



EU Approved



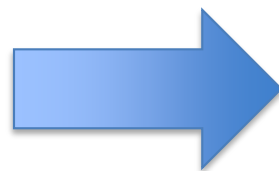
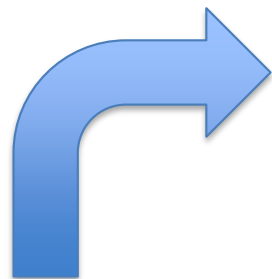
“Impacto productivo y estrategias de control de *Mycoplasma gallisepticum* y *Mycoplasma synoviae*”

**18° Jornada Avícola - Colombia
Marzo 2018**



Javier Uriarte
Technical service Manager – LATAM

Cambios...



Complejo Respiratorio de las Aves

- Asociación de factores múltiples
 - Medio ambiente (humedad, temp., amoníaco, etc.)
 - Manejo (Densidad animal, estrés).
 - Micotoxinas
 - Virus inmuodepresores (Gumboro, AI, EM, Reovirus)
 - Virus respiratorios (EN, BI, IA, LT, NV)
 - Bacterias (E. coli, Coriza, ORT, Pasteurella)
 - **Micoplasmas (MG, MS)**



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ECO Animal Health Ltd, United Kingdom.

Aerosol-induced *Mycoplasma synoviae* arthritis: the synergistic effect of infectious bronchitis virus infection

W. J. M. Landman* and A. Feberwee

Animal Health Service, Poultry Health Centre, P.O. Box 9, 7400 AA Deventer, the Netherlands

Mycoplasma gallisepticum modifies the pathogenesis of influenza A virus in the avian tracheal epithelium

Hicham Sid, Sandra Hartmann, Henning Petersen, Martin Ryll, Silke Rautenschlein*

Clinic for Poultry, University of Veterinary Medicine Hannover, Bünteweg 17, 30559 Hannover, Germany

THE ROLE OF *MYCOPLASMA SYNOVIAE* IN COMMERCIAL LAYER *E. COLI*

PERITONITIS SYNDROME AND *MYCOPLASMA GALLISEPTICUM*

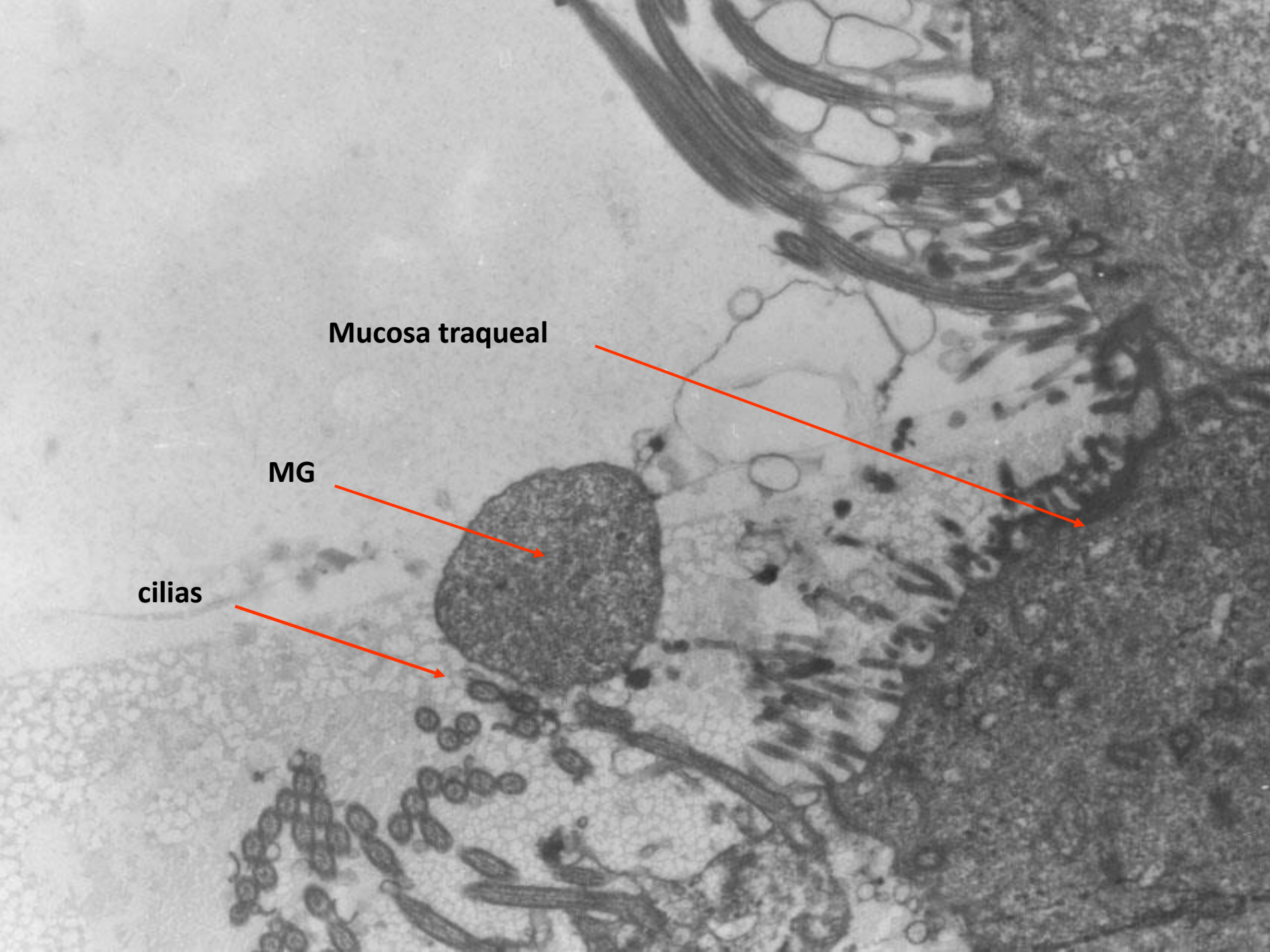
INTRASPECIFIC DIFFERENTIATION METHODS

by

ZIV RAVIV

MYCOPLASMA SYNOVIAE INFECTION ON NEWCASTLE DISEASE VACCINATION OF CHICKENS

Rita de Cássia Figueira Silva^{1*}; Elmiro Rosendo do Nascimento²; Virgínia Léo de Almeida Pereira²;
Maria Lúcia Barreto³; Maria da Graça Fichel do Nascimento⁴



Mucosa traqueal

MG

cilias

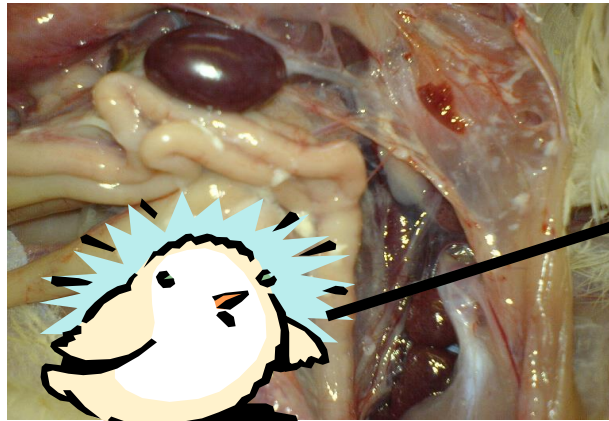
Características

- Bacterias procariotas (Mollicutes)
- Extremadamente pequeños (300-600 nm)
- Carencia de pared celular
- Pleomórficas y flexibles
- Carencia de elementos de resistencia y antigenicidad (capsulas, cilias, esporas, plásmidos, toxinas, etc.)
- Muy lábiles al medio ambiente y desinfectantes (¿?)
- Capacidad de penetración intracelular



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Epidemiología



Aves, Fomites

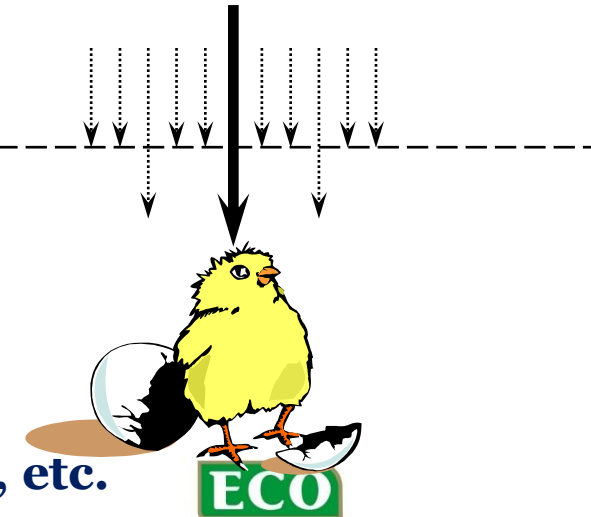
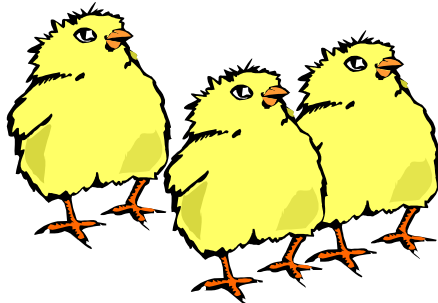


Vertical

6-10 días aprox.

Horizontal

Exudados, aerosoles, polvo ambiental, plumas, fomites, etc.



