

Pre-Peak Lay Broiler Breeders with Impaired Mobility and High Mortality Associated with Myopathy and Hypocalcemia

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Impaired Mobility Syndrome – Introduction



■ Signs and history

- Mostly early producing flock prior to peak lay (25-30 wks)
- Lethargy, tremors, paralysis, and death
- Panting, lethargy, cyanotic combs, death
- Increased mate persecution
- Often suspected acute calcium imbalance
 - 'Calcium tetany'?
 - Diet, genetics, management

■ Mortality

- Up to 1-2%/wk for 1-2 wks

Impaired Mobility Syndrome – Introduction



- Necropsy findings
 - Shelled egg in shell gland
 - Congested lungs, cyanosis, skeletal/heart muscles
 - Active ovary (normal or superovulatory)
 - No other lesions
- Poorly defined in literature



Impaired Mobility – Field Studies 2005

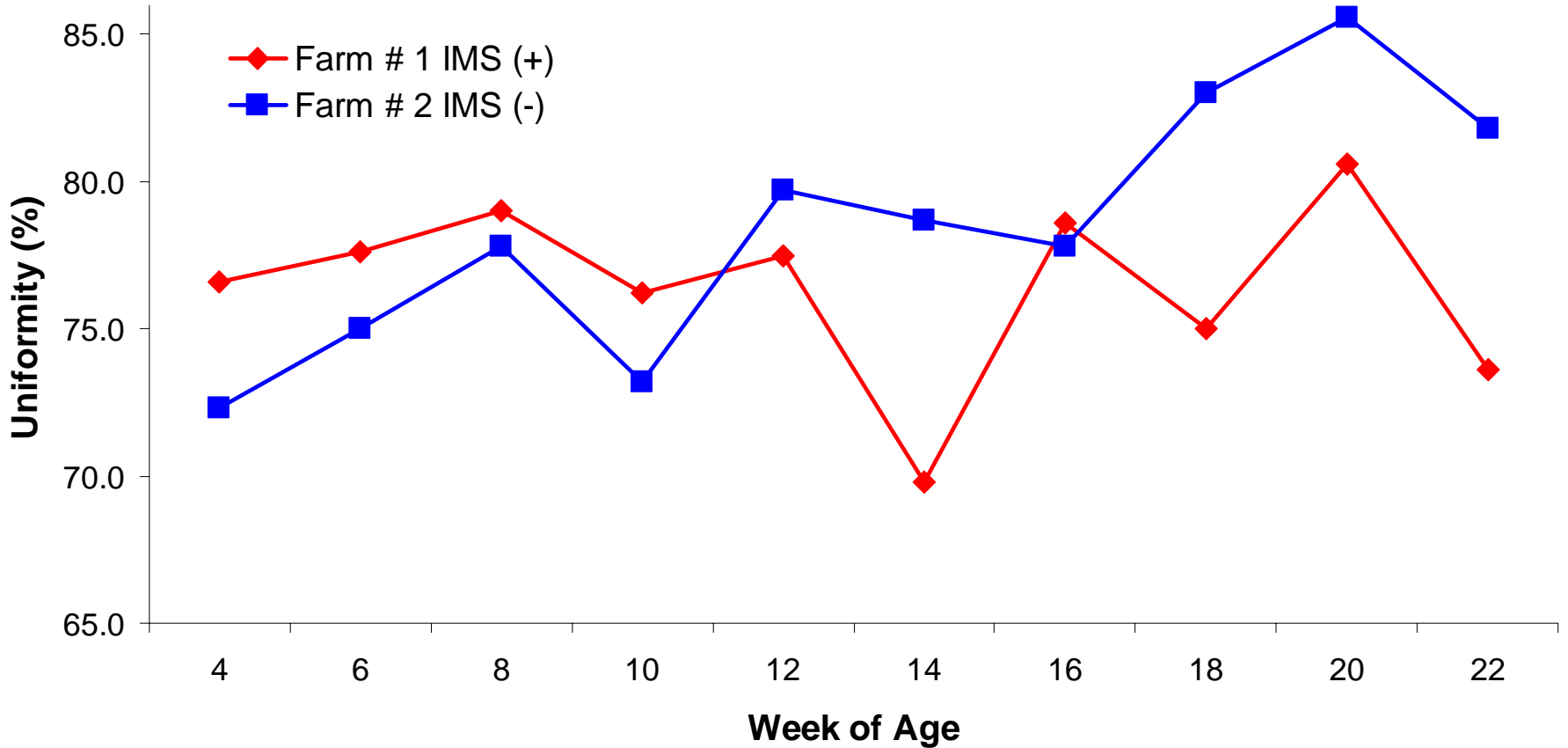
- Impaired mobility did not appear to be associated with calcium tetany
 - Other metabolic alteration?
 - Rapid onset of egg production
 - Respiratory disease?
 - Pullet house issues (dust & ventilation)
 - Incited by reproductive stress
 - Multiple etiologies?
 - **'Impaired mobility syndrome' (IMS)**



