

An Unusual Outbreak of Erysipelas in Broiler Breeder Chickens

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Case history

- 59-week-old broiler breeders
- Increased mortality in 1 of 2 houses
 - House 1, past 3 days mortality: 50; 50; 59
- Clinical signs:
 - Lethargy
 - Swollen heads; snicking
 - Lameness
- 2 live and 1 dead hens submitted for necropsy



Clinical signs



Mild to severe facial/periorbital swelling (3/3)
Depression (2/2 live)



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Gross pathology

Lesion	Birds affected/Total
Catarrhal sinusitis	3/3
Tracheitis	3/3 (mild)
Corneal ulceration	1/3
Hepatomegaly	3/3
Splenomegaly	1/3
Renomegaly	3/3
Airsacculitis	1/3
Cecal worms	3/3



Differentials

- **High mortality with respiratory disease**
 - Infectious laryngotracheitis (ILT)
 - Avian Influenza (AI)
 - Newcastle Disease (NDV)
- **Facial swelling with sinusitis**
 - Mycoplasmosis (*M. gallisepticum* or *M. synoviae*)
 - Infectious Coryza (*Avibacterium paragallinarum*)
 - Swollen head syndrome (infectious bronchitis or avian metapneumovirus with secondary *E. coli*)
- **Hepato- and renomegaly**
 - Acute bacterial septicemias (*E. coli*, *P. multocida*, etc)



Bacteriology

Culture media	Isolate	Sample
Blood agar	Heavy, pure growth <i>Erysipelothrix rhusiopathiae</i> *	2/3 livers; 2/3 sinuses
Chocolate agar	No growth	3/3 sinuses
Tetrathionate broth (Salmonella enrichment)	No growth	3/3 liver swabs

