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Current Challenges at Boar Studs and Possible Solutions

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ITM Magapor 17 MAY 2025 - ZARAGOZA

Topic 1

Osteochondrosis dissicans (OCD)

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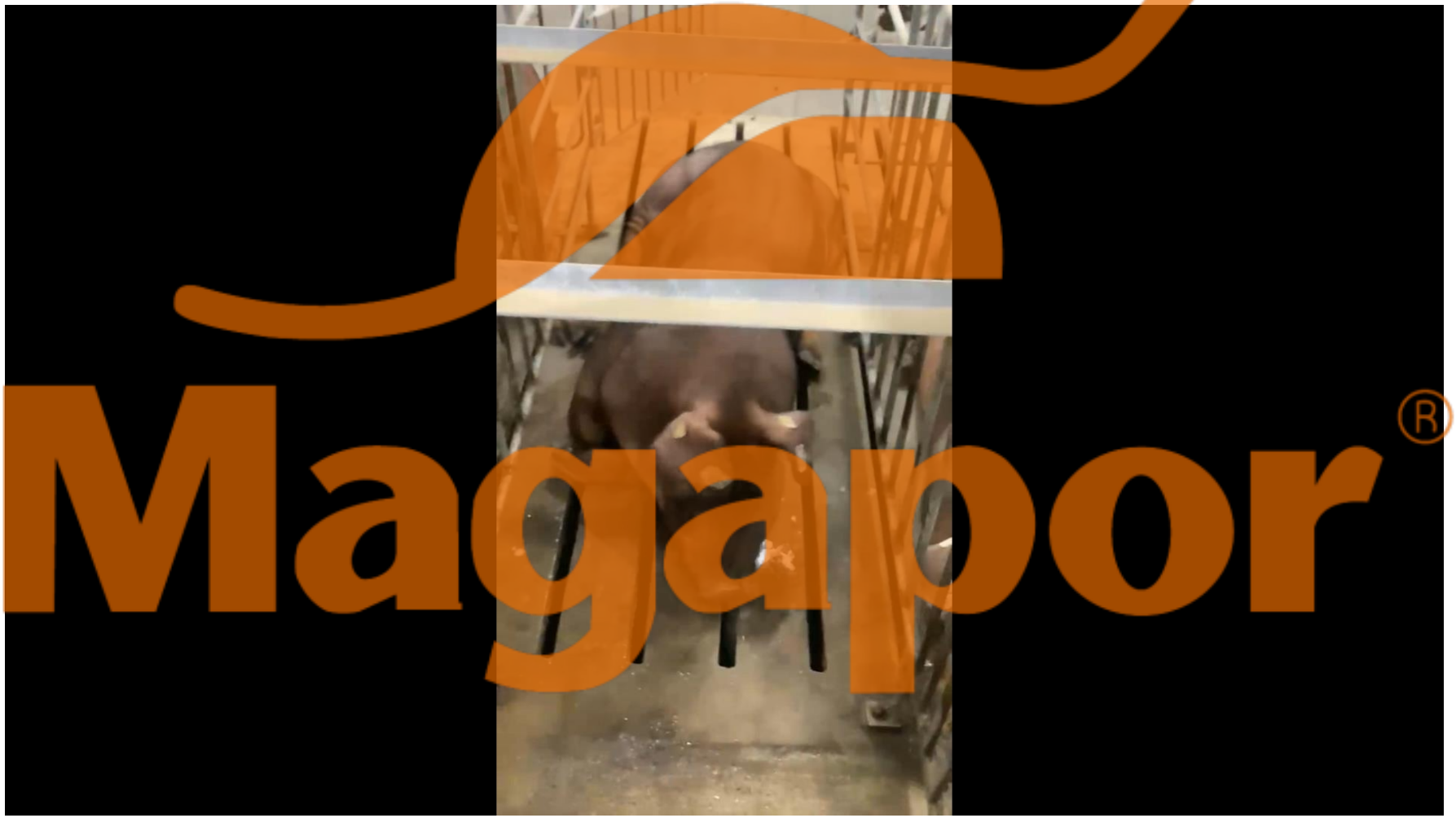
What is OCD?

- Developmental disorder of large, fast-growing animals
- Affects the shoulder, elbow, hip, knee/stifle, and hock joints
- Signs include
  - Lameness
  - Dog-sitting
  - Swollen Joints
  - Painful joints (reduced jump rate in boars)

Selection of Boars by Gait

- 10 Duroc boars selected
- Ranging from 7 to 10 months of age
- 2 of each with…
  - Normal Gait
  - Hip Swagger
  - Dog-sitting
  - Acute Splay
  - Chronic Splay

What do these boars look like?



What do these boars look like?

