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Welfare Quality Reports No. 14

The Welfare Quality Lameness Control Programme for Dairy Cattle

Resources to Help Farmers and Advisors Tackle Lameness Problems in Dairy Herds

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WELFARE QUALITY REPORTS NO. 14

Welfare Quality Reports
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INTRODUCTION

The programme is intended for use by farmers who wish to reduce the level of lameness in their dairy herd. It offers a structured approach to lameness control, based on the latest research. Veterinary input is advisable at the diagnosis stage, and consultation with an adviser or fellow farmers along the way may be helpful. Implementing the lameness control plan consists of the following steps.

1. *Diagnosis* – what is the problem, how big is it, which cows are affected? You need to know what conditions (lesions) are causing your cows to be lame – for example, sole ulcers and digital dermatitis have different control strategies. Whether you already know this will depend on the quality of your existing records. If you have no records, we suggest examination of cows' feet by a vet or foot trimmer. This should include all the current lame cows in the herd, and possibly some which appear "tender" on their feet and may be developing the early stages of lesions. You also need to be aware of the scale of the lameness problem. We recommend scoring the whole milking portion of the herd for lameness, recording the identity of the lame cows so that they can be treated.
2. *Risk assessment* – what is causing the problem? Once the main lesions have been determined, it is time to consider the risk factors which may be contributing to causing the problems. This can be done in a very detailed way, using the full risk assessment form, or in a less formal way, by considering the general areas of management likely to influence the main problems.
3. *Action plan* – what can be done about it? Once the risks have been identified, start to consider what could be done to reduce or remove the risks. Make an action plan with specific points. Follow it!
4. *Monitoring* – is progress being made? The situation needs to be regularly monitored, both to record progress, and to become aware of any changing situations. Quarterly locomotion scoring and a complete review annually are recommended.

This folder contains materials to help with each of the stages, in colour coded sections. These, plus additional materials, are also available through the web site <http://www.welfarequality.net>.

2

DIAGNOSIS

2.1 WHAT PROBLEMS DO YOUR COWS HAVE? (WHAT ARE THE MAIN LESIONS?)

Following are four common problems.

2.1.1 Sole Ulcers (Also Known As Rusterholz Ulcers, or Pododermatitis Circumscripta)

Sole ulcers arise when the soft tissues inside the sole are damaged and normal horn cannot be produced. The 'live' soft tissue or corium is exposed. Damage can be caused by:

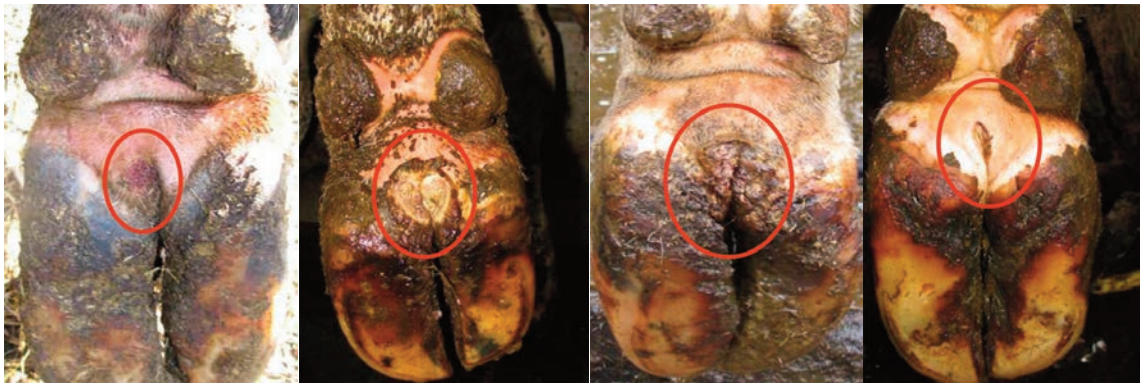
- physical pressure;
- changes in the physiology and metabolism of the cow linked to calving, illness or diet.

2.1.2 White Line Lesions

White line lesions arise when separation occurs at the 'white line' that forms the junction between the sole and the wall. If infection enters the foot through the gap the effects can be very serious.

2.1.3 Digital Dermatitis (Also Known As Mortellaro Disease)

- Digital dermatitis is an infection found most commonly on the skin of the interdigital space, or above the heel.
- The organisms associated with it are called spirochaetes.
- Slurry on the feet creates ideal conditions for these to grow.
- The appearance of the lesion changes as it progresses through different stages.



Early erosive stage | Granulomatous stage | Proliferative stage | Regressing stage

2.1.4 Foul in the Foot (Also Known As Interdigital Phlegmon or Necrobacillosis)

Foul in the foot occurs when the interdigital skin is punctured and bacteria called Fusobacterium necrophorum infect the interdigital space.
The foot rapidly becomes painful and swollen.

Other foot lesions are illustrated on the following pages.

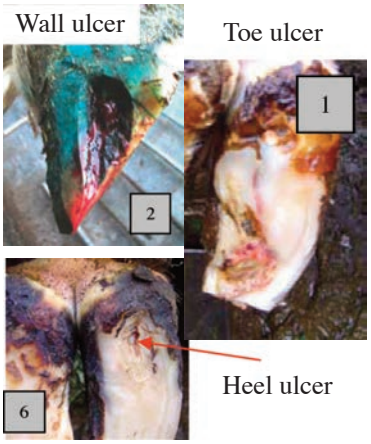
Lesion Reference Chart for Diagnosis

Claw Capsule (Horn) Lesions

Haemorrhage: Blood stained horn, indicating damage to blood vessels underlying the horn. Occasionally free flowing blood, trapped between two layers of horn. Horn beneath is intact (no soft tissue exposed – this would be an ulcer).

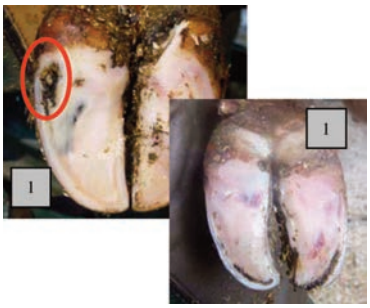
Sole ulcer (Rusterholz ulcer): Incomplete horn cover exposing soft tissues at the typical 'sole ulcer site'.

Other ulcers: Incomplete horn cover exposing soft tissues at any other site – e.g. heel, wall or toe.



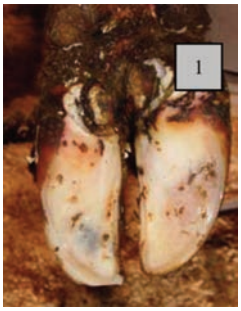
Rotten toe (pedal bone necrosis): Cavity in toe of claw, usually with foul smell. Infection has entered claw at toe and reached the bone.

White line separation: Physical separation of horn at the white line. Often white line appears black due to entry of foreign material.



White line abscess: Abscess formation due to infection tracking along white line separation. In the illustration, the track of infection has been opened up, and pus drained.

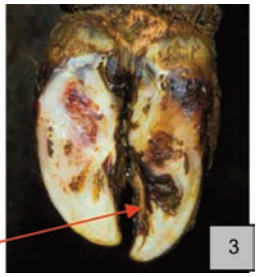
Heel erosion: Loss of heel horn – pitting, clefts or extensive horn loss.



Wall fissure: Crack in the inner or outer wall of the claw, either horizontal, or vertical (sandcrack)

Overgrown claw: Excess net horn growth, resulting in a misshapen claw.

Under-run horn: A 'flap' of horn with a cavity beneath, formed as a result of disturbance in horn growth or horn quality. Cavity revealed when flap of horn was trimmed away.



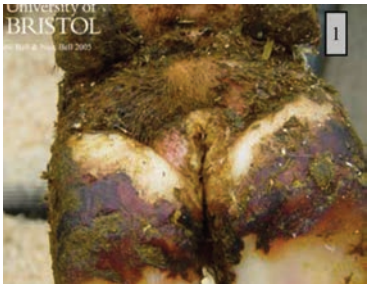
Lesions in red are most likely to be painful.

Lesion Reference Chart for Diagnosis

Skin and Interdigital Space

Digital dermatitis (DD) or Mortellaro disease: Inflammation of the skin, typically just above the heel, but may be found at other sites, e.g. occasionally in the interdigital space. Caused by infection by a group of organisms called 'spirochaetes'. Many stages andforms of this condition are seen.