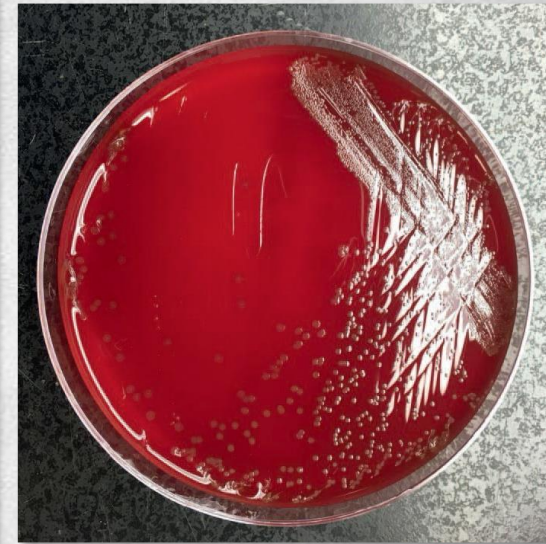


Image source: Shamoun *et al.*, Av Dis 67, 2023

**E. rhusiopathiae*; 99.9% confidence value by Vitek[®] MS MALDI-TOF



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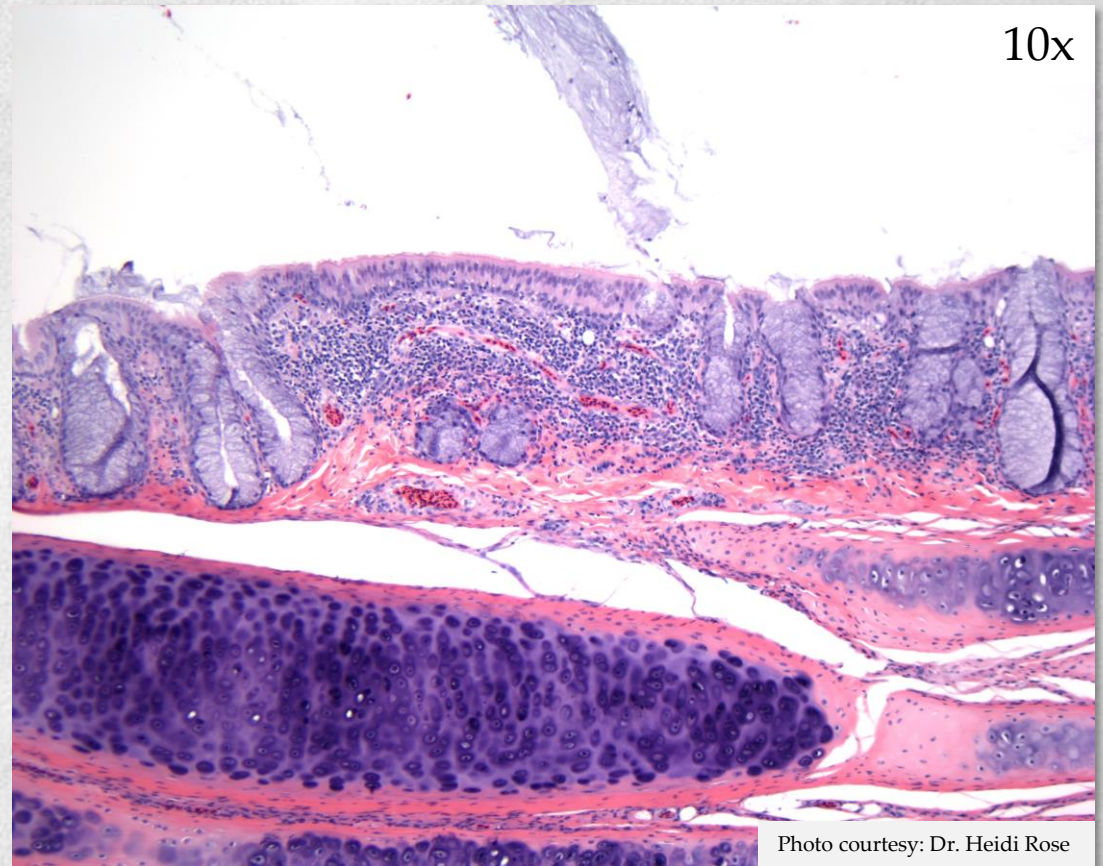
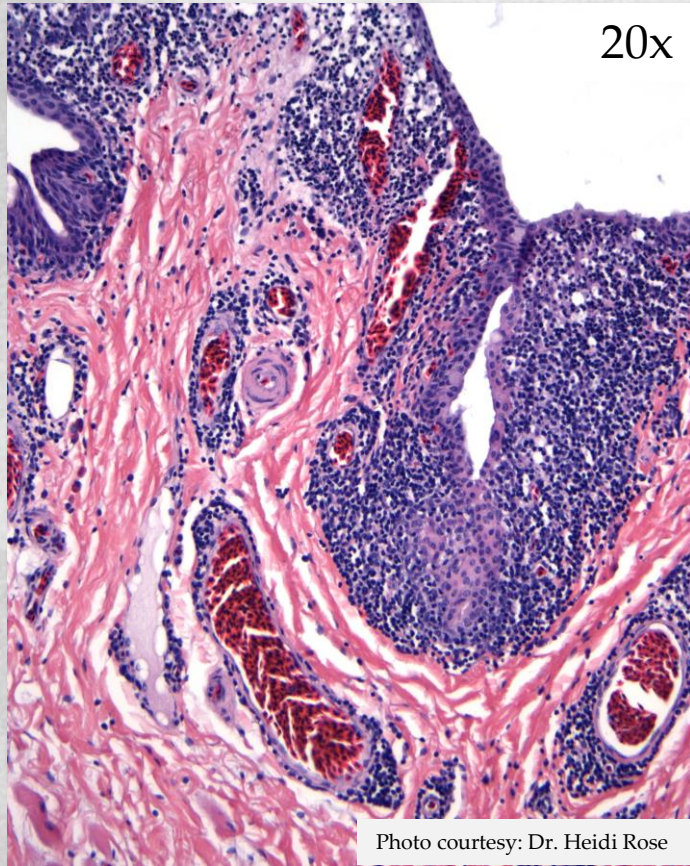
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Real-Time PCR

Agent	Result
AI	Negative
NDV	Negative
ILT	Weak positive (CT = 35.31)
MG/MS	Negative



