

2019

REPORT

FOR THE AVIAN NETWORK AND THE BACKYARD GROUP



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The mandate of the avian network is to monitor health in order to gather and disseminate the necessary information for interventions aimed at protecting animal health, public health, and access to markets. For more information on the Avian Network, consult the following Web page: <https://www.mapaq.gouv.qc.ca/fr/Productions/santeanimale/maladies/RAIZO/reseauaviaire/Pages/reseauaviaire.aspx>

Key Facts

Infectious Laryngotracheitis

In January 2019, a diagnosis of infectious laryngotracheitis (ILT) was made on two commercial flocks (broilers) in the municipality of Saint-Dominique in the Montérégie. These cases were the subject of a vigilance notice sent to veterinarians. Québec's avian disease control team (EQCMA) also issued notices to producers and stakeholders in the affected zone. These flocks regained their negative status on May 14, 2019. The Ministry of Agriculture, Fisheries and Food (MAPAQ) and the industry continuously cooperate on the detection and control of ILT because it represents a significant economic threat to the Québec avian sector.

Avian Influenza

In May 2019, low pathogenicity avian influenza sub- type H6 was detected in a commercial flock of ducks in Chaudière-Appalaches. It was not a reportable strain and was part of a North American line of a subtype circulating among wild birds. The farmed birds did not show clinical signs, and there was no epidemiological link to other flocks. The last case of mildly pathogenic avian influenza, in a domestic flock, in Québec was in 2009. Wild birds are recognized as a natural reservoir of the virus. The risk of the introduction and of propagation of avian influenza can be reduced by following regulations regarding confinement of birds and following biosecurity practices.

Duck Adenovirus-1 Tracheobronchitis

In July 2019, for the first time in Québec, a case of duck adenovirus-1 tracheobronchitis was diagnosed in a duck farm in the MRC Les Maskoutains in the Montérégie. There was no direct or indirect link between this farm site and commercial flocks of layer hens, pullets or broiler breeders. The birds presented with increased mortality and cough. Macroscopic

examination revealed hyperemic tracheas with obstructive clusters of whitish casein, and intranuclear inclusion bodies were visible in the bronchia at the histology. The diagnosis was confirmed by PCR (polymerase chain reaction) analysis and sequencing of the virus.

Also called Atadenovirus or Adenovirus group 3, this virus was identified in Ontario in 2007 in ducklings. It causes infections that are primarily asymptomatic or which manifest through cough, dyspnea and an increase in mortality in ducklings and in goslings. It is not an immediate reportable disease in domestic waterfowl, however, in chickens this virus is responsible for Egg Drop Syndrome and is an immediately reportable disease (directors of laboratories must therefore report it to the Canadian Food Inspection Agency and to MAPAQ).

In chickens, clinical signs include loss of colour in pigmented eggs, as well as thin, supple or absent egg shells. The egg drop is due to the production of abnormal eggs, and the potential loss can be as much as 40%. The consequences can therefore be considerable in laying hens, pullets and breeders. Vertical transmission is the primary mode of transmission. Horizontal transmission is also possible but the propagation happens more slowly. This condition can have considerable health and economic repercussions for the Québec avian flock. Thus, it is important to limit direct and indirect contacts between the sectors.

Avibacterium gallinarum

In December 2019, a confirmed case of *Mycoplasma synoviae* Mycoplasmosis (MS), associated with *Avibacterium gallinarum*, was detected in a commercial flock of poultry in the MRC Beauce-Sartigan. Morbidity was low and only a very small increase in mortality was noticed in the flock. Necropsy showed severe caseous sinusitis-conjunctivitis. According to MAPAQ's databank,

Avibacterium Gallinarum was isolated only once in a commercial poultry flock over the past 20 years and it is rarely isolated in backyard flocks. The agent responsible for Infectious Coryza is *Avibacterium Paragallinarum*, but *Avibacterium Gallinarum* is an opportunistic pathogenic agent and can cause lesions appearing as avian cholera (*chronic fowl cholera-like lesions*). Transfer vehicles and poorly cleaned materials are known risk factors in the transmission of the disease.