Mild DD



Scabbed DD

Granulomatous DD

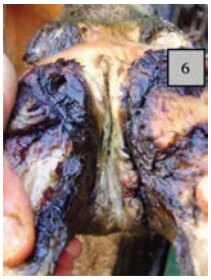
Hairy wart DD

Severe DD

Interdigital dermatitis: Mild, surface inflammation of skin between the claws, similar to scald in sheep, caused by organisms different from the 'spirochaetes' that cause digital dermatitis. If there is any sign of pain, the condition is likely to be digital dermatitis in the interdigital space.

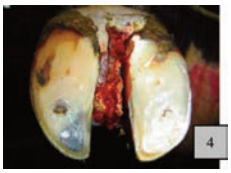
Interdigital growth: Also known as 'tyloma', 'fibroma', or 'corn'. Hard tissue growth protruding into the interdigital space.

Foul in the foot or interdigital phlegmon or interdigital necrobacillosis or (in America) footrot.



Fissure/ cracked skin between claws with characteristic odour resulting from dead tissue.

Superfoul: Fissure in skin with characteristic odour, and extensive necrotic (dead) tissue. Extreme with sudden onset. May lead to septicaemia and death. Likely to occur in epidemics.



Other Lesions

Foreign body penetration: Penetration of sole or white line by stone/thorn, etc.

Deep sepsis: Infection entering the foot has reached the deep structures e.g.tendons and joint

Hock damage: Mild hair loss or more severe ulcers, wounds swellings.

Lesions in red are most likely to be painful.

2.2 HOW MANY LAME COWS DO YOU HAVE AND WHO ARE THEY?

2.2.1 Watching Cows Walking

The only way to find out definitely how many cows are lame is to watch all the cows walking individually. This is often most easily done as the cows leave the milking parlour. Observe cows walking undisturbed in a straight line on a clean, level, non-slippery hard surface. Observe all cows either from the side or from behind and from the side. Use the method below to score each cow, recording the identity of any scored lame or severely lame, and the foot or feet affected. Recording forms can be found in Chapter 5.

0 – Not Lame.
Timing of steps and weight-bearing equal on all four feet.

1 – Lame.
Imperfect temporal rhythm in stride creating a limp (irregular foot fall – uneven temporal rhythm between hoofbeats, weight not borne for equal time on each of the four feet).

- Needs to be examined and treated.

2 – Severely Lame.
Strong reluctance to bear weight on one limb, or more than one limb affected.

- Requires urgent attention, and further professional advice, and special nursing (soft underfoot surfaces and little walking).
- In the most severe cases, culling may be the only possible solution.

A confusingly large number of different methods for scoring 'lameness', 'locomotion', 'gait' and 'mobility' have been developed. Within Welfare Quality® the system above was chosen because it is simple, and identifies the cows (score 1 and 2) which should be treated immediately.

The important things are:

1. to choose a method you can work with and keep to it, so that you can compare levels of lameness over time;
2. to attend to all the lame cows that you find.

2.2.2 Watching Cows Tied in Stalls

For cows that are tied in stalls and cannot be released, another method must be used. Note that this is less sensitive than locomotion scoring, so that mildly lame cows may not be detected.

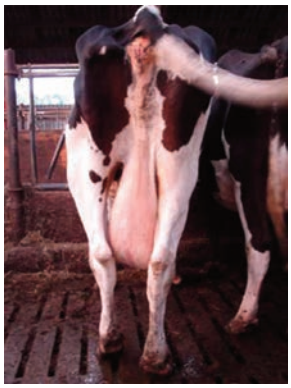
Assessing lameness in tied cows

First make sure all the cows are standing. One by one, observe each cow, first standing still in the stall and then as you move her from side to side. (The cow can often be moved simply by stepping from side to side behind her. If necessary apply gentle hand pressure to the hind quarters). Note the presence of any of the indicators in the table below. Check again after moving the cow. A recording sheet is provided in Chapter 5.

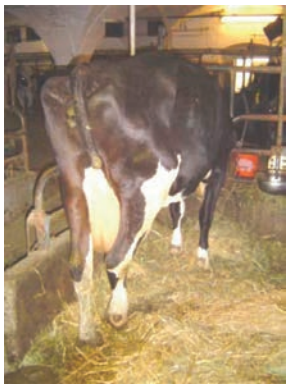
Indicators of lameness in tied cows

- Frequent 'stepping' (shifting weight from one foot to another).
- Standing on the edge of a step.
- Resting a foot (one foot more than another).
- Rotation of feet from the line parallel to the midline of the body.
- Reluctance to bear weight on a foot when moving from side to side in the stall.

The presence of two or more indicators suggests reliably that the cow is lame. Some lame cows may only show one of these indicators. Cows showing rotation of the feet alone may not all be lame. However, these cows may have problems developing in their feet, or need their feet trimming, so examining them may be beneficial.



Stepping (repeatedly shifting weight between feet)



Resting a foot

Rotation of feet

Standing on the edge of a step

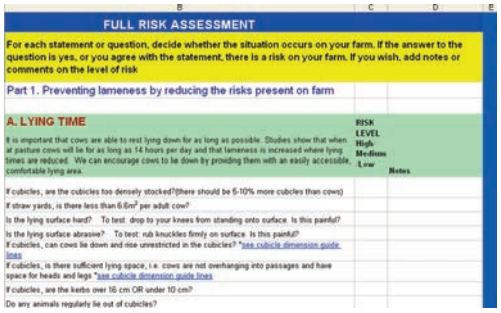
3

RISK ASSESSMENT

WHAT IS THE CAUSE OF THE PROBLEMS?

To understand where the lameness problems are likely to be coming from, the most thorough approach is to carry out a risk assessment. This involves considering all the factors that are known to be causes of lameness and deciding whether they are likely to be contributing to the problem on your farm. We recommend that, for full benefit, you carry out a Full Risk Assessment, but if time is limited, you can begin with a Short Risk Assessment. It may be helpful to walk around the farm with a fellow farmer, or advisor, to gain the benefit of 'a different pair of eyes'.

If you wish to conduct a detailed Full Risk Assessment (recommended), complete the form beginning on the next page, noting whether each risk exists on your farm. You may find it helpful to classify the risks as high, medium or low, depending on how important you feel they are. Help Sheets are available for answering the questions on stall design and nutrition, if required.


FULL RISK ASSESSMENT

For each statement or question, decide whether the situation occurs on your farm. If the answer to the question is yes, or you agree with the statement, there is a risk on your farm. If you wish, add notes or comments on the level of risk

Part 1. Preventing lameness by reducing the risks present on farm

A. LYING TIME

RISK LEVEL: High, Medium, Low

Notes

It is important that cows are able to rest lying down for as long as possible. Studies show that when at pasture cows will lie for as long as 14 hours per day and that lameness is increased where lying times are reduced. We can encourage cows to lie down by providing them with an easily accessible, comfortable lying area.

If cubicles, are the cubicles too densely stocked?(there should be 5-10% more cubicles than cows)

If straw yards, is there less than 6.6m² per adult cow?

Is the lying surface hard? To test: drop to your knees from standing onto surface. Is this painful?

Is the lying surface abrasive? To test: rub knuckles firmly on surface. Is this painful?

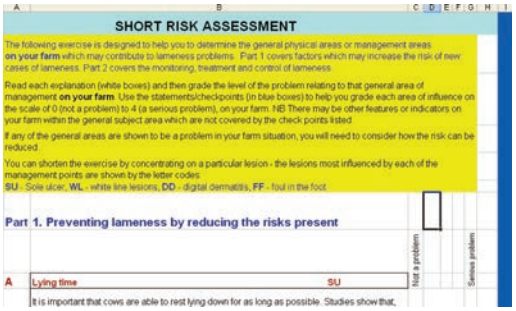
If cubicles, can cows lie down and rise unrestricted in the cubicles? *see cubicle dimension guide lines

If cubicles, is there sufficient lying space, i.e. cows are not overhanging into passages and have space for heads and legs *see cubicle dimension guide lines

If cubicles, are the kerbs over 16 cm OR under 10 cm?

Do any animals regularly lie out of cubicles?

A form for carrying out a Short Risk Assessment is given at the end of this Chapter. If any of the sections appear to be a problem, use the appropriate part of the Full Risk Assessment to investigate in more depth.


