

2019

ANNUAL REPORT

FOR THE SWINE SECTOR



Dr. Claudia Gagné-Fortin, Veterinarian, Department of Animal Health

Colleagues:

Dr. Marie-Eve Lessard, Dr. Edisleidy Rodriguez and Dr. Isabelle St-Pierre, Veterinarians, MAPAQ
Dr. Sylvie D'Allaire, Dr. Martine Denicourt, Dr. Jean-François Doyon, Dr. Christian Klopfenstein,
Dr. Alain Laperle and Dr. Simon Vaillancourt, Sentinel Veterinarians

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Key Facts

Porcine Delta Coronavirus and Porcine Epidemic Diarrhea

The first case of Porcine Delta Coronavirus Diarrhea (PDCV) in Québec was detected in April 2019 in a nursery in the Montérégie area. In addition, porcine epidemic diarrhea was detected in a nursery in Montérégie in March 2019. This is the first detection since 2015. Further details on the clinical situation of these herds, as well as on other cases declared positive during 2019, are available below on sections specific to those diseases. A new description of the disease caused by PDCV has been made available on the porcine epidemic diarrhea and to PDCV webpage of the swine network ([diarrhée épidémique porcine et au DCVP](#)). Information is based on the recent experience seen in Québec and in Canada, as well as on the situation experienced in a large network in the United States.

Porcine Pleuropneumonia

A case of porcine pleuropneumonia diagnosed in feeder hogs was caused by serotype 17 of *Actinobacillus pleuropneumoniae*. This is the first time that this serotype has been detected in Canada. The case presented with typical lesions of pleuropneumonia. Serotype 17 is present in the United States and in Europe.

Salmonella Litchfield

A human outbreak of 13 cases of infection by Salmonella Litchfield (*S. Litchfield*), including two cases in Québec and 11 in Ontario, occurred in 2019. The two cases in Québec had consumed ground pork. The Ontario cases were linked to the consumption to a pork sausage (raw, fermented, dried), which was the object of a recall: <https://www.canada.ca/fr/sante-publique/services/avis-sante-publique/2019/eclosion-salmonellose-saucissons.html>.

On the animal side, MAPAQ's animal health laboratory (Laboratoire de santé animale or LSA) identified strains of *S. Litchfield* in hog feces on four occasions during 2018. Isolates from autumn 2019 were transferred to a human laboratory for genetic characterization. These were determined to be identical to human strains that had circulated in Ontario and Québec from May to October 2019. Between January 2010 to October 2019, of 35 isolated strains of *S. Litchfield* at LSA, 24 were found in poultry, seven in hogs, three in bovines and one in a fish aquarium. The investigation into the

fall outbreak led to the conclusion that «the positive farms were not linked to the sausage». Nonetheless it remains important to pay attention to the control of salmonellas from pigs, whether or not they are causing illness in the animals themselves.

African Swine Fever

Worldwide concerns regarding the spread of African Swine Fever (ASF) continue, in part intensified following the declaration of a case in China in August 2018. For any country affected, ASF has serious consequences in terms of animal health and the economy. It is a contagious hemorrhagic disease of wild and domestic suidae to which all age classes are susceptible. It is a disease that must be reported to the Canadian Food Inspection Agency and to MAPAQ and is included on the list of diseases of the World Organization for Animal Health (OIE). The ASF virus survives for a long time in meat and processed products and, at the present time, there is no vaccine nor effective treatment.

Until now Canada has escaped this disease. Consequently, federal and provincial governments, as well as the Canadian pork industry have redoubled their efforts to improve prevention activities and to prepare for the possibility of ASF cases being declared in the country. Notably, to this end, the swine network has produced various information documents to increase vigilance of veterinarians and the pig owners. This network has also participated in development of a plan for enhanced surveillance for early detection of ASF in commercial, back-yard, and wild pig populations in Canada. Further information on ASF is available at www.mapaq.gouv.qc.ca/PPA.

Québec's Integrated Animal Health Programme

In the Education and Prevention component of Québec's integrated animal health programme (Programme intégré de santé animale du Québec or PISAQ), campaigns are implemented to educate farmers on subject related to animal health, and to help farmers adopt best practices of disease prevention and control. The campaign's collective control strategies for porcine reproductive and respiratory syndrome project began in the fall of 2017 and ended on March 31, 2019. In all, 537 sites were visited during this period representing 22% of sites meeting the eligibility criteria. A detailed report will be released in the future.

