

2018

ANNUAL REPORT FOR THE SWINE SECTOR



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

Colleagues:

Dr. Myriam Bernier, Dr. Isabelle St-Pierre and Dr. Flavien Ndongo Kassé, MAPAQ Veterinarians,
Dr. Sylvie D'Allaire, Dr. Martine Denicourt, Dr. Jean-François Doyon, Dr. Christian Klopfenstein, Dr. Alain Laperle
et Dr. Dorine Tremblay, Sentinel Veterinarians

Support for translation provided through the AgriAssurance Program under the Canadian Agricultural Partnership, a federal-provincial-territorial initiative.

Key Facts

Porcine Dysentery

A case of porcine dysentery was detected in feeder hogs in February. The animals suffered from brownish diarrhea without mucus or blood. The necropsy revealed the presence of lesions of superficial colitis with abundant, runny, greyish liquid in the colon. A PCR test for *Brachyspira hyodysenteriae* was positive. This herd was relatively isolated from other porcine herds and had few contacts with animals from other farms, so much so that the risk of transmission was low.

In April, fecal samples from another farm sent to MAPAQ's animal health laboratory was PCR positive for *Brachyspira hyodysenteriae*. Finished hogs from the farm in the Lotbinière MRC showed greyish diarrhea without mucus or blood. The on-farm necropsy did not show lesions in the spiral colon. The result of a sequencing, carried out at the Faculty of veterinary medicine's molecular diagnostic laboratory, showed a homology of 99% with the strain of *Brachyspira hyodysenteriae* B78. This strain has been reported in the literature as being of low pathogenicity¹. In this study, 21 hogs were inoculated with the strain and one (4.8%) developed clinical signs of porcine dysentery.

Hemotropic Mycoplasma

In May, a diagnosis of a hemotropic mycoplasma infection arose in a farrowing barn where four sows suddenly died in the same week. The microscopic examination that was carried out on one of the sows revealed petechiae in various tissues (lungs, pericardium, and pleura) as well as hemorrhages in the thymus. The result of the mycoplasma sequencing showed homology with a sequence that had been identified a few years earlier on a hog farm in Québec, where cases of abortions and sudden mortality in gestating sows had been reported. It also revealed a strong homology with a sequence that had been described in an article² indicating an elevated prevalence of this new agent in the province of Zhejiang

in China. The article also mentioned that carrier status is common and suggested that the agent had a weak pathogenicity.

A second case was detected in November in another farrowing barn, where abortions in sows and an increase in mortality occurred. One of the sows was sent to the laboratory for necropsy, and an atrophied spleen was noted (about one quarter the normal size). Injectable tetracyclines were administered to the febrile sows and mixed in the feed to control the disease.

Nerve Problems Caused by Sapelovirus

Nerve problems associated with sapelovirus seem to have made their appearance in Québec. Two cases were detected in the laboratory during the final quarter of 2018. The first case manifested itself by paralysis in conscious and alert nursery piglets. The morbidity rate was 3.75% and the mortality rate was 0.25%. The second case arose in early feeder hogs, which were sent for necropsy due to meningitis and sudden death. A positive PCR test was obtained from the brain and spinal cord.

The sapelovirus is an enterovirus that does not belong to the same group as the enterovirus responsible for Talfan-Tesch disease. At MAPAQ's laboratory, it was detected on two occasions in 2016 and on two other occasions in 2017. The virus is propagated in the same way as other enteroviruses, which is by fecal-oral transmission or by indirect transmission associated with mechanical vectors. Animals can be carriers without manifesting clinical signs. In the past this virus was named enterovirus 8. It must be included in the differential diagnosis of cases of meningitis and paralysis.

1 Jensen, N.S. and T.B. Stanton (1993). "Comparison of *Serpulina hyodysenteriae* B78, the type strain of the species, with other *S. hyodysenteriae* strains using enteropathogenicity studies and restriction fragment length polymorphism analysis" Vet. Microbiol. 36: 221-231.