SHORT RISK ASSESSMENT

The following exercise is designed to help you to determine the general physical areas or management areas on your farm which may contribute to lameness problems. Part 1 covers factors which may increase the risk of new cases of lameness. Part 2 covers the monitoring, treatment and control of lameness.

Read each explanation (white boxes) and then grade the level of the problem relating to that general area of management on your farm. Use the statements/checkpoints (in blue boxes) to help you grade each area of influence on the scale of 0 (not a problem) to 4 (a serious problem), on your farm. NB There may be other features or indicators on your farm within the general subject area which are not covered by the check points listed.

If any of the general areas are shown to be a problem in your farm situation, you will need to consider how the risk can be reduced.

You can shorten the exercise by concentrating on a particular lesion - the lesions most influenced by each of the management points are shown by the letter codes.

SU - Sole ulcer, WL - white line lesions, DD - digital dermatitis, FF - foul in the foot

Part 1. Preventing lameness by reducing the risks present

Not a problem

Serious problem

A Lying time SU

It is important that cows are able to rest lying down for as long as possible. Studies show that,

If a particular lesion as your main problem, the Short Risk Assessment can be narrowed down to relate only to that lesion.

FULL RISK ASSESSMENT		
For each statement or question, decide whether the situation occurs on your farm. If the answer to the question is YES, or you AGREE with the statement, there is a RISK PRESENT on your farm. If you wish, add notes or comments on the level of risk		
Part 1. Preventing lameness by reducing the risks present on farm		
It is important that cows are able to rest lying down for as long as possible. Studies show that when at pasture cows will lie for as long as 14 hours per day and that lameness is increased where lying times are reduced. We can encourage cows to lie down by providing them with an easily accessible, comfortable lying area.	**RISK LEVEL High/ Medium/ Low**	**Notes**
In cubicles, are the cubicles too densely stocked? (There should be 5–10% more cubicles than cows.)		
In straw yards, is there less than 6.6m^2 per adult cow?		
Is the lying surface hard? To test: drop to your knees from standing onto surface. Is this painful?		
Is the lying surface abrasive? To test: rub knuckles firmly on surface. Is this painful?		
In cubicles or tiestalls, can cows lie down and rise unrestricted ? See cubicle and tiestall dimension guide lines, but also observe cows.		
In cubicles,or tiestalls, is there sufficient lying space, i.e. cows are not overhanging into passages, or hitting barriers, and have space for heads and legs ? See cubicle dimension guide lines and observe cows.		
In cubicles, are the kerbs over 16 cm OR under 10 cm?		
Do any animals regularly lie out of cubicles?		
B. STANDING TIME Waiting for feed, water, milking or other management activities forces cows to stand. It is important that the amount of time cows are required to stand is kept to a minimum.	**High/ Medium/ Low**	
Is there less than 60 cm of feed space per cow OR less than 10 cm of water space per cow?		
Is there competition for feed/water space? e.g. out of parlour feeders.		
Do the cows stand for more than 1 hour per milking?		
Are cows held in separation pens with no bedded lying area or AI stalls for more than 1 hour?		
Do cows have to stand for more than one hour in a holding pen before treatment of any kind?		
C. SLURRY MANAGEMENT Slurry in the yards and passageways acts as a reservoir for the organisms that cause infectious diseases such as digital dermatitis. Exposure to slurry also softens the claw horn causing it to wear more rapidly and increasing the risk of claw lesions such as sole ulcer and white line disease. It is therefore important to minimise the amount of slurry in the environment of the cow, and the contact between feet and slurry.	**RISK LEVEL High/ Medium/ Low**	
If there are automatic scrapers, do any cows ever walk through a wave of slurry deeper than 2.5cm?		
Does slurry or mud accumulate to a depth of 2.5cm or more at any point between scrapings?		
Are there any areas of pooled slurry or slurry contaminated water caused by poor drainage or damaged concrete? i.e. pools/puddles over 2.5cm deep.		
Does the scraper (tractor or automatic) miss areas of slurry or leave smears?		
Is there any stale slurry accumulated, or edges/corners of yards and passageways which are difficult to reach when scraping?		
Is the layout of buildings and yards irregular, making scraping difficult?		
Are any yards, passageways or tiestalls without slats scraped LESS OFTEN than twice a day when cows are fully housed and once a day when at pasture?		

FULL RISK ASSESSMENT		
For each statement or question, decide whether the situation occurs on your farm. If the answer to the question is YES, or you AGREE with the statement, there is a RISK PRESENT on your farm. If you wish, add notes or comments on the level of risk		
D. UNDERFOOT SURFACES AROUND THE YARD Uneven floor surfaces can cause physical trauma to the claw horn. Twisting and turning movements on uneven surfaces may lead to separation of the white line. Injuries to legs and feet can also occur if cows slip on smooth concrete or slats.	**High/ Medium/ Low**	
Is there any rough or damaged concrete? To test: does the surface feel rough through your boots?		
Is there any sharp or eroded concrete? e.g. newly laid or eroded by slurry or silage effluent.		
Are there any areas where the concrete is slippery for cows?		
Are there slats in walking/ standing areas?		
Are loose stones or grit ever seen on concrete yards?		
E. TRACKS AND GATEWAYS Rough tracks may cause physical damage to the claw horn, or interdigital skin. Claw horn may also be softened and more vulnerable to damage if the tracks and gateways are wet. Interdigital skin can become damaged, increasing the risk of infection resulting in foul in the foot. Studies have shown that cows will select the most suitable parts of a track to walk on if allowed to walk at their own speed. This may reduce the effects of unfavourable track and gateway surfaces.	**RISK LEVEL High/ Medium/ Low**	**Notes**
Do cows have to walk more than 1 mile on hard walking surfaces?		
Are the tracks or gateways rough or stoney? i.e. rubble, loose stones, grit are seen at the surface.		
Do tracks, gateways, fields or water sources become water logged while in use by the cows?		
Are there steep slopes, sharp turns or bottlenecks (sudden narrowing) on the tracks?		
Are loose stones from the tracks/ gateways carried onto concrete yards or across roads?		
F. COW FLOW Sharp turns and steps may cause separation of the white line. Narrow passages and blind ending passages may force cows to make more twisting and reversing movements espicially if they are bullied by dominant cows in these areas.	**High/ Medium/ Low**	
Are there steep sloping yards or walk ways (greater then 1 in 20)?		
Are the passageways less than 2.4m wide for cubicle passages and less than 3m wide for feed passages?		
Are there blind ended passages in the cubicle house?		
Do cows turn sharply when entering or exiting the parlour?		
Are there large steps on the route through the parlour?		
G. HERDING Pushing cows up in the collecting yard can cause further twisting and turning and if there is insufficient space then cows will raise their heads and be unable to place their feet carefully to avoid hazards. Cows' heads will also be raised if they are rushed when being herded between the farm and the grazing.	**RISK LEVEL High/ Medium/ Low**	
Do you use a backing gate or leave the parlour during milking to push up cows in the collecting yard?		
Do you ever drive cows along tracks, especially using a dog or vehicle? To test: Cows cannot place feet carefully when their heads are up. Do you ever see cows' heads in the air when they are walking on the track?		

