

MS³

Mycoplasma synoviae - Maybe Sneaky, Maybe Silent?

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The real experts



Dr. Stanley Kleven



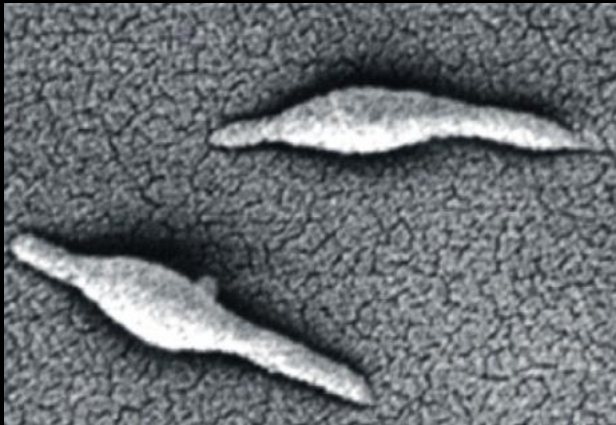
Dr. Naola Ferguson-Noel



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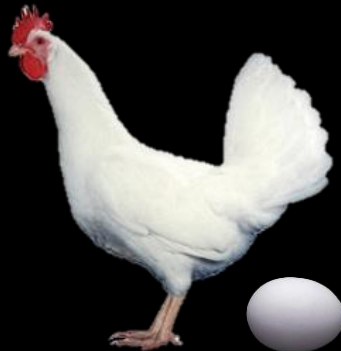
What are Mycoplasmas?

- Bacteria that lack a cell wall
- Tend to be very host specific
 - Pig mycoplasmas do not infect chickens etc.



What are Mycoplasmas?

- Pathogenic Poultry Mycoplasmas
 - *M. gallisepticum*
 - *M. synoviae*
 - *M. iowae* (turkeys)
 - *M. meleagridis* (turkeys)



Mycoplasma Synoviae

- Disease Problems
 - Synovitis
 - Respiratory Disease
 - Eggshell Apex abnormalities
 - Silent infections



M. Synoviae in the U.S.

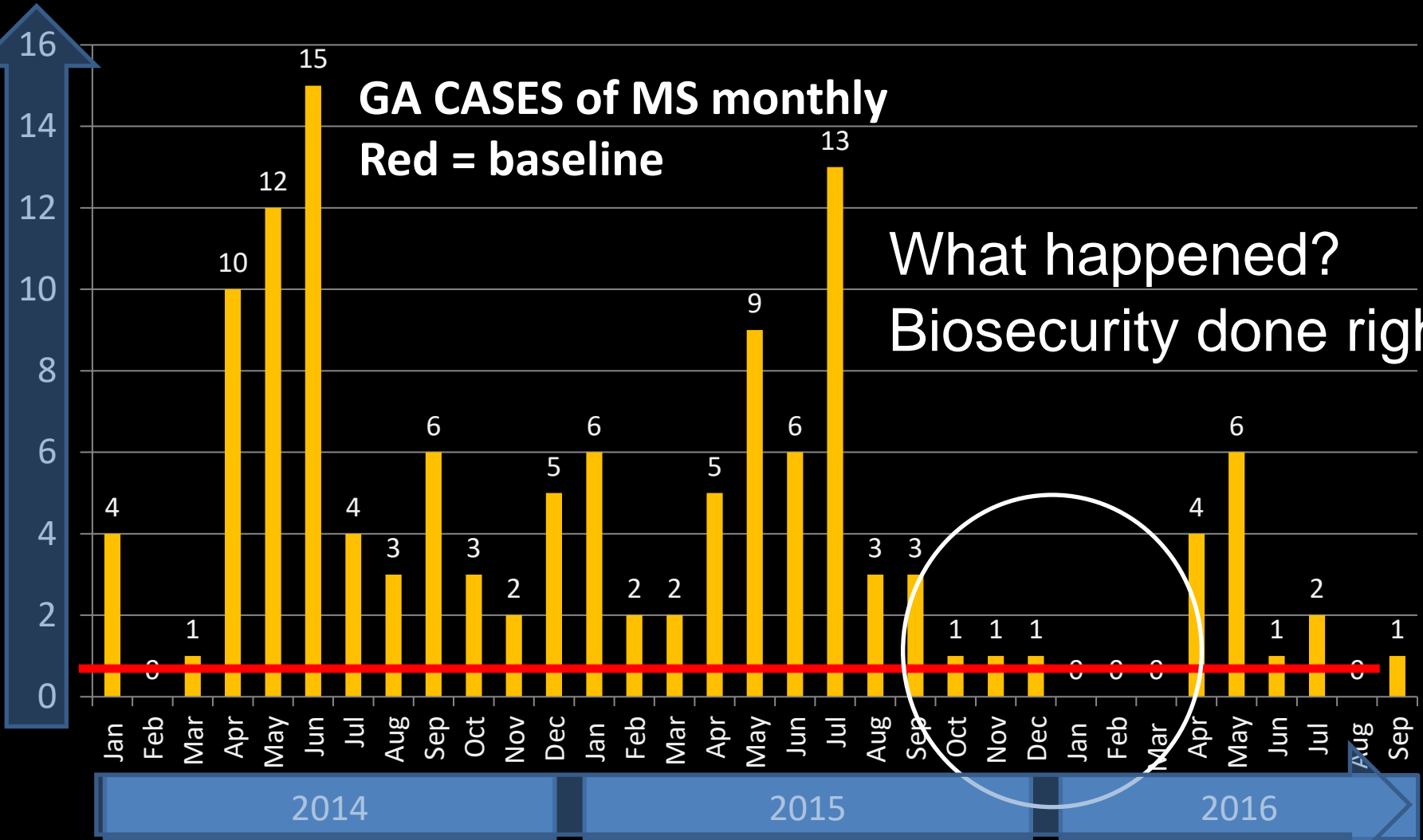
- Low prevalence in commercial poultry – NPIP
 - Breeders are free
- Common in commercial layers
- Outbreaks in other poultry relatively infrequent



Courtesy of Dr. Louise Dufour-Zavala, GPLN, Gainesville, GA

GA CASES of MS monthly Red = baseline

What happened?
Biosecurity done right.