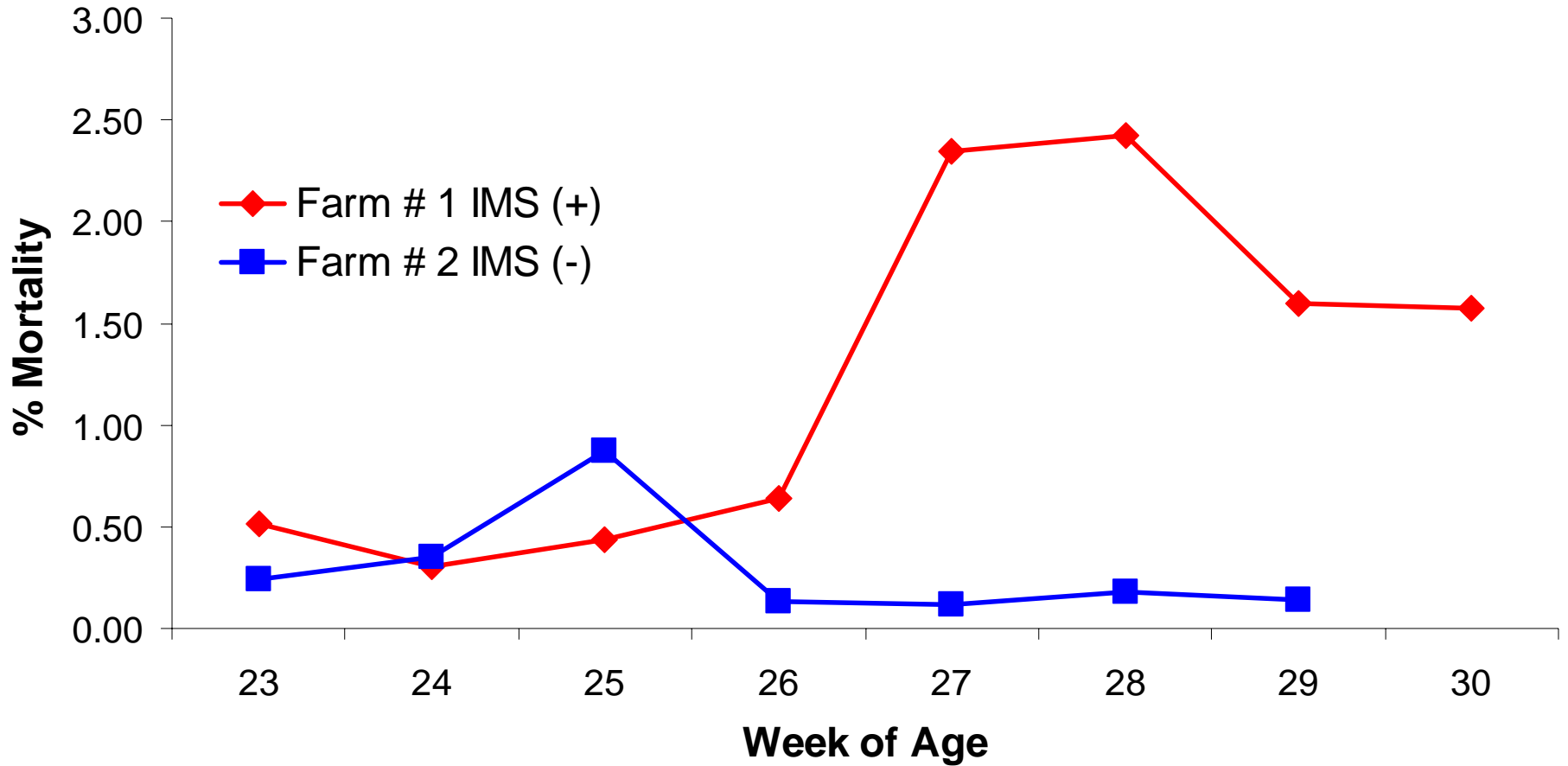
Field Study – Materials and Methods

- Two broiler breeder farms evaluated
 - Same integrator
- Farm #1
 - Problems noted of IMS and ↑ mortality
 - One breeder house
 - ~9,200 hens (1♂:10♀)
 - Evaluated for 3 wks (28-30 wks of age)
- Farm #2
 - Next breeder flock placed
 - Two breeder houses
 - ~ 9,000 hens/house (1♂:10♀)
 - Evaluated for 5 wks (25-29 wks of age)

Field Study Farms # 1 & 2 - Pullet Weight Uniformity (%)



Field Study Farms # 1 & 2 - % Mortality





Field Study: Farm #1 – Feeding Schedule

- Breeder feed at 25 weeks of age
 - Ca = 3.25, P=0.65
 - Fine limestone
- Changed at 26 weeks of age
 - Ca = 3.4, P=0.73
- Intermittent Ca + Vit D supplementation starting at 26 weeks of age
 - On Ca 2-4 days then off 4-5 days



