

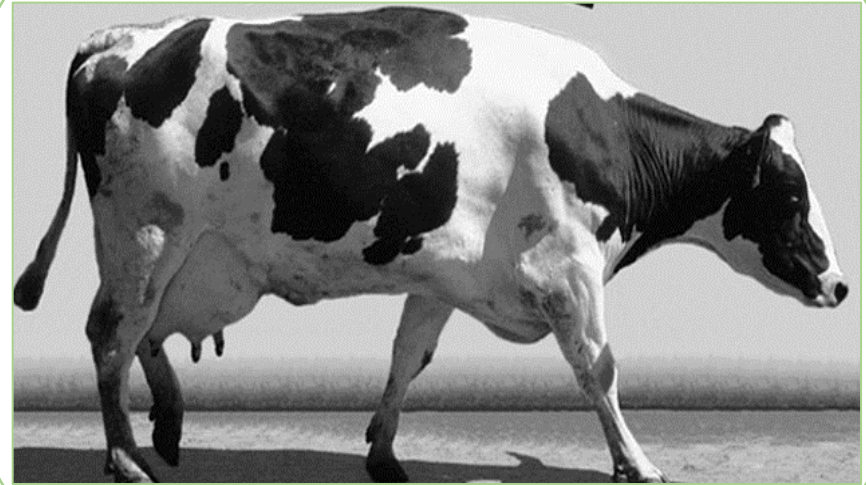
SCORING LOCOMOTION AND HOOF CONDITION (Level 1)

| Topic | Training & information Content |
|-------|---|
| 3.1 | Estimating feeding value of fodder & feed on dairy farms |
| 3.2 | Sampling feeds & forages/analysis interpretation |
| 3.3 | Estimating Dry Matter intake for various breeds/age categories of dairy cattle in the tropics |
| 3.4 | Reviewing feed intake, rumen fill, Body Condition Scoring (BCS) |
| 3.5 | Life weight estimation of cows |
| 3.6 | Rumen fermentation |
| 3.7 | Mineral & vitamin requirement, guidelines |
| 3.8 | Manure scoring and evaluation |
| 3.9 | Guidelines for ration calculations for various breeds, heifers, lactation stage (Rumen8) |
| 3.10 | Use of Rumen8 software for ration calculation |
| 3.11 | Optimization of ration with Rumen8 |
| 3.12 | Feeding management guidelines |
| 3.13 | Feeding management of dry cows/close-up |
| 3.14 | Feeding systems |
| 3.15 | Metabolic disorders |
| 3.16 | Scoring locomotion and hoof condition |
| 3.17 | Mycotoxin in dairy cattle nutrition |
| 3.18 | Heat stress in dairy cattle nutrition |
| 3.19 | Monitoring feeding management, using KPIs (based on Rumen8) |



1. You will learn about (learning objectives):

- How to score locomotion in cows.
- Hoof conditions in cows and prevention measures.
- Diseases that affect hoof and locomotion.



2. Introduction

- The performance and production of a dairy cow is best if she is healthy and comfortable.
- An important feature of cows' health is their legs and feet. A dairy cow should be able to walk without any problems.



Cows walking in normally

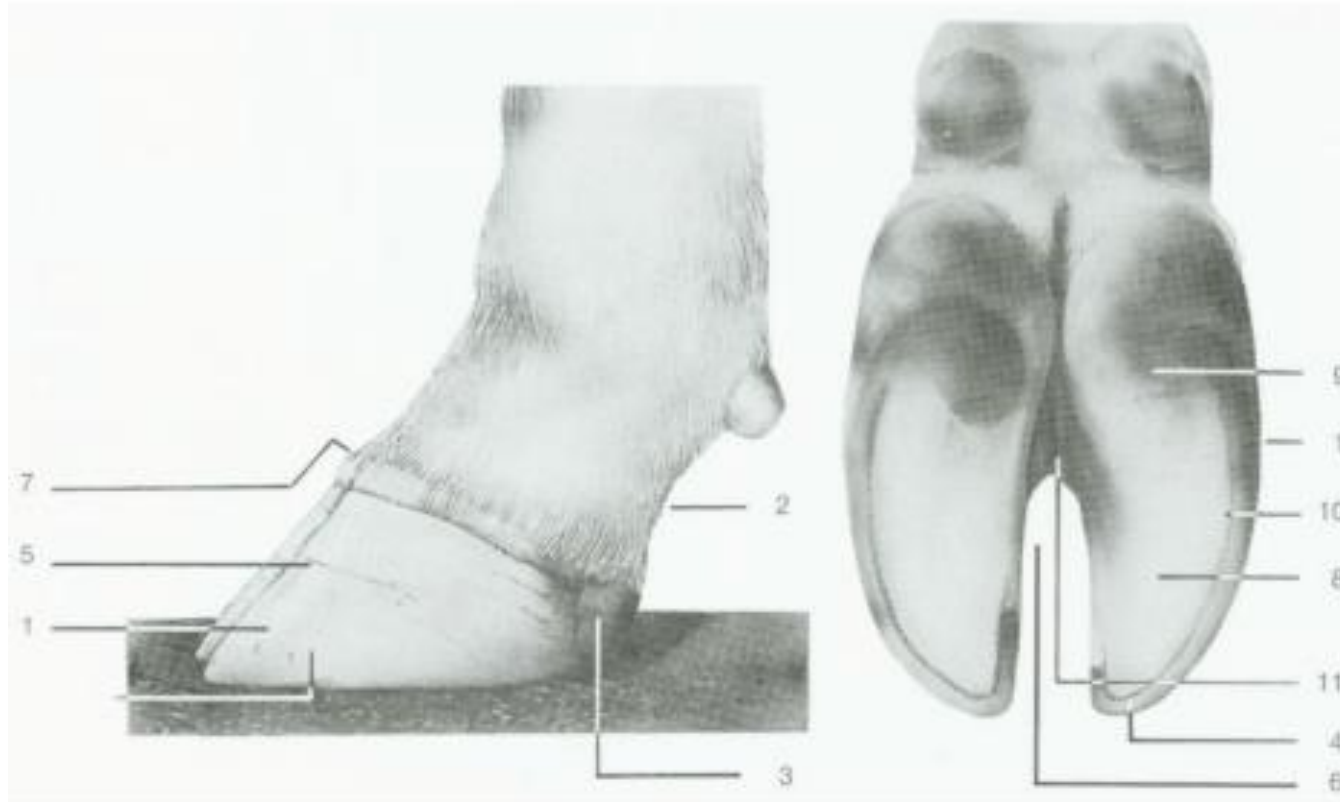


2.1 Introduction Cont'd...

- A locomotion (or lameness) score provides a five point system for assessing the ease with which cows can walk over a level surface. The scores vary from normal to severely lame.
- The hoof score describes the degree of inflammation and infection of the hoof.