➤ **Edades Múltiples y Bioseguridad!**

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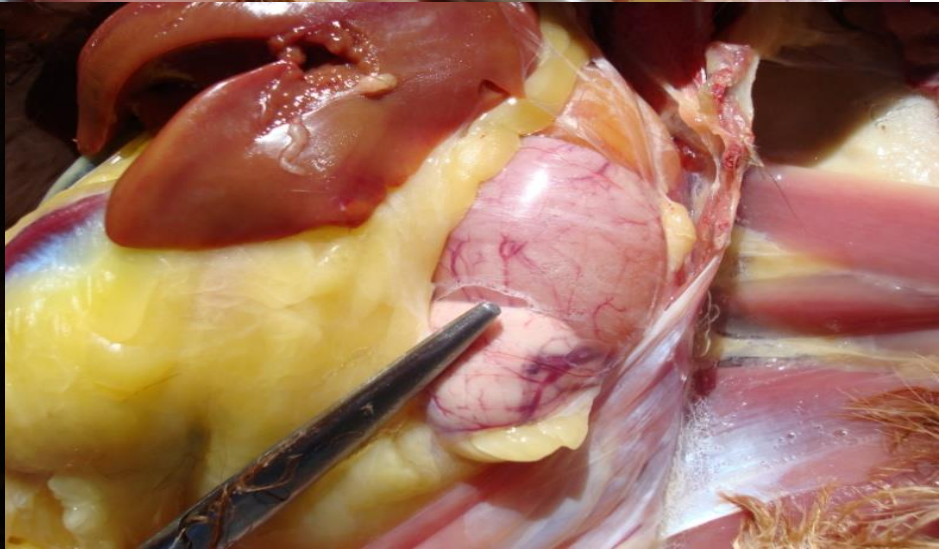
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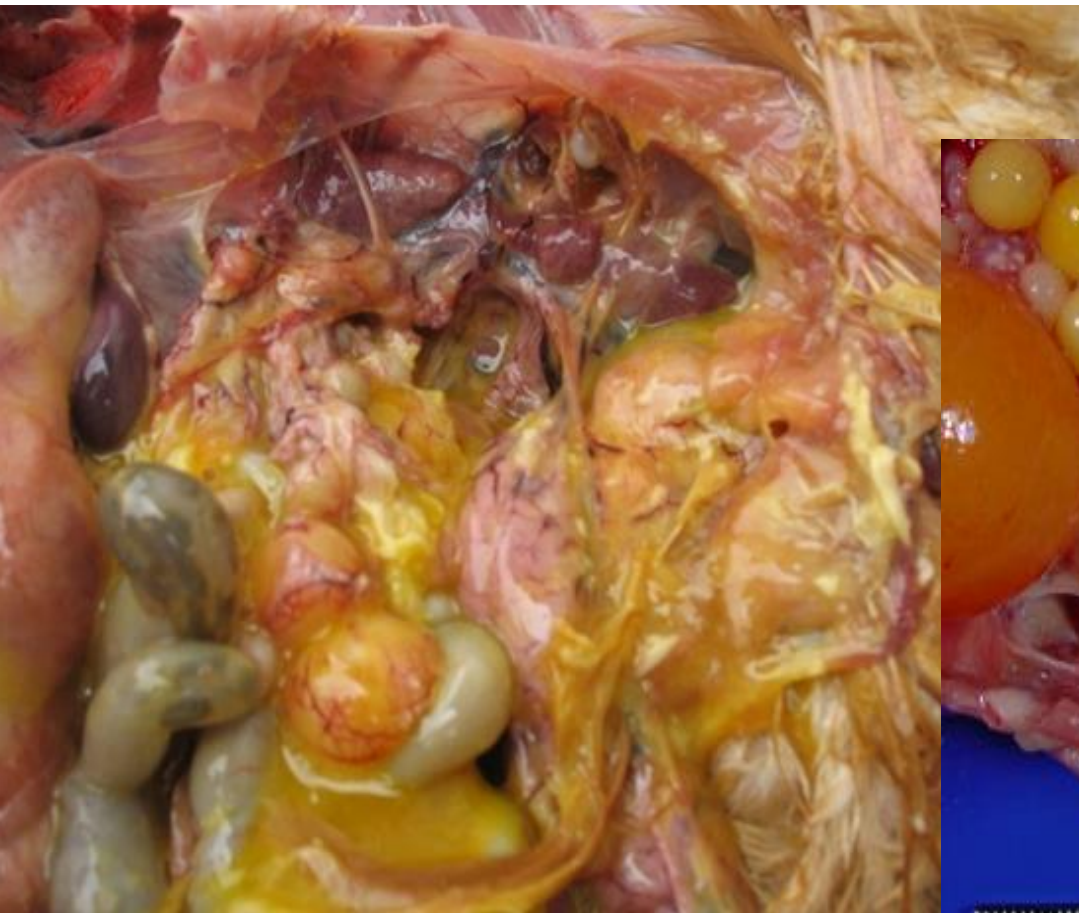








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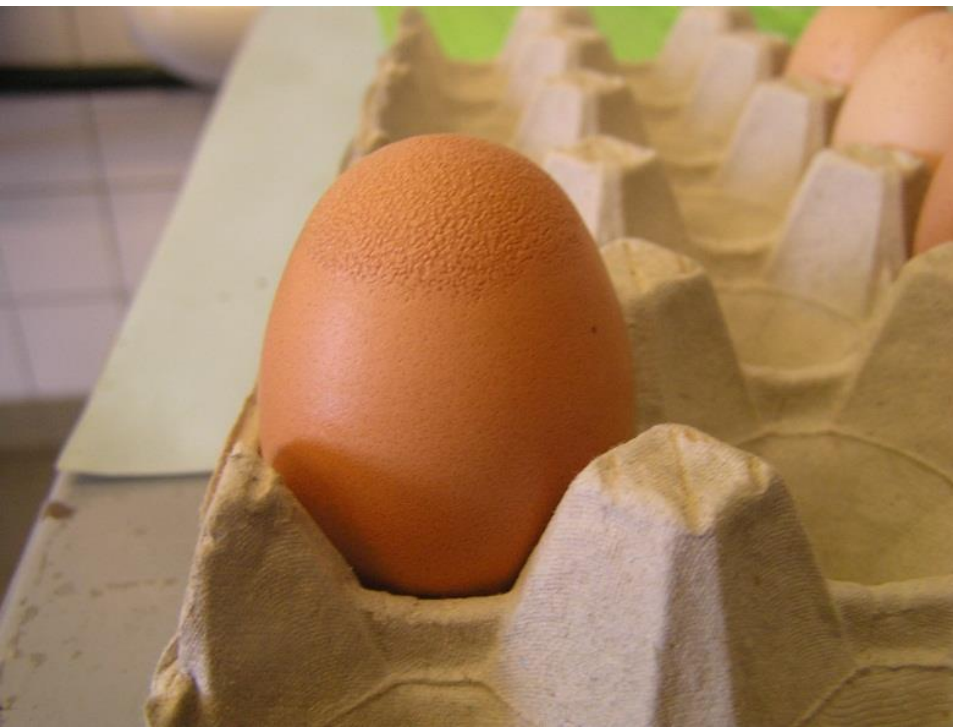
Raviv et al. (2007) 'Role of *Mycoplasma synoviae* in commercial layer *Escherichia coli* peritonitis syndrome.' Avian Dis. Sep;51(3):685-90.

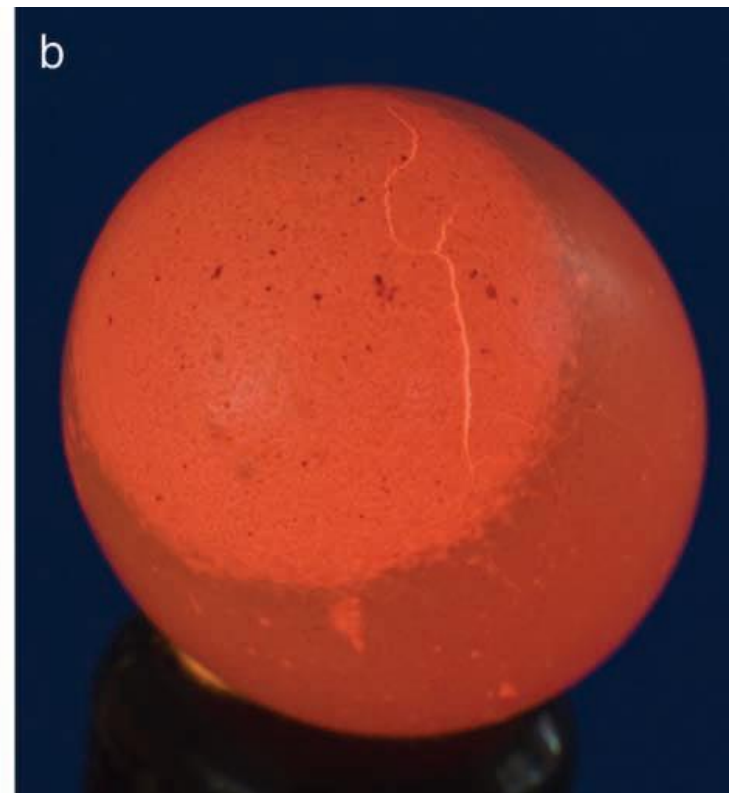


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EAA/GTE:
anormalidad en la
cascara del apice del
huevo