Histopathology



Lymphocytic conjunctivitis and catarrhal, lymphocytic tracheitis

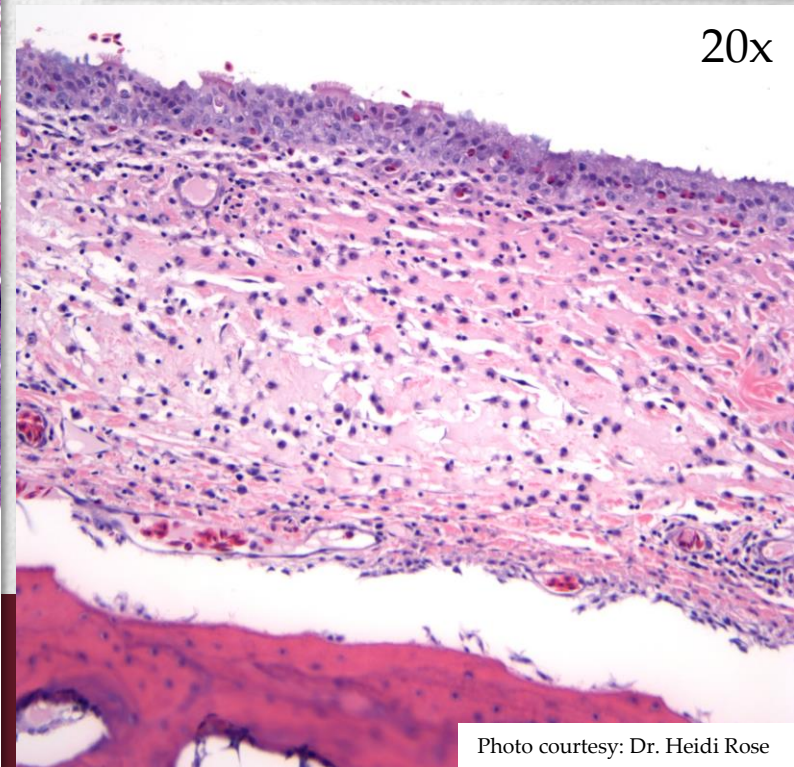
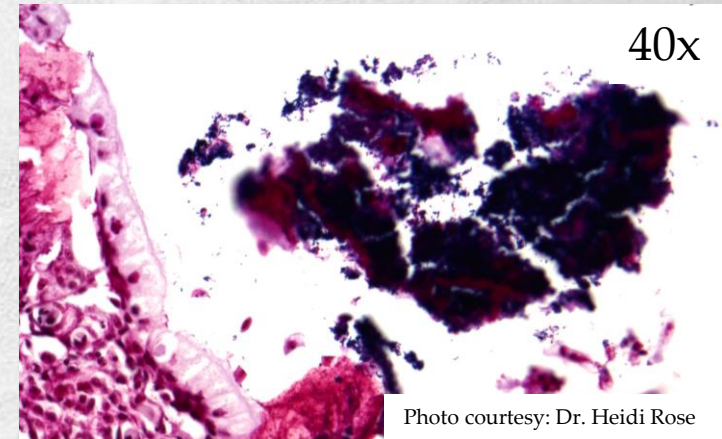
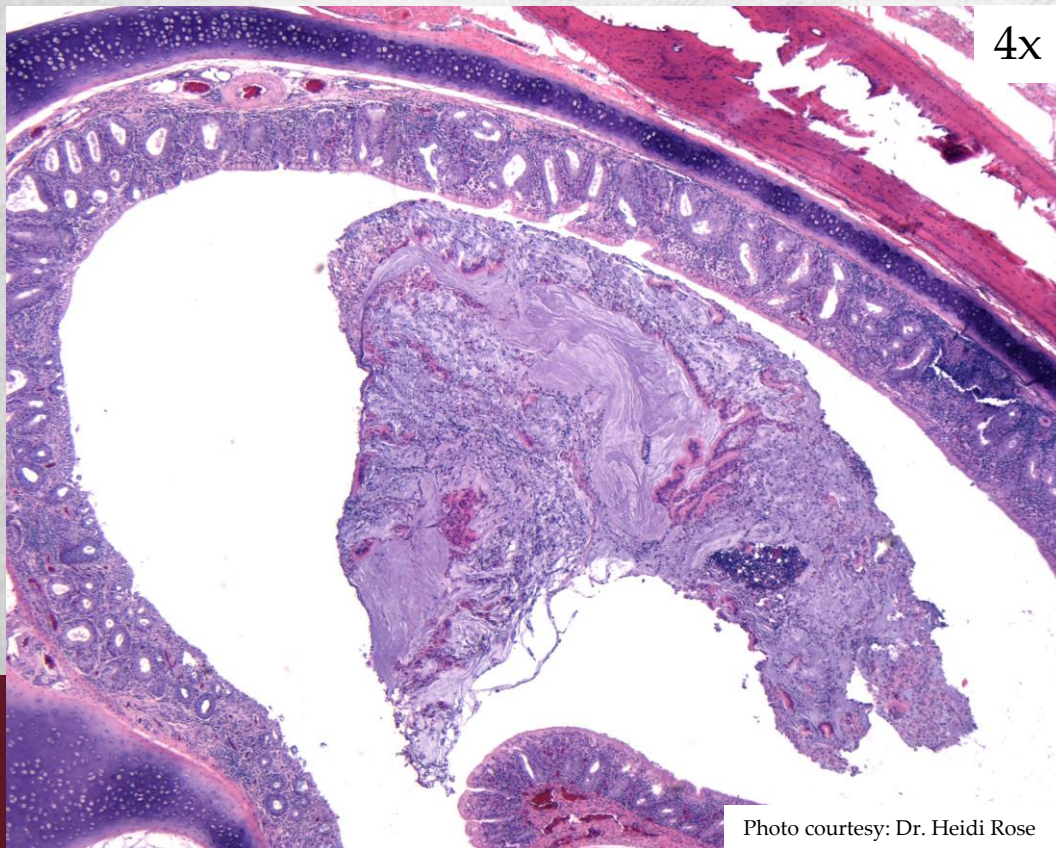


