



THE UNIVERSITY OF GEORGIA
College of Veterinary Medicine

Stability of live Mycoplasma vaccines in the field

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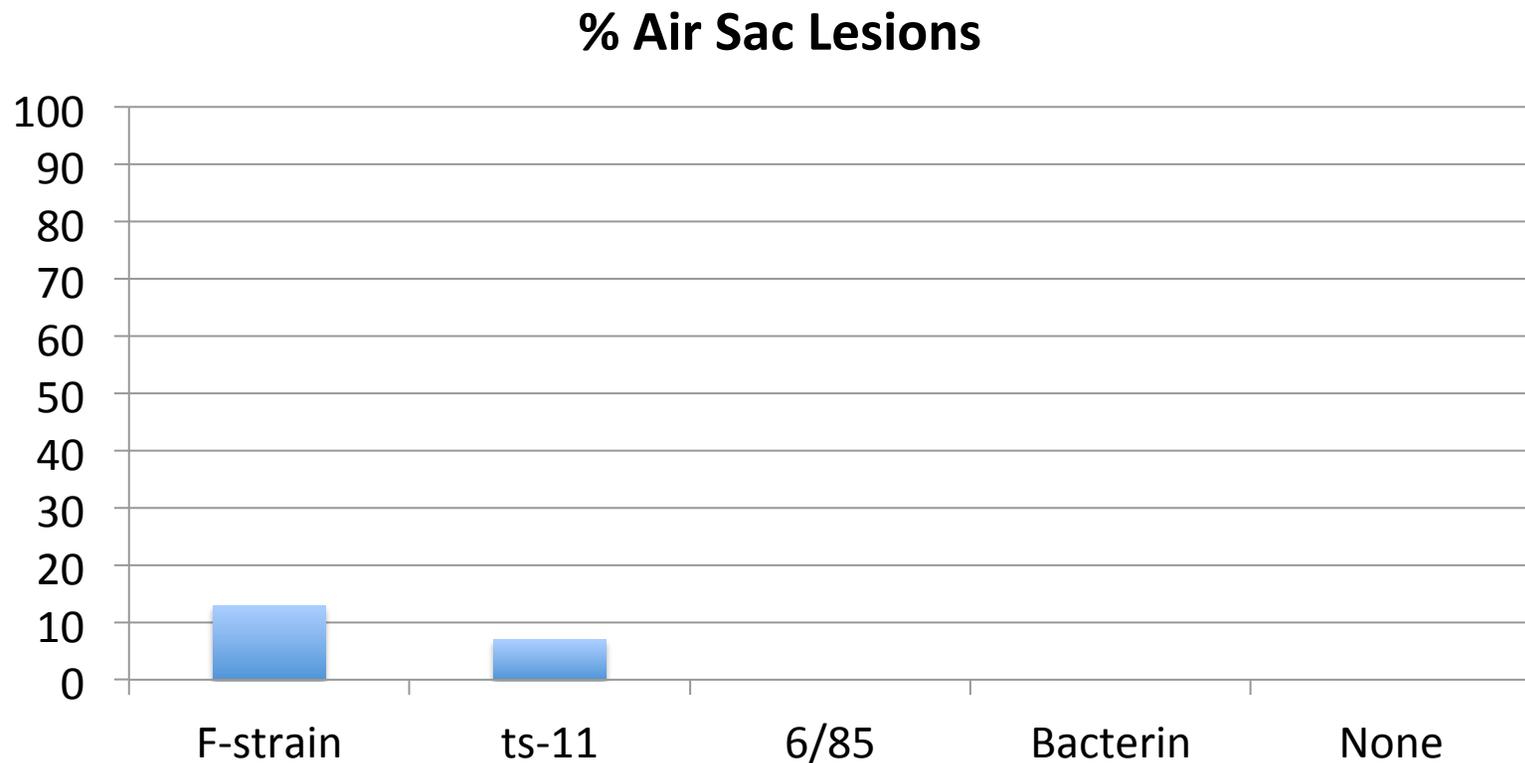


The Perfect Vaccine

- Safe
 - Reactivity
 - Transmission – horizontal and vertical
 - Reversion to virulence
- Efficacious
 - Duration of immunity
- Low Cost
- Easy to Administer and Transport
- Stable
 - On the shelf and in the birds



Safety of Live Vaccines and Bacterin



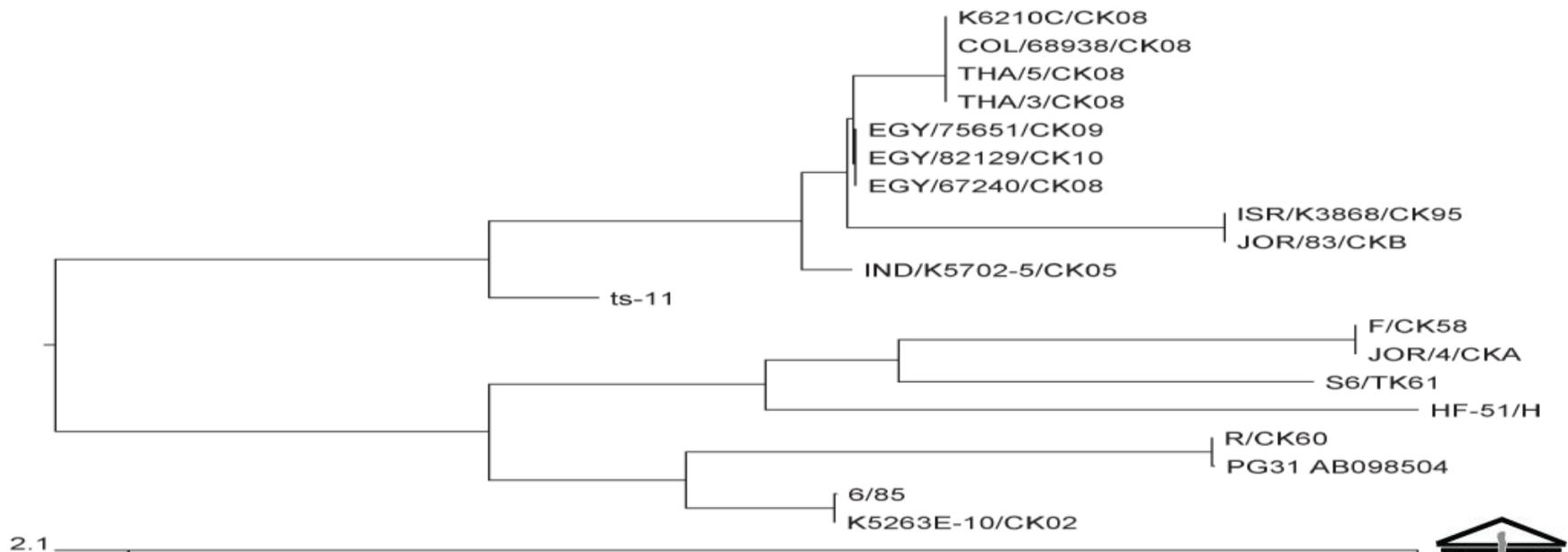
MG epidemiology in Jordan

- Relatively large and developing chicken industry
- No national plan to control MG infection
- Farmers depend on vaccination and/or chemotherapy
- 70 % of broiler flocks that suffered from respiratory disease were positive for MG by ELISA



