



“False layer” cases

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ATLANTIC POULTRY CONFERENCE

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“False layer” cases

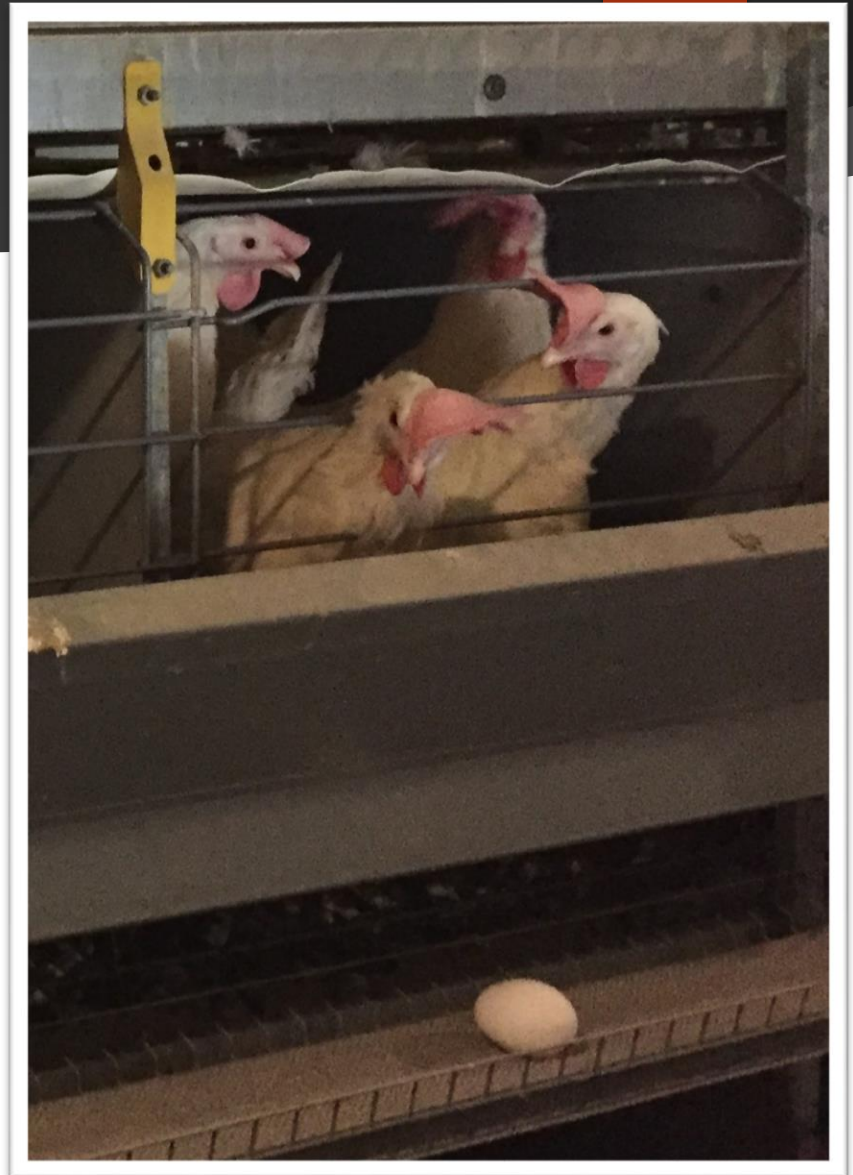
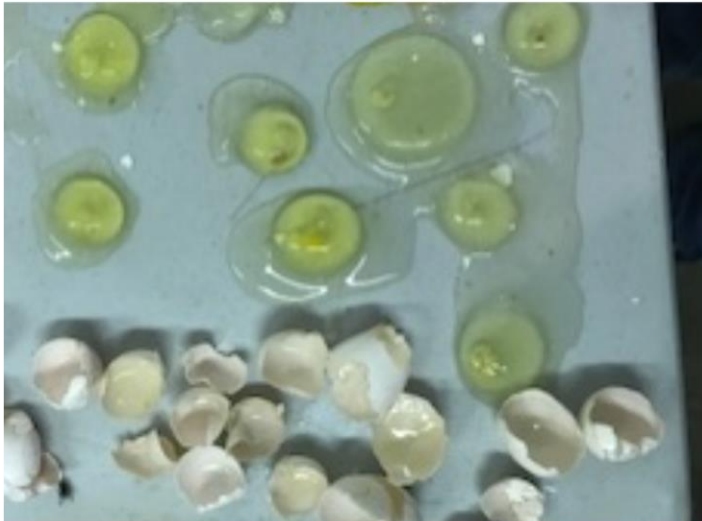
- ▶ 4 cases from June to September 2017
- ▶ Egg production stops at 22–24 weeks
 - ▶ Percentage varies, 40%–85%
- ▶ Equipment
 - ▶ Cages
- ▶ Layers
 - ▶ No clinical signs
 - ▶ Normal feed consumption
 - ▶ Normal mortality rate
 - ▶ «Big belly birds» in dead birds



“False layer” cases

► Eggs

- Increased rate of very small eggs with no yolk
- Some cages had fewer eggs
- Normal eggs and shells



“False layer” cases

- «Big belly» in dead birds
- Distended abdomen
- Emaciation
- Cystic left oviduct
- Large amount of fluid



“False layer” cases

- ▶ «Big belly» in live birds
 - ▶ Vertical gait
 - ▶ Palpation
 - ▶ Distended abdomen
- ▶ Necropsy
 - ▶ Large amount of fluid
 - ▶ Cystic oviduct



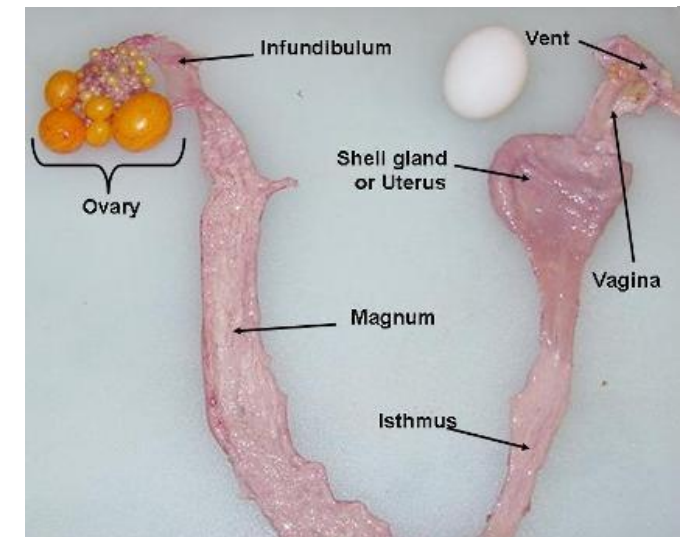
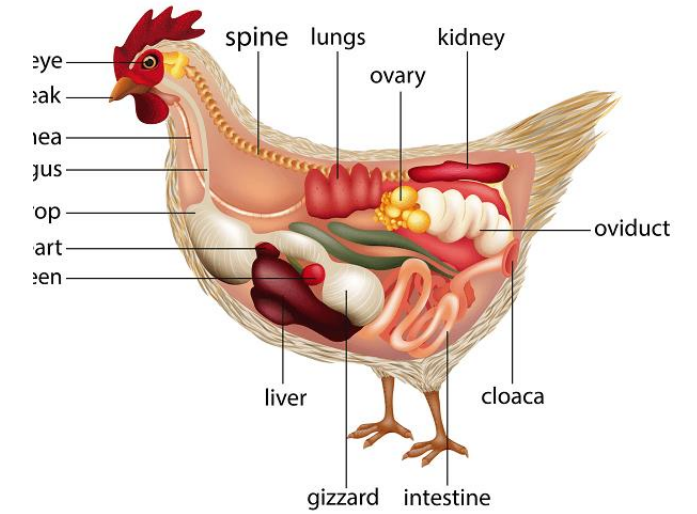
“False layer” cases