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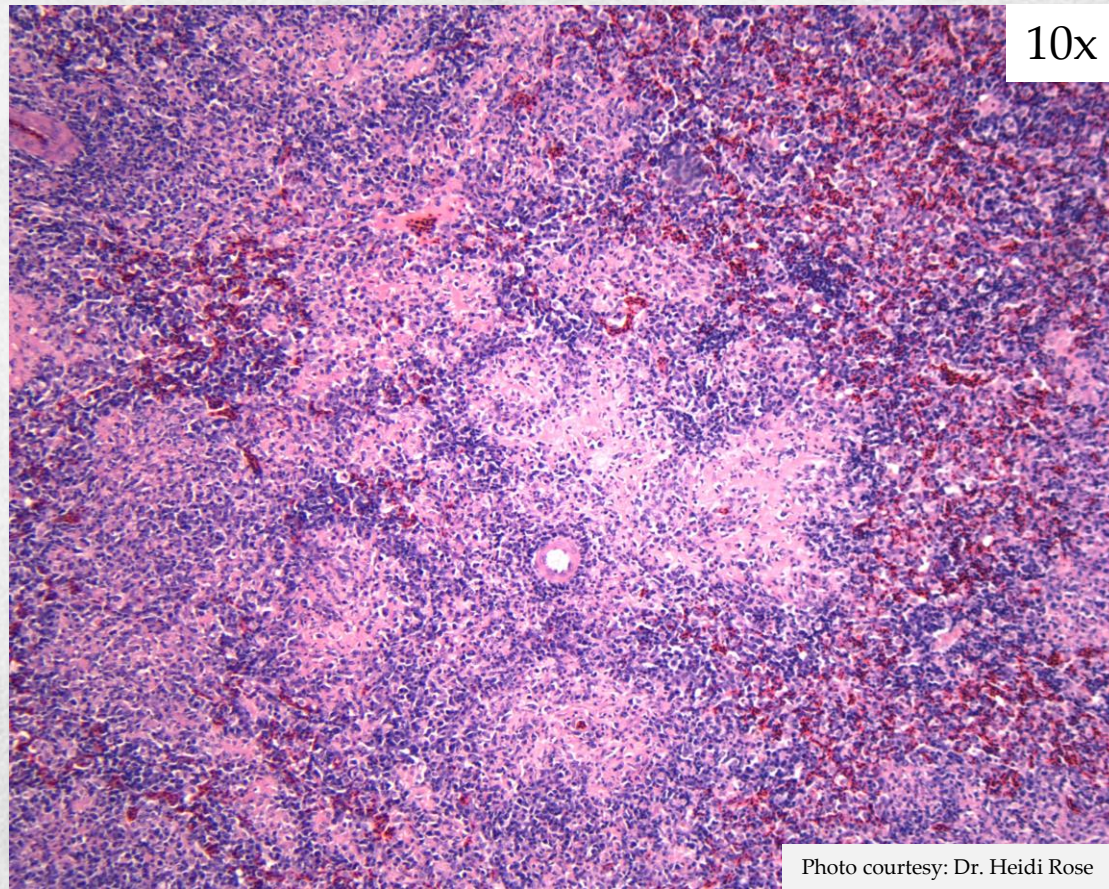
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Histopathology

Lymphocytic, focally erosive, catarrhal rhinitis and sinusitis with edema.
Gram positive bacterial rods within nasal exudate.