FULL RISK ASSESSMENT		
H. MANAGEMENT AROUND CALVING	**High/ Medium/ Low**	
The period immediately following calving is stressful, especially for first lactation animals. Fresh calved cows and heifers have to adjust to a new diet, increased time standing (around milking and while eating), change of housing and introduction to a new group of cows.		
There is no separate management group for first lactation cows only		
Are freshly calved cows housed in cubicles during the first 56 DIM?		
Are cows and pregnant heifers housed in cubicles in the transition period (1 month before calving)?		
There is no cubicle training of bulling/ pregnant heifers prior to calving		
I. DIGITAL DERMATITIS SPREAD WITHIN THE HERD	**High/ Medium/ Low**	
While it is not clear how digital dermatitis spreads between the feet of different cattle it is possible that this and other diseases may be transferred directly via infected hoof trimming equipment and hands.		
Could digital dermatitis be spread between age groups/ management groups on the farm (e.g. mixing age groups, scraping adult cow slurry through young stock areas)?		
Hoof knives and hands are not disinfected between trimming the feet of different cows		
Have first lactation heifers ever calved with digital dermatitis?		
J. BIOSECURITY	**RISK LEVEL High/ Medium/ Low**	**Notes**
Digital dermatitis is a large cattle health problem and therefore a financial problem for many dairy herds. If there is no digital dermatitis in the herd then it is important to mainiain high biosecurity standards to prevent the disease infecting your herd. *If you don't know what digital dermatitis looks like then see the Diagnosis pages for some examples and descriptions.*		
Do you ever bring in any livestock from outside the herd onto the farm (cows, youngstock, bulls, beef animals, sheep), or show animals?		
Do your animals ever mix with neighbouring animals because of insecure boundaries?		
Could visitors (especially those working with cows' feet) bring digital dermatitis onto the farm on boots, vehicles or equipment (e.g. hoof knives)?		
	High/ Medium/ Low	
Upsets to rumen stability, in particular reductions in rumen pH, can cause disruptions to claw horn growth. This results in weaker claw horn which is susceptible to trauma or penetration by foreign bodies and therefore lesions causing lameness.		
There is no transition ration fed in the 2–3 weeks before calving, to prepare the rumen for the lactation diet		
Are the cows ever restricted from from forage for periods of more than 1 hour ?(e.g. milking time, AI.)		
Have there been confirmed cases of rumen acidosis in the herd?		
Forage is not analysed using multiple core samples, and the analyses used in rationing.		
Is the forage to concentrate ratio low? (i.e. less than 50% of dry matter [DM] is forage)		
Are any cows fed more than 4kg of concentrate per day in the parlour?		
Is the overall DM of the diet less than 45%?		
Is the NDF less than 35% of the DM?		
Is there more than 25% carbohydrate (sugar & starch) in the ration on a DM basis?		
Is there more than 18.5% crude protein in the ration on a DM basis?		
Are replacement heifers fed diets of less than 55% dry matter during the rearing period?		

FULL RISK ASSESSMENT		
Part 2. Treating, controlling and monitoring existing lameness cases		
Regular observation of all cows to identify new cases is important for earlier treatment of lameness. Lesion records can be used to identify outbreaks of infectious disease such as digital dermatitis at an earlier stage and allow footbathing routine or other control measures to be stepped up in response.		
L. MONITORING LAMENESS	**RISK LEVEL High/ Medium/ Low**	
Good records of lameness cases and the types of lesions seen when treating lame cows will help to identify seasonal patterns, high risk periods and possible causes. Periodic whole herd scoring may pick up cows which have not been detected previously. Monitoring records will show if there is progress or an increasing or changing problem.		**Notes**
Locomotion (lameness) scoring is not carried out on a regular basis		
There is no monitoring of numbers of each lesion type and the time of year they are most common.		
Lameness and lesion records are not used to define treatment and prevention strategies.		
The success of treatment of lame cows is not assessed 7 days after treatment, with re-examination of the claws if a problem persists.		
M. TREATMENT AND CLAW TRIMMING	**High/ Medium/ Low**	
It is essential that cows showing signs of lameness are promptly examined and where necessary receive appropriate treatments		
Is it possible that cows are not detected within 24 hours of becoming lame?		
Lame cows are NOT examined and treated within 24 hours of detection		
Farm staff responsible for trimming the claws of cows have not had recent training in claw trimming.		
The feet of all adult cows are not examined once per year and claw overgrowth corrected.		
The feet of replacement heifers are not examined and overgrowth corrected before first calving.		
Is it difficult to trim the feet of cows in the cattle crush?		
There is no comfortable hospital area (straw yard or nearby paddock) for nursing lame cows.		
	RISK LEVEL High/ Medium/ Low	
Good footbathing practice can help to treat and control infectious diseases, especially digital dermatitis, in the whole herd. It can also be helpful in situations of widespread heel erosion or soft soles.		**Notes**
Do you footbath the milking herd less than once a week with a disinfectant footbath?		
Is there a delay after housing before footbathing begins?		
Are cows' feet dirty before footbathing (no hosing or pre-bath)?		
Do pre-wash waterbaths quickly become contaminated with slurry?		
Is the footbath is less than 2.4m long?		
The footbath can not be filled to at least 10 cm (4") deep at both ends		
Do cows walk in slurry again immediately after footbathing?		
Is the footbath solution changed too infrequently for the size of herd and bath? (Calculate cow passages per litre, e.g. no more than 200 cows should pass through a 200 litre bath before the solution is changed.)		
Do dry cows and/or youngstock miss the footbath?		
Once you have completed this exercise, list the points which need attention. Think about ways in which the risks could be reduced, seeking advice if necessary. Write an action plan and follow it. See "Taking Action" pages for action plan tips.		

SHORT RISK ASSESSMENT

The following exercise is designed to help you to determine the general physical areas or management areas on your farm which may contribute to lameness problems. Part 1 covers factors which may increase the risk of new cases of lameness. Part 2 covers the monitoring, treatment and control of lameness. Read each explanation (in white boxes) and then grade the level of the problem relating to that general area of management on your farm. Use the statements/checkpoints (in blue boxes) to help you grade each area of influence on the scale of 0 (not a problem) to 4 (a serious problem), on your farm.
NB There may be other features or indicators on your farm within the general subject area which are not covered by the check points listed. If any of the general areas are shown to be a problem in your farm situation, you will need to consider how the risk can be reduced. Refer to the Full Risk Assessment for more detail on a section. You can shorten the exercise by concentrating on a particular lesion - the lesions most influenced by each of the management points are shown by the letter codes: SU - Sole ulcer, WL - white line lesions, DD - digital dermatitis, FF - foul in the foot.

Part 1. Preventing lameness by reducing the risks present

Not a problem ... Serious problem

Grade

A	**Lying time** — **SU**					
	It is important that cows are able to rest lying down for as long as possible. Studies show that, when grazing, cows will lie for as long as 14 hours per day and that lameness is increased where lying times are reduced. We can encourage cows to lie down by providing them with a comfortable lying area.	**1**	**2**	**3**	**4**	**5**
	There is swelling, hair loss or scabbing on cows' hocks or knees, indicating that the lying surface may be too hard or too abrasive. Cows make more than one attempt to lie down, or knock against the cubicle/stall partitions while lying down, indicating that the dimensions or design may be restricting them. Animals lie out of cubicles, indicating that the lying surface or dimensions may be inadequate, or cubicle training has not been carried out successfully.					
B	**Involuntary standing time** — **SU**					
	It is important that the amount of time cows are required to stand is kept to a minimum so that their opportunity to lie down is not restricted.	**1**	**2**	**3**	**4**	**5**
	Cows have to stand for longer that one hour in the collecting and/ or dispersal yards during milking, or in separation areas with no bedded lying area, e.g. AI stalls. There is less than 60cm/cow of feed space or less than 10cm/cow of water space, which may result in cows standing while waiting to eat or drink.					
C	**Involuntary standing time** — **SU WL DD FF**					
	Slurry in the yards and passageways acts as a reservoir for the organisms that cause infectious diseases such as digital dermatitis. Exposure to slurry also softens the claw horn, causing it to wear down more rapidly and increasing the risk of claw lesions such as sole ulcer and white line disease. It is therefore important to minimise the amount of slurry in the environment of the cow.	**1**	**2**	**3**	**4**	**5**
	There are large quantities of slurry in yards and passageways or a build up of stale slurry in areas which are difficult to clean. Cows' feet have a layer of slurry higher than the dew claws, or slurry balled on the dew claws, indicating repeated exposure to deep slurry. In tie-stalls, the ends of the beds are wet and dirty.					
D	**Floor/ walking surface (other than cowtracks)** — **WL**					
	Uneven floor surfaces can cause physical trauma to the claws. Twisting and turning movements on uneven surfaces may lead to separation of the white line. Injuries to legs and feet can also occur if cows slip on smooth concrete or slats.	**1**	**2**	**3**	**4**	**5**
	There are rough, damaged, uneven, slippery or slatted floor surfaces in yards or passageways					

SHORT RISK ASSESSMENT

Not a problem — Serious problem

Grade

E **Tracks, gateways and outdoor water sources** **WL FF**

	Grade 1	2	3	4	5
Rough tracks may cause physical damage to the claw horn, or interdigital skin. Claw horn may be softened and more vulnerable to damage if the tracks and gateways are wet. Interdigital skin can become damaged with risk of infection causing foul. Studies have shown that cows will select the most suitable parts of a track to walk on if allowed to walk at their own speed. This may reduce the effects of poor track and gateway surfaces.					
There are stones, rubble, flints or grit on tracks, gateways or around outdoor water sources, cows walk long distances on hard/rough tracks or there are steep slopes, sharp turns or sudden narrowing on cow tracks.					