3. Parts of a Cow's foot

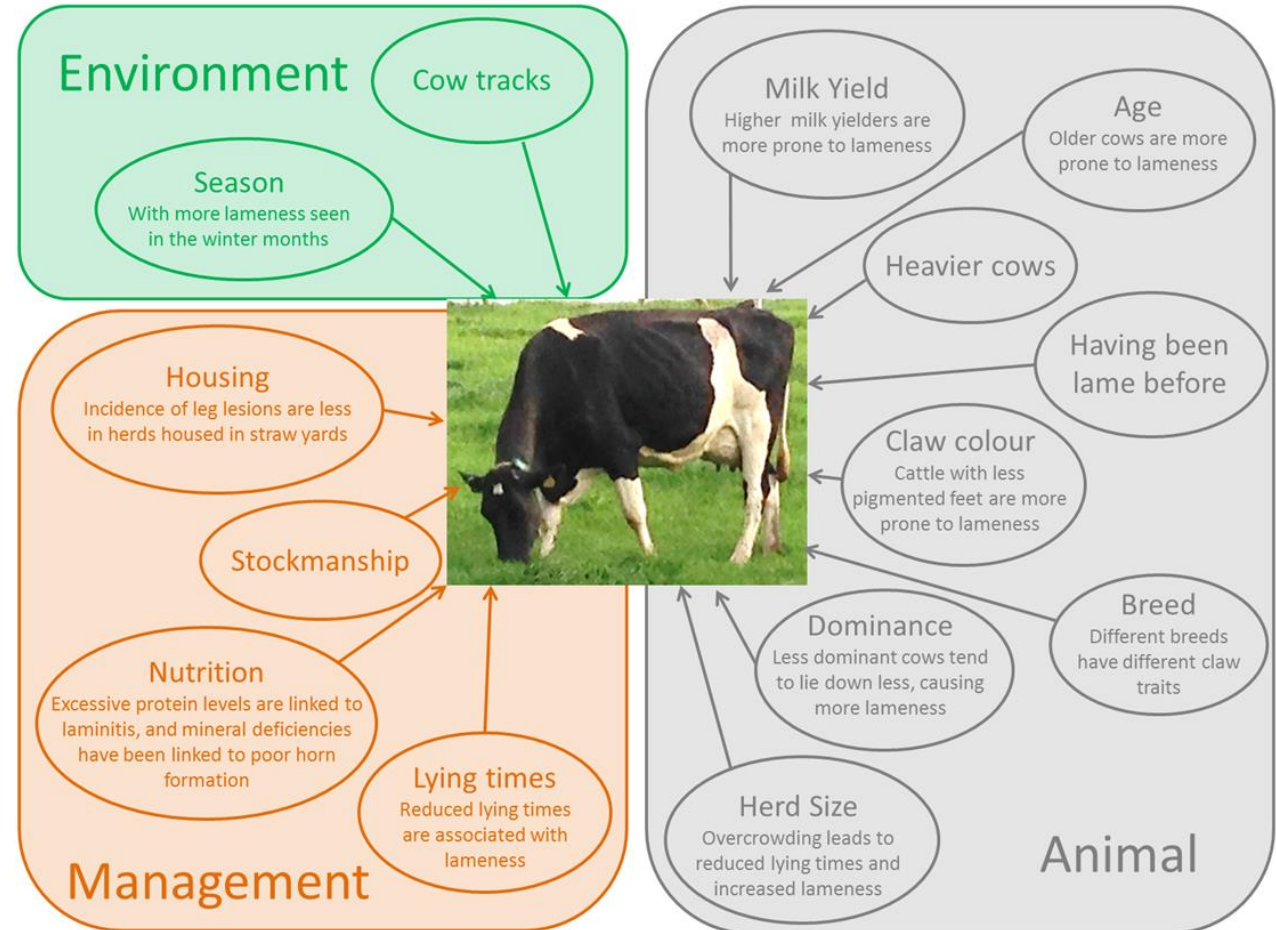


1. The horny wall of the claw
2. The pastern
3. The heel or bulb
4. The weight-bearing border of the wall
5. Growth rings
6. The interdigital space
7. The coronet
8. The sole; if the claw is healthy, the thickness is 5 -7 mm.

9. The soler part of the heel; the weight-bearing part of the heel.
10. The white line; the horny connection between the weight-bearing border and the sole.
11. The interdigital skin.

4. Lameness

- Lameness is a common problem in cows and can greatly affect their welfare and productivity.
- Lameness is associated with environmental, management and animal factors/conditions.



5. Environmental factors affecting lameness

- Seasons: Lameness risks are greater in wet season than in dry season.
- During wet (weather) seasons, conditions in cow barns are conducive for maintaining high bacterial levels.
- Lameness in grazing cattle tends to increase about three weeks after heavy rainfall.

