The information was obtained from a survey of the clinical impressions of practicing veterinarians between May 1st, 2019 to July 31st, 2019, and laboratory data from the Animal Health Laboratory, with input from poultry specialists. It is the intent of this program to advance and protect the health of poultry in Ontario

Ontario Animal Health Network (OAHN) - Poultry Producer Report - OAHN Q3 2019

Quarter 3, 2019 (May 1st, 2019 - July 31st, 2019)

Avian Influenza Reminder for Poultry Farmers

Influenza A virus (IAV) can infect both domesticated and wild birds, including chickens, turkeys, pheasants, quails, ducks, geese, and guinea fowl. Birds become infected when they have direct contact with the ocular or nasal discharge or feces from infected birds or from contact with contaminated surfaces, food or water supply.

There is an increased risk of IAV infection to poultry flocks during fall wild bird migrations.

Avian influenza can be brought into a barn by breaches in biosecurity, and it is most often transmitted from one infected commercial flock to another by movement of infected birds or contaminated equipment or people. All poultry farmers should monitor for mortalities and track flock feed and water consumption. Watch for any clinical signs of disease, such as depression, decreased feed consumption, a drop in egg production, swollen wattles, sneezing, gasping, discharge from the nose or eyes, diarrhea or sudden death.

If you have any concerns regarding the health status of your flock, contact your veterinarian immediately.

Key steps to reduce the risk of infection in your flock include:

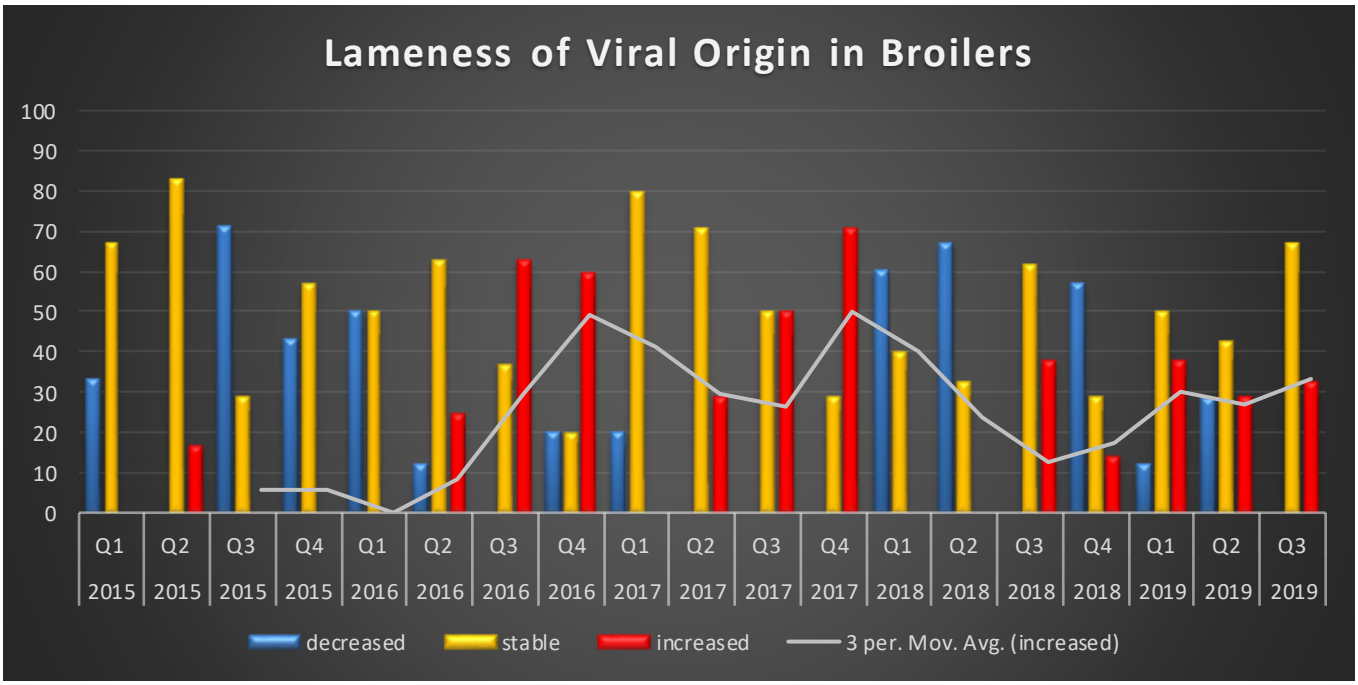
- Ensure adequate training of farm and company personnel in biosecurity and disease prevention.
- All people entering poultry barns, including farmers, employees, and service providers must put on clean footwear, protective clothing and follow all biosecurity protocols each time a barn is entered.
- Minimize visits to other poultry production sites and avoid any co-mingling of birds or contact with outside/wild birds.
- Avoid exchanging and sharing equipment with other poultry production sites or farms.
- Ensure all vehicles and farm equipment that access the barn vicinity are properly washed, disinfected and thoroughly dried before use.
- Ensure that laneways are restricted and secured.
- Prevent wild bird and rodent entry to poultry barns and related facilities.
- Ensure that bedding is free of contaminants (feces from wild animals, etc)
- If possible, "heat treat" the barn/litter ahead of chick or poult placement (to 30°C for at least 3 days).

