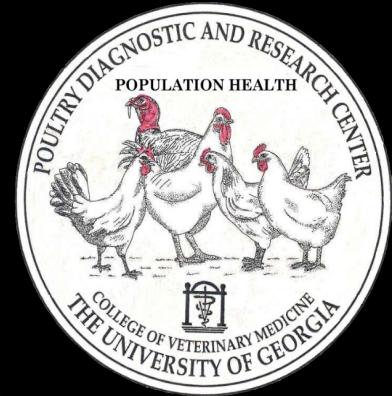




College of  
Veterinary Medicine  
UNIVERSITY OF GEORGIA



# PRD (Poultry Respiratory Disease)-CAP

Oct 24<sup>th</sup> , 2018

Naola Ferguson-Noel, DVM, MAM, PhD

**Objective 2.1.3: Co-infection of broiler chickens with *Mycoplasma synoviae*, NDV, IBV and ILTV to reproduce airsacculitis and mortality reported with MS infections in the field.**

# Completed Trials

- *Mycoplasma synoviae*-ILT<sub>V</sub> vaccination
  - **Evaluation of ILT CEO Vaccine in MS Positive Broilers**
  - Evaluate effect of MS on protection from CEO vaccine
- *Mycoplasma synoviae*-ND<sub>V</sub> vaccination
  - **Evaluation of B1 LaSota vaccine in MS Positive Broilers**
- *Mycoplasma synoviae*-IB<sub>V</sub> vaccination
  - **Evaluation of IBV Ark vaccine in MS Positive SPF chickens**
- *Mycoplasma synoviae*-IB<sub>V</sub>/ND<sub>V</sub> vaccination
  - **Evaluation of triplex (Ark, Mass, La Sota) vaccine in MS Positive broiler chickens**

# Experimental Design

Treatment group	IBV Vaccination	MS (8 WOA)
1	Yes (2 WOA)	No
2	Yes (2 WOA)	Yes
3	Yes (4 WOA)	No
4	Yes (4 WOA)	Yes
5	Yes (8 WOA)	No
6	Yes (8 WOA)	Yes
7	No	No
8	No	Yes

# Experimental Design

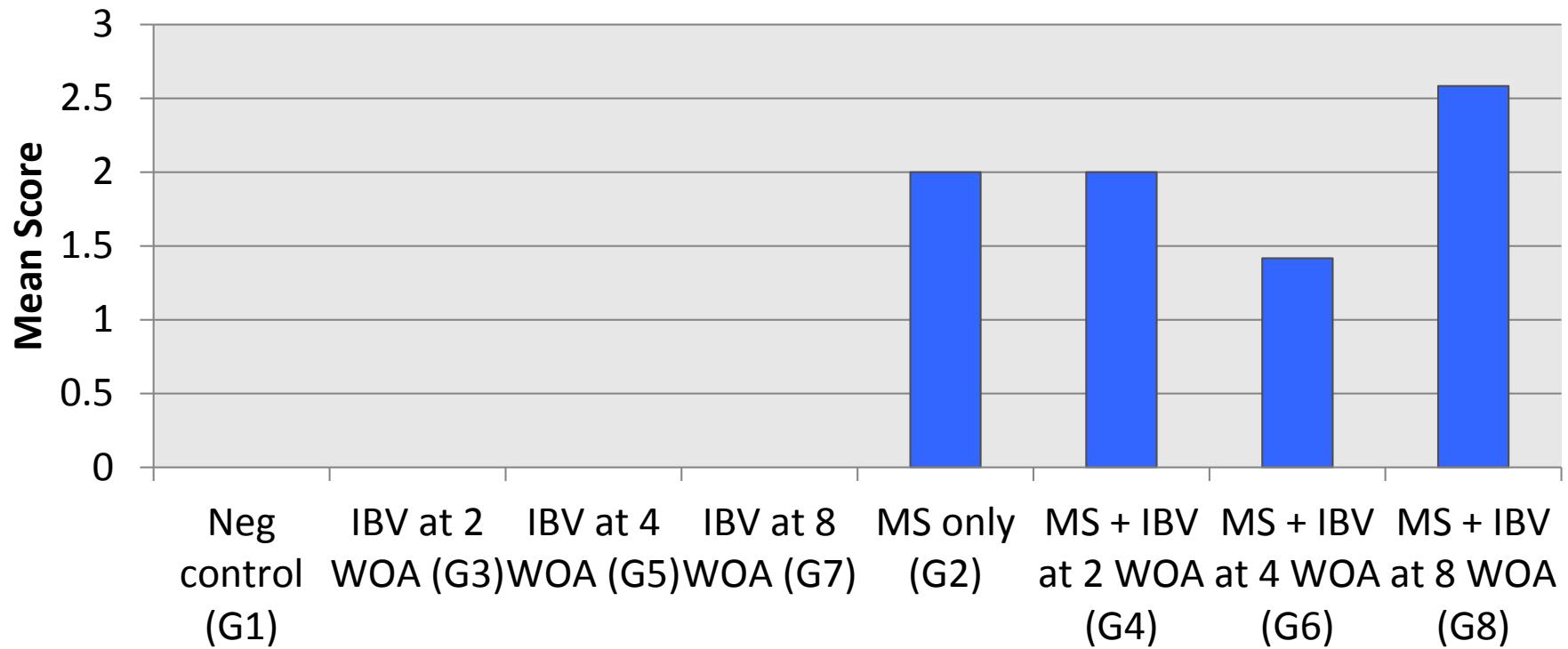
- MS - K6677 log<sub>10</sub> 9.1 CCU/ml
  - aerosol
  - 1ml of actively growing culture per bird
- IBV - Mildvac® -Ark (Arkansas Type Live Virus, MSD)
  - 100ul eye drop

# Experimental Design

- SPF layers
- 12 birds per group
- Swabs – 3, 5, 7 & 14 dpv (4 and 8 wk IBV)
- Necropsy – 14 dpc MS