F **Cow flow** **WL**

	1	2	3	4	5
Sharp turns and steps may cause separation of the white line because of strains and stresses on the feet. Narrow or blind ending passages may force cows to make more twisting and reversing movements, especially if they are bullied by dominant cows in these areas.					
There are narrow or blind ending passageways, large steps, sharp turns or steep slopes in the yards or passageways or on the route through the parlour. There is competition for feed space, water or popular areas.					

G **Herding** **WL**

	1	2	3	4	5
Pushing cows up in the collecting yard can cause further twisting and turning. If there is insufficient space then cows will raise their heads and be unable to place their feet carefully to avoid hazards. Cows' heads will also be raised if they are rushed when being herded between the farm and the fields.					
The rear cows are hurried (especially using dogs or vehicles) when being herded on tracks and/or cows are pushed up in the collecting yard (especially using backing gates)					

H **Management of high risk periods** **SU** **WL**

	1	2	3	4	5
The period immediately following calving is stressful, especially for first lactation animals. Fresh calved cows and heifers have to adjust to a new diet, increased time standing (around milking and while eating), change of housing and introduction to a new group of cows.					
First lactation heifers are housed with adult cows in early lactation, fresh calved cows are housed in cubicles, cows or first lactation heifers are observed lying out of cubicles.					

I **Biosecurity (reducing disease spread between cows in the same herd)** **DD**

	1	2	3	4	5
While it is not clear how digital dermatitis spreads between the feet of different cattle, it is possible that this and other diseases may be transferred directly via infected hoof trimming equipment and hands.					
Digital dermatitis (and other infectious diseases) could be spread between cows or management groups on the farm by mixing age groups, scraping slurry from infected groups to non-infected groups or failing to disinfect hands and hoof knives between treating the feet of different cows.					

SHORT RISK ASSESSMENT

		Not a problem Grade Serious problem				
		1	2	3	4	5
J	**Biosecurity (reducing the risk of new diseases entering the herd) DD**					
	If there is no digital dermatitis in the herd then it is important to maintain high biosecurity standards to prevent the disease infecting your herd. If you don't know what digital dermatitis looks like then see the lesion reference pictures for some examples and descriptions					
	Buying in new cattle, allowing your cattle to mix with cattle from other farms or having visitors to the farm, particularly if they work on cows' feet, could all introduce digital dermatitis. The organisms could be present on animals or in slurry or manure.					
K	**Nutrition SU WL**					
	Upsets to rumen stability, in particular reductions in rumen pH, can cause disruptions to claw horn growth. This results in weaker claw horn which is susceptible to trauma or penetration by foreign bodies and therefore lesions causing lameness.					
	Does the ration contain less than 50% forage, more than 18.5% protein, more than 25% starch and sugar, less than 35% NDF or less than 45% DM? Are any cows ever restricted from access to forage for longer than an hour (e.g for milking, AI, PD)? Are there sudden changes in diet for any animals? Any of these, among other factors, could upset the rumen balance and affect horn growth and quality, or, in extreme cases cause acute laminitis.					
L	**Claw trimming SU WL**					
	Overgrown and abnormally shaped claws result in damaging pressure on the internal parts of the feet, preventing the growth of healthy horn. Regular examination of the claws is important so that preventive or corrective trimming can be carried out if necessary. Correct claw trimming is a skilled task requiring training and practice.					
	Are there cows with overgrown or poorly shaped claws, or is claw trimming carried out by an untrained person?					

Part 2. Treating and controlling existing lameness cases

The following points are designed to identify areas where improvements of monitoring or treatment of lameness cases may be made to help control lameness and improve recovery rates.

		1	2	3	4	5
M	**Identifying and monitoring lameness cases SU WL DD FF**					
	Regular observation of all cows to identify new cases is important for earlier treatment of lameness. Keeping good records of lameness cases and the types of lesions seen when treating lame cows will help to identify the causes of problems, seasonal patterns and high risk periods. Lesion records can also be used to identify outbreaks of infectious disease such as digital dermatitis at an earlier stage.					
	The herd is not assessed for lameness on a regular basis lameness may not be detected within 24 hours of onset. New lameness cases and repeat treatments are not recorded and monitored over time.					
N	**Identifying and monitoring lameness cases SU WL DD FF**					
	It is essential that cows showing signs of lameness are promptly examined and where necessary receive appropriate treatments and care.					
	Cows are not examined within 24 hours of lameness being detected farm staff responsible for treating lame cows have not had recent training in claw trimming there is no comfortable hospital area for lame cows.					

SHORT RISK ASSESSMENT

O

Footbathing DD FF	Not a problem / Serious problem — Grade
Good footbathing practice can help to treat and control infectious diseases, especially digital dermatitis, in the whole herd. It can also be helpful in situations of widespread heel erosion or soft soles. However, footbathing can be ineffective if not appropriately carried out.	**1** **2** **3** **4** **5**
Footbathing will not be effective if: the frequency of footbathing is less than once a week, the footbath solution is not at recommended strength, the solution is not replaced often enough, the footbath is less than 10cm deep or 2.4m long or footbathing is not started until after cows are housed or a disease outbreak has started. If cows' feet are dirty when they enter and exit the footbath, effectiveness is also reduced.	

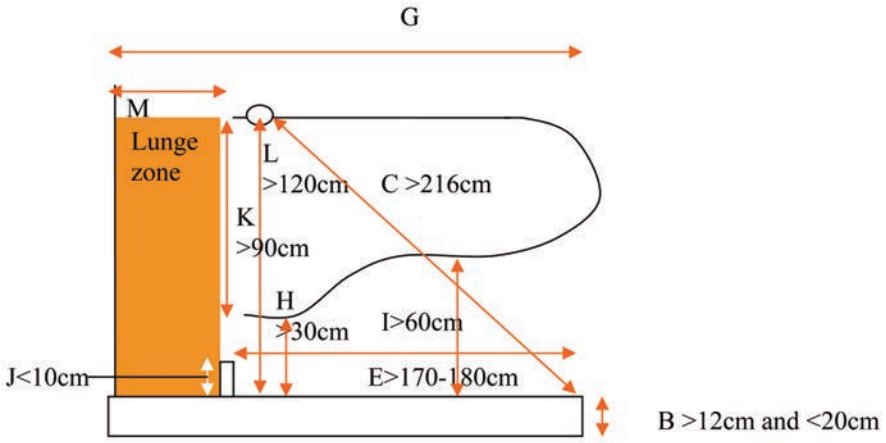
Notes

For more information on any of the categories, refer to the detailed risk assessment.

Once you have completed this exercise, list the points which need attention. Think about ways in which the risks could be reduced, seeking advice if necessary. Write an action plan and follow it. – See Taking Action for action plan tips.

CUBICLE COMFORT HELP SHEET 1

The diagram below is marked with the recommended dimensions for cubicles for Holstein-Friesian cows weighing over 600 kg. The table can be used to help you to measure a representative cubicle from each row and record any measurements that could reduce comfort. Overleaf is a table of the main measurements for other sizes of cow.



Recommended cubicle dimensions for Holstein-Friesian cows over 600 kg.
Total length G>240cm with M>60cm for side lunge, G>270 with M>90cm with only forward lunge space lunge

Measurement	Ideal (cm)				
A – Width	>117				
B – Kerb height	12–20				
C – Diagonal neck rail to rear	>216				
D – Base & bedding soft?		Yes/No	Yes/No	Yes/No	Yes/No
E – Brisket to rear of cubicle	>170				
F – Wall or centre?		W or C	W or C	W or C	W or C
G – Total length	See fig				
H – Height of lowest rail at head end	>30				
I – Height of lowest rail at rear	>60				
J – Bob space /leg stretch obstruction (e.g. brisket board)	height<10				
K – Side lunge	>90				
L – Ht of neck rail or partition for side lunge	>120				
M – Lunge zone interrupted?		Yes/No	Yes/No	Yes/No	Yes/No
N – Abrasive ?		Yes/No	Yes/No	Yes/No	Yes/No
Number of cubicles					
Overall are there any limitations? (notes)					

CUBICLE COMFORT HELP SHEET 2

Cubicle measurements for different weights of cow.

