

ABSTRACT

Report on Response to and Investigation of an ILT Outbreak in the Fraser Valley during 2006

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During the period February to November, 2006, there were 16 occurrences of Infectious Laryngotracheitis (ILT) on 14 farms in the Fraser Valley. The “at risk” populations included broiler chickens, specialty meat chickens, and pre-vaccinated broiler breeder replacements. All cases occurred within a geographical area in Sumas Prairie bounded by the mountains to the south, Highway 1 to the north, Sumas Way to the west, and Lickman Road in Chilliwack to the east. The Poultry Industry Emergency Response Committee responded to the outbreak with the following objectives:

- a. To give direction to the industry as to appropriate actions to take both in the event of an outbreak on the farm and in the event of an outbreak nearby.
- b. To test the capabilities of an industry-led response to a disease threat.
- c. To gather information about the outbreak in an attempt to determine possible sources of the virus and to identify possible risk factors leading to an outbreak.

This response has led to a standard industry protocol including self-quarantine, enhanced manure management, and enhanced cleaning and disinfection in affected premises. Several people worked cooperatively on this response, providing a good informal test of the plan capabilities.

The investigation provided some ideas with regards to the factors contributing to this outbreak. The number of cases, however, was insufficient to provide evidence of solid links to causative variables. There was a suggestion, however, that those farms that escaped infection were more likely to have better biosecurity practices. The presence of ditches or ponds, particularly if frequented by waterfowl, were also possible risk factors in this analysis. Please see the attached report for full details.

June 30, 2007

Report on Response to and Investigation of an ILT Outbreak in the Fraser Valley during 2006

Prepared for the Emergency Response Committee of the BC Poultry Association

**Dr. Bill Cox
Dr. Nancy DeWith**

1. Background

Infectious Laryngotracheitis (ILT) is a viral disease of chickens that causes severe inflammation and hemorrhage of the tracheal mucosa. Affected birds can be seen to be gasping for air and coughing, discharging bloody mucous or blood clots. The damage caused to the trachea may be severe enough to cause death due to suffocation, and a rise in mortality is often the first sign that a chicken producer will see. Less severe cases can result in inflammation around the eyes and swollen sinuses. Individual birds may recover in 10 to 14 days. Active infection in a flock may persist for 4 to 6 weeks if left unchecked.

In long-lived flocks, such as layers or breeders, vaccination in the face of the outbreak generally helps to halt the progress of the disease. The disease typically breaks in broilers near the end of the grow-out, by which time the birds are destined for slaughter.

ILT is a provincially notifiable disease. Notification to the BC Ministry of Agriculture results in the release of details of the case to the poultry community at large. There is no regulatory or control action taken by the province. There is, however, the expectation that the industry will heighten biosecurity levels to prevent further spread of the disease.

In late winter and through into the fall of 2006, there was an outbreak of ILT in a restricted geographical region in Sumas Prairie. A total of 16 cases were reported beginning in February, with the last case reported in November. On two premises, the disease occurred twice in different flocks, for a total of 14 affected farms.

2. Affected Populations

One flock of layers developed signs consistent with ILT in early February. This flock was 11 weeks of age and broke with the disease after having been vaccinated against ILT approximately 3 weeks earlier. The remaining affected flocks were broilers or broiler breeder replacements, none of which had been vaccinated. Twelve broiler chicken flocks were affected. At the time of diagnosis, they were between 32 and 56 days of age, with the exception of one flock of specialty birds at 11 weeks of age. Three broiler breeder flocks were 6, 8, and 9 weeks of age, all affected before scheduled vaccines were to be given.

3. Chronology of Cases

Cases occurred at approximately two to six week intervals, with some appearing in clusters within a few days of one another. A month-by-month summary of cases is presented in the following table:

Month	No. Flocks Affected	Flock Type (date)
February	2	Layer (3 rd), Broiler (24 th)
March	1	Breeders (29 th)
April	3	Broiler (25 th and 26 th)
May	1	Broiler (8 th)
June	1	Broiler (22 nd)
August	3	Breeders (16 th), Broilers (22 nd , 31 st)
October	4	Breeders (26 th), Broilers (6 th , 30 th , 31 st)
November	1	Broilers (2 nd)

4. Emergency Response Committee Action

In November 2006, the decision was made by the Emergency Response Committee to respond to the ILT outbreak with a series of actions. The objectives of the response included:

- a. To give direction to the industry as to appropriate actions to take both in the event of an outbreak on the farm and in the event of an outbreak nearby.
- b. To test the capabilities of an industry-led response to a disease threat.
- c. To gather information about the outbreak in an attempt to determine possible sources of the virus and to identify possible risk factors leading to an outbreak.

a. Direction to the Industry

The BC Poultry Association issued a letter to all producers that gave general information about the disease and its control. In addition, specific information was sent to producers that should be followed when a farm has been affected by ILT, including enhanced biosecurity measures, manure handling procedures, and thorough cleaning and disinfection. Finally, a self-quarantine list describing procedures to be followed by producers in the event of an ILT break on their farm was circulated.

These documents are presented in Appendix 1.

b. Capabilities of an Industry-Led Response

Several people worked cooperatively to achieve the objectives of this initiative. While the plan was only in the draft stage and no key personnel were named, those engaged in the response activity acted informally in roles that will be defined in the final plan.

c. Investigation into the ILT Outbreak

A standard Questionnaire was developed, based on those used in previous outbreak investigations, by Dr. Nancy DeWith of the BC Ministry of Agriculture and Lands. The questionnaire focused on a number of standard biosecurity measures and possible sources of the virus, including equipment, manure, and people movement.