MG epidemiology in Jordan

- 2004-2005 vs 2007-2008 (n=24)
- None of the flocks were vaccinated
- 21 isolates indistinguishable from F-strain



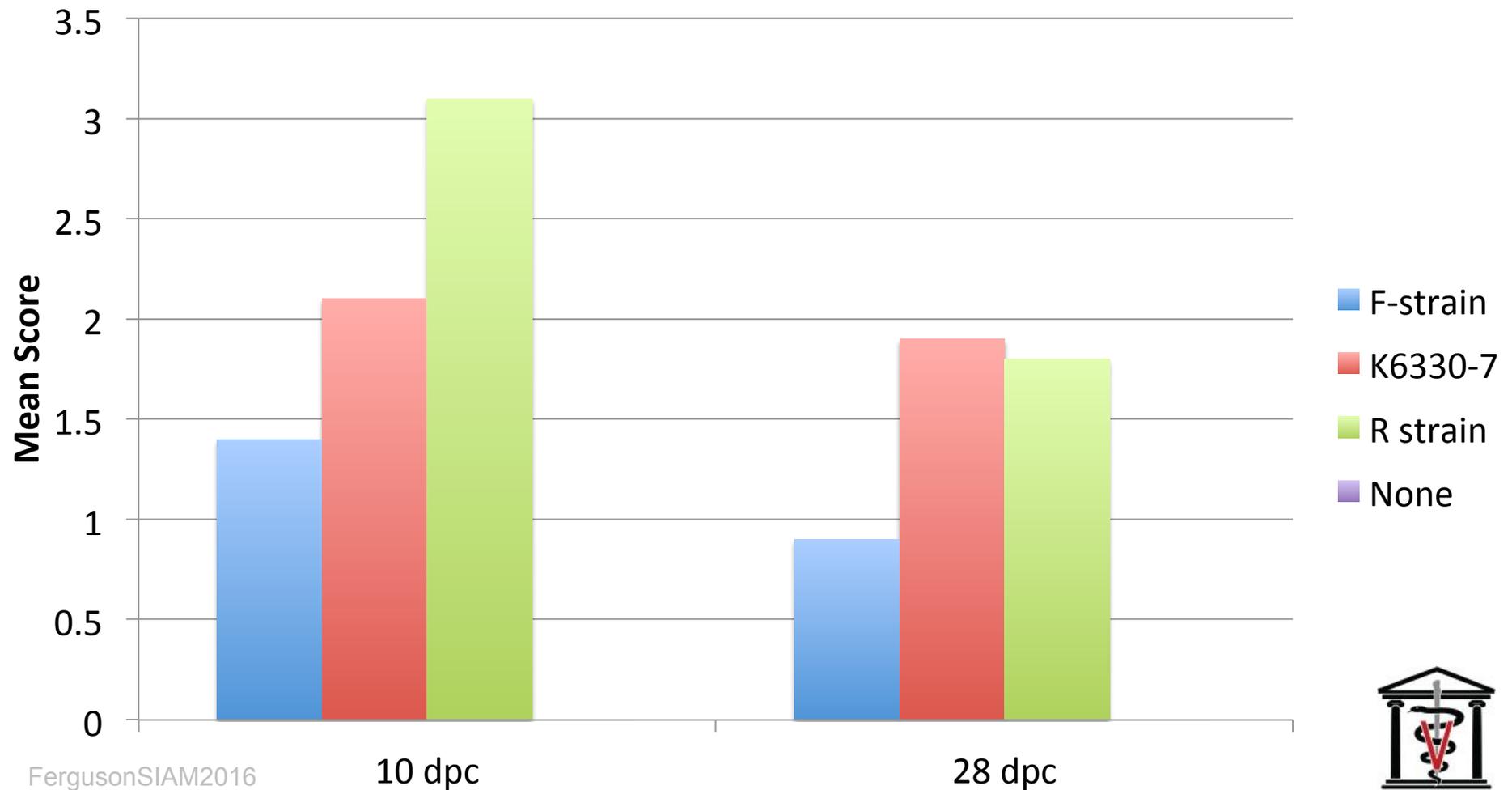
MG epidemiology in Jordan

- 2004-2005 vs 2007-2008 (n=24)
- None of the flocks were vaccinated
- 21 isolates indistinguishable from F-strain
- The most common vaccine used in Jordan in the early 2000's was F-strain
- In later years, F-strain availability was very limited



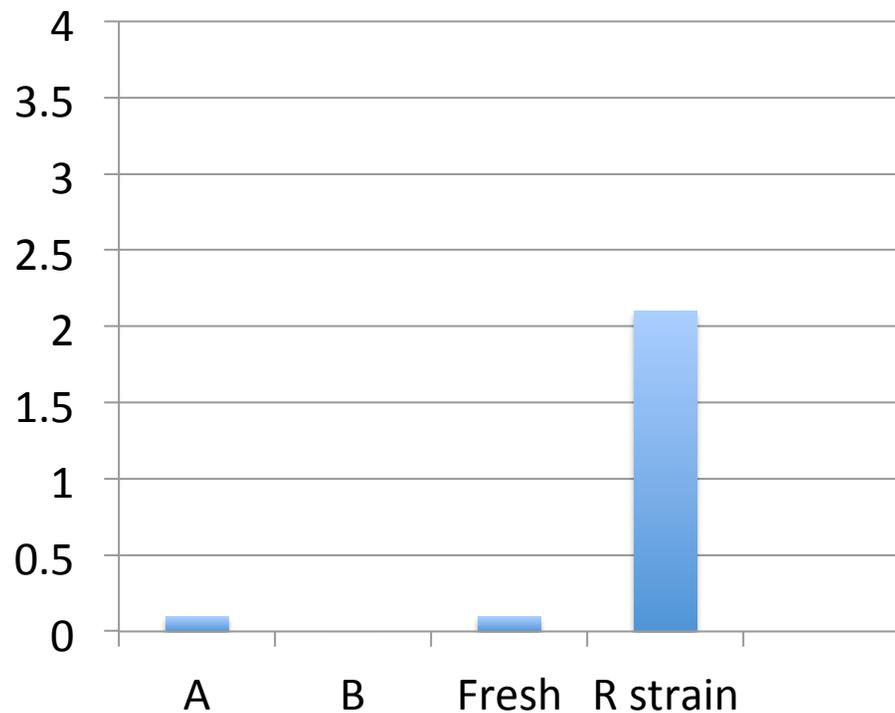
Jordan F-Strain – Increased Virulence in Broilers