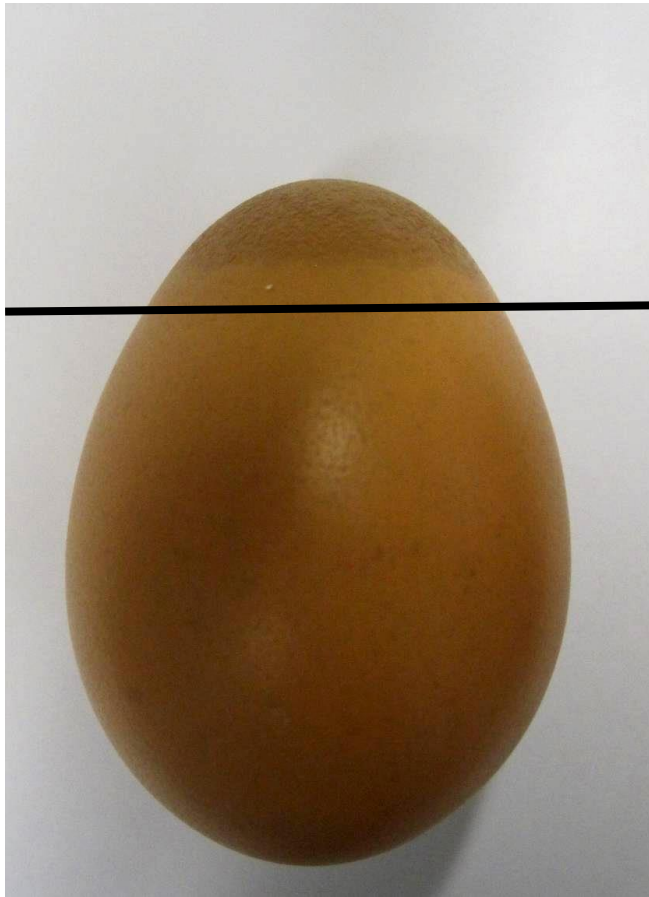




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Punta del iceberg



Reducción en
producción,
Mayor cantidad de
huevos de segunda
Reducción de
incubabilidad
Manejo extra

Que causan MS y MG?

- *Aumento mortalidad e infecciones secundarias*
- *Problemas respiratorios, sinovitis, aerosaculitis, peritonitis.*
- *Reacciones post-vacunales.*
- *Problemas de uniformidad.*
- *Aumento del índice de conversión.*
- *Decomiso de carcasas.*



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Desafío experimental con Ornithobacterium rhinotracheale y Mycoplasma synoviae en pollo de engorde

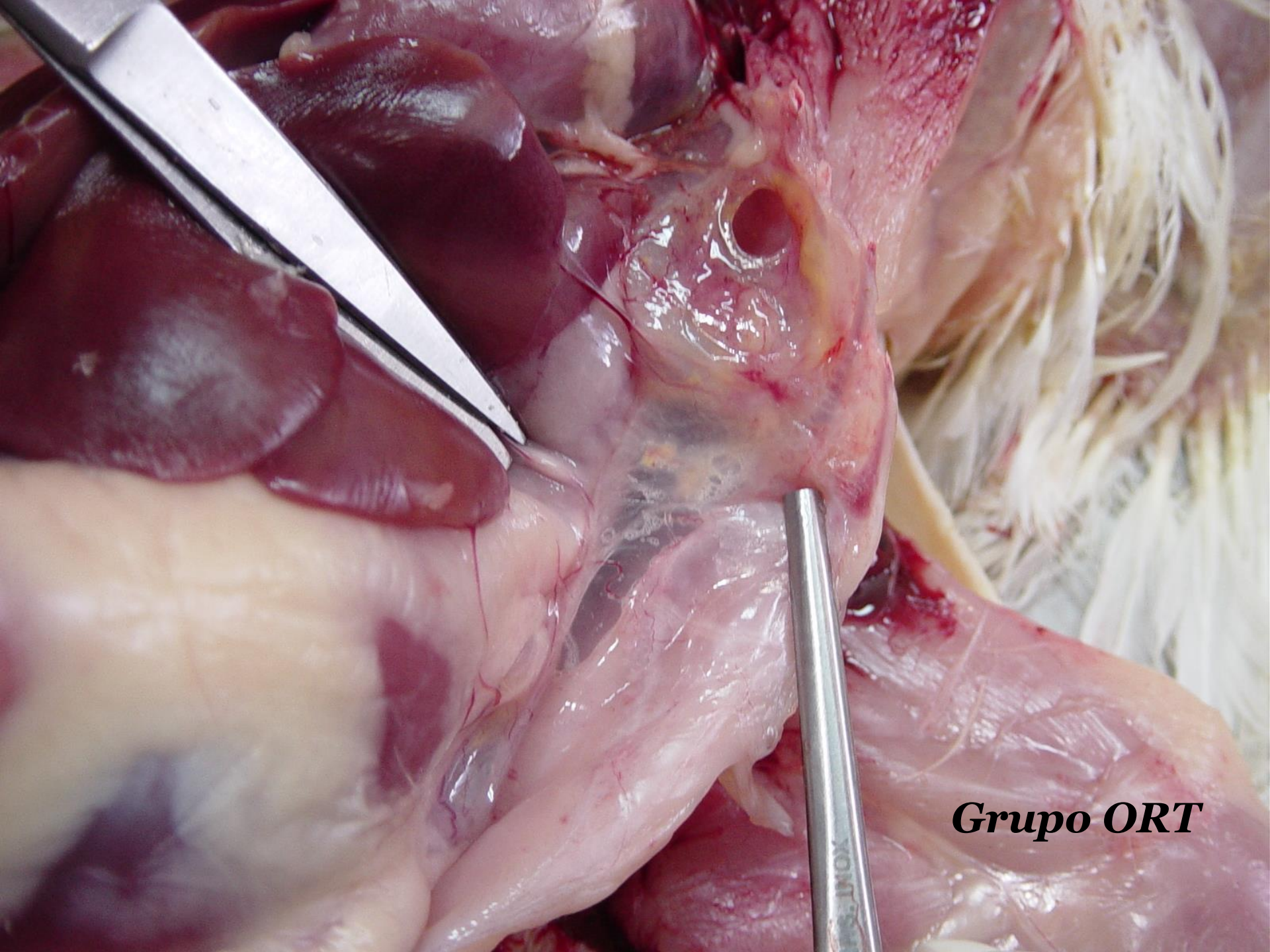
- Evaluar el posible sinergismo entre ORT y MS en un grupo de pollos de engorde.
- 40 pollos Ross divididos en 4 grupos.
- Vacunados con ND-IB (La Sota-Massachusetts) a los 14 días de vida.
- Inoculados con ORT y MS a los 21 días de vida.
- Se evaluaron lesiones a los 7 y 14 días post-infección en pulmones, sacos aéreos y tráqueas.



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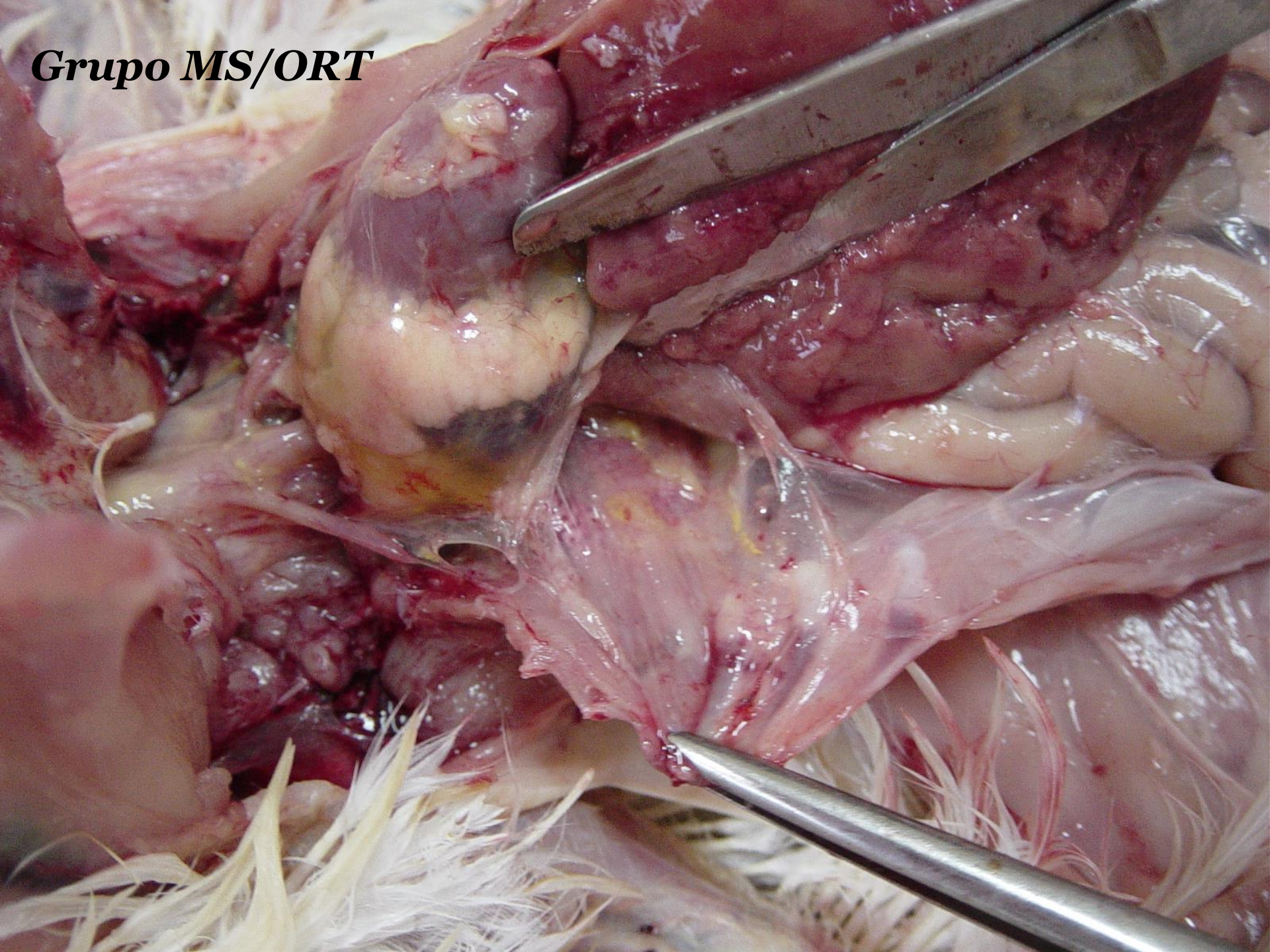
Grupo MS