Wet conditions in the fields



Wet conditions in the barns

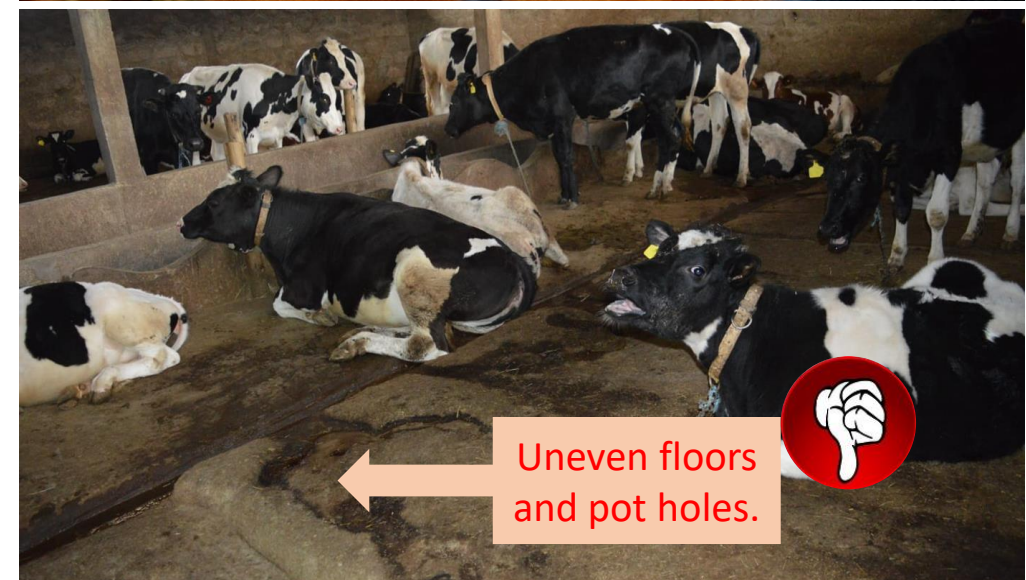


6. Management and housing factors affecting lameness

- Manure management and prevention of prolonged contact between feet and slurry are preventive measures in control of lameness.
- **Overcrowding**, especially of first calved heifers, reduces resting time, increasing lameness cases.
- **Housing:** Cubicle lying surface can affect lameness;
 - The overall incidence of lesions is lower in straw yards than in cubicles with concrete yards.
 - Sand bedded cubicles are associated with less incidences of lameness.



Cows in sand bedded cubicles



7. Feeding practices affecting lameness

- Feeding errors and deficiencies of certain nutrients can be a key factor in foot problems.
- The risk period is from the last week before calving to the first weeks after calving. Heifers are particularly vulnerable.
- Shortage of vitamins, minerals (copper and zinc) and trace elements can lead to reduced hoof and horn quality.
- Sudden changes from a low plane of energy pre-calving to high plane after calving may predispose cows to lameness.



8. Animal factors affecting lameness

- Breed and genetic characteristics influences lameness:
 - Heavier cows are more prone to clinical lameness.
 - Age: very old cows and younger heifers are more prone to lameness.
- Many foot lesions are also related to the early post-calving period.



Resting: Increased standing time may lead to foot lesions and lameness

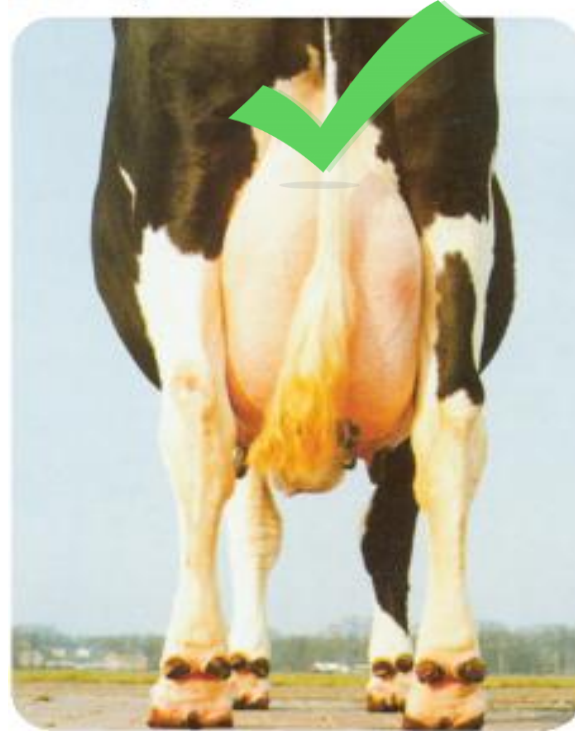


Jersey cattle are generally smaller breeds

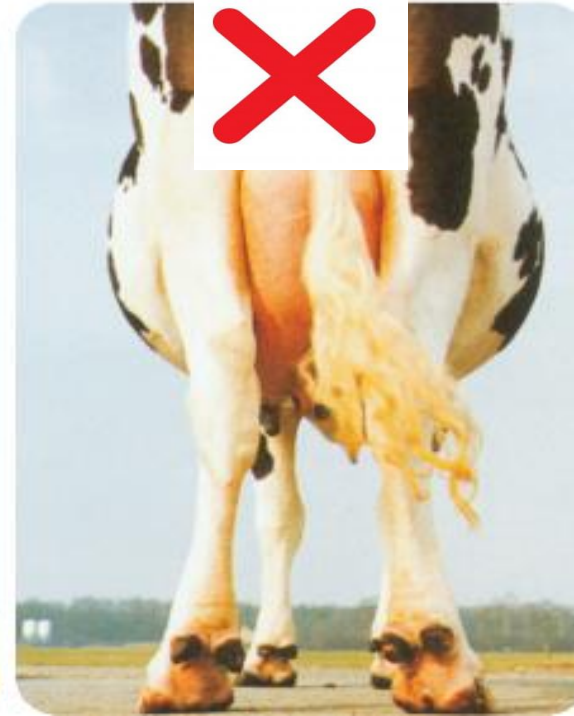
9. Weight bearing on hooves

- Cow's feet are made to bear their weight to ensure good mobility.
- The weight should be equally distributed.