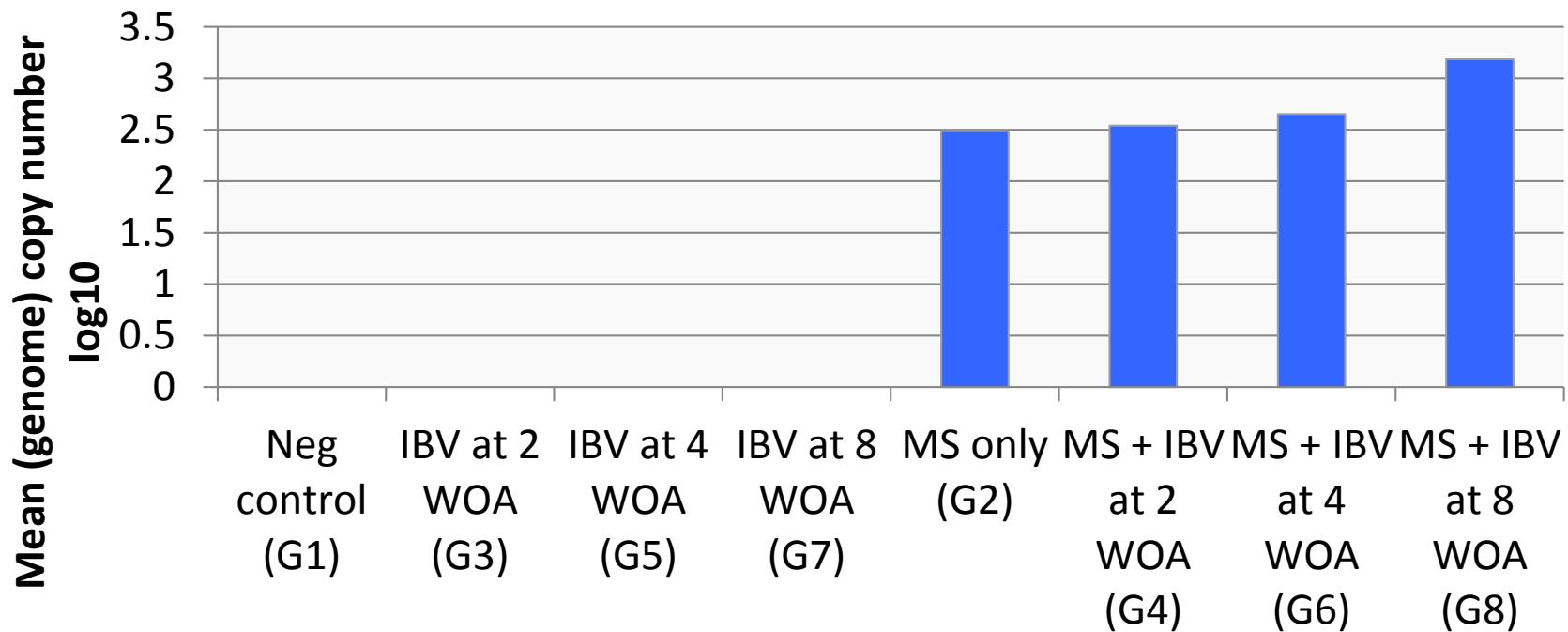
# MS

**AS Score**

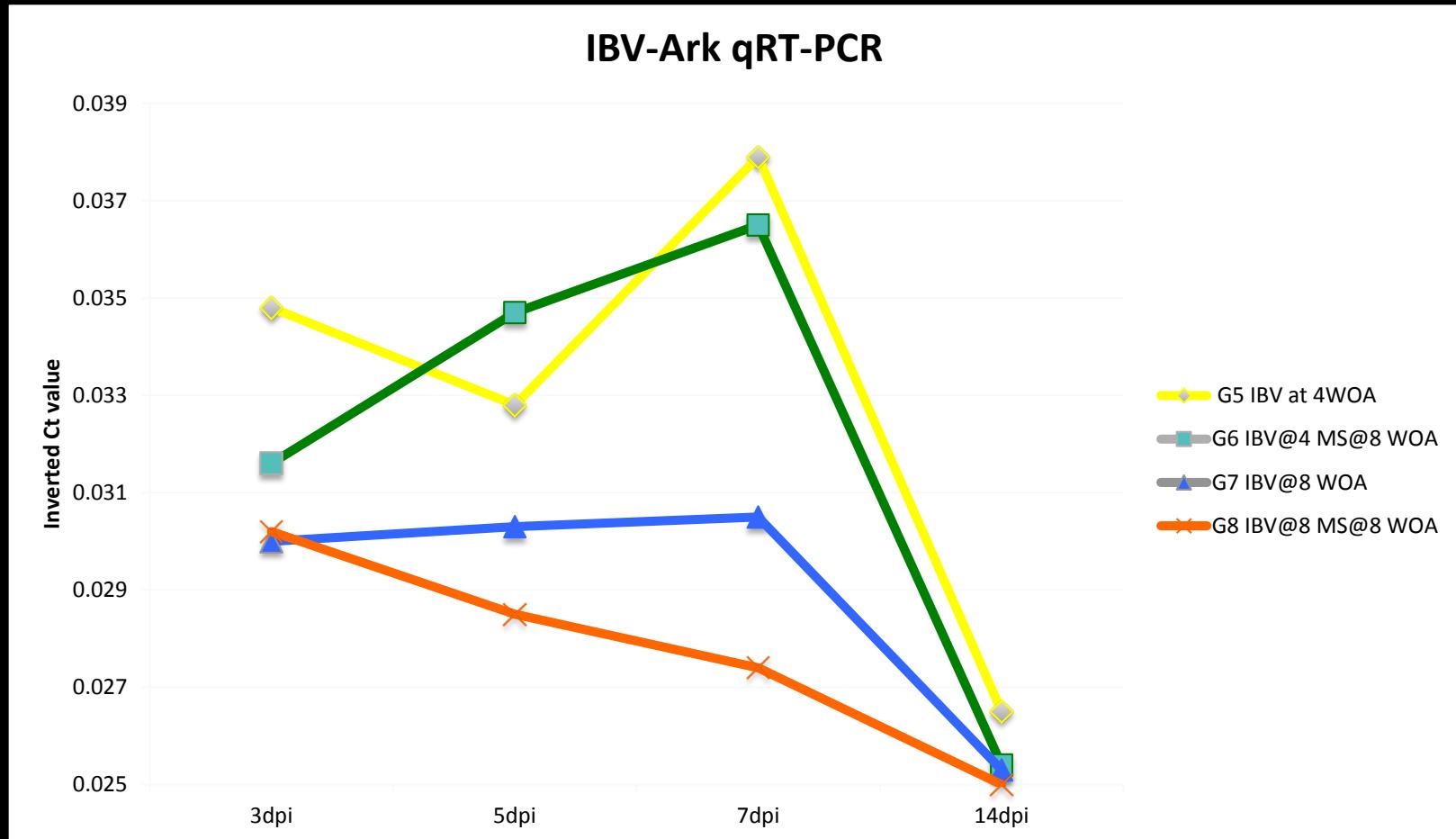


# MS