Additional information is available at:
http://www.omafra.gov.on.ca/english/livestock/vet/facts/avian_influenza.htm
http://www.omafra.gov.on.ca/english/livestock/poultry/smallflock.html
http://www.inspection.gc.ca/animals/terrestrial-animals/biosecurity/standards-and-principles/avian-biosecurity/eng/1344748344710/1344748451521

Reovirus Update

Overall, in Ontario broiler flocks, reovirus-associated lameness cases were stable to increased this quarter (Q3 2019) (**Fig A**) compared to the previous quarters (Q4 2018, Q1 2019, Q2 2019) with a surge identified in the last couple of weeks of this quarter. The number of reovirus-associated lameness cases started to increase in Q2 2016 (Feb 01 -Apr 30 2016) and continued to surge in Q3 and Q4, 2016. A decrease in reovirus cases was observed in Q1 2017, which was followed by an increase in cases in Q2, Q3, and Q4 2017 (**Fig A**).

Fig A. Trend of reoviral-associated lameness in broilers between January 2015 and July 2019 based on the clinical impression survey of Ontario poultry veterinarians



a) The bars represent the proportion (%) of veterinarians who report the number of cases seen in a quarter as decreased, stable or increased compared to historical expected numbers of cases.

The major clinical presentations are: lameness, leg deformities, especially splayed legs, and tenosynovitis. In addition, higher numbers of birds are unsuitable for loading at the end of the grow - out. The age of the affected flocks is variable. Both horizontal and vertical transmission can occur.

Genotyping of reovirus isolates were conducted to better understand which strains of reovirus are currently circulating in the Ontario broiler population. Genotyping results indicate that there has been a shift in the genetic composition of the variant reovirus strains. New reovirus strains show low similarity to vaccine virus strains and historical avian reoviruses. In 2017 the most prevalent strain became variant D (**Fig B**). The variant D virus strain is highly virulent and can spread through the infected flocks quickly, causing severe clinical signs. Vaccination of Ontario broiler breeder flocks with autogenous reovirus variant D strain started in July 2018 and the placement of the first broiler chicks from these flocks started in early October 2018. Currently, all chicks in Ontario originate from the vaccinated breeder flocks.
In 2019, variant D strains are continuing to be the most prevalent; however, reporting is inconsistent with variant D strains reported in Q1 but not in Q2. Since 2018 a new strain, variant H began to emerge (**Fig B**).

Fig B) Distribution of reovirus strains in broilers tested at the Animal Health Laboratory between January 2011 and July 2019.