Correct weight bearing



Incorrect weight bearing due to overgrowth of the outer claw



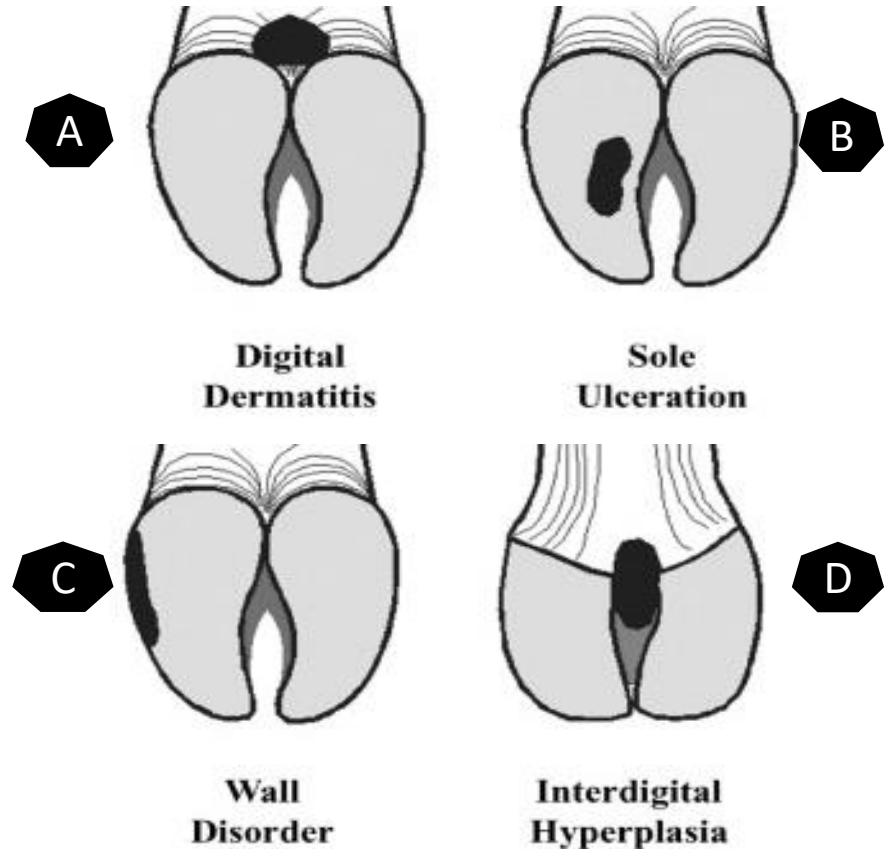
10. Other factors causing lameness

- After calving a cow with milk fever condition is not able to stand and walk. If treated early lameness can be avoided.
- Foot and mouth disease(s).
- Injuries resulting to pelvic dislocation.
- Injuries on the hooves such as cuts.
- Calves born with disabilities are considered lame.



11. Diseases associated with lameness

- Lameness can be caused by abnormal change on the hooves or feet; for example:
 - i. Hard and soft feet
 - ii. Foot rot
 - iii. Heel erosions (C)
 - iv. Laminitis
 - v. Sole ulcers (B)
 - vi. Digital dermatitis (A)
 - vii. Interdigital dermatitis (D)
 - viii. Hock and feet injuries



12. Hard and soft feet and Foot rot

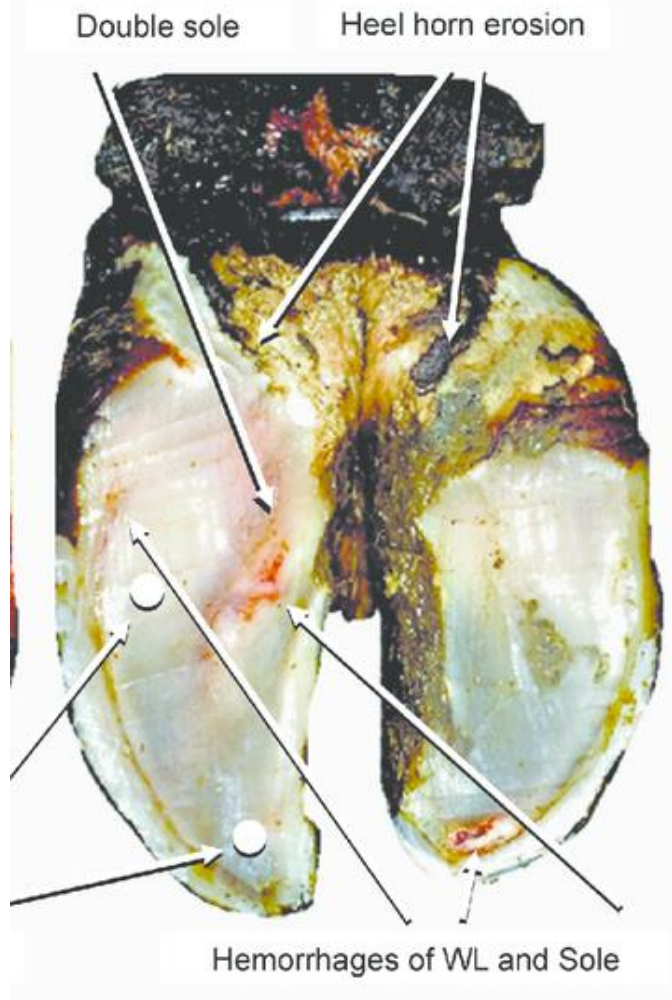


Hard and soft feet: Foot infections, abscesses or sole ulcers may stem from cracks that result when feet are too soft or hard.



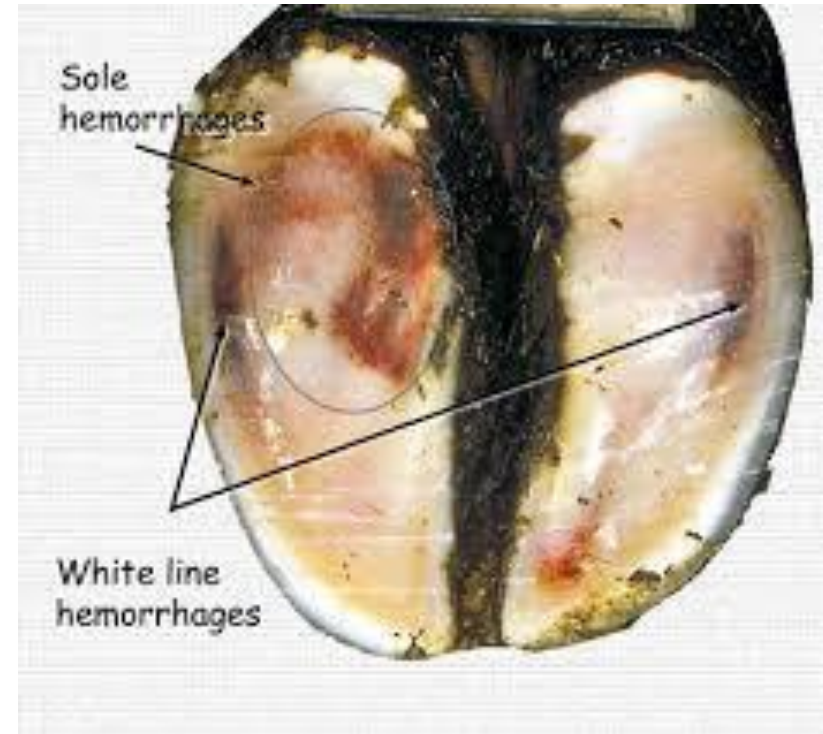
Foot rot: A smelly infection of the foot, which generally occurs high between the claws or toes. It is an infection caused by bacteria from barns, exercise lots, mud-holes and pastures.