Air Sac Lesion Scores

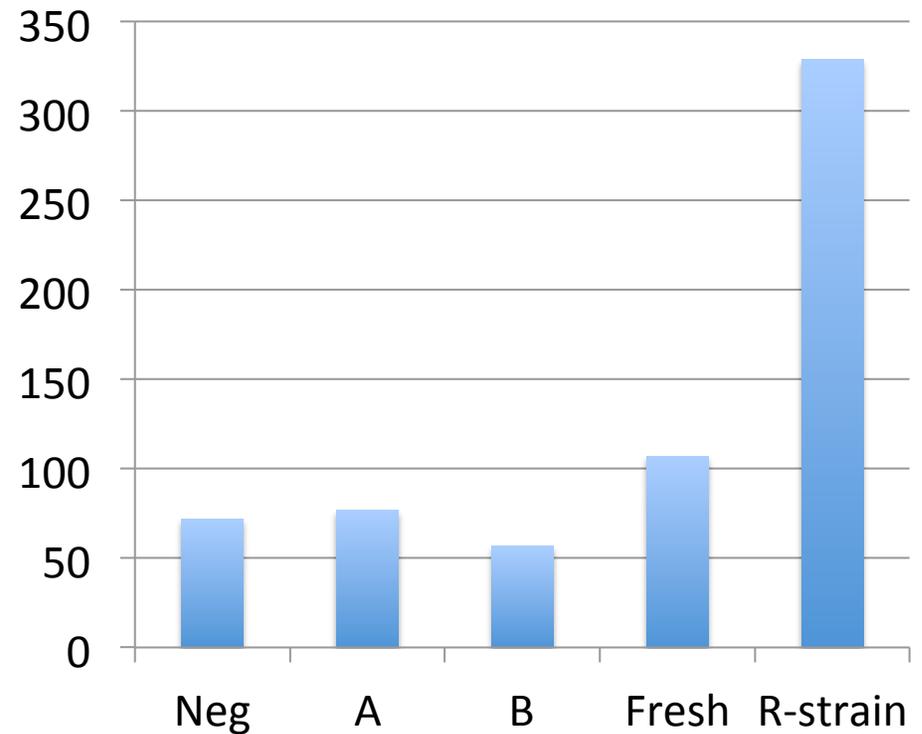


Safety of F Strain Vaccines – SPF Layers

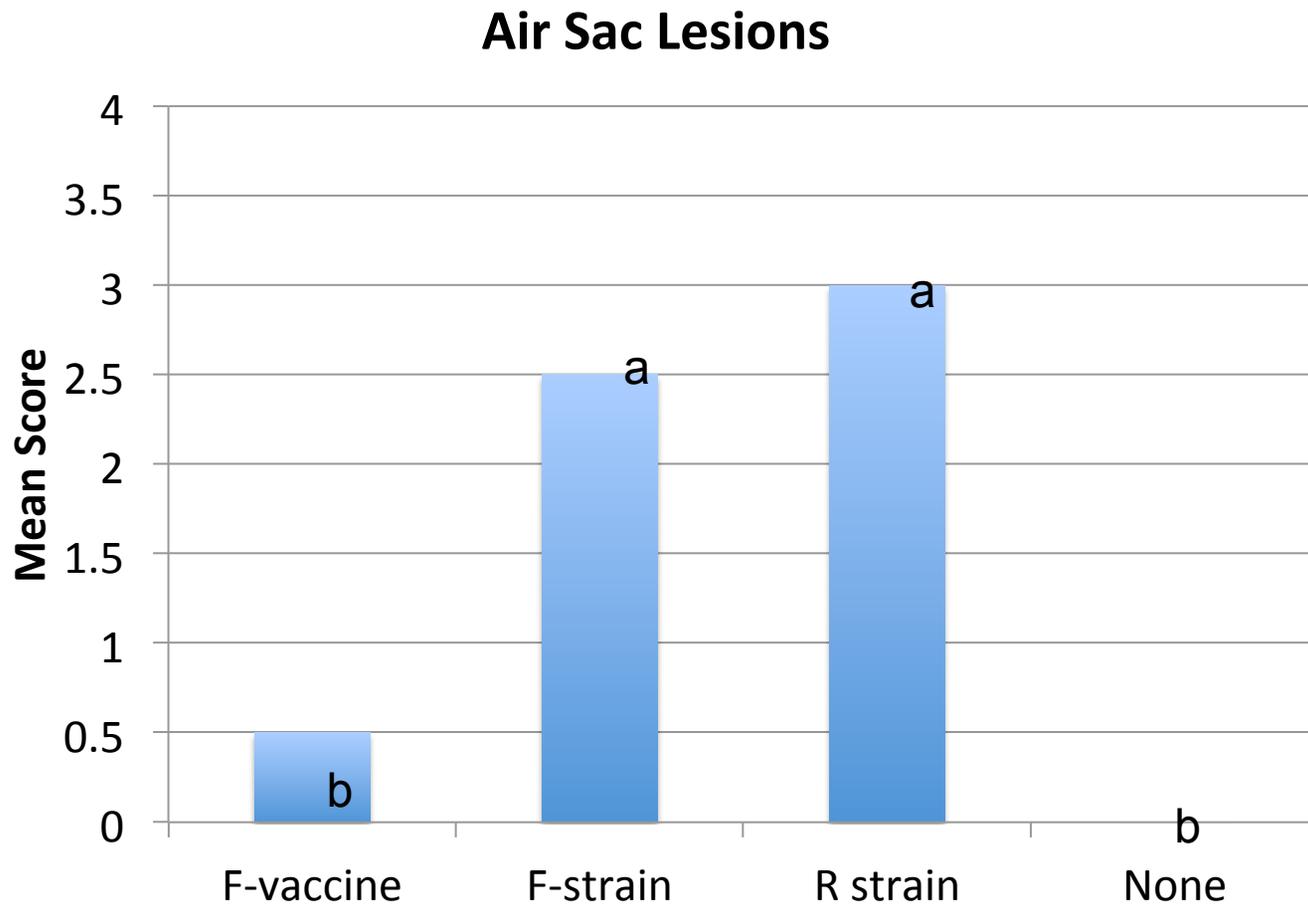
Mean Air Sac Lesion Score



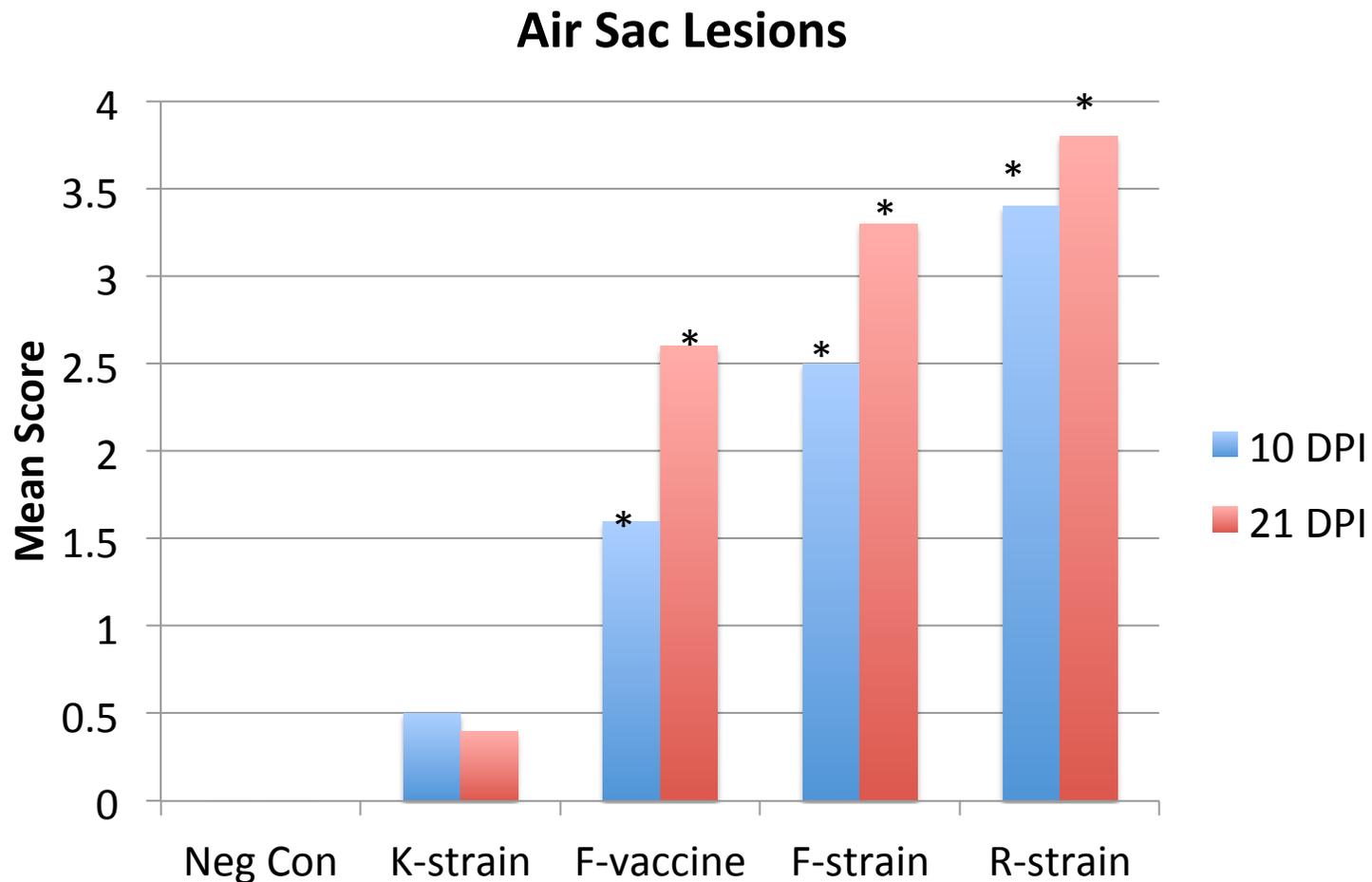
Tracheal Mucosal Thickness