The questionnaire is presented in Appendix 2.

Investigation centered upon interviewing all cases and randomly selected controls. There were 13 case premises, 18 control premises (no ILT) selected inside the zone in which cases occurred, and 19 controls outside the zone. Of those, 12 case premises and 25 control premises agreed to participate. Board or commission auditors interviewed each producer personally. Auditors carrying out the interviews were Kathy Erickson and Brian Hoven of the BC Chicken Marketing Board and Angela McKee of the BC Hatching Egg Commission. Interviews began in late November and were completed by mid-January.

Results were compiled and differences in the frequency of “Yes” or “No” responses for each parameter were compared statistically by Dr. Nancy DeWith. For those criteria that showed either statistically significant, or apparently significant differences, odds ratios were calculated to quantify the risk associated with each variable.

5. Results of the Investigation

Because of the small number of cases, many suspected differences could not be proven statistically. However, some trends could be discerned, all of which must be interpreted very carefully. Table 1 lists the important parameters and the differences observed between case and control premises. The p-values calculated and listed following each is a measure of the probability that they are different; p-values of less than 0.05 are considered to be statistically significant. The next column lists the Odds Ratio, which is a measure of the likelihood of the stated response occurring on a case premise compared to the control premise. In plain language, the Odds Ratio for a response would read as follows:

"The odds of a case having done *such and such action* was *x* times the odds of controls doing the same action."

For example:

"The odds of cases having creeks/ditches/ponds in or around their property was 8.64 x greater than for controls."

The final column provides the 95% Confidence Interval for the Odds Ratio. The stated Odds Ratio provides a point value of what one could expect, but there is a variation around that value. The 95% Confidence Interval, therefore, is the range of that potential variation over which we can be 95% sure (or confident) that actual Odds Ratio will occur. Because of the small number of cases, this Confidence Interval is quite wide. For the example above, the range is 0.96 to

77.55; so, it is possible that the likelihood of creeks/ditches/ponds being present may be almost equal between cases and controls to as high as 77 times more likely for cases than controls.

This variation is one reason for the caution required in interpreting the results. Another reason for caution is that a link to one parameter may not reflect cause and effect directly, and further reasoning must go into the interpretation of a suspected link.

A number of parameters showed statistically significant or near significant differences between cases and controls, including the following:

- i. Family moving freely within barns (more frequent in controls)
- ii. Selling or buying birds at live bird markets (more frequent in controls)
- iii. Leftover feed to next flock (more frequent in cases)
- iv. Peroxide used as water treatment (more frequent in controls)
- v. Creeks, ditches, or ponds around property (more frequent in cases)
- vi. Waterfowl in creeks, ditches, or ponds (more frequent in cases)
- vii. Use of disposable or dedicated boots in barns for visitors or catching crews (more frequent in controls)
- viii. Average distance from closest backyard flock (closer in cases 371 m vs. 718 m)

All of these must be viewed carefully. For example, one would intuitively assume that selling or buying birds at live bird markets would be a risk factor; however, if this difference is true, then there are likely other factors about those who visit live bird markets, such as practicing better biosecurity on farm in recognition of that risk. The distance to backyard flocks must also be viewed with some caution. For example, while backyard flocks may be a risk, the distance stated is an estimate and cases looking for a possible source may have a tendency to underestimate the distance.

While manure is considered a major risk for the spread of disease in general and ILT in particular, no statistical link could be determined in this study.

Because of the small number of cases, further statistical analysis proved to be of little value. Overall, it would appear that controls practiced better biosecurity than cases. The connection with surface water and waterfowl on or near property cannot be discounted.