Histopathology



Fibrinous splenitis



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Virology

- Virus isolation in SPF chicken embryonated eggs
 - Tracheas
 - No virus isolated (3 passages)
 - Cecal tonsils
 - No virus isolated (3 passages)



Diagnosis

- Erysipelas

Erysipelothrix rhusiopathiae septicemias and sinusitis

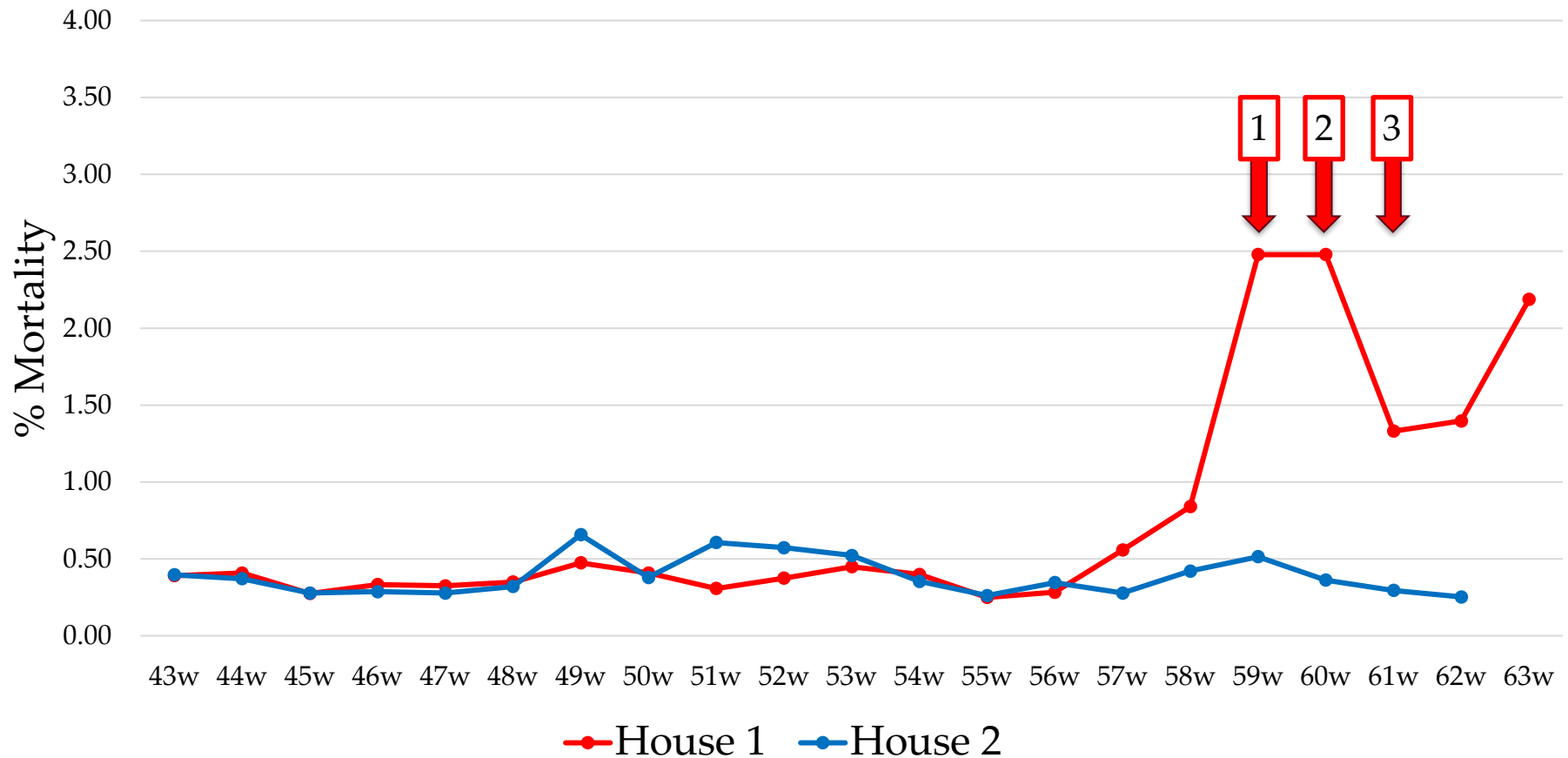
- Weak ILT PCR positive



Farm quarantined
Submission of additional birds for testing...