Safety of F-Strain Laying Chickens



Safety of F-Strain Turkeys



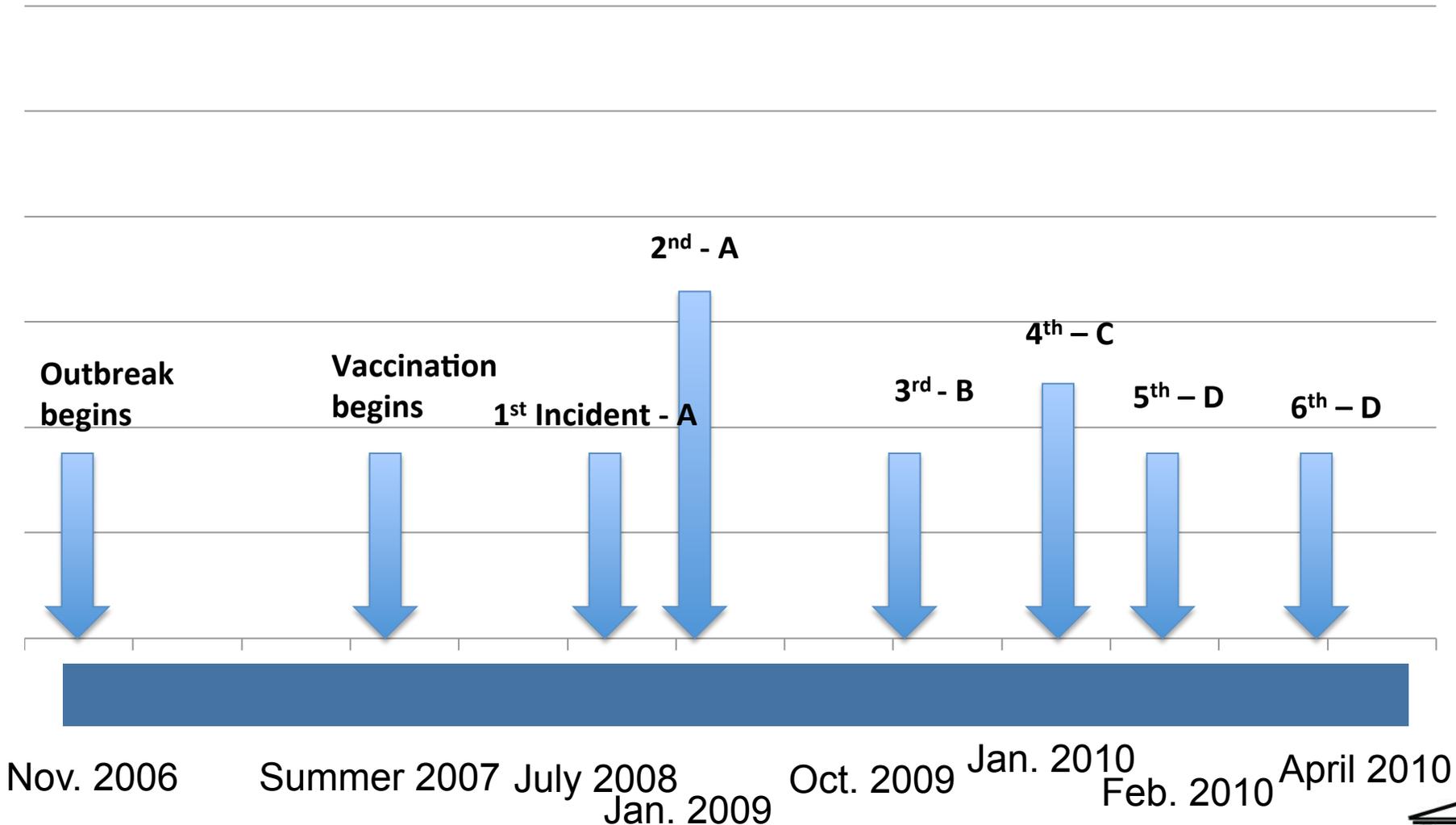
Conclusions

- F-strain vaccines attenuated (for chickens)
- Lateral spread = increased virulence

Biosecurity!!!!