Table 1 – Analysis of Salient Parameters from ILT Case Controlled Questionnaire

Parameter	Number Responding "Yes"				p-value	Odds Ratio	95% CI ¹
	Controls		Cases				
	Number	%	Number	%			
Share equipment with other farms	8	32	7	58	0.1642	2.98	(0.72-12.34)
Anyone from this farm visit another farm	16	64	11	92	0.119	6.19	(0.68-56.07)
Anyone from this farm inside someone else's poultry barn	11	44	8	67	0.2953	2.55	(0.61-10.71)
Did family move freely within barns on this farm	14	56	2	17	0.0352	0.16	(0.03-0.87)
Did you place chicks for broilers/pullets	21	84	12	100	0.2883	~2.29	(0.23-22.87)
Add birds during production cycle	8	32	1	8	0.2204	0.19	(0.02-1.77)
Shavings used as bedding for birds	5	20	4	33	0.4318	2	(0.42-9.42)
Poultry litter/manure from other farms spread onto neighbour's fields	7	28	6	50	0.2738	2.57	(0.62-10.74)
Normally sell or buy birds at live bird markets	6	24	0	0	0.149	-0.26	(0.03-2.47)
Dead birds disposed of by composting	14	56	5	42	0.4951	0.56	(0.14-2.26)
Leftover feed at end of production is fed to next flock	16	64	11	92	0.119	6.19	(0.68-56.07)
Feed bins are located on ventilation exhaust side of barn	16	64	6	50	0.4879	0.56	(0.14-2.27)
Rodents inside barns	19	76	11	92	0.3891	3.47	(0.37-32.74)
Dogs in yard	19	76	11	92	0.3891	3.47	(0.37-32.74)
Rabbits in yard	8	32	2	17	0.4447	0.43	(0.08-2.41)
Put feeders out for wild birds	3	12	0	0	0.5367	-0.61	(0.06-6.54)
Source of water for drinking/cleaning (city)	14	56	9	75	0.3065	2.36	(0.51-10.85)
Peroxide used as water treatment for barn water	9	36	0	0	0.0355	-0.15	(0.02-1.33)
Noticeable dust around property	8	32	6	50	0.4701	2.12	(0.52-8.70)
Creeks, ditches, ponds on or around property	14	56	11	92	0.0581	8.64	(0.96-77.55)
Waterfowl in creeks, ditches, ponds on or around property	9	36	9	75	0.0382	5.33	(1.14-24.9)
Sell/give ungraded eggs to broker	8	32	1	8	0.2204	0.19	(0.02-1.76)
People picking up ungraded eggs enter egg room	7	28	1	8	0.2323	0.23	(0.03-2.16)
Use of disposable/dedicated boots for catching crews (always used)	18	72	5	42	0.1459	0.28	(0.07-1.17)
Use of disposable/dedicated boots for business visitors (always used)	24	96	9	75	0.0908	0.13	(0.01-1.36)
Use of footbath for catching crews (always used)	11	44	3	25	0.3065	0.42	(0.09-1.95)
Use of footbath for business visitors (always used)	12	48	3	25	0.2863	0.36	(0.08-1.66)
Average number of barns	2.9		4.1		0.2099		
Average distance from closest commercial barn	495 m		645 m		0.4379		
Average distance from closest backyard flock	718 m		371 m		0.0319		

1. 95% CI = 95% Confidence Interval around the stated Odds Ratio

5. Conclusion

While this response to the ILT situation in 2006 was not carried out with the urgency of an emergency response, it did serve to provide some direction for future outbreaks. First, good information was generated that will serve as a platform for subsequent responses. Second, the response demonstrated that the Emergency Response Plan has the capacity to deal with such an outbreak; several segments of the industry, including Boards and Commissions, BC Ministry of Agriculture and Lands, private individuals, and the poultry producers at large, all cooperated to achieve the results we have observed. The following actions, which will be required in an emergency, were demonstrated:

- a. Activation of premise identification database and mapping
- b. Dissemination of pertinent information to poultry producers
- c. Investigation into the outbreak
- d. Cooperation and action from all segments

This was a useful exercise to conduct that will help in the development of the Poultry Industry Emergency Response Plan.

APPENDIX 1

Information Documents Disseminated to the Poultry Industry

British Columbia Poultry Association
#140 South Fraserway
Abbotsford, BC

November 22, 2006

Dear: BC Poultry Producer

Re: *Infectious Laryngotracheitis in Chickens*

Infectious Laryngotracheitis (ILT) has recently been diagnosed on a number of commercial poultry farms in the Fraser Valley. The number of farms affected has caused the industry to become concerned and take the following steps to mitigate the risk of further infection.

- A. Infected and non-infected farms are asked to **ensure the following protocols** in the handling of their farm operations (see attachments)
- B. Infected premises will be **assisted by the appropriate board/commission staff** in implementing the protocols.
- C. There will be a questionnaire presented to both infected and some non-infected farms to assess the potential vectors that may or may not be involved in this situation. The results of the questionnaire will help in determining a risk assessment model (which can be used on farm), movement of the infection, how it started and necessary epidemiology for future verification. **Please assist the veterinarians or board staff** who will be administering this questionnaire.

ILT is a provincially reportable disease in BC. When a diagnosis of ILT has been confirmed the veterinarian or the veterinary diagnostic lab must inform the Chief Veterinary Officer, Dr Ron Lewis. He, in turn, will inform and disclose the location of the affected farm to the BC poultry industry and to the CFIA through the issuance of a Reportable Disease Notification. CFIA only uses the information for trade purposes.

Sincerely

Ray Nickel
President
BC Poultry Association

Rick Thiessen, President BC Chicken Association
Derek Janzen, Pres BC Egg Association
Calvin Breukelman, Pres BC Hatching Egg Association
Pat Huestis, Pres BC Turkey Association
Ken Falk, Pres BC Specialty Bird Association

ILT is caused by a herpes virus that principally infects chickens, but may also infect some other related species such as pheasants or peafowl. ILT does not affect turkeys. It usually appears in birds older than about 4 weeks of age. Once in a flock, if left unchecked, it may persist as an active infection for as long as six weeks.

The virus primarily infects the lining of the trachea, the bird's windpipe. Infected birds show signs of respiratory distress, with a snick sometimes evident in the flock. The snick may develop into a severe cough in serious cases. Individual birds may be seen to be gasping with their neck extended. Some birds may display watery eyes, swollen sinuses, and nasal discharge. In most cases, however, the producer may only notice a rise in mortality. Dead birds will be in good body condition and, in broilers, may actually resemble flippers on first glance.

