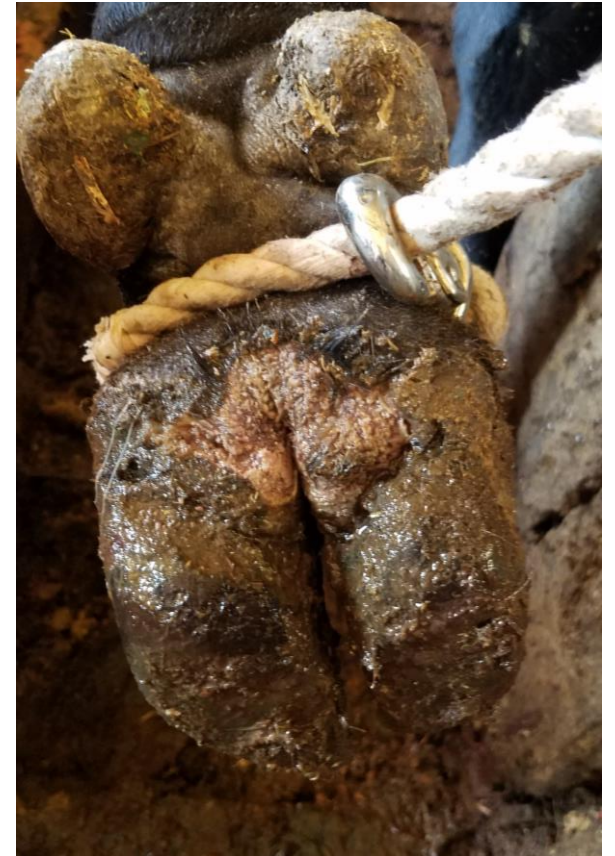


Digital Dermatitis: Old Disease – New Research



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Digital Dermatitis



▪ Historical Perspective

First described in 1974 in Italy

- described a “spirochete-like” organism (*Treponema*) in 1988 in the US
- attempts to produce lesions using *Treponema* alone have failed
- will see antibodies to *Treponema* in affected cattle
- exact etiology still remains elusive as unknown if *Treponema* is causative agent or just along for the ride

Digital Dermatitis

- Digital Dermatitis or Hairy Heel Warts

Lesions occur on the skin of the back side of the foot

- circular or oval with clearly demarcated edges
- epithelial filiform papillae (“hairy warts”) chronic lesions
- ulcerative and proliferative changes on histopath
- 80-90% of lesions occur on the back feet

Pain response due to lesions causes changes in gait

- shift weight to front of toe to keep lesion off floor
- decreased walking activity and feed intake
- decreased feeding performance

Digital Dermatitis

- Digital Dermatitis or Hairy Heel Warts

Risk factors for development are not well understood

- stress induced immunosuppression?
- wet environment with mud and/or manure?
- mixing of cattle from different sources? Holsteins?

Bacterial population changes as lesions go from acute to chronic

- absence of viral or fungal DNA in any lesion
- each stage of the lesion has a particular population
- as lesions age *Treponema* numbers increase
- appears to take approximately 90-100 days