MG Outbreak in NE GA and ts-11 Vaccination



ts-11 - Increased Virulence and Vertical Transmission

- Pathogenicity Trial
 - El Gazzar, M., Laibinis, V. & Ferguson-Noel, N. (2011). **Characterization of a ts-11-like *Mycoplasma gallisepticum* Isolate From Commercial Broiler Chickens.** *Avian Dis*, 55, 569-574.



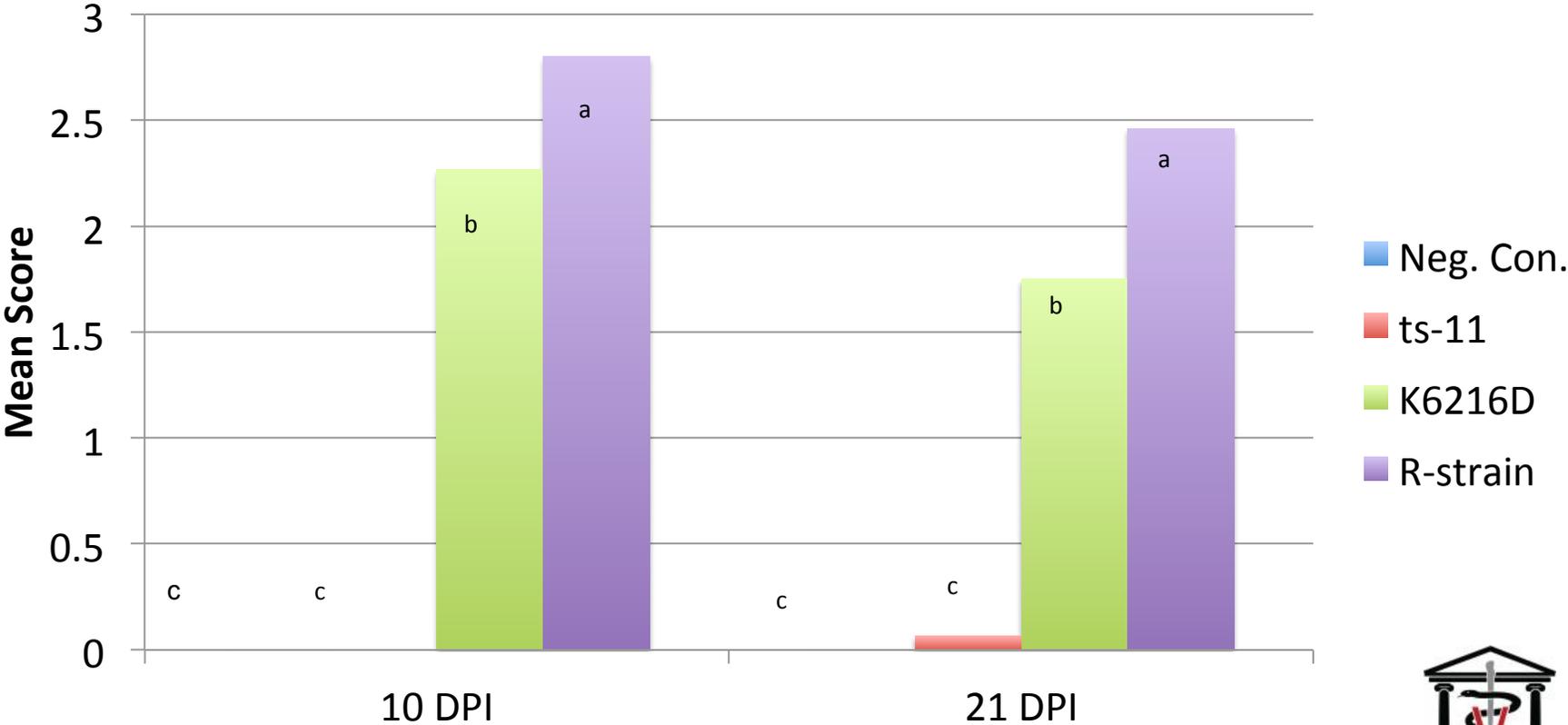
Pathogenicity Trial

- Cloned ts-11-like field isolate from broilers vs ts-11 and R-strain
- Broilers
- Inoculate at ~5 woa via aerosol
- Necropsy at 10 and 21 dpi – serology, real-time PCR, air sac lesions, tracheal lesions, culture of air sacs



NE GA ts-11 – Increased Virulence in Broilers

Air Sac Lesions



ts-11 - Increased Virulence and Vertical Transmission

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- Vertical Transmission Trial
 - Armour, N.K. & Ferguson-Noel, N. (2015). **Evaluation of the egg transmission and pathogenicity of *Mycoplasma gallisepticum* isolates genotyped as ts-11.** *Avian Pathol*, 1-24. doi: 10.1080/03079457.2015.1044890

