculture ordered all poultry in the Control Area destroyed the focus of the disease control unit shifted to prioritized slaughter. Even though all the birds would eventually be destroyed, there was a need to contain the spread of the virus within the high density poultry area around the city of Abbotsford. High risk contacts from positive premises continued to be identified, tested, and monitored through dead bird surveillance (PCR testing) and given priority. All premises within 1 km were similarly assigned.

Commercial premises in corridors on either side of the city, extending from the Fraser River to the USA border as well as those between 2 and 3 km from an infected premises, were identified. These became high priority flocks for slaughter. Industry took the lead in the depopulation effort. Surveillance testing of flocks determined that the virus had not spread in the area around Chilliwack and destruction of commercial poultry was suspended.

The BC experience suggests that disease control within the poultry industry, where wild bird reservoirs exist, will depend on the ability to compartmentalize commercial operations in isolation from both wildlife and birds raised out doors.

Policy and Procedures

Dr. Jim Clark

Dr. Jim Clark served as Chair of the Policy and Procedures Committee of the National Emergency Response Team. He has since become a Senior Staff Veterinarian in Ottawa, occupying a position created in response to the Avian Influenza experience.

Early in the morning of February 19th I received the first indication of an avian influenza virus diagnosis in British Columbia (BC). It was purely a coincidence that Dr. Wendy Powell (CFIA) and I were in BC that very day to consult with the industry on a national Low Pathogenic Avian Influenza (LPAI) Survey. The phone rang at 0500hrs BC time and Dr. Gilles Dulac, CFIA's Foreign Animal Disease expert, somewhat hesitantly asked if this was Dr. Powell's room. Since I recognized Gilles' voice, I answered "No, you are speaking with Jim Clark". Gilles proceeded to explain what was known about the laboratory results from sampling the first poultry farm. Avian Influenza had been isolated and identified as an H7, but it appeared that the pathogenicity was low. Even so, he said that there was likely going to be a decision to destroy the flock. This information was critical, as we were scheduled to meet with local industry later that morning at the BC Ministry of Agriculture, Forestry and Food (BCMAFF) laboratory. It was obvious to me that this announcement of the H7 avian influenza virus isolation was going to pre-empt the agenda of that meeting.

When we saw the large number of vehicles and media vans in the parking lot at the BCMAFF laboratory, my thoughts were confirmed. Dr. Ron Lewis the Provincial Veterinarian BCMAFF, Dr. Wendy Powell, Dr. Phil Owen the local CFIA District Veterinarian in Abbotsford and I answered questions from producers and media about what was happening. Things were progressing quickly and a decision to destroy the flock had been made by this time.

The next day I flew to Winnipeg with Dr. Powell for the second scheduled poultry consultative meeting. Although there was some discussion about the BC situation, we focussed on the advertised agenda. Once back in my home town of Guelph, I continued innocently in my role as Chief of the Animal Health and Production Program Network for Ontario as infection crept surreptitiously into the Lover Mainland of BC. By March 10th, in the midst of an evolving outbreak, I was appointed Chair of the Policy and Procedures Committee of the National Emergency Response Team (NERT). NERT was mobilized the same day and the first meeting was held March 11th.

I became immediately immersed in the preparation of permits to allow movement within the newly established Control Area alluded to in Dr. Wayne Lees' article. The first several 16 - 18 hours days were filled with requests for information from every direction. The important work done to support the Emergency Operations Centre (EOC) seemed to happen amongst a multitude of daily meetings and ran into the evenings. Every day consisted of a series of conference calls, meetings to ensure we were on top of events as they occurred, providing policy and procedural information to what seemed anyone and everyone.

Conclusion

- Outbreak duration = 3 mo
- CFIA resources stretched to the limit
- International reviewers commended the effort expended

CFIA recruits from Canada	**~400**
Temporary staff	**148 labourers 27 clerical**
CFIA on site at peak	**210-245**
Provincial staff on site at peak	**102**

Meetings with industry representatives consumed a large amount of time. We had to deal with the divergent needs of the national and regional poultry industry groups. The need for information was overwhelming, from every front imaginable. The media, our international trading partners, industry, as well as national and provincial government organizations all demanded insights on a daily basis.

We amended existing policy on the basis of input from international expertise from other countries recently experienced in outbreaks of HPAI. Early in the outbreak, Occupational Safety and Health (OSH) and human health issues came to the forefront. Information about direct contact illnesses (influenza and conjunctivitis) and the potential creation of a human pandemic through recombinant activity with human strains of influenza A was reviewed with Health Canada. We addressed concerns in parallel with those of the World Health Organization (WHO) and the BC provincial health community. While solutions to their issues were available, putting them in place while trying to effectively eradicate the disease was challenging to say the least.

Many ad hoc partnerships and teams were formed in response to this HPAI outbreak. The poultry industry sector played a key role in addressing many issues that could not have been resolved without their praiseworthy cooperation. The BC provincial and Abbotsford municipal government organizations brought expertise and solutions to the table. The BCMAFF laboratory in Abbotsford was very important in ensuring flocks slated for depopulation were negative prior to their destruction and disposal. Creative people in all organizations designed wonderful solutions to problems.

One of the most challenging problems CFIA faced was that of the dead chickens. We became very good at euthanising them but disposal options

Can it happen again?

- Same risk factors = constant "infection pressure"
- Poultry industry must adopt a fortress mentality

Risk factor	Mitigate by:
High density of poultry operations	Municipal zoning bylaws
Shared people, birds, equipment	Industry-wide biosecurity
Co-location of pigs & poultry	Zoning bylaws & Industry biosecurity
Waterbird migratory route	Farm level biosecurity
High density of people	Public health programs
Travel to SE Asia	Travel health programs

were extremely limited. The arrival of composting methodology alleviated our associated. On farm composting allowed the maximum opportunity for biocontainment, a major benefit in disease control. Destruction and disposal on farm facilitated the decontamination of barns in a timely manner, as materials were moved out and alongside the buildings from which they originated. This eliminated the need for movement of materials off the premises, saving manpower, time and physical resources.

Looking back, I feel that by early May the CFIA, with the cooperation and assistance of a wide variety of individuals and organizations had stopped HPAI in its tracks. Could we improve our response? Definitely!! One must recognize that Canada's last mobilization against a rapidly spreading Foreign Animal Disease (FAD) incursion of this nature (BSE not withstanding) was in 1952 . With that in mind, I think we did a commendable job. Decades of training and FAD exercises paid off. Based on what we and others learned from this experience, response plans will change, strategies will be rewritten and organizations will modify their roles and responsibilities to improve our collective ability to respond to the next challenge.

Poultry Carcass Disposal During the Avian Influenza Outbreak

Dr. Ken Stepushyn

Dr. Ken Stepushyn is a CFIA veterinarian who walked directly from the BSE investigation in Yakima, Washington to co-manage the Disposal Section of the BC Emergency Operations Centre during the Avian Influenza outbreak.

Setting the Scene

We thought we were prepared. In September of 2000 a working version of an emergency plan for livestock carcass disposal was developed collaboratively by the BC Ministry of Agriculture, Food and Fisheries (BCMAFF) and the Canadian Food Inspection Agency. The plan was generic and meant to address a broad range of emergency and non-emergency situations that could arise in BC. Except for the sheer volume of a foot-and-mouth disease outbreak, the plan would put into place a defensible process along with adequate capacity to manage disposal of livestock carcasses under various massive loss situations. When low pathogenic H7N3 was diagnosed in a broiler breeder flock near the City of Abbotsford in February of 2004, it appeared that a disposal solution for the flock upon its destruction could be readily in hand through activation of the plan.

To understand what happened from that point forward, one has to consider both the nature of municipal solid waste management in the BC lower mainland, and increasing public health concerns about the zoonotic potential of avian influenza. Municipal solid waste management is an ongoing concern in region. There are multiple contributing factors limiting the development and availability of landfills or other methods of disposing of solid wastes in that area.

Activation of off-farm disposal capacity that was relied upon from the 2000 plan became problematic. The potential presence of a zoonotic agent in the material being disposed of limited the options for site utilization at landfills or for handling at the large regional incinerator. When constrained in this manner, substantially less capacity became available than would be standing by for non-disease emergencies. At the time of the outbreak, none of the facilities that were relied upon to provide disposal capacity would do so voluntarily.

How the Capacity Issue was Tackled

This was difficult situation. Fortunately, unaffected by capacity issues was the portion of the plan defining the working relationship among the CFIA and BCMAFF and other agencies. For six very intense weeks the Disposal Section of the BC Emergency Operations Centre and the Resource Management Branch of BCMAFF worked side by side to incrementally add capacity. At first it took the form of small air curtain incinerators. Next, some landfill resources were added, followed by portable incineration space. Finally, substantial composting capacity was added. Each incremental addition required hours of meetings and the drafting and redrafting of protocols acceptable to partners and regulators.

Utilization of composting technology in the field for disease outbreaks situations was new to the CFIA. Fortunately, with some foresight the practical utility of the technology had been recognized. The process had been tested under laboratory situations at the CFIA Laboratory Fallowfield in Ottawa, Ontario. It had also been field tested in Maryland, USA. Transfer of the technology from the lab to the field situation arrived in the form of the senior scientist Dr. Lloyd Spencer (see article) and his staff. Composting didn't stop there. When a decision was made to depopulate disease free flocks adjacent to infected flocks, substantial disposal capacity was needed.

Commercial composting technology was evaluated and adopted quickly

Radio Frequency Microchips Track Poultry

AnimalNet
November 1, 2004
The Leader-Post (Regina) Sarah Staples

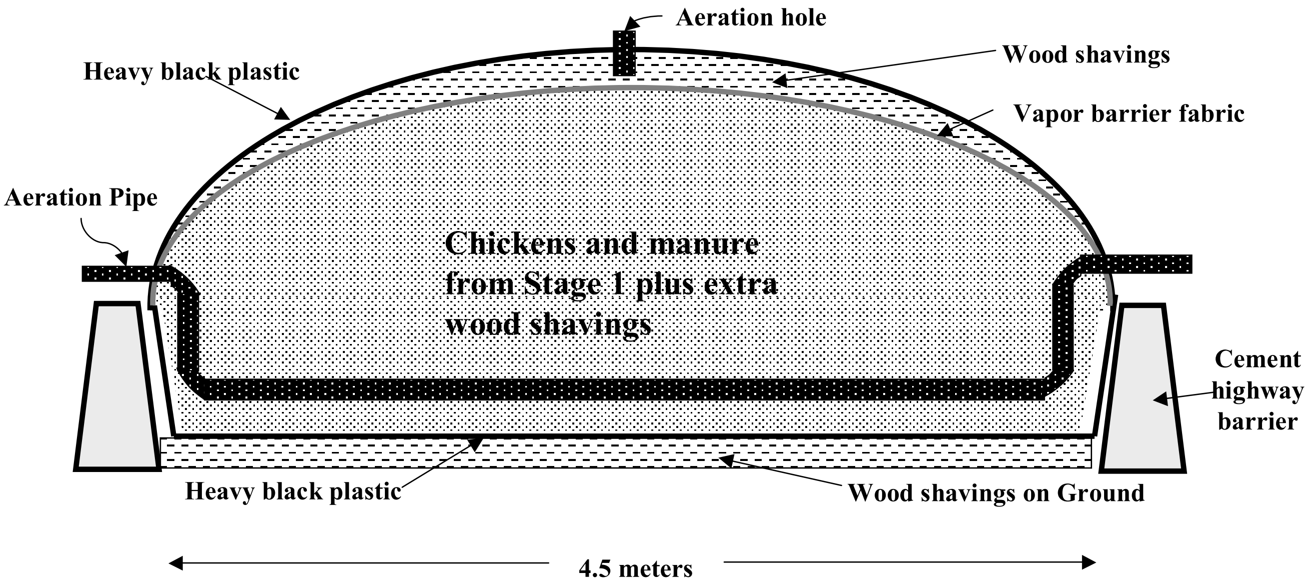
Thailand is, according to this story, seeking Canadian expertise to set up what's believed to be the world's first nationwide system to track poultry using radio frequency microchips in a move aimed at controlling outbreaks of avian influenza that have devastated Asian and North American poultry markets, and are feared as the likely springboard for the next human flu pandemic.

Advanced ID Corporation says it's been asked by the Thai government to craft a proposal for attaching radio frequency identification, or RFID, tags to crates of poultry destined for export. The Calgary-based company started out nine years ago selling a RFID chip for pets to clients, including Queen Elizabeth.

The story says that the system would monitor crates as if they were pallets of goods on their way to Wal-Mart. Tags the size of grains of rice would be attached to the crates, which would carry detailed information about the chickens' roughly 45-day production cycle -- from the time and place they were born until their slaughter and export.

If one crate is stricken with avian virus, both it and any other crates it came into contact with en route to slaughter could quickly be traced back to their original farms, letting health officials plot the scope of an outbreak more efficiently.

Cross section of Stage 2 compost pile



by the Resource Management staff of BCMAFF. In combination these approaches accounted for about 75% of the disposal requirements for 2.25 million birds. Composting provided greater flexibility to decision making in the eradication of disease, while its utilization is unlikely to lead to long term negative environmental consequences.

Avian H5N1 Influenza in Cats

AnimalNet
October 8, 2004
Science, Volume 306, Issue 5694, p. 241
Thijs Kuiken, Guus Rimmelzwaan, Debby van Riel, Geert van Amerongen, Marianne Baars, Ron Fouchier, Albert Osterhaus

Abstract

During the 2003 to 2004 outbreak of avian influenza A (H5N1) virus in Asia, there were anecdotal reports of fatal infection in domestic cats, although this species is considered resistant to influenza. We experimentally inoculated cats with H5N1 virus intratracheally and by feeding them virus-infected chickens. The cats excreted virus, developed severe diffuse alveolar damage, and transmitted virus to sentinel cats. These results show that domestic cats are at risk of disease or death from H5N1 virus, can be infected by horizontal transmission, and may play a role in the epidemiology of this virus.

The Human Side

Missing from this narrative is the story of those scores of individuals who worked field disposal crews in heavily garbed protection against the agent, coupled with weather conditions at the time of the outbreak, made work inside infected barns arduous and physically taxing. Biosecurity requirements dictated the wearing of hot protective garments and dust masks. Strict protocols had to be observed for even the simplest of routines such as taking a break, or temperature measurement of a compost pile. Regimented and professional conduct of the disposal crews and their chiefs, working under very difficult conditions, was requisite for success.

Emphasis on biosecurity for composting poultry and manure during an outbreak of highly pathogenic avian influenza in British Columbia

Drs. J. Lloyd Spencer, Bryan Rennie and Jiewen Guan

Dr. J. Lloyd Spencer is a research scientist (emeritus) of the Canadian Food Inspection Agency. At the time of the outbreak he specialized in avian diseases and had already conducted a number of composting experiments at the Agency's Ottawa Laboratory Fallowfield, assisted by Bryan Rennie and Jiewen Guan

At the request of the Emergency Operations Center (EOC) established to respond to an outbreak of highly pathogenic avian influenza virus in the Fraser Valley of British Columbia, flocks of chickens and turkeys were composted on farms during April and May, 2004 when ambient temperatures were usually between 20 to 30 degrees Celsius. Composting was also referred to as "bio-heat treatment" to clarify that the composting process produced heat, ammonia and other products that could kill virus.

Farmers cooperated with EOC crews in operating tractors, front end loaders and other equipment. The fire department in Abbotsford, British Columbia facilitated operations by filling and making available "water bladders", pumps and hoses that were intended for use in fighting forest fires. On farms where there was evidence of infection with avian influenza, the birds were killed by pumping CO2 into the buildings. Composting crews began their work as soon as possible, after the buildings were determined safe to enter. In order to start the composting process and also to reduce dust that could carry influenza virus, the interior of buildings, bird carcasses and litter were sprayed with water. Composting was done in two stages with the first stage indoors and the second stage outdoors.

Farm 1 was a broiler operation, and first stage composting operations commenced 1 to 3 days after 65,000 market age broilers had been killed with CO_2. As was the case on other farms, most of the broilers were in two story buildings and the crew used garden tractors equipped with blades on the top floor to push birds and their sawdust litter through holes in the floor. These wastes were wetted as they fell from the top floor. The dampened carcasses and litter on the bottom cement floor were pushed towards the center of the building to make windrows that were about 1.5 m high and 3 m wide at the base. The windrows were then covered with wood shavings and this cover facilitated composting and helped to control odors. Aeration of the static piles during the first stage was probably facilitated by air spaces created as the carcasses decomposed and shrunk.

After 5 days in the barns, the piles were moved for second stage composting to a structure that was outside but in close proximity to the barns. The structure consisted of two parallel rows of cement highway dividers (0.7 m high) that were 4.5 m apart and served as walls. The walls were 76 m long and the ground between the walls was covered with a 15 cm layer of wood shavings. Heavy black plastic was placed over the wood shavings and the surplus plastic was draped over the cement walls so as to contain all liquids within the structure.

Tractors equipped with front end loaders were used to move piles from within barns to outside structures. The tractors traveled over the wood shavings that were in the space between the walls and deposited their loads on the plastic lined floor. To avoid having tractors travel over the plastic, it was rolled out as required to lengthen the pile. Loads of moist compost and loads of dry wood shavings were added alternatively to the pile. In addition, 5400 kg of pelleted broiler feed was added.

To provide passive aeration, lengths of 10 cm diameter drainage pipe, flexible and perforated, were laid crosswise about every 1.2 m over the compost mix (about 0.4 m above the plastic floor). Ends of the pipes extended beyond the cement walls. The completed pile was about 1.5 m high and 75 long. The top of the pile was covered with vapor barrier fabric and this was covered with a 30 cm layer of wood shavings. The entire pile was then covered with black plastic. The ends of the aeration pipe extended through the plastic at the sides of the piles and air holes were also made in the plastic at the top of the pile. Used tires were laid over the plastic to hold it in place.

Farm 2 was a cage layer operation where 61,000 chickens had been killed. The first stage of composting was carried out by removing the dead birds from the cages and dropping them onto the manure that was on the cement floor, 2.4 m below the cages. The chickens and manure were covered with sawdust and wood shavings so as to form windrows and these were moistened with water during preparation. For convenience, windrows of compost remained undisturbed in the layer barns for 22 days and were then moved and composted in an outside structure similar to that prepared on farm 1.

The temperature of the compost piles was monitored with a 1.8 m long probe that contained three thermocouples spaced about 0.6 m apart. The probe was inserted into the lower, middle and upper layers of the compost piles. Temperatures were taken about every 1.4 m along the length of the piles. The average temperature of first stage compost usually reached about 40 C and average temperatures in the second stage usually remained between 40 to 50 C during the 3 week period after preparation. Based on available literature, the EOC prepared a document entitled *"Temperature and time criteria for assessing avian influenza virus inactivation in composted avian materials during the 2004 British Columbia H7N3 outbreak"* that can be found on the website of the Canadian Food Inspection Agency.

Based on these guidelines the temperatures in compost piles met the criteria for inactivation of the virus. Another measure of the effectiveness of the composting process was the breakdown of carcasses. Compost piles composed of chickens on one farm and turkeys on another, were examined after 40 days in second stage structures. There were no

USDA Awards Contract to Fort Dodge Animal Health to Establish An Avian Influenza Vaccine Antigen Bank for Poultry

Press Release

WASHINGTON, Oct. 25, 2004 - The U.S. Department of Agriculture's Animal and Plant Health Inspection Service, Center for Veterinary Biologics, has awarded a five-year contract to Fort Dodge Animal Health to develop an avian influenza (AI) vaccine antigen bank for poultry that will house enough antigen to produce 40 million doses of AI vaccine.

The vaccine will be manufactured and stored at Fort Dodge Animal Health facilities located in Charles City, Iowa. The facilities will house enough frozen antigen to produce up to 10 million doses of vaccine for each of the following AI subtypes: H5N2, H5N9, H7N2 and H7N3. In the event of a high pathogenicity AI (HPAI) outbreak, the frozen antigen would be used to prepare the vaccine for possible use in poultry in order to manage the disease.