Cow breed/weight	Holstein Friesian > 600 kg	600 kg	550 kg	500 kg	450 kg e.g. Jersey
Measurement (see figure)	Ideal (cm)				
A – Width	>117	117	112	107	102
B – Kerb height	>12 & < 20				
C – Neck rail to rear	>216				
E – Brisket to rear of cubicle	>170	159	153	147	141
G – Total length with forward lunge	See fig	236	225	214	203
H – Height of lowest rail head end	>30				
I – Height of lowest rail at rear	>60				
J – Bob space/leg stretch obstruction	Brisket board. height<10				
K – Side lunge	>90				
L – Height of neck rail (or partition, with side lunge)	>120	111	107	103	100

Dimensions in cm based on recommendations by Nordlund & Cook.

Nordlund & Cook (2003) A system to evaluate freestalls. Advances in Dairy Technology 15; 115.

TIESTALL HELP SHEET
NOTES ON FINDINGS FROM STUDIES ON TIESTALLS

The most important features of tiestalls relevant to lameness are:

1. cleanliness of the area underfoot
2. comfort of the lying surface
3. design of the partitions, if present
4. design of the tethering system

To avoid lameness the cow needs:

- the ability to lie down and rise naturally;
- no collision with fixtures;
- comfort when lying down;
- clean, dry feet;

- regular exercise.

Cows in tiestalls often show abnormal rising and lying down behaviour. This indicates their movement is restricted. They may be reluctant to lie down, which could result in more trauma to their feet. They may injure themselves by collision with parts of the stall. Wounds and swellings of the hock and knee (tarsus and carpus) are more common in tiestalls than in freestalls. Watch cows carefully and compare their rising and lying movements in the stall and at grass to find out if the stall is causing restrictions.

A higher risk of foul in the foot and knee and hock lesions has been found in cows tethered by yokes rather than neckbar ties.

A cow needs to be able to lunge forward to rise naturally. The tethering method, including chain length, partition design, and any obstructions in the front of the stall (e.g. feed trough) all affect how the cow can move. Only the single headrail design, with a chain tied to a neck chain or strap, gives complete freedom for natural rising.

A comfortable lying surface, with sufficient grip to allow cows to rise and lie down safely is important.

Use of cow trainers has been associated with reduced risks of lameness, but with increased risk of hock lesions (possibly because, with cow trainers, less bedding tends to be used, giving less cushioning for the hocks).

On slats, cows stay cleaner, but in one study were found to lie down less than on solid floors. Rubber slatted flooring in the rear part of the stall has resulted in a reduction in dermatitis and heel horn erosion, presumably due to reduction of the contact between cows' feet and slurry. Keeping the ends of the beds dry is important for controlling dermatitis and heel erosion.

Daily exercise for cows kept in tiestalls was associated with less leg problems and non-infectious hoof disorders, and less severe hock skin lesions in a Norwegian study. (NB on one farm the exercised cows suffered more sole ulcers, but the surface of the exercise area was very rough on this farm). In a Swedish study, exercise was shown to result in shorter, steeper claws.

TIESTALL HELP SHEET – DIMENSIONS

The most important dimensions of tiestalls in relation to lameness are bed length, stall width, tie rail height, lunge space and manger height.

The length of the bed should be 1.2 times the rump height of the cow.

The minimum width for a stall is the 'imprint width' of the cow (the distance across from the upper hock to the far extent of the abdomen on the opposite side of the cow when the cow is lying down). As a general rule, the imprint width is twice the width between the hook bones (Anderson, 2004).

The tie rail controls the position of the cow in the stall, and the degree of her movement. The cow should be able to lie down and rise without touching the rail, and the tying position should allow the cow to stand parallel to the side dividers with all four feet in the stall. The height of the tie rail above the level of the surface on which the cow's front feet stand should be about 0.8 times the rump height of the cow. Stall design and tying method must allow the cow to lunge sideways or forwards when rising. The lunge space between 30 cm and 115 cm above the bed height should be clear to allow lunging either to the front or the side of the stall. Manger design should not cause injury to the knees by collision. The surface of the manger should be 10 cm above the level of the cow's feet to prevent the cow from having to stretch to eat, which puts pressure on the front feet (Anderson, 2004).

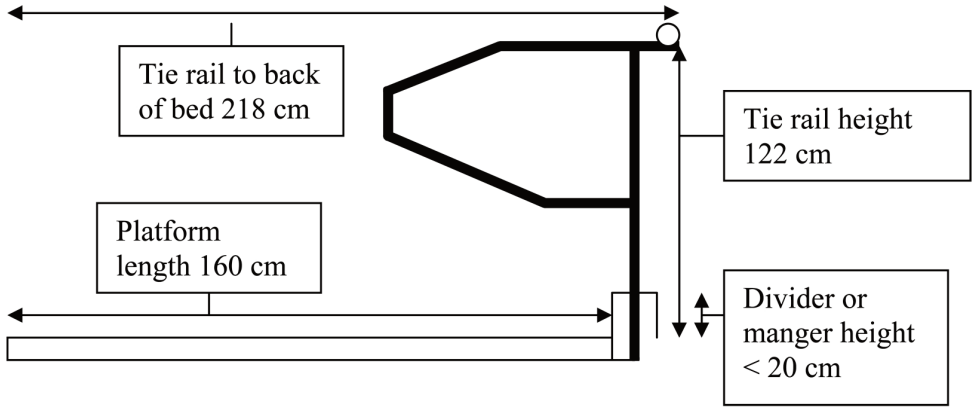
The tables below show recommended dimensions for stalls for Holstein-Friesian cows of different weights. However, it is suggested that you measure a representative sample of your cows in first lactation, older cows and dry cow groups, and check the dimensions of the stalls using the rules above.

Record any measurements that could reduce comfort. Amendments should then be considered.

Dimensions from the recommended codes of practice for the handling of dairy cattle, Agriculture Canada

Animal weight (kg)	Stall width (cm)	Stall platform length
400	100	135
500	110	140
600	120	150
700	130	160
800	140	170
Stalls should be 10 cm longer if electric trainers are used		

Animal weight (kg)	Stall width (cm)	Short stall platform length (cm)	Medium stall platform length (cm)
Up to 400	100	150	185
Up to 550	115	165	200
Up to 700	120	175	210
More than 700	125	185	220
Slats for removal of liquid manure are not deemed part of the stall length			



Recommended stall dimensions for 700 kg Holstein cow.
Source: Anderson (2008).

NUTRITION HELP SHEET
GUIDELINES FOR RATIONS TO REDUCE THE RISK OF LAMENESS

Studies have shown that drier diets are associated with lower levels of lameness. It is not clear whether this is a nutritional effect, or simply an effect of drier slurry.

Rumen acidosis has been associated with an increased risk of 'laminitis'-type foot problems, although the full explanation of this link is not clear.

Extremely high levels of concentrate, starch and sugar, and crude protein, and low levels of fibre, have in some cases been shown to lead to foot problems. The products of digestion of such diets may affect the blood supply to the feet, particularly in situations of rumen acidosis. In exceptional circumstances this can result in acute laminitis, and in less extreme situations, results in poor quality horn and 'subclinical' changes, which make the feet more vulnerable to other insults.

Guidelines for levels of dietary components are summarised below.

Measure	Guideline
Overall diet Dry Matter (DM)	at least 55% for youngstock and 45% for lactating cows
Forage: concentrate ratio	at least 50:50 on a dry matter (DM) basis (i.e. at least 50 % of DM is forage)
Neutral Detergent Fibre NDF	at least 35% of the DM (350g/kg)
	Physically effective NDF at least 32% of the dry matter (320 g/kg DM)
Crude Protein content	maximum 18.5% of DM (185g/kg DM)
Starch plus sugar content	maximum 25% of DM (250g/kg DM)
Maize silage	maximum 60% of ration by dry matter unless hay, straw or some other forage with a high physically effective NDF is added
Wholecrop	maximum 15kg/head freshweight

Changes in diet should always be made gradually as the population of rumen microbes will be affected. Because cows are particularly susceptible to lameness around the time of calving, the change from dry cow diet to lactation ration is particularly important. The following table gives guidelines for diets for cows as they approach calving.