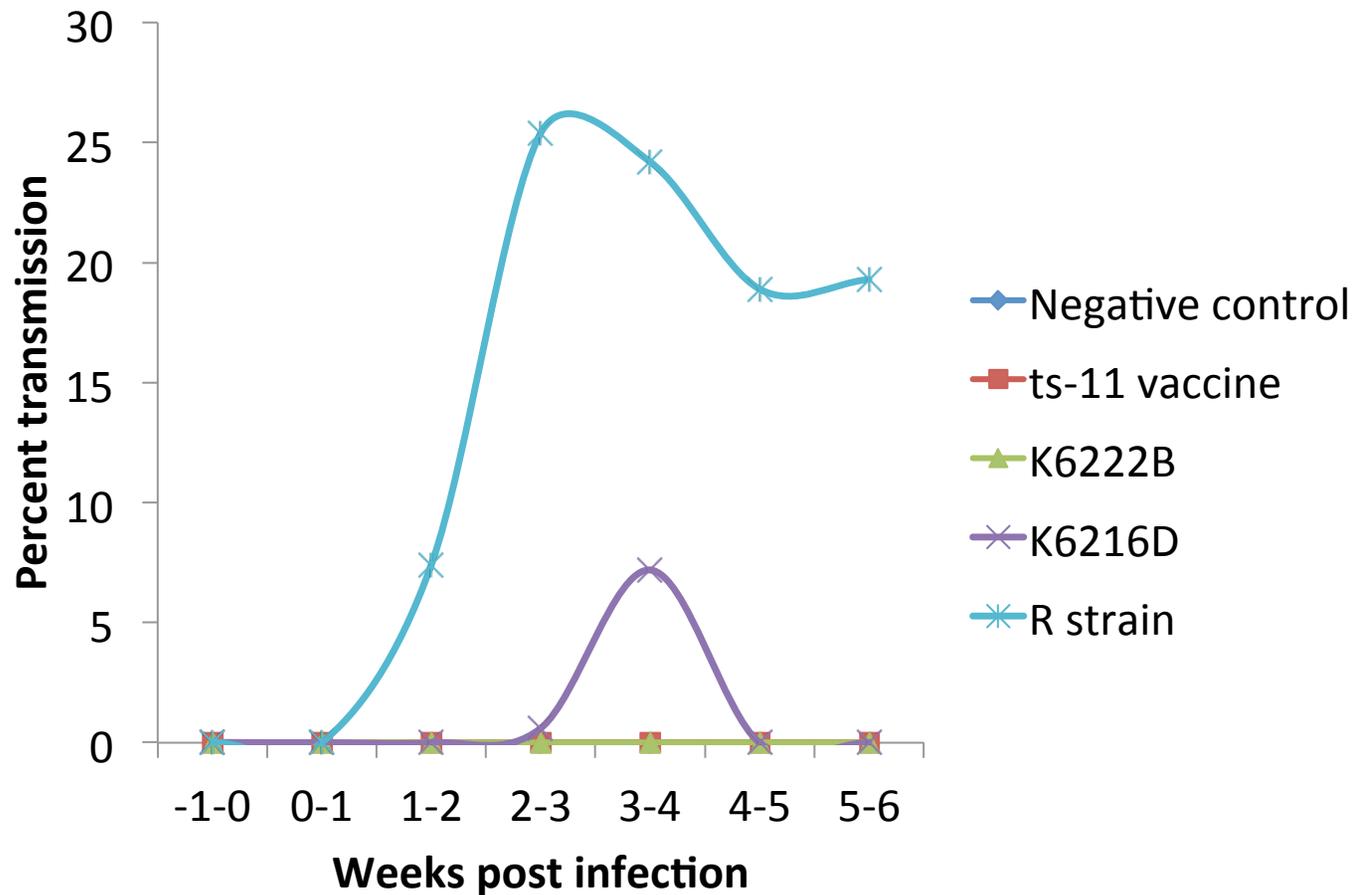


Vertical Transmission Trial

- Cloned ts-11-like field isolates from broilers and broiler breeder vs ts-11 and R-strain
- Layers
- Inoculate at 28 woa via eye drop and aerosol
- Culture fertile eggs (18 days) for 6 wk pi
- Necropsy at 6 wk pi – serology, real-time PCR, air sac lesions, tracheal lesions, culture of air sacs, ovaries and oviducts



Vertical Transmission of ts-11 genotype



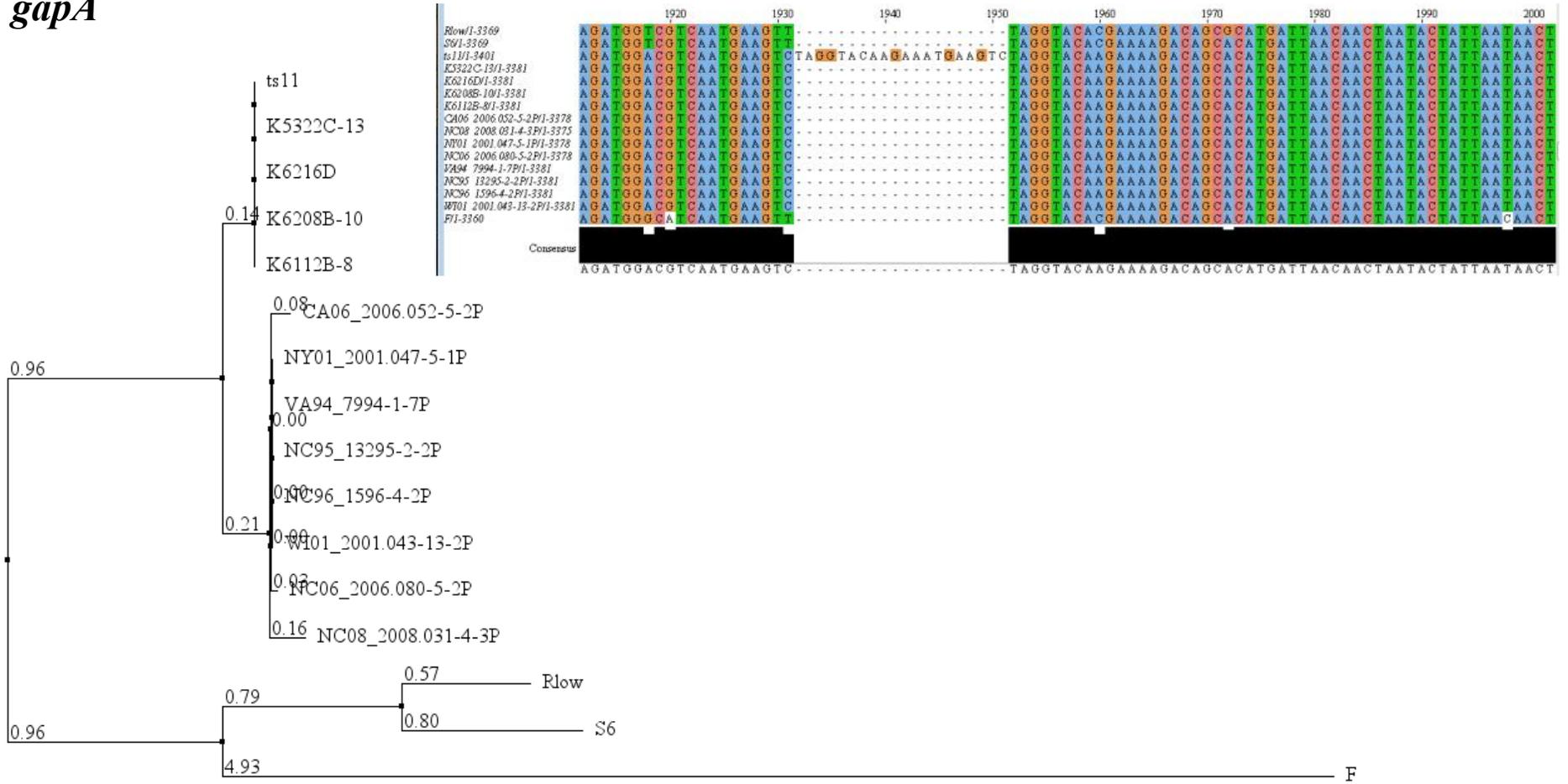
ts-11 - Increased Virulence and Vertical Transmission

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- Whole Genome Analysis
 - Manuscript submitted