The AI vaccine antigen bank is scheduled to be completely stocked by January 2005.

"The AI vaccine antigen bank will be a great asset in helping APHIS work to keep highly pathogenic avian influenza from becoming established in the U.S. poultry population," said APHIS Administrator W. Ron DeHaven.

Under APHIS guidelines, H5 and H7 AI vaccines are allowed to be used as tools for combating any potential outbreak of HPAI in the United States but only under APHIS supervision or control as part of an official animal disease control program.

HPAI is an extremely infectious and fatal form of avian influenza that, once established, can spread rapidly from flock to flock. An outbreak in the United States could potentially cost the poultry industry millions of dollars in losses. From 1983-84 an HPAI outbreak in the Northeastern United States cost nearly $65 million, and the destruction of 17 million birds.

In Gonzales County, Texas, a flock of 7,000 broiler chickens were destroyed Feb. 21, 2004, after the H5N2 strain of HPAI was confirmed in several birds from the flock-the first case in the United States in 20 years.

unpleasant odors and there was almost no soft tissue. Only fragments of carcasses such as wings, keel bones and skulls remained and the composted product was considered safe for disposal on agricultural land. It was concluded that the composting procedures followed had provided good biosecurity and were safe and efficient for disposal of virus contaminated poultry carcasses and other organic wastes in the face of an outbreak of highly pathogenic avian influenza virus.

Avian Influenza Vaccination

Dr. François Caya

Dr. François Caya is a new recruit to the Canadian Food Inspection Agency's (CFIA) Disease Control section of the Animal Health and Production Division, as a veterinary program specialist in poultry for Foreign Animal Disease (FAD). He is currently working closely with Dr. Gilles Dulac in Avian Influenza related issues. François brings his experience with industry as a poultry practitioner to this position.

The poultry industry has undergone substantial changes in recent years, resulting in shorter production cycles and greater animal densities per territorial unit. This transformation of the industry partially accounts for the potentially spectacular impact of outbreaks of avian influenza. Currently, stamping-out is the main tool used to combat outbreaks of notifiable avian influenzaa (NAI). However, the slaughter and destruction of large numbers of animals is questionable from an ethical point of view, especially when the NAI outbreak has low pathogenicity. Moreover, the use of vaccinations in recent NAI outbreaks around the globe has shown the potential of this management approach.

The position of vaccination among the options for controlling outbreaks of notifiable avian influenza

It is difficult to determine an ideal scenario for using an avian influenza vaccine, since each outbreak presents a unique set of factors (species, density, pathogenicity of the strain). However, a committee of the World Organization for Animal Health (OIE) (Capua 2003) has suggested guidelines for using vaccination as a control measure (Table 1).

The most critical step in controlling outbreaks of NAI is still the early diagnosis of the index case. This step is not a problem in outbreaks of highly pathogenic notifiable avian influenza (HPAI). However, low pathogenicity avian influenza (LPAI) outbreaks can occur without outward signs of clinical disease and thus spread for some time before detection and diagnosis.

Currently available vaccines

Inactivated homologous vaccines were originally prepared as 'autogenous' vaccines. They are made from the allantoic fluid of infected eggs, then inactivated by a betapropiolactone or formaldehyde. The antigens are then emulsified in an oily adjuvant. These vaccines have proven effective in preventing outbreaks and reducing viral shedding (Karunakaran 1987, Swayne 2000). However, given the impossibility of differentiating vaccinated from field-exposed birds, sentinel birds must be used to ensure sound management of the use of these vaccines.

Inactivated heterologous vaccines are manufactured in a way similar to that of inactivated homologous ones. They differ in that the virus strain used in the vaccine is of the same H type (hemagglutinin) as the field virus, but has a different neuraminidase (N). Following field exposure, clinical protection and reduction in viral shedding are ensured by the immune reaction induced by the homologous hemagglutinin (H), while antibodies against the neuraminidase induced by the field virus can be used as a marker of field infection.

When vaccinating birds with an inactivated vaccine, there is still risk of infection by a field strain, transmission and shedding of the infectious virus. The sub-types H5N2, H7N1 and H7N7 are currently commercially available.

Recombinant vaccines use genetically modified vector viruses that express hemagglutinin H5 or H7 on their surface. The most widely used vector is the fowlpox virus. Other viruses can also serve as a vector-the infectious laryngotracheitis virus and the baculovirus (Crawford 1999, Luschow 2001). Since these vaccines do not induce the production of antibodies to neuraminidases, it is easier to differentiate between vaccinated and naturally infected birds. However, as the viruses used as vectors are endemic in certain areas, it is ineffective to vaccinate birds that have antibodies to the vector virus. Currently, only one recombinant H5 vaccine is commercially available. The use of these vaccines is still limited.

Worldwide use of vaccination

Inactivated vaccines have been widely used in the United States since 1970, primarily in turkey rearing during outbreaks of low pathogenicity influenza (e.g. H9N2, Minnesota 1995). Prior to 1995, the use of H5 and H7 sub-type vaccines was prohibited in the

Table 1. Guidelines for the application of control policies for NAI

H5/H7 virus pathogenicity	Index case flock	Evidence of spread to industrial sector	Population density in area	Policy
HPAI/LPAI	Backyard	No	High/Low	Stamping-out
HPAI/LPAI	Backyard	Yes	Low	Stamping-out
			High	Vaccination
HPAI/LPAI	Industrial	No	High/Low	Stamping-out
HPAI/LPAI	Industrial	Yes	Low	Stamping-out
			High	Vaccination

HPAI: Highly pathogenic avian influenza

LPAI: Low pathogenicity avian influenza

Scientists Say Common Bird Flu Strain Could Spark Pandemic

Ann Bagel
August 11, 2004
Meatingplace.com

A strain of bird flu common throughout Asia is becoming more virulent and could set off a pandemic by mixing with human viruses, according to research published in the August issue of the Journal of Virology.

A team of scientists from the United States and Hong Kong discovered that a higher percentage of mice infected with the H9N2 bird flu virus from the 2001-2003 period died compared to those infected with a 19997 version of the virus. The research also suggested that is the H9N2 strain mixed with a human virus, the results could pose serious risks to the world's population.

The H9N2 strain is believed to have mixed with a human virus to produce the deadly H5N1 virus, which has killed millions of birds and 24 people so far this year in Asia.

United States, but has since been permitted as part of a program to control outbreaks. In fact, an inactivated homologous vaccine derived from a low pathogenicity influenza H7N3 responsible for a series of outbreaks in turkeys in Utah (1995) was developed to control these outbreaks.

More recently, inactivated homologous vaccines have been used to try to control outbreaks of low pathogenicity avian influenza in Mexico and Pakistan (Swayne 2000). In these cases, however, vaccination was ineffective in stamping out the disease because of the absence of sentinel birds and the difficulty of suitable serological methods to differentiate vaccinated birds from infected birds.

Since 2000, Italy has successfully used a strategy of DIVA vaccination (Differentiating Infected from Vaccinated Animals) as a supplemental measure in eradicating low pathogenicity influenza H7N1. This strategy is based on the use of a heterologous vaccine (H7N3). Field control of the strategy is achieved through an intensive program of serological monitoring using sentinel birds and a screening test for anti-N1 antibodies.

More recently, vaccination with a heterologous vaccine has proven useful in reducing the transmission of the avian influenza epidemic H5N1 ravaging Asia (Ellis 2004).

Canadian situation

At present, there are no avian influenza vaccines licensed for use in Canada. Steps have been undertaken by the Veterinary Biologics Section of the CFIA to amass information on the products available elsewhere in the world to facilitate their licensing should an urgent need arise. In the event of an emergency, animal health regulations allow the Minister to temporarily exempt products from the usual requirements and make them available to Canadians.

Future of avian influenza vaccines

From an experimental standpoint, studies show that vaccination against NAI reduces birds' susceptibility, protects them from the development of clinical signs and reduces viral shedding. However, the virus is still able to replicate in vaccinated birds. This is why vaccination, for the moment, remains just a tool for use in conjunction with other more conventional measures, biosecurity in particular.

New types of avian influenza vaccines are being developed, which suggests they will become easier to use and provide better results. The improved performance of the poultry industry in recent decades is in large part due to the use of vaccination. It is therefore highly probable that this same tool will support the industry in the near future in its fight against avian influenza.

[a]**Notifiable avian influenza: New OIE definition that includes all highly pathogenic avian influenza viruses and low pathogenicity H5 and H7 sub-types.**

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The Liaison Officer's Tale

Don Beer

Don Beer is the Assistant Fire Chief of Operations of the Abbottsford Fire Rescue Service and serves as the Deputy Emergency Coordinator, City of Abbotsford, British Columbia.

Friday March 12, 2004 was as normal a day as can be expected within the Fire Rescue Service. My telephone rang as the Deputy Emergency Coordinator. This is a position I staff along with my full time responsibilities as Assistant Fire Chief of Operations. The caller asked, "Can you be at a meeting at three this afternoon? There has been a positive identification of Avian Influenza on a farm within Abbotsford and we need to isolate an area within the city. It means closing roads".

From the call came an eighteen week commitment to Avian Influenza. I asked myself, "How does a fire fighter become this involved in the feather industry?" I soon came to know all about Avian Influenza and just how much a community is affected by an animal disease outbreak.

From that first afternoon there was a sense of urgency to stop the Avian Influenza virus from spreading. The actions of many were immediately directed towards containment of the virus.

I am accustomed to working within a command structure at a fast, calculated pace in the fire service. So early in the event was my first encounter with the individuals gathered to address this Avian Influenza outbreak that clear lines of command and organizational structure were just being established. In the initial hours, a group of people was identified and the working relationships started to form. As Liaison Officer, I continued to address command and organizational structure issues through the weeks ahead.

The group assembled was successful in achieving the first goal of establishing an isolation area referred to as the High Risk Region (HRR). This was done through total road closures and inspection/decontamination stations. Unfortunately the virus could not be contained within that established HRR. From that point on it seemed that all involved were concerting every effort to get ahead of the virus.

My role as City of Abbotsford Liaison Officer to the CFIA Emergency Operations Centre lasted seven days a week for the first five weeks. For the remaining 13 weeks I shared responsibilities with Abbotsford's Emergency Advisor. The only activity that was typical each day was the early morning briefing at the CFIA EOC - getting the updates from the day before, test results from overnight and the goals for that day.

As local Liaison Officers we continued to insist on addressing forward planning. The concern was that all available local staff and resources were focused on controlling the virus rather than allocating resources to look ahead and conduct forward planning. In fairness to all working on controlling the outbreak, there were so many pressing issues that planning could not be given a high priority.

Keeping the Mayor and senior city staff apprised of the activities and occurrences so that they were aware of the issues was a key component of the Liaison position. A log was kept each day identifying updates and requests. The requests came in all forms for local knowledge, information and assignment of city staff. Police, Fire, Public Works and Mapping departments all contributed to the event.

Working closely with liaison officers from many levels of government, different government departments and the CFIA staff was always in the forefront. Our collaboration facilitated the creation of a Farm Stress Line; the coordination and procurement of shower trailers, pumps, bladders, water, transport trailer parking, street cleaning, widening and road blocking

Bird Flu Is a Crisis of Global Importance

USAHA News Flash

27 September 2004, Bangkok/Rome -- The avian influenza epidemic in Asia is a "crisis of global importance" and will continue to demand the attention of the international community for some time to come, the UN Food and Agriculture Organization (FAO) and the World Organization for Animal Health (OIE) said in a joint statement today.

Recent outbreaks in China, Viet Nam, Cambodia, Malaysia and Thailand show that the virus continues to circulate in the region and will not probably be eradicated in the near future, the two organizations said.

More research is urgently needed as the role of wildlife, domestic ducks and pigs in transmitting the virus among animals is still not fully understood. A permanent threat to animal and human health continues to exist.

Major investments needed

While much progress has been made in early detection and reaction, countries still need to step up proactive surveillance and control measures. Major investments are required to strengthen veterinary services, in particular for surveillance, early warning, detection, reporting and response and for the rehabilitation and restructuring of the poultry sector, FAO/OIE said.

The newly published FAO Recommendations on the Prevention, Control and Eradication of Highly Pathogenic Avian Influenza (HPAI) in Asia, prepared in close collaboration with OIE, review the factors that should be taken into account in designing and implementing control programmes and explain how countries can adopt a strategy appropriate to their individual situation.

In response to recent controversies on vaccination against bird flu, OIE and FAO reiterated that the slaughter of infected animals is the best way of controlling and ultimately stamping out the disease.

However, FAO/OIE acknowledged that this policy may not be practical or adequate in certain countries because of social and economic reasons or because of high viral challenge due to infection in villages, wild birds or domestic waterfowl. In such cases, countries wishing to eradicate the disease may choose to use vaccination as a complementary measure to the stamping out policy.

Vaccination

The two agencies stressed that vaccines, if used, should be produced in accordance with the international guidelines prescribed in the OIE Manual of Diagnostic Tests and Vaccines for Terrestrial Animals.

The OIE Terrestrial Code states that a country may be considered free from HPAI based on the absence of virus irrespective of whether vaccination has been carried out. Therefore, the two organisations confirm that the use of vaccines does not imply automatic loss of export markets. It has been shown that the use of such vaccines does not only protect healthy birds from disease but also reduces the load of viruses excreted by infected birds and thus the likelihood of transmission of the virus to other birds and to humans.

However, the decision on whether to use vaccines has to be made by each country based on its own situation, OIE/FAO said.

The factors countries should consider in making their decision include their ability to detect and react to the disease as early as possible and the need for transparent and timely notification; this will have to be supported by a good institutional framework and sound legislation underpinning veterinary services.

Any vaccination strategy should be developed in consultation with all stakeholders, including the private sector. The types of poultry and production sectors to be vaccinated must be determined and clearly documented. Infected poultry and those in contact with the virus should not be vaccinated.

The two agencies said vaccination should be carried out under the supervision of official veterinary services and be accompanied by a parallel surveillance strategy. This would include the capacity of the veterinary services to identify and monitor the circulating virus as well as the response to vaccination, by means including the use of non-vaccinated sentinel birds and the application of serological tests capable of differentiating infected from vaccinated animals.

sign erection and, identification of central compost sites.

I don't wish upon any community the wrath of devastating Avian Influenza. The opportunity of identifying goals and working as a team towards its elimination, is where I found my highest level of comfort as a local representative.

Editor's Note: See related article by Dr. Brian Keyes.

Industry Liaison

Marvin Friesen

Marvin Friesen is the CEO of the Friesen Group of Companies in Abbotsford, BC. He served as Industry Liaison to the British Columbia Emergency Operations Centre.

On Thursday February 19th 2004, I was attending the Pacific Agricultural Show in Abbotsford, where our feed company, Clearbrook Grain & Milling (CGM) had a booth. I was helping the sales staff in meeting with poultry and dairy feed customers. Someone approached me to ask if I had heard that there was a suspect Avian Influenza case in the Fraser Valley. I have been involved with the poultry breeding and hatchery business in Abbotsford and in Oregon for 20 years and know that disease is always a possibility. Having seen our customers in California deal with Avian Influenza, Exotic Newcastle, and MG in British Columbia, I had confidence that no matter what was found, we as an industry had the knowledge, skills and ability to deal with it.

Dr. Mark Bland, CGM's consulting veterinarian, was also at the show. I asked him to attend the afternoon meeting at the Provincial Lab to gather information about the emerging problem. Dr. Bland has extensive experience with Nicolas Turkey Breeding farms, and with the California Poultry Diagnostic Labs. Dr. Bland said that while CFIA thought they were prepared, he felt that a potential disaster was in the making. Since, my knowledge about the various aspects of the disease, mode of transmission, incubation period, and symptoms was limited, I began to scour my contacts and sources for information about AI.

The index farm is within 5 km of three of CGM's breeding farms, one of which is a complete shower in shower out facility. My feeling was that if the AI virus were to spread to this farm, there would be little hope for anyone else. Over the next month, all three farms tested positive for Avian Influenza.

For the next 6 weeks, information about what was happening in Abbotsford was scarce. I took several national conference calls with CFIA and the industry as well as daily calls with the Canadian Poultry Egg and Processors Council office in Ottawa for any news.

On March 30th, the BC Poultry Committee asked me if I would be the Industry Liaison to the BC Emergency Operation Center. I had no idea what this meant. I did know that someone in Industry needed to be able to get information back to industry leaders and members. The control of the disease was not going to be managed in isolation. Ownership of the issue was broader than just the regulators. I hoped to provide balance.

By April 1st , there were about 12 positive farms, yet no one knew which farms they were. The information was kept confidential. As Industry Liaison, I was afforded the opportunity to sign a confidentiality waiver allowing me to access the growing number of farms that tested positive. It was my feeling that industry could finally begin to help.

The toughest directive I have ever given was with a room full of producers, processors, and industry. We decided to ask the Federal Minister of Agriculture to order the entire depopulation of the Fraser Valley, an impact that could reach $1 billion. It was our belief that the Industry could die slowly, or it could be proactive, depopulate, and get on with rebuilding.

My role at the BCEOC evolved into that of a conduit of information. I provided opinions and information to CFIA .I gave daily reports to the industry. This included the Province of B.C., Agriculture Canada and the individual farmers who were waking up to find that they now had the

A War and a Mystery: Confronting Avian Flu

AnimalNet
October 12, 2004
New York Times
Keith Bradsher and Lawrence K. Altman

BANGKOK - A 9-year-old girl in northern Thailand, according to this story, made an innocent mistake late in September, when after the girl's mother and grandmother killed the remaining two of 13 chickens as a precaution against avian influenza, and not realizing that the healthy-looking birds could still be infectious, the girl plucked the chickens and prepared them for cooking. She died at a Thai provincial hospital on Oct. 3.

In communes in Vietnam, small chicken farms in Thailand and the jungles of northern Malaysia, health officials, scientists and farm workers are, the story says, fighting an increasingly menacing yet little-understood foe: the A(H5N1) strain that causes avian influenza, or more popularly, bird flu.

A spate of recent deaths, including the first possible case of human-to-human transmission, has stirred fears of a broader outbreak among people and raised the possibility of a human pandemic.

Tamiflu, a powerful antiviral drug that might slow the early stages of an outbreak, is in extremely short supply, according to the World Health Organization. And a vaccine - the only thing that could stop the global spread of the disease - will not be available for months, at the earliest: the Chiron Corporation, one of two manufacturers trying to develop a human bird flu vaccine, last week had its license to make conventional flu vaccine temporarily suspended by the British government...

Until 1997, scientists had not believed it was even possible for an avian influenza virus to pass directly from birds to people without first combining with a mammalian influenza virus. Pigs can harbor avian and mammalian influenza viruses while showing no ill effects, and have been blamed for periodically allowing new avian influenza viruses into human populations that have little if any immunity to them.

But in 1997, an outbreak of A(H5N1) infected 18 people in Hong Kong, killing 6 of them. Scientists discovered to their surprise that at least half of those infected appeared to have caught the disease directly from birds. Officials ordered the slaughter of every chicken, duck and goose in the territory, and were widely credited with having possibly averted a pandemic.

After months of calling for an international effort to eradicate the disease, the United Nations Food and Agriculture Organization declared in late September that the virus had become so widespread in domesticated and wild birds alike that it would take years to wipe out, though health officials are not even sure it is possible to do so.

disease on their farms. I worked for seven days a week twenty-four hours a day until the last positive farm at the end of May.

In times of crisis, people rise to the occasion, and I am grateful to my fellow farmers, business associates, provincial and federal employees, and the communities who worked together to deal with this unprecedented poultry disaster.

Occupational Safety and Health (OSH)

Gaetan Y. Levesque
(from an interview with Dr. Rosemary Hood)

Gaetan Y. Levesque is the National OSH Coordinator for the Canadian Food Inspection Agency (CFIA). CFIA OSH provides training in relation to wearing personal protective equipment (PPE): the biosecurity suit, overalls, boots, mask, gloves, goggles, and booties. CFIA Laboratories Directorate provides training in biosecurity : managing and preventing migration of a virus. Health Canada (HC) is responsible for premedicals, the provision of vaccinations and prophylactics (Tamiflu).