Measure	Rough guide
Dry matter intake as high as possible – but it will be limited. Presentation of feed is therefore important – freshly and frequently supplied, good access	>9 kg/day
Energy density to counteract restricted intake (cows require 120–140 MJ/day)	10.5–11 MJ/kg DM
Include some starch to prepare the rumen microbes	up to 35% of ration
Include forages that will be used in the lactation ration	
Include some long fibre	Straw, hay, round bale silage
Crude protein	13–15% of DM
Digestible Undegradable Protein	250–300g/day
Low calcium	Use a standard dry cow mineral with standard dry cow diet
The alternative to low calcium diets is the Dietary Cation-Anion Balance (DCAB) diet	Calculate dietary cation-anion balance of the diet and use a specific DCAB mineral NB NEEDS EXPERT KNOWLEDGE and MONITORING
Magnesium supplement	to exceed 40g/day

NUTRITION HELP SHEET
DIETS OR FEEDING REGIMES THAT MAY LEAD TO RUMEN DISTURBANCES

Risks include:

- access to large amounts of concentrate separate from forage e.g. more than 2 kg per milking fed in the parlour, especially if forage is not immediately accessible afterwards;
- periods of more than one hour when cows have no access to forage;
- insufficient space for all cows to reach forage;
- sudden changes in ration;
- empty forage trough;
- stale or unpalatable forage;
- forages being over-chopped (too much fibre less than 2.5cm long) either due to setting of forage harvesters or over-chopping in mixer wagon;
- fibre which is too long (> 10 cm) so that cows can sort it out and leave it;
- inaccurate assessment of dietary components – e.g. no forage analysis;
- rations not properly mixed, variation along the feed barrier;
- situations where the ration on paper does not match what arrives at the feed face (inaccurate or no weighing).

If in doubt consult a competent nutritionist.

4

ACTION PLAN

TAKING ACTION TO CONTROL LAMENESS

What Do I Do Next ?

Once you have identified the type and the extent of the lameness problem, by examining cows and/or records, and the likely causes, by carrying out a risk assessment, it is time to consider the action needed to control the problem.

Who Needs To Be Involved ?

The farmer and those who work on the farm will be the best people to work out practical ways of reducing the risks that have been highlighted. However, an outside person, whether a fellow farmer or an adviser, can be helpful in suggesting new solutions to problems. Involve everyone who works with the cows, milking, feeding, scraping slurry, trimming feet etc. Consult your vet on any treatment issues and discuss the planned management changes with the vet to avoid any potential conflict with other health issues.

How Do I Go About It?

Work through the points identified as risks. Think carefully about why the risks arise and how things can be changed so that the risks are reduced. It may be helpful to visit other farms and see examples of what can be done. Consult your vet or adviser if technical information is needed or visit the website.

Then make an 'Action Plan' of practical action points. Make a manageable list of up to 10 points to begin with.

What Do I Put In The Plan ?

Choose the points which you think will make the most difference to the greatest problem, and which can be realistically achieved.

The first point on the Action Plan should always be a reminder to

- examine and treat any lame cows within 24 hours.

It may be helpful to consider the actions under the following general headings:

- improving lying time;
- improving underfoot surfaces;
- improving foot hygiene;
- effective foot bathing;
- foot trimming;
- nutrition;
- management at calving.

How Can I Make Sure Action Is Taken ?

Write down the action points, with the name of the person who will be responsible for ensuring each one is carried out, and a realistic timescale for completion. Discuss the actions with the people responsible.

A form that could be used is provided at the end of this section.

Display the plan in a prominent position on the farm where all the staff can see it.

CONTROL OF THE FOUR MAIN TYPES OF LESION

Control plans should be specific to the farm, concentrating on the areas highlighted by the risk assessment. However, this page gives a reminder of the main areas to concentrate on for the control of the four major types of lesion.

1. Sole Ulcers

- Reduce standing time, increase lying time.
- Maximise comfort around calving.
- Improve horn quality.
- Avoid extremes of diet and rumen upsets.
- Maintain correct foot shape by functional trimming.

2. White Line Lesions

- Improve underfoot surfaces.
- Reduce twisting and turning by cows.
- Improve horn quality.
- Avoid extremes of diet and rumen upsets.

3. Digital Dermatitis

- Reduce contact between feet and slurry.
- Keep feet clean.
- Biosecurity.
- Footbathing.

4. Foul in the Foot

- Avoid damage to interdigital space.
- Avoid wet, muddy conditions underfoot.
- Footbathing.
- Prompt treatment to avoid superfoul.

ACTIONS TO CONTROL LAMENESS

Farmer name _____

Date _____

Checklist for lameness control areas (Tick as appropriate)

Prompt treatment of lame cows	✓	Walking surfaces and cow flow	
Foot hygiene		Foot trimming	
Foot bathing		Nutrition	
Standing/Lying time		Transition management	

Specific action point	Person responsible	Timescale	Progress

I intend to tackle the points above. Farmer signature ……

It is strongly recommended that you agree to pass this information on to your vet, who can then check potential impact on other herd health issues.

RELEVANT RECENT RESEARCH FINDINGS TO GUIDE ACTION

Cubicles and Bedding

The following recommendations for reducing risk of lameness arise from a study of the relationships between risk factors and lameness levels on 49 farms in the UK (Barker et al., 2007).

- In cubicles, if possible avoid the combination of a thin layer of sawdust on rubber mats or mattresses. This was associated with higher levels of lameness than any other bedding type. The reason is likely to be a result of the combination of poor cushioning and an abrasive surface making cows less likely to lie down, increasing trauma to the feet.
- Whatever the type of bedding, make sure it is deep enough to make the bed comfortable.

Work from Austria (Dippel et al., 2007) adds further evidence that encouraging cows to lie down is central to the reduction of lameness. Specifically, deeper bedding in cubicles was associated with less lameness. Also, there was an interaction between the cow:cubicle ratio and the time taken for cows to lie down. When there were fewer cubicles per cow, and cows took longer to lie down, lameness prevalence was higher. This suggests that a limited number of restrictive cubicles is a particularly high risk situation.

Underfoot Surfaces

Soft (rubber covered) flooring provides good comfort for cows when walking, but lack of wear results in claw overgrowth, if the whole area is rubber covered. On rubber flooring, the foot retains a more ‘natural’ shape, which is lost on very abrasive floors (the sole

remains concave, with weight bearing on the wall). If net growth is too excessive, access to an area providing a moderate amount of abrasion and/or additional claw trimming might be needed to maintain good claw conformation (Telezhenko, 2007). Cows like to walk on rubber surfaces, but also may prefer to lie on them if their cubicles are uncomfortable or difficult to enter (e.g. if there is a lot of competition). Although cows show a preference for rubber covered surfaces, and walk more 'naturally' on them, not many studies have actually shown a reduction in lameness associated with rubber floors.



In a German intervention study, lameness levels were reduced by making floors less slippery (March et al, 2008). This can be achieved by grooving concrete, or scattering sand. A Czech study also showed a relationship between less slippery surfaces and less lameness (Dembele et al., 2006).

The German study showed that more frequent cleaning of floors (even slatted floors) led to a reduction of lameness.

Avoid excessive walking of cows on concrete tracks or roadways, to avoid excessive wear (perhaps surprisingly, there were more lesions in herds walking on concrete tracks, roads or no tracks, than in herds on stone or dirt tracks, in the study of Barker (2007). Ensure that tracks are kept well drained with smooth, well maintained surfaces.


Other Management Factors

Automatic scrapers in cubicle houses were found to be associated with higher levels of lameness by Barker et al. (2007). This may be explained by the common combination of automatic scrapers and use of small quantities of sawdust on mats. However, the scrapers are likely to disturb behaviour patterns and lead to sudden twisting movements. If they have to be used, try not to run them when the passageways are crowded. Also check the height of the slurry wave and the places where slurry is left at the end of the run to see if these are causing cows' feet to be immersed in slurry above the dewclaws.

Passageways should preferably be at least 3m wide. Wider passages allow better cow flow which helps the integration of new animals to a group and reduces bullying. More space in the passages also reduces stocking density and thus the contact cows have with slurry.