Flexion Testing of Rear Limbs

- Every boar first walked normally around the barn
- Each rear limb held in a flexed position for 20 seconds – then the boar was walked
- Observed for changes in gait

Group	Right flexion sign	Left flexion sign
Chronic	+	+
Chonic	+	+
Acute	+	+
Acute	+	+
Dogsitter	+	-
Dogsitter	-	-
Hip Swagger	+	-
Hip Swagger	-	+
Control	+	-
Control	-	-

Necropsy Findings

- Every boar had signs of OCD
- OCD was found most commonly in the elbow joint
- In general – boars with OCD in additional locations (stifle, tarsus, hock, and shoulder) had more severe symptoms

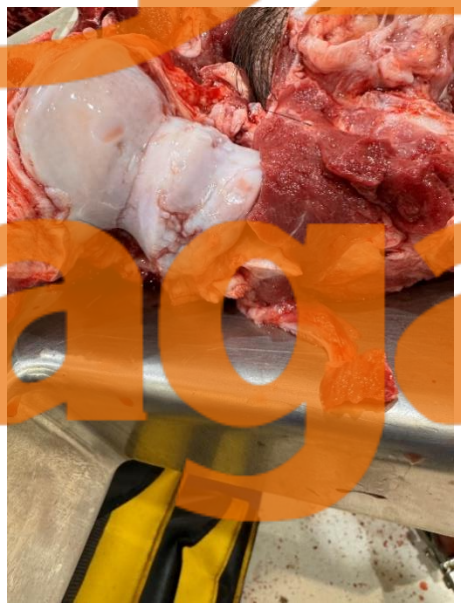
Necropsy Findings

- OCD signs were most commonly bilateral
- 1 exception – a hip swagger boar with a right flexion test sign, OCD lesion on the right humeral condyle

Necropsy Findings

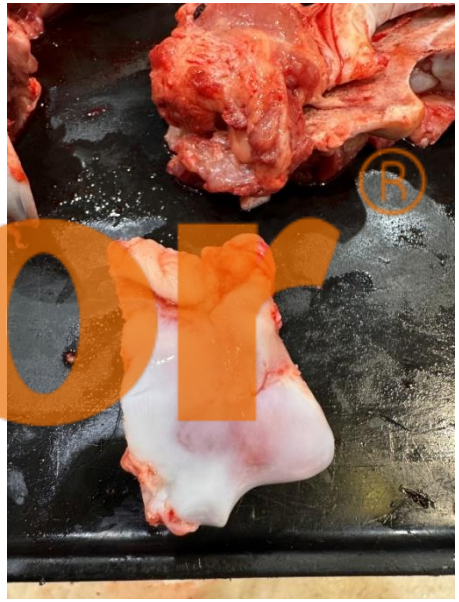
Stifle joint
Femoral condyles

Elbow joint
Humeral condyles



Hip joint
Femoral head

Hock joint
Talus



Necropsy Findings

- Rib growth plate separation in 8/10 boars
- In some cases…
  - Hemorrhage
  - ‘Growth arrest line’
  - Salter-Harris Type 1 fractutres

Necropsy Findings

- Sacrolumbar vertebral lesions in 5/10 boars
- Lesions include…
  - Collapsed disc spaces
  - Hemorrhage
  - Necrosis of bone and cartilage