Emergency Response Stress Management

OSH and the effectiveness of an emergency response is all about people. Respecting one's limitations, to prevent physical exertion and heat exhaustion, are essential in a demanding emergency response activity such as was experienced in the BC outbreak. Essentially, employees were mummified once dressed in PPE; speaking through a mask impeded communications and increased the likelihood of heat exhaustion. There were many jobs in this category of risk that required various skills and expertise while working in an abnormal situation: discontented owners, media pressure, bird decomposition smells and waste product disposal.

The response to the Avian Influenza crisis in Abbotsford, BC was multi-disciplinary with individuals coming from different parts of Canada, the United States and abroad to provide assistance. A shared concern during emergency response was employee safety. How did OSH respond to Avian Influenza with safety in mind?

Workers were performing varied tasks, under sometimes difficult conditions, within the context of crisis management.

Avian Influenza A/H5N1, Migratory Birds Avian Influenza Discovered in Novosibirskaya Region (Russia)

AnimalNet
October 28, 2004
A ProMED-mail post

According to the Interfax news agency, avian influenza type H5N1 has been discovered in migratory birds in the Novosibirskaya region. As suggested by Alexander Shestopalov, the head of the zoonoses laboratory in the State Scientific Center for Virology and Biotechnology "Vector," preliminary data indicate that the virus was brought from south-east Asia by migratory birds, such as ducks and geese, which annually winter there. The analysis of tests of samples obtained from the birds in the spring and the autumn months is proceeding, with final resultsexpected in December 2004. Shestopalov stated that the H5N1 virus was identified in birds sampled last year [2003]. The birds, which probably are carriers of the influenza virus, live generally in the lowland zone of Barabinsko-Kulundinskoj (Novosibirsk area), which is known as a crossroads for migrating birds. "It is a rather sparsely populated area with many lakes; therefore, direct contact of the carrier birds with people is unlikely," Shestopalov noted. Scientists have warned of possible mutations, and genetic reassortment, of avian and human influenza viruses. They have warned that conditions for such a scenario might prevail [also] on Russian territory.

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Source: *Agency Mednovosti.ru, 25 Oct 2004 [in Russian, translated by NP,edited] http://pda.mednovosti.ru*

Our primary concern was ensuring the worker's safety and health while performing these tasks. In addition, we were tasked with ensuring on-site bio-safety compliance in relation to safe and hygienic work practices.

Recognizing that training is a critical element in incident/accident prevention, energy was put into providing bio-security/OSH awareness sessions for all employees required to work on farms or assigned to backyard culling. Session development/delivery required taking into consideration participants' ages, life/professional experience (general labour, technicians, specialists, farm operators), academic background and private, municipal, provincial or federal legislative/regulatory associations.

The Canada Labour Code, Part II due diligence requirements were emphasized and the importance of wearing personal protective equipment and practising safe work and hygiene strategies were stressed. In addition, the need to report incidents/accidents was highlighted.

The buddy surveillance system was emphasized to prevent accidents and bio-security breaches. The importance of nutritional intake, drinking water, replenishing electrolytes, rest and respecting one's limitations were discussed with the intent of preventing physical exertion and heat exhaustion.

To ensure consistency of information and the adherence to work/hygiene practices, all awareness sessions covered the same topics, regardless of the emergency responder's role in the situation.

OSH, within the context of a crisis, is critical to the effectiveness of the response. Given the demands placed upon responders, the success of crisis management is proportionate to respondents' health, physical well-being and their capability to maintain activities for prolonged periods of time.

The Official Spokesperson

The following extract is the media's view of Dr. Cornelius Kiley, the Canadian Food Inspection Agency's (CFIA) spokesperson during the Avian Influenza outbreak. The article was written by Ms. Tricia Leslie of the Abbotsford Mission Times, at the epicentre of the incursion.

The man behind the face of a CFIA spokesman

By Tricia Leslie - Times

Some may think of him as the face of the Canadian Food Inspection Agency. But Dr. Cornelius Kiley is more than just a CFIA spokesman.

As CFIA regional veterinary officer [B.C.], Kiley usually works out of the federal agency's Burnaby office dealing with diseases that affect animals and livestock, from rabies to hog cholera to tuberculosis to Bovine Spongiform Ecephalopathy [BSE].

He became a familiar face and voice during the avian influenza outbreak in the Fraser Valley.

As the CFIA's spokesman, Kiley was often on the TV news, his photo appeared regularly in local, provincial and national newspapers and his comments were heard on radio airwaves throughout the country.

"A couple of times I almost got accosted at Tim Horton's [in Abbotsford]," Kiley said, from an office at the Abbotsford CFIA emergency operations centre, where he has spent much of his time since Feb. 19 [when avian influenza was confirmed at a farm in Abbotsford]. "I'm the face behind this."

Because he has had media training and has been a CFIA spokesman before [during the BSE crisis, for example], Kiley said the powers that be within the CFIA "have a certain comfort level with me as a spokesperson."

But being that spokesman meant working long hours, weekends, attending town hall meetings and answering media calls early in the morning and late at night.

"You'd be asked questions from a bunch of different angles," Kiley said. "It's important to give an accurate, consistent message and have a consistent spokesperson the whole way through."

Kiley said the communications aspect was crucial, even if it meant 30 to 40 media interviews in one day, to get reliable information out to the public and the media.

New information was pouring into the CFIA offices on a daily basis and Kiley was quick to point out that he had a team assisting him in all communications efforts, people who sorted phone calls and provided him with up to date situation reports.

"It can be stressful - I have a new cell phone now," Kiley said with a rueful smile. "I've got a thick skin. You have to know where [people] are coming from . . . I'm not one of those people who takes my work home with me."

Kiley's home is in Vancouver and he enjoys the activities many British Columbians enjoy in their spare time - golfing, biking and the occasional hike. He will likely make the commute to Abbotsford regularly over the next few months as the poultry industry recovers.

Surveillance and testing is ongoing at numerous premises in Abbotsford, mostly where avian flu was actually detected [42 commercial farms and 11 backyard flocks], and if anything, Kiley said many have learned from the experience of controlling and managing such an outbreak before it spread further.

"Hindsight is always 20-20," he said. "I think the message is, you can never relax. This was just a nasty, infectious virus and with the industry and the way it is here, people have to always be vigilant."

Kiley said there is no indication the virus is present anywhere and that restocking is underway on many farms and backyards.

"We're quite encouraged," he said.

"I've spent a lot of personal time dealing with this . . .I know people need to vent, you're just the person they're venting at," he said. On the other hand, "I need a long holiday," he said with a grin.

Role of the BC Provincial Veterinarian in the Avian Influenza Outbreak in British Columbia

Dr. Ron Lewis

Dr. Ron Lewis, the Chief Provincial Veterinarian for British Columbia (BC), contacted the Canadian Food Inspection Agency (CFIA) and the British Columbia Ministry of Agriculture, Food and Fisheries (BCMAFF) Executive when the identification of avian influenza was established by PCR and tissue culture at the provincial laboratory. In his official reporting role, he provided the emergency link reporting to both internal and external organizations. Ron, like all Chief Provincial Veterinarians, is the designated person responsible for this emergency.

The provincial authorities continued in this role. Following the index case, the Animal Health Centre (AHC) also identified the second, and confirmed the third - all in broiler breeder operations in close proximity.

Experts Call Wild Birds Victims, Not Vectors

AnimalNet
October 12, 2004
New York Times
Donald G. McNeil Jr.

Wild birds are the ultimate source of all avian flus - but that, according to scientists cited in this story, does not mean that they are important in spreading the current virus or should be wiped out to stop it. The story explains that scientists searching for the roots of the A(H5N1) virus that is threatening to turn into a human pandemic consider live bird markets, **travelling poultry workers and the movement of domestic poultry and fighting cocks more likely vectors for spreading the disease from country to country and from farm to farm.** Wherever the strain originated, it has been surviving and mutating in domestic flocks for years, scientists said. The issue became important early this year, when some Asian health officials accused migratory birds of spreading the flu and threatened to attack them with the same lethal vigour that has been applied to domestic chickens. For a brief period in July, Thai officials killed open-billed storks and chopped down the trees they nested in. Singapore officials publicly - and rather fantastically - discussed killing crows and mynahs, which do not migrate, and netting wild birds to clip their wings. The gates of nature reserves in several countries were closed and people were warned to shun wild birds. In Vietnam, panic led to the release of many pets, which were seen roosting in city trees. Colin Poole, Asia director for the Wildlife Conservation Society, which runs the Bronx Zoo and animal protection programs around the globe, was quoted as saying, "I've never seen anything like it. Birds had become the enemy." In fact, scientists said, most ways the flu can move depend on humans. **In "wet markets," dozens of birds are penned together. Poultry workers' boots and truck tires can track infected feces long distances.** Fighting roosters are frequently carried long distances to bouts where thousands of dollars may be bet on them. When restrictions are imposed, they have been smuggled, even crossing borders hidden in hubcaps, one doctor said. Dr. Juan Lubroth, senior officer of the infectious disease group at the Food and Agriculture Organization of the United Nations, was quoted as saying, "We don't have indications that wildlife are major players" in the current outbreak.

Eagles Testing Positive for H5N1 Imported Illegally into Europe from Thailand

AnimalNet
October 28, 2004
Eurosurveillance Weekly Volume 8 Issue 44
René Snacken et al.
Institut Scientifique de Santé Publique, Brussels, Belgium

On 18 October 2004, a Thai man travelling from Bangkok to Brussels was apprehended by customs officials at Brussels international airport, and found to be illegally carrying two mountain hawk eagles (Spizaetus Nipalensis) in his hand luggage [1,2]. These birds were wrapped in a cotton cloth, with the heads free, and inserted headfirst in a bamboo tube around 60 cm in length, with one end (the feet end) open [3]. The two tubes were in a kind of sports bag, with the zip not totally closed to allow some air to enter. The birds were immediately put into quarantine at the airport. They later tested positive for avian influenza H5N1, which is currently circulating widely in southeast Asia, and were euthanised. The H5N1 diagnosis was made using a haemaglutination inhibition test using monospecific polysera and confirmed by H5 specific polymerase chain reaction (PCR). Sequencing is ongoing. The high pathogenicity of the virus was confirmed using the intravenous pathogenicity index. Results were available on 22 October, testing was carried out at the Veterinary and Agrochemical Research Centre (VAR/CODA/CERVA), Brussels. The Thai man, who received prophylactic treatment on 24 October, travelled to Vienna from Bangkok on 17/18 October with EVA Airways, flight number BR 0061, and then got a connecting flight to Brussels on 18 October with Austrian Airlines, flight number OS351. Passengers on these flights were advised to get medical advice if they had any flu-like symptoms (cough, fever, rhinorrhoea). Twenty-five people who had been in direct or indirect (same room) as the infected eagles (custom officers, a veterinarian, laboratory staff) were examined and received oseltamivir prophylaxis. Swabs (2 nasal and 1 throat) from 23 people (21 custom officers, the Thai passenger and his brother) were tested on 24 October 2004. A tear swab was also collected from the veterinarian, who developed bilateral conjunctivitis three days after having handled the birds. His family was given prophylaxis. The eagles had been ordered by a Belgian falconer who offered 7500 Euro for each bird. This falconer already owned four other eagles of the same species. These two birds detected by customs may reflect a much larger underlying problem of bird smuggling into European Union member states. They easily remain undetected because airport scanners only detect metal objects.

Dr. Lewis worked with other branches of the BCMAFF, the CFIA, city of Abbotsford, BC Provincial Emergency Program staff and the major poultry industries in eradication, testing, disposal, and surveillance activities.

He provided an avian health veterinarian, Dr. Victoria Bowes, to work with the epidemiology unit of the CFIA at the Emergency Operations Centre (EOC).

Ron attended meetings with industry and the CFIA at the EOC - initially on a daily, then weekly basis as the outbreak response progressed. Ron informed the provincial Minister, BCMAFF Executive and other ministry staff, as required, regarding the progress of eradication activities. He attended meetings with the CFIA President, poultry industry representatives, the federal Minister of Agriculture and Agri-Food, and CFIA staff.

Dr. Lewis worked with the National Centre for Foreign Animal Disease (NCFAD) and Animal Health Branch staff to ensure common Standard Operating Procedures; performed proficiency testing for quality assurance; and implemented additional rapid testing equipment and protocols. To increase testing capacity, Ron's staff hired and trained additional technicians under CFIA contract to assist in high-throughput testing. The AHC provided confirmatory negative testing of flocks before birds were sent through normal processing channels. All testing results were shared by the AHC and the NCFAD.

Dr. Lewis also participated in many media events: news conferences, briefings and interviews with newspaper, TV and radio reporters.

Ron gives us his next steps following the successful eradication of AI in British Columbia. A great deal of work remains to be done, for example:

- Continue and complete work with industry to improve biosecurity on poultry premises and develop and implement an effective disease surveillance program for the feather industry groups in BC.
- Improve the Foreign Animal Disease Eradication Support (FADES) plan with the CFIA to include items such as share test protocols; de-centralizing some of the decisions regarding eradication activities; implement annual testing of the FADES plan; a mechanism for involvement of industry representatives in FADES planning and response; and in the event of a zoonotic disease place more emphasis on public health concerns.

Outbreak-motivated Developments

Dr. John Kellar

Canada has been building upon its experiences at the hands of foreign animal disease incursions since 1952. Fortunately, those of former OIE List A significance have been so few as to be counted on one hand. Their infrequency demands that every ounce of knowledge be squeezed out in that narrow post-outbreak interval before competing issues reassert themselves. In that knowledge, a formal internal review involving geographically distributed focus groups has already sought to update emergency response approaches.

Further to that end, open forums have brought constructive criticism at the scene of the outbreak and elsewhere, as reported in the media and cited in this edition. The Poultry Industry Council (www.poultryindustrycouncil.ca) hosted one such event in August in the poultry production heartland of Ontario, engaging industry and disease control participants from the outbreak. The Council has made available biosecurity workshop videotapes.

In other venues, outbreak participants have delivered presentations aimed at raising consciousness of the disease and its potential impacts from both an animal and a zoonotic perspective. In respect of the latter, consultations are underway between the Canadian Food Inspection Agency and Health Canada towards establishing closer investigative linkages, to traverse the traditional gap separating animal and human disease surveillance.

Enveloping both is the reality that the continued presence of the disease in

CAHNET

...its position within the Canadian Surveillance Landscape

Examining / Protecting	humans	domestic animals	wildlife	environment
humans	Health Canada Network	2.1		
domestic animals	2.1	1. **CAHNet**	2.2	2.3
wildlife		2.2	Canadian Cooperative Wildlife Health Centre	
environment		2.3		Centre for Coastal Health / Environment Canada Network

1. CAHNet's core activity
2. CAHNet's reciprocal, collaborative inter-network connections with
   - 2.1 Health Canada
   - 2.2 Canadian Cooperative Wildlife Health Centre
   - 2.3 Centre for Coastal Health

wild birds represents a perennial risk of re-infection. To that end, the Canadian Animal Health Network is furthering its linkages with its wildlife surveillance partner, the Canadian Cooperative Wildlife Health Centre (wildlife.usask.ca). The National Wildlife Diseases Strategy, the subject of another article in this edition, will accelerate that development. These actions are not new, but rather a re-capitulation and re-emphasis of interrelationships described diagrammatically in the first edition of the CAHNet Bulletin in 1998. The diagram is reproduced immediately below.

Avian influenza was the subject of a disease outbreak simulation exercise held (OMAF/CFIA) in Ontario in October. Such projects incorporate a number of accepted parameters that describe the rapidity and means whereby the disease could be expected to spread. Each natural outbreak offers an opportunity to reassess them within the Canadian context. So as to update knowledge in this area, several research projects have been initiated to capitalize on data accumulated during the Abbotsford event.

The first is a case control study proposed at the St. Hyacinthe campus of the University of Montréal. The reader will recall from experience that when disease walks across a landscape, it afflicts some individuals and not others. Case control studies in animal health measure variability in key factors between affected and unaffected groups to gain insight into activities, environmental or other intrinsic factors which may have predisposed to infection. The results can be employed to design preventive measures and enhance biosecurity. During the recent outbreak, extensive information was collected from 25 affected and 75 unaffected poultry farms.

In the investigative whirlwind surrounding disease outbreaks, the appearance of clinical signs in one individual or location, followed by those in a second, could be easily misconstrued as transmission from the first to the second. While that remains one possibility, both might instead have been infected by a third source. Similarly, variability in incubation periods, as a result of the intrinsic factors described above, could have obscured real transmission in the opposite direction from that clinically observed. In addition, the individuals might have succumbed to independent strains wafting concurrently through the sector.

While outbreak preoccupation often precludes these finer assessments, information collected during eradication can be reassessed later in search of the true story. To that end, geospatial, temporal and viral genetic information is now being added to that described above towards a definitive plotting of the evolution of the Abbotsford event.

Avian influenza virus can remain viable for long periods in tissues, feces and water. People and materials so contaminated, along with birds themselves, are often cited as principal means of spread. Within their enclosed, humid and warm environments, intensively raised domestic poultry infected with the disease can be looked upon as "viral factories" producing volumes of

Any questions, comments, suggestions?

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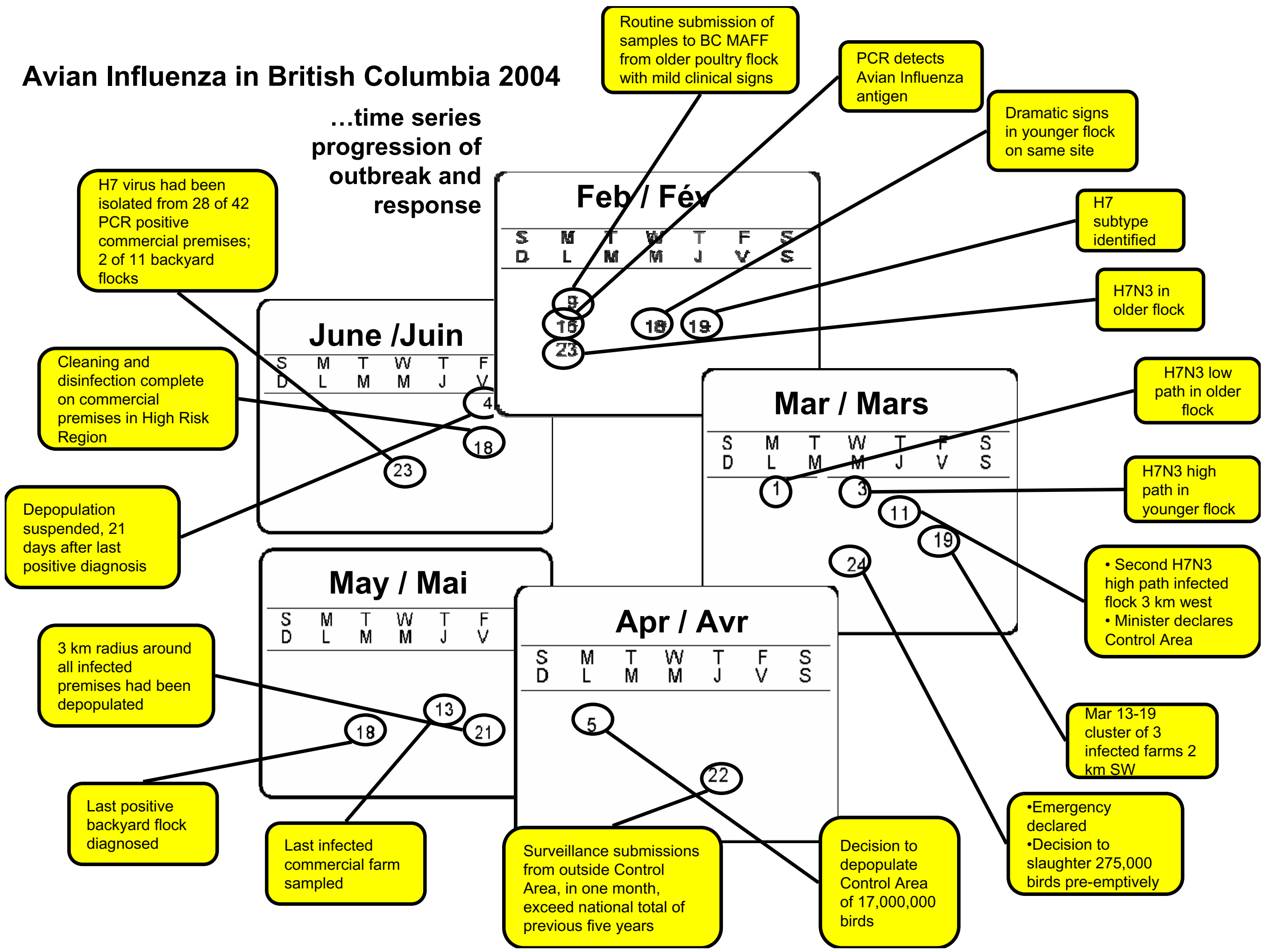
or any colleague in the Animal Disease Surveillance Unit



infective particles as described elsewhere in this Bulletin.

