Guidelines for selecting good feet and structure

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Introduction

• Lameness is a very important economic problem in all sectors of cattle industry

• According to a study by USDA* (NAHMS)

  – Direct effects of lameness account for 15% of culling in US dairy herds

Based on these data, it has been estimated that the indirect effects of lameness on production and reproduction could account for an additional 49.1% of culling in US herds

Lameness in Feedlot Cattle

- Records on 1,843,652 animals in 5 large western feedlots
  - Lameness - 16% of health problems (5% of deaths)
  - Lame cattle accounted for 70% of all sales of non-performing cattle
  - Price of salvaged cattle was only 53% of original purchase price
  - On average, salvaged cattle left 85 days after arrival; and on average, weighed only 10 pounds more than their in-weight

Lameness in Cow/Calf Operations

• Economic impact because of:
  – Value of individual breeding animals
  – Reproductive loss
    – Extended intervals from calving to first service/conception
    – More services per pregnancy
    – 8.4 times more likely to be culled
    – May take a mature bull up to 2 months to regain normal fertility after a lameness event
      » Do breeding soundness following lameness
Lameness in Cow/Calf Operations

- Economic impact because of:
- Lameness treatment/labor cost
  - Lesion dependent $150 - $800
  - Surgical costs septic joint - $1200 – 2000
Lameness incidence

• Medical records UTCVM
  – 1600 cases presented from East Tennessee
  • Black Angus predominant breed
Awareness of the problem:
Quotes from Ranchers.net’s “Bull Session”

• Lets just say time spent kicking straw away and walking some bulls out might be time well spent...........
• Are you guys telling me that some Angus have got bad feet..........
• Unfortunately it is more than some – but deep straw at bull sales seems to correct the defect.
Guidelines for selecting good feet

• Make sure you can see/pay attention to the feet
  – Standing & walking hard surface
    • May show subtle lameness
    • Walk strong, easy, flat back
  – Not recently trimmed
  – Look more critically at young animals
Methods to judge for good feet

• Visual scoring based on conformation
• Objective scoring system expressed in precise units
  – Breed selection based on claw measurements that are suitable to increase longevity of offspring
    • Toe angle
    • Claw size/volume
    • Leg angle side view
• Combination of both
Conformation

- **Claw size (heritable)**
  - Look at claw size in relation to body size
  - Should provide large and stable bearing surface
    - Ability to act as shock absorber dependent on size.
    - Larger size better able to dissipate weight bearing forces
      - Reduce lameness risk.
**Claw size**

- Top and bottom claw width good prediction for claw size
  - Should not narrow down from the width across the coronary band to the toe
- Toe length correlates with width

1600 pound Angus bull: Front claw top width 2.75” Bottom width 2.5” Toe length 2.75”
Rear claw top width 2.75” Bottom width 2.75” Toe length 2.75”
Conformation

- Front claws
  - Claw size equal; 54% total claw volume
  - Balanced weight bearing between claws
Conformation

• Rear claws.
  – Outer claw consistently larger and wider than inside claw
  – Naturally bears more weight relative to inside claw
    • overgrowth resulting in > concussion - lameness
    • 90% lameness in outer claw rear leg
Conformation

• Toe angle & heel height (genetic)
  • Steep toe angle
  • Good heel height
Conformation

• Toe angle
  • Genetic correlation between sole lesions and toe angle
  • Toe angles (50 – 60°) positively correlated with increased survival
    – Bulls siring steeper foot angle have daughters that live longer
  • Toe angle more correlated with longevity than leg traits
Conformation/ shape

• Toe angle
  – Correlation between toe angle and toe length and heel height
  – Shallow angle – longer toe – low heels
    • Shifts weight bearing towards the heel
    • Associated with more sole ulcers
Conformation

• Straight walls and toe
Conformation

• Angle of outside wall
  – Should be perpendicular with bearing surface
  – Inward curvature of the outside wall and rotation at the toe - screw claw
Screw Claw conformation

• Outside wall displaces sole weight bearing
Causes of screw claw

• Multifactorial problem
  • Heritable
    - Autosomal recessive
Heritable Screw claw.

Abnormal angle between the bones in the foot causing curvature of the outside wall and rotation of the toe.
Heritable Screw claw

• Diagnosis
  – Family history
  – Young age
  – Outer claw of rear leg
  – Typical signs
    • Toe rotation
    • Curvature of outside wall
  – Absence of laminitis
Acquired screw claw

• Multifactorial problem
  – Weight bearing
  – Laminitis
    • High grain
  – Management
    • Confinement
    • Concrete
Acquired screw claw

- What is generally regarded as heritable screw claw is highly correlated with laminitis
Screw claw

- Heritable
  - Genetic factors

- Acquired
  - Nutrition; Weight bearing; concrete

Lameness
Laminitis.
Damage of the horn producing tissues causes horizontal and vertical cracks and grooves
Methods to judge for good feet

• Visual scoring
  – Australian BeefClass Structural Assessment
    • Used for genetic analysis of structural traits, to predict the structure of an animal’s progeny
    • Front feet claw set, hind feet claw set, front feet angle, rear feet angle, rear leg side view, rear leg hind view.

Score 1 Splayed toes
Score 5 Straight wall
Score 9 Toe rotation/curve
Methods to judge for good feet

• A score of 5: Ideal

• Score 4 and 6: Includes most animals and would be acceptable in any breeding program

• Score 3 and 7: Acceptable in most commercial breeding programs. Seed stock producers should be wary.

• Score 2 and 8: Should be looked at closely before purchasing

• Score 1 and 9: Considered culls.
Conformation

• Upper leg traits (McDaniel; Distl)
  – Heritability high enough to achieve genetic response

• Hocks
  – Hock angle viewed from side
    • Post hocks
    • Function poorly in absorbing mechanical stresses of weight bearing – predispose to degenerative joint disease (arthritis)
    • Hock angle should be slightly straight but less than 175°
Graph 1. Relationship between phenotypic score for rear legs set and least square solutions for culling rate before starting the 3rd lactation in Dutch Black & White cows.
Lameness in Cow/Calf Operations

• NCBA National Market Cow and Bull Quality Audit on Slaughtered Cattle\(^1\)
  – 7.37% of cattle had at least 1 arthritic joint
  – 3.97% of cattle had 2 arthritic joints


Normal claw conformation

- Wide bearing surface
- Toe angle 50 – 60°
- Toe length short 3”
- Straight wall at the toe
- No rotation at the toe
- Straight side wall
- Good heel height 1.5 inches
- Absence of obvious grooves on wall
- Narrow interdigital space
Legs and feet scoring system

• Claw quality scoring based on visual as well as claw measurements
  – Toe length 3”
  – Claw angle 50 -60°
  – Claw size Wide top & bottom
  – Side wall angle - straight

• Overall score for feet and legs
  – Rear legs set side view
  – Locomotion
  – Stride
  – Bones and joints
General considerations regarding lameness

• Lame animals bring very little money
• Immediate attention required. Claw lesions can deteriorate quickly and critical structures such as tendons and joints can become involved
• Most problems DO NOT respond to antibiotics except foot rot in which case you should have improvement within 3 days