Continuing with PISAQ's Education and Prevention component, a new campaign focused on judicious use of antibiotics in hog barns was launched on May 1, 2019. The aim of this campaign is to encourage and support farmers and veterinarians to reduce the use of antibiotics. This will support the overall pork industry goal of reducing antimicrobial use by 20% by 2020; in part by modifying breeding practices

to enable the optimization of overall animal health. Further information, on PISAQ and the various campaigns, is available at www.mapaq.gouv.qc.ca/PISAQ.

Monitoring of Visceral Lesions in Federal Processing Plants

A new partnership with Les Éleveurs de porcs du Québec was established in 2019 to disseminate some statistics concerning various types of lesions seen in the viscera at slaughter, particularly in the liver and lungs, in hogs processed in Québec in some federal processing plants. This made it possible to create provincial compilations and graphs of the changes in these lesions throughout the year, as illustrated in Graph 1. These lesions could indicate the presence of certain illnesses in the herds such as ascariasis for lesions in the liver; as well as enzootic pneumonia, swine influenza or porcine pleuropneumonia for lung lesions.

Graph 1

Graph of percentage of viscera inspected in the plant and lesions, April 2018 to December 2019



Report to Producers and Stakeholders

Members of the pork network meet quarterly in order to analyse data coming from Québec's animal health laboratories and clinical impressions of the participating veterinarians, as well as to discuss various porcine health issues encountered over the preceding months. A report for veterinarians in the pork sector is produced from these meetings in order to provide this information. In the third quarter of 2019, a new report was created for farmers and other pork sector stakeholders. This new report provides information on the status of porcine health in Québec, as well as recommendations to improve the prevention and control of diseases.

Surveillance of Mandatory Reportable Diseases

In keeping with the Regulation Respecting the Designation of Contagious or Parasitic Diseases, Infectious Agents and Syndromes, veterinarians and laboratories must notify MAPAQ when they suspect or confirm the presence of certain diseases. This goal is to preserve the health status of the herd and of public health, as well as improve monitoring of endemic diseases that are of concern. In the pork sector, the diseases in question are principally Porcine Delta coronavirus, porcine epidemic diarrhea, swine dysentery, transmissible gastroenteritis, influenza, salmonellosis, and Senecavirus A. Detailed information concerning notifications is presented below.

Surveillance of Certain Diseases

Surveillance of Porcine Epidemic Diarrhea and Porcine Delta Coronavirus

The viruses for porcine epidemic diarrhea (PED) and for porcine Delta Coronavirus (PDCV) can cause clinical digestive signs in hogs of all ages, with higher mortality in piglets. These diseases present no risk to human health or food safety. In order to support rapid detection of these viruses in Québec, veterinarians can submit samples when animals present with suspect digestive signs if they come from a risk zone or if they may have been in contact with the virus. Samples can be submitted free of charge under LSA's monitoring program. Samples can also be submitted from infected herds in order to follow the evolution of the disease through to the return to a negative status. In addition, weekly monitoring of PED and of PDCV is carried out

in sample receiving areas and unloading areas of the necropsy rooms in the Complexe de diagnostic et d'épidémiosurveillance vétérinaires du Québec and Québec's LSA. In 2019, 195 analyses were carried out for each of the two viruses. All of the analyses proved to be negative.

Positive results from samples submitted by external laboratories also trigger notifications to MAPAQ. Eighty-six positive results for PED coming from 40 different submissions sent to these laboratories were reported to MAPAQ. For PDCV, 114 positive results were obtained from 46 different submissions. Some of the positive tests for these two viruses were obtained from samples taken from processing plants or in trucks used for transporting hogs. Positive samples are often linked to deliveries of hogs coming from Ontario, where these diseases are currently present on farms or in assembly yards. Other positive results were associated with animal-meat meal, which is not added to feed for hogs. The remaining positive tests come from farms contaminated in 2019. In all cases, MAPAQ ensured that the business in question works with the Équipe québécoise de santé porcine (EQSP) to eradicate the virus and diminish the risks of contaminating other Québec herds.