Report to Avian Sector Producers and Stakeholders

A quarterly report to the poultry sector's producers and stakeholders has been produced by the avian network and disseminated by EQCMA since 2018. The goal is to supply information on the health status of the Quebec flock and on general measures of prevention and control.

Backyard Group

The activities of the Backyard Group continued in 2019. During the winter, the group held a telephone conference on poultry lympho-proliferative diseases. In addition, the online discussion group, [the public directory of veterinarians offering service to owners of backyard bird flocks, as well as the monitoring program of important avian diseases in backyard flocks](#) are always offered. At the end of 2019, the group comprised 88 members, an increase of 9 since the end of 2018.

Monitoring Programs

Monitoring of Avian Influenza Virus in Domestic Birds

Monitoring of avian influenza in domestic birds is one component of integrated monitoring of this disease. Samples are taken every time the domestic birds are sent for a necropsy to MAPAQ's diagnostic laboratories.

In addition, samples taken for export testing are also analyzed. Samples are then tested by PCR.

In 2019, the laboratory received 1,233 submissions, each of them including more than one sample. In total, 2,536 samples were analysed and the mandatory reportable influenza virus (highly pathogenic or of type H5 or H7) was not detected in any of them. In May 2019, Low-pathogenic avian influenza of subtype H6 was found in a commercial flock of ducks in Chaudière-Appalaches.

Monitoring of Avian Influenza Virus in Wild Birds

The other component of the integrated monitoring of avian influenza is the monitoring of wild birds. In wild-bird mortality events that meet certain criteria, samples are collected for testing. The decision to test is made based on the region, the species and the number of dead birds indicated.

In 2019 the MAPAQ's animal health laboratory (Laboratoire de santé animale or LSA) carried out 94 analyses. The influenza virus was detected in one sample taken from a ring-billed Seagull. Subtype was H13, a strain circulating in the North American seagull population.

Monitoring of Atypical Strains of Infectious Bronchitis Virus

The monitoring program for atypical strains of the infectious bronchitis virus started on July 25, 2017. Even though this program was still offered in 2019, no request for analysis has been made within it. However, referring veterinarians have made 82 requests for sequencing. Table 1 summarizes the strains of the infectious bronchitis virus that were sequenced at the molecular diagnostic laboratory of the Faculty of veterinary medicine in 2019.

Table 1

Number of strains of the infectious bronchitis virus that were identified between January and December 2019

Strains	Number
Delmarva (DMV)	47
Mass41	17
CA1737	4
Conn46	4
Qu16	2
DMV and Mass41	7
DMV and Conn46	1

Monitoring of Avian Diseases of Importance to Backyard Flocks

The monitoring program for avian diseases of importance to backyard flocks evaluates suspect cases of avian influenza, Newcastle disease, ILT and *Mycoplasma gallisepticum* (MG) mycoplasmosis in backyard flocks that meet admissibility criteria. In 2019, a total of 30 submissions were received within this program: 17 in necropsy and 13 in molecular biology. The submissions gave rise, among other things, to 13 diagnoses of MG mycoplasmosis, 16 diagnoses of MS mycoplasmosis and 15 diagnoses of ILT.

Monitoring of Diseases Designated by Regulation

The [Regulation to designate contagious or parasitic diseases, infectious agents and syndromes](#) came into effect on April 30, 2015. Its aim is to improve the speed of intervention, when that is deemed necessary, to preserve flock and public health, as well as to reinforce the monitoring of endemic diseases of concern. In the avian sector, the monitored diseases are Avian Influenza, Newcastle Disease, Avian Infectious Laryngotracheitis, Avian Pasteurellosis, Avian Mycoplasmosis, Salmonellosis and West Nile virus. In commercial flocks no case of Avian Influenza or highly-pathogenic Newcastle Disease was reported in 2019.

Note that a declaration based on a positive sample is considered as one report and that several reports could be grouped together in the same laboratory submission (a single file).