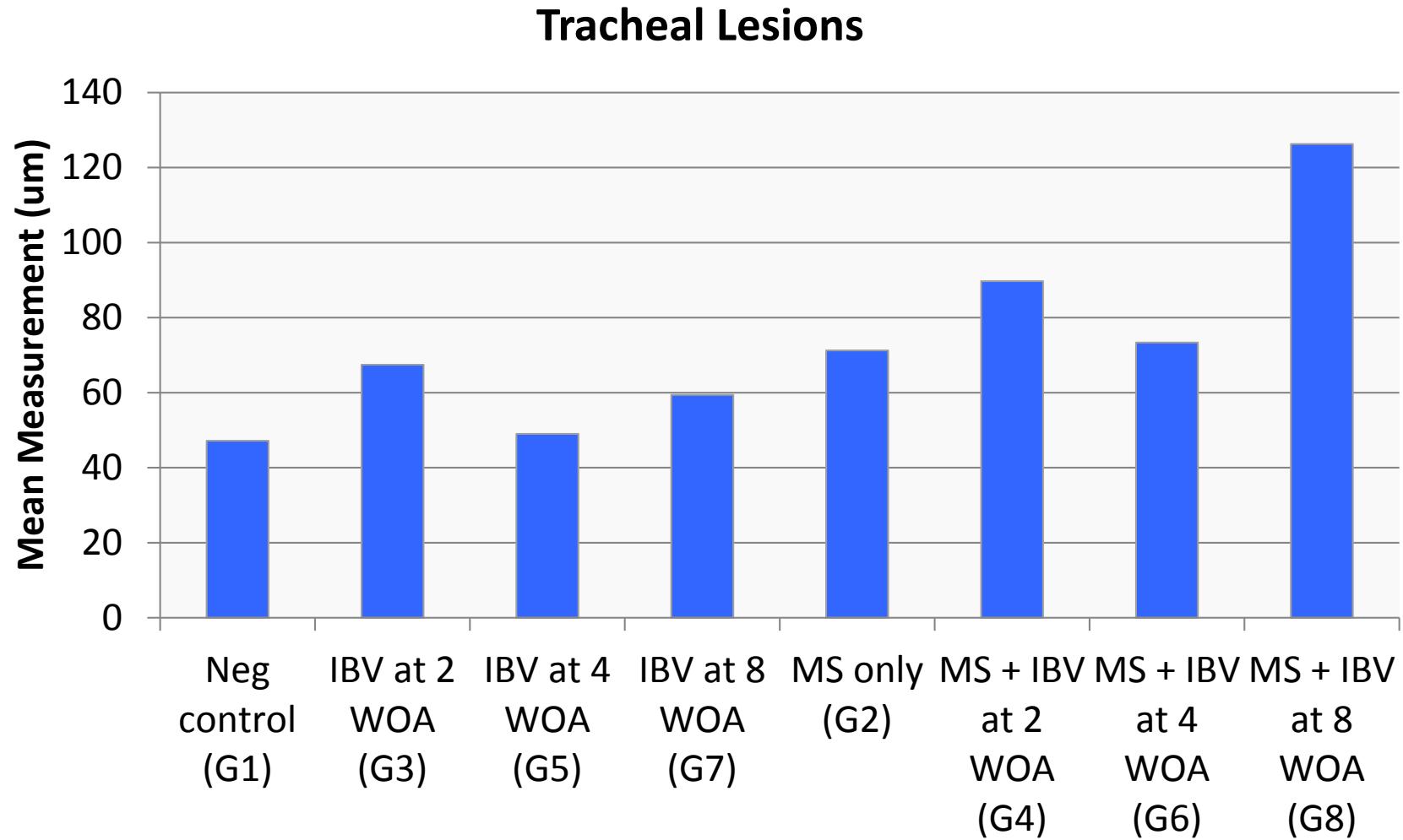
qPCR - MS



# IBV

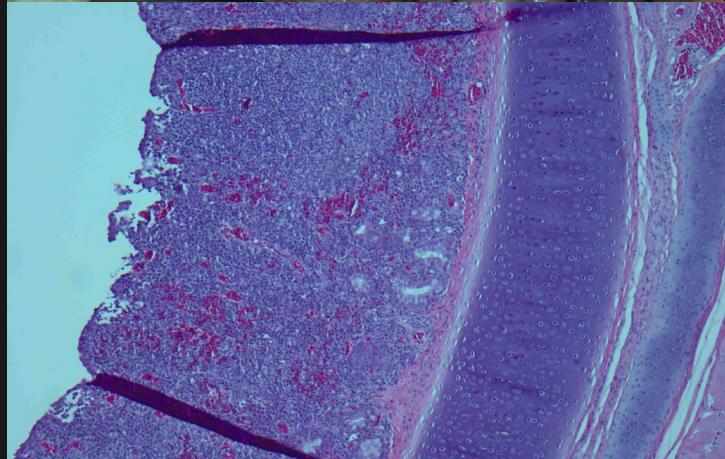


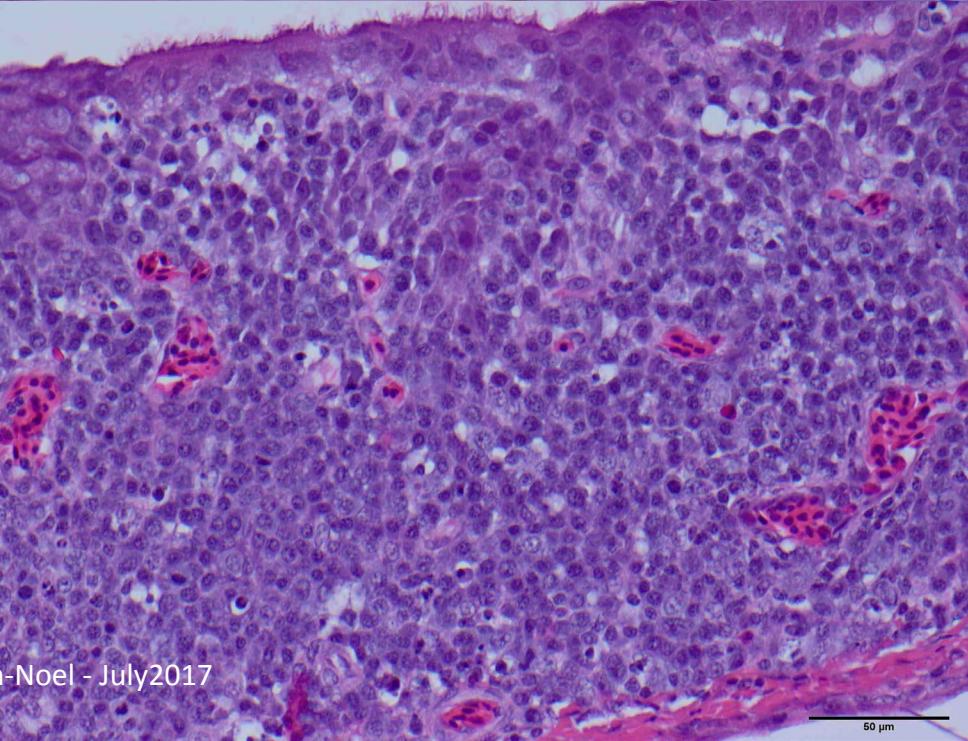