- ▶ Looking for «Big belly birds»...
 - ▶ Not easy to find!
- ▶ Evaluation of oviducts
- ▶ Prevalence
- ▶ Necropsy
 - ▶ 30 healthy birds
 - ▶ Random



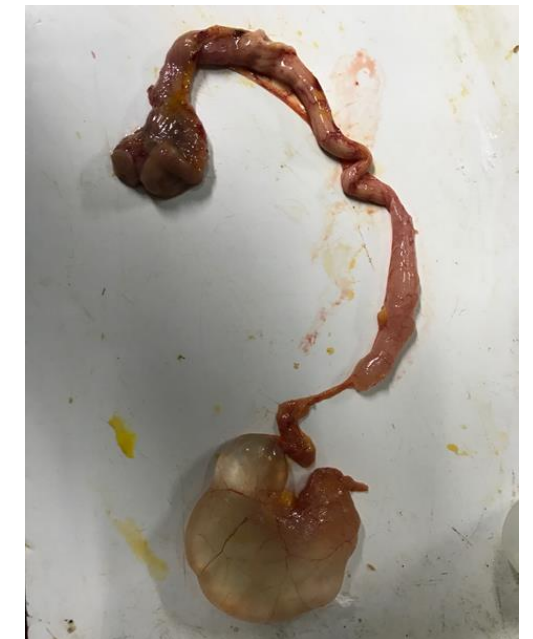
Normal Oviduct

- ▶ Normal length
- ▶ Normal development



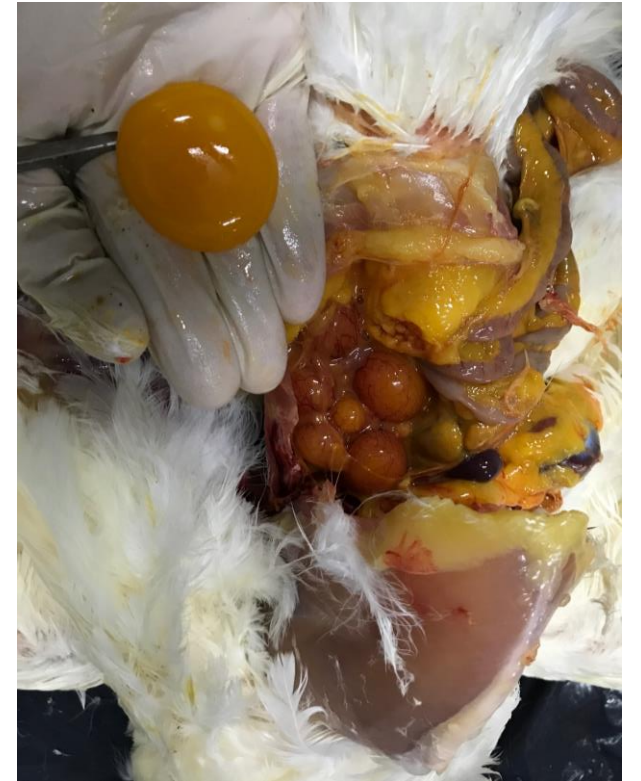
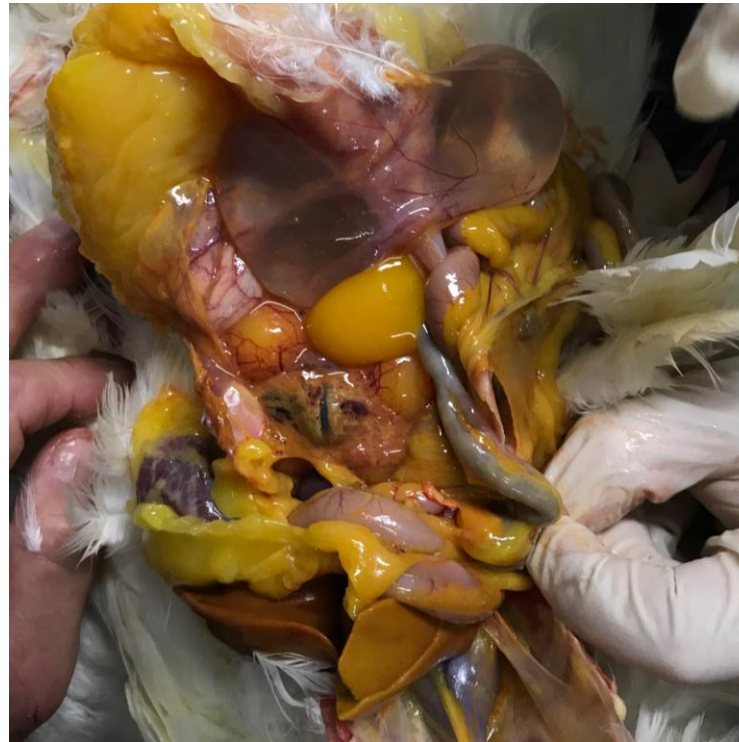
“False layer” cases

- Left oviduct
 - Short
 - Atresia
 - Partial aplasia
 - Cysts



“False layer” cases

- Free yolk in the abdominal cavity
- Reabsorption after ovulation



“False layer” cases

- Abdominal fat deposition
 - Abondant
 - Dark yellow
- Fatty liver



Impact of the disease on egg layers

- ▶ Between May and December **2017**, **four cases of "false layers"** were reported. The flocks were **slaughtered** due to their low egg production.
- ▶ **Two new cases** were reported in early February **2018** with **epidemiological links** to cases reported in 2017.
- ▶ 2 cases found in the **spring of 2018** with no virus detection. The production peaks were in the low '90.
- ▶ In some other cases, a **detection of false layers by palpation** has been done in the barn for culling purpose.
- ▶ **IBV DMV strain was detected** in the **first three cases** of 2017. There was **no virus identification** in the **last 3 cases**.