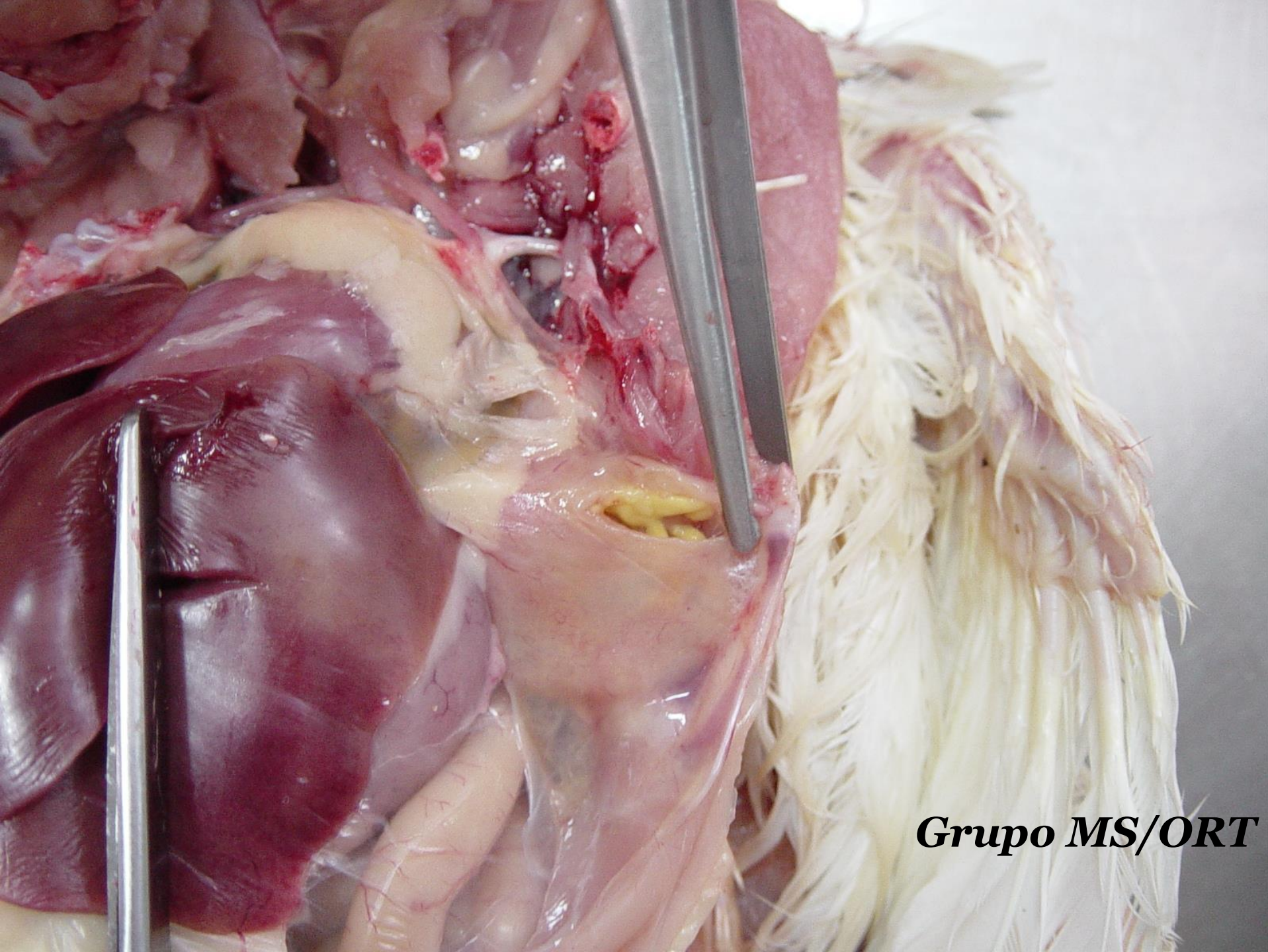




Grupo ORT

Grupo MS/ORT





Grupo MS/ORT



MS-ORT



MS



ORT

Score de lesiones

Grupo	7 días PI			14 días PI		
	Sacos Aéreos	Pulmón	Tráquea	Sacos Aéreos	Pulmón	Tráquea
ORT/MS	5.4 (90.0) ^b	1.8 (90) ^b	1.8 (90) ^b	3.6 (60.0) ^b	1.4 (70) ^b	1.4 (70) ^b
MS	2 (33.3) ^a	0.2 (10) ^a	1 (50) ^{ab}	2.4 (40.0) ^{ab}	0.4 (20) ^{ab}	1.2 (60) ^b
ORT	2.2 (36.7) ^{ab}	0.6 (30) ^{ab}	0.8 (40) ^{ab}	2.2 (36.7) ^{ab}	0.6 (30) ^{ab}	1 (50) ^{ab}
Control Neg	0.2 (3.3) ^a	0.2 (10) ^a	0.2 (10) ^a	0.4 (6.7) ^a	0.2 (10) ^a	0.2 (10) ^a

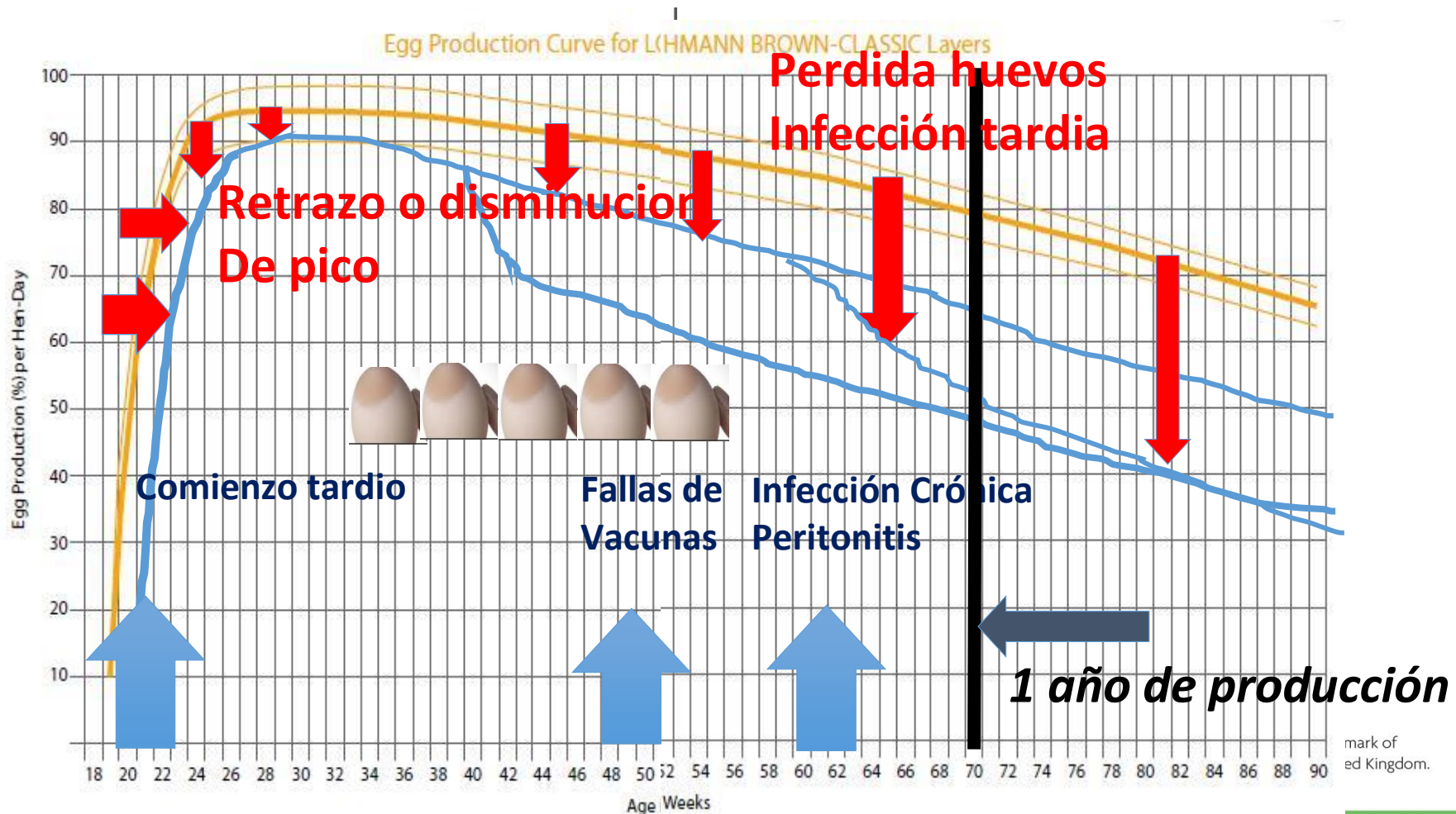


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PERDIDAS – DISCRETAS PERO IMPORTANTES