The first detection of PDCV on a Québec farm occurred on April 12, 2019. It was detected by PCR analysis of piglet feces from a nursery in the Montérégie. The source of the contamination was confirmed as being the maternity herd (outside Québec) that supplied the piglets. The sows had shown no symptoms other than a loss of appetite a few days beforehand. As for the Québec nursery, diarrhea had been noted among the piglets, but they were not severely affected. Given the weak specificity of clinical signs among the sows and the small number of affected animals at the start, PDCV was not suspected right away. Thus, from May to July, there was movement of hogs between the nursery site in Montérégie, and three supplementary feeding sites in the Montérégie, Lanaudière and Estrie areas were declared infected. As of January 14, 2020, PDCV has been eradicated in all breeding sites.

Elsewhere, a maternity herd, with no tie to the first outbreak, was confirmed positive for PDCV by PCR analysis, on December 9. The herd used a four-week batch farrowing system. The diarrhea appeared in gestating sows while there were no piglets in the farrowing rooms. The piglets in the subsequent cycle were affected by diarrhea and increased mortality (50% deaths including those euthanized). The

survivors nevertheless had good growth performance with a weaned weight of 7.5 kg at 22 days. The source of contamination could not be formally identified.

These cases show the importance of monitoring clinical signs in sows, where the virus causes loss of appetite, watery diarrhea and even death. Piglets can also be affected because sows are incapable of nursing them sufficiently. It is thus pertinent to include PDCV in the differential diagnosis, not only in cases of diarrhea, but also cases of weak and emaciated piglets. For nursing or nursery piglets, the disease seems less severe than porcine epidemic diarrhea and explosive diarrhea is not necessarily the primary sign.

Finally, a case of porcine epidemic diarrhea (PED) was confirmed on March 22 in a nursery in Montérégie. The source of contamination could not be determined, but contamination associated with transportation remains the most plausible hypothesis. In April, pigs from the nursery were transferred to a feeder farm in the Laurentides. The two farms succeeded in eliminating the virus, in July and October respectively. All other sites with an epidemiological tie to this case have been tested and found to be negative. Therefore, Québec regained its negative status for PED on October 8, 2019, six and a half months after the contamination.

Surveillance of Senecavirus A

A monitoring program for Senecavirus A permits veterinarians to submit samples to the laboratory from animals that present with clinical signs compatible with the disease. In the case of an introduction of the virus into Québec, the program could also serve to confirm the status of herds having an epidemiological link to a confirmed case. In 2019 two analyses were requested as part of this program and the results were negative. Because of limited demand, the program will be stopped in 2020, but it could be reactivated if the situation so justified, for example the detection of cases on farms in Québec. PCR analyses for SVA are continued on porcine necropsy cases. In 2019, 80 PCR analyses were performed on necropsy cases and all of them were negative.



Surveillance Programme for Porcine Reproductive and Respiratory Syndrome in the Veille sanitaire provinciale

Porcine reproductive and respiratory syndrome (PRRS) is responsible for significant economic losses for the hog sector in Québec. Collective and regional control strategies have been in effect for many years. In cooperation with Les Éleveurs de porcs du Québec, MAPAQ offers free testing from production sites belonging to farmers who participate in the Veille sanitaire provinciale (VSP). A total of 1472 PCR analyses and 922 ELISA tests were carried out in 2019. In addition, ELISA testing on oral fluids was added in 2019. This test is carried out at the Faculty of Veterinary Medicine (FMV), and 167 ELISA oral fluids tests were completed over the past year.



The pork network also collaborates with the epidemiology and porcine medicine laboratory (Laboratoire d'épidémiologie et de médecine porcine or LEMP) of the FMV with regard to PRRS virus monitoring. Graphs representing up-to-date information on the new introductions of this virus in Québec are disseminated every three months in reports directed to veterinarians. For more information on the LEMP: <https://www.med-vet.umontreal.ca/lemp/index.php/site/index>.

Surveillance of swine influenza

The swine influenza surveillance programme helps to strengthen the monitoring of this disease. When veterinarians suspect cases of influenza, they can submit samples to laboratories for no-cost PCR testing. This programme helps to improve knowledge about the circulation of the different sub-types and strains of influenza in Québec. In the event of an increase in the number of diagnoses, or an identification of new strains, veterinarians can be informed about it, usually through the pswine network's quarterly reports. In addition, public health authorities can be advised if a new strain is identified or if human cases are involved. In 2019, 375 PCR analyses for type A influenza were carried out within this programme. Positive samples underwent further PCR analyses to characterize the H and N types.