Pullet Cases						
Grower	Producer	Hatch Date	Age	Breed	Production	Flock Size
		Nov 22-29	24wk	Shaver	41	17600
		Nov 22-29	24wk	Dekalb/Sha	74/58	36000
		Nov 22-29	24wk	Bovan	55	16800
		Nov 22-29	24wk	Bovan	70	7600
		Nov 22-29	24wk	Bovan	50	30300
		Nov 22-29	24wk	HY BR	86	5200
		Nov 22-29	24wk	HY BR	90	9696
		Nov 22-29	24wk	ISA Br	90	8972
		23-Nov	24wk	Lohmann	84	62400
		27-Sep	32wk	Lohmann	90	40320
		23-Sep	33wk	Lohmann		23500
		05-Oct	31wk	Lohmann	86	14428
		05-Oct	31wk	Lohmann	88	5935
		05-Oct	31wk	Lohmann	87	11880
		05-Oct	31wk	Lohmann	87	3840
		18-Nov	25wk	Shaver	75	23240
		18-Nov	25wk	Lohmann	60	30720
		22-Nov	24wk	Lohmann	70	4278
		22-Nov	24wk	Lohmann	66	7500
		18-Nov	25wk	Bovan	66	13545
		17-Jan	15wk	Lohmann		64000
		17-Jan	15wk	Lohmann		44000
6	22					481754

It all started
with cases
in Ontario...

Fall 2016 in Ontario

- **Commercial layers affected during production**
 - **Peak ranging from 40% to 90%** (expectation >95%)
 - **Depopulation of many flocks** and major loss for the industry
 - **No clinical signs during the growing period** but showed a low peak of lay
 - Knowing that a **flock affected by IBV** during the **first 3 weeks of life** may experience false layer syndrome...

Fall 2016 in Ontario

- **Increased incidence of clinical cases of IBV**
 - **Commercial egg layers**
 - Reduced laying performance
 - 10%–20% transitory decrease in **egg production**
 - Flocks remained **under the production curve** (>5%) **for months**
 - **Breeders**
 - **No reports of false layer syndrome**
 - Minor drop in **egg production**
 - Increase in water consumption and **wet litter**
 - Slight increase in **mortality**
 - **Broilers:**
 - increases in **mortality and condemnation**

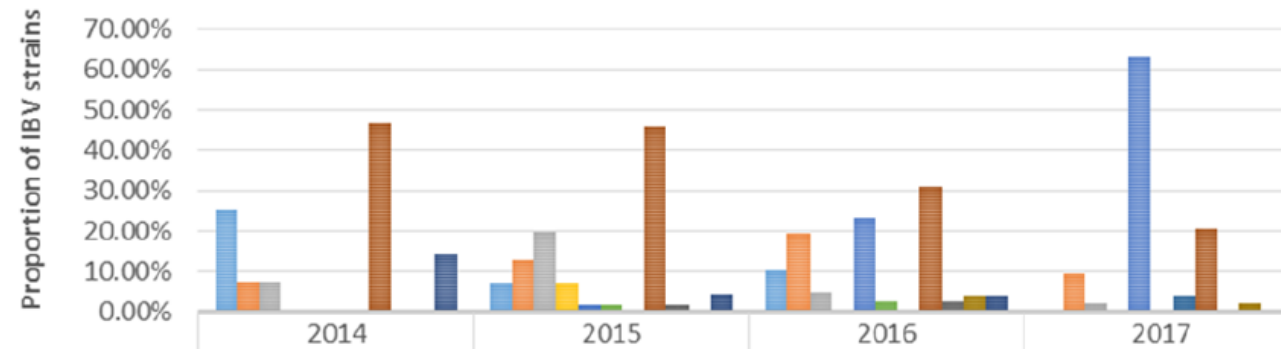
Fall 2016 in Ontario

- **Many submissions for virus identification (IBV PCR)**
 - Virus not identified
- **Identification of a Delmarva IBV (DMV 1639) strain**
 - News PCR primers
 - November 2016: University of Guelph
 - In layers, broiler breeders and broilers
 - June 2017: University of Montréal