2 Fu, Y. and others (2017). "Identification of a novel *Hemoplasma* species from pigs in Zhejiang province, China" J Vet Med Sci. 79(5): 864-870. doi: 10.1292/jvms.16-0545

African Swine Fever

The propagation of African swine fever (ASF) in Asia, which began with the declaration of a case in China in August 2018, then in Europe, particularly in the wild boar population in the south of Belgium in September 2018, has added new concerns in the global hog industry. ASF has grave consequences for swine health and economics in affected countries. 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, MAPAQ and the World Animal Health Organization (OIE). It is caused by a virus that survives for a long time in meat and processed products. At the present time, there is no vaccine nor effective treatment.

Until now Canada has remained ASF free. Consequently, federal and provincial governments and the Canadian hog industry have redoubled their efforts to improve the country's ASF prevention and preparation activities. To this end, the hog network has notably produced various information documents to increase awareness and vigilance of veterinarians and producers.

Québec's Integrated Animal Health Programme

In one of the components of Québec's integrated animal health program, campaigns were implemented to educate farmers about animal health and to help them to adopt best practices. The campaign's theme of collective control strategies for porcine reproductive and respiratory syndrome (PRRS) began in the fall of 2017 and continued into 2018. In total, 484 animal health visits were carried out between project launch and December 31, 2018. The campaign ended on March 31, 2019 and a report is anticipated.

Monitoring Programs

Monitoring Program for Epidemic Porcine Diarrhea and Porcine Delta Coronavirus

Porcine epidemic diarrhea (PED) virus and porcine Delta coronavirus (PDCV) can cause gastrointestinal illness in hogs of all ages, with highest mortality in piglets. These diseases do not pose any risk to human health or food safety. As part of this program, and with the goal of encouraging the early detection of these viruses in Québec, veterinarians may submit samples, free of charge when animals present with suspect gastrointestinal signs, when they come from a risk zone related to a confirmed case or when they may have been in contact with the virus. In addition, weekly monitoring for PED and PDCV is carried out in the unloading areas of the necropsy rooms in Québec's veterinary epidemiology-surveillance Complex and Québec's animal-health laboratory. In 2018, a total of 131 analyses were done for each of the two viruses. All analyses proved to be negative.

Monitoring Program for Senecavirus A

A passive monitoring programme for Senecavirus A (SVA) allows veterinary doctor practitioners to submit samples to the laboratory from animals who present with clinical signs compatible with the disease. In addition, in the case of an eventual introduction of the virus in Québec, the program could also serve to confirm the status of herds with an epidemiological link to a confirmed case. In 2018 no analysis were requested as part of this programme. PCR analyses are regularly carried out for SVA during porcine necropsies completed for other reasons. In this way 56 PCR analyses were completed in 2018 and all proved to be negative.

Monitoring Program for Porcine Reproductive and Respiratory Syndrome in the Context of Provincial Health Monitoring

The 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. The Éleveurs de porcs du Québec and MAPAQ offer free analyses in order to determine the status of production sites of the farmers who participate in the provincial health monitoring project. A total of 959 PCR analyses and 1,413 ELISA tests were carried out in 2018. This represents a substantial increase compared to the last two years, when 316 PCR analyses and 652 ELISA tests were done in 2017 and 475 analyses and tests in 2016.

Monitoring Program for Porcine Influenza

The porcine influenza monitoring program allows for intensified monitoring for this disease and generates information about different sub-types and various strains of influenza in Québec. When veterinary doctor practitioners suspect influenza cases, they can submit the samples to laboratories for PCR testing. When there is an increase in the number of diagnoses or the identification of new strains, veterinarians working in the porcine sector can be informed, particularly in the quarterly reports of the porcine network. In addition, public health authorities can be informed if a new strain is identified or if human cases are associated with it.

Within this programme, there were 495 requests for analyses in 2018. Of these, 49.7% produced a positive result for type A influenza, which was increased over the previous year when 33.5% of the analyses were positive. The classic sub-types H1N1 and H3N2 were identified most often (30.9% and 28.5% respectively). The complete results are presented in Table 1. Furthermore, it should be noted that the H3N1 subtype was detected in Québec for the first time. The sequencing made it possible to determine that the new subtype was a combination of H3N2 and H1N1 with genes had been previously identified in Québec.