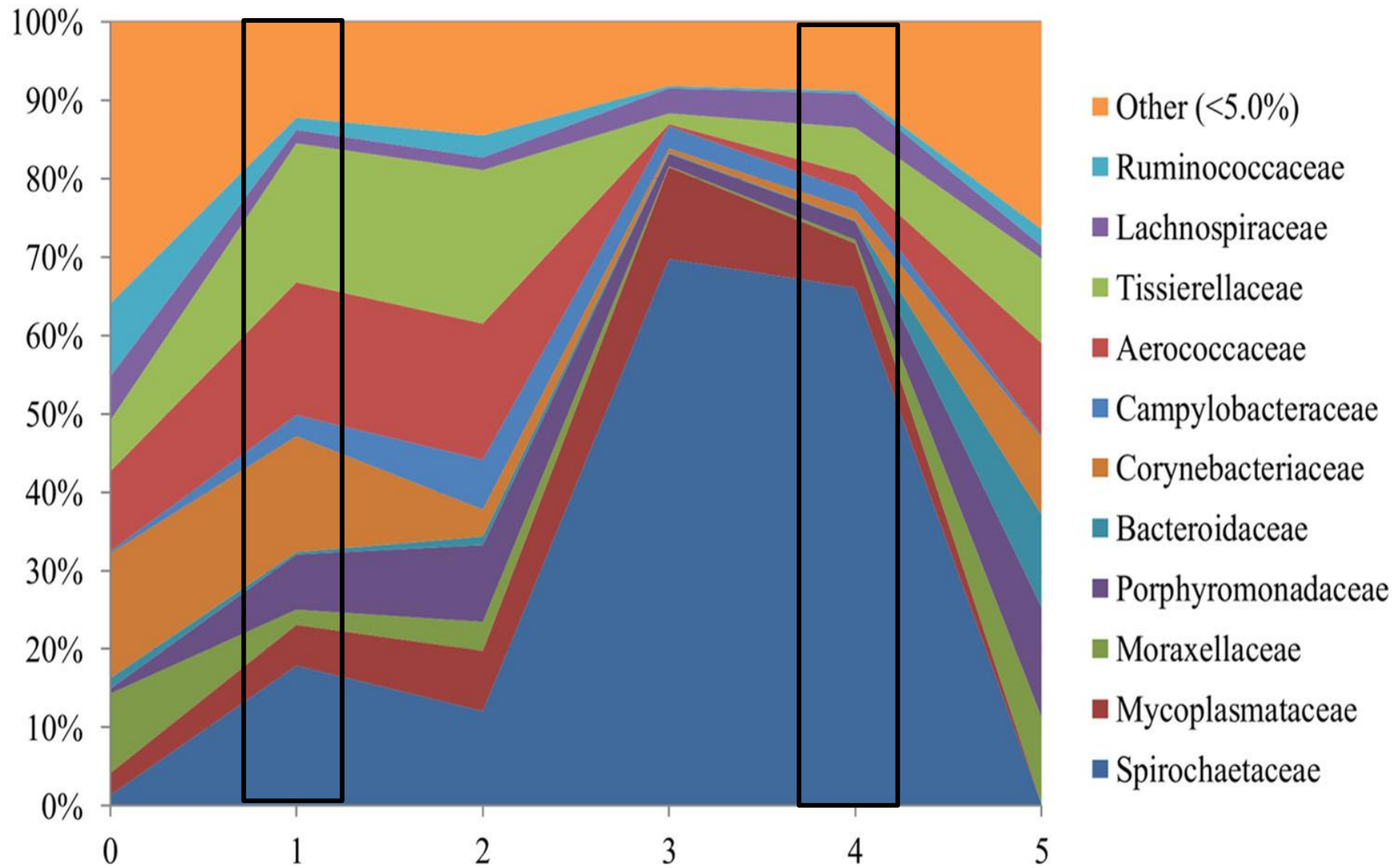










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Digital Dermatitis

- Digital Dermatitis or Hairy Heel Warts

Parenteral antibiotics are not useful

- routine footbaths at receiving and reimplant
- reports of three consecutive days at arrival
- problem pens walked through footbath as needed

a) EOD through footbaths for 3 treatments

- 10% copper sulfate (16 lbs. in 20 gal. water)
- 5% formaldehyde (1 gal. 36% soln. in 19 gal. water)
- tetracycline sprayed on lesions (100 grams/gallon water)
- individual tetracycline bandages on clinical cases

Digital Dermatitis Project



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Digital Dermatitis Project

▪ Biopsy 100 Active DD Lesions for Metagenomic Analysis

Objective was to compare bacterial profile to work done in dairy industry

- do similar lesions behave differently?
- impact on management practices?
- potential of vaccine development?

Collected samples from nine different feedyards and a packer (139 head total)

- tissues under microscope and special staining
- biopsies have been processed and data analysis underway

Feedlot Lameness / HHW Project

- Cooperating Feedlots

Couser Cattle Company

Joe Kilburg

Grieman Brothers Feedyard

Royal Beef (Jim/Julie Christensen)

Van Voorst Cattle (Steve Van Voorst)