TYPE	2011	2012	2013	2016	2017	2018	2019
PA 03200 12	42.86%	2.38%	0.00%	1.47%	0.90%	0.00%	4.11%
AR 95742 2012	0.00%	0.00%	0.00%	0.00%	0.90%	0.88%	0.00%
GA 12297 2012	0.00%	2.38%	0.00%	0.00%	0.00%	0.00%	2.74%
KR-738	0.00%	0.00%	0.00%	2.94%	0.90%	3.51%	1.37%
NOT TYPED	0.00%	2.38%	0.00%	1.47%	1.80%	8.77%	9.59%
ON classic 10-076656	0.00%	0.00%	0.00%	14.71%	0.90%	1.75%	4.11%
ON classic 10-077184	28.57%	0.00%	0.00%	5.88%	1.80%	3.51%	4.11%
ON classic 10-078957	0.00%	0.00%	0.00%	4.41%	0.00%	0.00%	9.59%
S1133	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.37%
SK R8	0.00%	0.00%	0.00%	0.00%	0.00%	0.88%	0.00%
SK-R38	0.00%	0.00%	66.67%	0.00%	0.00%	0.00%	0.00%
Variant A	0.00%	38.10%	0.00%	25.00%	1.80%	7.02%	5.48%
Variant B	0.00%	42.86%	33.33%	0.00%	0.00%	0.00%	1.37%
Variant C	0.00%	0.00%	0.00%	27.94%	4.50%	1.75%	2.74%
Variant D	0.00%	0.00%	0.00%	7.35%	82.88%	46.49%	34.25%
Variant E	14.29%	9.52%	0.00%	7.35%	1.80%	10.53%	4.11%
Variant F	0.00%	2.38%	0.00%	1.47%	0.90%	1.75%	2.74%
Variant G	0.00%	0.00%	0.00%	0.00%	0.90%	1.75%	2.74%
Variant H	0.00%	0.00%	0.00%	0.00%	0.00%	11.40%	9.59%

Severity of the clinical signs, speed of spread through the flock, and the proportion of chicks affected with these variant reovirus infections are unpredictable. Properly implemented biosecurity is the poultry producer's first-line of defense against reovirus infections. Biosecurity protocols should be well thought-out, stringently implemented, and continuously followed.

Biosecurity recommendations for Ontario poultry farms

The following is a list of **suggested biosecurity measures** for Ontario poultry farms:

- Each farmer, employee, and every person entering any poultry barn must put on clean footwear, protective clothing, and follow all biosecurity protocols.
- Minimize visits to other poultry production sites and avoid any co-mingling of birds.
- Avoid exchanging equipment with other poultry production sites.
- Ensure all vehicles/farm equipment that access the barn vicinity are clean and that the laneway is restricted/secured.
- If possible, have a pressure washer or a hose available to wash tires and equipment, and make this available to all service vehicles and visitors.
- If possible, "heat treat" the barn/litter after cleanout and introduction of new bedding, and in advance of bird placement (to 32˚C or 90˚ F for a minimum of 2-3 days). Note the floor under the bedding must reach 32˚ C for this technique to be effective. The temperature should be measured with an appropriate thermometer (consider an infrared thermometer) at multiple locations along the inside perimeter of the barn at least 3 times a day.
- The barn floor should reach 32˚C at least 4 days prior to placement to create a stable barn temperature at an optimal chick range.

- **Before spreading manure** from infected flocks or suspect flocks, it is important that it is properly **composted** to neutralize the virus. Pile and compost the litter inside the affected barn or in a designated and contained facility/area. You need to check the temperature of the compost pile 3 times a day and ensure the temperature of the compost pile is at least 32˚C or 90˚ F for a minimum of 3 days.
- **Do not spread used untreated litter** within at least 1 km of a poultry barn. Avoid spreading on very windy days.
- Have an effective **insect** (e.g. darkling beetle) and **rodent control program** as vermin can be vectors of pathogens, and can act as reservoirs and can transmit pathogens to subsequent flocks.