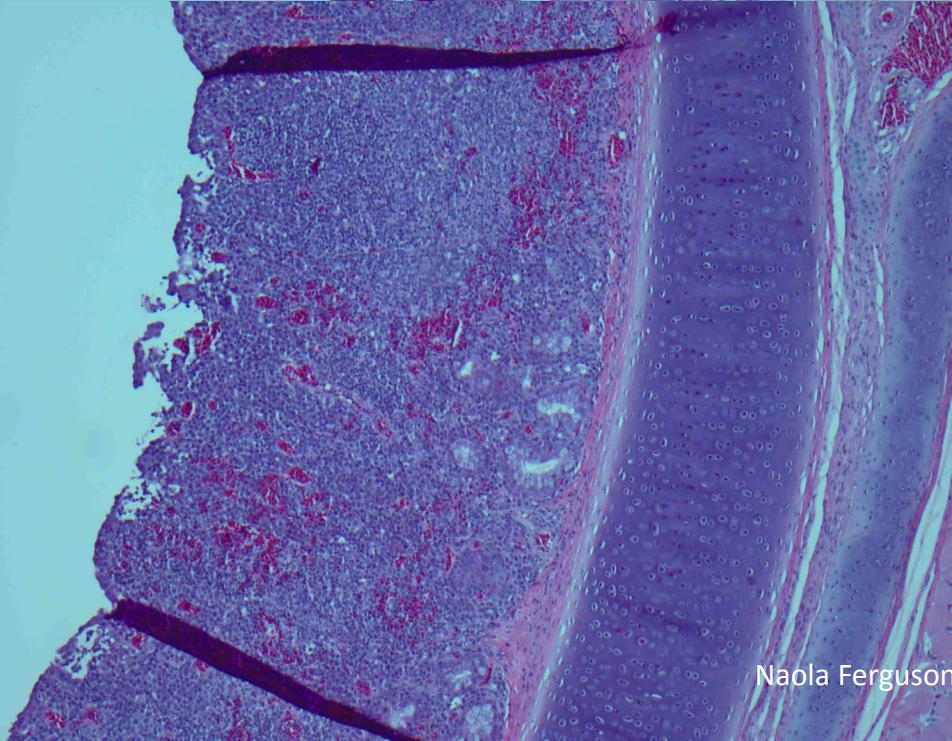
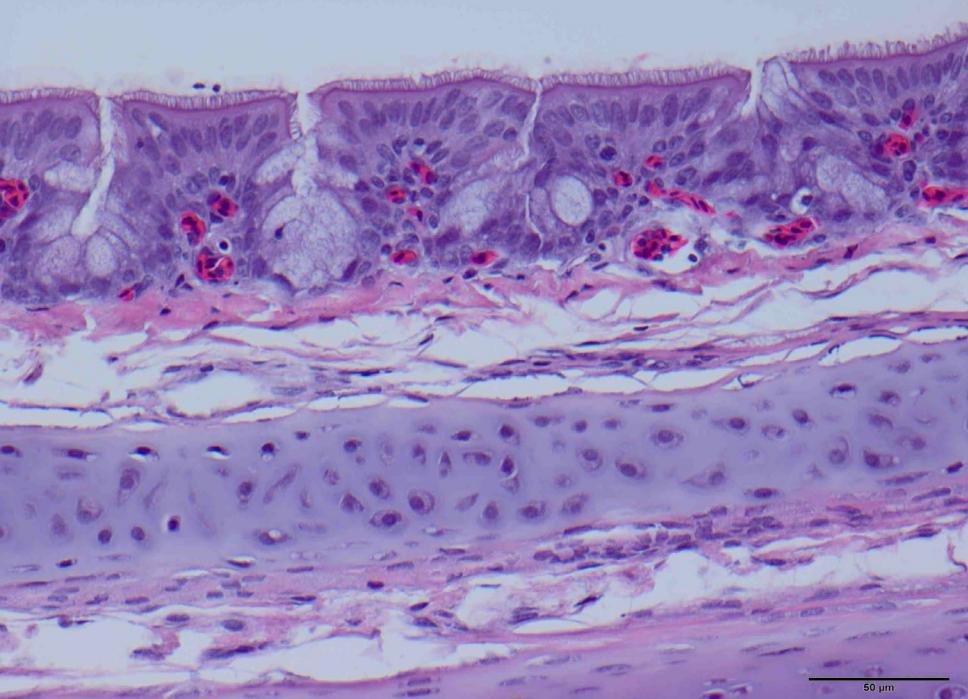
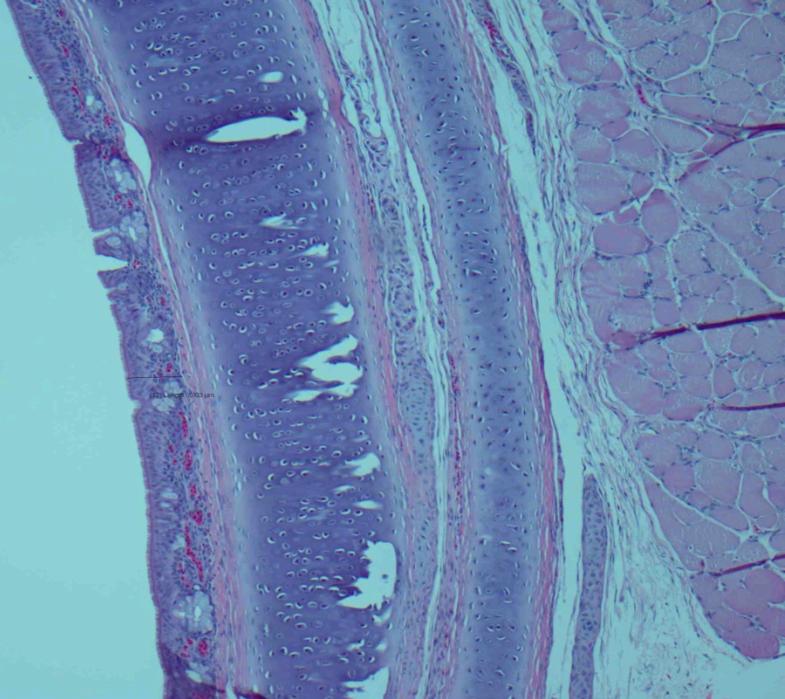
# MS-IBV