Greg Pudenz Cattle Company

Upchurch Feeders / Bar K Cattle

Darin Green Feedlot

H&S Farms

Upper Iowa Beef Processors

Nevada, IA

Sabula, IA

Garner, IA

Royal, IA

Sioux Center, IA

Breda, IA

Colo, IA

Hull, IA

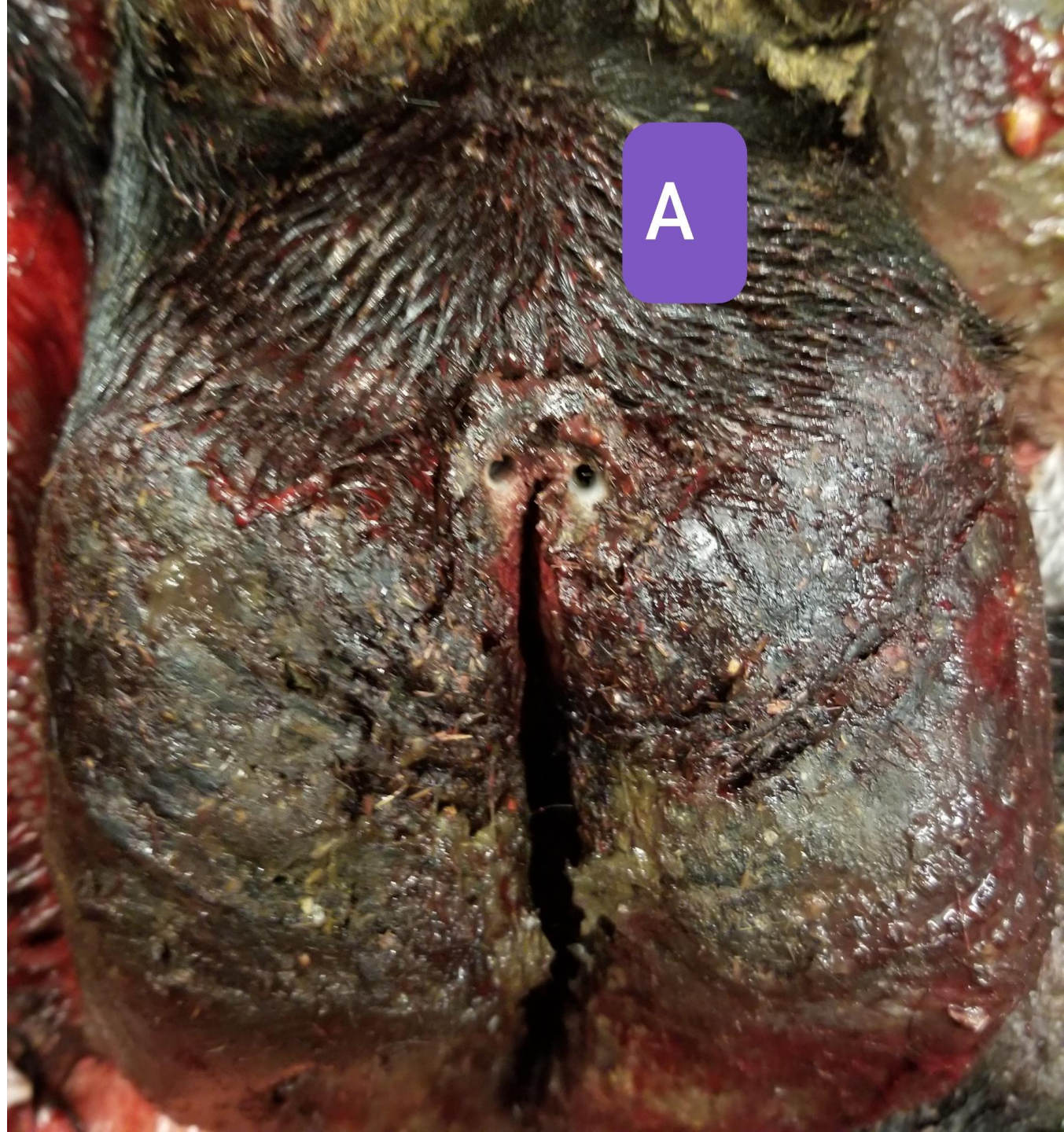
Carroll, IA

Lime Springs, IA



Digital Dermatitis Project

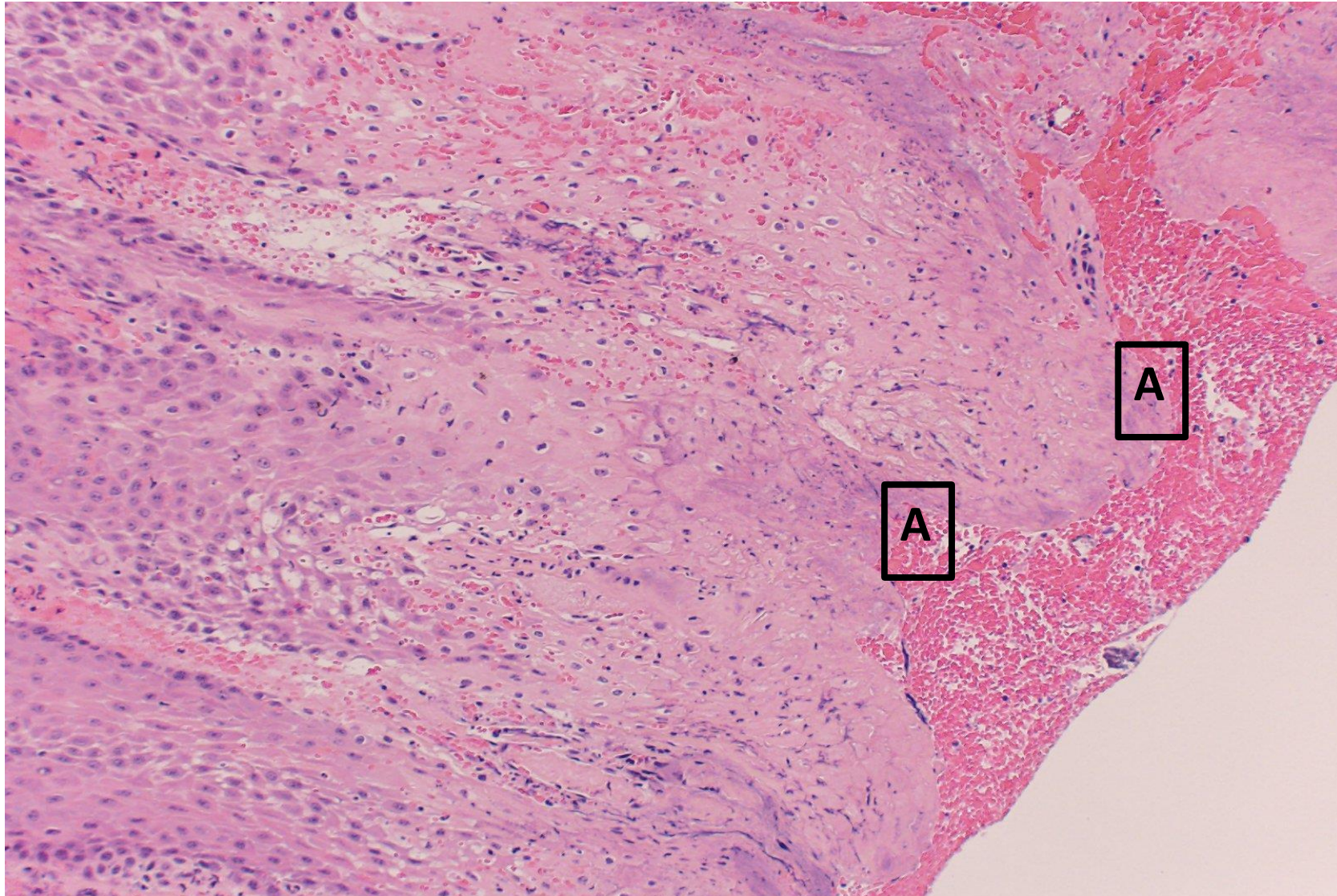




