

Built To Last

*Effects of Varying Heifer Rearing
Systems on Hoof Health*

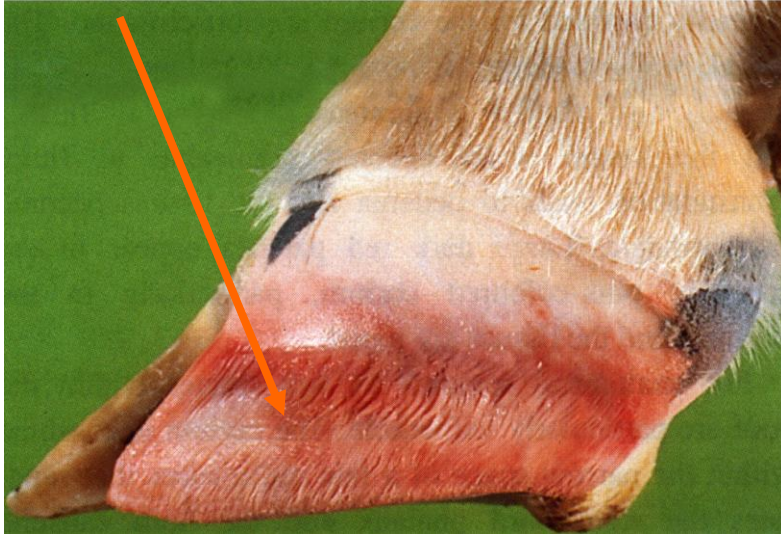
Travis Busman

Wall Horn is the Strongest, Most Dense Horn



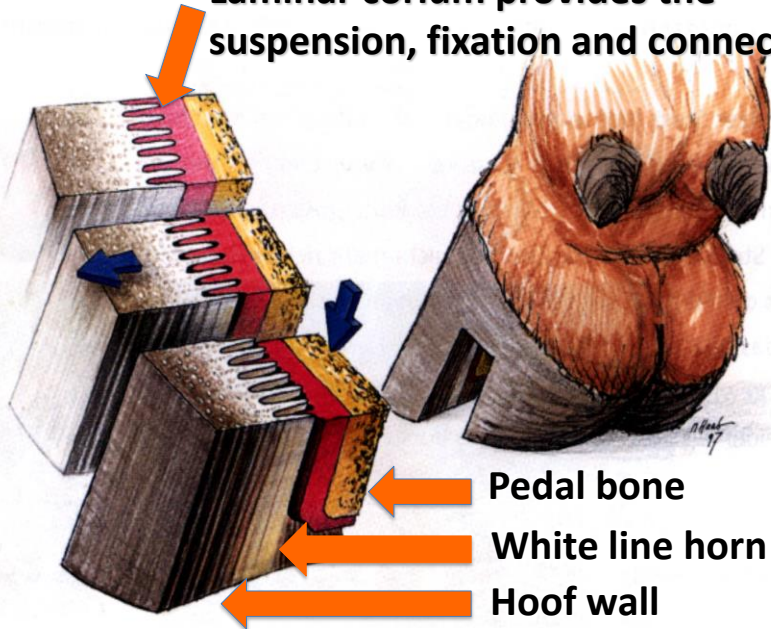
Copyright © 2018 Dairyland Hoof Care
Institute, Inc. All rights reserved.

1,356 Laminar corium folds



Copyright © 2018 Dairyland Hoof Care
Institute, Inc. All rights reserved.

**Laminar corium provides the
suspension, fixation and connection**



Pedal bone

White line horn

Hoof wall

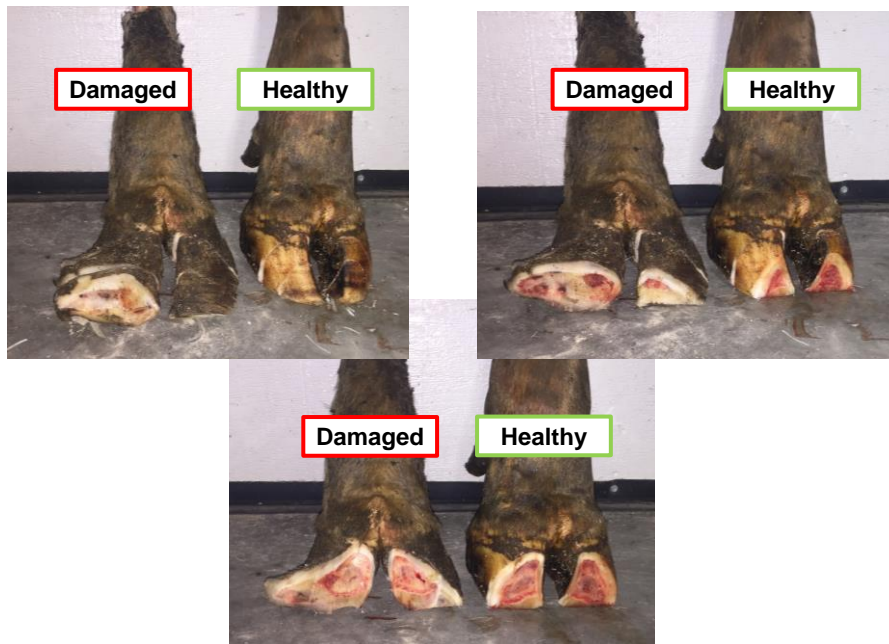
Copyright © 2018 Dairyland Hoof Care
Institute, Inc. All rights reserved.