# Evaluation of Virulence

- Air sac lesion scores
- Tracheal lesions
- Synovitis
- Ovarian regression
- Egg production
- EAA?
- Weight gain?
- MS recovery - culture/PCR
- Serology





Naola Ferguson-Noel - July 2017



# Tracheal Lesion Evaluation of broilers co-infected with MS and ILTV

Valerie Marcano  
AVMA 2018  
Denver, CO

0 DPH

- Birds hatched

14 DPH

- MS Chal (2 groups)
- ILT Vx

28 DPH

- ILT Chal

7 DPH

- MS Chal (2 groups)

21 DPH

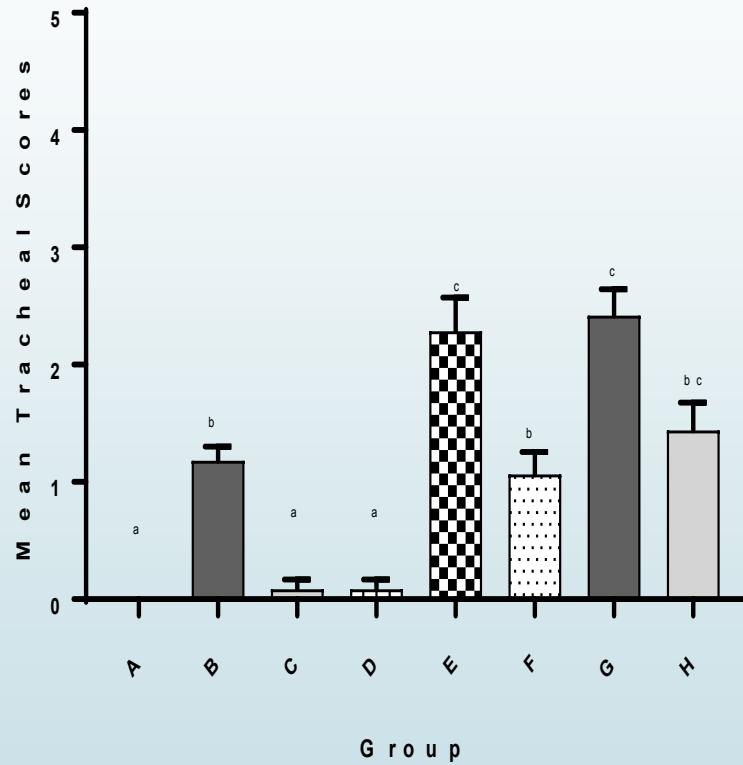
35 DPH

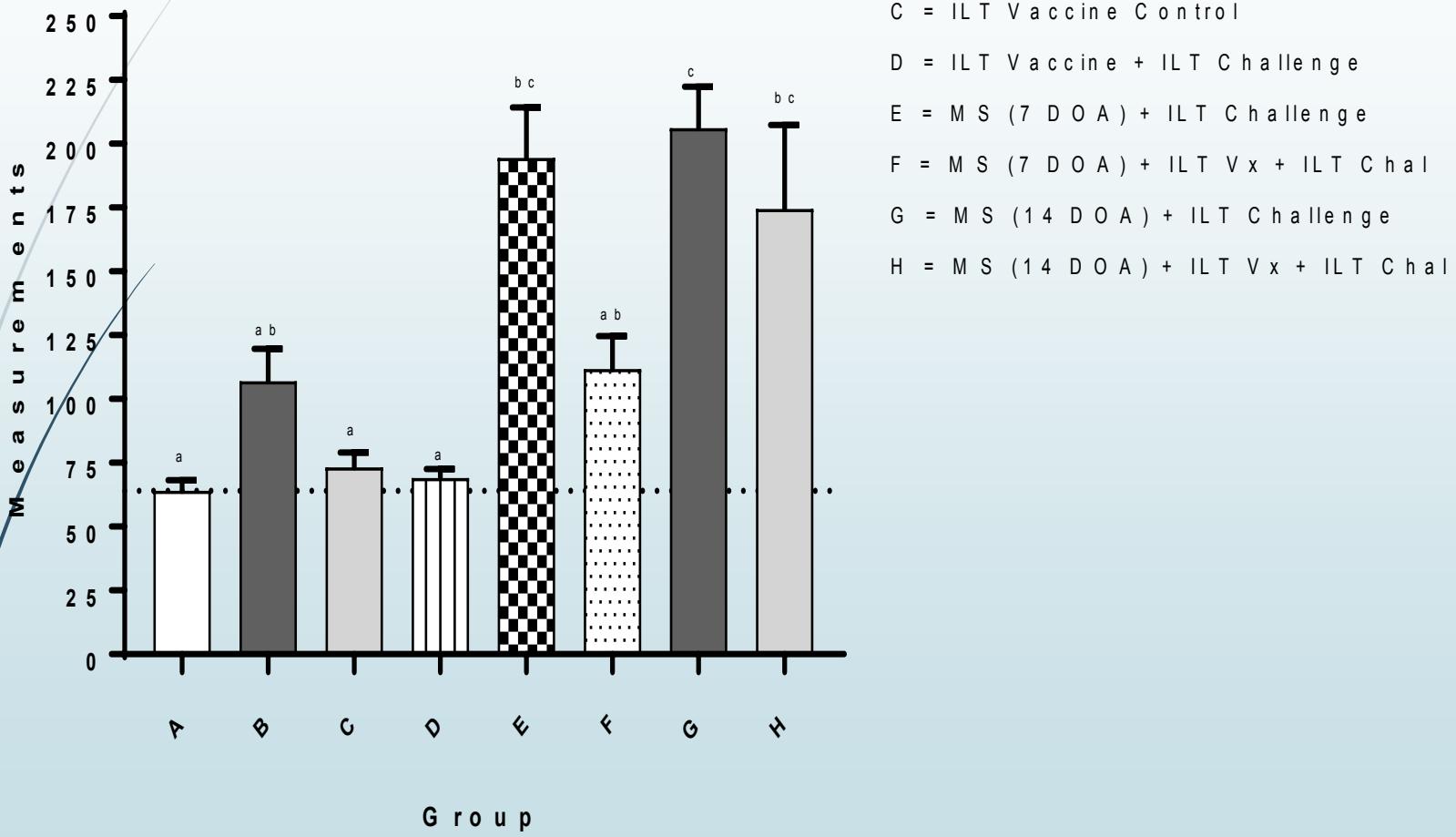
- Necropsy

Treatment group	MS	ILT vaccine (14 DOA)	ILT Challenge (28 DOA)
A	No	No	No
B	No	No	<b>Yes</b>
C	No	<b>Yes</b>	No
D	No	<b>Yes</b>	<b>Yes</b>
E	<b>Yes (7 DOA)</b>	No	<b>Yes</b>
F	<b>Yes ( 7 DOA)</b>	<b>Yes</b>	<b>Yes</b>
G	<b>Yes (14 DOA)</b>	No	<b>Yes</b>
H	<b>Yes (14 DOA)</b>	<b>Yes</b>	<b>Yes</b>

	<b>Group</b>	<b>MS</b>	<b>ILTV</b>	<b>ILT C</b>	<b>Average Score</b>	<b>Comments</b>
	A	-	-	-	0.0	None changes observed
	B	-	-	<b>Yes</b>	<b>1.1</b>	<b>Deciliation (9/11), dilated mucous glands (10/11), transitional epithelium (6/11), <u>Mild lymphocytic infiltration (10/11)</u></b>
	C	-	<b>Yes</b>	-	0.1	None changes observed
	D	-	<b>Yes</b>	<b>Yes</b>	<b>0.1</b>	None changes observed
	E	<b>7 DOA</b>	-	<b>Yes</b>	<b>2.3</b>	<b>Deciliation (7/7), dilated mucous glands (5/7), transitional epithelium (5/7), <u>moderate to severe lymphocytic infiltration (7/7)</u></b>
	F	<b>7 DOA</b>	<b>Yes</b>	<b>Yes</b>	<b>1.1</b>	<b>Mild to moderate lymphocytic infiltration (13/16)</b>
	G	<b>14 DOA</b>	-	<b>Yes</b>	<b>2.4</b>	<b>Deciliation (12/12), dilated mucous glands (10/12), transitional epithelium (10/12), <u>moderate to severe lymphocytic infiltration (12/12)</u></b>
	H	<b>14 DOA</b>	<b>Yes</b>	<b>Yes</b>	<b>1.4</b>	<b>Deciliation (12/12), <u>mild to moderate lymphocytic infiltration (14/14)</u></b>

Group	MS	ILTV	ILT C	Average Score
A	-	-	-	0.0
B	-	-	Yes	1.1
C	-	Yes	-	0.1
D	-	Yes	Yes	0.1
E	7 DOA	-	Yes	2.3
F	7 DOA	Yes	Yes	1.1
G	14 DOA	-	Yes	2.4
H	14 DOA	Yes	Yes	1.4