Case history



Gross pathology

	Case 1 (59wk)	Case 2 (60wk)	Case 3 (61wk)	Total
Catarrhal sinusitis	3/3	0/9	0/15	3/27
Tracheitis	3/3 (mild)	5/9 (mild)	5/15 (mild-marked)	13/27
Corneal ulceration	1/3	0/9	0/15	1/27
Multifocal hepatitis	0/3	1/9	3/15	4/27
Hepatomegaly	3/3	1/9	7/15	11/27
Splenomegaly	1/3	5/9	6/15	12/27
Renomegaly	3/3	0/9	0/15	3/27
Polyserositis	0/3	2/9	1/15	3/27
Peritonitis	0/3	6/9	1/15	7/27
Airsacculitis	1/3	0/9	0/15	1/27
Cystic oviduct	0/3	0/9	1/15	1/27
Round worms	0/3	0/9	1/15	1/27
Cecal worms	3/3	0/9	4/15	7/27

Gross pathology



Photo courtesy: Dr. Martha Pulido



Photo courtesy: Dr. Martha Pulido

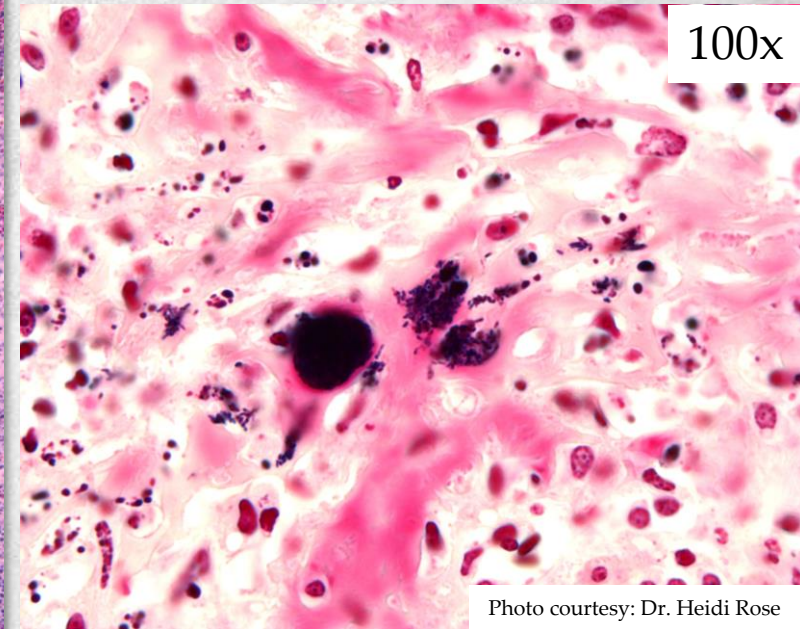
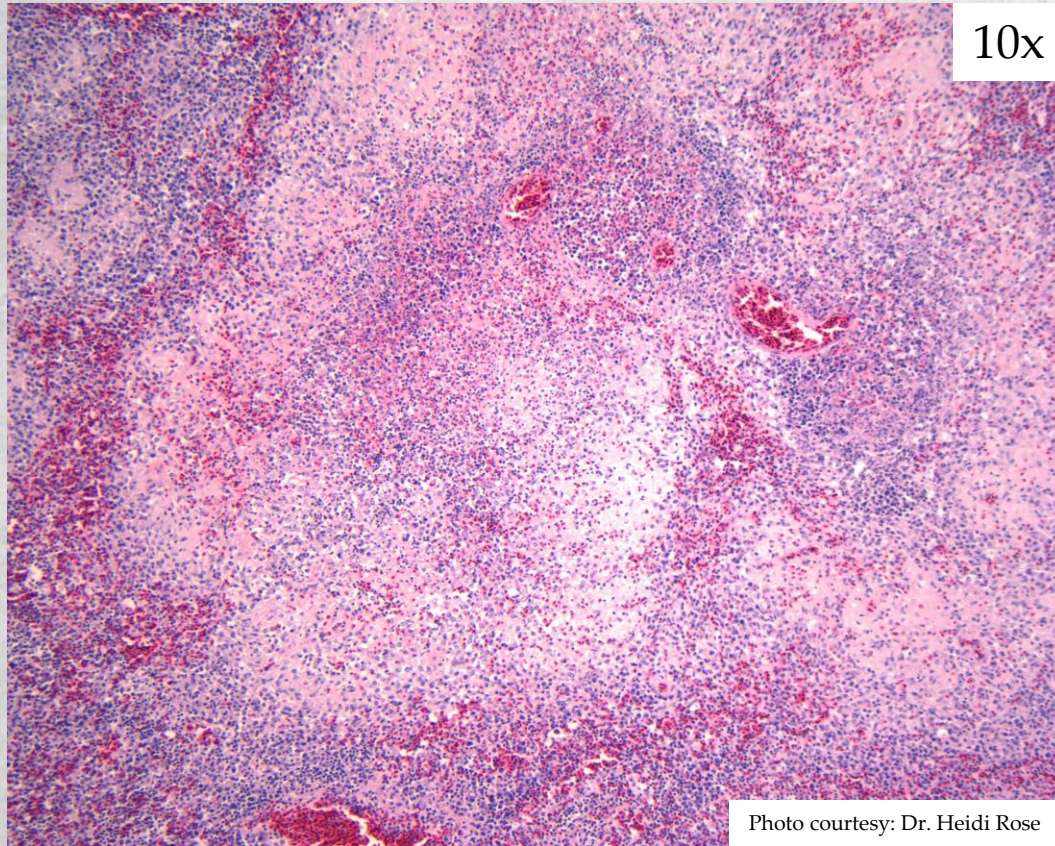
Moderate to marked splenomegaly
with mottling and necrotic foci