USA AI cases:

1

AR

Last



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Internationally?

- MS not traditionally a serious problem
- Has been responsible for serious respiratory disease and/or synovitis in several areas of the world
 - Eastern Europe, Holland, Mexico and Argentina



M. Synoviae in Canada?

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<https://doi.org/10.1177/1040638719843577>



Focus Issue

A two-year prospective study of small poultry flocks in Ontario, Canada, part 1: prevalence of viral and bacterial pathogens

AVIAN DISEASES 65:547–553, 2021

Nancy M. I
Leonardo S

Original Article

I	Type of production	PCR test	
		Positive	Negative
	Breeders (turkeys and broilers)	2 (4.3%)	45 (95.7%)
	Egg laying pullets	7 (10.8%)	58 (89.2%)
	Egg layers	44 (57.9%)	32 (42.1%)
	Chicken broilers	11 (6.8%)	152 (93.2%)
	Meat turkeys	4 (4.8%)	80 (95.2%)

MS Susceptible species?

- Chicken
- Guinea Fowl
- Goose
- Japanese Quail
- Pheasant
- House Sparrow
- Turkey
- Duck
- Pigeon
- Red Legged Partridge
- Budgerigar



Strain Variability

- Mycoplasma strains vary in:
 - Virulence
 - Tissue tropism
 - Antigenic makeup

A Major Factor in the Type and Severity of the Disease Problem is the Virulence and Pathotype of the Strain Involved



Transmission of MS

- Rate of spread is rapid in a barn
- Infection rate is high
- Transmission to adjacent barns is rapid
- Egg transmission is unpredictable, generally transient at a low rate



Survival of MS on various substances

Cotton	2 days	Feathers	3 days
Rubber	8 hours	Hair	8 hours
Straw	12 hours	Ear	4 hours
Shavings	4 hours	Nose	12 hours
Wood	12 hours	Skin	0 hours
Feed	0 hours	Buffer	NT

Christensen, N. H., C. A. Yavari, A. J. McBain, and J. M. Bradbury. Avian Pathol. 23:127-143. 1994.



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MS Carriers

- Organism disappears from lesions
- BUT, the upper respiratory tract remains infected
- Infection rate remains high
- Flock will remain serologically positive



MS breaks in mature birds

- Typically no clinical signs observed
- Spread is rapid
- Infection rate is high
- Egg transmission is highest during the first 1-2 months



Back to those disease problems

- ...
 - Synovitis
 - Respiratory Disease
 - Eggshell Apex Abnormalities
 - Silent infections



Leg Problems Caused by *Mycoplasma synoviae* (Infections Synovitis)