A = Negative Control

B = ILT Challenge Control

C = ILT Vaccine Control

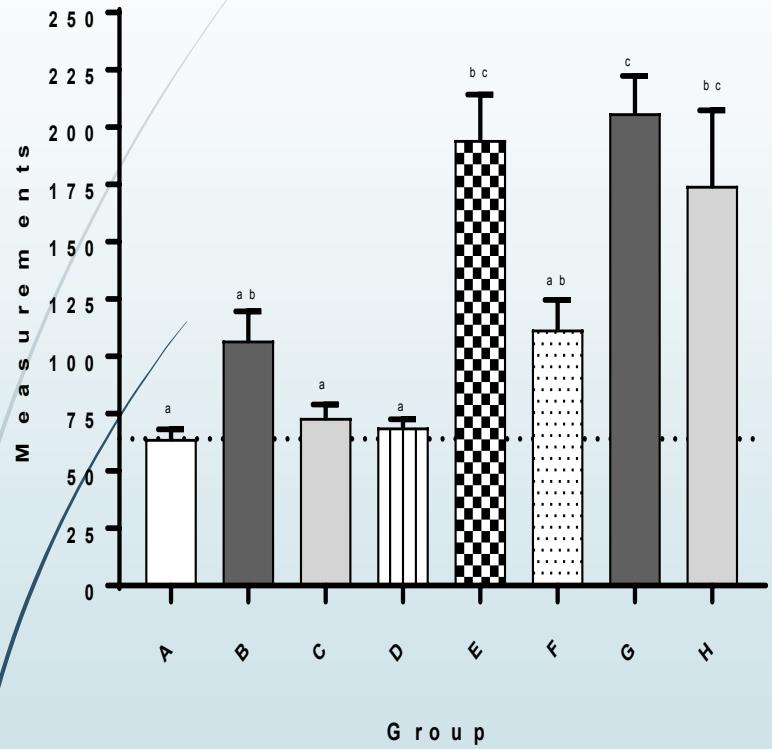
D = ILT Vaccine + ILT Challenge

E = MS (7 DOA) + ILT Challenge

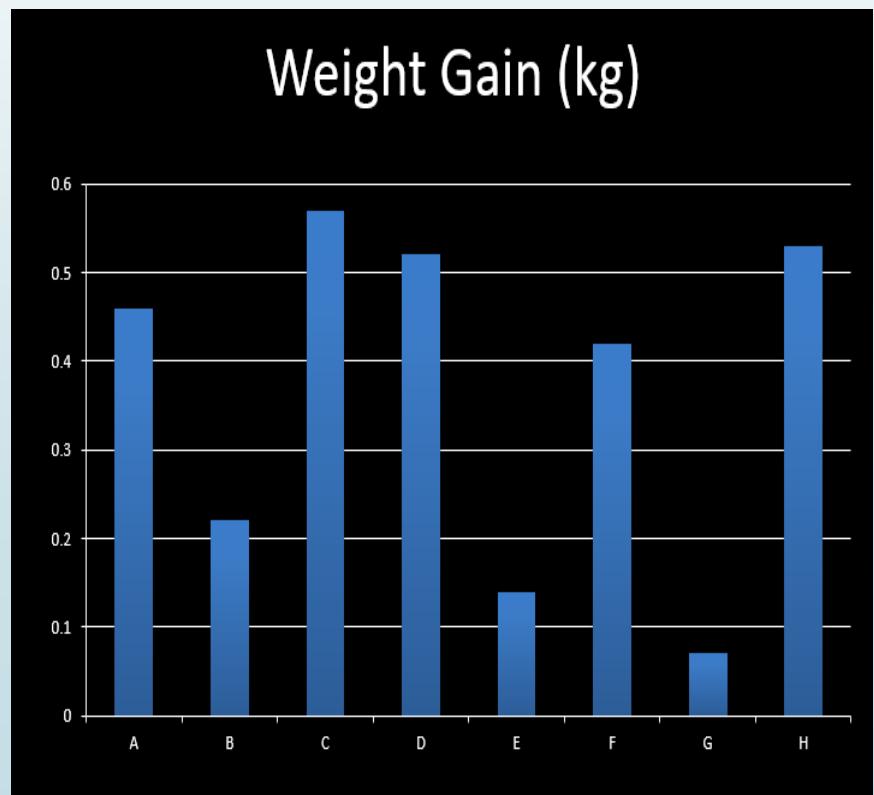
F = MS (7 DOA) + ILT Vx + ILT Chal

G = MS (14 DOA) + ILT Challenge

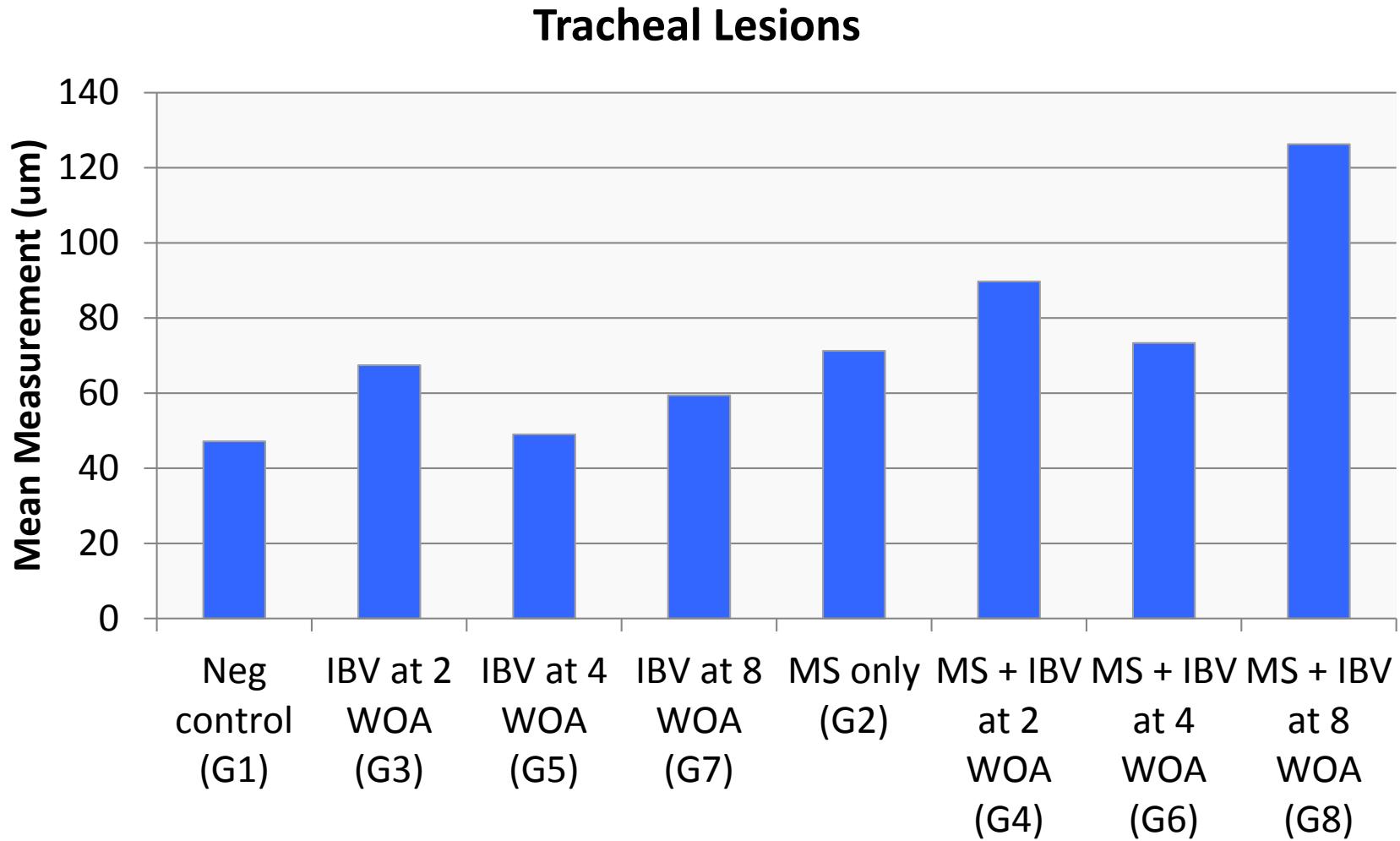
H = MS (14 DOA) + ILT Vx + ILT Chal



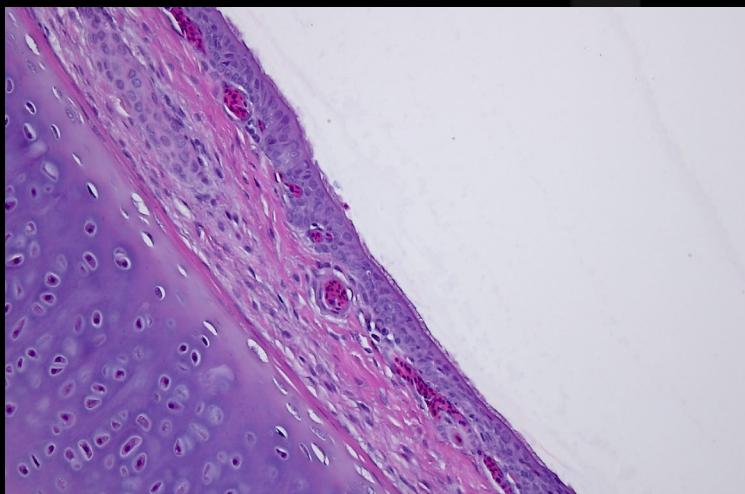
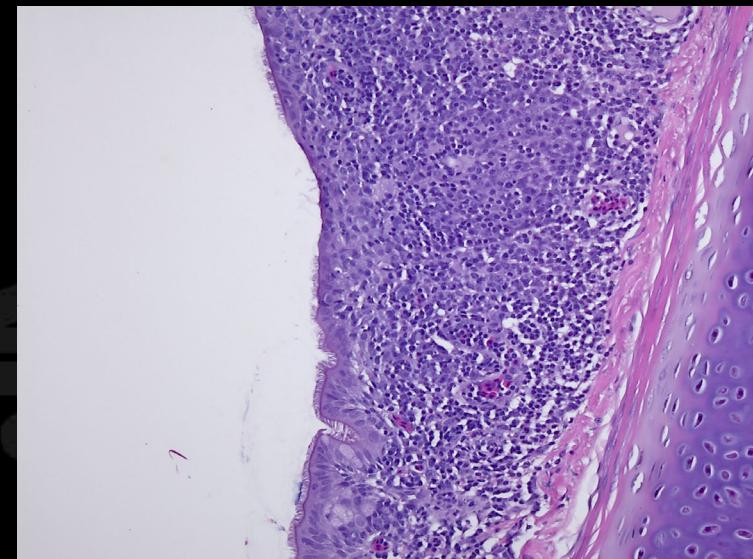