Protecting a flock from ILT

ILT virus can be prevented from entering a flock of chickens by practicing good biosecurity procedures. A number of effective steps can easily be taken:

1. Reduce or eliminate visitors.
2. Keep barn access gates closed. Have all visitors park outside the barn area, close to the road, and walk in.
3. If the vehicle must come onto the farm, make sure it is clean.
4. When entering a barn, insist on the visitor wearing clean coveralls and boot covers or farm-issued footwear and coveralls.
5. If any tools or equipment are being brought into the barn, make sure they are clean and apply disinfectant prior to entry.
6. For layer, breeders, or other long-lived flocks, discuss vaccination programs with the consulting veterinarian.
7. Review on-farm manure management protocols. Ensure all manure haul vehicles and equipment are clean before entering the premises.

Notice to Broiler Producers with Flocks Infected with Infectious Laryngotracheitis Procedures to Minimize Risk of Spread

1. Initiate self-quarantine procedures (see attached self-quarantine procedures).
2. Notify the processing plant of the situation to institute the following actions:
 - a. The affected flock should be the last pick up of the day.
 - b. All equipment used for catching should be cleaned and disinfected before leaving the farm.
 - c. If weather permits, the trucks should be covered with tarps.
 - d. The trucks should use a route to the processor that avoids passing other poultry farms.
 - e. Trucks used to haul those birds should be thoroughly cleaned, decontaminated, and disinfected after the birds have been shipped.
3. Make sure equipment and supplies are available to assist catchers in cleaning and disinfecting their equipment.
4. All mortalities should be incinerated immediately.
5. If mortalities must be composted, make sure that the compost pile is properly prepared, covered, and protected from wildlife that may scavenge the carcasses.
6. Manure Management: (recommended no spreading of manure in FV region)
 - a. After the flock has been shipped, contain the manure in the barn and heat treat to 40° C for 3 days.
 - b. Composting needs to be done according to recommendations, preferably heat treatment is done first (consult with local veterinarian)
 - i. Further composting, after heat treatment, will help to reduce the risk of virus survival even more. If manure is composted on site, however, it must be well away from the barn and properly prepared and covered.
 - c. If manure, after heat treatment, is hauled off the farm, make sure the load is properly secured and covered.
7. Do a complete cleaning and disinfection of the barn:
 - i. Wash down entire inside area, including ceiling, walls, and floor, using a detergent.
 - ii. Rinse entire inside area down and allow time for drying.
 - iii. After all surfaces are dry, spray disinfectant making sure all surfaces are thoroughly coated.
 - iv. Allow the disinfectant to dry before preparing for the next flock.
8. Board auditors will be made available to provide direction in the cleaning and disinfection procedure.
9. The BCPA or your veterinarian will follow up with a questionnaire to gather information about this disease break.

**Notice to Hatching Egg and Table Egg Producers with Flocks Infected with Infectious
Laryngotracheitis
Procedures to Minimize Risk of Spread**

1. Initiate self-quarantine procedures (see attached self-quarantine procedures). Maintain self-quarantine procedures for at least 4 weeks after the last ILT mortality has been seen.
2. Notify the hatchery or grading station of the situation to schedule your farm as the last egg pick up of the day.
3. ILT vaccination may have to be rescheduled, therefore, consult with your veterinarian regarding your vaccination program.
4. Have your veterinarian or the Animal Health Centre monitor mortalities at least once weekly until certain that no further ILT deaths are occurring.
5. All mortalities should be incinerated immediately.
6. If mortalities must be composted, make sure that the compost pile is properly prepared, covered, and protected from wildlife that may scavenge the carcasses.
7. Do not move live birds off the farm for any reason, including spiking or quota top-up.
8. Manure Management: (recommended no spreading of manure in FV region)
 - a. After the flock has been shipped, contain the manure in the barn and heat treat to 40° C for 3 days.
 - b. Composting needs to be done according to recommendations, preferably heat treatment is done first (consult with local veterinarian)
 - i. Further composting, after heat treatment, will help to reduce the risk of virus survival even more. If manure is composted on site, however, it must be well away from the barn and properly prepared and covered.
 - c. If manure, after heat treatment, is hauled off the farm, make sure the load is properly secured and covered.
9. Do a complete cleaning and disinfection of the barn:
 - i. Wash down entire inside area, including ceiling, walls, and floor using a detergent.
 - ii. Rinse entire inside area down and allow time for drying.
 - iii. After all surfaces are dry, spray disinfectant making sure all surfaces are thoroughly coated.
 - iv. Allow the disinfectant to dry before preparing for the next flock.
10. Board auditors will be made available to provide direction in the cleaning and disinfection procedure.
11. The BCPA or your veterinarian will follow up with a questionnaire to gather information about this disease break.

SELF QUARANTINE PROCEDURE FOR FLOCKS INFECTED WITH ILT

1. Follow the advice of your poultry veterinarian regarding any treatment of your flock.
2. Review and list the on-farm traffic, visitors and bird movements in the previous 24 days. Refer to visitor log.
3. Service unaffected barns first or dedicate a specific employee to the affected barn(s).
4. Immediately restrict on and off-farm access by locking gates and requiring phone-ahead pre-arrangements for deliveries/pick-ups. *Suspend all unnecessary traffic.*
5. Follow strict personal biosecurity procedures for leaving the farm (e.g. non-farm clothing, footwear and vehicle), especially if meeting with other poultry industry members, even socially.
6. Postpone scheduled vaccinations until discussed with your veterinarian.
7. Postpone or cancel movements of any birds on or off the farm.
8. Dispose of dead/culled birds preferably on-farm by incineration or composting. Make sure the compost pile is protected from scavenging wildlife. Treat all carcasses as infectious material.
9. Call your feed company, egg truck, and all other essential services to request “end-of-day” service.
10. Cancel all unnecessary farm visits.
11. Optional but recommended: Enhanced biosecurity signs posted at gates indicating that an infectious disease has been diagnosed and access is restricted.
12. For broiler producers, continue this self-quarantine until the barn has been thoroughly cleaned and disinfected.
13. For hatching egg and table egg producers, continue this self-quarantine procedure for at least 4 weeks after the last ILT mortality has been seen.