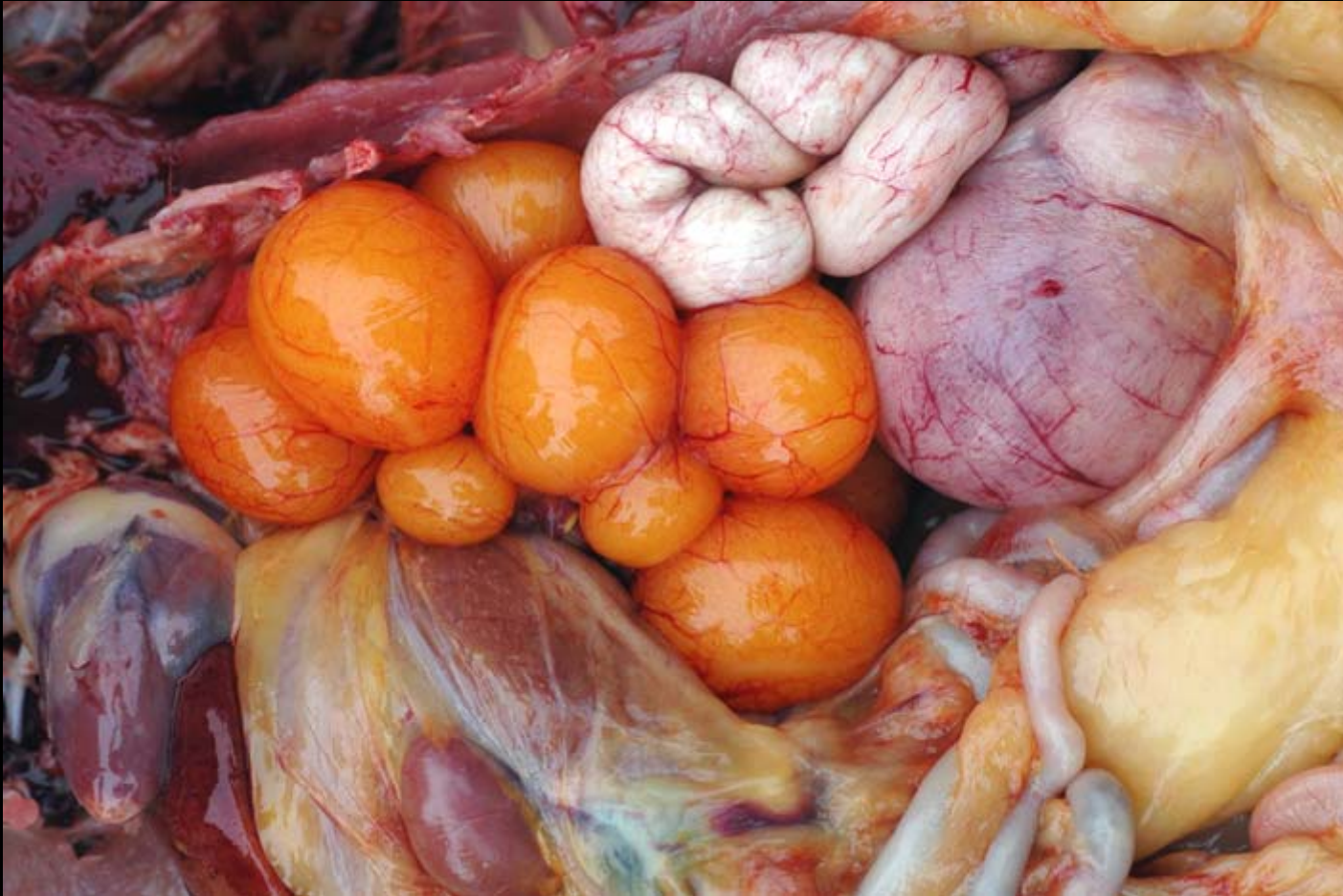
Field Study – Materials and Methods

- Blood weekly: healthy & affected
- Necropsy weekly
 - Impaired mobility (clinically affected)
 - Down hens without obvious leg lesions
 - Fresh mortality
 - Normal controls
 - Farm #1 week 28 & 29 only
 - Farm #2 none sampled
- Histopathology
 - Breast & adductor muscle, sciatic nerve, brain, spine, bone, kidney, heart, lung, liver, thyroid/parathyroid