Signs

- Increased number of lame and cull birds
- Swollen joints
- Poor uniformity



Lameness & Poor Uniformity



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Enlarged Joints & Foot Pads



Swollen Foot Pad



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Enlarged Hock



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Exudate in Hock Joint

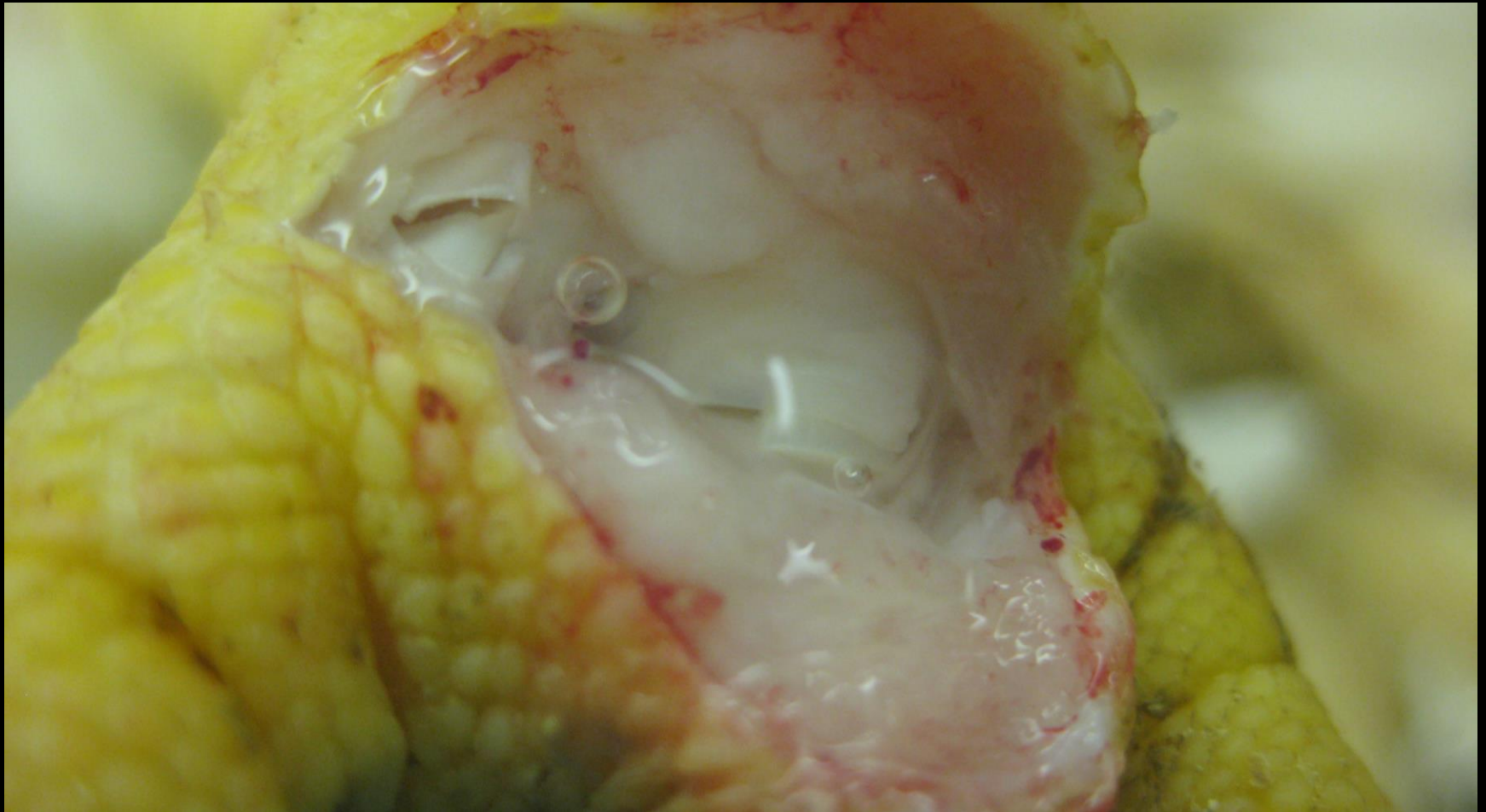


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Exudate in Foot Pad