APPENDIX 2

ILT Investigation Questionnaire

Premises ID: _____

ILT in British Columbia
Case Control Questionnaire

Part A

Time frame for the Questionnaire: All premises, Feb 1, 2006 to Nov 15, 2006

Interview date: _____ <mm/dd/yy>

Interviewer (print full name): _____

Poultry Production Type(s) & Flock Size(s):

.....

Owner Name: _____

Manager Name: _____

Farm Name: _____

Farm Address: _____

(Barn Location) _____

Contact Phone #: _____

Case Premise or Control Premise

Premises ID: _____

Part B

Using graph paper, or the aerial photograph of the premises, ask the owner to prepare a diagram of the farm property including:

- driveways and buildings
- landscaping around buildings (grass, cement, gravel) and vegetative barriers
- air intake and fans on buildings
- feed bins, well heads
- creeks & ditches and ponds, location of drainage tiles.
-

Indicate location of residences on farm property.

Indicate and name roads, and indicate north.

Premises ID: _____

1. Do you own or manage all poultry on these premises? (Circle response)

- 1 = own
- 2 = manage
- 3 = neither
- 4 = own and manage

2. Do you own or manage other poultry premises? YES NO

If yes, what is total number of other premises _____

Describe these premises in the following table:

#	Distance from Survey Farm	Production Type (Species/Type)	ILT Status (Pos. or Neg.)

3a. Do you work off-farm? YES (full-time) YES (part-time) NO

3b. Do you or anyone else living or working on this premises work at a job which provides equipment, materials or services to the livestock or poultry industries?

YES NO

If YES, provide details: (Who, where, when)

3c. Do any employees work on another farm (include family employees)?

YES NO

If YES, provide details: (who, when, type of farm)

Premises ID: _____

4. Barn information during the time period (Commercial Operation Only)

Bird/Production Type

- 1 = broiler
- 2 = broiler breeder
- 3 = broiler pullets
- 4 = layer (table egg)
- 5 = layer breeder
- 6 = layer pullet
- 7 = turkey
- 8 = turkey breeder
- 9 = other

Ventilation

- 1 = natural (curtain or fixed opening)
- 2 = power (negative pressure)
- 3 = other

Ventilation Intake Side

Specify the side of the barn where intakes are located

Inventory: Number of birds in each barn as of October 15, 2006

Age : Age of birds in days or weeks as of October 15, 2006 (specify days or weeks)

Barn ID	Bird Type	Ventilation	Intake Side	Inventory (as of Oct 15) # of birds	Age (as of Oct 15) Days/weeks
Barn 1	1 2 3 4 5 6 7 8 9	1 2 3	N S E W		
Barn 2	1 2 3 4 5 6 7 8 9	1 2 3	N S E W		
Barn 3	1 2 3 4 5 6 7 8 9	1 2 3	N S E W		
Barn 4	1 2 3 4 5 6 7 8 9	1 2 3	N S E W		
Barn 5	1 2 3 4 5 6 7 8 9	1 2 3	N S E W		
Barn 6	1 2 3 4 5 6 7 8 9	1 2 3	N S E W		

4b&c. Are vegetative buffers or fan hoods used to reduce dust?

b. Vegetative buffers YES

NO

c. Fan hoods

YES

NO

Premises ID: _____

5. During the timeframe, where and on what dates were birds sent to slaughter? Identify any catching crews used to transport poultry.

Slaughter Plants				Catching Crews
5a. Superior	Y	N	N/A	_____ <mm/dd/yy> _____
5b. Lilydale	Y	N	N/A	_____ <mm/dd/yy> _____
5c. Sunrise	Y	N	N/A	_____ <mm/dd/yy> _____
5d. K&R	Y	N	N/A	_____ <mm/dd/yy> _____
5e. Wingtat	Y	N	N/A	_____ <mm/dd/yy> _____
5f. Hallmark	Y	N	N/A	_____ <mm/dd/yy> _____
5g. Fraser Valley	Y	N	N/A	_____ <mm/dd/yy> _____
5h. Fairline	Y	N	N/A	_____ <mm/dd/yy> _____
5i. Western	Y	N	N/A	_____ <mm/dd/yy> _____
5j. Other _____	Y	N	N/A	_____ <mm/dd/yy> _____

6. During the time frame, what companies or individuals picked up eggs (indicate number of times):

(If not used, enter 0)

- 6a. Western _____ times
 6b. Fraser Valley _____ times
 6d. Golden Valley _____ times
 6e. Farm gate sales to broker _____ times
 6f. Farm gate sales to consumers _____ times
 6g. Family or friends living off premise _____ times

7. Is any of the farm machinery, equipment or tools shared (or borrowed) with other farms (including other farms you own/manage and contract/hired work)?
 YES NO

Please provide details: (who, what, when, type of farm)

8. Before the time frame, were any precautions taken for equipment coming onto the farm?
 YES NO

Time Frame: Feb 1, 2006 to Nov 15, 2006

Premises ID: _____

9. Were any of the following domestic animals present on your farm site? Please specify if any were located in or had access to **poultry** barns.