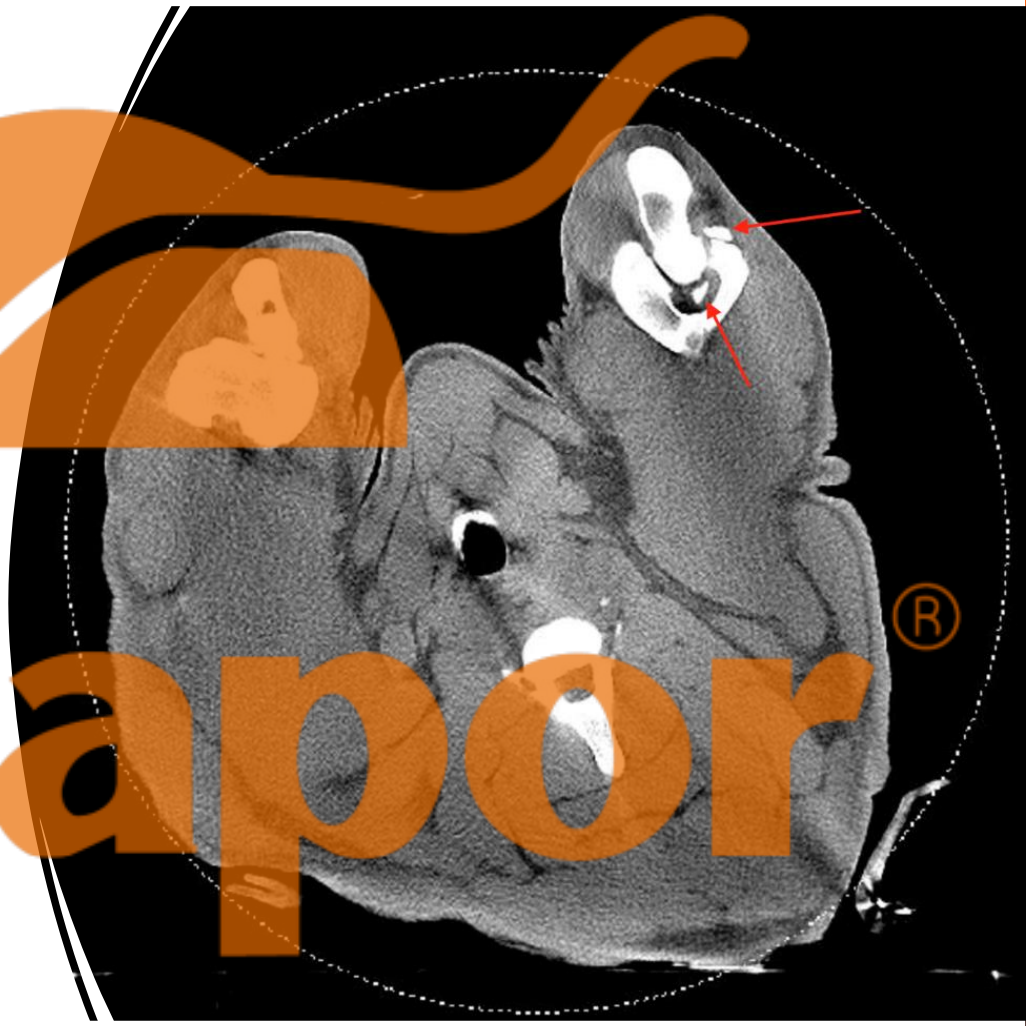
Necropsy Findings

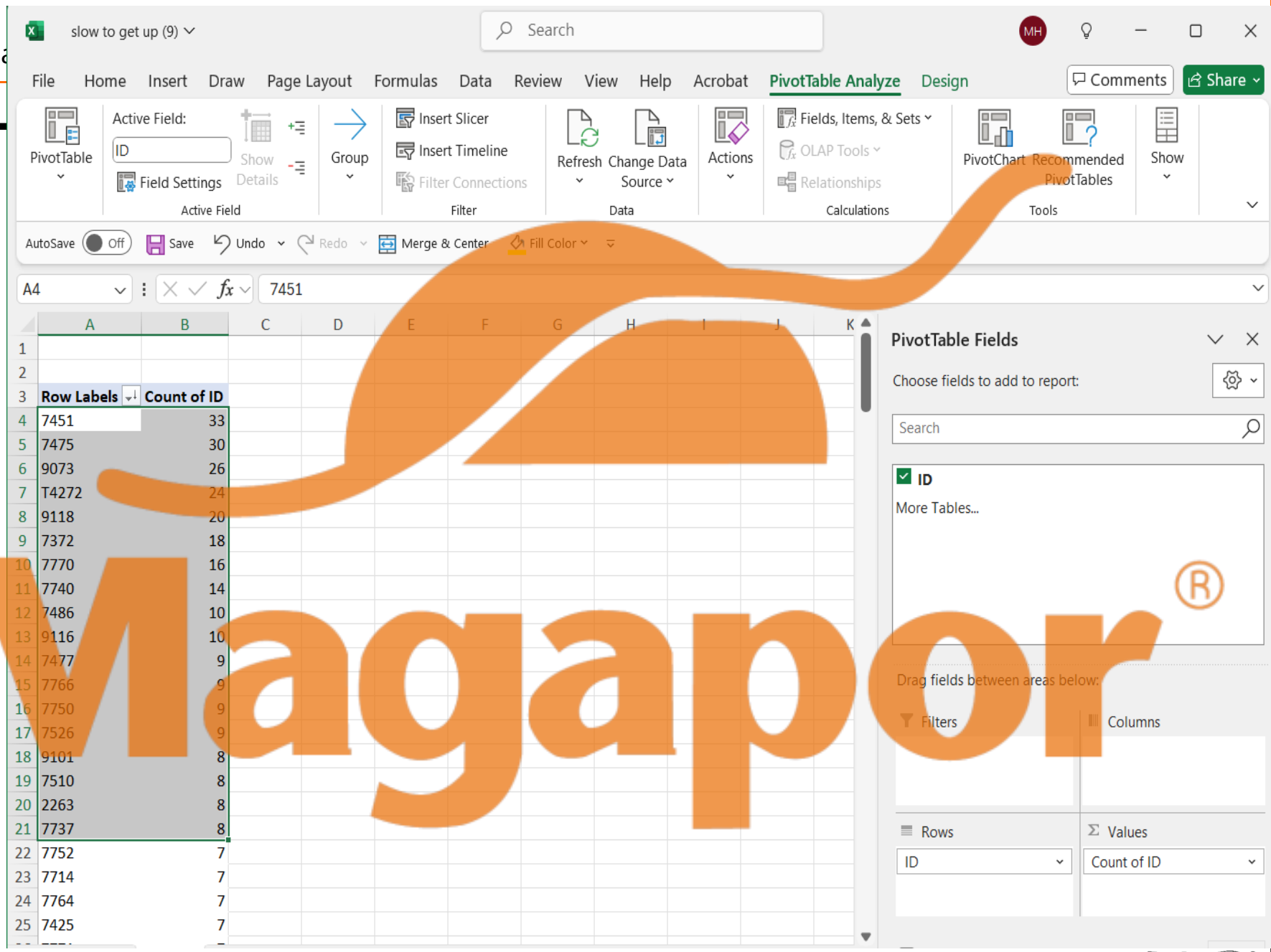
Infectious agents found…

- 4/10 Erysipelas
- 2/10 Mycoplasma hyosynoviae
- 1/10 Strep suis

CT Findings

- All OCD lesions found were older lesions, so no lesions were seen on CT that were not also seen grossly
- Remember: age of boars was 7-10 months
- Better used as a diagnostic in younger boars
  - Identify early OC/OCD lesions

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Sick Pen Accountability

- For many staff – getting up a lame boar is not intuitive

Work with the animal

Use momentum

Safety is the priority

If a boar cannot get up –
it should be euthanized

Sick Pen Accountability

- Boars that are not gotten up are a welfare concern