Perdida de Huevos 5 -10..... %
Retrazo en Pico
Disminucion en el Pico

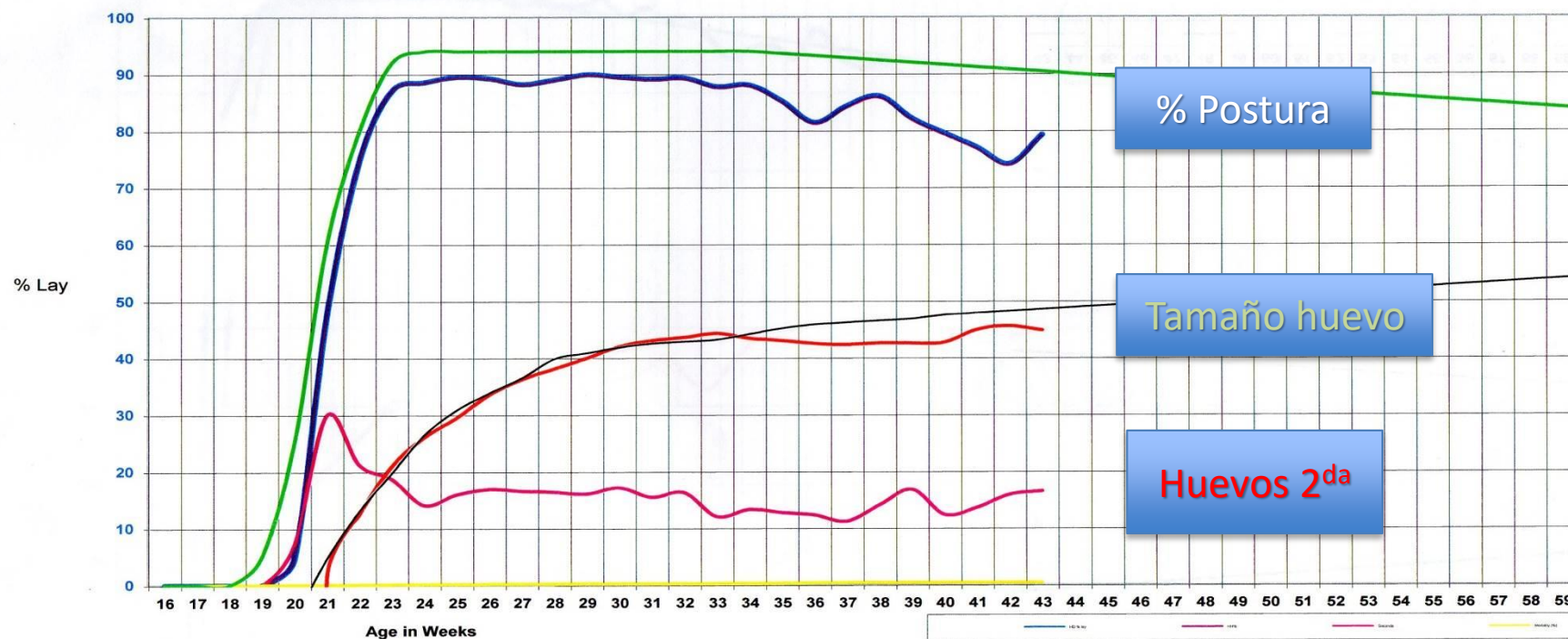
Egg apex abnormalities--- Huevos de 2^{da}
Huevos pequeños ---Huevos 2^{da}
Aumento de mortalidad y de IC



Parvada MG + vs Curva estándar

Jan 2016

PERFORMANCE GRAPH of Flock:



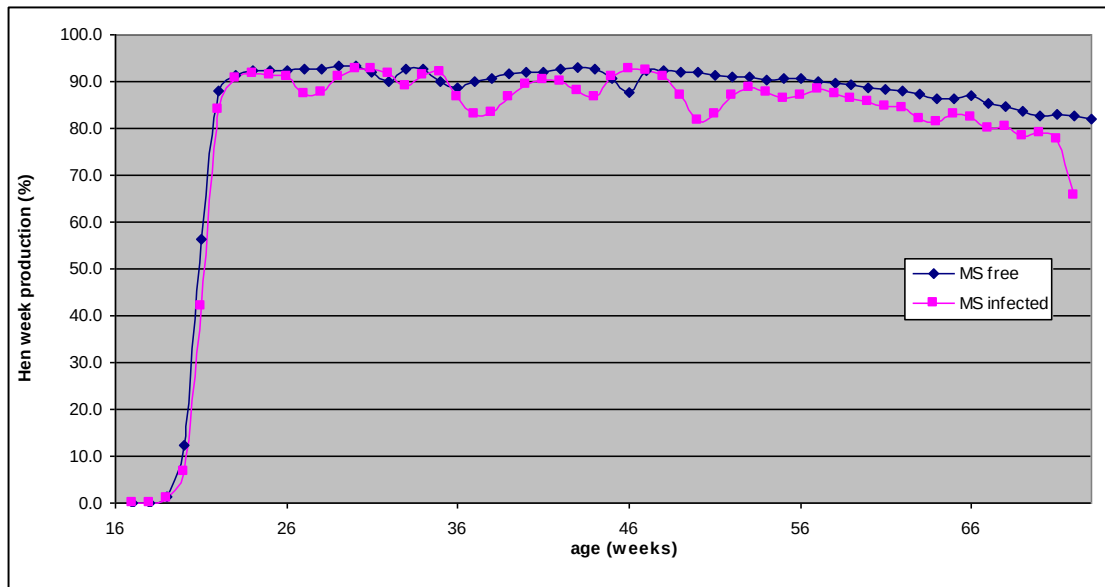
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Pérdidas por MS en granja comercial free Range

Debido a la variabilidad de signos clínicos (subclínica) y factores externos (ESTRES) es difícil cuantificar exactamente las perdidas causadas por MS. Estas varían en cada establecimiento.

-Datos productivos de dos parvadas (una positiva y una libre de MS)



	MS libre	MS Positiva
Huevos por Gallina alojada	321	299.9
Uso de antibioticos	£1957.95 (approx. \$3016)	£4394.51 (approx. \$6770)
Huevos B (liquido)	2.87%	3.75%
IC	2.36	2.47
Mortalidad	5.0%	12.6%



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Evaluación del impacto de la infección mixta de MG y MS en gallinas de postura comercial y el control mediante antibióticos.

- Comparar la efectividad en parámetros productivos de tres tratamientos en gallinas ponedoras positivas a *Mycoplasma gallisepticum* y *Mycoplasma synoviae*.
- Aves destinadas a las pruebas: Lohmman Brown
- Granja multiedad con antecedentes de micoplasmas.



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Distribución de los grupos:

- Tratamiento 1 : Macrólido – 1 Semana al mes
 - Tratamiento 2: Macrólido – 1 Semana al mes
 - Tratamiento 3: Pleuromutilina – 1 Semana al mes
 - Control: Sin medicación
-
- Tratamiento 1 : Macrólido – Continuo
 - Tratamiento 2: Macrólido – 1 Semana al mes
 - Tratamiento 3: Tetraciclina – 1 Semana al mes
 - Control: Sin medicación

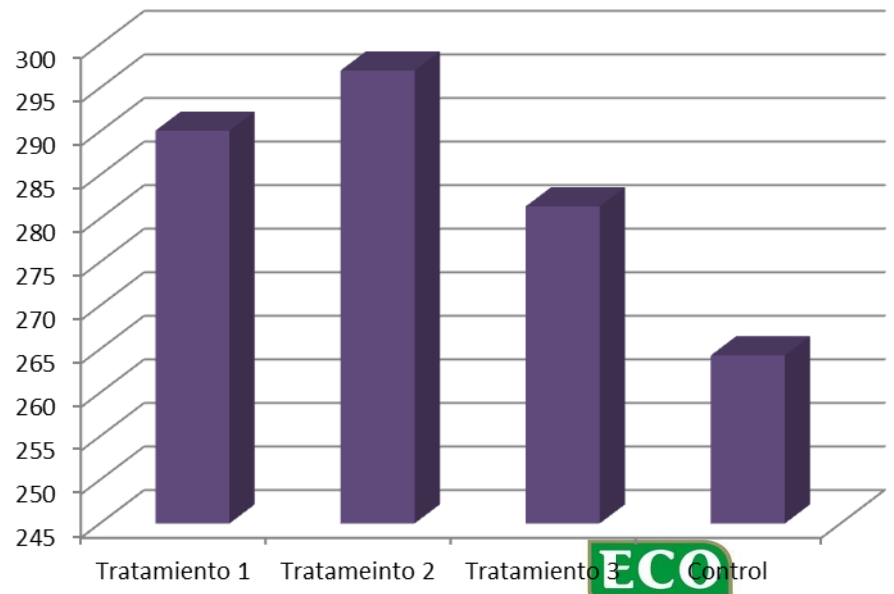
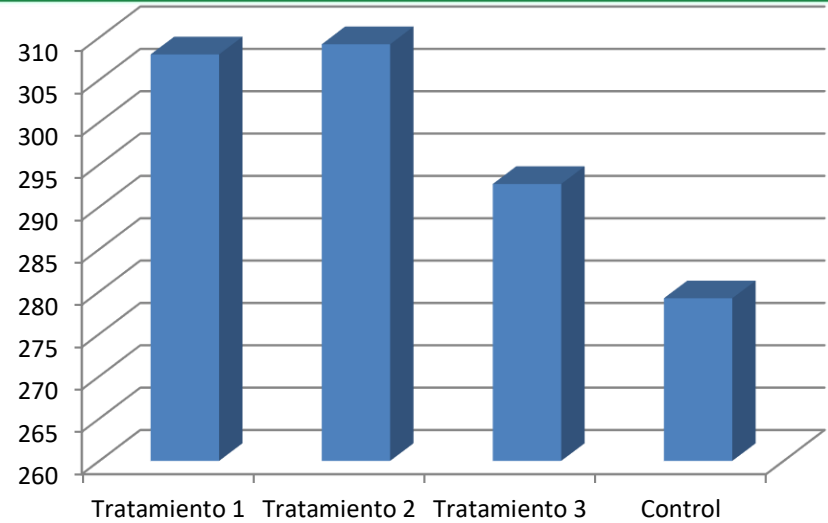
Parámetros evaluados:

- % Postura
- Huevos gallina día
- Huevos gallina alojada
- Masa de huevo (peso huevo)
- Peso del ave
- Mortandad



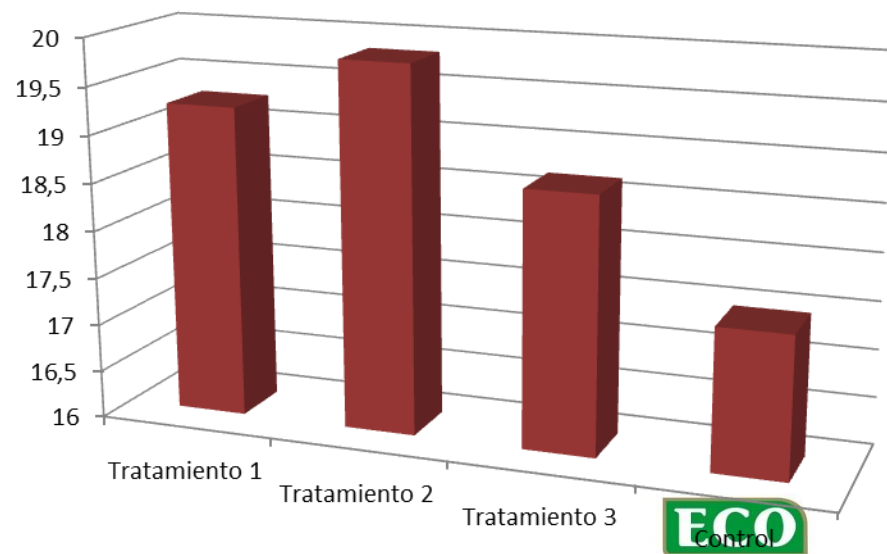
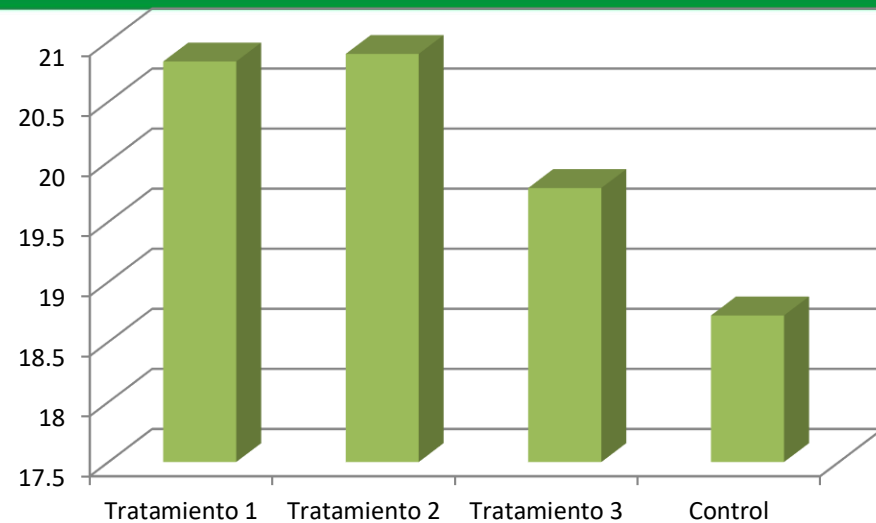
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Huevos por gallina alojada



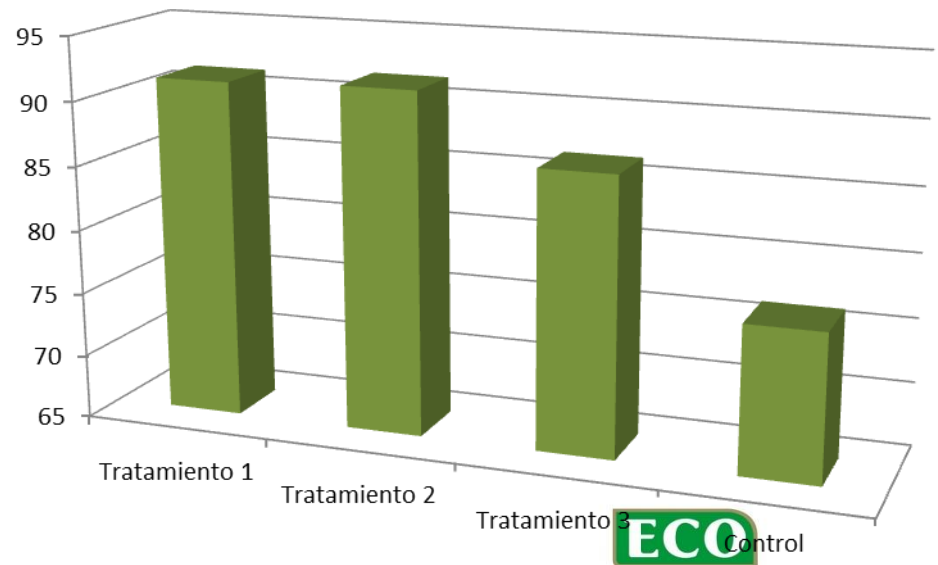
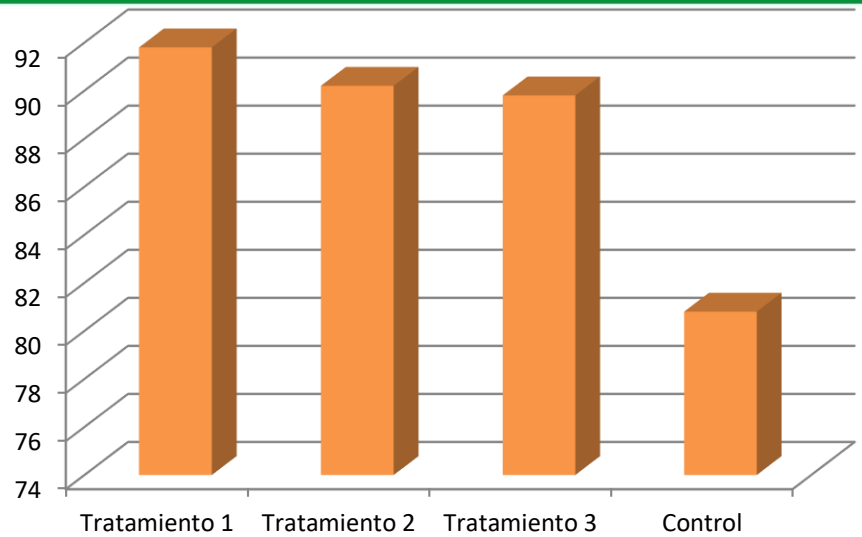
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Kgs de Huevo por Ave Alojada



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% Viabilidad



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	Parámetros productivos		
Grupos	Huevos por g/a	Kg de masa de huevo por g/a	Viabilidad
Tratamiento 1	307,7 ^a	20,690 ^a	91,8 ^a
Tratamiento 2	309,2 ^a	20,749 ^a	90,2 ^a
Tratamiento 3	292,7 ^{ab}	19,648 ^b	89,9 ^a
Control	279,7 ^b	18,657 ^c	80,8 ^b

	Parámetros productivos		
Grupos	Huevos por g/a	Kg de masa de huevo por g/a	Viabilidad
Tratamiento 1	290	19,27	91,4
Tratamiento 2	297	19,83	91,7
Tratamiento 3	281	18,67	86,6
Control	264	17,48	76,5

Ganancia huevos Ave/alojada

- Control: Base de producción - Ganancia: u\$d = 0
- Tratamiento 1 : 28 huevos - Ganancia: u\$d = 1,82
- Tratamiento 2: 29,5 huevos - Ganancia: u\$d = 1,91
- Tratamiento 3 : 13 huevos - Ganancia: u\$d = 0,845

Ganancia huevos Ave/alojada

- Control: Base de producción- Ganancia: u\$d = 0
- Tratamiento 1 : 26 huevos- Ganancia: u\$d = 1,69
- Tratamiento 2: 33 huevos- Ganancia: u\$d = 2,14
- Tratamiento 3 : 17 huevos - Ganancia: u\$d = 1,10

Precio del Huevo = u\$d 0,065 - Cambio \$ 3000 = 1 u\$d



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²Proteol LCV, Z.I. Plessa Beucher, 35220 Châteaubourg, FranceTaylor & Francis
Taylor & Francis Group

Avian Pathology (October 2009) 38(5), 333–340

Effect of a live *Mycoplasma synoviae* vaccine on the production of eggshell apex abnormalities induced by a *M. synoviae* infection preceded by an infection with infectious bronchitis virus D1466

A. Feberwee¹*, C. J. Morrow², S. A. Ghorashi³, A. H. Noormohammadi³ and W. J. M. Landman^{1,4}

AVIAN DISEASES 56:272–275, 2012

The Efficacy of Three Commercial *Mycoplasma gallisepticum* Vaccines in Lay

N. Ferguson-Noel,^{AC} K. Cookson,^B V. A. Laibinis,^A and S. H. Kleven^A^ADepartment of Population Health, College of Veterinary Medicine, University of Georgia, Athens, GA 30602^BPfizer Animal Health Pfizer-Global Poultry, Durham, NC 27703

Avian Pathology (August 2005) 34(4), 341–347

Safety and efficacy of *Mycoplasma gallisepticum* TS-11 vaccine for the protection of layer pullets against challenge with virulent *M. gallisepticum* R-strain

Judit Bíró¹*, J. Povaszán², L. Körösi², R. Glávits³, L. Hufnagel⁴ and L. Stipkovits¹

pathogen causing Eggshell and other countries around the world. The effect of this treatment on the production of eggshell apex abnormalities was evaluated. The results showed that tylosin commercial layers.