Genotypes of IBV strains in Ontario

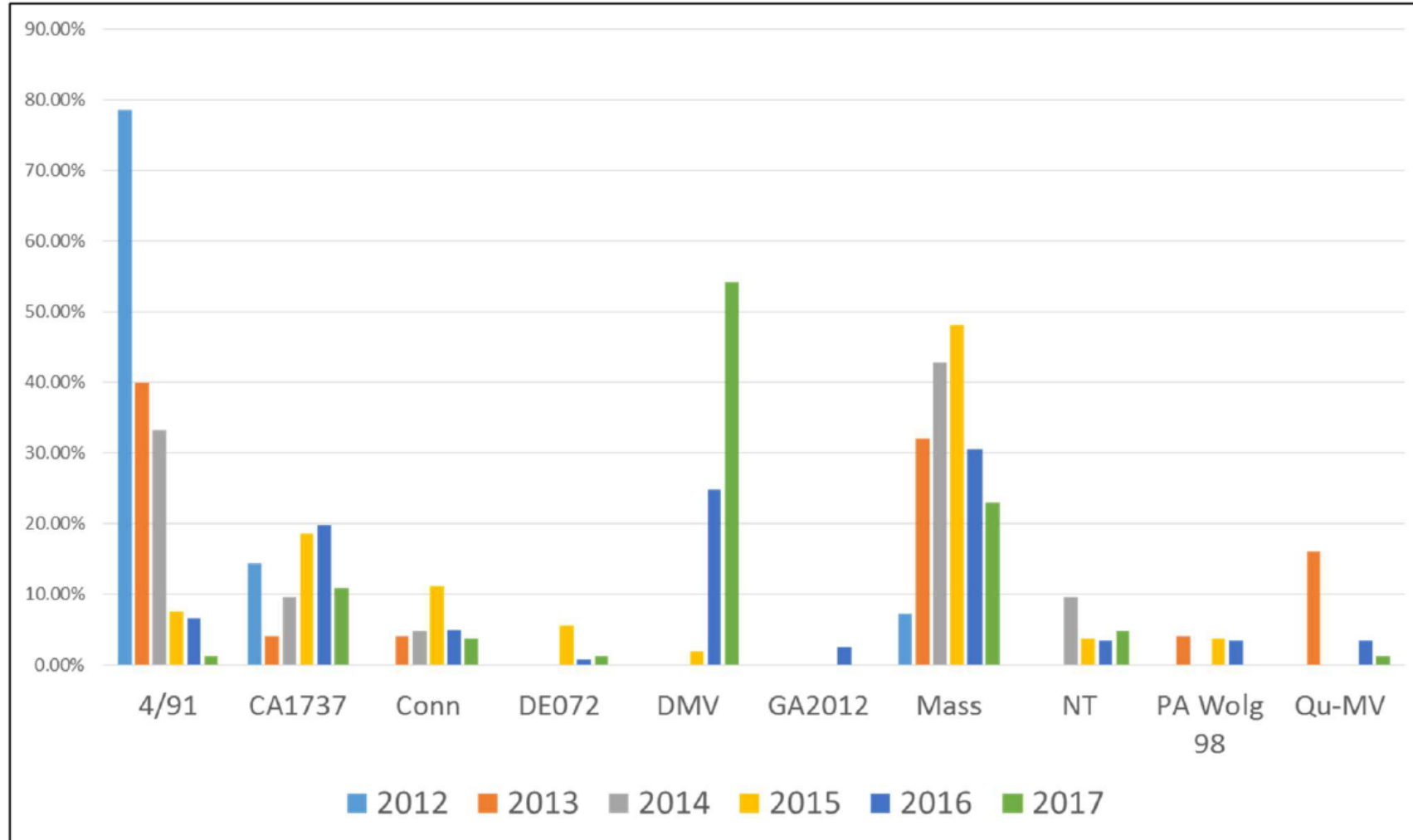


GENOTYPING OF IBV STRAINS



4/91	25.00%	6.94%	9.92%	0.00%
CA 1737	7.14%	12.50%	19.08%	9.26%
Conn	7.14%	19.44%	4.58%	1.85%
CU82792	0.00%	6.94%	0.76%	0.00%
DMV	0.00%	1.39%	22.90%	62.96%
GA 2012	0.00%	1.39%	2.29%	0.00%
GA 13384 2013	0.00%	0.00%	0.00%	3.70%
Mass	46.43%	45.83%	30.53%	20.37%
PA Wolg 98	0.00%	1.39%	2.29%	0.00%
QU mv	0.00%	0.00%	3.82%	1.85%
Ungrouped	14.29%	4.17%	3.82%	0.00%

Distribution of IBV strains in Ontario

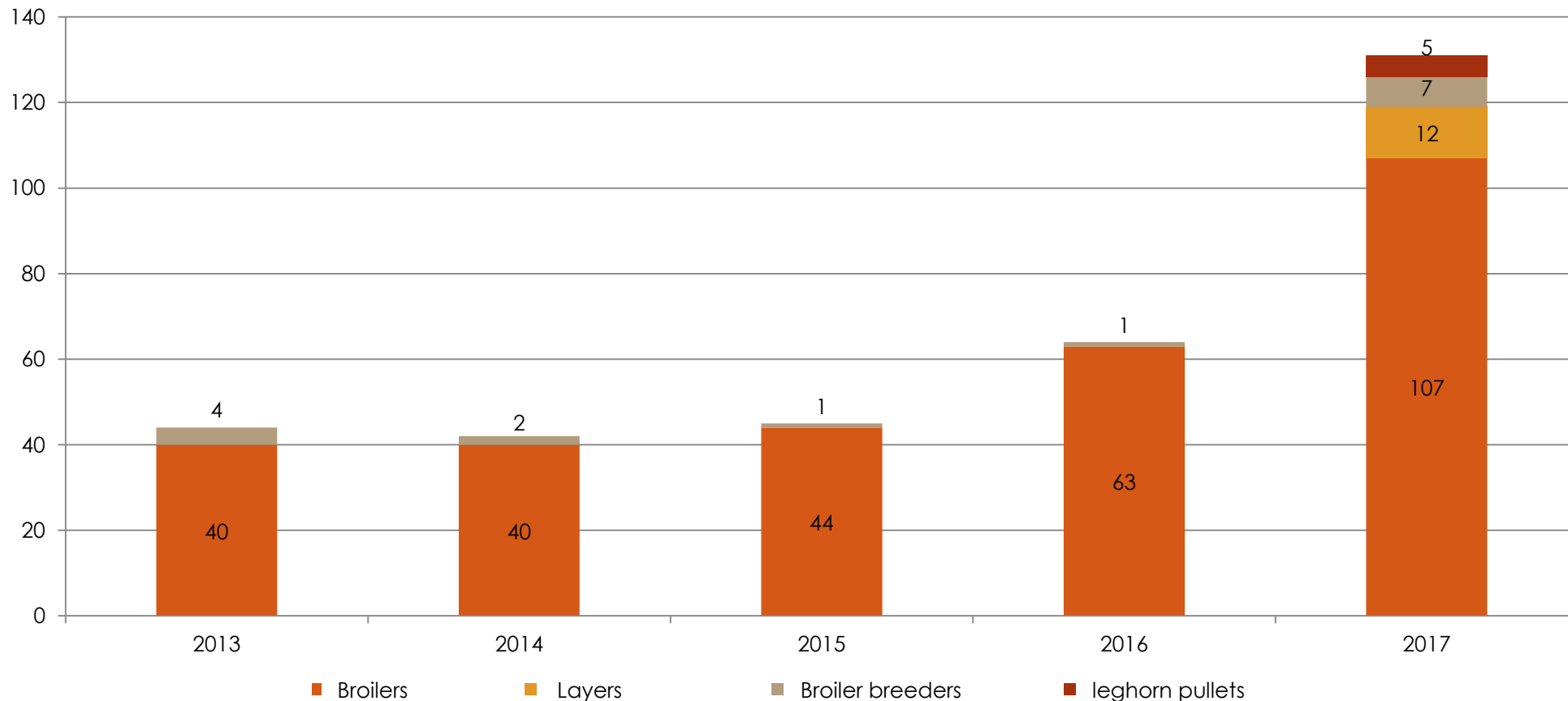




What our laboratory tests have taught us
over the last few months...

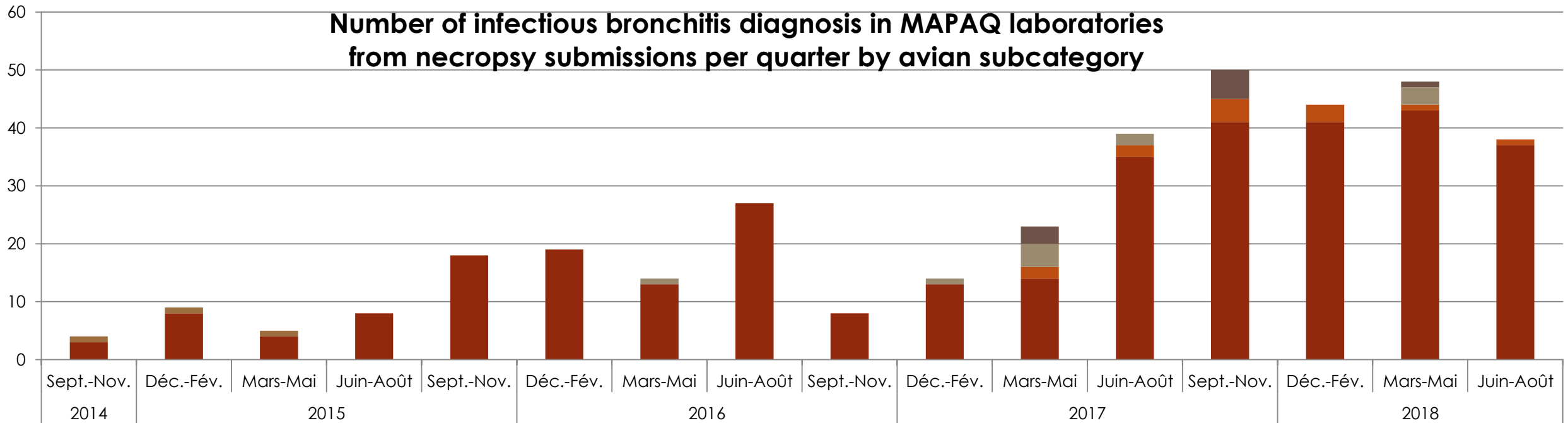
Infectious bronchitis diagnosis

Distribution of infectious bronchitis diagnosis in MAPAQ laboratories from 2013 to 2017