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Exudate in Foot Pad

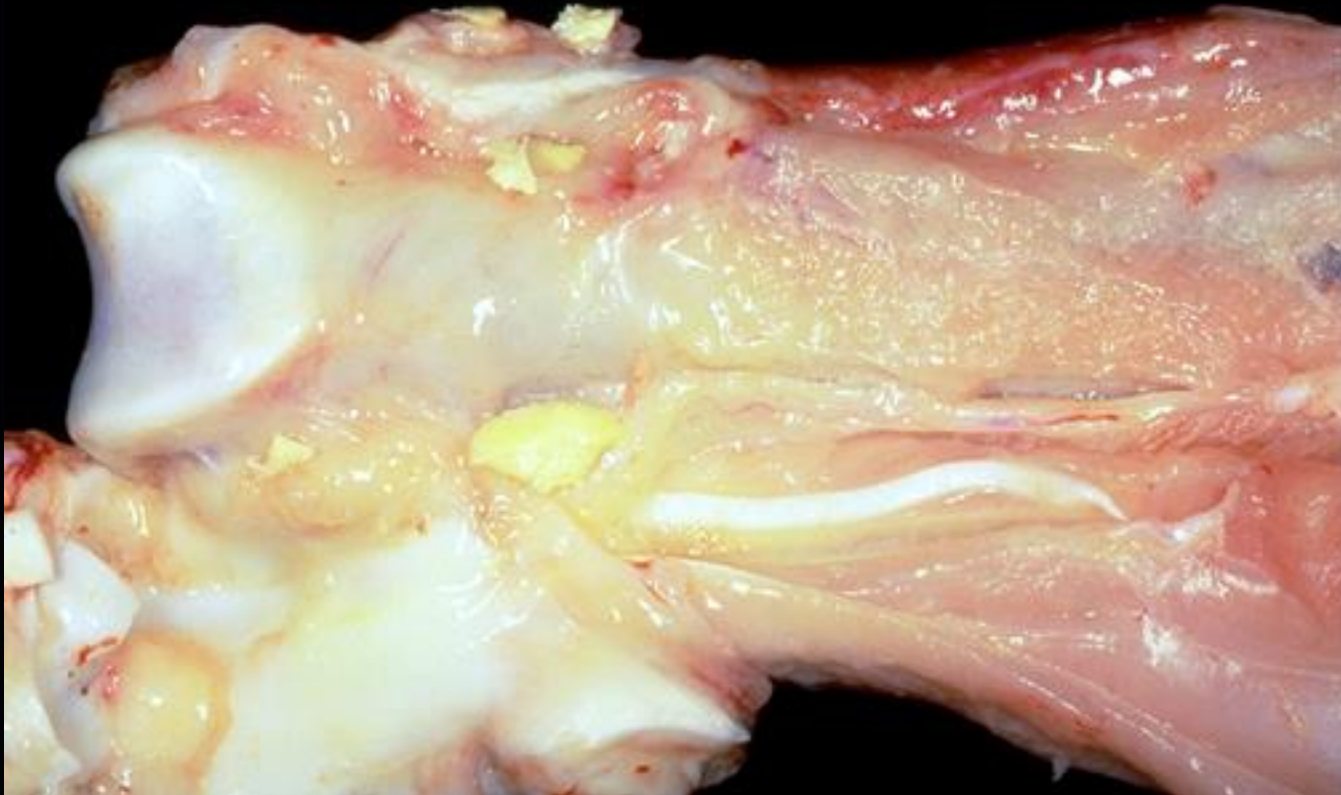


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Chronic Synovitis

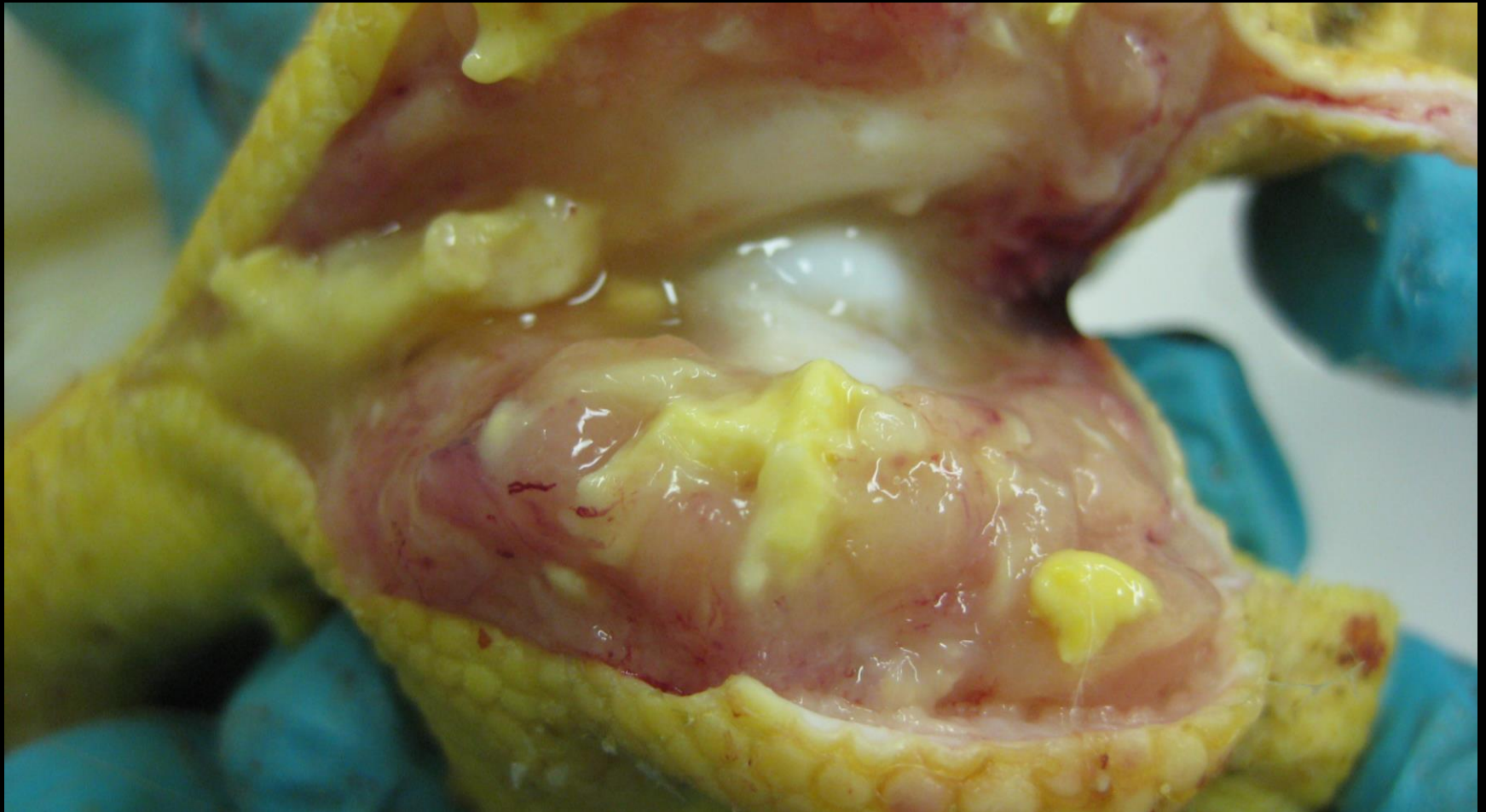


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Chronic Synovitis



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Keel Bursitis



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Cartilage Erosions



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Respiratory Diseases Caused by *Mycoplasma synoviae*