Farm # 1 –

Results

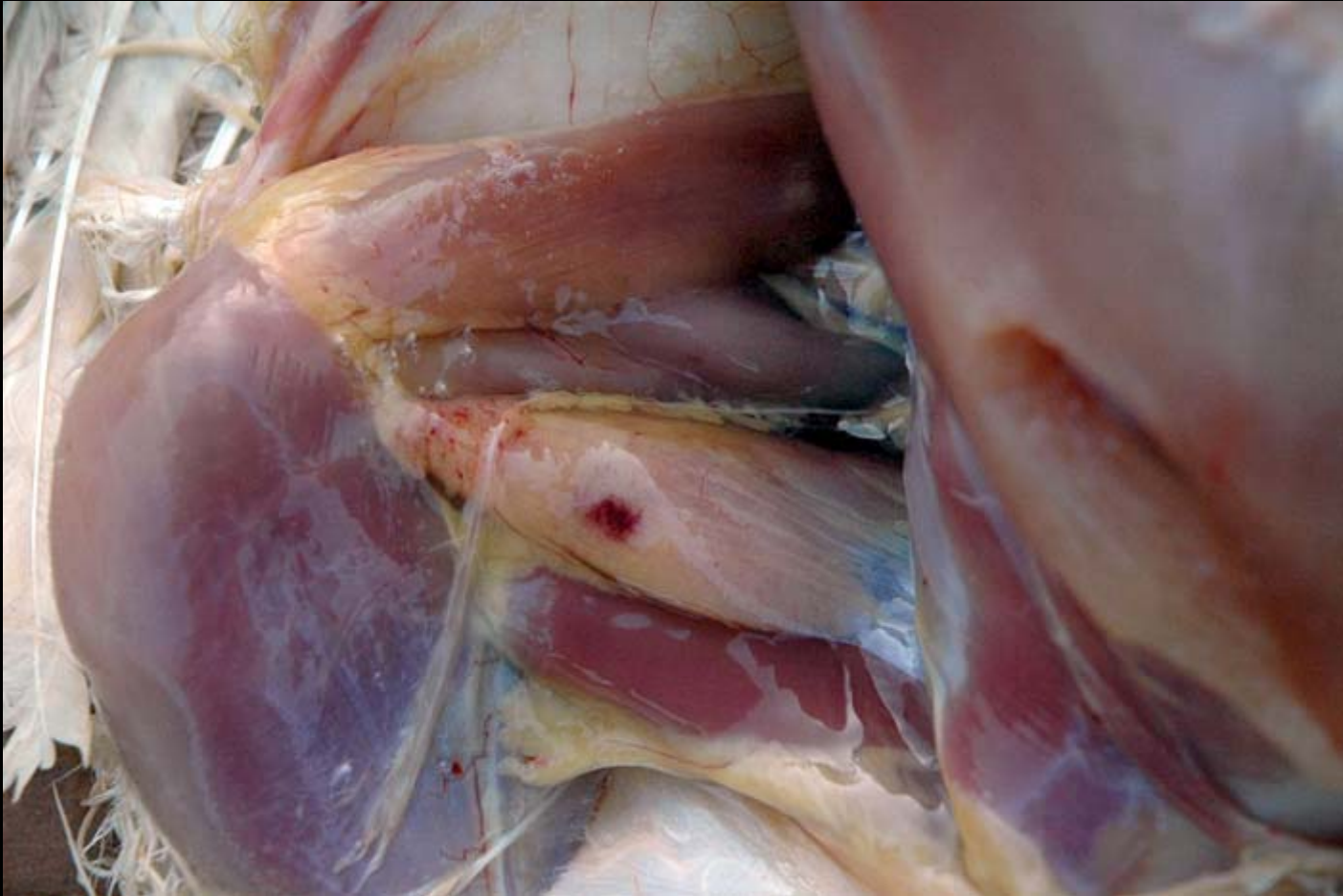
- Necropsy findings
 - Shelled egg in the shell gland
 - No other gross lesions = Ca tetany suspect
 - Myopathy
 - Breast
 - Adductor
 - Several birds with myopathy were not in production
 - Superovulation
 - Hock trauma (entrapped in slats)
 - Peritonitis
 - Ovarian regression
 - Gout