During the Abbotsford event, tactical air sampling was undertaken with the objective of detecting avian influenza virus within buildings harbouring infected flocks, in their immediate vicinity and at distances of up to one kilometer away. Concurrently, a portable weather station was established to evaluate local weather conditions. The combined results will assist researchers in modelling the potential windborne spread of this and other infectious diseases, while contributing to the case control assessment described earlier.

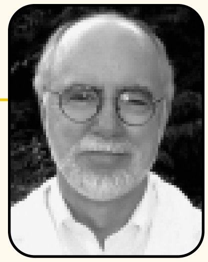
Research continues on the disposal methods introduced during the outbreak. Composting or bio-heat treatment, under study before the Abbotsford event and significant contributors to its success, offers considerable promise in resolution of the logistical disposal nightmare that shackles all disease eradication initiatives.

In context, the preceding describes a series of actions motivated by the emergence of one disease outbreak and the potential for a recurrence. Perhaps more instructive to policy planning than all the above is the determination of the probability of the latter. All other things being equal, one would expect that to be governed by the current prevalence of low pathogenic avian influenza in the domestic flock.

Motivated by the Abbotsford experience, the preliminary consultations described elsewhere in this edition have led to the drafting of a survey outline. Development continues at the time of writing.

Editor's note: For further information regarding the preceding, readers may contact Drs. Wayne Lees (wlees@inspection.gc.ca) and Christine Power (powerc@inspection.gc.ca)

CAHNECTIONS



In his own words, John Robinson admits to being at the British Columbia Ministry of Agriculture, Food & Fisheries (BCMAFF), Animal Health Centre laboratory in Abbotsford, B.C. for over 30 years and as a consequence is a really old guy...but still kicking. John is Head of Virology and Molecular Diagnostics. In the last few years he has specialized more in the viruses of fin than feather, except for the Highly Pathogenic Avian Influenza [HPAI) outbreak that recently demanded his undivided attention.

John is an alumnus of Washington State University, where he received his Bachelor of Arts degree in English, followed by his Doctor of Veterinary Medicine degree (DVM). You cannot do this in Canada. He then proceeded to the University of Wisconsin (Madison), continuing his growing passion for virology. Five years of study later he earned an M.S. and Ph.D. in Veterinary Science with a minor in medical (human) microbiology.

Thoroughly academically exhausted, he decided to go into dairy practice in Washington State, but was coaxed away to Oregon State University to take up a virology research position as Assistant Professor at the College of Veterinary Medicine in Corvallis. Within the year, all alone one afternoon perusing the American Veterinary Medical Association journal, he came across the employment advertisement that was to change his life forever; that of the offering of a diagnostic virologist position in British Columbia, Canada. John had visited B.C. twice on fishing holidays during his years as an undergraduate. Immediately intrigued, he applied and to his utter amazement was accepted forthwith. The rest is history. Now a dual citizen (smart guy) and never looking back, John never fails to enjoy each and every day in B.C. (rain or not!). He thinks it has got to be one of the most beautiful places on earth. We agree.

John has been involved with a number of professional activities during his career. These include a one year stint in which he left the Ministry to become manager of Scott's Poultry broiler hatchery and technical services veterinarian. He returned to his first love, the laboratory and eventually was invited as the guest lecturer at the Veterinary Institute in Changchun, China. He was also an adjunct professor at the University of British Columbia, teaching a course in Poultry Diseases during that time. Most recently he has been involved with the Ministry developing policies relating to Genetically Modified Organisms (GMO) and their place in B.C. agriculture.

Enhanced Virulence Of Influenza a Viruses With The Haemagglutinin Of The 1918 Pandemic Virus

AnimalNet
October 7, 2004
Nature Vol 431 No 7009 p. 703-707
Darwyn Kobasa, Ayato Tajadam Kyoko Sinya, et al

Abstract

The 'Spanish' influenza pandemic of 1918-19 was the most devastating outbreak of infectious disease in recorded history. At least 20 million people died from their illness, which was characterized by an unusually severe and rapid clinical course. The complete sequencing of several genes of the 1918 influenza virus has made it possible to study the functions of the proteins encoded by these genes in viruses generated by reverse genetics, a technique that permits the generation of infectious viruses entirely from cloned complementary DNA. Thus, to identify properties of the 1918 pandemic influenza A strain that might be related to its extraordinary virulence, viruses were produced containing the viral haemagglutinin (HA) and neuraminidase (NA) genes of the 1918 strain. The HA of this strain supports the pathogenicity of a mouse-adapted virus in this animal. Here we demonstrate that the HA of the 1918 virus confers enhanced pathogenicity in mice to recent human viruses that are otherwise non-pathogenic in this host. Moreover, these highly virulent recombinant viruses expressing the 1918 viral HA could infect the entire lung and induce high levels of macrophage-derived chemokines and cytokines, which resulted in infiltration of inflammatory cells and severe haemorrhage, hallmarks of the illness produced during the original pandemic.

CAHNECTIONS

For 16 years, her entire veterinary career, Victoria Bowes has devoted herself to providing full service diagnostic support for all avian species, be it commercial poultry, mixed backyard flocks, caged pet birds or wildlife. Following graduation from the Ontario Veterinary College in 1987 with her Doctor of Veterinary Medicine degree, she continued graduate studies in the Department of Pathology to earn an M.Sc. in Avian Pathology in 1988. Her Masters thesis focused on the enigma of Sudden Death Syndrome in broiler chickens.

Her first "real job" was at the provincial veterinary diagnostic lab in Winnipeg, Manitoba. It lasted a year until the splendid beauty of British Columbia lured her westward. She has remained gainfully employed since 1989 at the BC Ministry of Agriculture, Fisheries and Food's Animal Health Centre in Abbotsford. In 1992, in its inaugural year, Victoria was awarded board certification by the American College of Poultry Veterinarians. She is also a member of the American Association of Avian Pathologists and the Association of Avian Veterinarians.

Her primary diagnostic workload comprises investigative submissions from poultry producers who are experiencing unexplained mortality or production problems. It was through this routine disease monitoring service ("passive" surveillance) that Salmonella pullorum was diagnosed in 1997 and the first case of Avian Influenza (H7N3) was diagnosed earlier this year. In addition to those from commercial poultry, diagnostic submissions from smaller backyard flocks are encouraged through highly subsidized submission fees. In response to the recent outbreak of avian influenza, in which many backyard flocks were depopulated, Victoria has supported and encouraged the organization of backyard farmers into an official association. This liaison will be useful for providing health care information to a previously neglected poultry sector.

In 1998, a large number of Trumpeter Swans overwintering in the Fraser Valley began to die from toxicity related to the ingestion of lead shot. Victoria was invited to a team of biologists from the Canadian Wildlife Services and the US Fish and Wildlife Services conducting what turned out to be a 4 year study into the location of the source. Victoria has provided expert witness support to the Society for the Prevention of Cruelty to Animals in the prosecution of several cases, including a notorious cock-fighting ring, as well as supporting the Canadian Food Inspection Agency (CFIA) in the enforcement of the Humane Transport of Animals Act.

During the recent outbreak of Avian Influenza, Victoria provided scientific background information to CFIA's epidemiology team concerning waterfowl and influenza viruses, specific aspects of poultry biosecurity and the dynamics of commercial poultry hatcheries. She also served as an advisory member on the Exemptions Committee which reviewed and evaluated owner requests for exclusion from the bird cull based upon the genetic merit or rarity of specific, valuable bird collections. She has been an integral member of the BC Poultry Industry Enhanced Biosecurity Initiative that emerged following the outbreak in an effort to establish minimum standards of biosecurity for the commercial poultry industry. She is currently involved in the establishment of an Emergency Disease Response Plan for the poultry industry and has already provided them with a specific "Producer Self-Quarantine Protocol" that would assist in immediate disease containment upon suspicion of any infectious disease.

Victoria is admired and respected as a dedicated and approachable professional by members of the BC poultry industry. She and her husband live on 5 secluded acres with a menagerie of lazy spoiled animals that are unaware of their second chances at life, and she wouldn't have it any other way. While the salmon still return to the Fraser River, Victoria will not be far away with a fishing rod and steaming thermos of Tim's coffee. If she's lucky, she will "limit out" and only be an hour late for work!

The Infrastructural Vision

Dr. John Kellar

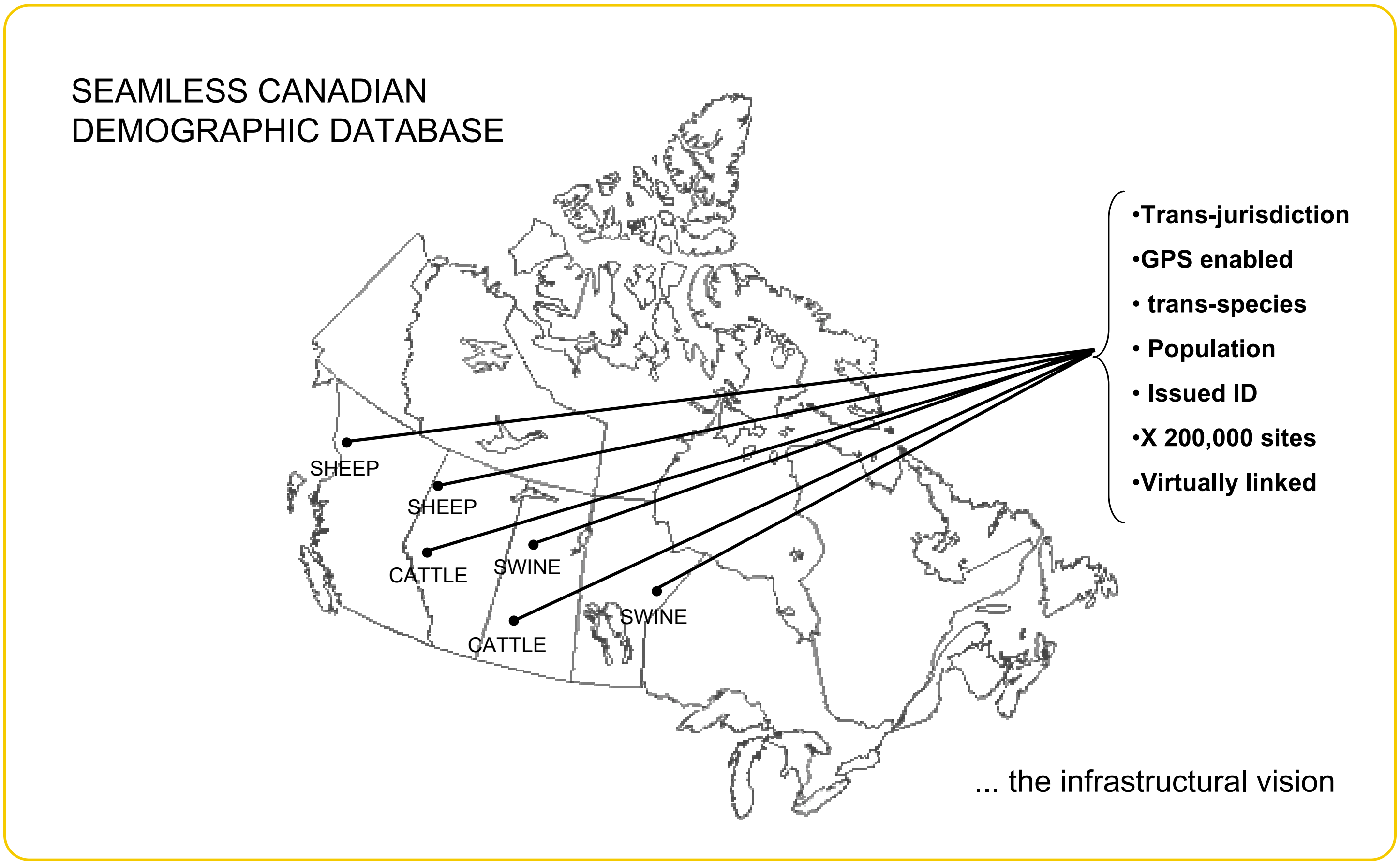
The cost-effectiveness of disease eradication efforts pivots on the infrastructural foundation upon which they are mounted. The investigative response team enters the scene of an outbreak to help, but in doing so ironically imposes its own needs list upon the already afflicted sector. The team carries in with it a wish list for information on the underlying demographics of the species afflicted, their traditional movement patterns, specific movements, relationships and exposure vulnerabilities.

All stakeholders recognize the futility of such chases in the midst of an incursion. As a result, industry, provincial and territorial governments have long collaborated within the Canadian Animal Health Network in the construction of the ultimate disease mitigation tool. No, it doesn't take the form of a vaccine, medication or the most recent in electronic devices. They aspire only to create, in respect of animal agribusiness, a file of factual information analogous to that which is crucial to problem solving within any enterprise.

In this instance, it takes the form of a seamless national demographic database which cuts across species and jurisdictional boundaries to encompass the approximately 200,000 sites on which livestock and poultry species are produced, marketed and processed. It will register each uniquely numbered site's geographic coordinates in manipulable Global Positioning System (GPS) format. In addition to traditional name, address and other "tombstone" information, each land location's file will retain the approximate populations of the species husbanded and the identification series issued to them.

In conjunction with, or as an intimate component of, the emerging Canadian Livestock Identification Agency structure, the database will raise disease eradication capacity to a new threshold. Upon receipt of a tentative diagnosis, with the affected site number and the national identification borne by the afflicted animal in hand, epidemiologists will search an electronic database for the beast's movement history. They will map the places it had passed through during key epidemiologic intervals and highlight the tag series borne by the other animals resident there at the time. They will trace the movements of such exposed animals to market, slaughter, export and other sites encompassed by the National Livestock Identification and Tracing Program.

Around the currently affected site and former ones considered exposed, they will scribe polygons of dimensions that reflect the potential contiguous radii of spread of the disease in question. They will forward to planners an assessment of the populations potentially at risk and the closest sites at which they could be



mustered. They will provide an indication of the logistical implications of a series of optional strategies of containment and mitigation, while delivering a list of the potential risks imported by trading partners. All of this, if necessary, as the first Inspector puts on green coveralls and jumps into a government vehicle to visit the scene.

Realization of this vision commenced a decade ago with activities leading to the creation of the Canadian Cattle Identification Agency. It is being furthered through the imminent incorporation of the Canadian Livestock Identification Agency. The latter structure reflects the interest of the multiple other species which have since created identification business plans or already launched their respective national programs.

The Canadian Cattle Identification Agency's database was designed to encompass the evolutionary steps needed to facilitate the vision. A number of forums and studies during the last two years have culminated in an industry commitment to incorporate GPS coordinates in all livestock identification databases. Related submissions have already been made to the federal government for joint development in this area and traceability.

Multiple sectors, in a joint representation to key Ministers, recently petitioned for creation of a national demographic database through the mandatory imposition of premises identification numbers. Meanwhile, the Canadian Food Inspection Agency is enhancing its data processing capacity to make the best use of the emerging tool.

For those who wish to follow the evolution more closely, there follows a chart of key developments and the individuals committed to their success.

Building Towards the Infrastructural Vision

Structural Element	Mandate	Contact	Coordinates	Comment
ID	CCIA	Julie Stitt	julie@canadaid.ca	Original, award-winning, industry-led national ID initiative
	CLIA	Keith Flaman (dairy) Clare Schlegel (pork) Brad Wildeman (beef)	kflaman@holstein.ca clare@sugarfield.ca bradw.pma@sasktel.net	Sector co-chairs guiding ID into animal agribusiness-wide application
	ATQ	Linda Marchand	lmarchand@agri-tracabilite.qc.ca	Enhanced, encompassing provincial program
	Govt (CFIA)	Richard Robinson John Kellar Eric Aubin	rrobinson@inspection.gc.ca jkellar@inspection.gc.ca aubine@inspection.gc.ca	Facilitating cost-effective, industry-led process. E. Aubin late of CPC.
GIS	CPC	Clare Schlegel	clare@sugarfield.ca	Industry seeks cost-effective sourcing of GPS coordinates
	Govt (CFIA)	Connie Doan Eric Aubin Vic d'Angiolo	doanc@inspection.gc.ca aubine@inspection.gc.ca VD'Angiolo@inspection.gc.ca	CFIA seeks to optimize use of coordinates provided by industry
Demographics	CCIA	Julie Stitt	julie@canadaid.ca	CCIA database forwards compatible to application
	Govt (CFIA)	John Kellar Jette Christensen	jkellar@inspection.gc.ca christensenj@inspection.gc.ca	Collaborative disease spread study in swine built around demographics.
Infrastructure-Enabled Initiatives				
Zoning	CAHC	Matt Taylor	m-taylor@telusplanet.net	Protagonist in industry-led West Hawk Lake zoning initiative
	Govt (CFIA)	John Kellar Christine Power	jkellar@inspection.gc.ca powerc@inspection.gc.ca	Facilitating industry's adoption of zoning in disease mitigation
Surveillance	CAHNet	Wayne Lees Rosemary Hood	wlees@inspection.gc.ca hoodr@inspection.gc.ca	Optimizing collaborative approach with industry, other governments, other federal departments

Creation of the Canadian Livestock Identification Agency

Eric Aubin

Eric Aubin is the Chief of Livestock Identification and Legislation with the Canadian Food Inspection Agency.

In 1999, the Minister of Agriculture and Agri-Food Canada (AAFC) indicated his preference that the Canadian Cattle Identification Agency (CCIA) be broadened to include other livestock groups. Following the Canadian Bovine Spongiform Encephalopathy (BSE) crisis, the merits of his suggestion were reinforced. In the autumn of 2003, a meeting took place between CCIA, the hog, goat and horse industries. Information was exchanged on the needs of these sectors and the services that could be provided by the national identification agency. It already served cattle and bison, with commitment to sheep.

In the spring of 2004, AAFC allocated funds to support the secretariat of a new organization that would be called: the Canadian Livestock Identification Agency (CLIA). Secretariat staff wrote discussion papers, suggesting national traceability policies, guidelines and approaches from birth to slaughter that would be common for all livestock sectors. Working groups were created to develop the policies: Premises Identification and Geo-Referencing; Communications; Regulations; Standards & National Performance Targets Strategy; Systems Compliance & Integrity Strategy; and Lot Identification and Traceability.