1 = not on premises

2 = on premises but not in poultry barn

3 = in poultry barn

- | | | |
|-----|--|------------|
| 9a. | other chickens (fancy, etc.) | _____ code |
| 9b. | other non-commercial poultry
(turkeys, geese, ducks, swans) | _____ code |
| 9c. | cattle | _____ code |
| 9d. | horses or other equids | _____ code |
| 9e. | sheep or goats | _____ code |
| 9f. | pigs | _____ code |
| 9g. | cats | _____ code |
| 9h. | dogs | _____ code |
| 9i. | rabbits (farmed) | _____ code |
| 9j. | other pet birds | _____ code |
| 9k. | other | _____ code |

10. About how far from your barn is the nearest poultry barn of another farm? **(Note:** specify units in **meters** or **kilometers** as appropriate)

10a. distance to nearest commercial poultry barn
_____ m km (Circle unit)

10b. distance to nearest back yard flock or other captive birds
_____ m Km (Circle unit)

Premises ID: _____

11. During the time frame, did you have the following visitors?

- 1 = not on premises
- 2 = at the house but not on farm
- 3 = on the farm but not in barn
- 4 = in barn or egg room

Catching Crew to do:

- 11a. Vaccination _____ code
- 11b. Beak trim _____ code
- 11c. Move birds to different barn _____ code
- 11d. Slaughter catch _____ code

For Business Purposes:

- 11e. Barn cleaning crew _____ code
- 11f. Feed representative _____ code
- 11g. Feed delivery _____ code
- 11h. Hatchery representative _____ code
- 11i. Chick placement _____ code
- 11j. Veterinarian _____ code
- 11k. Sales representative _____ code
- 11l. Repairman (include computer) _____ code
- 11m. Meter reader _____ code
- 11n. Pest control crew _____ code
- 11o. CFIA personnel _____ code
- 11p. other _____ code

For Non-business Purposes:

- 11q. Family/friends _____ code
- 11r. Tours _____ code
- 11s. Other producers _____ code
- 11t. Media _____ code
- 11u. Other _____ code

Premises ID: _____

12. Are visitors to the farm required to do any of the following (circle code):

- 1 = Always required
- 2 = Never required
- 3 = Sometimes required

If no visitors enter barns, skip to next question

Procedure	Catching crews	Other business visitors	Non-business visitors
12a. park in a restricted area away from chicken housing	1 2 3	1 2 3	1 2 3
12b. clean or disinfect vehicles upon entering/leaving	1 2 3	1 2 3	1 2 3
12c. not to have been on another poultry farm that day	1 2 3	1 2 3	1 2 3
12d. sign in/sign/out	1 2 3	1 2 3	1 2 3
12e. arrange visit in advance	1 2 3	1 2 3	1 2 3
12f. shower before enter barns	1 2 3	1 2 3	1 2 3
12g. wear disposable or dedicated boots in barns	1 2 3	1 2 3	1 2 3
12h. use a footbath before entering barns	1 2 3	1 2 3	1 2 3

Time Frame: Feb 1, 2006 to Nov 15, 2006

Premises ID: _____

13. PRIOR to the time frame were farm employees (including family workers, manager and owner) required to do any of the following:

- 1 = yes
- 2 = no
- 3 = sometimes

13a. restrict their access to certain barns (e.g. different personnel for each barn)	1	2	3
13b. use foot baths before entering barn	1	2	3
13c. shower before entering barn	1	2	3
13d. change clothes/coveralls prior to entering barns	1	2	3
13e. wear clean boots in barns	1	2	3
13f. use different equipment for each barn	1	2	3
13g. not be around other poultry (e.g. farms, markets, slaughter plants including other premises belonging to this company)	1	2	3
13h. cannot own poultry or birds	1	2	3
13i. other _____	1	2	3

14. DURING the time frame, did anyone who lives or works on this farm, visit another poultry farm?

YES NO

15. DURING the time frame was anyone who lives or works on this farm, inside someone else's poultry barn?

YES NO

16. DURING the time frame did members of the family move freely within poultry barns on this premises?

YES NO

17a. DURING the time frame were barn doors locked?

ALWAYS SOMETIMES NEVER

17b. PRIOR to the time frame were barn doors locked?

ALWAYS SOMETIMES NEVER

18a. DURING the time frame, did you have signs on your barns to warn visitors not to enter?

YES NO

18b. PRIOR to the time frame, did you have signs on your barns to warn visitors not to enter?

YES NO

Time Frame: Feb 1, 2006 to Nov 15, 2006

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19a. DURING the time frame was there a gate restricting access to the farm?
YES NO

19b. PRIOR to the time frame, was there a gate restricting access to the farm?
YES NO

20. Do you use all-in-all-out management for your barns -- that is, at the end of a flock cycle are all birds removed from the barn?
YES NO

20a. If yes, what is the usual 'down time' between flocks (in days)?
_____ days

20b. If yes, what type of clean out is done between flocks? _____ code

1 = no clean out

2 = manure cleaned out of barn

3 = manure clean out with blow down

4 = manure clean out with blow down and disinfectant

5 = manure clean out and power wash

6 = manure clean out with power wash and disinfectant

7 = manure clean out with blow down, power wash and disinfectant

Name of disinfectant used _____

20c. Who cleans and disinfects you barn(s) after each cycle?