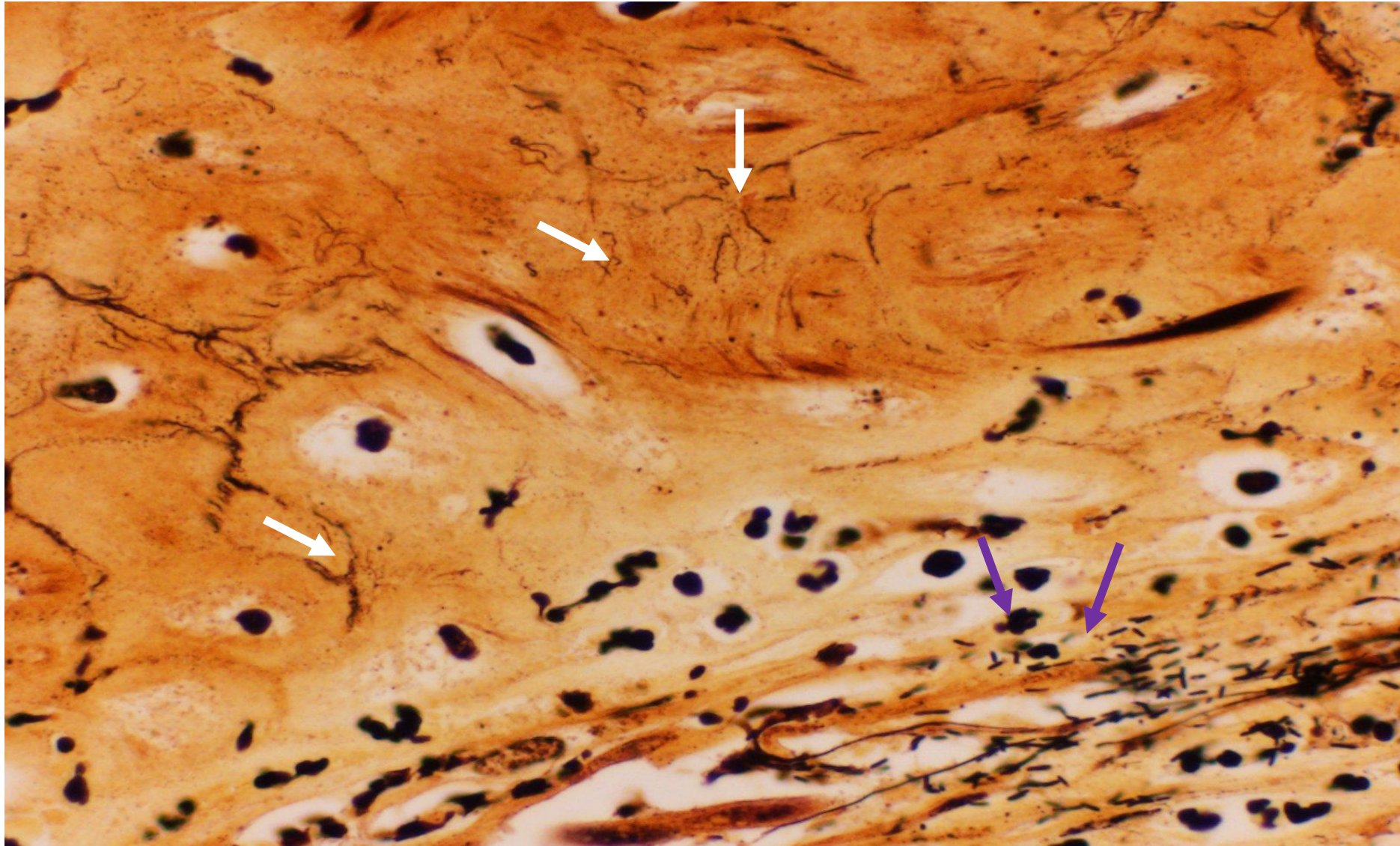
Digital Dermatitis Project



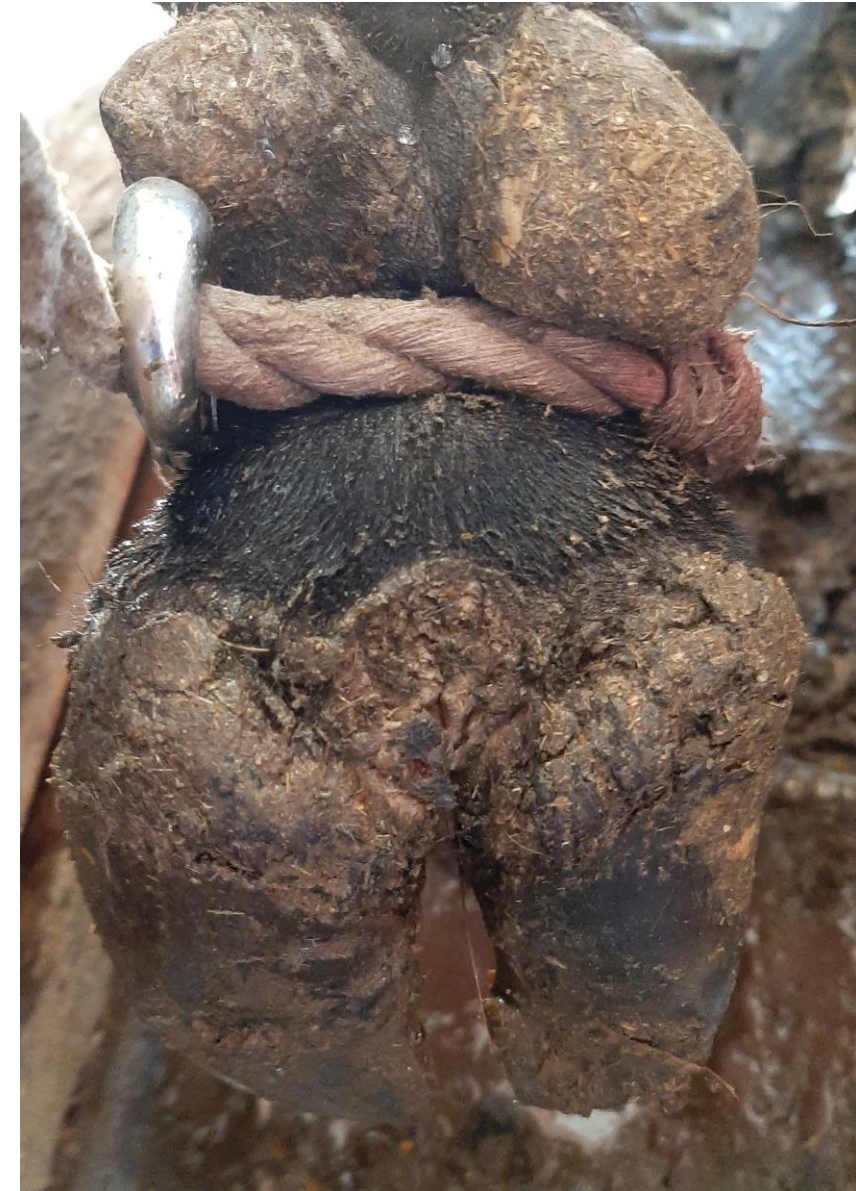