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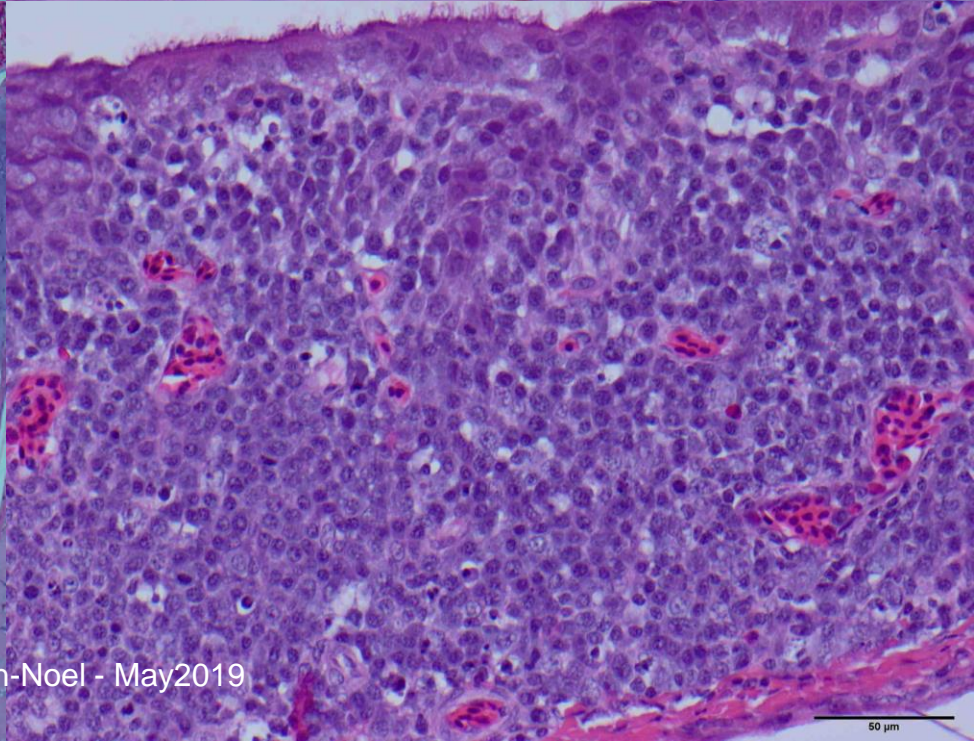
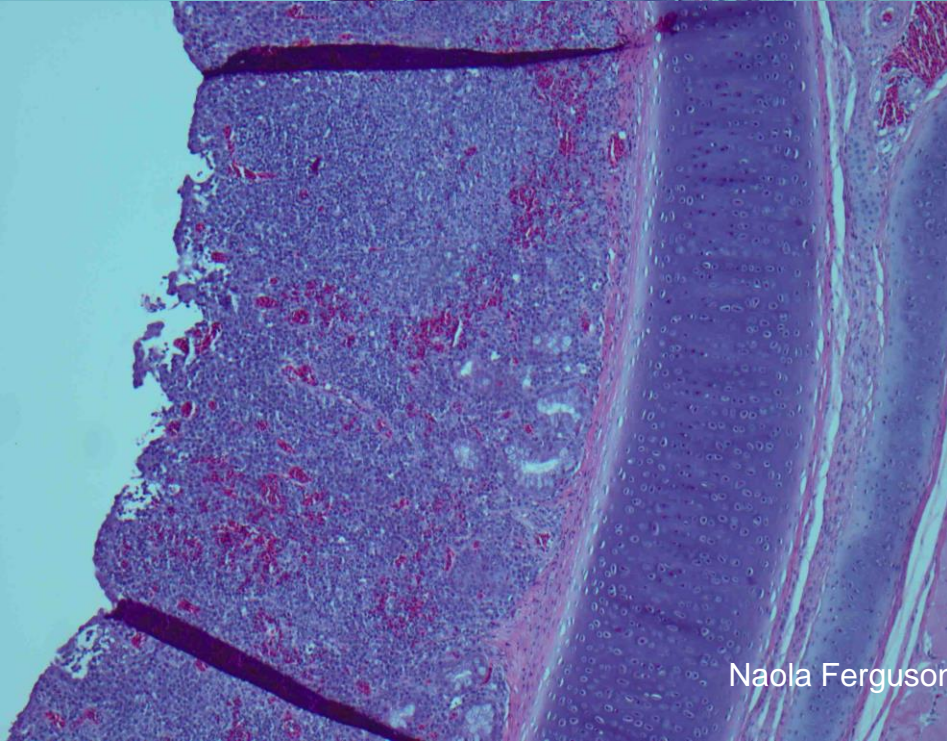