In addition to the data from the monitoring program administered by MAPAQ, data coming from porcine necropsy cases are also included. Something new in 2019: laboratories external to MAPAQ are now sharing influenza testing data with the swine network. These laboratories are the Diagnostic Services of FMV, Biovet and the Demeter laboratory. As part of this surveillance, there were 1549 requests for analysis in 2019. Of these, 33% were positive for influenza A. Influenza caused many problems on farms in the winter and spring of 2019. Many veterinarians reported cases that lasted into the summer and autumn. The complete results are presented in Table 1.

Table 1

Data on swine influenza surveillance, from MAPAQ's Animal Health Laboratory, the Diagnostic Service of the Faculty of Veterinary Medicine, Biovet and the Demeter Laboratory, for 2019

	Janvier	Février	Mars	Avril	Mai	Juin	Juillet	Août	Septembre	Octobre	Novembre	Décembre	Total
Positif influenza A*	30	31	42	84	66	38	19	13	28	57	55	44	507 (33%)
Positif – H1N1 pandémique	3	3	2	0	1	2	2	0	1	1	0	0	15
Positif – H1N1 classique	5	3	11	12	16	5	3	1	7	13	5	6	87
Positif – H1N1 classique	0	0	0	0	0	0	0	0	0	1	2	0	4
Positif – H1**	4	12	4	13	14	11	2	3	2	8	15	15	103
Positif – H3N2	5	3	8	21	15	6	8	3	8	15	15	9	116
Positif – H3**	3	4	8	7	9	5	2	4	4	12	12	2	72
Positif – H1 et H3**	1	1	1	0	0	0	0	0	0	2	0	0	5
Positif – N1	0	0	0	0	0	0	0	0	0	3	2	1	6
Positif – N2	0	0	0	0	0	0	0	0	0	2	1	0	3
Non sous-typé	2	5	8	31	11	9	2	2	6	6	4	11	97
Négatif – Influenza A	108	100	91	114	91	66	74	57	64	85	102	90	1042 (67 %)
Nombre total de demandes d'analyse	138	131	133	198	157	104	93	70	92	142	157	134	1549 (100%)

* It is possible for more than one type of influenza to be detected from the same submission.

** For some positive submissions, only the analysis for type H is carried out.

Surveillance of pathogenic *Escherichia coli*

The swine Network works in cooperation with the OIE's Reference Laboratory for *Escherichia coli* (E.cL) at the FMV in order to monitor the pathogenic strains of *E. coli* in Québec hogs. A quarterly report describes the various pathotypes and virotypes as well as resistance to certain antibiotics. The E.cL team also produces an annual report that makes it possible to follow the year-over-year trends in the evolution of the *E. coli* and their antibiotic resistance. The report is disseminated to all veterinarians who are members of the Association des vétérinaires en industrie animale du Québec (AVIA).

Overview of Necropsies and Biopsies

The purpose of this part of the report is to present epidemio-surveillance data that were obtained following necropsies in MAPAQ's laboratories. Since submission practices vary markedly by region, year and disease, these data reflect, only in part, the health status of Québec's porcine herd. They include submissions coming from veterinarians managing health problems on farms.

For information purposes, a submission consists of one or more tissues or animals from the same source, taken on the same date. A submission can have more than one diagnosis. In 2019, MAPAQ's animal pathology laboratories received 916 pig submissions. This number is larger than in 2018 (841), and in 2017 (802). Necropsy is a widely-used tool in the porcine sector. It allows clinical problems to be well characterised, thus contributing to an

increasingly judicious use of medications and to the adjustment of targeted preventive measures, depending on the disease.

The following tables present the main diagnoses that were made on suckling piglets, nursery piglets and feeder hogs following necropsies or biopsies in MAPAQ's laboratories. The percentages are calculated as a function of the number of submissions for the animal subcategory being studied. This makes it possible to highlight the importance of the pathologies that were seen, in terms of the number of submissions the laboratory received.