	Tylosin	Tiamulin	Tetracycline
0.00	0.0025	0.25	
0.00	0.015	0.5	
0.00	0.01	0.25	
0.005	0.01	<0.125	
0.005	0.015	0.5	
0.005	0.015	1	
<0.005	0.01	<0.125	
0.005	0.015	0.5	
<0.005	0.0025	0.5	
0.005	0.01	0.5	
0.2	0.6	0.46	

pilot Mr was monitored in a 000 layers

The farm layout is situated in Brittany, a region with large density of different species of poultry (broilers, turkeys, broiler breeders). It is composed by 4 sheds with 4 different ages.



The commercial eggs are sent to an egg processing facility to be sorted. All the downgraded eggs are broken at the farm. Additional downgraded eggs from other farms come to be broken at this farm. On this farm, there were many pathogenic agents (infectious bronchitis, Mycoplasma synoviae, red mites) but the consequences were limited because of preventative actions.

Mr infections have been responsible for 4% to 10% more downgraded eggs with problems on this farm are the circulation of trucks that transport contaminated farms. test for Ag/Mr (targeting 18S rRNA) it. Secondly, to determine susceptibility fresh eggs with EAA lesions was Chêne Vert – France) was performed.

in from the farm for various anti-

Tylosin	Tiamulin	Tetracycline
0.005	0.015	0.5

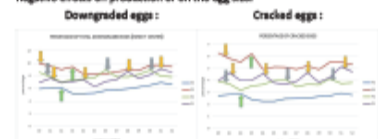
EXPERIMENTATION

Two sheds (P1 and P2) were treated with oxytetracycline (OTC at 400 or 600 ppm, 30–40 mg activity/kg of body weight/day) in the feed (for 10 days) and two sheds (P3 and P4) with Allosin® Water Soluble Granules (tylosin at 25 mg activity/kg body weight/day) in the water (for 3 days). The treatments started as soon as the number of downgraded eggs with EAA lesions reached 2%. The objectives were to evaluate the effect of these antibiotics on downgraded eggs and the duration between two treatments. Before the trial, the problem of EAA was identified at about 30 weeks of age in all sheds but the first treatments for Mr with OTC were not started until 35 to 42 weeks of age. Our observations and treatment trials began in week 40 (beginning of October) in 2016 and lasted 12 weeks (end of December 2016). The ages of the flocks at the beginning of the treatment were 53 weeks of age for P1 (25,000 layers), 51 weeks for P2 (52,000 layers), 54 weeks for P3 (44,000 layers) and 42 weeks for P4 (40,000 layers).

RESULTS

Egg production:

All flocks had very good egg production. The Mr infection didn't have large negative effects on production or on the egg size.



With Allosin® (tylosin) Water Soluble Granules, only one treatment was necessary. The number of downgraded eggs and the number of cracked eggs sorted at the egg processing facility were reduced after the single treatment by approximately 14% and 22%, respectively. Throughout the period, while some eggs with EAA lesions were seen, the percentage of EAA lesions remained less than 2%. With OTC, the number of downgraded eggs and the number of cracked eggs were also reduced after the treatment by approximately 10% and 12%, respectively. However, many eggs with EAA lesions were seen two weeks after the end of the treatment, making additional treatments necessary to maintain the quality of the eggs. For the treatments with OTC at 600 ppm, the duration between the two treatments were one week more than the treatments with OTC at 400 ppm.

CONCLUSION

The results of treatments indicate that the flocks using Allosin® (tylosin) through the drinking water had fewer downgraded eggs due to EAA lesions after the treatment and during the total production than the flocks treated with OTC through the feed.

No additional treatment was necessary after the first Allosin® (tylosin) treatment as the downgraded eggs with EAA lesions did not reach more than 2% after the first treatment. For the OTC treatment, the results were good during the treatment period and until 2 weeks after the end of the treatment. Additional treatments were necessary every 3 or 4 weeks.

These results are consistent with the MIC results. Currently, French Mr strains are more sensitive to tylosin than to tetracycline. Treatment with Allosin® (tylosin), administered through the drinking water, is an effective medication for reducing the number of downgraded eggs with EAA and for reducing the amount of antibiotic (in terms of both total number of treatment days and total mg/kg) needed for treatment.

Key words: Tylosin, oxytetracycline, Eggshell Apex Abnormalities, Mycoplasma synoviae, commercial layers.

Allosin® is a registered trademark of ECO Animal Health Ltd., London, United Kingdom.

*Corresponding author: jcdonval@chenevertconseil.com



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Laboratorio

- Aislamiento e identificación (IFD)
- Técnicas serológicas :
 - Aglutinación Rápida en Placa (ARP)
 - Inmunoensayos (ELISA)
 - Inhibición de la Hemoaglutinación (HI)
- Técnicas de biología molecular:
 - Reacción en Cadena por la Polimerasa (PCR)



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***Control y prevención de
Mycoplasma
Gallisepticum y synoviae
Vacunas y antibióticos.***



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MEDIDAS DE CONTROL

- Adquisición y mantenimiento de lotes libres
- Medidas de bioseguridad estrictas.
- Diagnostico correcto.
- Elección de programas de control
 - antibióticos
 - vacunas



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Programas de control

Empleo de vacunas:

- Bacterinas
- Vacunas vivas
- Vacunas recombinantes para MG

Antibióticoterapias:

- Profiláctica
- Metafiláctica
- Curativas
 - Macrólidos (tilosina, tilmicosina, tilvalosina, josamicina), pleuromutilinas (tiamulina, valnemulina), lincosamidas (lincomicina), fluoroquinolonas (enrofloxacina), tetraciclinas (clortetraciclina, oxitetraciclina,  doxiciclina)

Prevención - Vacunas

Vivas, inactivadas, recombinantes

Cepas atenuadas

- F, Mg
- 6/85, Mg
- Ms-1, Ms

Vivas

Cepas termosensibles

- ts11, Mg
- MS-H, Ms

Recombinantes:

Genes de MG expresados en viruela

Inactivadas
BACTERINAS



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Vacunas Vivas - Ventajas

- Disminución del uso de antibióticos
- Disminución del riesgo de generación de resistencia.
- Una sola aplicación.
- Capacidad de desplazar cepa de campo (Cepa F).
- Disminución de lesiones y pérdidas económicas.
- Generan reacciones serológicas pobres o nulas (No Cepa F)



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Vacunas Vivas-Desventajas

- Conservación, preparación y aplicación.
- Aplicar ambas vacunas (MS y MG)
- Deben ser aplicadas en aves libres. (PCR)
- Sensibilidad a varios antibióticos.
- Interpretación de las pruebas de monitoreo serológico y moleculares.
- Pérdida de protección hacia la mitad del ciclo productivo.
- Diseminación vertical y/o horizontal (ts-11 y cepa F).
- Posibilidad de reversión en las cepas termosensibles (cepa ts-11 y MS-H).



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Interpretación serológica post vacunación MS y MG

Manual de interpretación de resultados Biocheck

BIOCHECK VACCINATION BASELINES LAYERS/BREEDERS (Continued)

Titer values may vary according to age & type of bird , vaccine type, vaccination program, and other factors such as placement programs. You may find different results under different circumstances.

TEST	VACCINE TYPE	MEAN TITER RANGE	WKS AFTER VAC. TO TEST	% POS	VI Index	SUSPECT TITER INFECTION
MS	live MS-H (eye drop)	500 - 3 000	6 -12 wks	30- 70% Pos		> 5000 and > 90%
MG	live 6/85 (spray)	negative	6 -12 wks	0%		positive
	live Ts-11, (eye drop)	1 000 - 3 000	6 -12 wks	30-70%		> 5000 and > 90% Pos
	F-strain (dr. water, spray)	2 000 - 8 000	6 -12 wks	100%		
	inact. 2x (Gallimune MG)	3 000 - 6 000	4 - 6 wks after 2 nd	> 90%		
		500 - 1 000	10 -12 wks after 2 nd	40-90%		



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Antimicrobianos - Ventajas

- Facilidad de interpretación de pruebas serológicas y moleculares.
- Rapidez de acción ante brotes clínicos.
- Facilidad de aplicación.
- Disminución de lesiones y pérdidas económicas.
- Cobertura contra ambas especies de micoplasma.
- Cobertura contra patógenos secundarios.
- Costos ?



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Antimicrobianos - Desventajas

- Posibilidad de generación de cepas resistentes.
- Generación de residuos en alimentos (MRL)
- Alteración de características organolépticas en huevos.
- Problemas de palatabilidad en alimento y agua.
- Opinión pública.



Aivlosin® is a registered trademark of
ECO Animal Health Ltd, United Kingdom.

T1, T2 y T3 en pollas que no recibieron vacunas vivas de MS y MG.