SELF CONTRACTOR

(specify) _____

21. Do you place chicks for broilers/pullets? YES NO

21a. If yes, what hatchery(s) did chicks come from and give date?
(Provide information for the most recent placements.)

_____ code _____ <mm/dd/yy>

_____ code _____ <mm/dd/yy>

W = Western

FV = Fraser Valley = FV

PP = Pacific Pride

O = Other (specify) _____

22a. Where were pullets raised prior to being placed in the layer/breeder barn?
_____ code

1 = pullet house on farm

2 = another farm (specify) _____

3 = N/A

Time Frame: Feb 1, 2006 to Nov 15, 2006

Premises ID: _____

22b. How are pullets raised? FLOOR CAGES N/A

23. DURING the time frame, did you ever place additional birds into your flock during a flock production cycle?
 YES NO

If yes, give type of bird, dates, and whether birds were from your farm or a different farm:

Bird Type

- 1 = chick/poult
- 2 = pullet
- 3 = layer
- 4 = breeding hen
- 5 = rooster (include spiking)

Source

- 1 = own farm
- 2 = different farm

Bird Type	Source	Date (mm/dd/yy)
1 2 3 4 5	1 2	
1 2 3 4 5	1 2	
1 2 3 4 5	1 2	
1 2 3 4 5	1 2	
1 2 3 4 5	1 2	
1 2 3 4 5	1 2	
1 2 3 4 5	1 2	
1 2 3 4 5	1 2	

Premises ID: _____

27. Who disposes of litter/manure from your barns?

SELF CONTRACTOR (specify) _____

Do you usually dispose of manure using the following techniques?

27a.	stored on farm	YES	NO	
27b.	spread on own fields	YES	NO	
27c.	sell or give away		YES	NO
27d.	other _____	YES		NO

If litter/manure is stored on the farm, please indicate the following:

27e.	Length of time of storage _____	days/weeks/months	
27f.	Distance of storage pile from nearest barn _____	meters	
27g.	Is it covered?	YES	NO
27h.	Is it composted?	YES	NO

28a. Has litter/manure been brought onto the premises DURING the time frame?

YES NO

If yes, give source and date. <mm/dd/yy>

28b. Has poultry litter/manure FROM SOURCES OTHER THAN YOUR FARM, been spread onto fields adjacent to your property (i.e. your neighbours fields) DURING the time frame?

YES NO

If yes, give source (if known) and date. <mm/dd/yy>

29. Do you normally sell or buy, any birds, to or from live bird markets?

YES NO

30. DURING the time period, did you or anyone who lives or works on this premises attend any live bird markets?

YES NO UNKNOWN

Premises ID: _____

31. During the time period, how did you dispose of dead birds (normal mortality)?

31a. via renderer or other off-farm disposal?

YES
NO

i) If yes, do you deliver them to disposal/renderer or are they picked up?
_____ code

1 = delivered

2 = picked up by disposal/renderer

31b. incinerated (burned)?

YES NO

i) If yes, on or off premises?

_____ code

1 = on premises

2 = off premises

31c. buried?

YES NO

i) If yes, on or off premises?

_____ code

1 = on premises

2 = off premises

31d. manure pit?

YES NO

i) If yes, on or off premises?

_____ code

1 = on premises

2 = off premises

31e. field spread/fed to other animals?

YES NO

i) If yes, on or off premises?

_____ code

1 = on premises

2 = off premises

31f. composted?

YES NO

i) If yes, on or off premises?

_____ code

1 = on premises

2 = off premises

31g. other?

YES NO

i) If yes, describe: _____

Premises ID: _____

32. Outside of the time frame, how do you dispose of spent hens?
- | | | | | |
|------|----------------------------|-----|----|-----|
| 32a. | processed for food? | YES | NO | N/A |
| 32b. | processed for rendering? | YES | NO | N/A |
| 32c. | through live bird markets? | YES | NO | N/A |
| 32d. | other _____ | YES | NO | N/A |
33. Do you mix your own feed? YES NO
34. Do you pick up feed? YES NO
35. Is feed delivered to your farm? YES NO
36. Which feed companies supplied feed to your farm during the time frame?
- | | | | |
|------|---------------|-----|----|
| 36a. | Unifeed | YES | NO |
| 36b. | Ritchie Smith | YES | NO |
| 36c. | Otter coop | YES | NO |
| 36d. | Clearbrook | YES | NO |
| 36e. | Excel | YES | NO |
| 36f. | Other _____ | YES | NO |
37. How is leftover feed removed from the farm at the end of the production cycle?
- | | | |
|------|---------------------------|-----|
| 37a. | picked up by feed company | YES |
| | | NO |
| 37b. | fed to next flock | YES |
| | | NO |
| 37c. | fed to other animals | YES |
| | | NO |
| 37d. | discarded | YES |
| | | NO |
| 37e. | other _____ | YES |
| | | NO |
38. Do your barn ventilation systems have exhaust fans? YES NO
- 38a. If yes, are there feed bins on your premises that are located on the air **intake** side of a barn?
- | | |
|-----|----|
| YES | NO |
|-----|----|
- 38b. If yes, are there feed bins on your premises that are located on the ventilation **exhaust** side of a barn?
- | | |
|-----|----|
| YES | NO |
|-----|----|