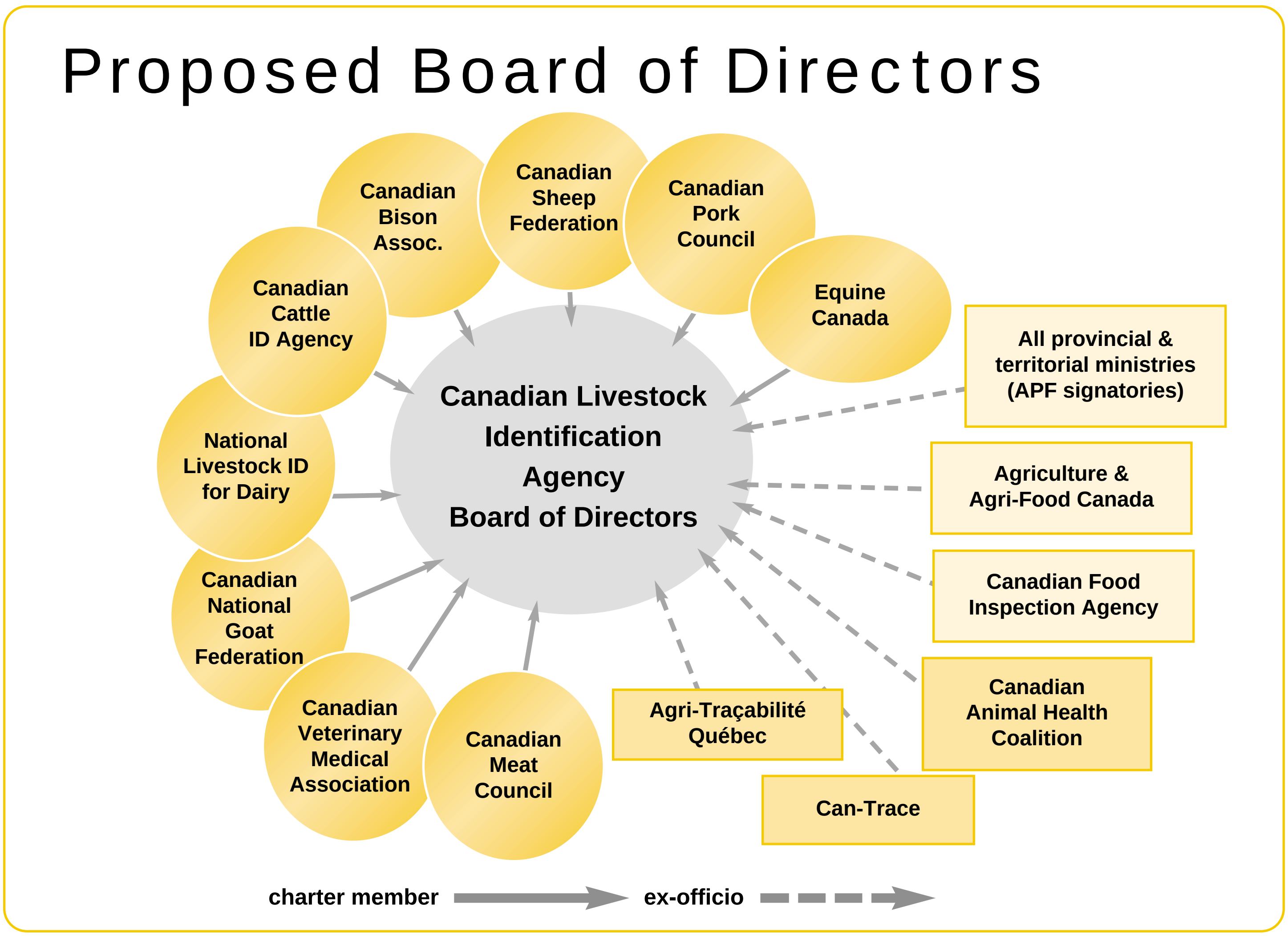
The approval of the by-laws and the hiring of a CLIA Executive Director should be completed by the end of 2004. The proposed Board of Directors is characterized in the accompanying diagram.

West Nile Virus Update

Dr. Les Kumor

In 2004, the information on West Nile Virus (WNV) provided on the Canadian Food Inspection Agency's (CFIA) Web site was updated to reflect the major developments in this disease since the page was originally created and posted in 2003. It is located at the following address : http://www.inspection.gc.ca/english/anima/heasan/disemala/wnvvno/wnve.shtml

As well as providing information on the CFIA's response to WNV and laboratory result interpretation, the site provides numerous links to other related subjects: Health Canada's WNV Information page,



WNV and Human Health, Surveillance, and to the Canadian Cooperative Wildlife Health Center (CCWHC) WNV Surveillance site.

New Measures in Turkey Slaughterhouses - The module entitled *"CFIA Response to West Nile Virus in Slaughtered Birds of the Order of Galliformes"* has been modified to include new knowledge of the disease in turkeys. In 2002, the Wisconsin Division of Public Health investigated and found a high prevalence of WNV antibody among turkey farm workers. Although the mode of transmission to these workers remains unknown, the assumption was made that transmission by less typical routes might have occurred. Despite uncertainty, epidemiological evidence suggested that percutaneous injury, fecal-oral, or respiratory exposure to aerosolized infected turkey feces could have caused human infection. Accordingly, Health Canada advised the CFIA inspection staff and plant employees to take extra precautions when conducting antemortem inspection in turkey slaughter houses. To address the safety of the inspection staff, the Web page provides a link to Health Canada's WNV Occupational Health and Safety Advisory.

WNV Equine Vaccines - There are two WNV vaccines licensed for use in Canada. Fort Dodge's Killed Virus (West Nile - Innovator) was registered for use in horses in 2003, and the Modified Live Virus, Canarypox Vector (Recombitek Equine West Nile Virus) manufactured by Merial Ltd. was approved by the Veterinary Biologics Section of the CFIA in April 2004. These vaccines are readily available to horse owners through their veterinary practitioners. Both require two injections, several weeks apart for primary immunization, and an annual booster for continued protection. For more information on the WNV vaccines for horses, you may wish to review the Fort Dodge (Wyeth) and the Merial Web sites.

Owners must keep in mind that vaccinated horses may develop antibodies to WNV, which may affect their eligibility for export to countries that require negative blood test results for this disease. Some other countries, however, require that horses be certified as vaccinated against West Nile Virus prior to import. Owners should consult their veterinarians if they plan to travel internationally with their horses.

WNV cases in wild birds and horses - As of October 19, 2004 there have been a total of 6190 wild birds tested in Canada, with 416 confirmed positive for WNV (Quebec,112; Ontario, 250; Manitoba, 16; Saskatchewan, 29; and Alberta, 9). No positive birds were reported from other provinces and territories.

The total number of presumptive or confirmed equine cases was 14: four confirmed positive cases in Alberta, nine in Ontario, and one presumed positive horse in Quebec. No deaths were reported.

During the same time period in 2003, there were 446 presumptive and confirmed positive cases in horses across six provinces: Nova Scotia, Quebec, Ontario, Manitoba, Saskatchewan and Alberta.

In 2004 there have been no reports of West Nile virus infection in other domestic animals.

For past and current information on the number of WNV confirmed or suspected cases and the species involved in Canada, see Health Canada's Web site http://www.hc-sc.gc.ca/pphb-dgspsp/wnv-vwn/mon_e.html#sitrep

National Wildlife Diseases Strategy takes shape at Ottawa Workshop

Trevor Swerdfager
Director General
Canadian Wildlife Service
Environment Canada

More than 50 wildlife disease experts met in Ottawa in April to develop action plans for the implementation of the National Wildlife Disease Strategy which is currently under development. The Strategy will be used by governments at all levels to minimize the harmful effects of wild animal diseases.

The rapid pace of disease emergence in Canada and around the world at the beginning of the 21st Century has created new challenges for public health, livestock health, wildlife management and national and regional economies. In the first six months of 2003, wild animal diseases were second only to war in claiming attention and causing exceptional expenditure by governments around the world.

Severe Acute Respiratory Syndrome (SARS), caused by a virus attributed to small wild **carnivores (civets)** in Asia, had cost the world economy approximately $136 billion as of June 2003. Other wildlife diseases, such as Bovine Tuberculosis, West Nile Virus (WNV), Monkey Pox and the Ebola Virus have affected international trade, caused human illness, strained response capacities and cost millions of dollars. It's estimated that about 70% of new or newly important diseases affecting human health and human economies worldwide have a wild animal source.

In Canada, governments and industries have invested heavily in eradicating Chronic Wasting Disease **(CWD)** from Canadian farms. The effects of **WNV** and Avian Bird Flu have also placed burdens on public health care budgets and the national economy.

The National Wildlife Disease Strategy is a collaborative initiative to develop a coordinated and integrated approach to wildlife disease management in Canada. Federal, provincial and territorial departments and agencies are working with non-government organizations, universities, and industry to finalize and implement this national plan.

The Strategy includes six goals: the prevention of emergence of new wildlife diseases; the early detection of new wildlife diseases; rapid response to new wildlife diseases; effective disease management; education and training; and communication. Officials in the public health, agriculture and trade, and wildlife resource management sectors developed draft action plans for each of the goals at the workshop.

"SARS, WNV, Bovine Spongiform Encephalopathy (BSE) and CWD have made it evident that effective disease surveillance and management must consider man, domestic animals and wildlife," said Gordon J. Glover, a veterinarian from Assiniboine Park Zoo in Winnipeg. "Our ability in Canada to monitor wildlife health status and respond appropriately to changes in health, have not kept pace with the increased risk of disease introduction," he said.

Participants agreed that the role and capacity of the Canadian Cooperative Wildlife Health Centre (CCWHC) should be expanded, and that it should act as the central hub for implementation of the national strategy. The CCWHC already provides a national inter-agency program of wildlife disease surveillance and technical data to inform policy and program decisions related to wildlife conservation and management, public health and agriculture. It is located at Canada's four veterinary colleges and funded by federal, provincial and territorial agencies and others.

The National Wildlife Disease Strategy and action plan summaries were presented to the Canadian Wildlife Directors Committee at their meeting in Iqaluit in mid-May. The Committee approved the draft Strategy and endorsed the draft action plans for further development. The Strategy was also presented to Deputy Ministers responsible for wildlife, forests, fisheries and aquaculture on June 24, 2004 and was endorsed. The draft action plans were well received and Deputy Ministers asked that work continue to refine them.

The National Wildlife Disease Strategy and action plan summaries are available on the Canadian Wildlife Service's website at: http://www.cws-scf.ec.gc.ca/cnwds/index_e.cfm

Anthrax and Its Winter Occurrences in Canada

Drs. Les Kumor & Jim McLane

This short communication summarizes the history of anthrax in Canada and documents rare occurrences of the disease during the wintertime.

Available records suggest that for the first half of the 20th Century, most of reported anthrax outbreaks in Canada occurred in Ontario and Quebec. To put into context the impact of this disease in a rural community, the Globe and Mail reported in July, 1901 that anthrax had broken out in cattle and horses at three locations in eastern Ontario. The majority were associated with pastures contaminated with effluent from local tanneries.

During the second half of the century, however, outbreaks have been reported almost exclusively in the prairie provinces. The CFIA's records show that between 1962 and the present, 25 distinct outbreaks occurred among domestic cattle in Manitoba, Saskatchewan and Alberta. For the most part, they have been small and each limited to one farm, with a few mortalities. Some were recorded on farms which had previous experience with the disease and where recent excavation was believed to have cycled bacterial spores back to the surface or, in some instances, into waterways where outbreaks had been recorded years previously on farms upstream of the affected site.

Whereas it is commonly perceived that anthrax is usually associated with warm weather, on rare occasions it has been reported during the winter months. In the last 44 years, there were four anthrax outbreaks reported in winter in domestic cattle in Saskatchewan.

The first such case was reported in the Maple Creek area in 1971. A three-year-old cow died suddenly on December 13, without appearing sick the day before. On post mortem, the carcass showed bloody discharge from the nostrils, mouth and anus, and the spleen was greatly enlarged, pulpy and black. Blood appeared dark and unclotted. A portion of spleen and two cotton swabs of blood were forwarded to the federal lab in Lethbridge and anthrax was confirmed on December 17.

The premises was quarantined and 95 head of cattle were vaccinated the next day. The carcass was burned and buried and an area of 30 square feet surrounding the grave was properly fenced. There were no further deaths on this farm and the quarantine was lifted 30 days post vaccination on January 17, 1972. Documented anthrax had previously occurred on this farm in 1952, but the source of infection was never determined.

The second recorded case of winter anthrax happened in Lone Rock in December, 1972. The farmer had lost three head of cattle and brought the third loss into the clinic in Lloydminster in late December. When the veterinarian opened the carcass, he noticed a very enlarged spleen, and even though it was in winter, he suspected it might be anthrax. The sample submitted to the lab on December 20 was confirmed to be anthrax.

Seven cattle and three horses died during this outbreak. The epidemiological investigation revealed that a pipeline had been buried through the pasture land that fall by an oil company. This activity could have uncovered anthrax spores, with the animals exposed either through contaminated feed or contaminated soil on the pasture. Since the source of infection could not be determined in this outbreak, the owner vaccinated his herd of livestock annually for the next 32 years without further incident.

The third case was reported in February, 1980 after a Maple Creek producer started to feed his cattle with a new stack of hay. Three cows died suddenly between February 19 and 26. A local practitioner did a post mortem on the third animal and a portion of spleen, which had been described as normal in size but "raspberry jam" in appearance, was sent to the Animal Disease Research Institute (ADRI) in Lethbridge. Anthrax was confirmed on February 28. The owner stopped feeding the hay on February 24, and the entire herd of 255 head of cattle and three horses was vaccinated on February 29.

Two cows with high fever were treated with penicillin and fully recovered. The Maple Creek flows through this property and the three dead cows were found within 20 m of the unfrozen stream. There were no further deaths on this farm and the quarantine was released on April 1. The epidemiology revealed that there had been no unusual cattle movement during the four months preceding the outbreak and anthrax had never previously been diagnosed on this farm.

However, approximately 50 km upstream, on a tributary of the Maple Creek, the first cases of anthrax in the area were reported in 1952 and, as previously described, in December 1971. The Maple Creek area has alluvium soil, low in organic matter, with a pH ranging from 8.0 to 8.2. The land on which these three cows had been found had been back flooded and the hay fed earlier was grown on some of this land. A sample of the hay was tested at the Animal Pathology Laboratory in Saskatoon, but researchers were unable to demonstrate the presence of B. anthracis using concentration, culture and animal inoculation techniques.

The most recent case of "winter anthrax" was reported early in 2004. A farm outside the small town of Neilburg was quarantined January 25, after anthrax had been discovered in a 170 head commercial beef herd. On January 19, a local practitioner investigated the cause of several sudden deaths. On the day of the visit, two additional cows had died. The postmortem findings in both animals, other than indicating the presence of a small amount of blood-tinged fluid at the nostril and anus, were non-specific. Tissues samples were sent to the Prairie Diagnostic Services in Saskatoon. The tentative diagnosis of anthrax was made on January 23 and confirmed by the CFIA laboratory in Lethbridge on Jan. 25. The herd was quarantined on the same day. The epidemiological investigation strongly suggested that canola bails, taken from a few quarters of land that contained many little sloughs and low lying areas, provided the most likely source of anthrax spores.

The canola had been swathed in the Fall of 2002 but not baled until May, 2003. There was also a history of excavations in 2002 throughout the farmlands from where the bales were gathered. It has been speculated that some wild or possibly domestic animal(s) died of anthrax many years ago in one of these low-lying areas, and in the baling process some soil contaminated with anthrax spores was wrapped up in one or more of the bales. The canola was fed to the cattle from November 2003 until January 24, 2004 and the herd was vaccinated on January 26. Nine cattle died in this outbreak. Three weeks after the livestock were vaccinated, the remainder of the canola bales were fed without further incident.

Anthrax is a Reportable Disease under the Health of Animals Act. Since it can be readily prevented by available vaccine, the Canadian Food Inspection Agency (CFIA) does not compensate producers for lost animals nor pay for any cost related to an outbreak. However, to enhance disease reporting, the government established Indemnity Regulations to encourage producers to report to the CFIA any suspicion of anthrax, so control measures could be quickly implemented to contain the disease and reduce further losses.

Anthrax outbreaks during the wintertime, even though unusual and rare, should not be totally unexpected. Dr. L. K. Anderson, former Regional Veterinary Director for Saskatchewan, aptly digressed in one of his memos to Animal Health staff, at the time of the 1980 outbreak: "As you are aware, it is unusual for anthrax to break out at this time of year; however, once again just such an incident clearly illustrates the need for us to maintain constant vigilance for the presence of any and all Reportable Diseases at all times of the year."

Livestock Traceability Activities in 2004

Eric Aubin

Eric Aubin is the Chief of Livestock Identification and Legislation with the Canadian Food Inspection Agency.

The year 2004 was full of activities in traceability. Without a doubt, the most important has been the accelerated development of the Canadian Livestock Identification Agency (CLIA). Working groups were created; national policy documents were written; and the bylaws of the organization should be approved by year's end. See the CLIA article elsewhere in this edition.

The CLIA Premises Identification and Geo-Referencing Working Group made recommendations on a definition for "premises"; on a national premises identification number scheme; and the information parameters to be collected in a national premises repository. These recommendations will be submitted to CLIA for approval. Geo-referencing of premises and provincial/federal Access to Information Regulations will be studied more extensively.

The Canadian Cattle Identification Agency (CCIA) introduced the universal use of Radio Frequency Identification (RFID) tags for beef cattle as of January, 2005. CCIA also developed a services enhancement plan.

Mandatory national identification came into effect for sheep January 1, 2004.

Regulatory changes on the identification of cattle, sheep and bison, spurred on by the BSE experience, await the Minister's approval. They apply stricter requirements to the identification of these species.

The national identification pilot study for hogs continues as planned. The final report will be released in January 2005. Consultations on national identification requirements will follow.

It is expected that a national horse identification plan will be developed in 2005. Domestic and trans-border consultations continue.

Equine Infectious Anemia - The Disease, Its Control Program Evolution and The CFIA's Participation in It.

Dr. Les Kumor

(Modified from CFIA's perspective on the EIA program in a Letter to the Editor, The Rider, April 2004)

The disease - Equine Infectious Anemia (EIA) is a viral disease that affects the immune system of horses and other equidae. It is transmitted in blood, mainly via blood-sucking insects, equipment contaminated with blood containing the virus, or through breeding. The EIA virus can only reproduce in living cells, and in this way spreads throughout the animal. All infected horses carry the virus for life. Because the virus lives within the cell, treatment and vaccination are ineffective.

In general, there are three forms of EIA: acute, chronic and inapparent carrier. In all three forms, the virus can be detected by the presence of antibodies produced by the horse in response to the infection. Acutely and chronically infected horses always pose a high risk of infection to EIA-free horses because they tend to have a high concentration of virus in their blood. Inapparent carriers, however, are seemingly healthy horses, with a low or undetectable level of virus in the blood. Inapparent carriers may never become infectious; however, stress and other diseases or treatments can activate the acute form resulting in a high concentration of virus in their bloodstream. Horse owners who are not well informed about EIA often debate the meaning of the Coggins test and balk at destroying “healthy” carriers.

The history - EIA or swamp fever has been recognized in Canada since 1881. Initial control efforts, based on the elimination of clinically ill horses, were largely unsuccessful because infected but inapparent carriers perpetuated the disease in the environment and served as a continuous source of infection for disease-free horses. In 1970, Dr. Leroy Coggins developed a diagnostic test for EIA using an agar-gel immunodiffusion (AGID) reaction. The Coggins test is consistently reliable in detecting the presence of antibodies regardless of whether the infection is acute, chronic or inapparent. The test's reliability and the identification of inapparent carriers paved the way for implementation of more successful EIA control programs.

The evolution of the EIA program - In 1971, EIA was made a Reportable Disease in Canada, and the first EIA program was introduced in1972. Agriculture Canada offered the Coggins test to Canadian horse owners and voluntary testing was performed by accredited veterinarians. The government was only involved in trace-out investigations and testing after a reactor was reported, and EIA reactors were either permanently quarantined or destroyed. There was no compensation paid for any destroyed horses during the first seven years of the program, but in 1978 the federal government introduced the payment of $200 to owners whose horses were euthanised. In 1989, Agriculture Canada began to accredit private laboratories to perform the Coggins test, although all atypical or positive results were confirmed in a federal laboratory before any quarantine and investigative activities were implemented.