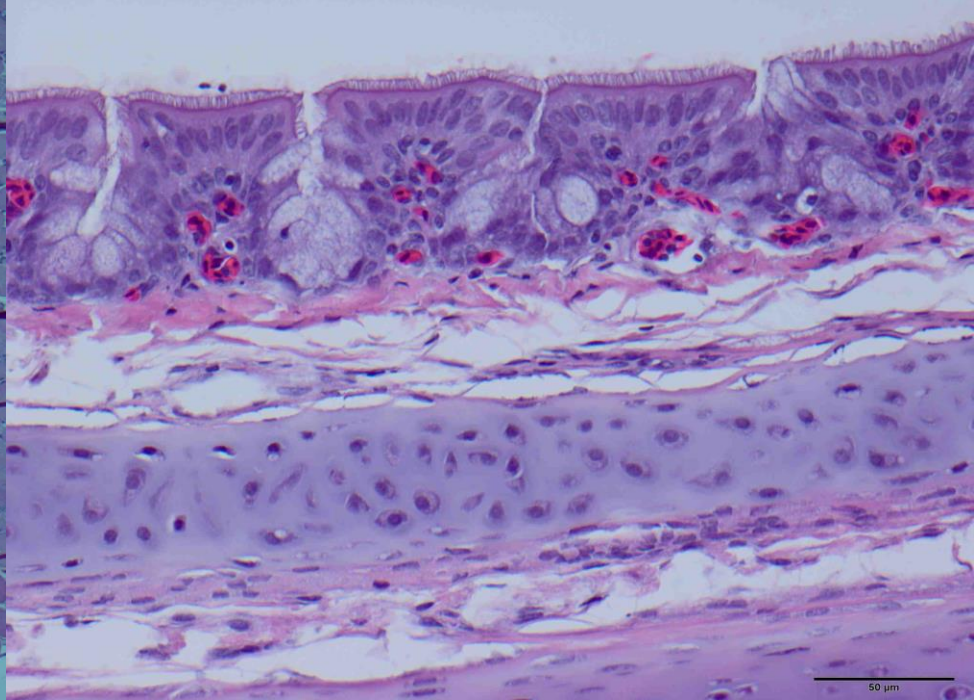
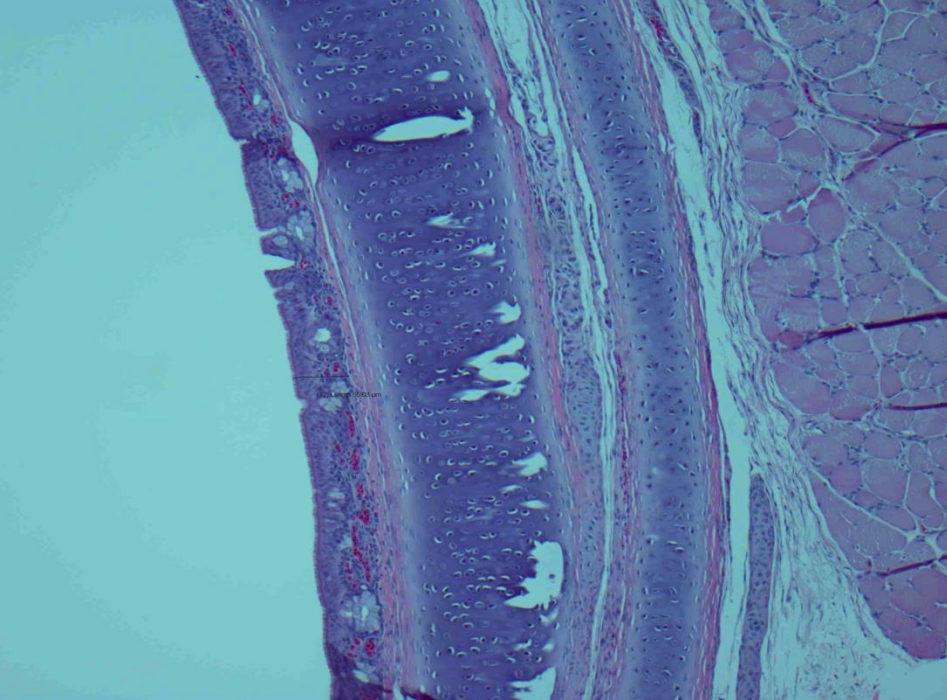
Tracheitis