- Weekends with only 1 staff member can be challenging
- Idea – Accountability Program
  - Training session with staff
  - Staff agree to take pictures of boars standing in their pens during chores
  - Send pictures to their supervisor daily



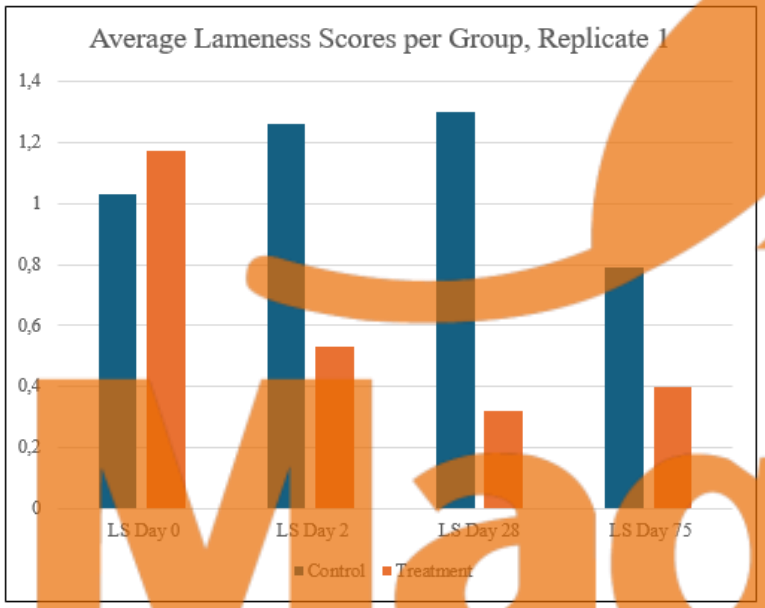


Note from staff member: Good morning - the boar in sick pen 32 can get up with help but does not remain standing. We will euthanize today. - SM

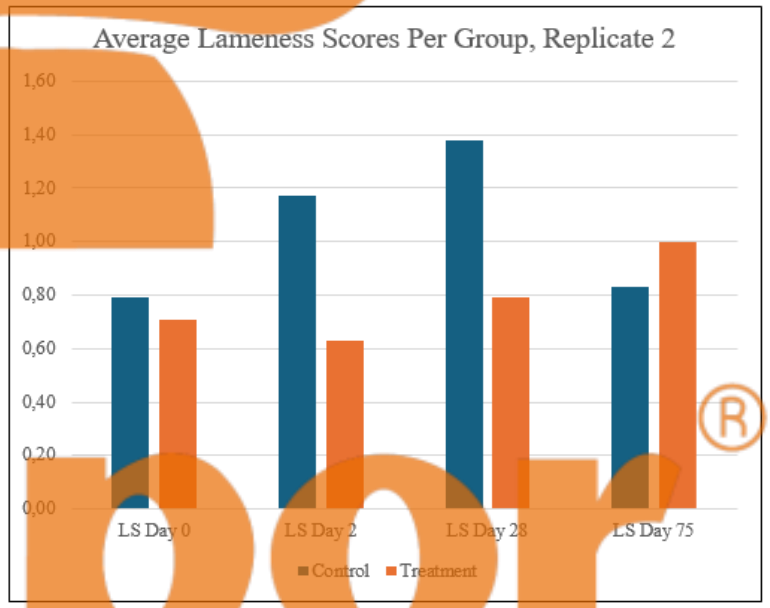
Preventative Strategies

- Vaccination for agents associated with infectious arthritis
  - Erysipelas
- Oral anti-inflammatory use (Meloxicam)
  - Use in times of stress for young OCD prone boars
  - Following transportation and during training
  - Study involving 2 replicates (Rep 1, n=59; Rep 2, n=48)