Super-ovulation, in production



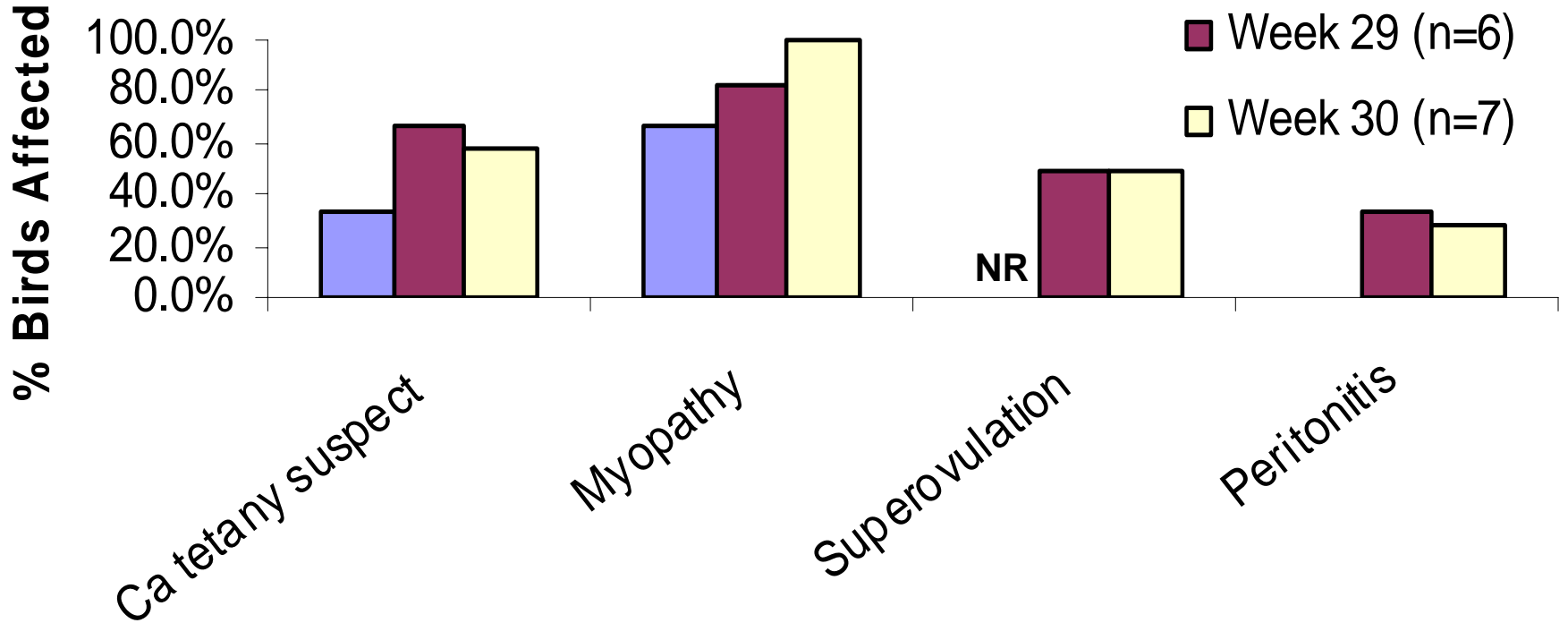
Myopathy – superficial pectoral muscles



Myopathy – adductor muscle

Gross Necropsy Results for Impaired Mobility Birds

Farm # 1



NR = Not recorded

Farm # 1 –