13. Heel erosions and Laminitis



Heel erosion: Is a condition usually seen in confined cows in wet, dirty barns.

Overgrown hooves shifts weight towards the heels exposing them to erosion, mostly in the hind claws.



Laminitis: Can result in long, overgrown and deformed feet or toes. May occur when foreign materials enter places where the wall and sole have separated. Highest incidences occur in the first 100 days postpartum.

14. Sole ulcers

- Sole ulcers are raw sores usually occurring on the inner side of the outside claw.
- Factors that can predispose cows to sole ulcers include moisture and manure, excessive wear, and poor hoof trimming.



15. Digital dermatitis and Interdigital dermatitis



Digital dermatitis: Lesions look like raised, red and yellow patches and are usually located at the back of the foot above the heel. Lesions are painful and prone to bleeding when manipulated.

Inter digital dermatitis: Is a bacterial inflammation of the interdigital skin and the heel. Wet and smelly inflammation is characteristic of the initial stage of this disease.



16. Hock and leg injuries

- A cow's hocks may have hair loss, ulceration or open sores or swelling.
- Hair loss is the least severe form of hock injury, ulceration and swelling are more severe cases that eventually cause lameness.



17. Hoof scoring

- Hooves should be taken care of and be as normal as possible.
- The diagram on the right shows normal hooves and the ones not acceptable which may cause lameness.

SIDE



Normal

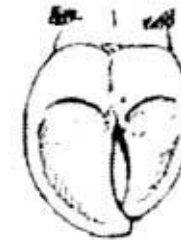


Large outside claw
& long curled toe



Scissor

SOLE

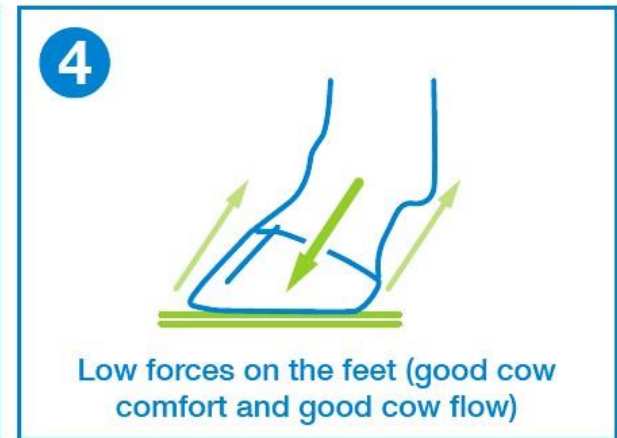
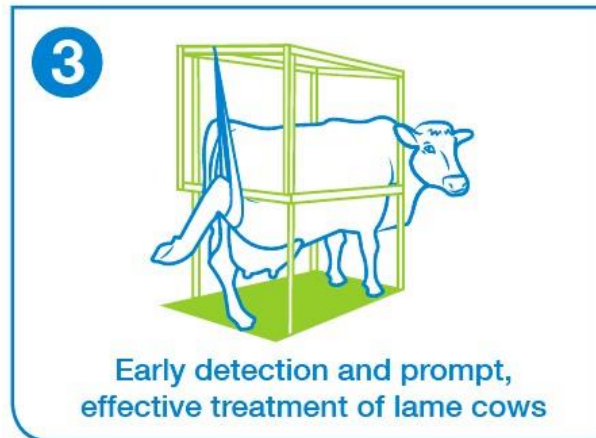
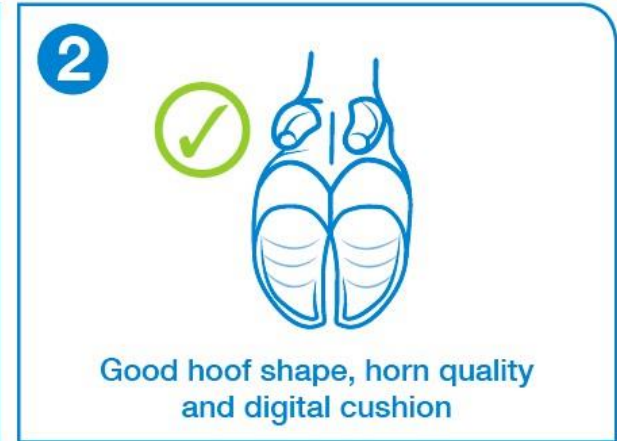
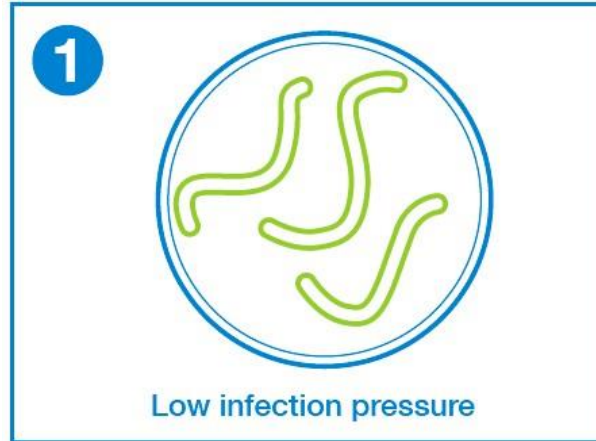


FRONT



18. Hoof and foot management

- Adopt the following as preventive measures to hoof and foot conditions.
 - Good feeding management
 - Hoof trimming (3)
 - Cow barn beddings and floors (4)
 - Footbaths and disinfectant (1)
 - General hygiene of the barn (1)
 - Breeding: Genetics to improve hoof condition(2)



19. Feeding management to prevent hoof issues

- Sufficient fiber in the feed ration, correct fiber to concentration ratio, gradual change in rations are very important for maintaining healthy hooves.
- Reduce drastic change of ration in all stages of cows.
- With a balanced ration and available feeds, cows eat enough in a short time and reduce standing times and increases resting time.



