

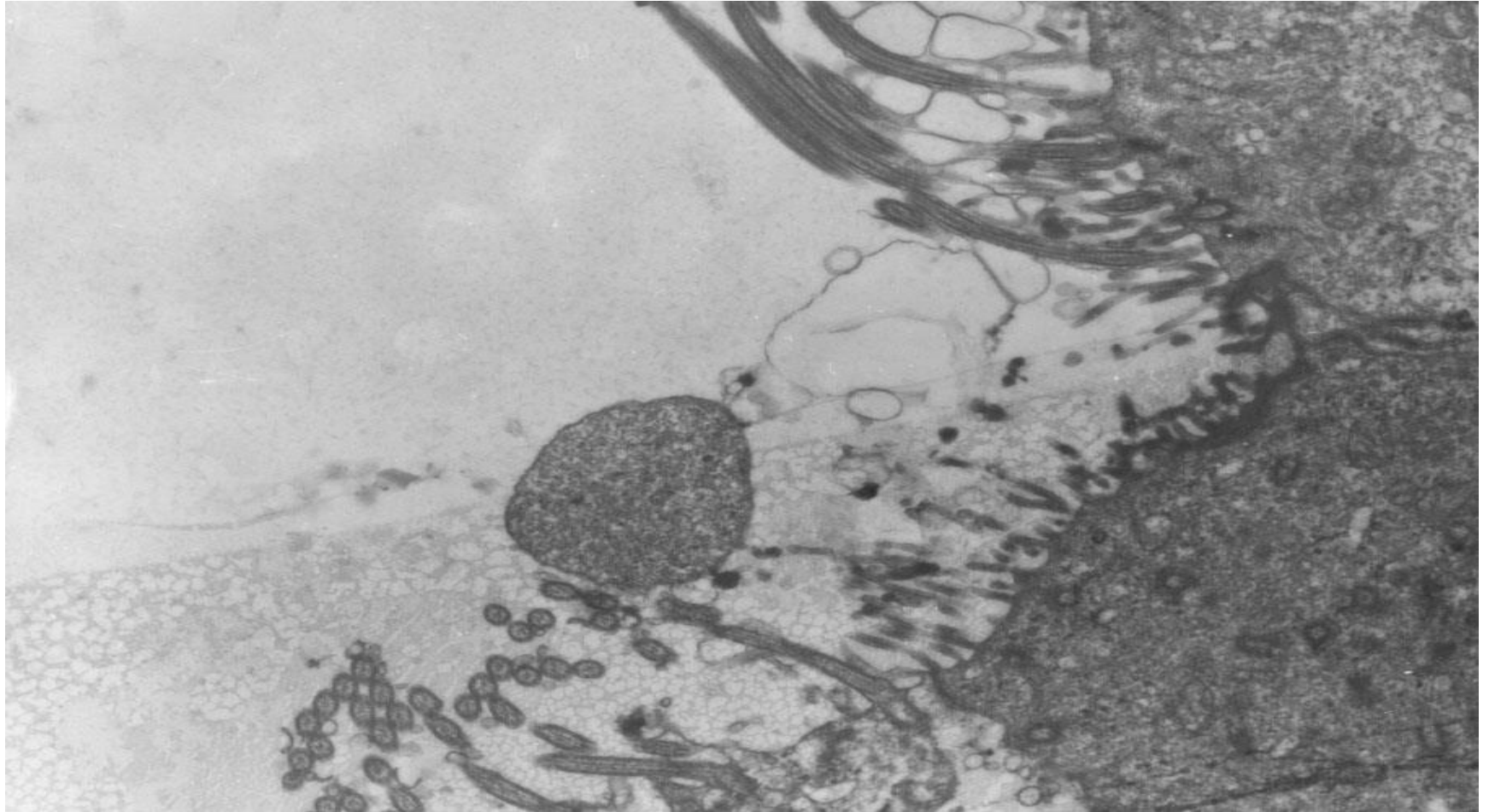




# **Mycoplasmosis in pheasants and treatment with Aivlosin (tylvalosin)**

**with acknowledgements to  
Professor Janet Bradbury and her staff  
University of Liverpool**

# EM of *M.gallisepticum* in the trachea





# Mg infection – 'Classic' manifestation



# We want then to look like this!



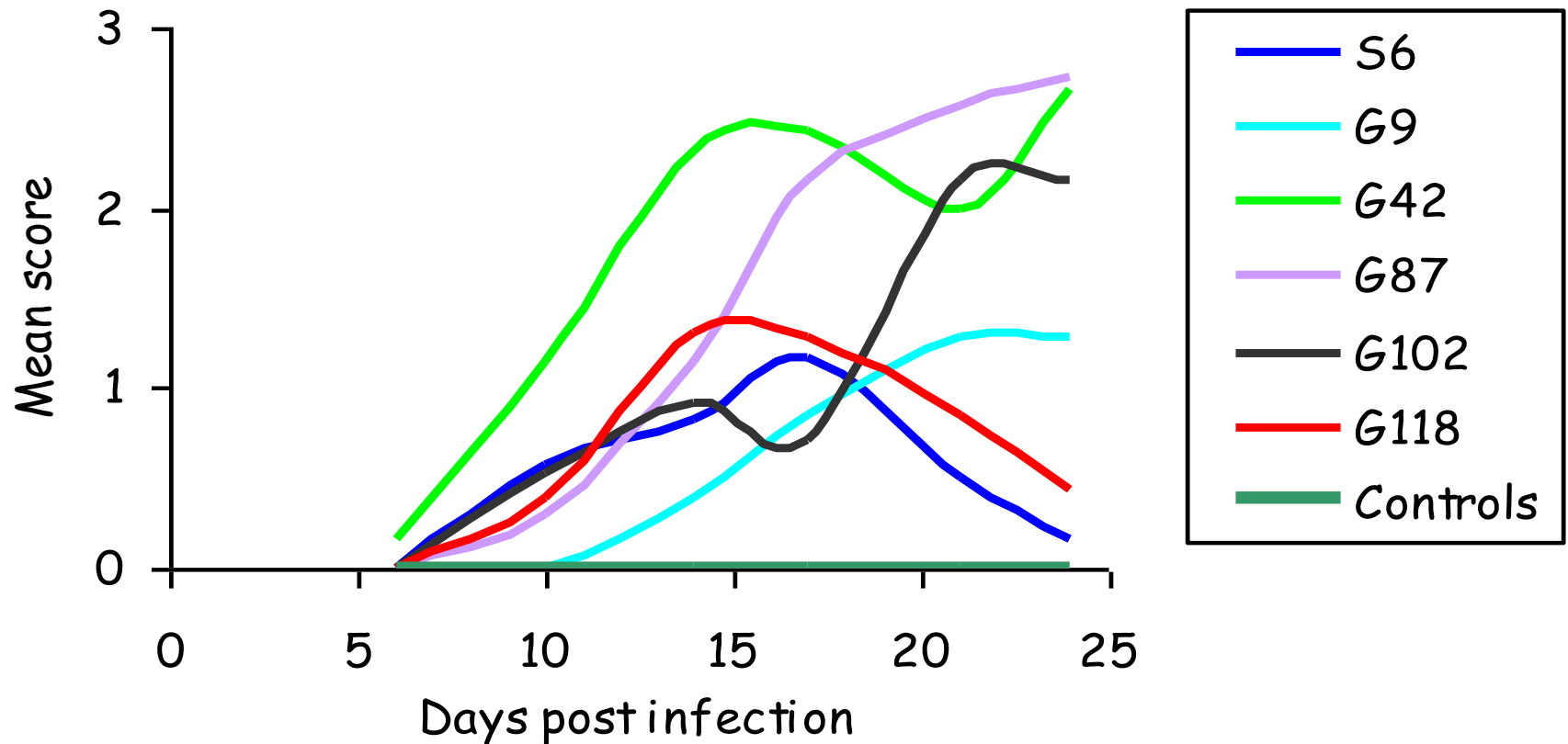
# Liverpool University Veterinary Faculty

- Faculty has been conducting pioneering work on Mycoplasma infection in game species
- Developed Experimental Challenge Model over many years
- Conduct and design of the ECO Regulatory studies with Aivlosin<sup>®</sup> subject to Home Office approval regarding welfare



# ***M. gallisepticum* infection in pheasants: mean clinical scores of six different strains.**

Forrester, Davies & Bradbury - GWCT and NGO Sponsored Study



# Isolation Unit - Liverpool Vet School





# **Pheasant - Dose Determination Study.**

- 4 TVN Dose rates evaluated plus –ve control
- 25 mg/kg dose selected for dose confirmation study
- Poultry studies carried forward as a part of the Pheasant MUMS licence...
- Both studies used in Licence application