Preventative Strategies



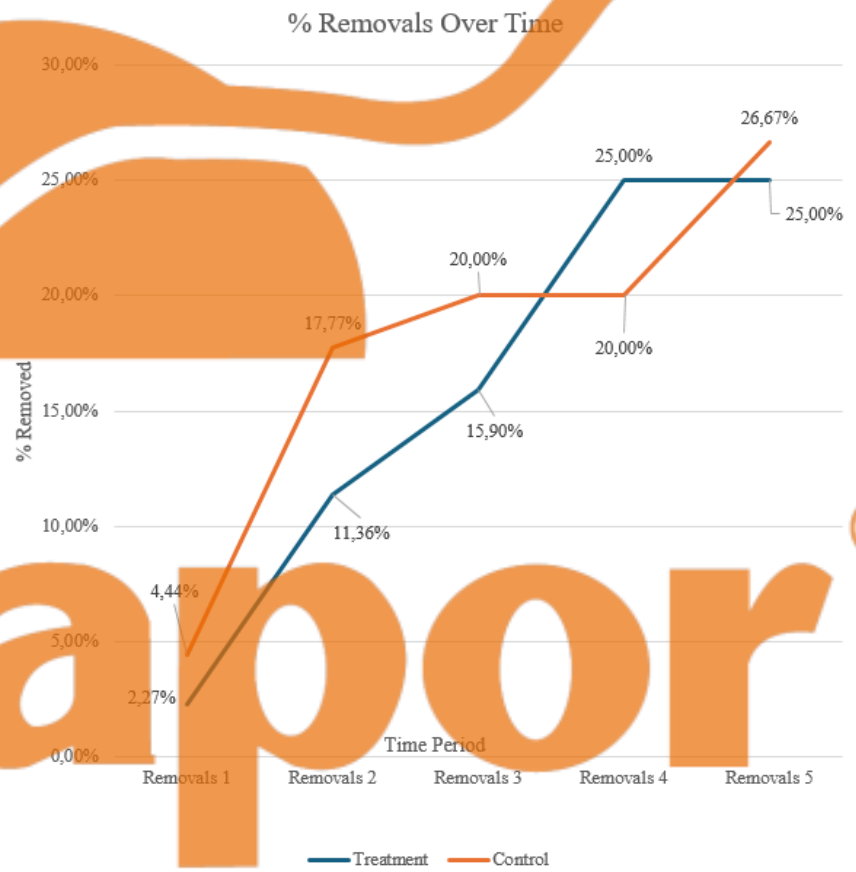
p = 0.54 p < 0.05 p < 0.05 p < 0.05



p = 0.72 p < 0.05 p < 0.05 p = 0.56

Preventative Strategies

- Followed groups out to 1 year post-arrival to the stud (~18 months of age)
- Removals data for animals removed for reasons reasonably associated with OCD
- Removals periods based on cull truck timing
- Improved herd retainment out to ~12 months of age



Preventative Strategies

- Treatment after lameness presentation is unfortunately often unrewarding
- Don’t forget infectious arthritis!
  - Mycoplasma hyosynoviae
  - Use antibiotics that are effective against Mycoplasma species and that have good joint penetration
- Don’t forget anti-inflammatories!