20. Cow barn floors

- Smooth floors are too slippery and the cows can slide and get injured.
- Too rough floors causes hoof erosions and can injure the cow.
- Averagely rough floors, with well drained slopes are good for the cows.



Too rough floor with poor drainage of slurry

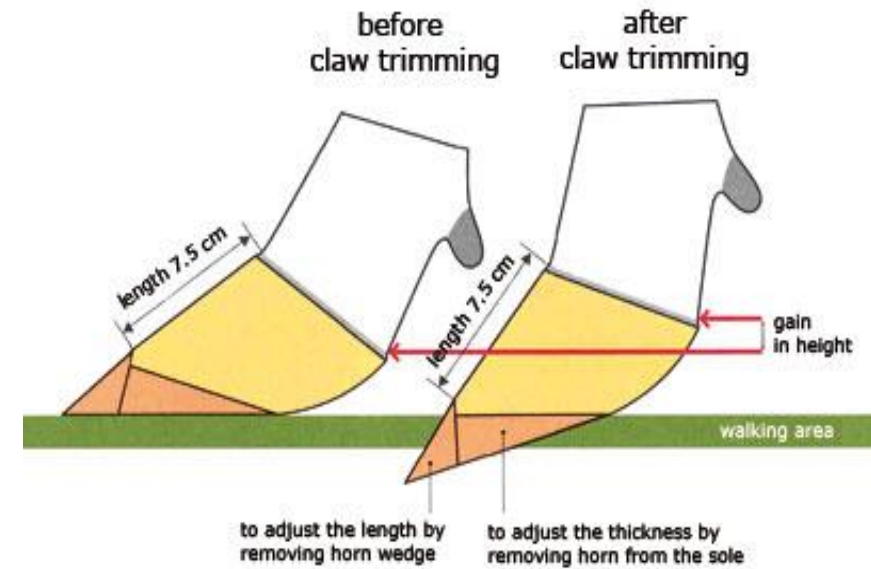
21. Cow barn beddings

- The laying area should be soft and doesn't injure the cow's hocks while lying down.
- Cows prefer laying areas that mimic the natural pastures. This minimizes standing time and reduces pressure on the hooves.
- Different material can be used to make the laying areas more comfortable and avoid injuries. e.g. sand, straws.



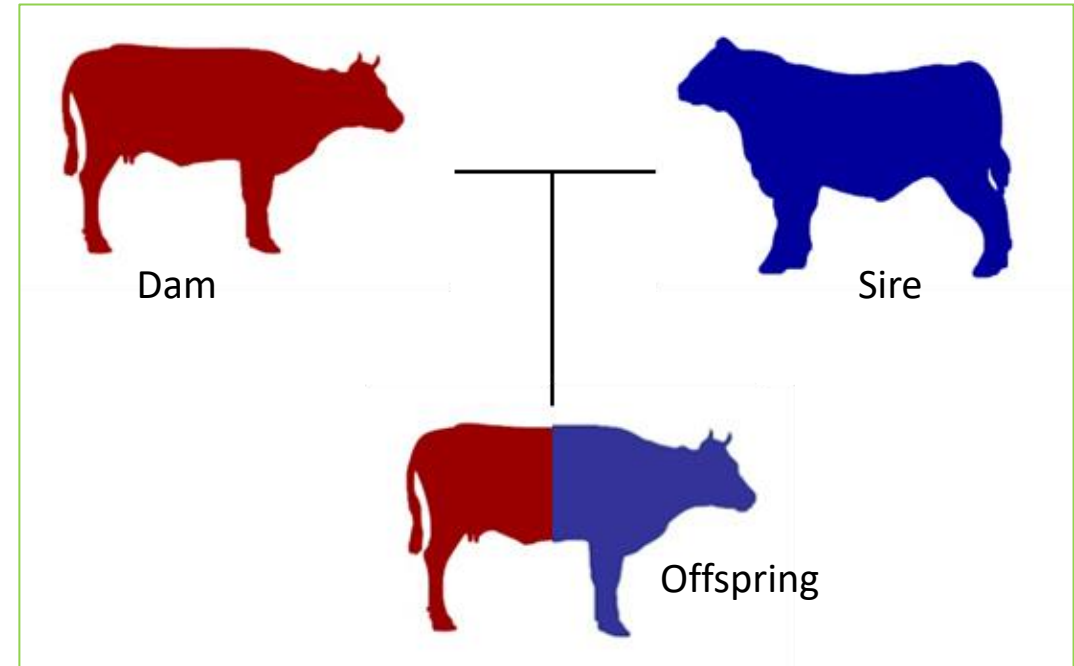
22. Hoof trimming

- Routine hoof trimming and conformation of the foot consistently improves the shape of the foot.