Histopathology

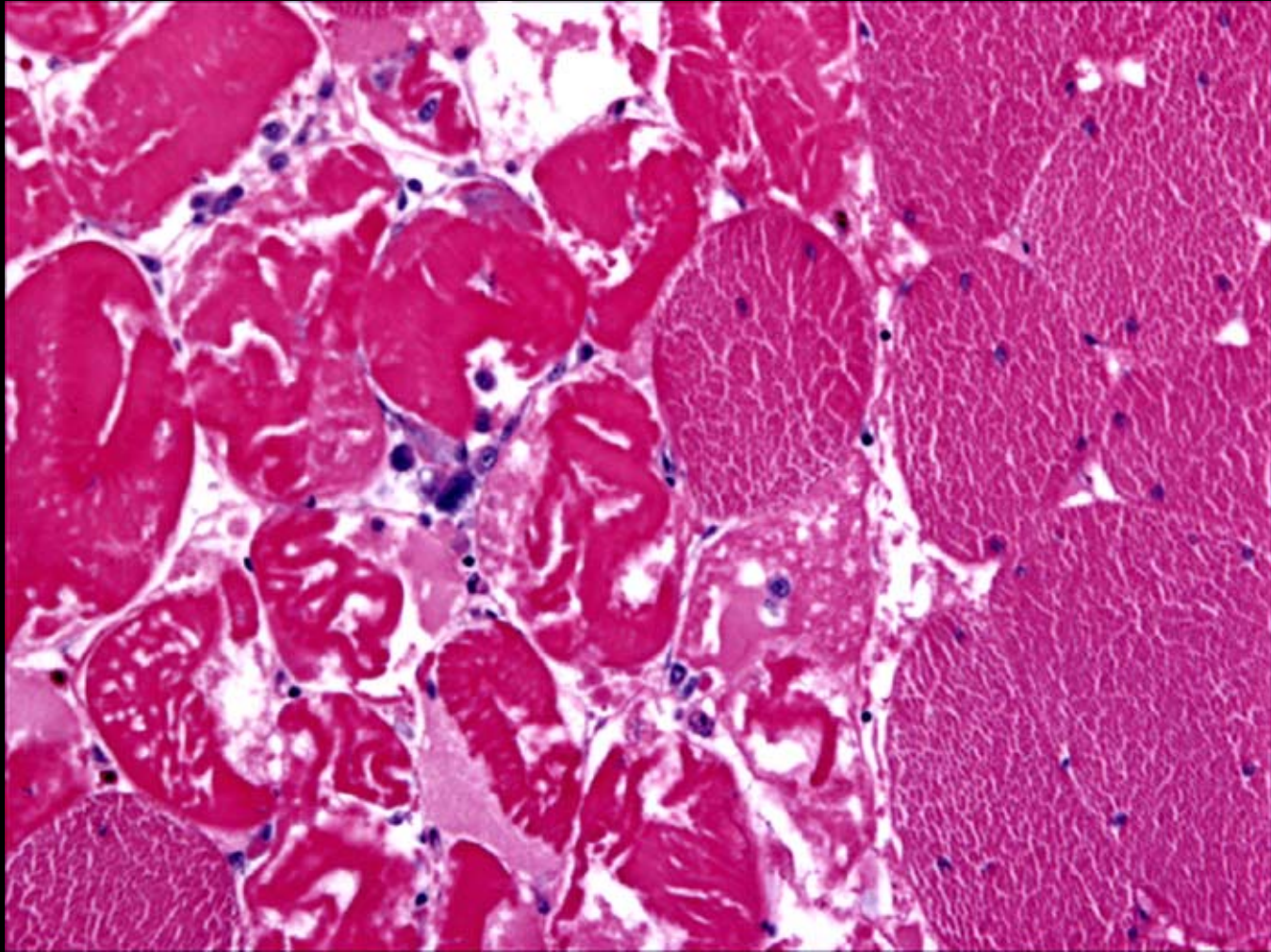
- Myopathy

- Breast and/or adductor

- 13/15 impaired mobility birds (86.7%)
- 9/10 calcium tetany suspect birds (90%)
- 5/7 fresh dead birds (71.4%)
- 2/7 clinically normal birds (28.6%)