Topic 2

Ralstonia pickettii

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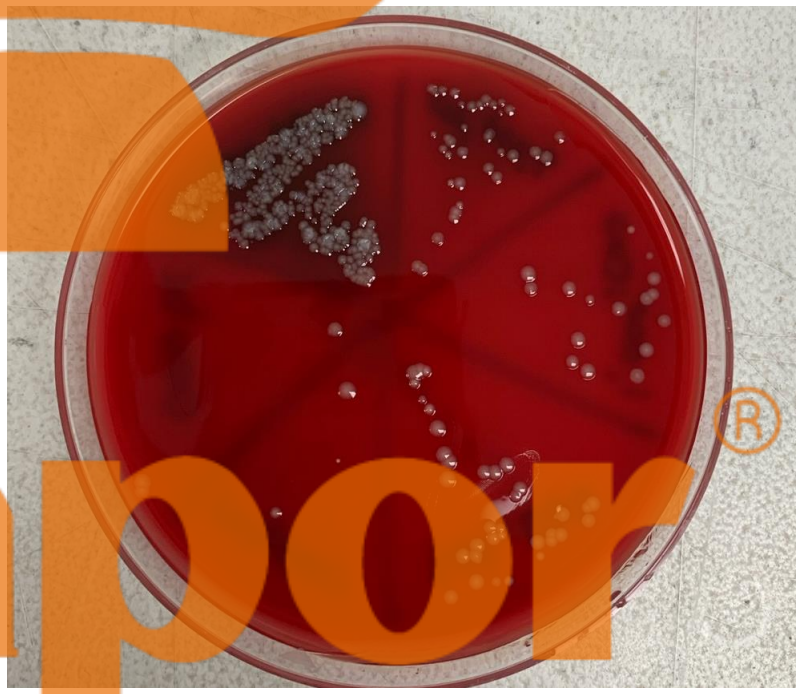
What is Ralstonia pickettii?

- Gram negative rod
- Grows in moist soils
- Forms biofilms in water pipes
- In previous work (Dr. Clements and Dr. Clark)
  - No effect on motility
  - Inhibited by antibiotics commonly found in extenders
- Increased incidence of growth in water samples and semen samples



Ralstonia Project 1

What is the effect of Ralstonia on semen without the influence of antibiotics in extender?

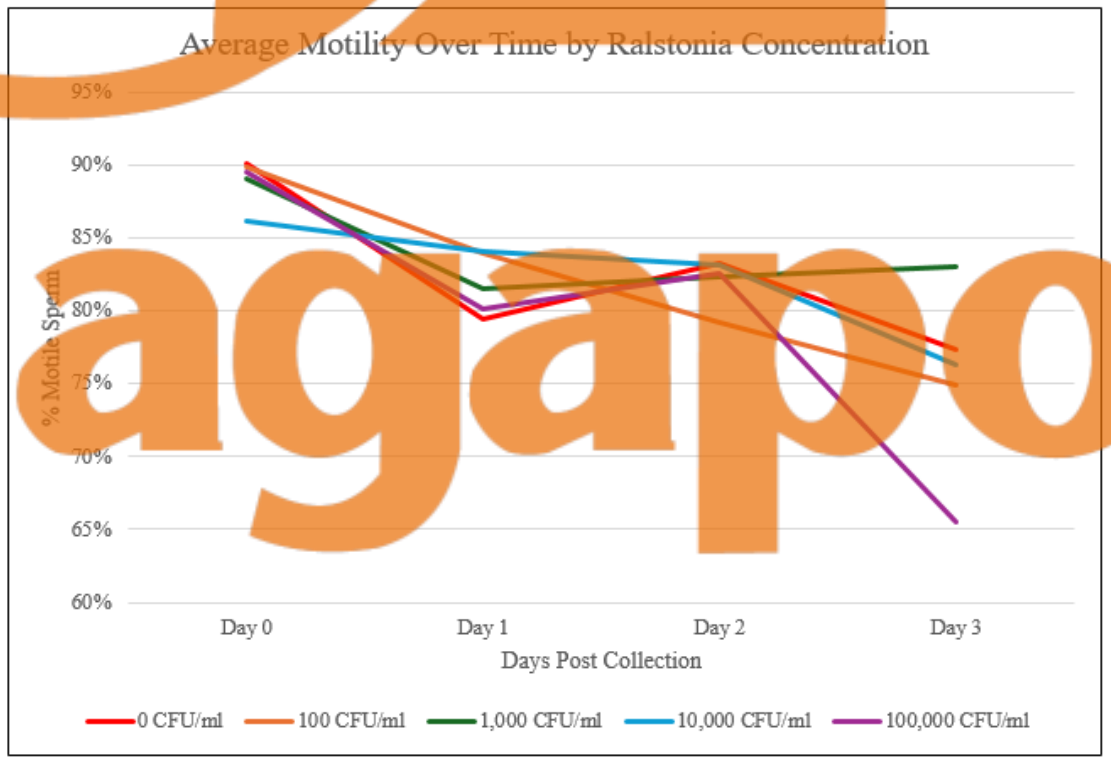
- Ralstonia grown on culture plates from field samples
- Serial dilution performed to determine measurable CFU/ml concentration
- Clean catch collection performed
  - 3 glove method + wipe the tip with alcohol
  - 1 out of 12 had growth using this method

Ralstonia Project 1

- Sample preparation
  - 5 ml samples
  - 1:16 dilution
  - Ralstonia added at increasing levels
- Sample testing
  - Day 0 to Day 3
  - Motility (CASA machine)
  - Acrosome integrity (microscopy)