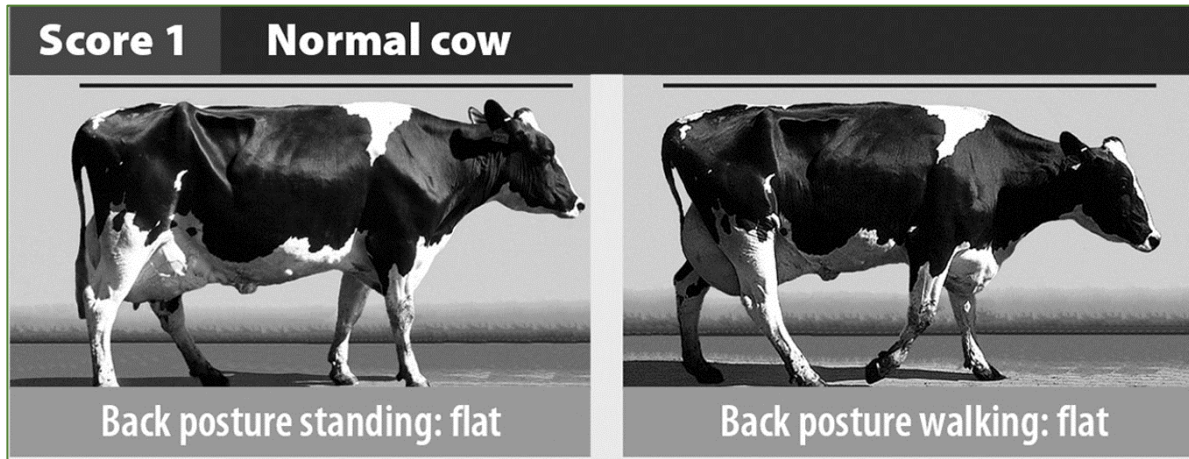
23. Footbaths & disinfectants and Breeding

- **Footbath:** A footbath is only effective if cows actually walk through it.
- The best place for a footbath is after the exit of the milking parlour.



- **Breeding** against poor feet and hooves conditions helps reduce susceptibility to foot diseases.
- Adequate selection for specific traits should be done. Use semen of proven sires that are known for improving the quality of feet and legs, and foot angle.

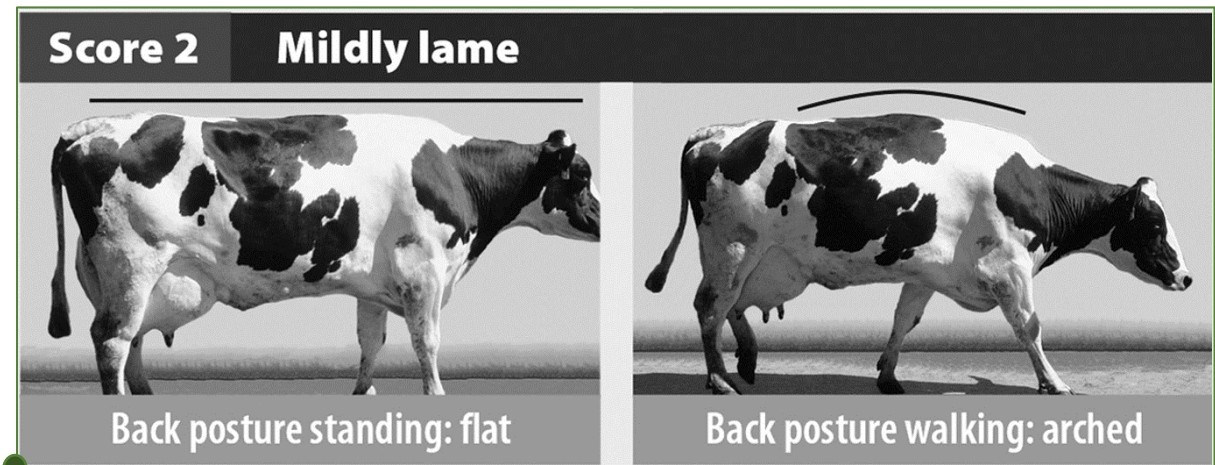
24. Locomotion scoring: Score 1 and 2



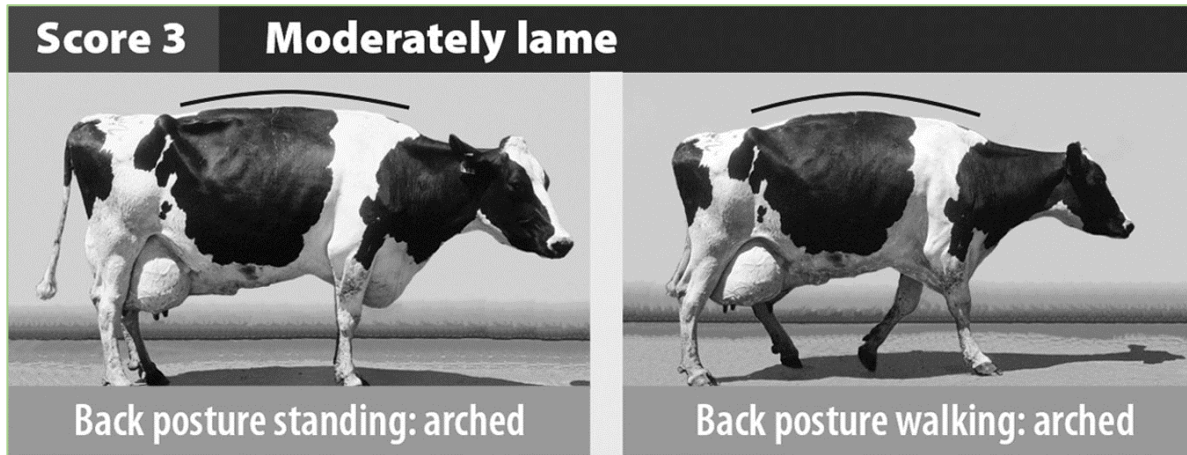
This is normal locomotion. It is characterized by;

- Smooth and fluid movement.
- Cow stands and walks with a level back. All legs bear weight evenly. Joints flex freely.
- Head carriage remains steady as the animal moves. Gait is normal.
- Cows feed intake and milk production levels are not affected.

- Back posture - flat or arch.
- Ability to move freely is not diminished. Cow is mildly lame.
- Cow stands with level back, but arches when walks. All legs bear weight.
- Joints slightly stiff. Head hangs lower and further from her body. Gait is slightly abnormal.
- Cow reduces feed intake by at least 1% of the average feeds it normally consumes per day. The milk production may not be affected.