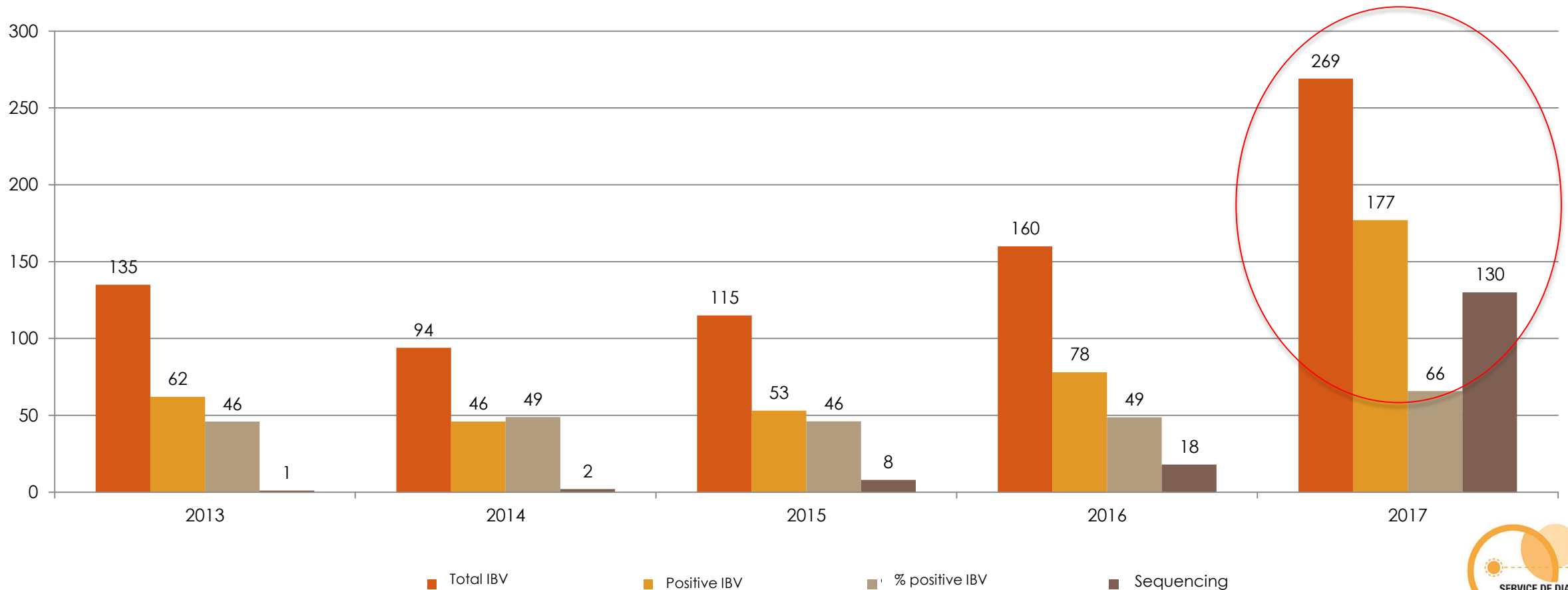
Infectious bronchitis diagnosis

Number of infectious bronchitis diagnosis in MAPAQ laboratories
from necropsy submissions per quarter by avian subcategory



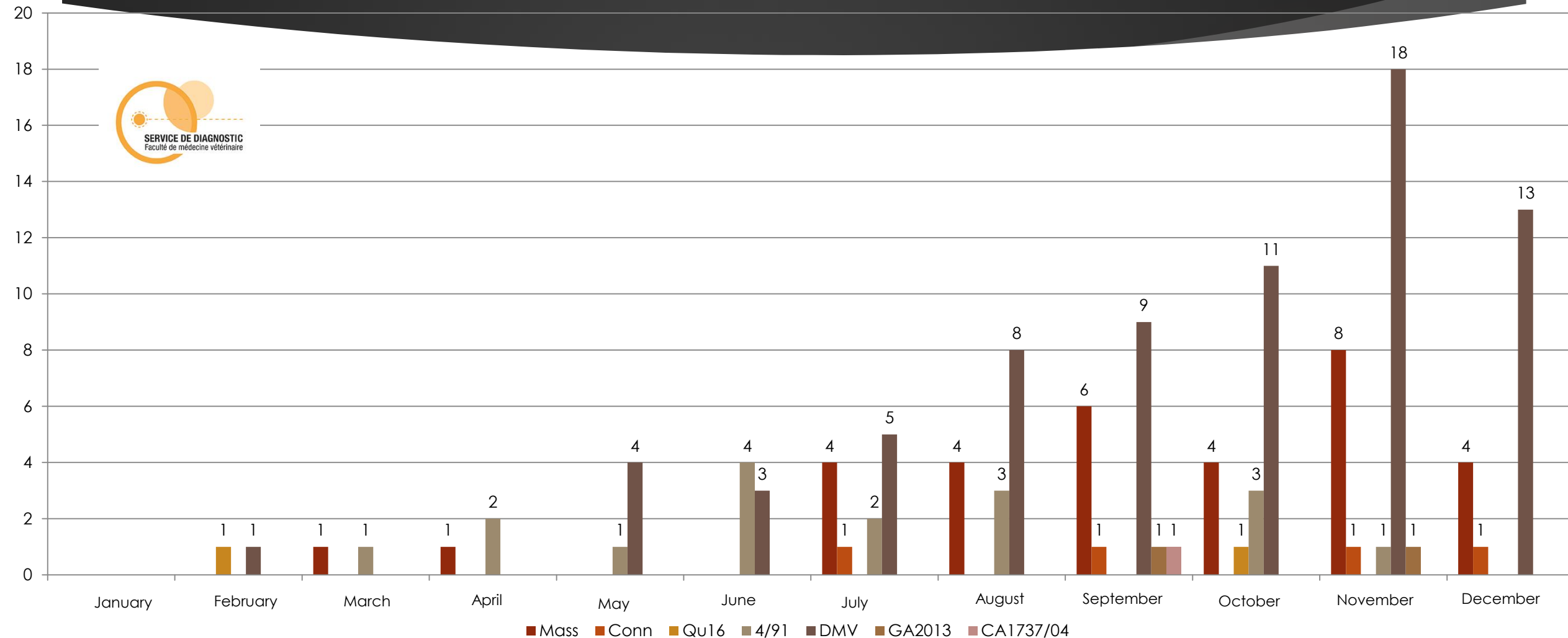
PCR testing for infectious bronchitis

Number of submissions with IBV PCR test, number of submissions with positive IBV PCR test, proportion of submissions with positive IBV PCR test and number of sequencings performed MAPAQ data (IBV PCR) and FMV data (Sequencing)