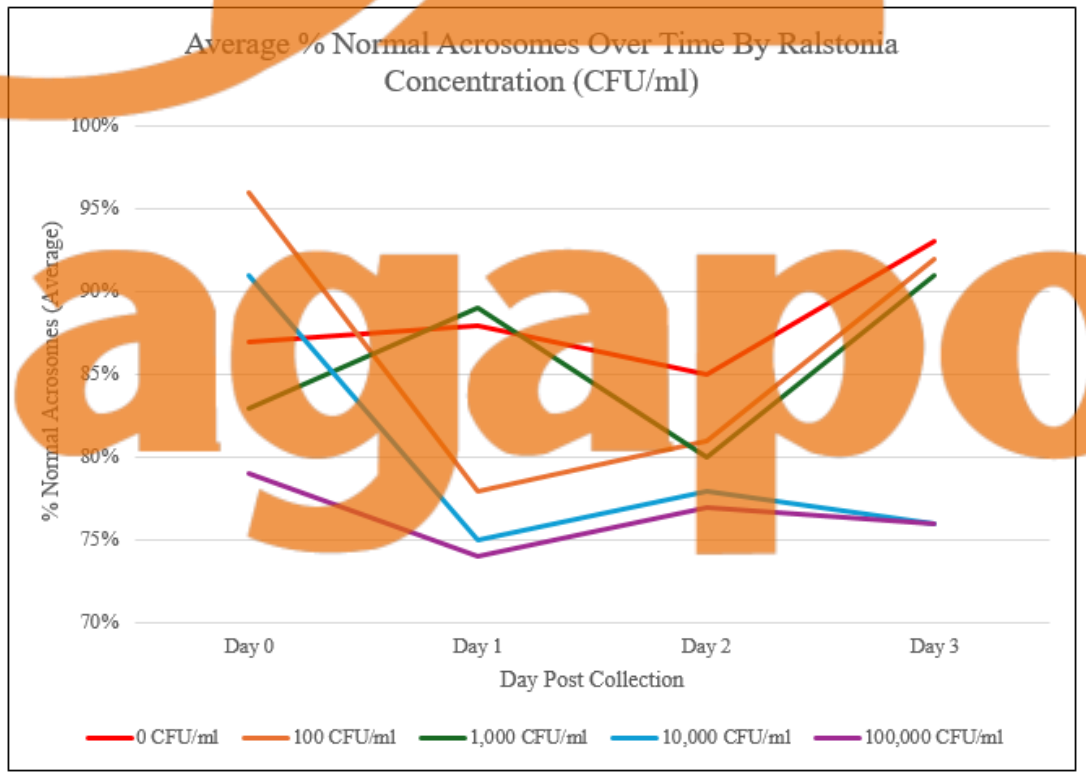
Ralstonia Project 1 – Round 1

- Comparing Control, 100, 1,000, 10,000, and 100,000 CFU/ml
- No significant difference in motility
- Note: 100,000 CFU/ml Day 3



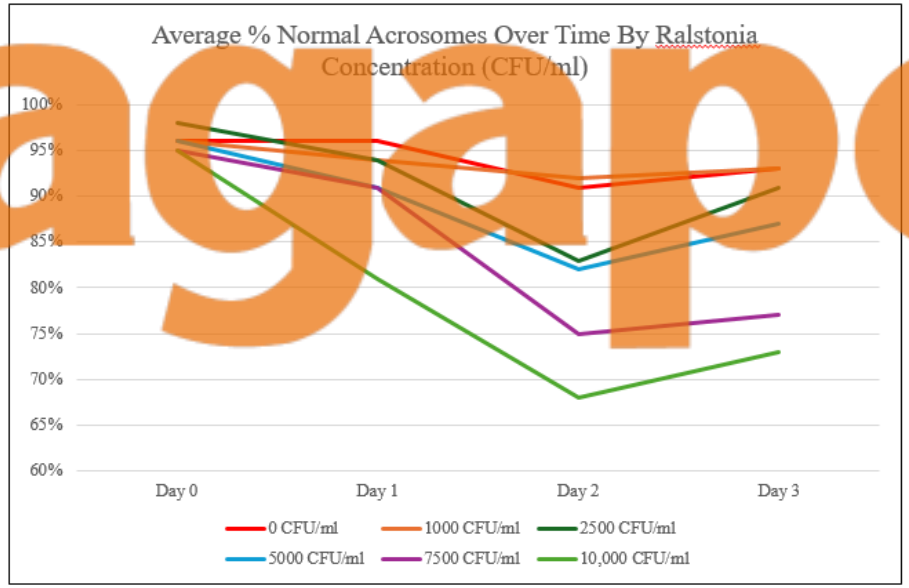
Ralstonia Project 1 – Round 1

- Significant decrease in acrosome integrity
- 10,000 CFU/ml ($p < 0.01$)
- 100,000 CFU/ml ($p < 0.01$)



Ralstonia Project 1 – Round 2

- Comparing: Control, 1,000, 2,500, 5,000, 7,500, and 10,000 CFU/ml
- Motility: no difference between groups
- Acrosomes: significant decrease at 5,000 CFU/ml and higher ($p < 0.05$)
- Failing acrosome scores starting at 7,500 CFU/ml



Ralstonia Project 2

- How much Ralstonia is necessary to be in a sample for it to grow in extender despite antibiotics?
- What is the effect of bacteria on semen in extender containing antibiotics?