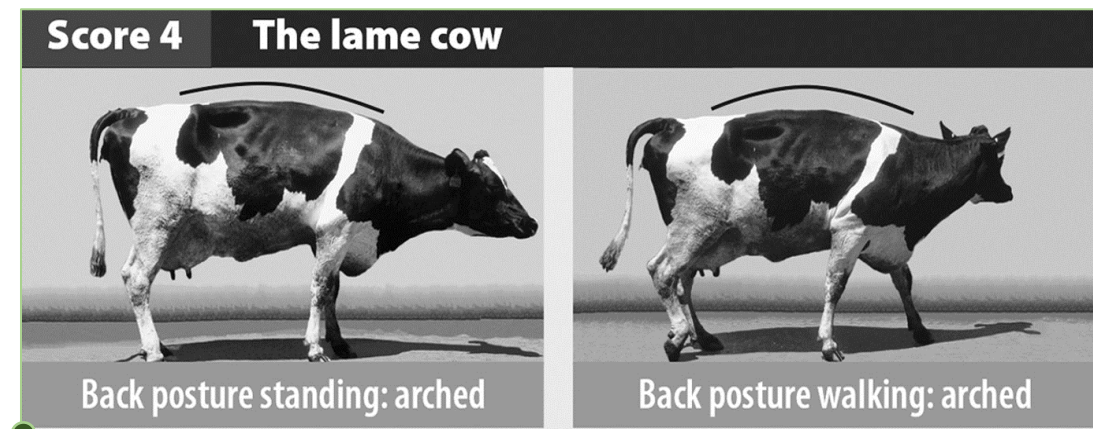


24.1 Locomotion score 3 and 4



- Arched back is always evident and gait is one deliberate step at a time.
- Reluctant to bear weight on at least one limp leg but still uses that limb in locomotion.
- Strides are hesitant and deliberate and joints are stiff.
- Head bobs slightly as animal moves in accordance with sore hoof making contact with the ground.
- Feed intake reduces by at least 7% of the average feeds it normally consumes per day. Milk production declines by 17%.

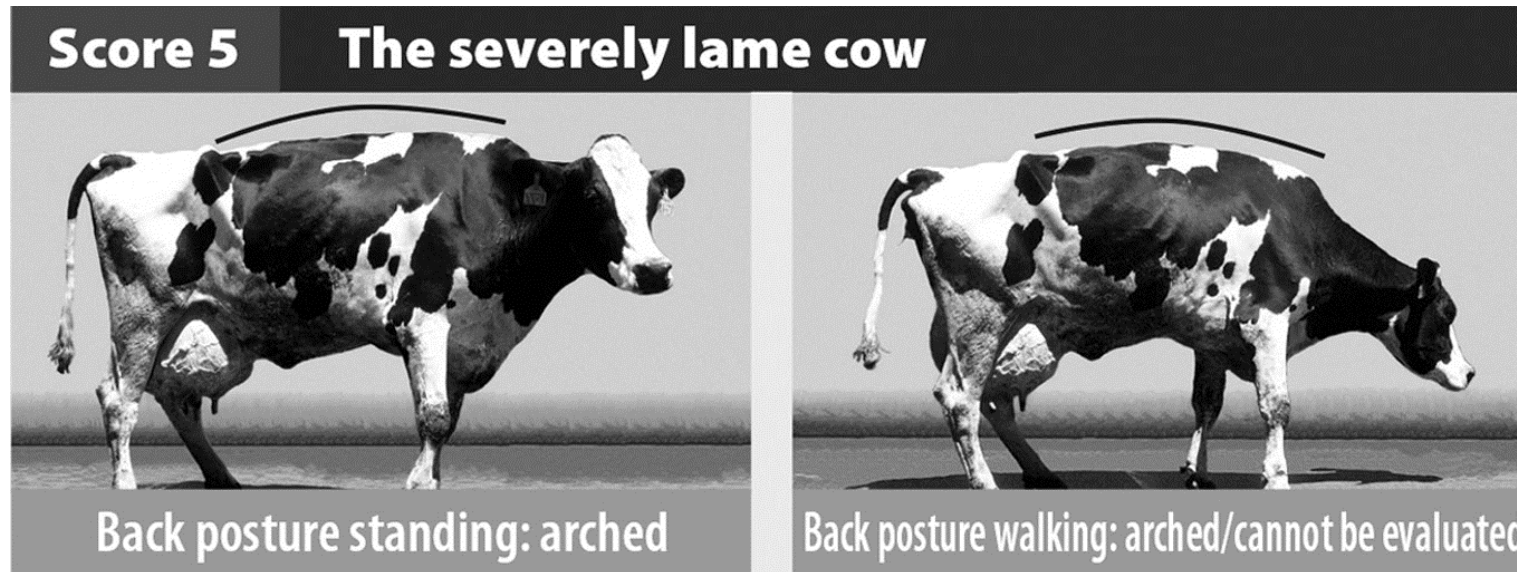
- Back posture - Arch.
- Capable of locomotion but ability to move is compromised. Moderately lame.
- Stands and walks with arched back. Slight limp and short strides in one or more legs.
- Joint shows signs of stiffness but does not impede freedom of movement. Head carriage remains steady.
- Feed intake reduces by at least 3% of the average feeds it normally consumes per day. Milk production declines by 5%.



24.2 Locomotion score 5

Characterized by;

- Extreme arched back when standing and walking. Inability to bear weight on one or more legs.
- Obvious joint stiffness characterized by lack of joint flexion with very hesitant and deliberate strides.
- One or more strides obviously shortened. Head obviously bobs as affected hoof makes contact with the ground.
- Score 5 feed intake reduces by at least 16% of the average feeds it normally consumes per day. Milk production declines by 36%.



25. Take home message/Summary

The general guidelines for proper foot care are:

1. Maintain a hygienic environment with dry surfaces, comfortable floors and areas as well as proper drainage.
2. Pay special attention to areas around water troughs and waiting areas not to become pools of mud during the rainy season.
3. Feed sufficient good quality roughage and avoid sudden changes in the daily ration.
4. Hoof trimming should be done on a regular basis, preferably at least twice a year.
5. Use footbaths regularly for preventative hoof care and individual cow treatment of lame cows.
6. Select proven sires that improve legs and feet.