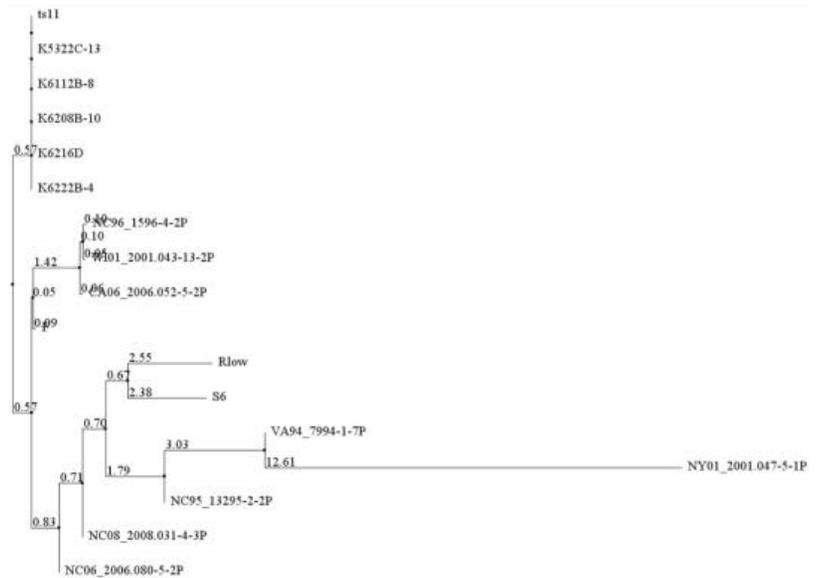
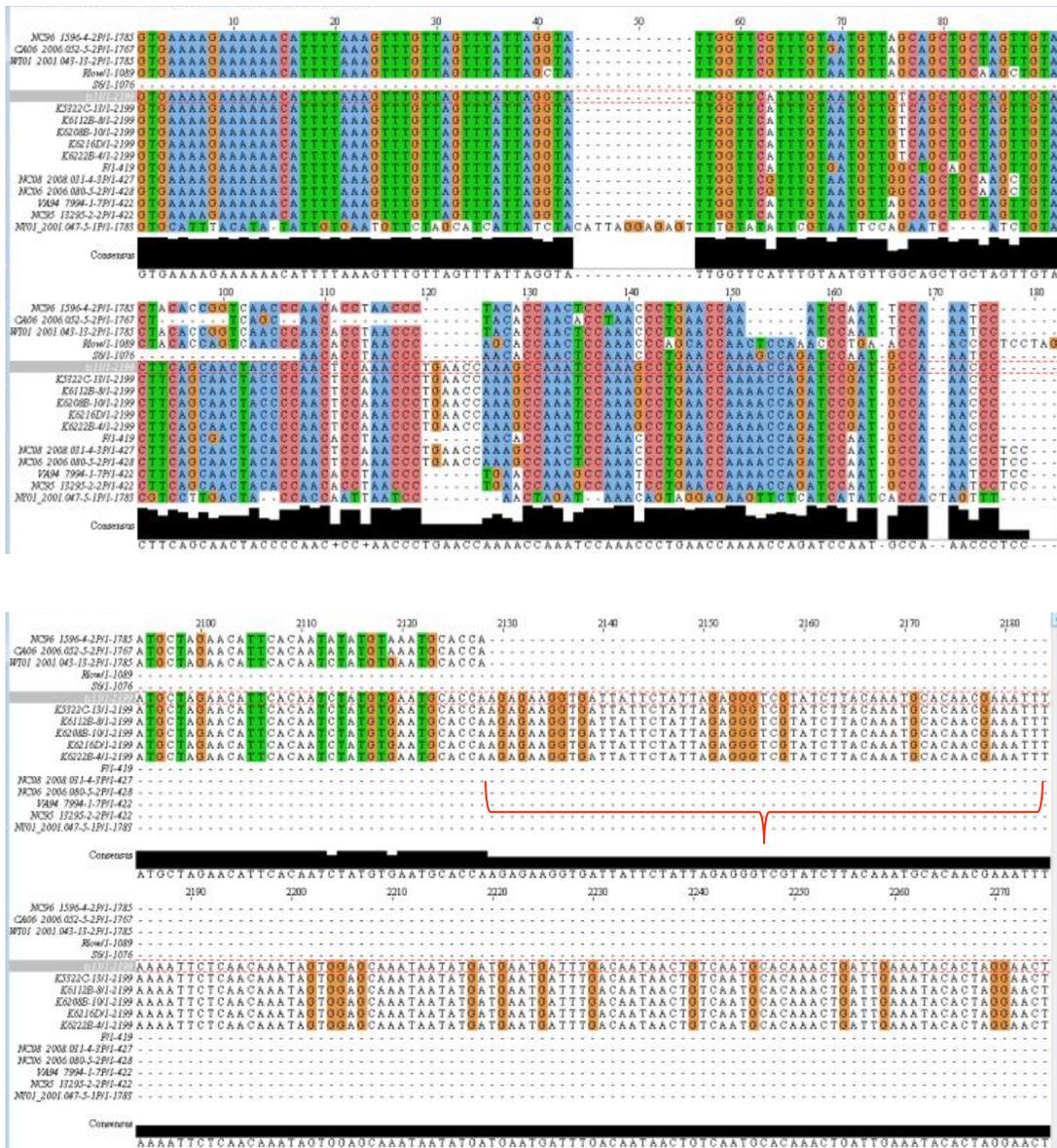
ts-11 Isolates for Whole Genome Analysis

Isolate	Description	Virulence
ts-11	Vaccine	attenuated strain
K5322C-13	Study - re-isolate	Avirulent/reisolate
K6112B-8	BB; No CS	Avirulent/reisolate
K6208B-10	BB; No CS	Avirulent/reisolate
K6216D	B; sick	Virulent
K6222B-4	BB; sick	Virulent
K6356-12	B; sick	Virulent
K6372-23	B; sick	Virulent