# Trial design (dose confirmation)

84 pheasants (Chinese cross, ring necked)

- 3 pens of 12 pheasants (medicated)
- 3 pens of 12 pheasants (unmedicated)
- 1 pen of 12 pheasants as no-challenge unmedicated controls

*Mycoplasma gallisepticum*

- intranasal inoculation at 14 days old

# Clinical signs evaluated

- **W** – Watery eyes
- **C** – Conjunctivitis
- **D** - Depression (reluctance to move, ruffled feathers)
- **N** - Nasal exudate \*
- **S** - Sinus swelling \*

\*1 = mild, 2 = moderate, 3 = marked

- **R** - Respiratory signs (sneezing, snicking, gasping)
  - 1 = mild (1-2 birds/pen)
  - 2 = moderate (3-8 birds/pen)
  - 3 = substantial (9-12 birds/pen)



# Untreated Pheasants infected with *M. gallisepticum* strain G87



**26 days post-infection  
clinical scores = 3**

# The uninfected controls stayed healthy!



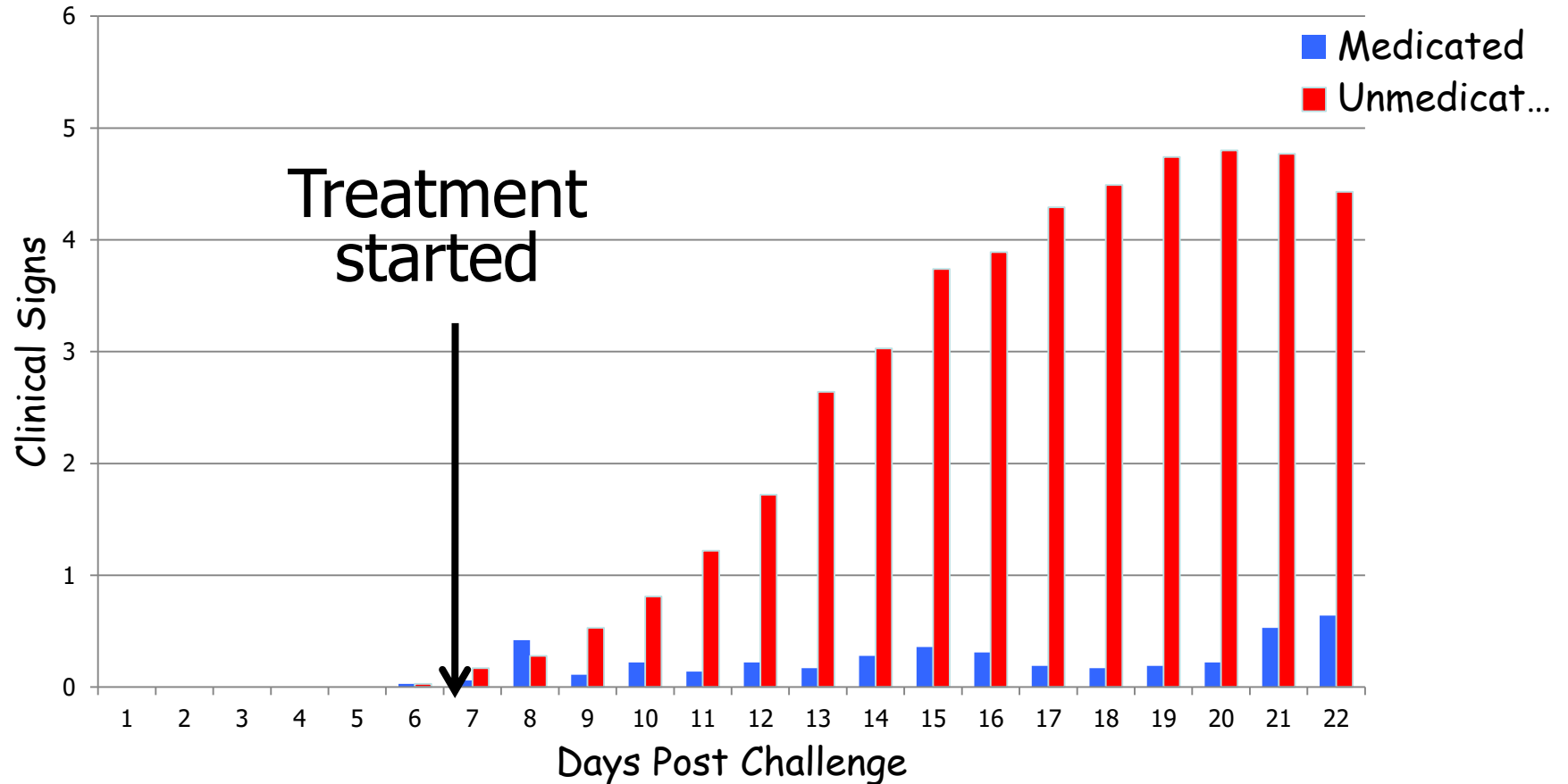
26 days old; clinical score = 0

# Lesion scoring





# Mycoplasma clinical scores



# Challenge Group 2 (unmedicated)

## Clinical Scores

Clinical scores in the challenged, unmedicated group 2 pheasants														
Pen 4					Pen 5					Pen 6				
DM10	DM11	DM12	DM13	DM14	DM10	DM11	DM12	DM13	DM14	DM10	DM11	DM12	DM13	DM14
D NE2B	D NE2B	L NE1U	D NE1U	D SS1U	L,D,C SS3B NE2B	L,D,C SS3B	L,D,C SS3B	L,D,C SS3B NE2U	L,D,C SS3B NE1U	DEAD	DEAD	DEAD	DEAD	DEAD
L,D,C SS2B, NE1B	L,D,C SS2B, NE1U	L,D,C SS2B, NE1U	L,D,C SS2B NE1U	L,D,C SS2U	L,D,C SS2U	L,D,C SS2U	L,D,C SS2U	L,D,C SS1U	L,D SS1U	L,D,C NE1U SS2B	L,D,C NE2B SS2B	L,D,C NE2B SS3B	L,D,C NE2B SS3B	L,D,C SS3B