From 1972 to 1993, of the approximately 1.8 million horses tested, about 14,000 were confirmed positive for EIA. Although some owners chose permanent quarantine for their animals, the majority of horses were destroyed. During the same time period, the rate of infection among horses tested dropped from 2.9% to 0.39%, suggesting that the program was successful in controlling the spread of the disease in all but some remote and high risk areas.

In 1994, faced with rising deficits, the government reduced its involvement in the program and modified the control policy. EIA remained a Reportable Disease and testing procedures and requirements did not change; however, Agriculture Canada notified the owners of infected and “contact animals” owners instead of investigating reactors and testing positive animals. Horses in contact with reactors were not quarantined and their testing was conducted at the owner's expense by CFIA-accredited veterinarians. Owners required a federal licence to remove infected animals from the premises. The government discontinued ordering the destruction of infected horses and the payment of compensation. Between 1994 and 1998, approximately 337,000 horses were tested and close to 550 reactors were either voluntarily destroyed or permanently isolated. During that period, the rate of infection among tested horses increased from 0.39% in 1993 to 0.66% as recorded in 1999.

The current program - In April 1998, the newly created Canadian Food Inspection Agency (CFIA) was approached by the equine industry to modify the EIA program. As EIA was not a zoonotic disease, nor did it pose food safety or human health risks, it did not fit well within the CFIA's mandate. Nevertheless, the CFIA recognized that unless EIA was controlled there could be devastating effects on the Canadian horse industry, including those related to international trade. Consequently, the CFIA agreed to participate in the control of EIA provided the new program would be industry-driven, self-funded and supported by the majority of horse owners.

Based on those principles, the CFIA agreed to administer the EIA program and its current form was created in late 1998. Participation is voluntary and all elements have been developed in conjunction with the industry. It is based on internationally recognized disease control standards, current knowledge of the disease, and the best diagnostic methods available. As there is no effective treatment for EIA and no vaccine to prevent it, the disease can be successfully controlled by testing and the elimination of reactors, including inapparent ones.

This CFIA's control program consists of two components. In the first one, owners voluntarily pay to have their horses tested with the Coggins test when they are identified and required by the industry (e.g. movement into shows, point of sale, etc). Testing is conducted by private veterinary practitioners and EIA private laboratories accredited by CFIA for that function. The CFIA is responsible for the second component of the program, the mandatory response. Each time an EIA positive horse is discovered, it must be reported to the CFIA and disease control measures implemented. The premises on which a reactor is discovered is declared an infected place and all susceptible animals must test negative to be allowed to move off the property. Horses in contact with the reactor within 30 days of the sampling date are also tested. All EIA test-positive horses are retested and reactors with clinical signs are ordered destroyed. Owners of horses that are confirmed positive for EIA without clinical signs must choose whether to keep the horse in a permanent quarantine or have it destroyed. In the latter case, the CFIA orders the horse destroyed and pays compensation. The government's part of the program is delivered at no charge to owners.

Between 1999 and the end of calendar year 2003, approximately 396,000 horses were tested voluntarily, with1,306 identified as EIA positive. The rate of infection among tested horses has continuously decreased since the introduction of the new program. In 2003 it was 0.07%, the second lowest in the history of the EIA control program.

Financial aspects - When the program was introduced in 1998, the maximum compensation payable for horses ordered destroyed was set at $500 and $1,000 for grade and purebred horses respectively. To further promote the program and encourage testing, compensation was increased to a maximum of $2,750 in May 1999 for all horses. Accredited laboratories charge owners a two dollar surcharge for each animal tested to offset the cost of the CFIA's mandatory response. While this amount may in some years cover the cost of compensation, it does not cover the CFIA's labour and operating costs. These are provided as a service to the industry.

Benefits vs. owners' concerns - Over the years, the overall response to the program by the horse industry has been generally positive, especially among horse owners who require a negative status to move their horses internationally or to attend local sporting events. For many horse owners, the test has allowed their herds to achieve EIA freedom and retain it by pretesting herd additions.

Despite the obvious benefits and successes of the program, there remain some negative views among owners of clinically healthy reactors or inapparent carriers. They are understandably reluctant to have their animals destroyed or permanently quarantined, and argue that these carriers pose little threat of transmission to other horses. However, there remains the possibility that their horses may revert to a more infectious state at some point and spread the disease. Although the risks posed by these asymptomatic horses are minimal, the consequences of infection are not.

This program has been revived by and for the equine industry. There is no food safety or public health concern and the government's involvement is based on the furtherance of animal health in Canada.

Program improvements - As part of the CFIA's continuous effort to promote the program and encourage greater participation of horse owners, the EIA section of CFIA's Web site has been upgraded. In addition to information on the number of horses tested annually and the number of EIA positive cases listed by the province and for the whole country for the last 10 years, the site has two new features which will be updated annually. The table, *Equine Infectious Anemia -Reason for Test*, breaks down the number of horses tested by categories such as: shows, export, racing, or as part of CFIA investigations or testing of clinical cases, and records the number of reactors in each test category group. This information is reported for each province and for Canada for 2002 and 2003. The table, *EIA Monthly Reactor Report*, lists the monthly distribution of reactors in each province, for these two years. The EIA Web site can be viewed at: http://www.inspection.gc.ca/english/anima/heasan/disemala/equianem/equianeme.shtml

Editor's Note: The inclusion of this detailed account is a reflection of the significance of this disease to the equine sector. It serves as one of a number of motivating influences behind Equine Canada's participation in the evolution of the Canadian Livestock Identification Agency.

Tularemia in Manitoba and Minnesota in Dwarf Hamsters

Dr. Terry Whiting
Disease Control Epidemiologist

Francisella tularensis is believed to be maintained in the environment by various terrestrial and aquatic mammals; outbreaks of disease in humans often parallel outbreaks of tularemia in wild animals[1]. The true incidence and spectrum of clinical disease in domestic animals is poorly understood[2]. Humans can acquire tularemia through contact with a variety of animals, including pet rodents[3].

Francisella tularensis type B was isolated from dwarf hamsters *(Phodopus cambelli)* received by a Minnesota pet distributor on September 16, 2004, from a pet distributor in Manitoba. The United States Centers for Disease Control (CDC) notified the Public Health Agency of Canada (PHAC) on September 27, 2004. Traceback of these hamsters led to a Manitoba breeder, where environmental and animal testing was undertaken beginning September 30, 2004. Syrian hamsters (Mesocricetus auratus) from the same breeder have subsequently tested positive for F. tularensis. Serologic evidence of exposure has been found in 7 dogs living under the hamster facility at the index farm and one of 11 rabbits tested adjacent to the building. A single live free ranging deer mouse, trapped the last week of September on the index premises, tested positive by PCR.
Pet stores in Manitoba were notified on October 7 to suspend sale or distribution of any hamster unless it had been in the facility for at least 14 days in the absence of clinical illness among hamsters at the site. Distributors and retailers were requested to notify Veterinary Services Branch (VSB) of any increased or unusual animal death or illness and submit all dead hamsters for testing. Passive surveillance has not yielded any confirmed cases of human tularaemia arising from exposure to these hamsters or other potentially infected pet rodents.

Traceback and farm visits to suppliers of hamsters in Manitoba (N=5) was completed the week of October 22nd by a VSB veterinarian and none reported unusual die-offs in pocket pets. Samples were taken from recent natural death loss where carcasses had been kept frozen as part of routine management and from healthy and poor-doing species at risk, at the rate of 10-12 animals per farm. No serological or other evidence of past or current exposure to tularaemia was identified. Farm dogs were serologically tested where available.

A telephone survey of pet stores across the province was administered October 19. Of 28 contacted, the survey turned up 4 retailers who reported die-offs of hamsters since July 1. Three of these retailers were known previously to public health authorities. Manitoba Public Health inspectors were deployed to collect sick or dead rodents from pet stores across the province, beginning the week of October 11. To date, they have retrieved approximately 20 dead pocket pets. PCR testing provided by the PHAC resulted in no further infected animals being identified other than a single pet store previously identified as having received animals in the same time frame as the Minnesota case. Further exposure studies are planned for pet store workers in Manitoba.

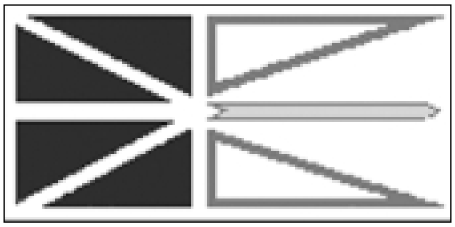
Data currently available supports a point source outbreak, probably from wildlife, and 100% mortality in domestic hamsters infected. Ongoing work in humans at risk is underway by Manitoba Health. However, the zoonotic impact of this outbreak appears to be minimal at this time.

1 Ellis J, Oyston PC, Green M, Titball RW. Tularemia. Clin Microbiol Rev. 2002 Oct;15(4):631-46.

2 Aiello SE et. al. 2003. Tularemia. Merck Veterinary Manual, 8th ed. Merck & Co.: Whitehouse Station NJ.

3 Avashia SB et. al. 2004. First reported prairie dog-to-human tularemia transmission, Texas, 2002. Emerg Infect Dis. Mar;10(3):483-6

Newfoundland and Labrador



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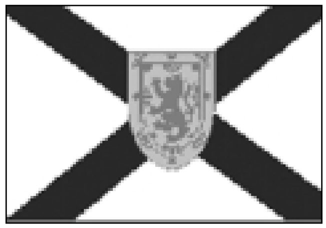
The provincial government is responsible for the provision of farm animal veterinary service and associated laboratory and regulatory programs. Over the last year we have been involved in a number of disease surveillance programs. These include the successful end of our rabies eradication program for the Island of Newfoundland that started with the first case in St. Paul's (December 2002) and ended in April 2004. At this point, we have collected and tested fox carcasses for one year since the last fox positive in April 2003 with no further cases.

There had been no cases on the Island since the outbreak of 1988, near Roddickton, and a single bat related case in 1989. There is still considerable work left after the official completion of the program as we try to determine the original source of the introduction, analyse the pattern of movement, and write up the outbreak details for scientific publication. We are very grateful for the vast knowledge and experience that has been generated through the Ontario Ministry of Natural Resources as well as the laboratory expertise resident within the Canadian Food Inspection Agency.

We are supporting graduate level studies into the ticks and tick-borne diseases of this province and the risks of West Nile virus introduction and establishment. We are also supporting industry needs for surveillance of Salmonella in the layer industry and federal-provincial interests in surveillance for TSEs.

As a related issue, the provincial government is currently reviewing all of its programs as a means of controlling and decreasing its expenditures. No announcements have yet been made on how this will affect animal disease surveillance.

Nova Scotia



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In September 2004, Dr. Grant Spearman, formerly of Manitoba, joined Dr. Lyn Ferns at the Department of Agriculture & Fisheries as Veterinary Pathologist, replacing Dr. Tom Hutchison. Over the past year, Dr. Gord Finley has continued to coordinate Nova Scotia responses to animal health and livestock disease threats and serve as representative on national animal health issues.

Disease Control Update - One case of Infectious Laryngotracheitis (ILT) in a small poultry flock was diagnosed and eliminated in the past year. As an annual preventative measure, mandatory ILT vaccination for 4H and show birds was carried out in June. Bovine Spongiform Encephalopathy (BSE) surveillance continues on brain samples from cattle over 30 months of age submitted to the Veterinary Diagnostic Laboratory. Samples are also being obtained from similar animals condemned at slaughter in registered Nova Scotia abattoirs. The Canadian Food Inspection Agency (CFIA) will also increase surveillance levels via the dead stock collection program and through large animal veterinarians.

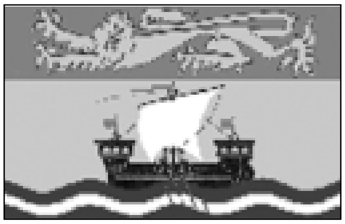
The lack of a testing laboratory in Atlantic Canada continues to be a concern should rapid turn around times for test results be needed. Nova Scotia is one of the first provinces to have exceeded its sample number quota, as set by CFIA for 2004. The proposed Canadian feed ban on "SRM" materials of ruminant origin would stress disposal systems. While no Chronic Wasting Disease has been diagnosed east of Saskatchewan it remains a Transmissible Spongiform Encephalopathy of interest in cervids. A few surveillance samples have been taken from hunter-killed deer and more are planned from wildlife parks and cervids over 24 months killed at abattoirs.

West Nile Virus (WNV) was not found in corvids or other species tested. Several horses, with neurological disease, have tested negative serologically for WNV. Lyme Disease activity seems to be decreasing, although a number of deer ticks have been found on the south shore of Nova Scotia. These will be tested at the Health Canada Laboratory in Winnipeg for the Lyme Disease agent. A risk assessment (Saskatoon Wildlife Cooperative) plus focus groups have been completed with the main players on possible wild turkey importations into Nova Scotia from Ontario. While there is no such thing as zero risk ... the overall level seems acceptably low provided a series of tests for specific poultry diseases is carried out before importation. Local commercial chicken farmers continue to express concern about the potential introduction of diseases to their flocks. The final decision will rest with the Minister of Natural Resources.

Diagnostic Services - The laboratory remains preoccupied with routine work, mainly from food-producing animals. Hematology, clinical chemistry, serology, bacteriology, histology and necropsy continue to be offered. Samples for virology and other selected tests are referred to the Atlantic Veterinary College. Other tests requested, which are not available in house, are sent to reference laboratories. Environmental testing continues for the poultry industry for the presence / absence of Salmonella species as part of their food safety programs.

Regulatory Update - A review of all aspects of Nova Scotia's Animal Health Program has started and should be completed during the next year.

New Brunswick



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In July of this year the New Brunswick Department of Agriculture, Fisheries and Aquaculture (DAFA) underwent restructuring and reorganization. The goals of the changes are to allow more focus on priorities (current and future) and arrangement of responsibilities along functional lines as well as placing more focus on regional services. The former Veterinary Services Branch was structured in 2001 with Dr. Michael Maloney as Chief Provincial Veterinarian. Veterinary Services are now part of the new **Livestock Development Branch** with by Dr. Michael Maloney as Executive Director and Chief Provincial Veterinarian. This new branch includes Livestock and Poultry Health (Veterinary Services), Livestock Development, and Food Safety and Quality sections. Fish health falls under the mandate of the Department's new **Sustainable Aquaculture and Fish Health Branch**. The changes to the veterinary and fish health services were seamless and are working well.

On March 29, DAFA hosted a Poultry Health Forum that brought New Brunswick's poultry industry to share poultry health management information and concerns while exploring cooperative efforts to prevent the introduction and spread of diseases. There was excellent representation by commercial producers, backyard flock owners, keepers of fancy show-birds, vendors and the Canadian Food Inspection Agency (CFIA). Presentations reviewed international, national and provincial poultry health problems and concerns; federal and provincial legislation pertaining to poultry health; and optimal biosecurity measures. Discussions ensued on what role each "partner" currently plays to protect and strengthen the poultry industry and look out for its best interests; what concerns each poultry sector has regarding poultry health and the entire poultry industry in New Brunswick; what can be done to address these concerns; and how all sectors of the poultry industry can work together and individually to protect against disease and its potential impacts, so as to strengthen the poultry industry in the province.

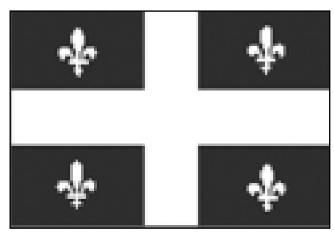
New Brunswick continued its wildlife rabies control program in the southwestern part of the province in the late summer and autumn of 2004. The program is still spearheaded by the Department of Health and Wellness, with practical support from DAFA and the Department of Natural Resources. This trap-vaccinate-release program has been ongoing for four consecutive years and targets wild raccoons, striped skunks and feral cats. New Brunswick has not detected raccoon variant rabies since May 2002. For the past two years, New Brunswick's wildlife rabies control program has been complemented by an oral rabies vaccination program in contiguous parts of Maine.

In May of this year, DAFA was informed of an *Aeromonas salmonicida* (furunculosis) outbreak at a fish hatchery facility in the northeastern part of the province. Further investigation indicated that the A. *salmonicida* demonstrated a massive resistance pattern to most known antibiotics, including resistance to all potentiated sulfonamides, erythromycin, amoxicillin, quinalones, florfenicol, oxytetracycline, oxylinic acid, streptomycin, ceftiofur, and chloramphenicol.

DAFA immediately generated a plan to prevent persistence or spread of this organism into the surrounding environment. The plan addressed five major pillars: risk to workers health; risk to human health (consumers); environmental risk; risks associated with depopulation; and consideration of needs for immediate and future research and development studies. The facility was depopulated within 7 days of first notification and the Department of Fisheries and Oceans, CFIA and Health Canada were consulted.

Since the outbreak, DAFA has been able to determine, with the help of personnel at Research and Productivity Council (RPC) laboratories, that the A. *salmonicida* was infiltrated with a first class fully integrated integron. The integron is over 100 kbps in size and further DNA analysis has uncovered the genetic sequence of the resistance packages within each of the cassettes. Experts have stated that the resistance pattern is not associated with irresponsible or indiscriminant use of antibiotics in the industry. Instead, they believe that resistance packages could be the result of untreated effluent from hospitals being discharged into local river systems. The province of New Brunswick alone has 13 hospitals which discharge untreated wastes into local waterways and coastal regions.

Quebec



Dr. Gabrielle Lévesque
Coordinator of the Réseau d'alerte et d'information zoosanitaire (RAIZO)
Institut national de santé animale (INSA)
Quebec Department of Agriculture, Fisheries and Food (MAPAQ)

The Institut national de santé animale (INSA) marked its first anniversary at the beginning of 2004. During this period, the institute was able to consolidate its surveillance and diagnostic network. INSA's mandate is to provide continuous surveillance, prevention and control of animal diseases and zoonoses and to take the necessary actions to protect animal and public health. Dr. Gabrielle Lévesque is now coordinator of the Réseau d'alerte et d'information zoosanitaire (RAIZO), taking over from Dr. Mona S. Morin.

Disease surveillance - In the past few years, the various crises affecting the animal health sector have demonstrated the importance of intensifying animal health surveillance activities. They have also highlighted the need to work in partnership in order to pool the expertise of all the parties concerned for the prevention and management of events affecting animal or public health.

In 2002, species-specific sentinel networks were established in order to quickly detect public or animal health problems in the field. A seventh sentinel network of the Réseau d'alerte et d'information zoosanitaire (RAIZO), for bees, was established in March 2004, which will make it possible to more quickly detect any abnormal situation relating to bee health.

In order to strengthen the partnership network established in the animal health sector and promote information sharing at the Quebec, national and international levels, the first INSA "Journées scientifiques" were held on April 14 and 15, 2004 in Quebec City. This event, attended by nearly 200 participants, provided an opportunity to present a retrospective of the major animal health incidents in Quebec in 2003 and to offer a half-day of national and international conferences on BSE. This event thus provided an ideal opportunity to take advantage of the expertise of distinguished speakers.

Avian influenza surveillance and vigilance are a major INSA concern. Meetings with the Quebec poultry industry were organized to determine the appropriate actions and division of responsibilities in order to more effectively prepare for a potential outbreak of the disease in the Quebec flock.

INSA is also continuing its activities in the field of surveillance of zoonoses and potential zoonotic agents (PZAs). The number of investigations conducted by INSA staff concerning zoonoses or PZAs increased from 224 in 2002-2003 to 243 in 2003-2004, the vast majority of these being attributed to salmonellosis and Q fever.