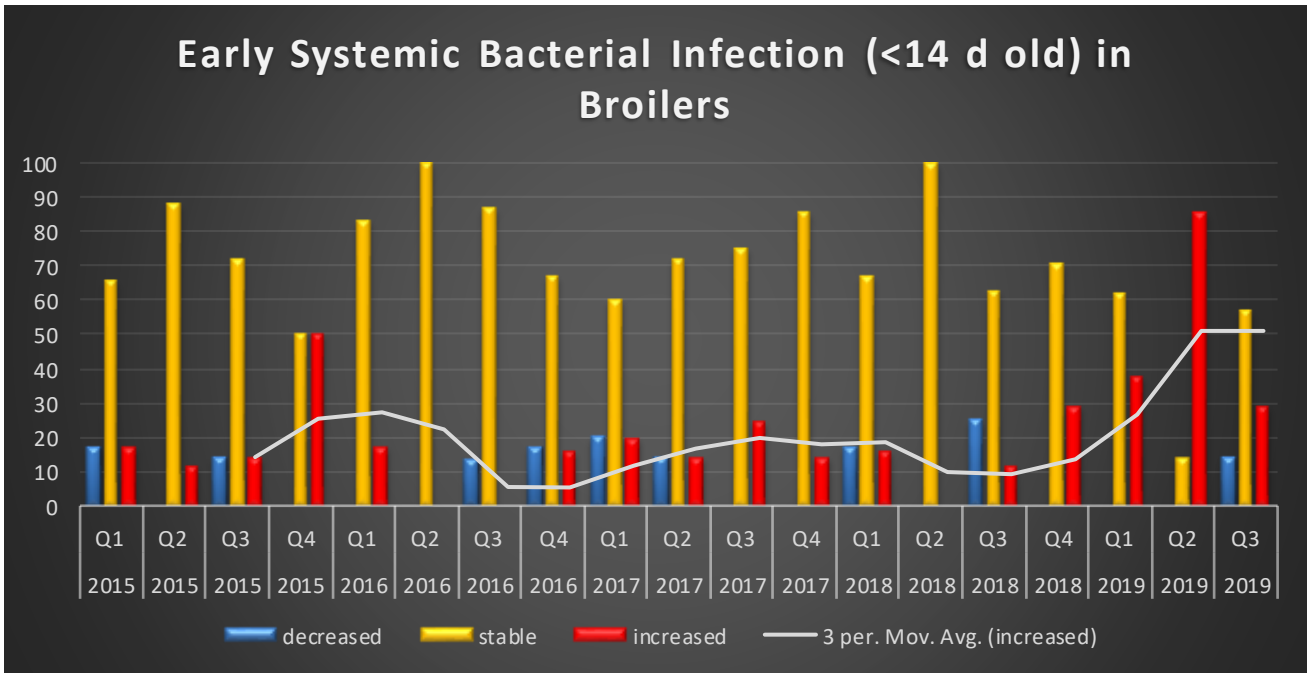
Additional information on biosecurity, composting, and darkling beetle control available at:
http://www.omafra.gov.on.ca/english/livestock/poultry/facts/16-047.htm
http://www.omafra.gov.on.ca/english/engineer/facts/09-017.htm
http://www.omafra.gov.on.ca/english/livestock/poultry/facts/16-053.htm

Poultry Veterinarian Survey Highlights

Broilers

- **Early systemic bacterial infections** (<14 d old) (Fig A) were stable to increased this quarter (Q3 2019) (**Fig C**). *Escherichia coli* was commonly identified from these cases.

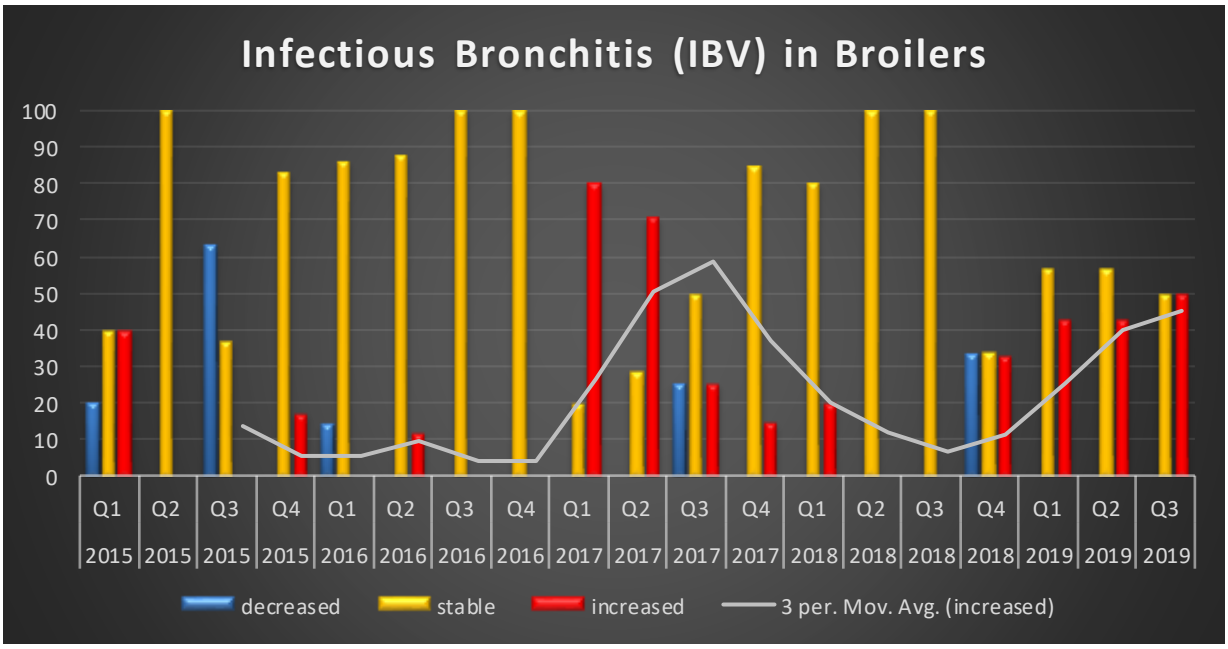
Fig C) Trend of early systemic bacterial infections in broilers between January 2015 and July 2019 based on the clinical impression survey of Ontario poultry veterinarians. [a)]