- Transmisión
- Vertical y
- Horizontal

Diagnóstico
PCR y ELISA

Día 1

Sem 4-6

Sem 15

Traslado

T1

T2

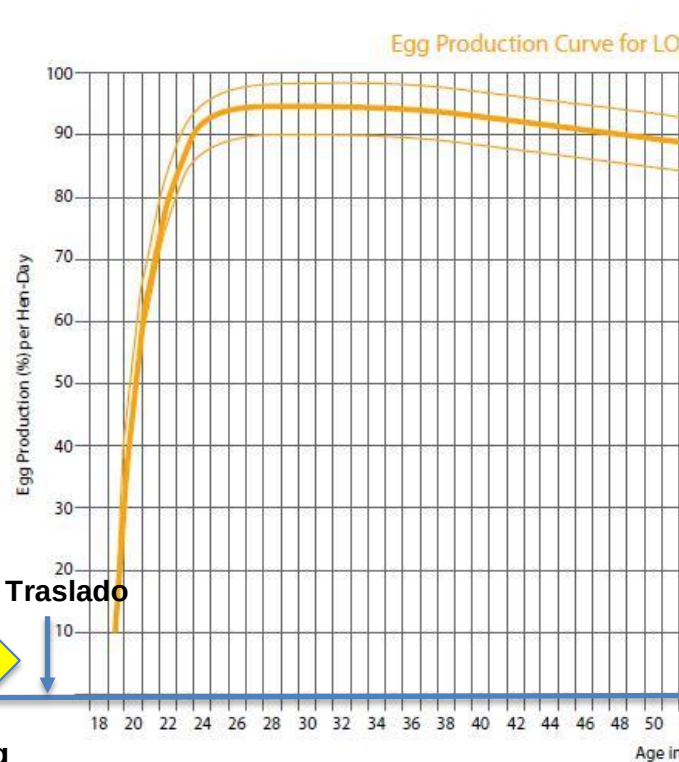
T3

45-60g

0.4 kg

1.3 kg

1.45kg



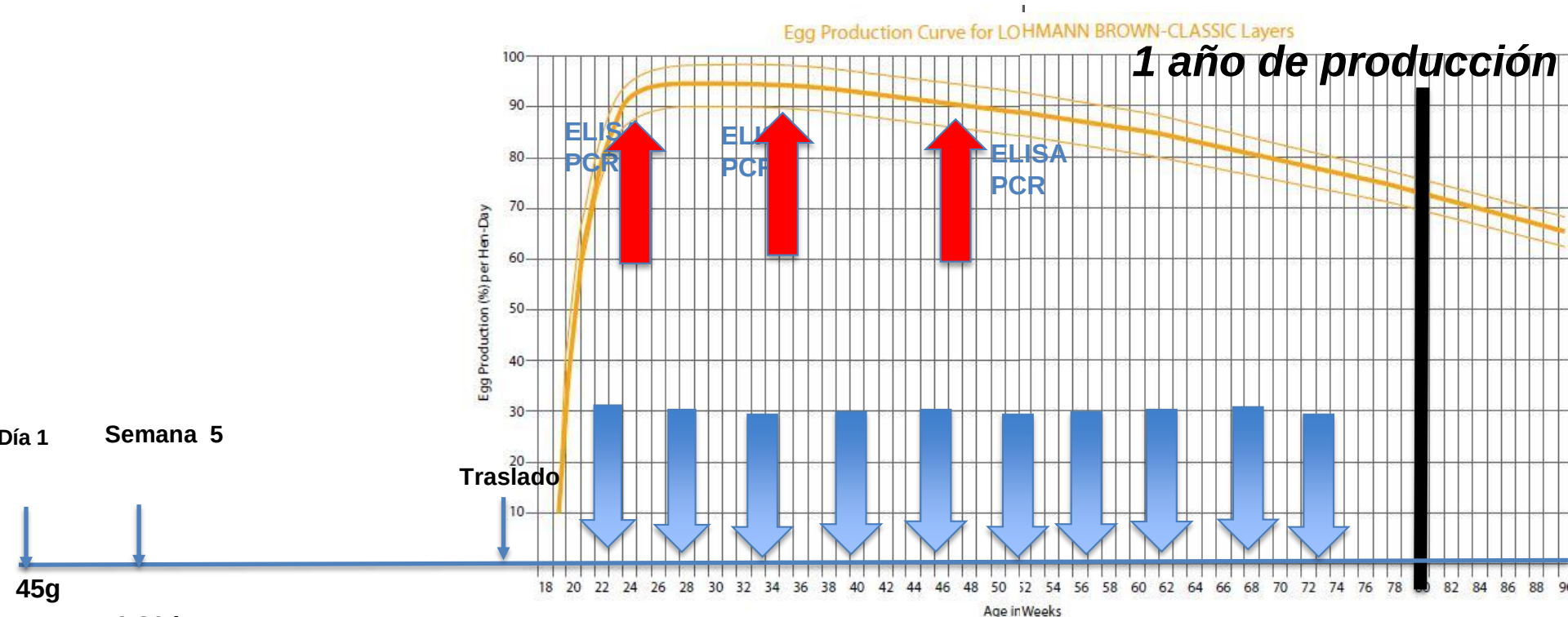
1 año de produc.

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T-4 Pulsos durante la producción cada 4 semanas

T-4 Pulsos durante producción en momentos críticos



Positivo Positivo Positivo

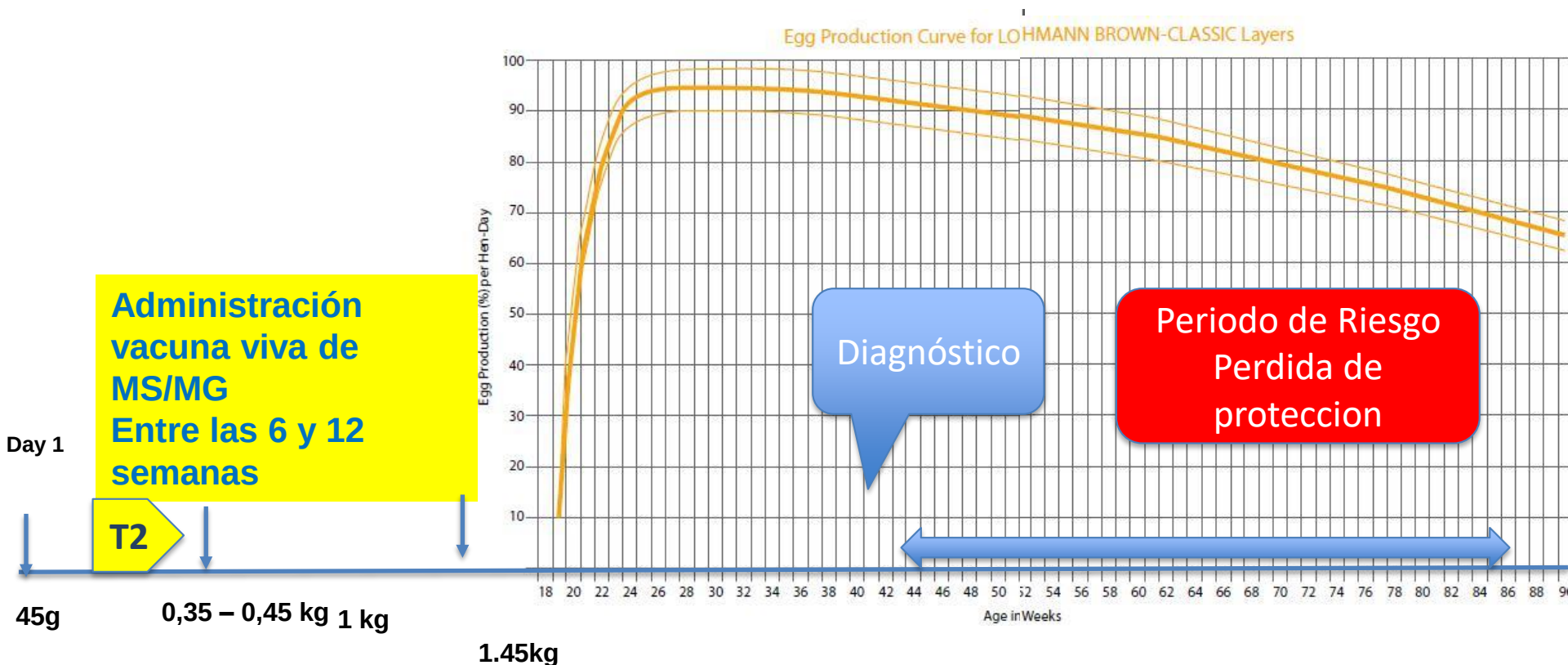
OUTSTANDING



Stay Ahead

T2 – previo a la vacuna viva de MG/MS

Al menos 5 días antes de la vacunación



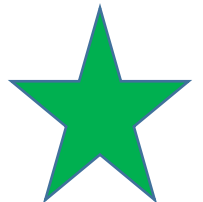
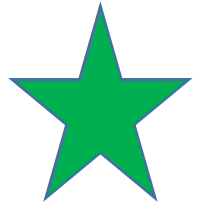
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- Diagnóstico y medicaciones

4 PUNTOS CRITICOS de MEDICACION

- Medicaciones tempranas
 - T1- Transmisión vertical
 - T2- Previo a la vacunación MS/MG
 - T3 – Previo traslado a postura
- Medicaciones tardías
 - T4- Durante periodo de puesta



“El terreno da lugar a las mediciones, estas dan lugar a las valoraciones, las valoraciones a los cálculos, estos a las comparaciones y las comparaciones dan lugar a las victorias”.

El Arte de la Guerra – Sun Tzu

Muchas Gracias!!!!



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