Table 2

Diseases for which at least one positive sample coming from domestic birds, their environment or from animal by-products have been reported to MAPAQ by external laboratories for the years 2016 to 2019

Number of positive files (number of reports)	2019	2018	2017	2016
Salmonellosis	10 (10)	9 (9)	9 (25)	8 (42)
Avian Infectious Laryngotracheitis	5 (5)	2 (2)	3 (3)	0 (0)
<i>M. synoviae</i> Mycoplasmosis	5 (5)	4 (7)	3 (26)	1 (7)
<i>M. gallisepticum</i> Mycoplasmosis	3 (3)	1 (1)	6 (10)	5 (9)
Avian Pasteurellosis	0 (0)	0 (0)	1 (1)	0 (0)

Table 3

Salmonellas from domestic birds reported by laboratories other than MAPAQ for the years 2016 to 2019 FLU

Number of reports	2019	2018	2017	2016
Salmonellosis ser. Kentucky	3	0	5	2
Salmonellosis ser. Heidelberg	2	0	0	0
Salmonellosis ser. Infantis	1	0	0	0
Salmonellosis ser. Typhimurium	0	1	0	0
Salmonellosis spp	4	8	20	40

Report of Necropsies and Biopsies

This section of the report presents epidemio-surveillance data obtained following necropsies and biopsies carried out in the laboratories of MAPAQ. The submissions come from veterinarians. Since practices related to the submission of samples can vary notably depending on the year, the regions, and the clinical presentation or disease, this report can only partially represent the health situation of the Québec Avian Flock.

A submission consists of one or several tissues or animals from the same source and taken on the same date. A submission may have more than one diagnosis. It should be noted that the data relating to the backyard flocks can be found in the section «Backyard Birds» at the very end of this document.

In 2019, the AHL received 1186 poultry submissions, while there were 921 in 2018, 824 in 2017 and 756 in 2016.

Summaries by Avian Sub-category

The tables that follow present the main diagnoses by sector since 2016. The percentages are calculated as a function of the total number of submissions for the production type, highlights of the relative importance of the diagnoses as a function of the number of submissions received at the laboratory.





Broilers

Table 4

Principal diagnoses of interest established following a necropsy or biopsy performed on broilers in MAPAQ's laboratories for the years 2016 - 2019

	2019	2018	2017	2016
Number of Submissions	972	712	559	529
Colibacillosis	391 (40 %)	318 (45 %)	265 (47 %)	241 (46 %)
<i>Enterococcus cecorum</i> Infection	296 (30 %)	111 (16 %)	72 (13 %)	94 (18 %)
Infectious Bronchitis	191 (20 %)	161 (23 %)	114 (20 %)	65 (12 %)
Viral Arthritis	195 (20 %)	75 (11 %)	109 (20 %)	83 (16 %)
Infectious Bursal Disease (Gumboro Disease)	184 (19 %)	147 (21 %)	106 (19 %)	85 (16 %)
Tibial Dyschondroplasia	112 (12 %)	48 (7 %)	36 (5 %)	49 (9 %)
Coccidiosis	64 (7 %)	74 (10 %)	51 (9 %)	54 (10 %)
Hepatitis with Inclusion Bodies	63 (6 %)	127 (18 %)	41 (7 %)	22 (4 %)
Staphylococci	35 (4 %)	18 (3 %)	11 (2 %)	15 (3 %)
Necrotic Enteritis	16 (2 %)	14 (2 %)	16 (3 %)	15 (3 %)
Ricketts	16 (2 %)	6 (0,8 %)	8 (1,4 %)	15 (3 %)
Deficiency (vitamin or mineral)	5 (1 %)	13 (2 %)	2 (0,36 %)	4 (0,1 %)
Omphalitis	10 (1 %)	12 (1,7 %)	10 (1,8 %)	16 (3 %)
Aspergillosis	8 (1 %)	9 (1,3 %)	13 (2,3 %)	33 (6 %)
Salmonellosis	9 (1 %)	4 (0,6 %)	12 (2,1 %)	2 (0,4 %)
Intoxication	6 (0,6 %)	3 (0,4 %)	0 (0 %)	1 (0,2 %)
Avian Infectious Laryngotracheitis	2 (0,2 %)	8 (1,1 %)	18 (3 %)	3 (0,6 %)
Chick Hypoglycemia (<i>spiking</i>)	1 (0,1 %)	4 (0,6 %)	4 (0,7 %)	6 (1 %)

The number of diagnoses of *Enterococcus cecorum* has been increasing since 2016. In fact, this diagnosis represented 18% and 20% of the submissions in 2016 and 2019 respectively.