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Histopathology



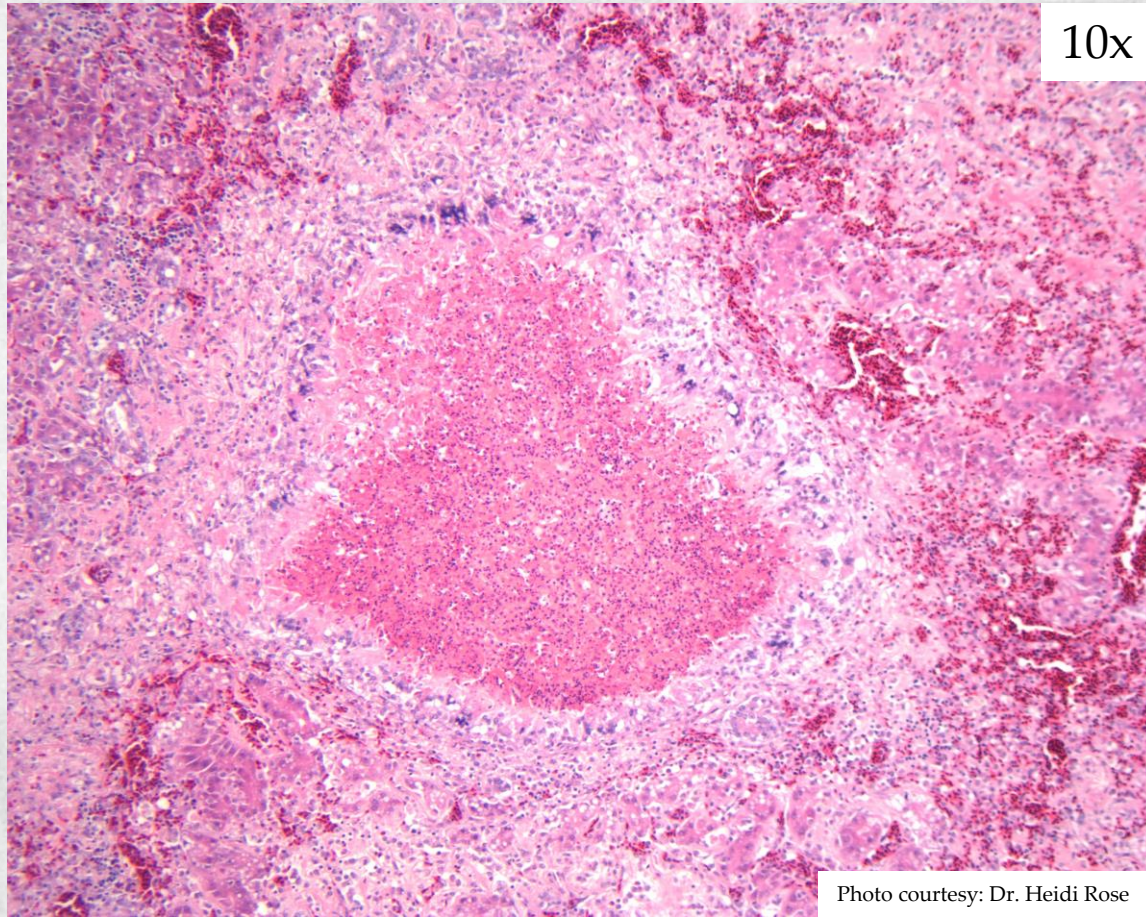
Necrotizing splenitis with intralesional Gram positive bacterial rods