- Microscopic lesions observed in birds without gross lesions

Myopathy -

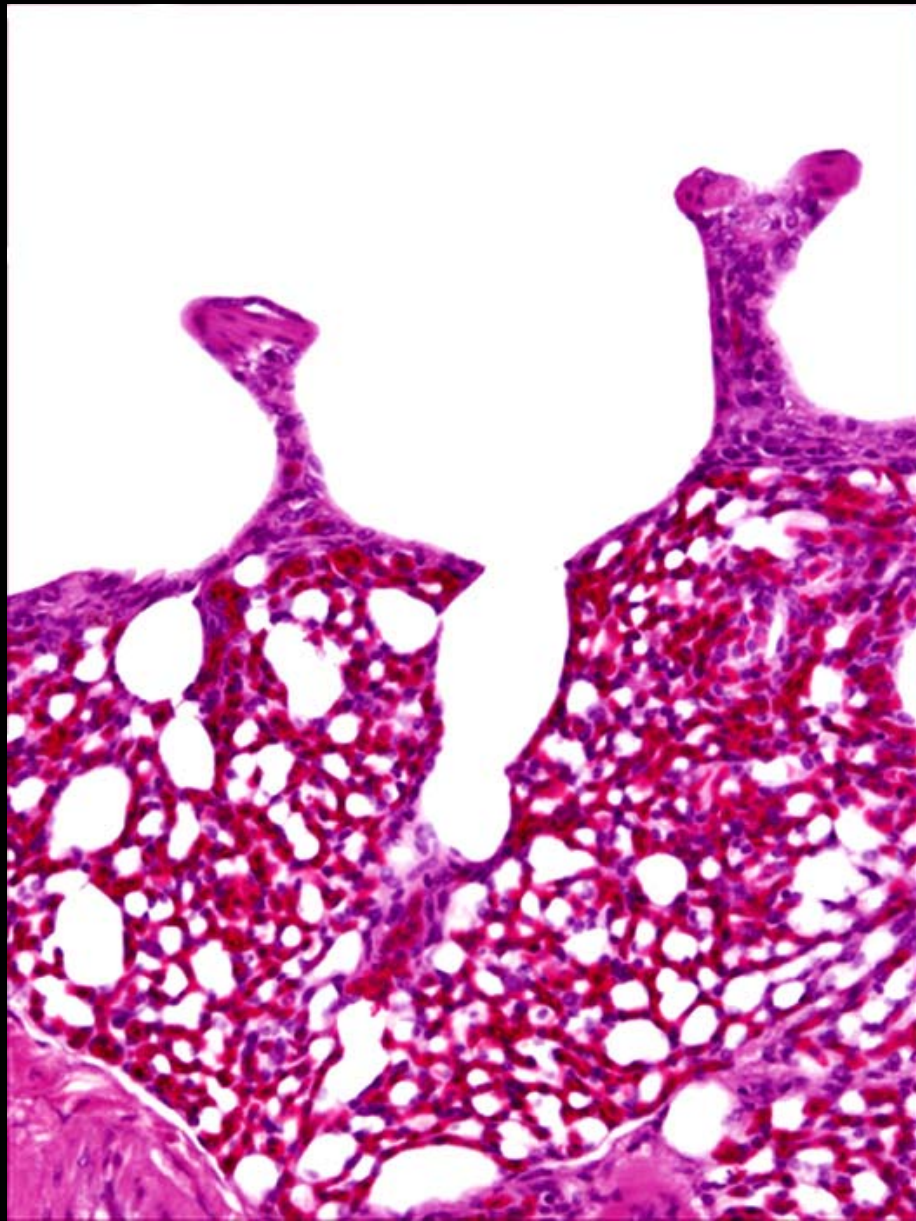


Degeneration and necrosis of muscle fibers without inflammation

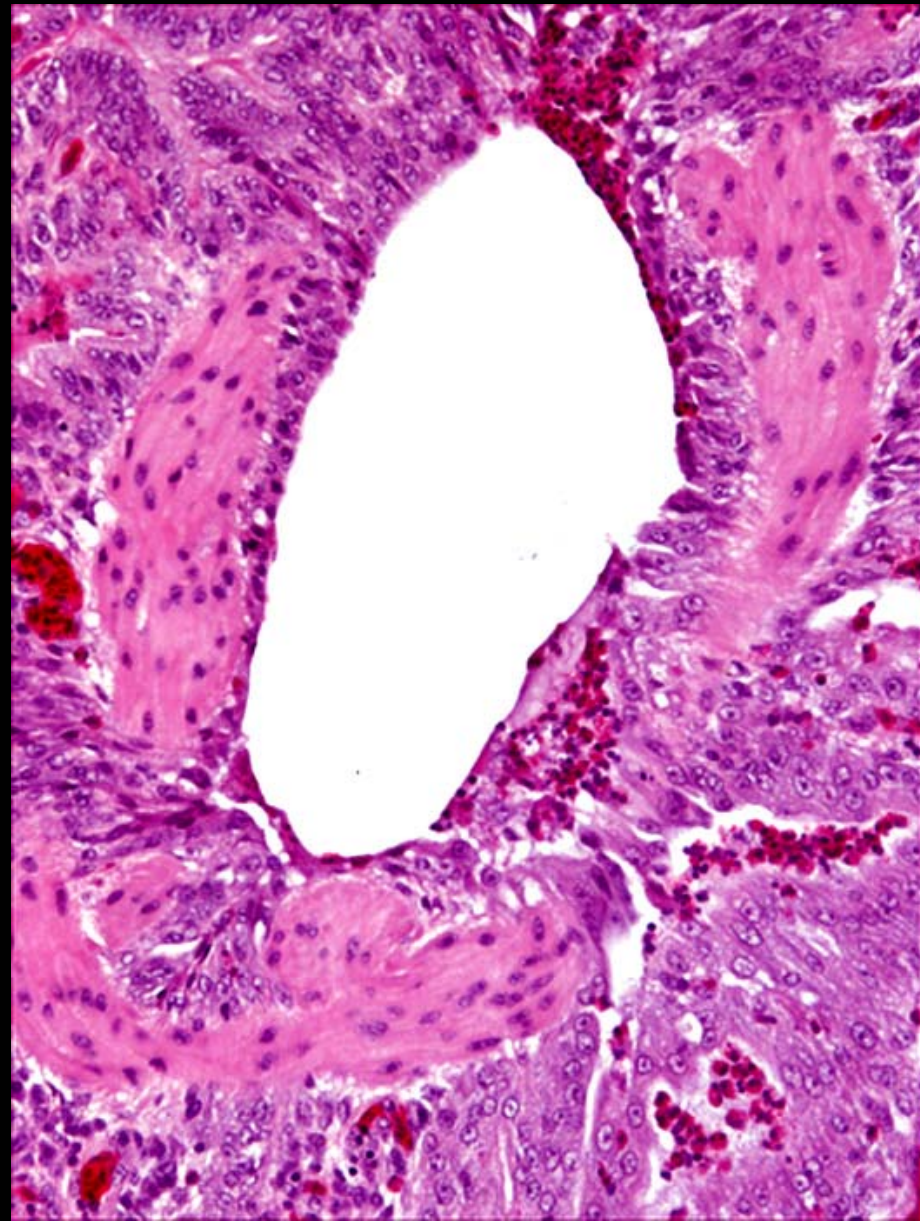
Farm # 1 –

Histopathology

- Respiratory disease
 - 'Avian Proliferative Pulmonary Disease' (APPD)
 - Healthy and affected birds
 - Not dead birds
 - Lung sampling techniques?