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Airsacculitis

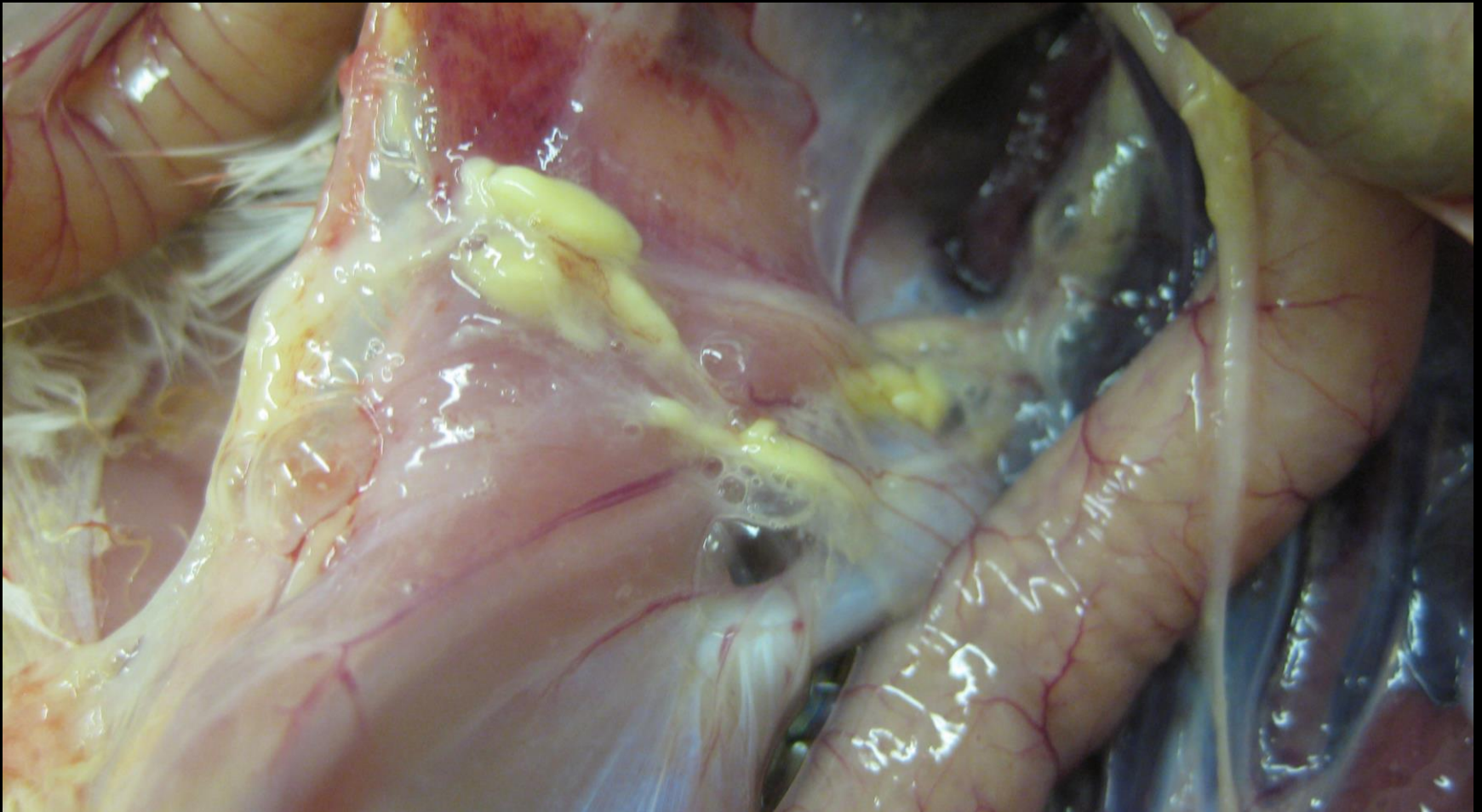


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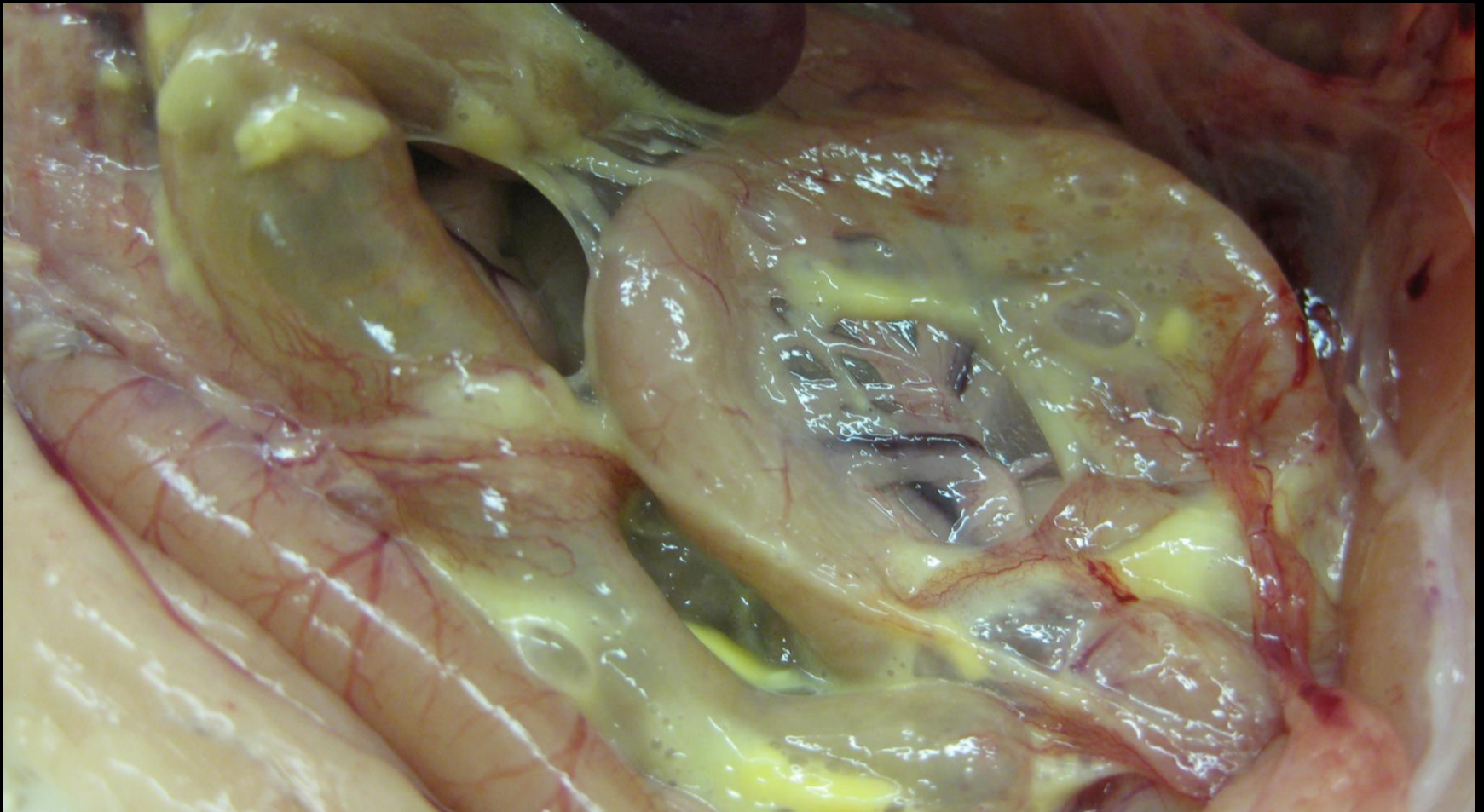