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Histopathology



Necrotizing granulomatous hepatitis



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Bacteriology

Isolate	Case 1 (59wk)	Case 2 (60wk)	Case 3 (61wk)
<i>Erysipelothrix rhusiopathiae</i> *	2/3 livers; 2/3 sinuses	2/4 bone marrows; 3/5 spleens	6/6 spleens; 3/4 livers
<i>Escherichia coli</i>	-	2/5 spleens; 1/1 liver	-
<i>Gallibacterium anatis</i>	-	1/1 liver	-
<i>Salmonella Enteritidis</i> **	-	-	1/6 spleens; Enrichment broth

**E. rhusiopathiae*; 99.9% confidence value by Vitek® MS MALDI-TOF

**Identified by ISR genotyping

Real-Time PCR

Agent	Case 1 (59wk)	Case 2 (60wk)	Case 3 (61 wk)
ILT	Weak positive (CT = 35.31)	Weak positive (CT = 37.03)	Negative



Viral genotyping

- **ILTV genotyping (PRDC, UGA)**
 - Genotypes II & III
 - II = TCO vaccine
 - III = TCO revertant virus



Final diagnosis

- Erysipelas (3/3 cases)
 - Other septicemias:
 - *Escherichia coli* (1/3 cases)
 - *Gallibacterium anatis* (1/3 cases)
 - *Salmonella* Enteritidis (1/3 cases)
- ILT TCO vaccine detection (2/3 cases)



Discussion

- *Erysipelothrix rhusiopathiae*
 - Gram positive rod
 - Extended survival in soil
 - Causative agent of Erysipelas
 - Peracute or acute septicemic disease
 - Entry through disrupted skin
 - Important disease in swine and turkey breeders
 - Zoonotic agent
 - Erysipeloid
 - Rare septicemic disease

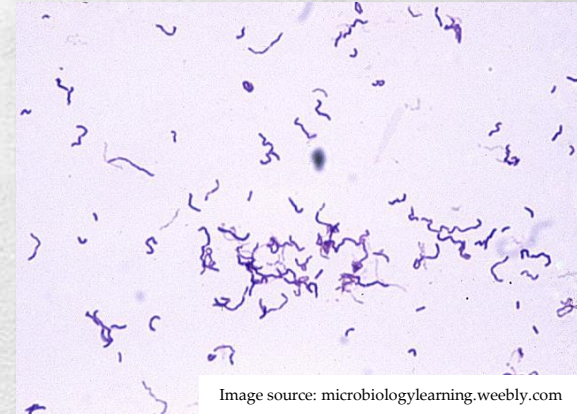


Image source: microbiologylearning.weebly.com



Image source: dermnetnz.org



Image source: oxfordsandyblackpiggroup.org



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Discussion

- **Erysipelas in chickens**
 - Emerging disease in laying hens with transition to free range, organic housing systems
 - Erysipelas in broiler breeders?
 - Rare – 1 published report
 - Erysipelas in broiler breeders in GA with swollen heads in 2019 (Shamoun *et al.* 2023, *Avian Dis*)
 - Erysipelas causing facial edema in chickens?
 - Rare - 2 published reports
 - Erysipelas in free-range layers in Germany with conjunctival edema (Schmitt *et al.* 2014, *Berl Munch Tierarztl Wochenschr*)
 - Erysipelas in broiler breeders in GA with swollen heads in 2019 (Shamoun *et al.* 2023, *Avian Dis*)



Discussion

- Factors contributing to Erysipelas outbreak in this flock?
 - Severe rodent issue on this farm
 - Rodents also suspected of being a vector in 2019 breeder case in GA (Shamoun *et al.*, 2023)
- Detection of ILT TCO vaccine/revertant virus 47 wks post vaccination?
 - Reactivation of ILT TCO vaccine under stress – Presumably induced by Erysipelas



Acknowledgements

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**Thanks for your
attention!**

Questions?

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