b) The bars represent the proportion (%) of veterinarians who report the number of cases seen in a quarter as decreased, stable or increased compared to historical expected numbers of cases.

- **Late systemic bacterial infections** (>14 d old) was stable this quarter. *Escherichia coli* or *E. coli* in combination with *E. cecorum* were detected from these cases.
- **Reovirus-associated lameness cases** was stable to increased this quarter (Q3 2019) (Fig A). Reovirus variants Genotype 4 Georgia strain, Ontario variant C strain, and Ontario variant E strain and a late surge of Ontario variant D strain were reported from the affected flocks (**Fig B**).
- **Lameness of bacterial origin** was stable to increased in this quarter. The majority had *E. coli* involvement and few cases had *Enterococcus* and *E. coli* or *S. aureus* involvement.
- **Lameness of developmental cause** was stable. One practitioner reported TD.
- **Lameness of nutritional origin** was stable this quarter. A few cases of **rickets** were reported.
- **Coccidiosis** was increased to stable this quarter. Eleven cases of small intestinal, three cases of intestinal and cecal, and one case of cecal coccidiosis was diagnosed by AHL. No secondary necrotic enteritis was reported from these cases.
- **Necrotic enteritis** cases were stable for this quarter.
- **Inclusion body hepatitis (IBH)** cases reported by poultry veterinarians this quarter (Q3 2019) were increased to stable. Age of the affected flocks ranged from 8 to 26 days. The majority of cases identified by the Animal Health Lab were: species D (serotype 11) with much fewer species E (serotype 8). Domestic breeder flock vaccination with reformulated autogenous vaccine containing serotype 8 and 11 strains of fowl adenovirus began in August 2018.
- The poultry veterinarians reported stable to increased **IBV infections** (**Fig D**). The DMV strain continued to be the predominant strain detected in affected flocks. One clinical presentation was increased mortality at the end of the flock. The typical summer drop in ascites was not reported by practitioners in this quarter and perhaps this continued elevated rate of ascites is linked to the stable to increased IBV infections.

Fig D. Trend of infectious bronchitis cases in broilers between January 2015 and Jul 2019 based on the clinical impression survey of Ontario poultry veterinarians