Cases of salmonellosis diagnosed in 2019 were caused by serotypes Heidelberg (3 cases), Enteritidis (3 cases) and Infantis (1 case). The serotype was not determined in one of the cases. One of the strains of *Salmonella* Enteritidis isolated was linked to a group of two Québec breeder flocks and three Canadian human cases, of which one was in Quebec. For staphylococci, in submissions where the bacterium was able to be identified by species, *Staphylococcus aureus* was isolated 21 times and *Staphylococcus xylosus* 2 times.

Broiler Breeders (in production and replacement)

Table 5

Principal diagnoses of interest established following a necropsy or samples performed on broiler breeders in MAPAQ laboratories from 2016 to 2019

	2019	2018	2017	2016
Number of Submissions	59	70	102	83
Broiler Breeders in Production				
Colibacillosis	17 (29 %)	10 (14 %)	22 (22 %)	15 (18 %)
Staphylococci	8 (14 %)	7 (10 %)	15 (15 %)	11 (13 %)
<i>Enterococcus cecorum</i> Infection	5 (8 %)	1 (1 %)	0 (0 %)	0 (0 %)
Coccidiosis	3 (5 %)	2 (3 %)	6 (6 %)	4 (5 %)
Infectious Bronchitis	1 (2 %)	3 (4 %)	7 (7 %)	1 (1 %)
Fowl Pox	1 (2 %)	1 (1 %)	2 (2 %)	4 (5 %)
Replacement Broiler Breeders				
Colibacillosis	12 (20 %)	13 (19 %)	16 (16 %)	22 (27 %)
Staphylococci	6 (10 %)	8 (11 %)	3 (3 %)	4 (5 %)
<i>Enterococcus cecorum</i> Infection	3 (5 %)	2 (3 %)	3 (3 %)	1 (1 %)
Infectious Bursal Disease (Gumboro Disease)	2 (3 %)	1 (1 %)	5 (5 %)	2 (2 %)
Omphalitis	1 (2 %)	2 (3 %)	3 (3 %)	3 (4 %)
Hepatitis with Inclusion Bodies	1 (2 %)	1 (1 %)	0 (0 %)	0 (0 %)

For broiler breeders in production, the number of diagnoses of Colibacillosis and of *Enterococcus cecorum* has increased compared to the preceding years. A diagnosis of *Enterococcus faecalis* amyloid arthropathy was made in the laboratory in 37-week broiler breeders. A selection for lameness and wasting was begun at 29 weeks, followed by an increase in mortality. Previously, the last diagnosis of *E. faecalis* amyloid arthropathy was in 2017.



Commercial Layers and Pullets

Table 6

Principal diagnoses of interest established following a necropsy or biopsy undertaken on commercial layers in MAPAQ laboratories from 2016 to 2019