West Nile Virus (WNV) surveillance continued in 2003 and 2004. INSA, which coordinates animal health activities, produced a video on collecting birds for the purposes of this surveillance program. In 2004, the number of cases reported was 2,277 compared to 7,031 in 2003. Of the 866 Corvidae analyzed at the Centre québécois sur la santé des animaux sauvages (CQSAS), 112 tested positive for WNV in 2004, compared to 846 in 2003. In addition, WNV was diagnosed for the first time in a bird in the Saguenay-Lac-St-Jean and Abitibi-Témiscamingue regions.

In 2003 and 2004, INSA conducted several investigations at the homes of people suffering from salmonellosis potentially in connection with aquariums. To determine the origin of the aquarium contamination, INSA undertook a surveillance program of the water accompanying tropical fish imported from various countries, such as Thailand, Singapore and the United States. From September 5, 2003 to September 8, 2004, 466 water samples were analysed. Salmonella was isolated from 92 of them, or 19.7%. Twenty-eight different serovars were isolated in these samples, the most frequent being Schwarzengrund. Salmonella Paratyphi B was also isolated in five samples. Posters and inserts providing information and recommendations on the safe handling of aquarium fish have been produced and will be distributed to pet stores.

Regulations - As part of INSA's regulatory activities, a sheep identification and traceability system was instituted with the coming into effect on March 17, 2004, of the Regulation respecting the identification and traceability of certain animals, made under the Animal Health Protection Act (RSQ, c. P-42).

On September 22, 2004, two draft regulations were published in the Gazette officielle du Québec, one on the registration of bee owners in Quebec and the other on mandatory marking of hives. These regulations are scheduled to come into effect in June 2005. The regulations on Quebec bee owners stipulates that bee owners will have to report the number of hives that they own as well as the location of these hives within Quebec and keep records. The regulation on mandatory marking of hives stipulates that bee owners must mark each hive with their name and address. Application of these regulations will help improve health monitoring of Quebec apiaries and promote more effective control strategies for bee predators.

A draft regulation permitting the designation of animal species or categories for the application of Division IV.1.1 (Safety and welfare of animals) of the Animal Health Protection Act was published on June 16, 2004. Once this regulation comes into effect, scheduled for the fall of 2004, dogs and cats will be designated as species subject to the animal welfare provisions of the Animal Health Protection Act and may be subject to inspection. A regulation on the registration of certain dog owners is also scheduled to come into effect in the fall of 2004 requiring these owners to register with the Quebec Department of Agriculture, Fisheries and Food (MAPAQ).

Animal pathology laboratories - The network of INSA laboratories contributes to animal health protection by providing expertise in the field of support for veterinary diagnoses and by conducting specialized analyses.

Under this mandate, a PCR test to screen for avian influenza genetic material, H5 and H7 subtypes, was instituted at the Laboratoire d'épidémiosurveillance animale du Québec (LEAQ) in St-Hyacinthe using technology transferred from CFIA's Winnipeg laboratory. This technology could be put to use in the new avian influenza surveillance activities.

The LEAQ is also planning to begin using the Biorad rapid ELISA test for the diagnosis of transmissible spongiform encephalopathies (TSEs) in early 2005.

Ontario

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Avian Influenza virus - The Ontario government has formed an Avian Influenza Working Group, headed by the Commissioner of Emergency Management (Dr. James Young), to address the potential risks to the province from AI virus. The group is focused primarily on public health and safety in the event of an outbreak with zoonotic potential. The Ministry of Agriculture and Food (OMAF) is one of the many contributors to this working group. OMAF has also held a series of meetings to determine the first steps and responsibilities of OMAF staff in the event of a significant outbreak of this disease.

OMAF is supporting the Canadian Cooperative Wildlife Health Centre (CCWHC) with a pilot surveillance initiative for Exotic Newcastle and AI viruses in wild cormorants sampled during a recent population cull. This is the start of a plan for increased surveillance for AI virus in wild bird populations. The Ministry of Health and Long Term Care is currently discussing the elements of an overall Ontario influenza surveillance program including human, avian and swine strains. AI surveillance in commercial poultry would be greatly enhanced by a coordinated national surveillance program. This is one of many pathogens that would benefit from a model whereby surveillance is designed nationally (federal-provincial-territorial) followed by regional implementation to meet local conditions.

The poultry industry, represented by the Poultry Industry Council, has been increasing awareness of avian influenza among producers and service personnel, stressing the need for enhanced biosecurity, and coordinated a simulation exercise in October. OMAF and CFIA Ontario have been working closely with the poultry industry in these efforts, and in emergency preparedness planning.

Ontario and the CFIA have signed the FADES plan Ontario (Foreign Animal Disease Emergency Support), which outlines the roles and responsibilities of federal and provincial partners in the event of a FAD. OMAF has also prepared an emergency response and communications plan for an event such as an AI outbreak, and has made municipalities aware of the need to include FADs in their emergency response plans.

Eastern Equine Encephalitis - EEE in horses has been reported sporadically. In 2003, there were 12 cases of EEE detected in Ontario, often in places where the virus had not been detected before. Throughout 2004, the Ministry of Health and Long Term Care has funded a surveillance project for EEE, which solicits diagnostic samples from equine neurological cases. Veterinarians submitting samples to the Animal Health Laboratory at the University of Guelph or to Vita-Tech Laboratories will be reimbursed for their time as well as the testing costs for both West Nile and EEE viruses (IgM ELISA, immunohistochemistry and PCR). The Ministry of Health is also undertaking mosquito surveillance in areas where the virus was detected in 2003.

Haines Report on Food Safety in Ontario - In July 2004, Justice Haines released his report on the Ontario meat regulatory and inspection system. The report broadly examined food safety and connected the elements of surveillance, biosecurity, preparedness, and animal health and welfare to food safety. Ontario government staff is currently working on implementation plans associated with the 113 recommendations made in the report.

BSE - OMAF staff have been working with Ontario Region CFIA staff to plan the implementation of enhanced testing for BSE. The Animal Health Laboratory at the University of Guelph has also put rapid test methodology in place to improve the turn around time and the diagnostic capacity associated with the program.

Manitoba

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Veterinary Manpower and Infrastructure - The provincial Veterinary Science Scholarship Fund supports 26 Manitoba students enrolled at the Western College of Veterinary Medicine. In addition, the Summer Student Employment Program provided 20 students this summer with experience in Manitoba's rural practices. Hopefully, these initiatives will encourage them to work in Manitoba after graduation. Manitoba has 28 publicly supported rural veterinary practices, many of which have reported a drastically reduced income due to BSE (30% range). Currently, the provincial veterinary laboratory is very short staffed with only 2 of its possible five pathology positions filled. The laboratory is undergoing renovations to allow TSE testing. This will hopefully be completed mid-2005.

Disease Control Update - Tetracycline-Resistant American Fowlbrood has been identified for the first time this year in Manitoba honeybees. Provincial staff are working to control the disease with enhanced inspection and brooder hygiene and controlled use of Tylosin in an extra label application. An outbreak of *Francisella tularensis type B* was identified in hamsters from a Manitoba producer in a shipment to Minnesota. The infection likely caused the death of all hamsters in a shipment to BC. Please see a more detailed report elsewhere in this Bulletin.

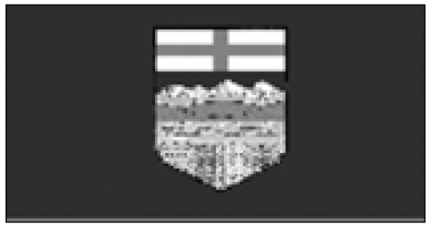
Mycobacterium bovis (Bovine tuberculosis) in the Riding Mountain National Park (RMNP) area continues to be a disease issue in Manitoba. It is handled under a federal/provincial TB Management Program in consultation with stakeholders. CFIA tested approximately 22,000 cattle and bison in 2003/04 in the RMNP area with no confirmed positives. Another 30,000 will be tested in 2004/05. Specimens from approximately 450 wild elk and 510 white-tailed deer were examined in 2003/04 from hunter-killed and special collections, with an additional 5 elk (west end of RMNP) and 3 white-tailed deer (white-tailed deer - Grandview area) found positive. Elk in the western part of RMNP are now believed to be a reservoir for TB and there is concern white-tailed deer may be as well.

In March 2004, CFIA reported a La Broquerie dairy herd was TB positive, probably from acquiring a TB positive animal from a herd dispersal near McCreary (2002, within 5km of RMNP). This will not change the TB Accredited Advanced status of the RMNP area nor the TB-free status of the remainder of Manitoba.

Fewer cases of West Nile Virus were reported in 2004, probably due to decreased numbers of Culex tarsalis mosquitoes (cool wet summer) carrying the virus. The provincial lab tested only 352 corvids this year with 16 positives compared to 819 tested and 290 positive in 2003. No equine cases were confirmed. One goose flock positive in 2002 was again positive in 2004.

Disease Surveillance Update - As of October, Manitoba has tested over 1000 high risk cattle for Bovine Spongiform Encephalopathy (BSE). The province met its 2004 BSE surveillance numbers of 880 primarily through a spring dead stock program in which CFIA were able to collect and test 750 animals. CWD has not been detected in Manitoba. The province has approximately 60 licensed farms (elk only) and 3,600 elk. CWD testing is mandatory for all elk that die of any means, including slaughter, which are 12 months and older. From 2001-2003, 230 farmed elk were tested by immunohistochemistry (IHC), with compliance high among provincial producers. Producers also have the option to join CFIA's voluntary accredited herd program. In wild cervids, Manitoba at the end of the 2003/04 hunt season has tested 3,415 animals, primarily along the southern and western edge of the province, by IHC. Approximately 900 will be assessed in 2004/05 in the same areas.

Alberta



Dr. Gerald Ollis
Chief Provincial Veterinarian
Food Safety Division
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Assistant Chief Provincial Veterinarian - In May, Dr. Gerald Hauer was appointed the Assistant Chief Provincial Veterinarian. Formerly in practice specializing in farmed cervids and bison and Alberta's provincial bison specialist, Dr. Hauer, has a solid background in alternative livestock health and management practices. He is a welcome addition to our office and the Food Safety Division.

BSE Surveillance and Testing - As a result of the May 2003 diagnosis of BSE in an Alberta cow and the discovery in December 2003 that another in Washington State was originally from Alberta, our province has implemented a number of changes to BSE surveillance, as well as enhancements to our laboratory testing facilities.

Annual target numbers for BSE testing on Alberta cattle are approximately 2,800 in 2004 and 10,500 thereafter. Obtaining adequate numbers of eligible samples is proving to be a challenge.

Alberta Agriculture Food and Rural Development (AAFRD), and the Canadian Food Inspection Agency have worked with Alberta Beef Producers, Alberta Milk, Alberta Veterinary Medical Association and the rendering industry, to develop an Enhanced BSE Surveillance Program designed to meet Alberta's BSE testing obligations. Details of the program, to be announced this fall, include making payments to producers, veterinarians, and renderers who submit samples eligible for BSE screening.

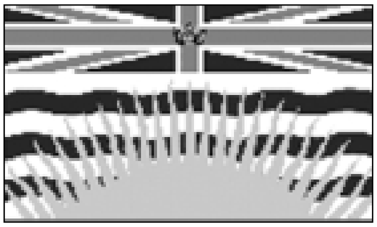
AAFRD has recently renovated and enhanced the biosecurity of its post-mortem laboratory in Edmonton. AAFRD is using the Bio-Rad TeSeE® ELISA kit as a rapid test for BSE screening. Robotic equipment has been purchased and staff trained to use this new technology in an enhanced Biosecurity Level II facility. At least 1000 samples per week can be processed. The National Centre for Foreign Animal Disease in Winnipeg will confirm positive test reactions.

Avian Influenza - The outbreak of highly pathogenic avian influenza (HPAI) in B.C. was the catalyst for the Alberta poultry industry to develop a response plan for dealing with poultry health emergencies, as well as food safety issues, weather-related emergencies and terrorism. The plan identifies potential technical, logistical and managerial resources, which may be required from the Alberta poultry industry, to assist in a disease control operation. The poultry industry is the first of Alberta's livestock commodity groups to develop a contingency plan to deal with animal health emergencies. Industry may have already held a tabletop exercise by the time of publication of this edition.

CWD National Herd Certification Program - As of August 15, 2004, there were 230 Alberta elk and deer producers enrolled in the National Chronic Wasting Disease Program. The breakdown of those enrolled is as follows: 4 at level B; 30 at level C; 98 at level D; 98 at level E.

West Nile Virus - West Nile Virus (WNV) in horses has been a Reportable Disease in Alberta since 2003. There were a total of 170 horses laboratory-confirmed with WNV in 2003. Of these, 59 (34.7%) died or were euthanized due to complications from the disease. WNV surveillance in 2004 has detected only two positive horses as of August 31, 2004.

British Columbia



Dr. Ron Lewis
Director,
Animal Health Centre - Animal Health Branch
Ministry of Agribulture, Food and Fisheries
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This year, two major issues have been in the forefront relating to animal health in British Columbia: the eradication of highly pathogenic avian influenza and the response to the discovery of bovine spongiform encephalopathy in Canada.

In February 2004, the Animal Health Centre diagnosed avian influenza in a 52 week old broiler breeder flock which was soon confirmed by the CFIA as a Low Pathogenic Avian Influenza H7N3. A mutation occurred in this agent resulting in the identification on March 8 of Highly Pathogenic Avian Influenza H7N3 in a 26 week old flock on the same farm. The infection rapidly spread to surrounding farms in the central Fraser Valley, home of approximately 19 million birds. The Canadian Food Inspection Agency set up control zones and depopulated 42 commercial farms and 550 small farms. In total, 17.1 million birds (of roughly 19 million) were eradicated in the Fraser Valley: 1.3 million from infected farms; 15.8 million test-negative birds from the surrounding control zone were either composted or sent through normal processing channels.

Farm gate sales losses were estimated at $156 million with margin losses of $58 million. The CFIA compensated producers $65 million for birds that were destroyed in controlling the disease spread. To protect against further outbreaks the industry, working with provincial and federal governments, established a committee to develop biosecurity protocols to create an improved national standard for Canada. These biosecurity standards are non-specific and will assist in protecting the poultry industry from a wide variety of pathogens in the future. A national Avian Influenza Forum with 190 participants from across Canada, including national poultry representatives, provincial and federal governments, and speakers from Holland and the Netherlands just concluded in Abbotsford. Several significant recommendations came out of this forum with the emphasis on improving biosecurity, updating our Foreign Animal Disease Eradication Support plan, and developing closer collaborations with public health workers.

The discovery of BSE in a cow in Alberta has had a catastrophic impact on the Canadian cattle industry and cattle producers in British Columbia have been significantly affected. To convince our trading partners of the low prevalence of BSE in Canada, BC and other provinces must provide surveillance data to demonstrate zero or very low prevalence. For this fiscal year, BC is to evaluate approximately 500 animals in the 4D category and, next year, at least 1900 animals must be checked for evidence of BSE. The program has been slow in starting in British Columbia and, to date, only 100 heads have been evaluated and found negative by the CFIA. The Animal Health Branch is preparing to assist by making infrastructure alterations at the Animal Health Centre to accommodate for rapid testing; in addition a laboratory scientist will be hired and trained to begin BSE testing as soon as possible. One major difficulty will be accessing appropriate samples which may require providing additional financial compensation to producers to encourage appropriate sample submissions.

The Animal Health Branch has completed this year's West Nile Virus surveillance following testing of 1470 corvids; all birds were negative by the VecTest and confirmatory negative PCR testing was performed on every 20th bird submission. British Columbia has yet to record a positive WNV bird or animal after 3 years of surveillance. No positive indigenous human cases have been recorded in this province.

In February, the Animal Health Centre was re-accredited by the American Association of Veterinary Laboratory Diagnosticians as a full-service veterinary diagnostic laboratory. This success followed several months of preparation by staff to ensure all standard operating procedures were in place; a quality manual had to be produced and quality control and quality assurance procedures were all being followed. The AAVLD is adopting guidelines from the OIE and must be fully compliant with these guidelines by 2006; this was a major undertaking and staff have been commended for their success.

The CAHNet Support Group

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Funding for this issue of the Bulletin has been provided by the Canadian Food Inspection Agency.

Laboratory Diagnosis of Bovine Tuberculosis in Canada for Calendar Year 2003

Cyril Lutze-Wallace, Steve Chen and Claude Turcotte
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The following article is reproduced with permission of the Editor-in-chief of the Canadian Veterinary Journal. It originally appeared in the November, 2004 issue, Volume 45, No. 11, pages 915-916.

The Mycobacterial Diseases Centre of Expertise (C of E) of the Canadian Food Inspection Agency is the national reference laboratory for Canada responsible for diagnosis of tuberculosis in animals in support of the National Bovine Tuberculosis Eradication Program. *Mycobacterium bovis*, a member of the Tuberculosis (TB) Complex of organisms, is the causative agent of bovine tuberculosis and is a reportable disease as defined by the Health of Animals Act and Regulations (1). For the calendar year 2003, a total of 948 diagnostic submissions from domestic and wild animals were received for tuberculosis testing by the C of E. Samples were received from six provinces (Prince Edward Island, Québec, Ontario, Manitoba, Saskatchewan and Alberta, see Table 1) and included submissions from routine slaughter surveillance in abattoirs (n=322), outbreak eradication (trace-forward, trace-back, n=125), skin test reactors (n=50), wildlife tuberculosis control programs (Manitoba, n=409), accredited veterinarians, clinics and veterinary laboratories (n=24) and zoo submissions (n=18). By species of origin (Table 1), cattle make up the largest group of submissions (n=347) followed by elk (n=265) and deer (n=188, includes white tailed deer, red deer and fallow deer). In total, 9252 histopathology tests were conducted and 1461 diagnostic cultures were prepared from submissions received during 2003.

The number of *Mycobacterium bovis* isolates obtained from all submissions received during 2003 was 15 (see Table 2). Isolates of *M. bovis* were obtained from a bovine skin test reactor from the Riding Mountain Eradication Area of Manitoba (n=1), from wild elk captured within Riding Mountain National Park (RMNP, n=12) and from hunter harvested wildlife (n=2, 1 from white tailed deer and 1 from elk) collected from areas adjacent to RMNP. There were no other jurisdictions in Canada from which *M. bovis* was isolated from submissions received during calendar year 2003. Further to the preliminary data presented by Lees et al. (2) for *M. bovis* isolates from elk in April of 2003 (n=10), a further two elk submitted in December of 2003 as part of the Riding Mountain National Park elk survey were found to be positive for M. bovis.

Several other species of *Mycobacteria* were recovered from specimens submitted to the Centre of Expertise in 2003 and are detailed in Table 2.

Table 1. Submission for TB testing by province* and species of origin

Species \ Province	AB	MB	ON	PQ	PE	SK	Total
Cattle	69	164	24	13	3	74	347
Bison	2	34	1	2		71	110
Elk	10	237	3	3		12	265
Deer	3	171	3	7		4	188
Porcine	4	4	3	3	1		15
Elephant			15				15
Others**		4	4				8
Total	88	614	53	28	4	161	948

*AB - Alberta; MB - Manitoba; ON - Ontario; PQ - Quebec; PE - Prince Edward Island; SK - Saskatchewan.
**Other species: five caprine and one each for canine, non-human primate (baboon) and ovine.

Table 2: Summary of Mycobacterial species isolated during 2003.

Mycobacterial spp.	Animal spp.						Province					Total
	cattle	elk	deer	bison	porcine	elephant	AB	MB	ON	PQ	SK	
M. bovis	1	13	1	-	-	-	-	15	-	-	-	15
M. avium subsp. *avium*	3	2	-	-	6	-	1	5	1	2	2	11
M. avium subsp. *paratuberculosis*	1	1	-	-	-	-	2	-	-	-	-	2
M. gordonae	-	-	1	-	-	-	-	1	-	-	-	1
M. xenopi	1	-	-	-	-	-	-	-	-	-	1	1
M. terrae	7	2	4	1	-	-	-	11	2	-	1	14
M. chelonae	2	1	-	-	-	1	-	3	1	-	-	4
M. fortuitum	-	1	-	-	-	-	-	1	-	-	-	1
M. triviale	-	1	-	-	-	-	-	1	-	-	-	1
M. flavescens	1	-	-	-	-	-	-	-	1	-	-	1
M. marinum	-	-	1	-	-	-	-	-	1	-	-	1
URG*	-	2	-	1	-	1	-	2	1	-	1	4

*URG: unidentified rapid grower, other environment Mycobacteria.