gapA



vlhA3.04b

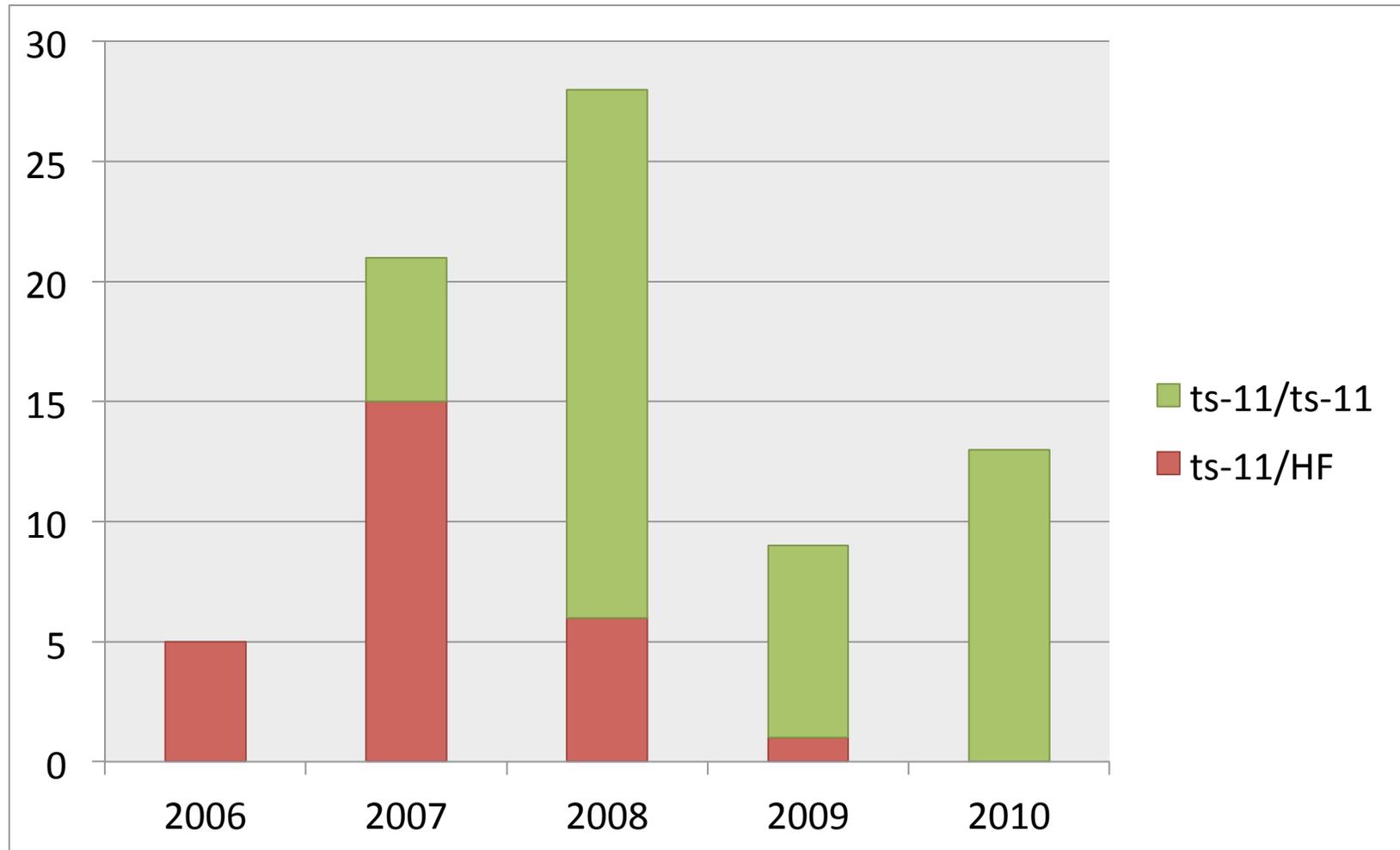


Increased Virulence and Vertical Transmission

- <http://www.gapoultrylab.org/wp-content/uploads/2012/05/Experience-in-Use-of-MG.pdf>



MG – GA Broiler-type

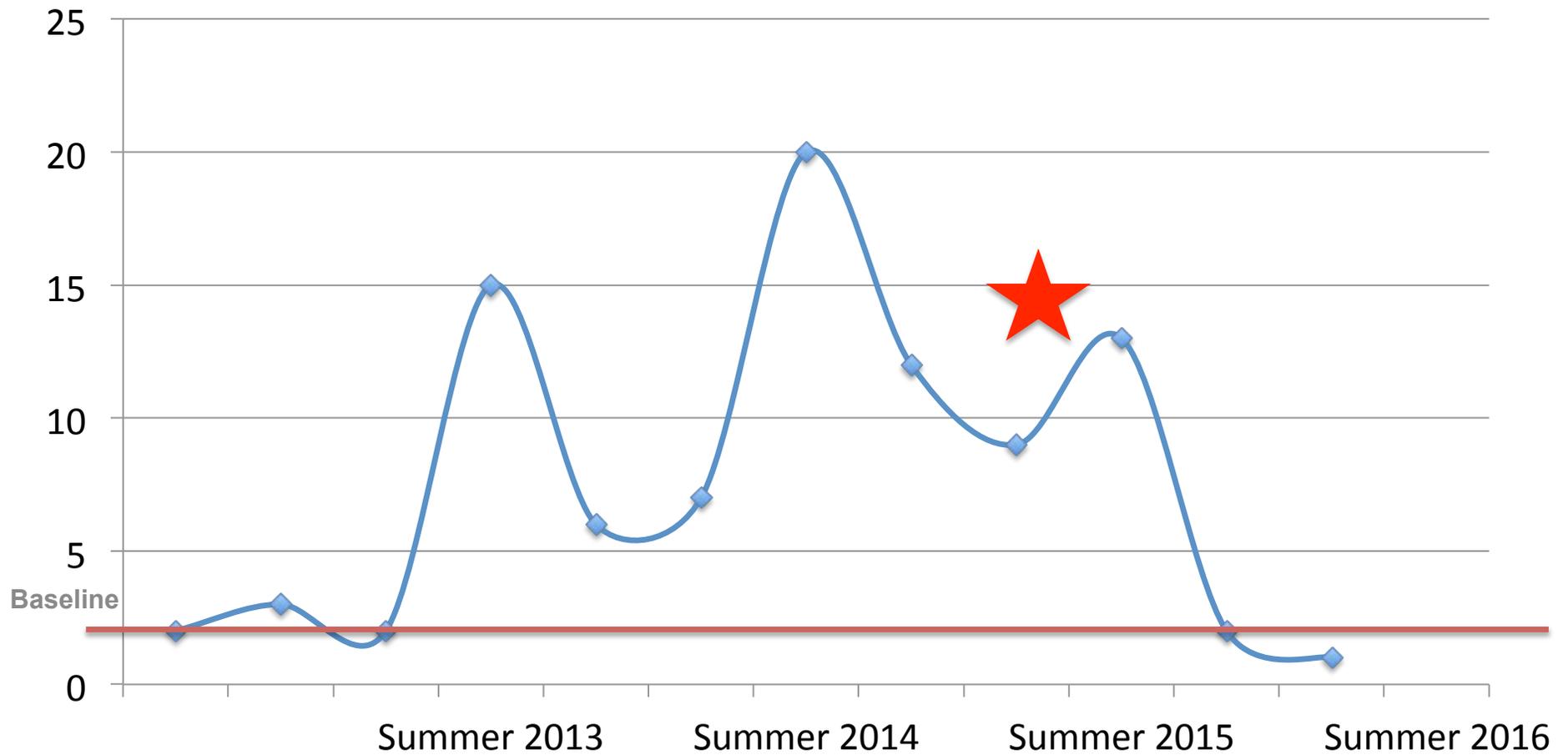


Questions

- Were the GA ts-11 isolates temperature sensitive?
- Maybe this is a GA “ts-11-like” field strain?
- Were the breeders/broilers also infected with a wild-type?
- Why did it take so long for the vertical transmission to begin?



MS Outbreak in NE GA



Thank you

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New Molecular Tests at PDRC:

M. gallisepticum ts-11 PCR

Campylobacter jejuni/coli

Avibacterium paragallinarum

Salmonella serotyping

Clostridium perfringens netB