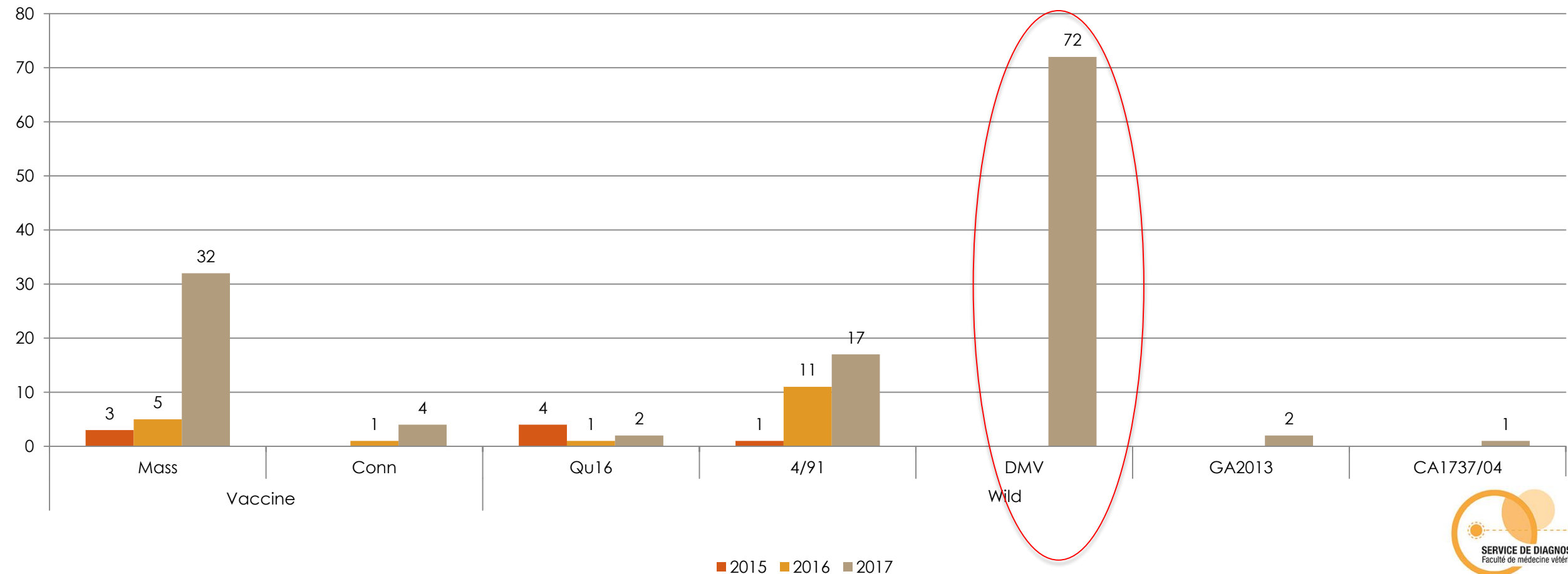
Infectious bronchitis strains

Number of IBV strains identified in Quebec in 2017 by month



Infectious bronchitis strains

Number of IBV strains identified in Quebec per year from 2015 to 2017



DMV 1639 strain

72 detections of DMV-homologous strains reported by the Veterinary Medicine Faculty (FMV) Diagnostic Service in 2017.

Retrospective: First detection on February 2, 2017

53 submissions received by Quebec Ministry of Agriculture, Fisheries and Food (MAPAQ) (47 farms), including 45 necropsies

► All main regions

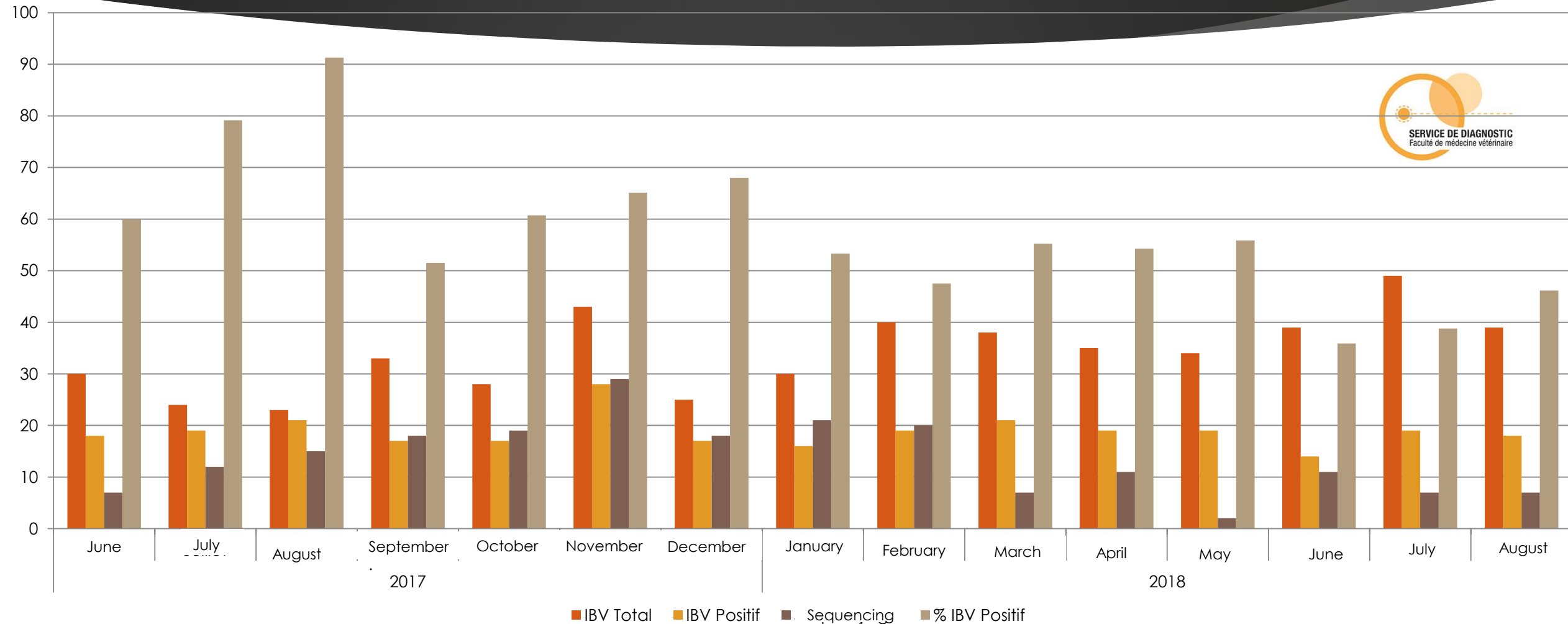
Region	Number of sites (%)
Centre-du-Québec	6 (13)
Chaudière-Appalaches	16 (34)
Lanaudière	6 (13)
Laurentians	1 (2)
Montréal	18 (38)