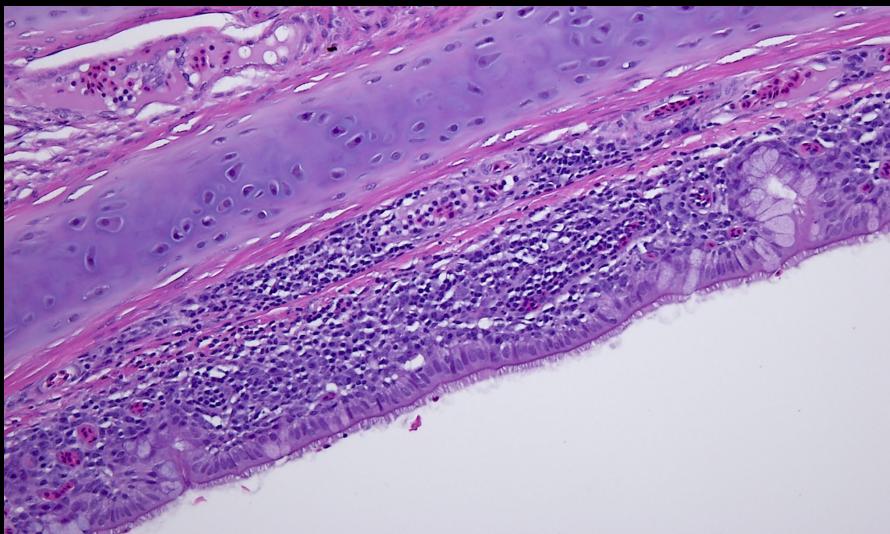
A = Negative Control  
 B = ILT Challenge Control  
 C = ILT Vaccine Control  
 D = ILT Vaccine + ILT Challenge  
 E = MS (7 DOA) + ILT Challenge  
 F = MS (7 DOA) + ILT Vx + ILT Chal  
 G = MS (14 DOA) + ILT Challenge  
 H = MS (14 DOA) + ILT Vx + ILT Chal



# MS-IBV



# MS Only

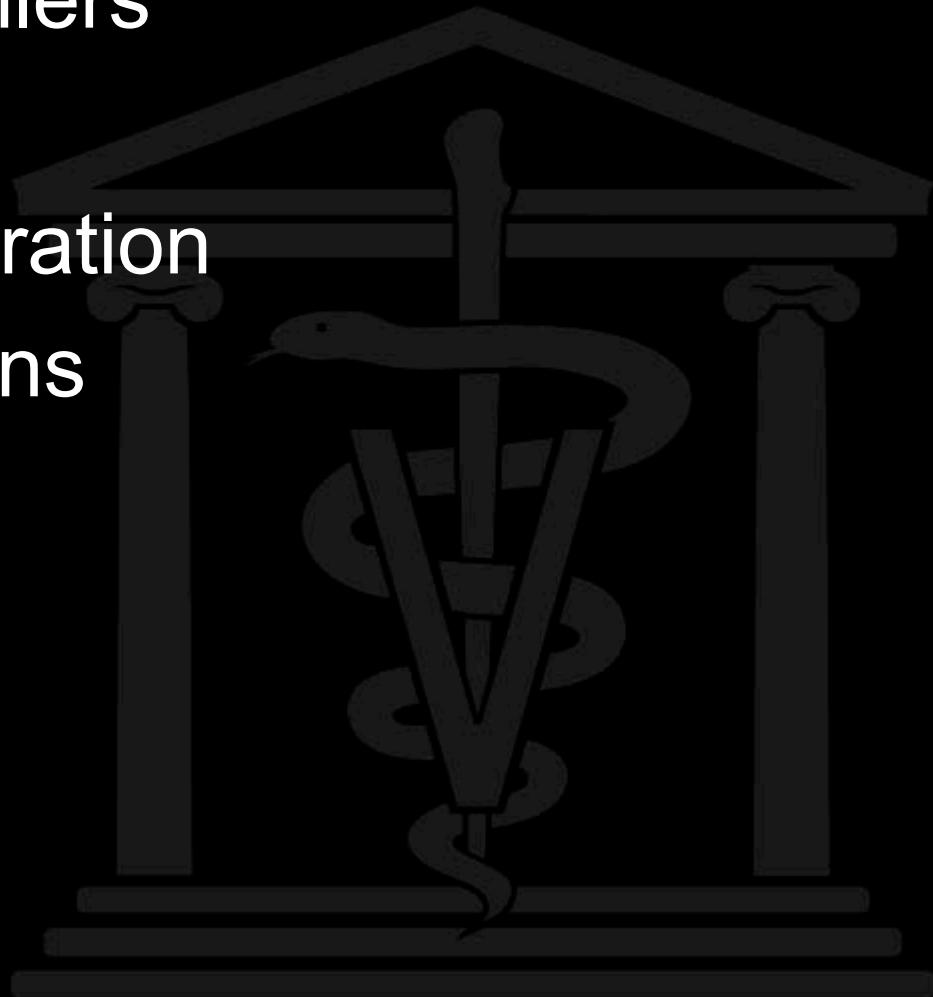


# Completed Trials

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# Variables

- Bird type – SPF, broilers
- Bird age
- Methods of administration
- Timing of co-infections



# Conclusions and Discussion

- MS lesions exacerbated by respiratory virus vaccination
- Effect on replication and shed of respiratory vaccines?
- Effect on protective immune response to respiratory vaccines?

# Acknowledgments

- Maricarmen Garcia
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# Thank you

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