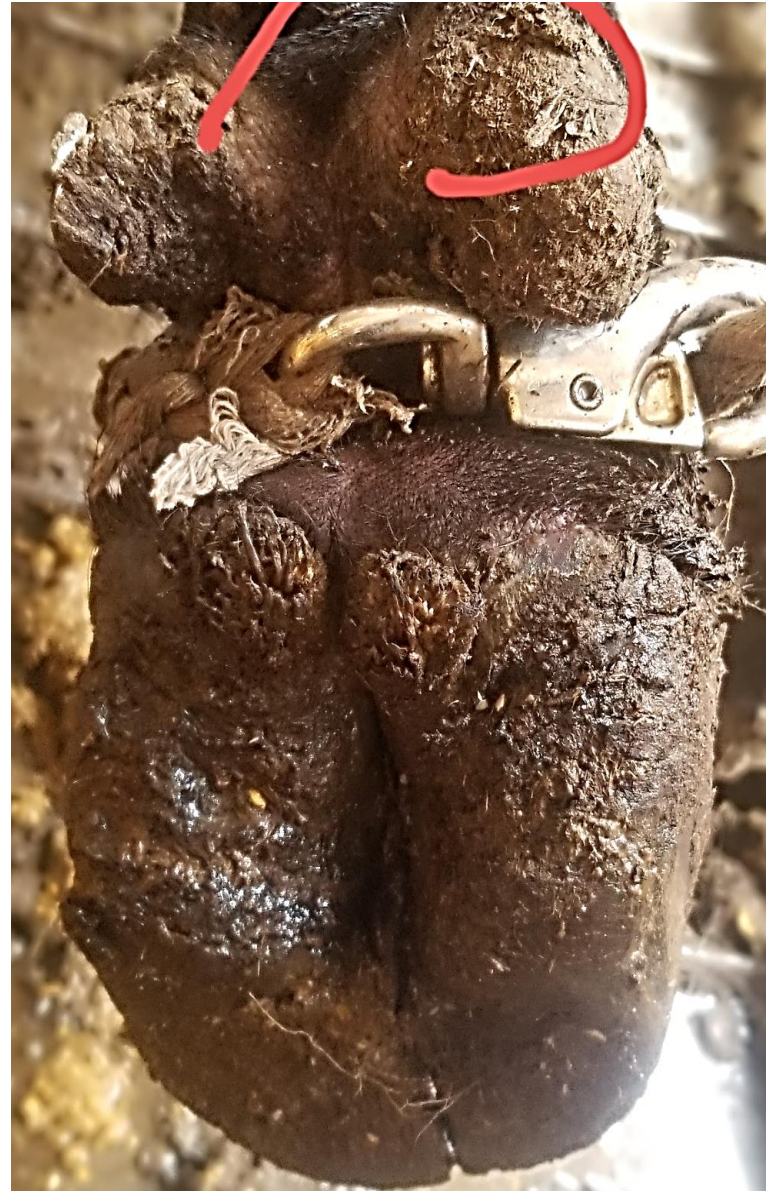
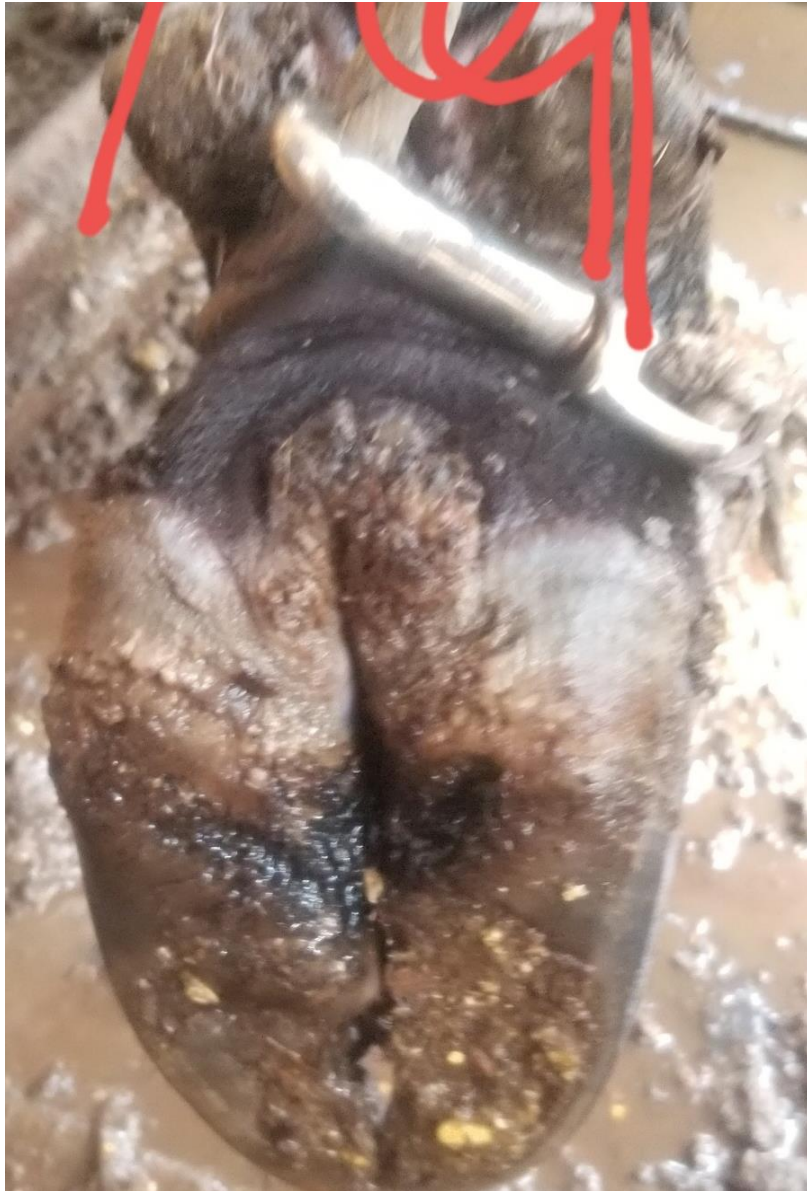
Digital Dermatitis