L,D,C SS2U, NE1U	L,D,C, SS1U, NE2U	L SS1U NE1U	L,C SS1U	L,D,C SS1U NE1U	L,D,C SS1B NE1U	L,D,C SS1B NE1B	L,D,C SS1B NE1B	L,D,C SS1B NE1B	L,D,C SS1B	L,D,C NE1U	L,D,C	L,C NE1U	L,D,C NE1U SS1B	L,D,C SS2B
L,D,C SS1U, NE2U	L,D SS1U, NE2U	L,C NE2U	D SS1U NE3U	D SS1U NE1U	L,C SS2B NE1U	L,D,C SS2B	L,C SS2B	L,D,C SS2B NE1U	L,D,C SS2B NE1U	-	-	L,C	L SS1U	L,D,C SS1U
L,D,C SS2B, NE2B	L,D,C SS2B, NE2U	L,D,C SS2B NE1B	L,D,C SS2B NE1B	D SS3B	L,D,C SS2B NE1U	L,D,C SS2B NE2U	L,D,C SS1U NE1U	L,D,C SS1B NE1B	L,D,C SS1B	L,D,C NE1B SS2B	L,D,C NE2B SS3B	L,D,C SS3B	L,D,C NE1U SS3B	L,D,C NE1U SS3B
NE1U	L	L	D NE1U	D NE2U	L,D,C SS2B NE1U	L,D,C SS2B NE1U	L,D,C SS2B	L,D,C SS1B	L,D,C SS1B	L,D,C NE2B SS3B	L,D,C NE2B SS3B	L,D,C NE2B SS3B	L,D,C NE2B SS3B	L,D,C NE1B SS3B
L,D,C SS2U NE2U	L,D,C SS2U, NE2U	L,D,C SS2B NE2B	L,D,C SS2B	L,D,C SS2B NE1U	SS1U NE2U	SS1U	SS1U NE2U	SS1U NE1U	SS1U NE1B	D,C SS1U	L,D,C SS2U	L,D,C SS2B	L,D,C SS1B	L,D,C SS2B
D NE1U	D NE1U	L NE2U	D NE1U	NE1U	-	L,D	L,D NE1B	L,D	L NE1U	L,D,C NE1B SS3B	L,D,C NE1B SS3B	L,D,C NE3B SS3B	L,D,C NE3B SS3B	L,D,C NE2B SS3B
D SS1U	L,D,C SS1U	D,C SS1U NE1U	L,D NE1U	L	L,C SS1B	L,D,C SS1B NE1U	L,D,C SS1U NE1U	L,D,C NE1U	L,D,C NE1U	L,D SS1U	L,D NE1U SS1U	L,D,C NE2U SS1U	L,D,C NE2U SS1U	L,D,C NE1U SS1U
L,D,C, SS2B, NE1U	L,D,C SS3B, NE1U	L,D,C SS3B	L,D,C SS3B NE3B	L,D,C SS3B	L,D,C SS3B NE1U	L,D,C SS3B	L,D,C SS2B NE1U	L,D,C SS2B	L,D,C SS2B	L,D,C NE1U SS1U	L,D,C NE1B SS1U	L,D,C SS1U	L,D,C	L,D,C NE2U
L,D,C SS3B NE1U	L,D,C SS3B	L,D,C SS2B NE1B	L,D,C SS2B NE1B	L,D,C SS3B	L,C SS1U	L,D,C SS1U NE2U	L,D,C SS2U	L,D,C SS2U	L,D,C SS2U NE2B	D NE1U	L,D	L,D,C NE1U	L,D,C SS1U	L,D,C NE1U SS2B
D	D	D NE1U	D SS1U NE1B	NE1U	-	D	-	-	-	L,D,C NE1B SS3B	L,D,C NE1B SS3B	L,D,C NE3B SS3B	L,D,C NE3B SS3B	L,D,C SS3B