Normal parabronchus



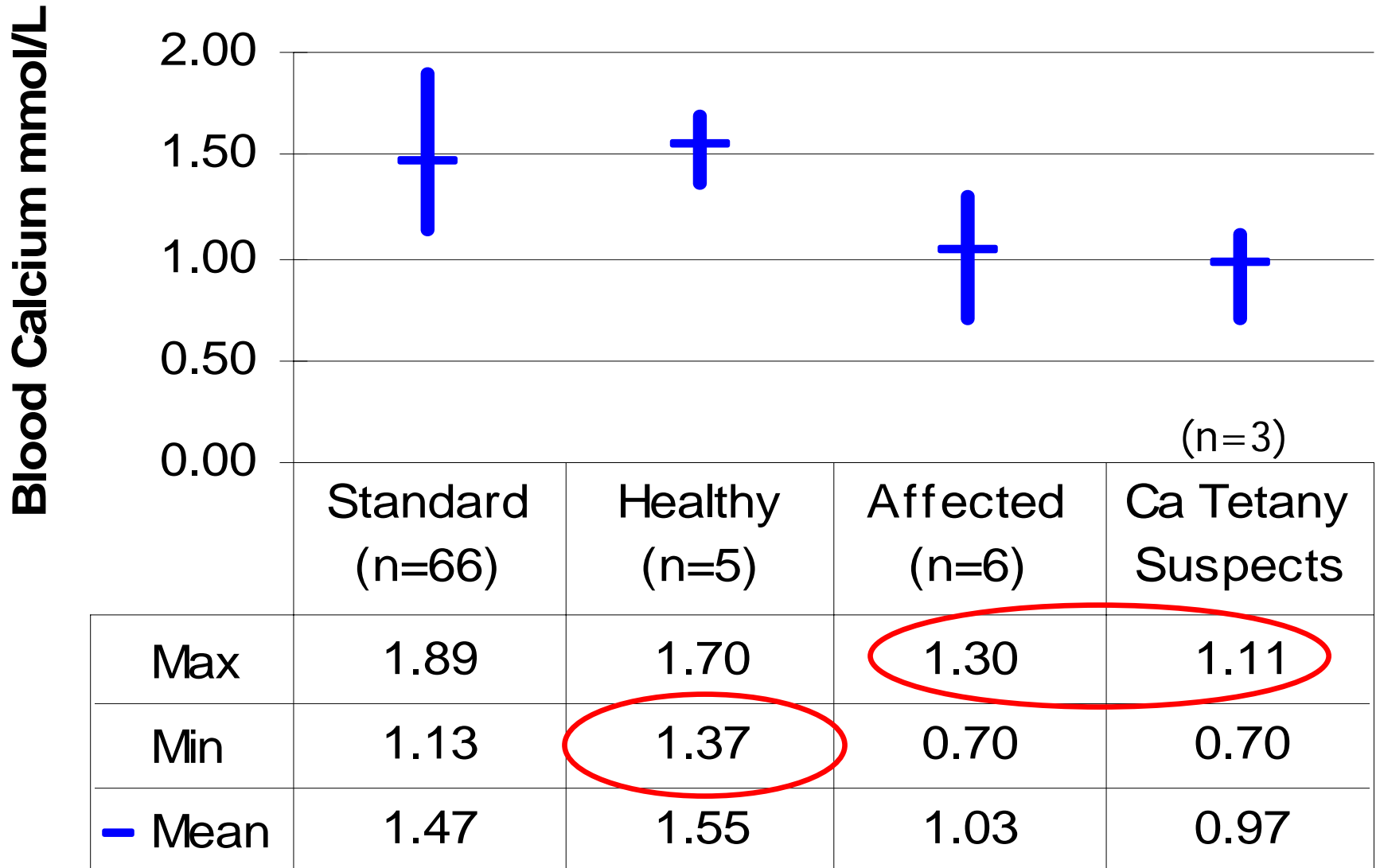
Constricted parabronchus with epithelial proliferation and luminal exudate

Farm # 1 –

Results

- Ionized calcium levels
 - Means lower in Ca tetany suspect birds than normal birds
 - Calcium tetany suspects = affected & gross lesions
 - Reproductively active
 - No other signs
 - Usually shelled egg in shell gland
 - Week 29 most pronounced

Field Study Farm # 1 Week 29: Ionized Calcium



Farm # 2 –

Results

- History: different calcium source (no fine limestone)
- Very low morbidity/mortality
 - Avg mortality = 0.14%/wk during evaluation
- Necropsy findings
 - No consistent problems
 - Peritonitis, spinal abscesses, trauma/fractures, vent pecking, Ca tetany suspects, septicemia, hydrocephalus, visceral tumors
- Serology
 - Some abnormalities, nothing consistent
- Histopathology
 - Evidence of myopathy and proliferative lung lesions in impaired mobility birds



Impaired Mobility Field Studies – Conclusions

- Farm # 1 was an Impaired Mobility Syndrome (IMS) flock with hypocalcemia
- Slightly atypical presentation
 - Dietary control problem
 - Pullet uniformity issues?
 - Fine limestone effect?
 - Myopathy
 - Cause or effect?
 - Microscopic lung lesions
 - Cause or effect?



Impaired Mobility Field Studies – Conclusions

- Have seen several IMS flocks without hypocalcemia
 - Keep other possible diagnoses open
 - Clinical signs: early morning
 - Complete necropsy is recommended
 - **VIEW SPINE**
 - Open all joints and view tendons in legs
 - Blood work and histopathology may be helpful when there are no clinical signs



Thank You!