Time Frame: Feb 1, 2006 to Nov 15, 2006

Premises ID: _____

39. Are all your feed bins closed to the outside, or is there an opening in the feed bin/lines that a wild animal or bird could access? _____ code

1 = closed
2 = accessible

40. Please indicate if the following animals ever gain access to:
 · the inside of the barns
 · feed bins, tanks, lines, hoppers, etc. outside the barns
 · the property in general
 ·

Animal Type	Inside Barn	Feed Outside Barn	Around Property
40a. rodents	Yes No	Yes No	Yes No
40b. wild birds	Yes No	Yes No	Yes No
40c. cats	Yes No	Yes No	Yes No
40d. dogs	Yes No	Yes No	Yes No
40e. raccoons, fox, opossum, coyote	Yes No	Yes No	Yes No
40f. rabbits	Yes No	Yes No	Yes No
40g. other	Yes No	Yes No	Yes No

41. DURING the time frame, were the following pests on the farm plentiful, moderate, or few?

1 = plentiful
2 = moderate
3 = few

41a. rodents (rats and mice) _____ code
 41b. insects/flies _____ code
 41c. wild birds _____ code

42. Do you put bird feeders out for wild birds? YES NO

43. Have you noticed unusual feathers on or around your property during the time frame?

YES NO

44. For the following purposes, what is the water source used?

44a. For supplying drinking water to the birds? _____ code
 44b. For cleaning the barn and egg room? _____ code

Time Frame: Feb 1, 2006 to Nov 15, 2006

Premises ID: _____

- 1 = deep well
- 2 = sand-point well
- 3 = municipal water
- 4 = surface water
- 5 = other _____

45. Do you use any type of water treatment for the barn water used on your property?

45a. filtration	YES	NO
45b. ozonation	YES	NO
45c. chlorination	YES	NO
45d. peroxide	YES	NO

46. Was there noticeable dust around your property since Feb 2006?

YES NO

47. Are there creeks, ditches, ponds or standing water on or around your property?

YES NO

48. Do waterfowl frequent these areas?

YES NO

Premises ID: _____

49. How many adults and children live on these premises?

49a. Adults (18 years of age and older) _____

49b. School age children (6 years to 17 years of age) _____

49c. Pre-school age children (0 years to 5 years of age) _____

50. Do children play in the farmyard? YES NO

51. Do children play in/enter the barns? YES NO

52. Do any of your close friends or family live on premises which have had birds diagnosed with infectious laryngotracheitis?

YES

NO

53. Have you changed any farm suppliers or service providers DURING the time frame?

YES

NO

If yes, please provide details:

54. Do you or anyone living or working on this premises, sell or give away ungraded eggs:

54a. Sell at the farm gate YES

NO

54b. Sell through a broker YES

NO

54c. Other (specify) _____

YES

NO

54d. Give to friends/family YES

NO

If yes to any of the above:

54e. Do these people enter the egg room? YES NO

54f. Is packaging material re-used? YES NO DON'T KNOW

54g. What kind of materials are used in the egg trays? _____ code

54h. What kind of materials are used in the egg cartons? _____ code

1 = plastic

2 = paper

3 = other

4 = foam

Time Frame: Feb 1, 2006 to Nov 15, 2006

Premises ID: _____

55. Do you normally vaccinate for the following diseases in your flocks:
(Please circle)

Bursal disease (IBD)	YES	NO
Avian encephalomyelitis (AE)	YES	NO
Fowl pox	YES	NO
Infectious laryngotracheitis (ILT)	YES	NO
Mycoplasma gallisepticum (MG)	YES	NO
Newcastle disease	YES	NO
Reovirus	YES	NO
Infectious bronchitis (IB)	YES	NO
Other	YES	NO

56. If you normally vaccinate for Infectious Laryngotracheitis (ILT) in your birds, please indicate the brands of vaccine you have used on your farm.

Vineland MLT® (LAHI)	YES	NO
Laryngo-Vac® (Wyeth)	YES	NO
LT Blen® (Merial Select)	YES	NO
LT-Ivax® (Schering-Plough)	YES	NO
Biotrach® (Intervet)	YES	NO
Other: _____	YES	NO

Premises ID: _____

56. Please indicate the dates you vaccinated your flocks for ILT Since Feb 1, 2006, and which method of vaccination you used e.g. drinking water, eyedrop, or spray:

Date(s)	Vaccination Method		
	DRINKING WATER	EYEDROP	SPRAY
_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

57. Since Feb 1, 2006, have birds on your farm had Infectious Laryngotracheitis (ILT)?
(Please circle)

YES

NO

NOT SURE

If yes, please indicate the date(s) when ILT was first recognized in your flock, and who made the diagnosis (e.g. Animal Health Lab, veterinarian, feed company representative, neighbour, self, etc):

Date(s)	Diagnosis made by:					
	VET	LAB	FEED REP.	NEIGHBOUR	SEL F	OTHE R
_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please describe if ILT was diagnosed in more than one barn on your farm:

58. If you have any additional comments, please use the space provided below:

Thank you for your cooperation in completing this questionnaire.