- **Infectious bursal disease virus (IBDV)** was stable to increased this quarter.
- **Runting and stunting syndrome** (RSS) was reported by a practitioner and a few cases were also identified by the lab.
- Over this quarter, there were increasing reports of proventricular dilation and thickened proventriculi on farm with no breed specificity. There were also sporadic reports of proventricular dilation resulting in delayed emptying following normal feed withdrawal practices causing increased condemnations at processing from contamination. In addition, field practitioners have reported seeing chickens with pendulous crops and chickens regurgitating feed. Samples of affected proventriculi from affected flocks on farm and at processing, were sent for immunohistochemical staining (IHC) for chicken proventricular necrosis virus (CPNV). Results of this initial screening show that only 3 of 18 cases of affected proventriculi were positive for CPNV. Cases positive on IHC were from young broilers with clinical presentation of runting and stunting showing severe proventriculitis on pathology examination. No samples of dilated proventriculi collected at processing were positive. In conclusion, initial testing does indicates that TVP is in Ontario broilers but to a limited degree. Further testing is warranted in order to determine the prevalence and the possible role that TVP may play in proventricular dilation. Further discussions with the poultry industry are underway to determine next steps forward to investigate proventricular dilation and proventriculitis.
- More cases of ventriculitis with adenoviral inclusions in the mucosal villi were identified by the lab in this quarter. Fowl adenovirus has been associated with gizzard erosions/ulcerations but this is an uncommon finding in Ontario broilers.
- One case of aspergillosis was reported.
- One case of ILT with the vaccine strain was reported.
- Two more cases with mild **inhaled foreign body pneumonia** associated with peat moss bedding were also reported this quarter.
- **Condemnation** issues were stable to increased this quarter (Q3 2019). Ascites, cases of proventricular dilation, proventriculosis, pendulous crop, yellow wing, and cecal cores at processing were also reported. Yellow wing is an interesting condition that results in condemnation at processing and is a condition that has been seen over the last year. The skin over the back between the two wings is yellow and the lesion is usually unilateral. Histology from one submission of affected birds indicates that there is a cellulitis, deep myositis and synovitis/chondritis of the shoulder joint. Further evaluation is warranted including bacterial cultures.

Broiler-Breeders

- **Early bacterial infections (<14 d old) with and without associated yolk sacculitis** were stable this quarter**.** Most commonly, *E. coli* was isolated with only occasional cases where a mixture of bacteria including *E. coli, Enterococcus cecorum,* and *Staph. aureus* were isolated. One case of starve-out and one case of very early cecal cocci infection have been detected.
- **Later bacterial infections (> 14 d old)** were also reported as a mixture of infections with bacteria, including *E. coli*, *E. cecorum*, *S. aureus,* and *Gallibacterium anatis.*
- **Intestinal intussusceptions** continue to be occasionally seen and the shift to affecting younger flocks also continues. This quarter, the AHL lab diagnosed 5 cases between 4 and 7 weeks of age. It is not unusual to find dark red fluid and blood-stained litter in the crops of affected chickens and this is considered to be part of the clinical picture of intestinal intussusceptions.
- One case of **CAV** in 9 week-old pullets was reported. This flock experienced high mortality at 11 weeks when vaccinated and also went on to develop systemic bacterial infection with *S. agneti* and *E. coli*

isolated. This is the second report of *S. agneti* being detected in immunosuppressed broiler breeders (see Q2 2019 report). The recent literature indicates that, in 2015, *S. agneti* was identified in broiler chickens with bacterial osteomyelitis, and more recently this bacterium has also been associated with bacterial endocarditis and septicemia in broiler breeders.

- Occasional cases of the atypical systemic mycosis associated with *Aspergillus oryzae* were also reported.
- Vaccine-induced granulomatous cellulitis, myositis, and vertebral osteomyelitis and spinal meningitis was also reported.
- **Necrotic enteritis** and **coccidiosis** remained stable for this quarter. Four small intestinal, 3 *E. necatrix*, 3 small intestinal and cecal, and 9 cecal coccidiosis were reported by the AHL.
- **Bacterial lameness** cases were stable this quarter. Arthritis and tenosynovitis with *Staphylococcus aureus* alone or mixed with *E. coli* or *E. cecorum* was noted in breeder flocks.
- **Variant C strain of reovirus** was detected in one young breeder flock with lameness.
- **Developmental lameness** cases were stable. A few males with TD were reported.
- **Lameness of nutritional cause** in males were reported by practitioners. Feeding female feed to the males during light stimulation and into production might be related to leg or footpad issues. A few cases of **rickets** were also reported by practitioners.
- A few cases of i**n-lay bacterial septicemia** at the beginning of lay were reported**.** Mostly *E. coli* in combination with other bacteria including *S. aureus, E. cecorum, G. anatis*, *E. faecalis,* and *P. aeruginosa* were detected. Infrequently, *E. coli* is isolated as the sole pathogen.
- **IBV infections** remained stable this quarter. Two flocks were infected with IBV strain DEL072 and production peaked at approximately 70%. One case of IBV_CA_1737 as well as occasional isolations of DMV were also reported from breeder flocks. One flock developed cystic oviducts and the IBV PCR results were inconclusive but it has been previously recognized that various variant strains of IBV are associated with cystic oviducts.
- **Disease-related hatchability issues** remained stable**.** Occasional **c**ases of astrovirus continue to be seen.
- Low percentage of ***Salmonella* isolations** on routine environmental monitoring were noted. *Salmonella* Kentucky, *S*. Heidelberg, *S*. Kiambu, *S*. Putten, and *S*. Livingstone were the most commonly reported serovars.