# Treatment Group 1 (Aivlosin)

## Clinical Scores

Clinical scores in the challenged, medicated group 1 pheasants														
Pen 1					Pen 2					Pen 3				
DM10	DM11	DM12	DM13	DM14	DM10	DM11	DM12	DM13	DM14	DM10	DM11	DM12	DM13	DM14
								NE1U	NE2U					
NE1U	NE1U	NE1U	NE1U	NE1U						NE1U		L NE1U	C,L SS2U NE2U	SS1U NE1U
														L SS1U NE1U
								NE1U	NE1U					
	NE1U		NE1U	NE2U					L		SS1U NE1U	SS1U NE1U	SS1U NE1U	
NE1U	NE1U	NE1U	NE1U	NE1U									SS1U NE1U	SS1U NE2U
													SS1U NE1U	SS1U NE1U
NE2B	NE1U	NE1U	NE1U	NE1U	NE1U	NE1U	NE1U	NE1U	L SS1U NE2U					



# Summary of main clinical findings

Measure <sup>1</sup>	Unmedicated	Aivlosin	significance
Watery Eyes	42%	3%	P < 0.0001
Conjunctivitis	40%	0	P < 0.0001
Nasal Exudate <sup>2</sup>	62%	17%	P < 0.0001
Sinus Swelling <sup>2</sup>	54%	4%	P < 0.0001
Depression <sup>3</sup>	64%	0.00	P < 0.0001

1. Percentage of days in period DM1 – DM14 that bird had clinical signs
2. Score of 1 or more (0 = normal, 1 = mild, 2 = moderate, 3 = marked)
3. Reluctance to move, or ruffled feathers

## Detection/isolation of *M. gallisepticum* from swab samples

Group	Eye PCR	Eye isolation	Sinus PCR	Sinus isolation
Medicated	9 (25%)	12 (33%)	19 (53%)	20 (56%)
Unmedicated	35 (97%)	35 (97%)	31 (86%)	33 (92%)
P value	<0.0001	<0.0001	0.0021	<0.0001

# Productivity

Group	Weight gain (g/bird/day) DM to DM14	Average total weight gain DM to DM14
Medicated	12.0	168.0 g
Unmedicated	9.6	115.2 g
Control	12.4	173.6 g

Pheasants in the Aivlosin–medicated group had significantly greater weight gain than birds in the unmedicated group ( $P = 0.0002$ )

# Conclusion

## **Tylvalosin,**

`...the antibiotic in Aivlosin, has been shown to be highly effective in the treatment of Mycoplasmosis in pheasants'

CVMP – Positive opinion

October 2009

EU Commission-approval

December 2009

Introduced to the UK/EU market

March 2010

Full season of prescriptions

2011



# Acknowledgments

- Dr Ann Forrester, Prof Janet Bradbury, Cynthia Dare  
University of Liverpool, Dept of Veterinary Pathology,  
Leahurst, UK
- Prof Rickie J Domangue  
Statistical Consulting Services, VA, USA
- Helena Windsor  
Mycoplasma Experience Ltd, Reigate, Surrey, UK
- John Tasker and Dr A Mockett  
ECO Animal Health Ltd, London, UK