Table 1

Results of swine influenza monitoring for the year 2018

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Number of laboratory submissions	50	37	55	48	45	27	15	27	28	75	56	31	494
Positive – Influenza A	17	12	21	25	21	10	5	6	12	33	26	12	2 (0,8%)
Positive – H1N1 pandemic	2	0	0	0	0	0	0	0	0	0	0	0	76 (30,9%)
Positive – H1N1 classic	6	6	9	12	9	7	2	2	1	11	8	3	70 (28,5%)
Positive – H3N2	4	2	6	7	4	3	1	3	7	15	10	8	5 (2,0%)
Positive – H1N2	0	0	0	1	0	0	0	0	0	1	3	0	2 (0,8%)
Positive – H3N1	0	0	0	0	0	0	0	0	0	0	2	0	45 (18,3%)
Non sub-typed	5	4	6	5	8	0	2	1	4	6	3	1	41(23,7%)
Negative – Influenza A	33	25	34	23	24	17	10	21	16	42	30	19	294 (59,5%)

Monitoring of Regulatory Diseases

The [Regulation to designate contagious or parasitic diseases, infectious agents and syndromes](#) dictates that veterinarians and laboratories must notify MAPAQ when they suspect or confirm the presence of certain diseases. This obligation aims to improve the speed of intervention, where necessary, in order to preserve livestock and public health. It also has the goal of improving monitoring of endemic diseases. Within the porcine sector, the listed diseases are porcine Delta coronavirus, porcine epidemic diarrhea, porcine dysentery, transmissible gastroenteritis, influenza, salmonellosis and Senecavirus A.

The results of this monitoring are presented in Tables 2 and 3. It should be noted that the declaration of a positive sample is considered as an alert and that many positive samples found together in the same laboratory submission are counted as one case.

Table 2

Diseases for which at least one positive case involving animals, their environment or animal by-products has been reported to MAPAQ by external laboratories for the years 2016 to 2018.

Disease	Number of positive cases (number of alerts)		
	2018	2017	2016
Porcine Deltacoronavirus*	28 (69)	45 (80)	44 (68)
Porcine Epidemic Diarrhea Virus*	29 (84)	40 (82)	64 (95)
Senecavirus A*	2 (2)	0 (0)	0 (0)
Porcine Influenza	58 (79)	71 (89)	95 (107)
Salmonellosis	6 (7)	10 (10)	8 (8)

* These results come only from samples taken in the processing plant or from ingredients for animal feed.



Table 3**Salmonella alerts from laboratories other than MAPAQ for the years 2016 to 2018**

Year	Number of Alerts		
	2018	2017	2016
Salm. ser. Derby	0	2	0
Salm. ser. Hindmarsh	0	1	0
Salm. ser. Typhimurium	1	2	0
Salmonella spp.	5	5	8



For porcine delta coronavirus (PDCV), porcine epidemic diarrhea (PED) and the Senecavirus A, positive tests were not from Québec animals. In fact, PED has been eradicated from Québec farms since November 2015, while PDCV and Senecavirus A have never been detected on a farm in the province. Positive tests for these three viruses were from samples taken at processors or in transport trucks. Often, they could be directly tied to a delivery of hogs coming from Ontario, where these diseases are currently present on farms and assembly yards. The other positive tests are linked to animal meal, which after testing positive, is excluded from hog feed. In all cases, MAPAQ makes sure that the business impacted acts in cooperation with Québec's porcine health team (EQSP) to ensure that no Québec farm runs the risk of being contaminated.

Overview of Necropsies and Histopathology

The purpose of this part of the report is to present epidemic-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 pigs. They only reflect submissions coming from veterinarians who are faced with health problems on farms.

For information purposes, a submission consists of one or more animal tissues from the same source, taken on the same date. A submission can be the subject of more than one diagnosis. In 2018, MAPAQ's animal pathology laboratories received 841 swine submissions. This number is the same as in 2016 (847), while there was a slight reduction in 2017 (802).

The following tables present the principle diagnoses made on suckling piglets, nursery piglets and feeder hogs, following necropsies or histopathology in MAPAQ's laboratories, as well as trends since 2016. The percentages are calculated as a proportion of the number of submissions for the animal subcategory. 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 4

Main diagnoses following a necropsy or histopathology, in MAPAQ's laboratories, on suckling piglets, in the years 2016 to 2018 and the percentage of the number of submissions for this animal sub-category.