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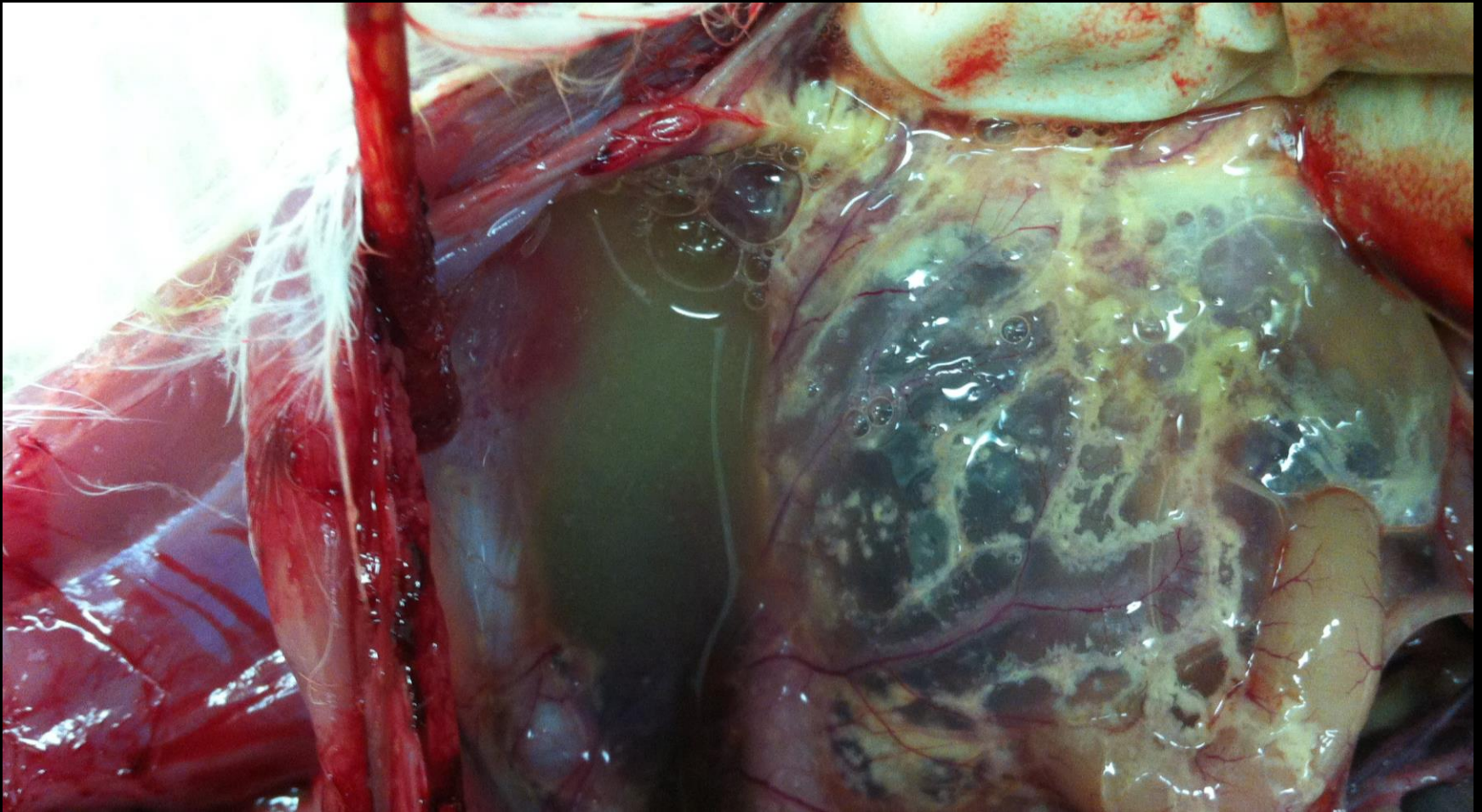


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Airsacculitis



Airsacculitis



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M. Synoviae in Layers

- Sometimes mild airsacculitis or synovitis in a small % of pullets
- Ordinarily no adverse effect on egg production when exposed during lay
- Slight production loss if strain is virulent or if there are complicating factors
- Some virulent strains may cause production loss



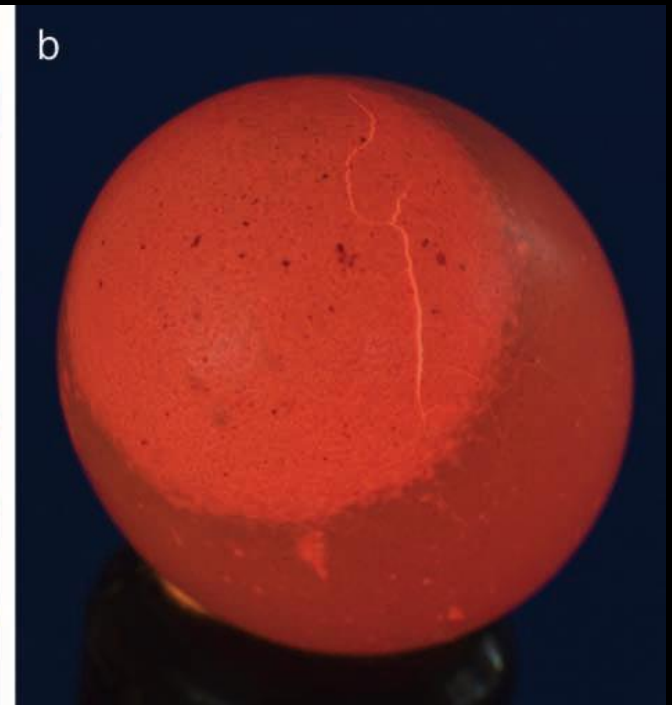
Complicating infections

- Infectious Bronchitis
- Newcastle Disease
- Infectious Laryngotracheitis
- Avian Influenza
- *E.coli*



Egg shell abnormalities associated with MS

- Egg shell apex abnormalities have been associated with MS colonization of the oviduct



MS Control Options

- Eliminate Flock?
- Quarantine/Isolate
- Treatment
- Vaccine?



Immunizing Agents Available for MS

- Inactivated oil-emulsion bacterins
- Live vaccine
 - MS-H
 - MS-1



MS take home message

- Commercial layer flocks in Canada are infected with MS
- Infections in commercial layers are silent
- Monitoring programs to understand prevalence



Thank You

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The Poultry Diagnostic and Research Center

- <https://vet.uga.edu/diagnostic-service-labs/pdrc-diagnostic-services/>

Scan to add us to
your contacts!



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It was in California, so he had to go down and pick it up. He and Jenny had done a frame-up restoration with upgrades and it was as shiny

The little ones are cute, but not too practical for a month-long trip back to California. My reaction was the same as everyone they encountered

Photo Courtesy: JOHN LAVOIE/SHUTTERSTOCK.COM
 them up. The floors are cork and all the cupboards and appliances are high-tech. Lights are LED and everything is the lat.

Fred Nelson is an accredited local appraiser who owns and operates Nelson Racing. Reach him at 403-262-3856.





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