Wall Horn = Weight Bearing



Tight Fixation

Copyright © 2018 Dairyland Hoof Care Institute, Inc. All rights reserved.



Copyright © 2018 Dairyland Hoof Care Institute, Inc. All rights reserved.

Yielding Surface Vs. Non-Yielding Surface with Sand Bedding

Yielding Surface



Non-Yielding Surface, Sand



Raising Heifers on Sand

- ◆ *Can we raise heifers in sand bedded freestalls from 5 months of age and maintain a high level of hoof health?*
- ◆ *If so, when are they prepared for that environment?*

Raising Heifers on Sand

- ◆ *Can we raise heifers on sand bedded freestalls and maintain a high level of hoof health?*
- ◆ *If so, when are they prepared for that environment?*

◆ **GREAT QUESTIONS!!!!**

Measuring Toe Triangles



Comparison of Toe Triangle Widths

Yielding	Non-Yielding - Sand
<ul style="list-style-type: none"> • Lateral Claw <ul style="list-style-type: none"> • 42.8mm • Medial Claw <ul style="list-style-type: none"> • 41.2mm 	<ul style="list-style-type: none"> • Lateral Claw <ul style="list-style-type: none"> • 51.0mm • Medial Claw <ul style="list-style-type: none"> • 56.2mm

Dramatic increase in claw width at the toe triangle while the bone narrows weakening the suspensory mechanism!

Bone Spurs

- ◆ Wider claws have narrowed coffin bones
- ◆ Compromised suspensory mechanism
- ◆ Bone spurs around the coffin joint limit mobility and causes pain



Coffin Joint Bone Spurs

- ◆ Inflammation surrounding the coffin joint observed
- ◆ Easily palpated

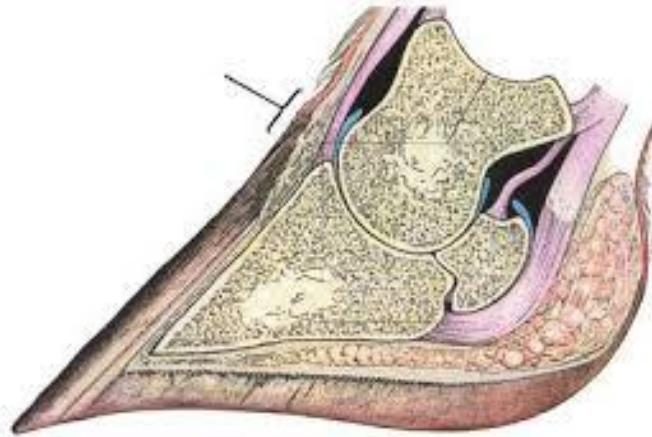


Resulting Horn Growth

- ◆ Convex plantar surface heel to toe as a result of limited mobility in the coffin joint
- ◆ Concave dorsal wall due to lack of mobility in the coffin joint



The *Inside* Story



Newborn Anatomy

- ◆ No fusion present at birth
- ◆ Less dense



13 Month Old Anatomy

- ◆ Fusion present in P1 and P2 at 13 months
- ◆ No fusion present in metatarsus
- ◆ Increased bone density



Mature Anatomy

- ◆ Fusion present P1, P2, and metatarsus
- ◆ Even more increase in bone density



Bone Spurs at Coffin Joint

Normal



Diseased



Bone Spurs at Coffin Joint

Normal



Diseased



Bone Spurs at Coffin Joint

Normal



Diseased



Bone Spurs at Coffin Joint



Convex Plantar Surface

Diseased



Healthy



Inflammation Causes

- ◆ Overcrowding
- ◆ Limit Feeding
- ◆ Headlocks/Excessive Pushing
- ◆ Sand Bedding Resulting in Thin Soles in Younger Heifers
- ◆ Digital Dermatitis
- ◆ Health Event – Pneumonia, Scours

Yielding Vs. Non-Yielding, Sand Bedded

- | | |
|---|-------------------------------------|
| ◆ Smooth, healthy coffin bones | ◆ Rough, Diseased coffin bones |
| ◆ Symmetrical navicular bones | ◆ Asymmetrical navicular bones |
| ◆ Symmetrical P2's | ◆ Asymmetrical P2's |
| ◆ Sound suspensory apparatus | ◆ Compromised suspensory apparatus |
| ◆ Narrow, Healthy horn capsules | ◆ Widened, Diseased horn capsules |
| ◆ Very low incidence of corkscrew claws | ◆ High incidence of corkscrew claws |

Raising Heifers on Sand

- ◆ *Can we raise heifers on sand bedded freestalls and maintain a high level of hoof health?*
- ◆ *If so, when are they prepared for that environment?*
- Thin soles/Toe ulcers observed in 6 month old heifers
- Not prior to 13 months of age
- Limit pen size/create dead-end alleys
- Minimize other risk factors

Conclusion

- ◆ Damage to the coffin bone is *irreversible!*
- ◆ Damage to the coffin bone is caused by inflammation
- ◆ Diseased coffin bones **will** result in a higher incidence of lameness
- ◆ Corkscrew claws *always* have diseased coffin bones
- ◆ We **cannot** maximize the potential longevity of our cows with compromised coffin bones

Conclusion

*Hoof Health
MUST begin at
Day 1*

Thank you!!!