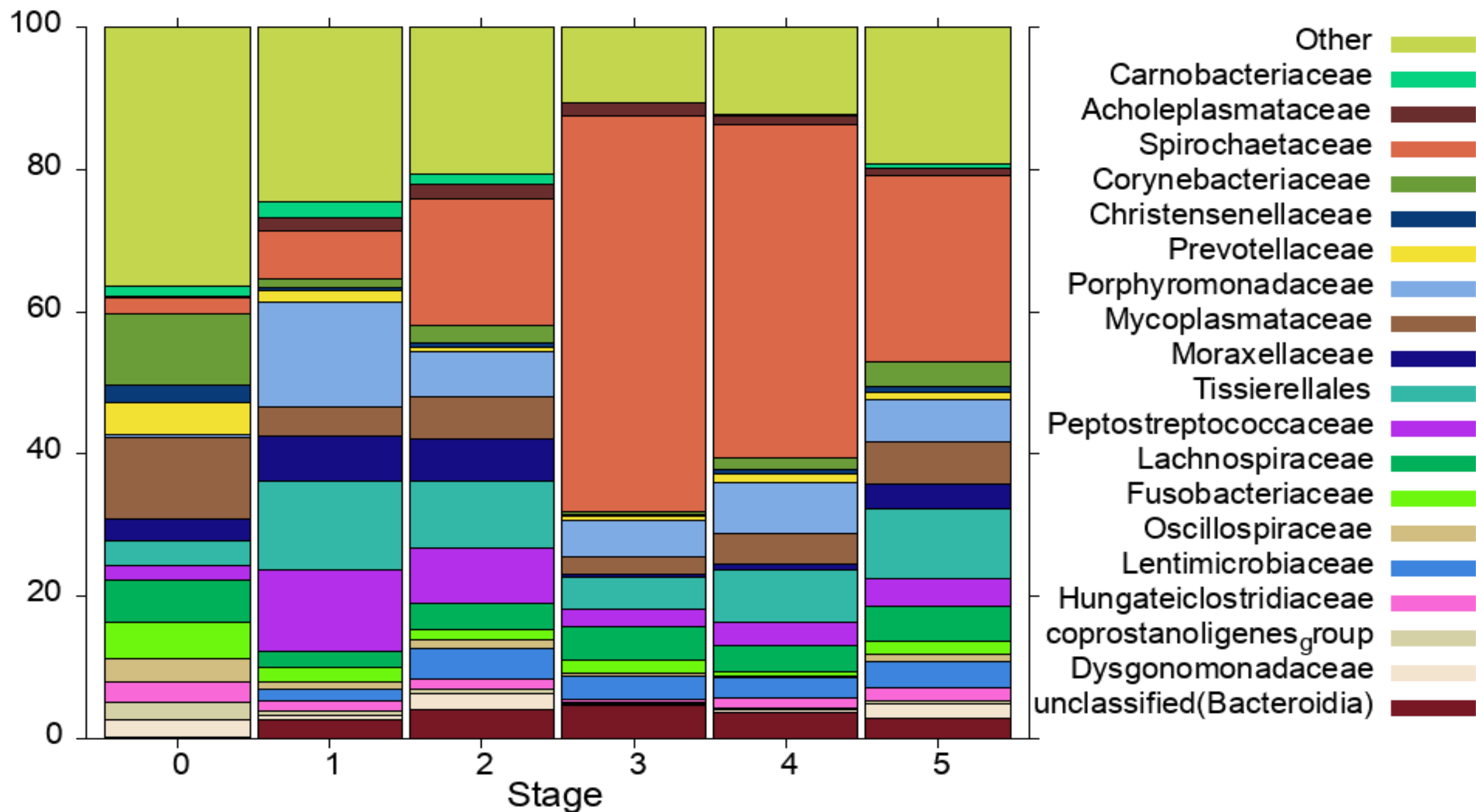
Digital Dermatitis



Digital Dermatitis Project (?)



Relative abundance by stage



Digital Dermatitis Ruminations?

- Bacterial profiles show great similarity in feedlot vs. dairy lesions
- “Three legged stool” in terms of future intervention strategies
 1. Better understanding of how organism survives in the environment(s)?
 - indoor cattle vs. outdoor cattle
 - potential to adopt technology from poultry industry for bedding packs
 2. Animal factors that affect lesion development?
 - prior to arrival and after arrival
 - what is the cause of the initial insult to the skin?
 - a) most bacteria don't penetrate normal skin (*Treponema sp.*)
 - b) *Dichelobacter nodosus*
 - c) real efficacy of mats in confinement barns?

Digital Dermatitis

- “Three legged stool” in terms of future intervention strategies (cont.)

3. Better options for treatment besides footbaths?

- potential vaccine development
 - a) cost comparison with footbath
 - b) cost of vaccine + number of doses
 - c) selection of bacteria or combination of bacteria
- immunostimulant or improved foot health (bacterial resistance?)
- program economics