► All types of birds

Bird type	Number of sites (%)
Broilers	32 (68)
Pullets	3 (6)
Layers	12 (26)

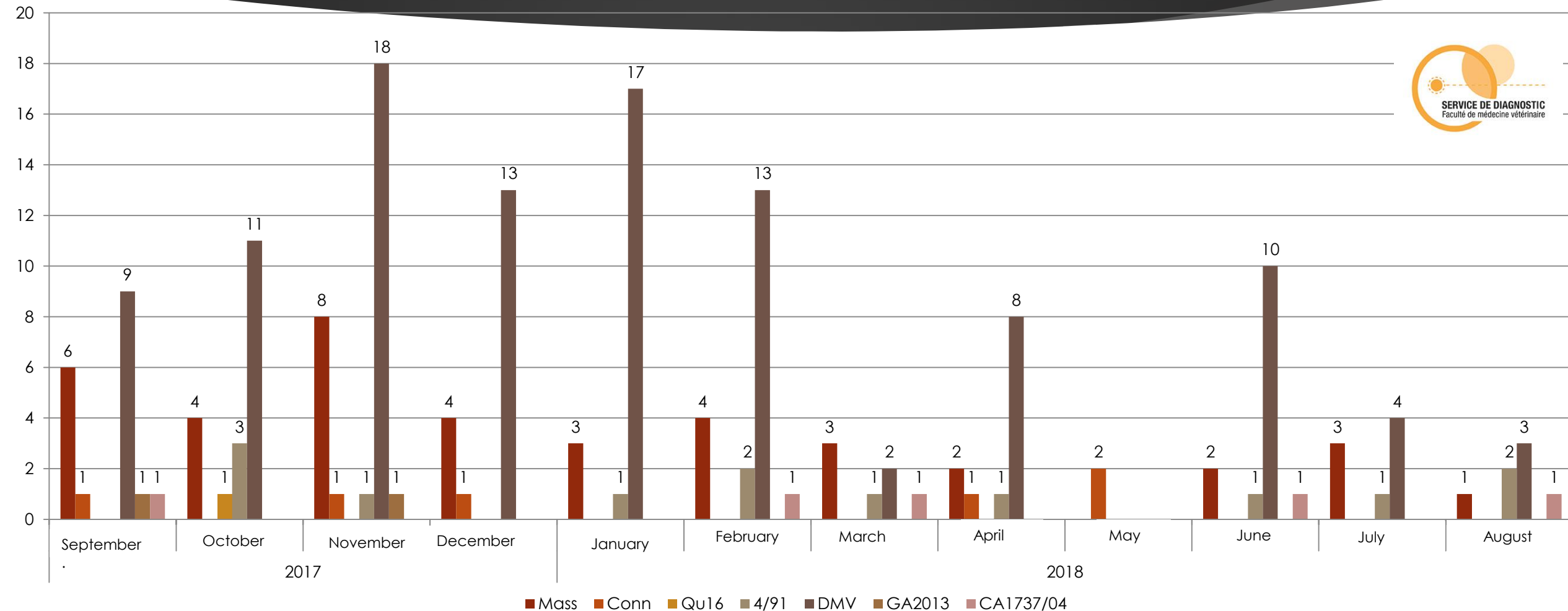
PCR testing for infectious bronchitis 2018

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Infectious bronchitis strains 2018

Number of IBV strains identified in Québec in the last 12 months

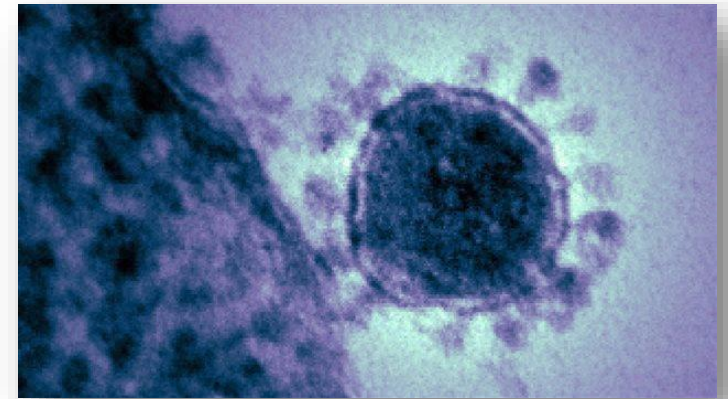




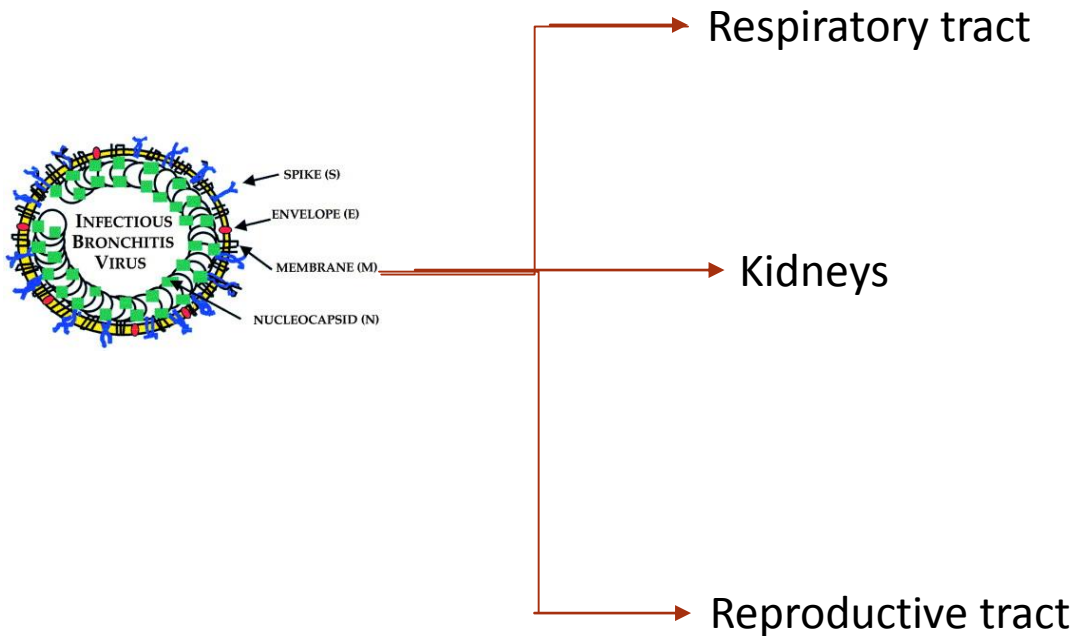
How did we get here?