Layers

- The disease pressure on laying hens has been low this quarter.
  - **Bacterial peritonitis / salpingitis** due to *E. coli* remained stable.
  - **Early systemic bacterial infection** (<14 d old) was episodic and isolated. *E. coli* is most commonly isolated.
  - **Infection bronchitis** causing production drop/abnormal eggs or respiratory issues remained stable. Two IBV cases with best match to DMV strain and 1 case with best match DE_072 have been reported by the AHL. The effect of IBV on the flocks is lower in comparison with previous years with minor brief drops in production and a few reports of false layers.
  - The report of increased incidence of coccidiosis is likely related to the increased uptake in coccidial vaccination.

Turkeys

- **Early** (<14 d old) **and late systemic bacterial infections** (>14 d old) were stable to increased. *E. coli* was the predominant bacteria in the early systemic bacterial infections. One case of mixed bacterial septicemia including *E. coli*, *S*. Bredeney and *P. aeruginosa* was reported in poults. In older birds, *E. coli*

alone or in combination with *E. cecorum,* caused late bacterial septicemia. Other causes of early mortality included starveouts, gizzard impactions, and round heart.

- ***Salmonella*** isolations in turkeys were slightly increased. The following serovars were isolated from turkey flocks: *S*. Heidelberg, *S*. Typhimurium, *S*. Mbandaka, *S*. Uganda, *S*. Schwarzengrund, *S*. Senftenberg, and *S*. Hadar.
- One case of **ionophore toxicosis** was reported from a turkey flock.
- Multiple concurrent lesions including tendon rupture, tibial dyschondroplasia (**TD**), long bone deformity, tenosynovitis; and tenosynovitis/synovitis were reported from a few flocks. One severe case of TD was also reported.
- *Bordetella bronchiseptica* and *S. aureus* were isolated from one flock of 10-week-old tom turkeys with dermatitis and cellulitis. The isolation of *B. bronchiseptica* is unusual in turkeys especially from skin lesions. Risk factors such as cats/dogs in close proximity to the flock were not identified.
- One case of **breast blisters** has been detected in a turkey flock.
- **Necrotic enteritis** and **coccidiosis** were stable this quarter.
- There was one report of **Fowl Cholera in toms.** There were no reports of **Erysipelas** this quarter.
- A few cases of **pecking** were reported by a practitioner.
- Several practitioners reported higher condemnations due to **breast blisters** in toms.

We thank the following poultry veterinarians who completed the veterinary survey: Dr. Elizabeth Black, Dr. Peter Gazdzinski, Dr. Shahbaz Ul Haq, Dr.Genevieve Huard, Dr. Mike Joyce, Dr. Anastasia Novy, Dr. Mike Petrik, Dr. Cynthia Philippe, Dr. Joanne Rafuse, Dr. Fernando Salgado-Bierman, Dr. Kathleen Sary, Dr. Ben Schlegel, Dr. Lloyd Weber, Dr. Alex Weisz, and Dr. Jessalyn Walkey.

Updates

- **Egg drop syndrome** (EDS'76) caused by duck adenovirus 1 (DAdV-1) in layer chickens has recently been reported in the US. Clinical signs included a partially rebounding drop in production with the production of shell-less, thin-shelled, and pale eggs that did not return to normal. If you have concerns regarding the health status of your flock, contact your veterinarian.
- Upcoming **Poultry Industry Council events:** https://www.poultryindustrycouncil.ca/poultry-industry-events/2019-08/
- **Poultry Health Research Network** information, events, and lectures can be accessed on the PHRN website: https://phrn.net/
  or on the PHRN YouTube channel: https://www.youtube.com/user/PoultryHRN

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