Ralstonia Project 2

- Known levels of Ralstonia mixed into extender to create 1 ml solution
- Wait 1 hour after mixing
  - Simulate time from mixing extender to adding semen samples on a production day
- Each sample plated – assessed for growth after 48 hours

Ralstonia Project 2

- Low amount of growth first seen at 5,000 CFU/ml
  - Less than 10 colonies grown
- High amount of growth seen at 500,000 CFU/ml
  - 20+ colonies grown or too numerous to count (TNTC)

Ralstonia Project 2

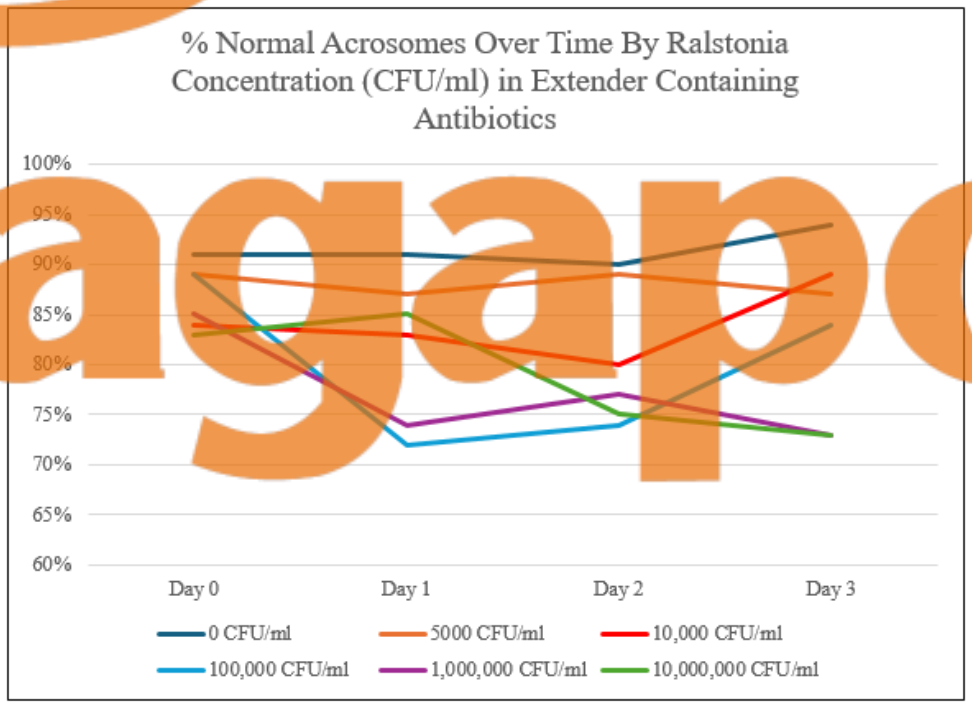
- The following levels of Ralstonia were chosen for testing:
  - Control, 5,000 CFU/ml, 10,000 CFU/ml, 100,000 CFU/ml, 1,000,000 CFU/ml, and 10,000,000 CFU/ml
- Extender used from the farm – heated to 32°C and mixed with chosen Ralstonia levels
- Waited 1 hour
- Semen added to create a 1:16 dilution

Ralstonia Project 2

- All control samples cultured
  - Each control sample grew 1 Ralstonia bacterium
  - A corresponding same-day water sample from the stud was positive for Ralstonia growth at a number TNTC
- Tested from Day 0 to Day 3
  - Motility (CASA machine)
  - Acrosome integrity (microscopy)

Ralstonia Project 2

- No difference in motility
- Significant difference in acrosome integrity starting at 10,000 CFU/ml ($p < 0.01$)
- Failing acrosome scores started at 100,000 CFU/ml



What to do about Ralstonia?

- #1 – test your water routinely for bacteria!
- #2 – if bacteria is grown in high amount in your water system across multiple tests – sanitize your water system!
  - Remember – sanitizers must be flushed out of the system or they can also harm sperm cells!

Prevention

- Every water system is different – often built when the farm was built
- Learn about your water system – familiarize staff with the system
- Often – the installer does not understand your goals

Questions?

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THANKS

GRACIAS

Dr. Megan Hood

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