The virus

- Very contagious coronavirus
- Infects broilers, broiler breeders and layers
- Not contagious for turkeys or wild birds
- Rapid propagation within a flock



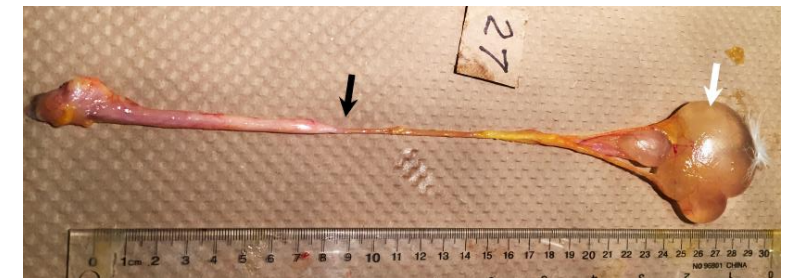
The infectious bronchitis virus



Bande et al., 2016



*Dr. Eric Parent, Delmarva genotype
40d old broiler chickens*



*Dr. Martine Boulianne, Delmarva genotype
24 weeks old laying hen*

Virus transmission

- The virus can **persist**:
 - in the digestive system and feces of the bird
 - for several weeks or months
- **Stress** can promote outbreak of the disease
- Birds can be **asymptomatic carriers**
- This virus:
 - survives and grows better in **cold weather**; infections are observed more often in winter
 - is fragile and **easy to kill** if it is exposed to **warmer temperatures** or **disinfectants**
 - **survives** longer if it is protected by **organic matter**

Virus transmission

- The virus is transmitted primarily:
 - by the **respiratory** tract
 - **in the air** (distance of 3,600 feet (approximately 1 km) under commercial farming conditions (Cumming, 1970)
 - **by feces**
- Horizontal transmission can be:
 - **direct** (from sick birds to susceptible birds)
 - **indirect** (water, equipment, clothing, food, transport of birds, any contaminated materials, etc.).
- There is **no evidence of egg transmission** (vertical transmission)

Serotypes

- There are **multiple serotypes** and **several may circulate in one region**
 - In general, there is **no cross protection** between them.
 - The most well-known are the **Massachusetts** and **Connecticut** serotypes.
- **Rapid replication, a high mutation rate** and **genome recombination** mean **extensive genetic diversity** and result in **many types of viruses** (Jackwood, 2012)
- The **rapid changes** result in **new variants or serotypes of the virus**.
- **New isolates** can be found **that can even cause disease in vaccinated birds**.

Serotypes

- The **new serotype** appeared in Ontario: **variant Delmarva strain (DMV/1639)**
- Strain **DMV/1639** apparently evolved into strain **PA/171/99**
- Strain **DMV/1639** has had **several mutations**
 - between the nephropathogenic cases initially observed on the Delmarva Peninsula and cases affecting mainly the respiratory system – evolution under negative pressure (Jackwood and Lee, 2017)



What have we done since?

Biosecurity - Cases of confirmed bronchitis

- 1) If possible, heat buildings after birds are removed and before manure is removed to 100°F (37°C) for 4 days
- 2) Wash, disinfect and dry buildings, follow with a downtime of 7 days before new birds are introduced
- 3) All-in-all-out management
- 4) Implement and/or improve biosecurity in pullet barns especially in the first 4 weeks of life
- 5) Implement and/or improve vaccination programs and procedures

Preventive necropsy in pullets

- 8-week-old pullets
- Cystic oviducts
- Risk factors
 - Strain involved
 - Age of infection
 - Maternal antibodies
 - Early vaccination of chicks



Québec Egg producers Federation

Prevalence and risk factors for IBV genotype Delmarva in commercial laying flocks of the province of Québec

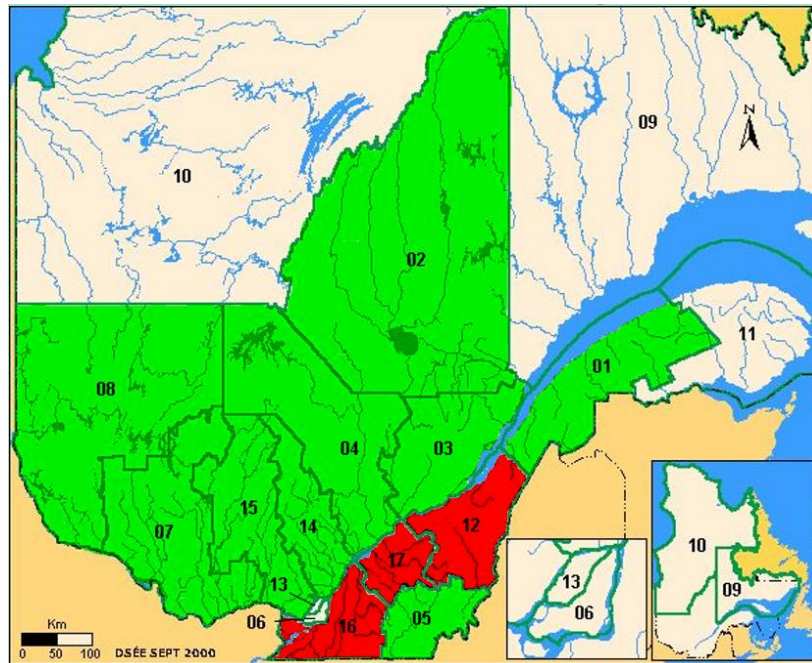
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Prevalence by Regional County Municipality (RCM)



Green: No Delmarva-positive site identified in the RCM
Red: At least 1 positive site for Delmarva identified in the RCM

RCM	Nb. of sites sampled	Positive sites	Negative sites	Prevalence (%)	C.I. 95% ¹
Abitibi-Témiscamingue	1	0	1	0	0.0 - 0.0
Bas St-Laurent	3	0	3	0	0.0 - 0.0
Capitale-Nationale	2	0	2	0	0.0 - 0.0
Centre-du-Québec	6	1	5	16.7	0.0 - 44.7
Chaudière-Appalaches	10	4	6	40.0	13.9 - 66.1
Estrie	4	0	4	0	0.0 - 0.0
Lanaudière	4	0	4	0	0.0 - 0.0
Laurentides	2	0	2	0	0.0 - 0.0
Mauricie	1	0	1	0	0.0 - 0.0
Montérégie	14	4	10	28.6	7.9 - 49.2
Outaouais	1	0	1	0	0.0 - 0.0
Saguenay-Lac-St-Jean	4	0	4	0	0.0 - 0.0

Conclusions

Prevalence of approx. 20%
in the Province of Quebec

- All positive sites located in 3 RCM (South of St. Lawrence river, between Mtl and Qc)
- RCM with the highest number of commercial laying facilities
- No positive site in Lanaudière (St-Félix-de-Valois: high density of chickens in the area)

Positive status affected by
the age of the flock

- Older = less likely to be positive
- Infection eliminated or under the detection threshold?
- Influence of the hatching date?

Analysis of the vaccination
programs pending

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Thank you