Year	2018	2017	2016
Number of submissions– Suckling Piglets	182	166	172
Rotavirus Diarrhea	52 (29%)	51 (31%)	51 (30%)
Arthritis, Polyarthritis and Polysynovitis	45 (25%)	32 (19%)	26 (15%)
Exsudative Epidermatitis	31 (17%)	28 (17%)	25 (15%)
Colibacillosis Diarrhea	23 (13%)	24 (14%)	15 (9%)
<i>Streptococcus suis</i> Infection	16 (9%)	5 (3%)	16 (9%)
Rhinitis (including inclusion bodies rhinitis)	10 (5%)	3 (2%)	8 (5%)
Porcine Reproductive and Respiratory Syndrome	10 (5%)	8 (5%)	17 (10%)
<i>Actinobacillus suis</i> Infection	7 (4%)	5 (3%)	16 (9%)
<i>Mycoplasma hyorhinis</i> Infection	7 (4%)	6 (4%)	4 (2%)
Coccidiosis	6 (3%)	2 (1%)	3 (2%)
Atypical Porcine Pestivirus Infection	1 (0.6%)	1 (0.6%)	0 (0%)

Table 5

Main diagnoses following a necropsy or histopathology, in MAPAQ's laboratories, on nursery piglets, in the years 2016 to 2018 and the percentage of the number of submissions for this animal sub-category.

Année	2018	2017	2016
Nombre de soumissions – Porcelets en pouponnière	341	259	272
Rotavirus Diarrhea	105 (31%)	75 (29%)	71 (26%)
Porcine Reproductive and Respiratory Syndrome	80 (23%)	70 (27%)	84 (31%)
Colibacillosis Diarrhea	75 (22%)	54 (21%)	44 (16%)
Porcine Influenza	64 (19%)	41 (16%)	36 (13%)
<i>Streptococcus suis</i> Infection	56 (16%)	60 (23%)	42 (15%)
Salmonellosis	39 (11%)	17 (7%)	29 (11%)
<i>Mycoplasma hyorhinis</i> Infection	30 (9%)	32 (12%)	32 (12%)
Inclusion Bodies Rhinitis	29 (9%)	18 (7%)	15 (6%)
Exsudative Epidermatitis	18 (5%)	10 (4%)	6 (2%)
Porcine Circovirus	15 (4%)	13 (5%)	17 (6%)
Glasser's Disease	13 (4%)	22 (8%)	3 (1%)

Table 6

Main diagnoses following a necropsy or histopathology, in MAPAQ's laboratories, on feeder hogs, in the years 2016 to 2018 and the percentage of the number of submissions for this animal sub-category.

Year	2018	2017	2016
Number of submissions– Feeder Hogs	256	324	342
Porcine Reproductive and Respiratory Syndrome	100 (39%)	109 (34%)	116 (34%)
Porcine Influenza	37 (14%)	48 (15%)	58 (17%)
(<i>M. hyopneumoniae</i>) Enzootic Pneumonia	34 (13%)	34 (10%)	50 (15%)
<i>Mycoplasma hyorhinis</i> Infection	26 (10%)	24 7%)	32 (9%)
Tracheitis	23 (9%)	30 (9%)	32 (9%)
Porcine Circovirus	20 (8%)	18 (6%)	21 (6%)
<i>Streptococcus suis</i> Infection	18 (7%)	33 (10%)	39 (11%)
<i>Actinobacillus suis</i> Infection	16 (6%)	19 (6%)	10 (3%)
Salmonellosis	13 (5%)	11 (3%)	9 (3%)
Porcine Pleuropneumonia	11 (4%)	17 (5%)	11 (3%)
<i>Mycoplasma hyosynoviae</i> Arthritis/synovitis	10 (4%)	15 (5%)	15 (4%)
Glasser's Disease	6 (2%)	9 (3%)	12 (4%)
<i>Lawsonia intracellularis</i> Enteritis	6 (2%)	4 (1%)	10 (3%)
Porcine Dysentery	1 (0,4%)	0 (0%)	0 (0%)