Acknowledgements

The authors gratefully acknowledge the contributions of staff of the Mycobacterial Diseases Centre of Expertise, CFIA Animal Health Program and Operations Field staff, and from private laboratories, veterinary clinics, veterinary schools, zoos, Provincial authorities and Parks Canada Agency.

References

1. Health of Animals Act. Available at www.inspection.gc.ca/english/reg/rege.shtml. Last accessed July 14, 2004.
2. Lees VW, Copeland S, Rousseau P. Bovine tuberculosis in elk *(Cervus elaphus manitobensis)* near Riding Mountain National Park, Manitoba, from 1992 to 2002. Can Vet J 2003; 44: 830-831.

Synopsis of the changes being implemented to the CFIA scrapie program

Dr. Penny Greenwood
Senior Staff Veterinarian
Canadian Food Inspection Agency

Before the end of 2004, major revisions will be made to the mandatory national program enacted by the CFIA whenever scrapie is present or suspected on a premise.

Upon receipt of a confirmed diagnosis of scrapie, the CFIA will give the flock owner a choice between total flock depopulation or the use of scrapie genotyping as a tool for triaging the groups of sheep to be ordered destroyed and definitively tested for scrapie. Based on genotype results the CFIA will order the destruction of the most genetically susceptible sheep on the premises and submit tissues for scrapie testing.

If additional sheep in this genetic group test positive for scrapie, then the group of sheep that has been identified with the next more resistant (less susceptible) genotype will be ordered destroyed and tissues collected for genotyping. This iterative process will continue until all scrapie tests from a genetic group of sheep are negative. Five years of surveillance of mature deadstock will be mandatory on all previously infected premises.

Another major change to the CFIA program will be the implementation of live animal testing to screen sheep flocks which provided female breeding stock to the infected flock. All sheep over 14 months of age that are genotyped as QQ at codon 171 will have a 3rd eyelid lymphoid follicle taken and submitted for scrapie testing. The status of the potential source flock will be surmised based on the results of the biopsy results.

The reader should note the following:

- Canada is not currently pursuing mandatory breeding for genetic resistance to scrapie.
- The CFIA is implementing the use of scrapie genotyping as a test to evaluate the risk and target different groups of sheep for destruction and definitive disease testing on scrapie-infected premises.
- Producers have the choice of utilizing scrapie genotyping as a risk management tool for scrapie on their premises.

Regulatory Statistics

Dr. John Kellar

Regulatory input to this edition of the CAHNet Bulletin includes the preceding articles and items on Anthrax, Equine Infectious Anemia, West Nile Virus, Bovine Tuberculosis and Scrapie. They are complemented by the following statistical tables describing the level of field or laboratory surveillance dedicated in recent years to Bovine Tuberculosis, Bovine Brucellosis, Rabies, Equine Infectious Anemia, Foreign Animal Diseases and Chronic Wasting Disease.

Should you require further information in respect of these programs, you may wish to contact the individuals mentioned in the following table:

Officers Responsible for Regulatory Programs

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Scrapie
Dr. Penny Greenwood
pgreenwood@inspection.gc.ca

Tuberculosis testing - 2003 - by province

Region	Bovine	Bison	Cervidae	Other Ruminants	Total
Atlantic	331	10	338	--	679
Quebec	3,602	292	3,504	--	7,398
Ontario	12,445	--	3,429	74	15,948
Manitoba	32,076	743	269	7	33,095
Saskatchewan	1,906	1,221	9,505	71	12,703
Alberta	2,750	1,084	9,694	199	13,727
B.C.	516	302	819	153	1,790
TOTAL	**53,626**	**3,652**	**27,558**	**504**	**85,340**
TOTAL 2002	93,948	280	31,572	1,023	126,823
TOTAL 2001	29,134	0	22,201	388	51,723

Brucellosis Testing - Canada 2000 - 2003

Reason for testing		No. of Tests 2003	No. of Tests 2002	No. of Tests 2001	No. of Tests 2000
Routine Testing	Export	16440	43664	36328	34766
	Listed herds	3	120	344	939
Screening Testing	Auctions	8314	19096	32326	35629
	Abattoirs	5709	15726	295	7571
Following BRT positives[1]		-	-	-	-
Testing during investigations		441	2	1382	681
Other testing		1180	1645	4331	4704
TOTAL		**32087**	**80253**	**75006**	**84290**

[1] BRT testing was discontinued in 2000

Equine Infectious Anemia Statistics - 2004*

Region	ATL	PQ	ON	MN	SK	AB	BC	TOTAL
2004 EIA Statistics								
No. of reactors	0	0	0	3	5	24	13	**45**
No. tested	1276	8757	14818	3830	2294	10547	3442	**44964**
2003 EIA Statistics								
No. of reactors	0	0	1	5	2	22	28	**58**
No. tested	2248	12226	28381	8560	5912	16562	6617	**80506**
2002 EIA Statistics								
No. of reactors	0	2	0	0	6	118	67	**193**
No. tested	1997	12871	25929	5695	5312	19142	7237	**78183**

* 2004 data for first six months

Previous editions of this Bulletin can be found at:

WWW.CAHNet.ORG

WWW.CAHNet.ORG

WWW.CAHNet.ORG

WWW.CAHNet.ORG

WWW.CAHNet.ORG

Number of Positive Rabies Diagnoses in Canada by Species and by Province - 2004*

Species	NWT / Nunavut	BC	AB	SK	MB	ON	PQ	NB	NS	NFLD	Total	% Total 2004	% Total 2003	% Total 2002
Dogs					2						2	1.98	1.51	2.29
Cats											0	0.00	1.89	2.58
Bovine						17 A)					17 A)	16.83	4.15	5.16
Equine				2		2					4	3.96	0.75	1.15
Caprine						1					1	0.99	0.38	0
Ovine											0	0.00	1.51	0.29
Porcine											0	0.00	0.38	0.29
Foxes	1					1	3			3	8	7.92	10.56	18.62
Skunks		4		11	29	9					53	52.48	28.68	28.94
Bats		2		1		10	1				14	13.86	43.39	32.09
Raccoons						1					1	0.99	6.04	7.45
Wolves							1				1	0.99	0.38	0.58
Groundhogs											0	0.00	0	0
Bison											0	0.00	0	0
Coyotes											0	0.00	0	0.57
Fisher											0	0.00	0	0
Lynx											0	0.00	0	0
Grizzly Bear											0	0.00	0.38	0.29
Total 2004	**1**	**6**	**0**	**14**	**31**	**41 A)**	**5**	**0**	**0**	**3**	**101**	**100.00**		
Total 2003		17 B)	4	24	50	127 A)	22	1	1	19	265 A)		100	
Total 2002	18	11	6	27	48	208 A)	24	3		4	349 A)			100

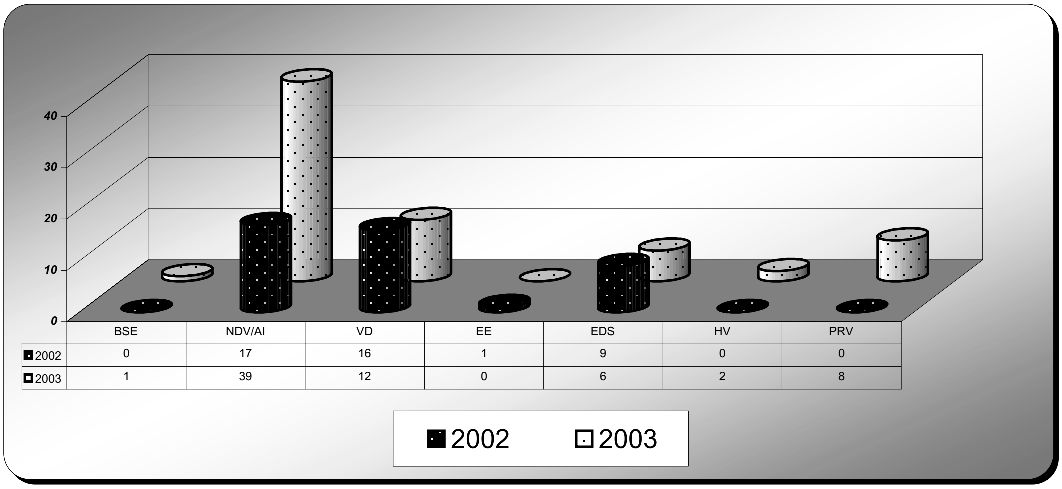
*** First 6 months of 2004. Diagnostic work was done by the CFIA's Ontario Laboratory - Fallowfield Ottawa and Animal Disease Research Institute Lehtbridge, Alberta**

A) Includes Clinical Bovines

B) A 52-year-old man from Port Coquitlam, British Columbia died of rabies. Test results showed that this was a bat variant of rabies virus. The last prior human death from rabies in Canada occured in a 9-year-old boy in Quebec in 2000.

FAD Submission - 2002-2003

Confirmatory Negatives



	BSE	NDV/AI	VD	EE	EDS	HV	PRV
2002	0	17	16	1	9	0	0
2003	1	39	12	0	6	2	8

BSE: Bovine Spongiform Encephalopathy

VD: Vesicular Diseases

NDV / AI: Newcastle disease /Avian Influenza

EE: Equine Encephalitides

EDS: Egg Drop Syndrome

HV: Hendra Virus

PRV: Pseudorabies

Bird Flu Is a Crisis of Global Importance

USAHA News Flash

27 September 2004, Bangkok/Rome -- The avian influenza epidemic in Asia is a "crisis of global importance" and will continue to demand the attention of the international community for some time to come, the UN Food and Agriculture Organization (FAO) and the World Organization for Animal Health (OIE) said in a joint statement today.

Recent outbreaks in China, Viet Nam, Cambodia, Malaysia and Thailand show that the virus continues to circulate in the region and will not probably be eradicated in the near future, the two organizations said.

More research is urgently needed as the role of wildlife, domestic ducks and pigs in transmitting the virus among animals is still not fully understood. A permanent threat to animal and human health continues to exist.

Major investments needed

While much progress has been made in early detection and reaction, countries still need to step up proactive surveillance and control measures. Major investments are required to strengthen veterinary services, in particular for surveillance, early warning, detection, reporting and response and for the rehabilitation and restructuring of the poultry sector, FAO/OIE said.

The newly published FAO Recommendations on the Prevention, Control and Eradication of Highly Pathogenic Avian Influenza (HPAI) in Asia, prepared in close collaboration with OIE, review the factors that should be taken into account in designing and implementing control programmes and explain how countries can adopt a strategy appropriate to their individual situation.

In response to recent controversies on vaccination against bird flu, OIE and FAO reiterated that the slaughter of infected animals is the best way of controlling and ultimately stamping out the disease.

However, FAO/OIE acknowledged that this policy may not be practical or adequate in certain countries because of social and economic reasons or because of high viral challenge due to infection in villages, wild birds or domestic waterfowl. In such cases, countries wishing to eradicate the disease may choose to use vaccination as a complementary measure to the stamping out policy.

Vaccination

The two agencies stressed that vaccines, if used, should be produced in accordance with the international guidelines prescribed in the OIE Manual of Diagnostic Tests and Vaccines for Terrestrial Animals.

The OIE Terrestrial Code states that a country may be considered free from HPAI based on the absence of virus irrespective of whether vaccination has been carried out. Therefore, the two organisations confirm that the use of vaccines does not imply automatic loss of export markets. It has been shown that the use of such vaccines does not only protect healthy birds from disease but also reduces the load of viruses excreted by infected birds and thus the likelihood of transmission of the virus to other birds and to humans.

However, the decision on whether to use vaccines has to be made by each country based on its own situation, OIE/FAO said.

The factors countries should consider in making their decision include their ability to detect and react to the disease as early as possible and the need for transparent and timely notification; this will have to be supported by a good institutional framework and sound legislation underpinning veterinary services.

Any vaccination strategy should be developed in consultation with all stakeholders, including the private sector. The types of poultry and production sectors to be vaccinated must be determined and clearly documented. Infected poultry and those in contact with the virus should not be vaccinated.

The two agencies said vaccination should be carried out under the supervision of official veterinary services and be accompanied by a parallel surveillance strategy. This would include the capacity of the veterinary services to identify and monitor the circulating virus as well as the response to vaccination, by means including the use of non-vaccinated sentinel birds and the application of serological tests capable of differentiating infected from vaccinated animals.

Newsworthy Canadian Research Accomplishment

November 4, 2004

SUMMARY: We are amending the regulations by adding the fluorescence polarization assay to the lists of confirmatory and official tests for determining the brucellosis disease status of test-eligible cattle, bison, and swine. This action is warranted because the fluorescence polarization assay has been shown to provide an efficient, accurate, automated, and cost-effective means of determining the brucellosis status of test eligible cattle, bison, and swine. Adding the fluorescence polarization assay to the lists of confirmatory and official tests for brucellosis in cattle, bison, and swine will help to prevent the spread of brucellosis by making available an additional tool for its diagnosis in those animals.

DATES: Effective December 6, 2004.

FOR FURTHER INFORMATION CONTACT:

Dr. Arnold Gertonson, National Center for Animal Health Programs, VS, APHIS, 2150 Centre Avenue, Bldg. B. MSC 3E20, Fort Collins, CO 80526-8117; (970) 494-7363.

[**Federal Register:**
(Volume 69, Number 213)]
[Page 64245-64249]
[DOCID:fr04no04-1]

Animal and Plant Health Inspection Service
9 CFR Part 78
[Docket No. 02-070-3]

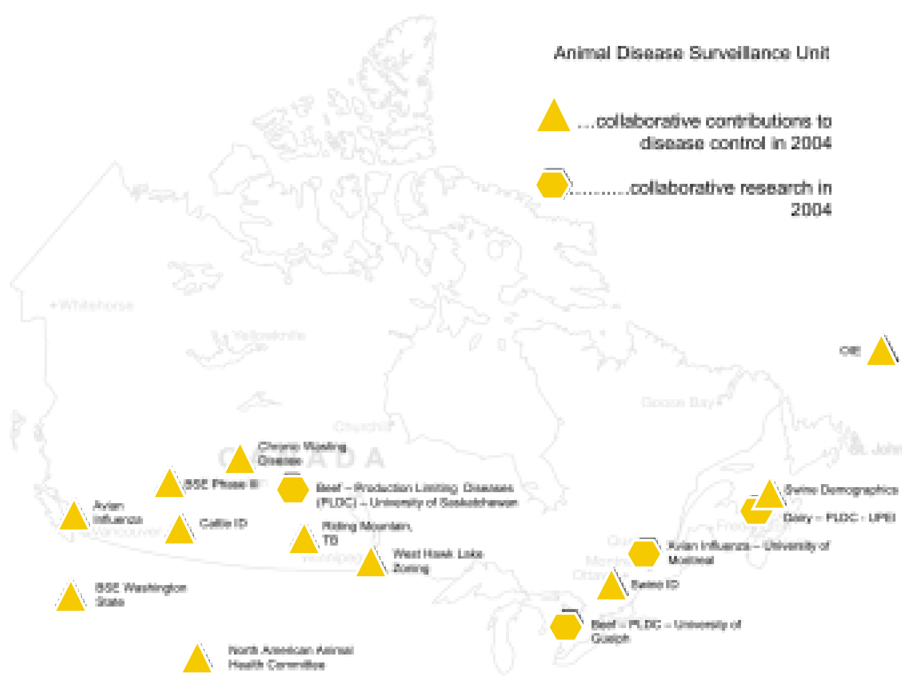
AGENCY: Animal and Plant Health Inspection Service, USDA.

ACTION: Final rule.

Editor's Note: The fluorescence polarization assay was developed by Dr. Klaus Nielsen and associates at the Canadian Food Inspection Agency's Ottawa Laboratory Fallowfield.

CANADA CWD SURVEILLANCE - 2003

PROVINCE	FARMED CERVIDS		WILD CERVIDS		TOTAL CERVIDS	
	POS	NEG	POS	NEG	POS	NEG
QUEBEC	-	69	-	10	-	79
ONTARIO	-	277	-	570	-	847
MANITOBA	-	135	-	850	-	985
SASKATCHEWAN	-	7,478	16	7,778	16	15,256
ALBERTA	-	8,823	-	1,219	-	10,042
YUKON	-	40	-	-	-	40
TOTAL	-	16,822	16	10,427	16	27,249
FEDERAL - CFIA	1	1,367	-	-	1	1,367
GRAND TOTAL	1	18,189	16	10,427	17	28,616



Review of Avian Influenza Outbreak Identifies Next Steps

AnimalNet
October 28, 2004
From a press release (edited)

ABBOTSFORD - Representatives from federal, provincial and municipal governments and the poultry industry concluded two days of meetings today with a commitment to strengthen future responses to animal disease outbreaks. The Canadian Poultry Industry Forum brought together more than 190 stakeholders to share perspectives on the avian influenza outbreak that affected the Fraser Valley last spring. The forum opened with an overview of the outbreak, which clearly demonstrated the unprecedented challenges posed by the scope and scale of the situation. Forum participants shared the concern that today's global movement of people and commodities means that threats such as avian influenza will likely emerge more frequently in the future. The CFIA and the BC MAFF agreed to update and exercise the joint federal Foreign Animal Disease Eradication Support Plan. The parties recognized the need to collaboratively define roles and responsibilities with all levels of government and industry stakeholders during an emergency. Federal and provincial governments also initiated discussions on strengthening linkages between laboratories participating in foreign animal disease testing and surveillance. The poultry industry proposed to work with national, provincial and local authorities to develop biosecurity protocols that enhance existing measures. Industry also tabled a number of proposals for new approaches to animal disease management. These included the establishment of a national working group to standardize biosecurity in the poultry industry and the creation of mechanisms to help improve rapid response and containment initiatives for any future outbreaks. Governments committed to review these proposals in detail, considering their compatibility with existing animal disease management strategies and regulations. The three parties agreed on the need to review compensation levels under the Health of Animals Act. Forum participants discussed the complex threats to human and animal health posed by diseases such as avian influenza. The CFIA, Health Canada and the newly established Public Health Agency of Canada committed to form a closer working relationship. The federal government, with support from both provincial human and animal health authorities, will work toward the refinement of generic and disease-specific national emergency management plans, with a focus on prevention, early detection and rapid response. The three co-chairs committed to produce a summary of the proceedings by mid-November. In addition, all participants committed to responding to all recommendations before Christmas.

Houses Made of Brick

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Over generations, Florida's trailer dwellers and Canada's animal agribusiness sectors have ridden parallel, cumulative learning curves at the hands of their respective calamities. Judging by their actions, each has interpreted the relative efficacy of survival via prevention or containment within the political environments which encompass them. Each being resident within political walls proven pervious to the whims of nature - and man - they have opted for secondary containment. In this regard, the compassionate side of human nature would grant that, short of changing venues, the trailer dwellers have probably done all that is within their means.

As children, we were indoctrinated with the moral virtue of such preparedness through the cleverly woven fable of The Three Little Pigs. Conditioned to the limitations of protection from higher authorities, they had constructed three memorably progressive barriers of their own, behind which they sought serial refuge from a universal issue that imperilled their collective existence. Ever-increasingly subject to the caprice of foreign markets, Canadian animal agribusiness has determined that disease-responsive infrastructure figuratively constructed of straw or wood, like the aluminum cladding of Florida's trailer parks, cannot contain the trade-borne economic impact of a perfect contagious storm. As a community driven, historically competitive sectors labour collaboratively with governments and each other towards reinforcement of their respective and collective economic houses, brick by cost-effective brick.

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