# UK 1<sup>st</sup> Full Season!

## Site A North of England

1. Large breeding unit  
300 pens of 10 hens + cocks, treated at start of breeding season

Chicks hatched/1000 eggs laid

Aivlosin 477\*

tylosin 469

tiamulin 469

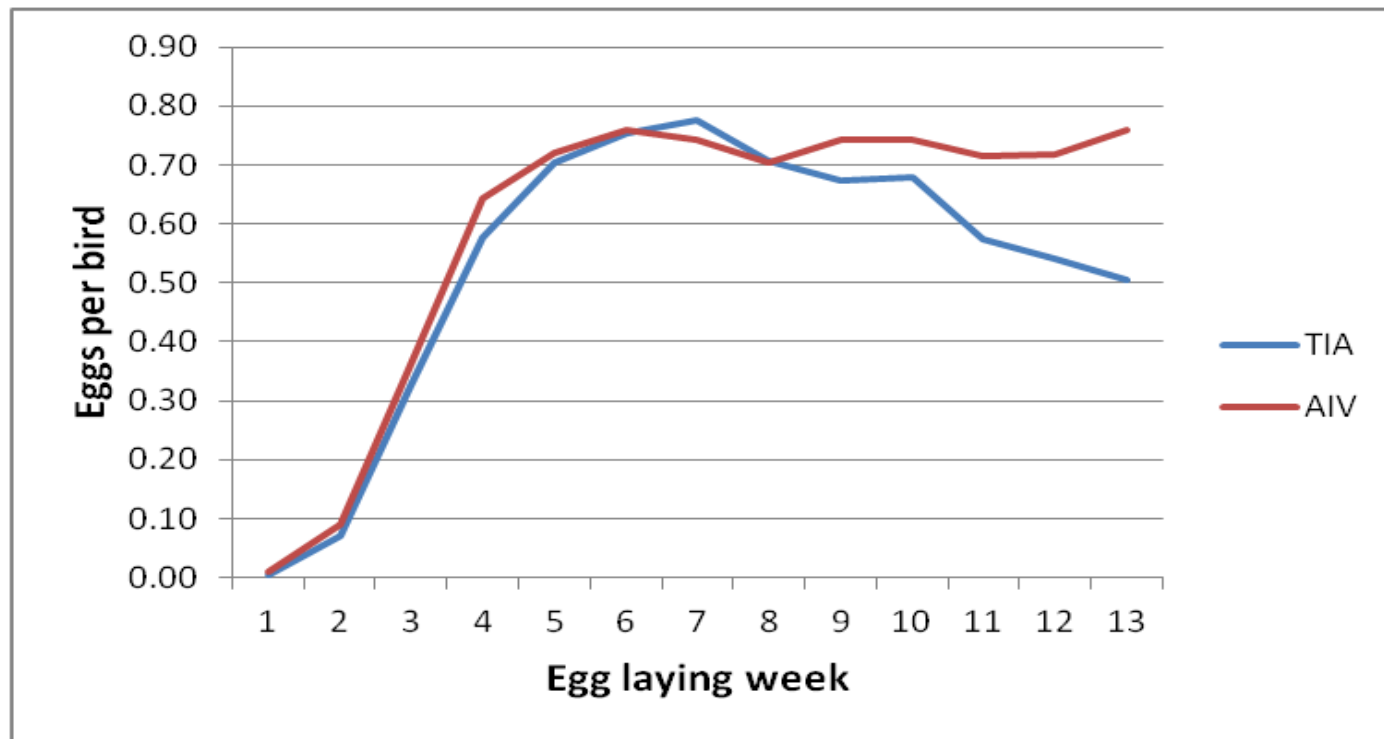
\* 8 chicks/1000 Additional chicks sold

# UK 1<sup>st</sup> Full Season!

**Site B** Large Game Farm - Central England

Pulse-dose medication in feed

Overall eggs/bird: Aivlosin<sup>®</sup> 52.2; tiamulin 48.3



# Thank you!

## Any Questions?





*M. gallisepticum* infection in pheasants:  
mean clinical scores of six different strains