	2019	2018	2017	2016
Number of submissions	76	51	74	64
Commercial Layers in Production				
Colibacillosis	8 (11 %)	6 (12 %)	9 (12 %)	11 (17 %)
Coccidiosis	6 (8 %)	2 (4 %)	6 (12 %)	9 (14 %)
Necrotic Enteritis	6 (8 %)	2 (4 %)	2 (4 %)	2 (3 %)
Mycoplasmosis <i>M. synoviae</i>	5 (7 %)	2 (4 %)	1 (2 %)	5 (8 %)
Infectious Bronchitis	4 (5 %)	5 (10 %)	8 (16 %)	0 (0 %)
Staphylococci	4 (5 %)	5 (10 %)	3 (6 %)	7 (11 %)
Fowl Pox	3 (4 %)	1 (2 %)	1 (2 %)	3 (5 %)
<i>Enterococcus cecorum</i> Infection	1 (1 %)	1 (2 %)	1 (2 %)	0 (0 %)
Commercial Replacement Layers (pullets)				
Colibacillosis	15 (20 %)	3 (6 %)	5 (10 %)	5 (8 %)
Coccidiosis	9 (12 %)	3 (6 %)	3 (6 %)	1 (2 %)
Lentogenic Newcastle Disease	4 (5 %)	1 (2 %)	0 (0 %)	1 (2 %)
Necrotic Enteritis	2 (5 %)	1 (2 %)	2 (4 %)	0 (0 %)
Infectious Bursal Disease (Gumboro Disease)	2 (5 %)	1 (2 %)	1 (2 %)	1 (2 %)
Infectious Bronchitis	2 (3 %)	1 (2 %)	9 (18 %)	0 (0 %)
Staphylococci	1 (1 %)	1 (2 %)	0 (0 %)	0 (0 %)
Marek Disease	1 (1 %)	1 (2 %)	0 (0 %)	0 (0 %)
Omphalitis	1 (1 %)	1 (2 %)	1 (2 %)	1 (2 %)

For staphylococci, is submissions where the bacterium was able to be identified by species, *Staphylococcus aureus* and *Staphylococcus hyicus* were both isolated on two occasions. The case of staphylococci in pullets was caused by *S aureus*.

There were five diagnoses of *Mycoplasma synoviae* Mycoplasmosis in 2019 in commercial layers. In one case necropsy revealed severe caseous sinusitis-conjunctivitis. *Avibacterium gallinarum* was also isolated in the lesions, in probable synergy with MS. In the other cases, the birds did not present with lesions compatible with *Mycoplasma synoviae* or the lesions were too minor to have a significant clinical effect.

In 2019, fowl pox was diagnosed on three occasions in flocks of commercial layers. Two of the cases were found in two different barns on the same site. In one case 63-week old birds presented with coalescent verrucous masses on the margins of the eyelids. In the other case the hens were submitted at 37 weeks and nodules were observed on the combs or the barbels or in the nares. In the third case, the birds were 36 weeks old and had lesions on the eyelids and the comb. One diagnosis of pox had been found in the same flock two years earlier.

Low pathogenic Newcastle disease was diagnosed on four occasions in commercial pullets in 2019. In three cases, an increase in mortality and respiratory signs was observed in the flock about one week after the administration of a live, attenuated vaccine for the disease. A vaccinal reaction was therefore suspected. In the fourth case it was not possible to confirm if it had been a viral vaccinal or wild strain, and the vaccination history was not known.

A very rare case of osteopetrosis, secondary to avian leucosis, was diagnosed in five week old pullets. A small percentage of the birds in the flock was affected.

Turkey Hens

Table 7

Principal diagnoses of interest established following a necropsy or biopsy performed on turkeys in MAPAQ laboratories from 2016 to 2019

	2019	2018	2017	2016
Number of submissions	48	88	89	80
Colibacillosis	13 (27 %)	30 (34 %)	28 (31 %)	25 (31 %)
Salmonellosis	9 (19 %)	14 (16 %)	11 (12 %)	7 (9 %)
Histomonosis	4 (8 %)	1 (1 %)	2 (2 %)	1 (1 %)
Ornithobacteriosis	4 (8 %)	8 (9 %)	4 (4 %)	1 (1 %)
Pasteurellosis	4 (8 %)	2 (2 %)	1 (1 %)	1 (1 %)
Aspergillosis	3 (6 %)	0 (0 %)	1 (1 %)	4 (4 %)
Coccidiosis	3 (6 %)	16 (18 %)	12 (14 %)	16 (20 %)
Dyschondroplasia	2 (4 %)	1 (1 %)	1 (1 %)	2 (2 %)
Necrotic Enteritis	2 (4 %)	6 (7 %)	3 (3 %)	3 (4 %)
Staphylococci	1 (2 %)	4 (5 %)	5 (6 %)	1 (1 %)
Intoxication	1 (2 %)	1 (1 %)	0 (0 %)	2 (2 %)

Fewer turkeys were submitted for a necropsy in 2019 compared to the previous years. Five serotypes of salmonellosis were isolated: Heidelberg (four cases), Muenchen (four cases, Uganda (one case), Agona (one case) and Albany (one case). In two cases, two serotypes were identified (Uganda and Muenchen; Agona and Albany). *Staphylococcus aureus* was isolated in the staphylococci case.