Table 2

Main diagnoses following a necropsy or a biopsy, in MAPAQ's laboratories, on suckling piglets, in the years 2017 to 2019 and the percentage of submissions with this diagnosis for this animal sub-category.

Diagnostic	2019	2018	2017
Number of Submissions – Suckling Piglets	183	182	166
Rotavirus Diarrhea	69 (38 %)	52 (29 %)	51 (31 %)
Arthritis, Polyarthritis and Polysynovitis	37 (20 %)	45 (25 %)	32 (19 %)
Colibacillosis Diarrhea	25 (14 %)	23 (13 %)	24 (14 %)
Exsudative Epidermatitis	20 (11 %)	31 (17 %)	28 (17 %)
Rhinitis (including inclusion bodies rhinitis)	19 (10 %)	10 (5 %)	3 (2 %)
Porcine Reproductive and Respiratory Syndrome	17 (9 %)	10 (5 %)	8 (5 %)
Swine Influenza	13 (7 %)	5 (3 %)	13 (8 %)
<i>Streptococcus suis</i> Infection	9 (5 %)	16 (9 %)	5 (3 %)
Other <i>Escherichia coli</i> Infections	9 (5 %)	4 (2 %)	21 (13 %)
<i>Actinobacillus suis</i> Infection	6 (3 %)	7 (4 %)	5 (3 %)
Atypical Porcine Pestivirus Infection	2 (1%)	1 (0,6 %)	1 (0,6 %)



Table 3

Main diagnoses following a necropsy or a biopsy, in MAPAQ's laboratories on piglets in nurseries in the years 2017 to 2019 and the percentage of submissions with this diagnosis for this animal sub-category.

Diagnostic	2019	2018	2017
Number of Submissions – Nursery Piglets	349	341	259
Rotavirus Diarrhea	97 (28 %)	105 (31 %)	75 (29 %)
Porcine Reproductive and Respiratory Syndrome	90 (26%)	80 (23 %)	70 (27 %)
Rhinitis (including inclusion bodies rhinitis)	78 (22 %)	60 (18 %)	31 (12 %)
Colibacillosis Diarrhea	71 (20 %)	75 (22 %)	54 (21 %)
Swine Influenza	70 (20 %)	64 (19 %)	41 (16 %)
Salmonellosis	49 (14 %)	39 (11 %)	17 (7 %)
<i>Streptococcus suis</i> Infection	42 (12 %)	56 (16 %)	60 (23 %)
Glasser's Disease	27 (8 %)	13 (4 %)	22 (8 %)
<i>Mycoplasma hyorhinis</i> Infection	26 (7 %)	30 (9 %)	32 (12 %)
Porcine Circovirus	25 (7 %)	15 (4 %)	13 (5 %)
Coccidiosis	13 (4 %)	10 (3 %)	15 (6 %)

Table 4

Main diagnoses following a necropsy or a biopsy, in MAPAQ's laboratories on feeder hogs in the years 2017 to 2019 and the percentage of submissions with this diagnosis for this animal sub-category.

Diagnostic	2019	2018	2017
Number of Submissions – Feeder Hogs	308	256	324
Porcine Reproductive and Respiratory Syndrome	96 (31 %)	100 (39 %)	109 (34 %)
Swine Influenza	49 (16 %)	37 (14 %)	48 (15 %)
Enzootic Pneumonia (<i>M. hyopneumoniae</i>)	35 (11 %)	34 (13 %)	34 (10 %)
Tracheitis	30 (10 %)	23 (9 %)	30 (9 %)
Porcine Pleuropneumonia	21 (7 %)	11 (4 %)	17 (5 %)
<i>Mycoplasma hyorhinis</i> Infection	20 (6 %)	26 (10 %)	24 (7 %)
<i>Streptococcus suis</i> Infection	18 (6 %)	18 (7 %)	33 (10 %)
<i>Actinobacillus suis</i> Infection	17 (6 %)	16 (6 %)	19 (6 %)
<i>Mycoplasma hyosynoviae</i> Arthritis/synovitis	16 (5 %)	10 (4 %)	15 (5 %)
Porcine Circovirus	15 (5 %)	20 (8 %)	18 (6 %)
Glasser's Disease	10 (3 %)	6 (2 %)	9 (3 %)
Sapelovirus Encephalomyelitis	5 (2 %)	2 (1 %)	2 (1 %)