In 2019 there were four cases of pasteurellosis in turkeys, without any epidemiological link among them. In one of the flocks, 42-week-old birds presented with a severe and acute fibrino-hemorrhagic pneumonia with a mortality of 1%. In another, the mortality rate reached 10%. The birds were 15 weeks old and suffered from pneumonias and severe airsacculitis associated with septicemias. A third case was diagnosed in 33-week-old breeders. The mortality was higher and lesions of pleurisy and of necro-hemorrhagic pneumonia were noted in the necropsy. A last case was diagnosed in 48-day-old hens that presented with a higher mortality, weakness and a light cough. The necropsy revealed lesions of pneumonia, pericarditis and airsacculitis. Vermin control is considered as a key factor in the prevention of disease.

Four diagnoses of histomonosis were made in a flock of turkeys in 2019 and there was no epidemiological link among them. A validated PCR on the tissues is now available from MAPAQ's animal health laboratory.

Other Species

Table 8

Number of submissions for domestic birds of other species sent for necropsy or biopsy to MAPAQ laboratories from 2016 to 2019

	2019	2018	2017	2016
Duck	17	19	22	7
Goose	6	4	1	1
Pheasant	5	0	1	0
Quail	1	0	3	5
Emu	1	2	1	3
Other/mixed	1	1	2	1
Guinea Fowl	0	0	2	2
Partridge	0	1	0	1
Pigeon	0	1	1	1
Ostrich	0	0	0	0
Peacock	0	0	0	0
Total	31	28	33	21

The diagnoses made following the submissions were very varied. In ducks, the most frequent diagnoses were aspergillosis (8 cases), amyloidosis (4 cases) and colibacillosis (4 cases). There was one case of airsacculitis, caused by *Riemerella anatipestifer*, in 62-day-old Peking ducks. According to MAPAQ's database, only three diagnoses of *R. anatipestifer* have been made since 2010.



Backyard Birds

In 2019, there were 42 submissions of backyard birds, including those received as part of the Monitoring Program for avian diseases of importance to backyard flocks.

Table 9

Summary of diagnoses of interest following a necropsy or a biopsy conducted on backyard birds in MAPAQ's laboratories from 2016 to 2019

	2019	2018	2017	2016
Number of Submissions	42	45	48	34
<i>M. synoviae</i> Mycoplasmosis	13*	24*	16*	9
Avian Infectious Laryngotracheitis	12*	20*	11*	8
Marek Disease	12	15	12	6
Coccidiosis	12	12	21	9
<i>M. gallisepticum</i> Mycoplasmosis	9*	19*	13*	8
Infectious Bronchitis	7	2	4	4
Nematodosis	5	10	13	5
Colibacillosis	5	2	2	1
<i>Avibacterium</i> spp.	2	1	1	0
Infectious Bursal Disease (Gumboro Disease)	1	1	1	1

* This number comprises also submissions received by the Faculty of veterinary medicine for PCR analysis, only.

Two flocks were coinfecting with three pathogens; infectious laryngotracheitis, *Mycoplasma gallisepticum* mycoplasmosis and *Mycoplasma synoviae* mycoplasmosis. A combined diagnosis of ILT and mycoplasmosis was established for eight flocks. Three small flocks were infected with the two mycoplasmoses. Seven flocks, were infected with one of these three pathogenic agents (ILT, MG or MS).

Antibiotic Resistance

The annual report produced by MAPAQ, which presents the results of the passive monitoring for antibiotic resistance, for 2019, is available [here](#).