Management of cows around the time of calving has a large influence on lameness. Reduced rates of sole ulcer were found where all cows calved outdoors. This would imply that remaining at grass (or possibly onto any soft surface) during early lactation helps to offset the other stresses on a dairy cow at this time e.g. increase standing during milking and social integration into a new cow group.

If routine foot trimming is carried out make sure that hygiene between cows is excellent to prevent the spread of DD. Also it is important that waiting for the foot trimmer does not become a reason for lame cows to be left untreated for more than two days.

References

Anderson, N. (2008) *Tie Stall Dimensions for Dairy Cows*, published online <http://www.omafra.gov.on.ca/english/livestock/dairy/facts/info_tsdimen.htm>.

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RECOMMENDATIONS

The main recommendations arising from recent work are summarised in the Table below.

Recommendations	Study
Provide deep bedding.	Barker et al., Dippel et al. (to prevent lameness), Brenninkmeyer et al. (to prevent hock lesions)
If cubicle design restricts lying down and cannot be improved, increase the number of cubicles per cow	Dippel et al.
If the number of cubicles is limited, remove any obstructions to lying down	Dippel et al.
In cubicles, ensure the soft surfaced area is long enough for cows to lie on	Brenninkmeyer et al. (to prevent hock lesions)
Concrete slats are the least suitable floor surface from the point of view of maintaining good claw shape and weight bearing. Rubber flooring improves cow comfort and foot shape (weightbearing area) but results in increased net growth. The trimming regime required is likely to depend on floor type.	Telezhenko; Van der Tol et al.
Avoid use of automatic scrapers in cubicle houses if possible. If used, avoid times when alleys are full of cows and ensure that slurry gathered by the scraper is kept away from the cows.	Barker et al.
Avoid slippery underfoot surfaces	Dembele et al.
Ensure feet do not become overgrown	Dembele et al.
Treat lame cows within 2 days of detection. Do not make them wait until the next visit by the foot trimmer	Barker et al.

Successful interventions (March et al.)	Outcome
Regular professional claw trimming	Reduced lameness
Improvements to lying surface (softness, cleanliness, cubicle dimensions)	Reduced lameness
Reduced slipperiness of floors	Reduced lameness
Improved floor hygiene – achieved by more frequent cleaning – even of slatted floors	Reduced lameness
Regular cleaning of feet in the parlour	Improved digital dermatitis detection and treatment

Having read these reports, you may think that there are no striking new findings relating to foot health, BUT

- are these known risks being addressed on YOUR farm?

- could YOU improve things for YOUR COWS by introducing any of the successful interventions ?

5

MONITORING

Monitoring is important, to be able to recognise progress, and to detect new problems quickly. Detecting and recording lame cows are both equally important. At first, if detection and recording both improve, it may appear that the number of lameness cases is increasing, but if the control programme is successful, the number of new cases and the duration of lameness should reduce. However, be aware that lameness caused by claw horn lesions (e.g. sole ulcers, toe ulcers, white line lesions) can take a long time to improve. Look out for a reduction in the number of new cases rather than in overall lameness levels, to begin with.

Recommendations for monitoring are:

Every time a cow is lame

- Record the following minimum information for all cases of lameness – date, cow, foot, type of lesion, treatment given.

Every three months

- Score the whole milking herd for lameness (treat any newly detected lame cows).
- Summarise number of cows treated and number of each type of lesion recorded over the last 3 months.

Every year

- Summarise number of cows treated and number of each type of lesion recorded over the last year.
- Carry out a risk assessment and make an action plan.

A variety of forms are available on the next pages to help you with recording. A choice of styles allows for personal preference.

Simple lesion recording form – page 1

LAMENESS RECORDS FARM NAME _____ YEAR _____

Fill in cow number and foot in appropriate section when lameness is diagnosed

	Month		Month		Month		Month	
Sole Ulcer (Rusterholz)								
								
White Line Abscess or Separation								
								
Digital Dermatitis (Mortellaro)								
								
Foul/Phlegmon								
								
Other (Specify)								
Repeat treatments								
Total lame cows in month								
Notes								

Simple lesion recording form – page 2

LAMENESS RECORDS FARM NAME _____ YEAR _____

	Month		Month		6 Month Summary	Month		Month	
SU					ave. herd size				
					A				
					no. cows SU				
					B				
					% herd lame SU per year Bx2x100/A				
WL					no. cows WL lesions				
					C				
					% herd lame WL lesions per year Cx2x100/A				
DD					no. cows DD				
					D				
					% herd lame DD per year Dx2x100/A				
FF					no. cows foul				
					E				
					% herd lame foul per year Ex2x100/A				
OT					Total lame cows (including 'other' excluding repeat treats & multiple lesions recorded on one examination				
					F				
RT					% of herd lame adjusted to annual figure F x 2 x 100/A				
Total lame cows in month									
Notes									

Simple lesion recording form – page 2

LAMENESS RECORDS FARM NAME _____ YEAR _____

									6 Month Summary
	Month		Month		Month		Month		
SU									ave. herd size
									G
									no. cows SU
									H
									% herd lame SU per year Hx100/G
WL									no. cows WL lesions
									J
									% herd lame WL lesions per year Jx100/G
DD									no. cows DD
									K
									% herd lame DD per year Kx100/G
FF									no. cows foul
									L
									% herd lame foul per year Ex2x100/A
OT									Total lame cows (including 'other' excluding repeat treats & multiple lesions recorded on one examination
									M
RT									% of herd lame Mx100/G
Total lame cows in month									
Notes									

Instructions for Using the Lameness Recording Chart

Use the lameness recording chart:

1. As an easy way of summaring historical records for the year before your start on the Lameness Control Programme.
2. To keep an easily visible up-to-date record of lameness once you have started on the Programme *stick it on the wall*!

When a cow is lame, examine her feet and fill in cow ID and foot/feet affected under the appropriate month and lesion.

If a cow has two (or more) lesions at the same time, enter her in each lesion section, but mark with a star or line, to make it easy to count her only once in the 6 month or annual summary.

If a cow has repeat treatments for the same lesion in the same or a later month, enter her in the 'repeat treatments' section. This avoids double counting and shows clearly any cows with chronic problems, who should be considered for culling at the end of the year.

At the end of 6 months, calculate an interim summary (multiply the totals by 2 to estimate the figures for 12 months).

Remember there may be a difference between summer and winter, so this is only an ESTIMATE of annual incidence.

At the end of 12 months calculate the annual summary and compare with results for the previous year.

NB If the same cow is lame in separate months for DIFFERENT reasons, count her each time in the total count of lame cows. If the same cow is lame for the SAME reason in different months, only count her once.

NB At the end of the first year on the programme, the incidence of lameness may appear greater than the figure from historical records. This may be due to improved recording and not reflect a true increase in the level of lameness.

Persevere for another year and see the difference!

Full lameness/foot trimming recording form

FOOT TRIM OR LAMENESS RECORDS		Lameness case number this month	Lameness case number this year		Claws trimmed		Digital Dermatitis	Sole ulcer	White line	Foul-in-the-foot	Other – describe	Lameness score before treatment (see score below*) and foot affected	Suspected main problem if more than one lesion or description of other lesion(s)/notes	Treaments? E.g. trim, block, antibiotic spray, inject, bandage, straw yard, nursing paddock	Treatment by: vet, foot trimmer, farm staff (initials)	Locomotion score 7 days after treatment	Repeat treatments
Cow ID	Date				Left	Right											
				Fore													
				Hind													
				Fore													
				Hind													
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				Fore													
				Hind													
Tally of cases																	

* Lameness scores: score 0 = not lame, 1 = lame (definite limp or uneven rhythm), 2 = severely lame (strong reluctance to bear weight or more than one limb affected).

Simple Lameness Scoring Sheet

Farm	**Date**	**Scorer**

Score 0 – Not lame	**Score 1 – Lame** (Definite limp or uneven rhythm)	**Score 2 – Severely lame** (Very reluctant to bear weight on one or more feet)
Make a tally in this box of cows that are not lame	Record the identity of lame cows	Record the identity of severely lame cows
	Arrange to examine and treat these cows	Arrange professional attention, special housing and nursing for these cows

Total no. of cows scored		
Total Score 0	Total Score 1	Total Score 2
% Herd Score 0	% Herd Score 1	% Herd Score 2

Lameness Scoring Sheet

	Cow ID	Score	Limb		Cow ID	Score	Limb		Cow ID	Score	Limb		Cow ID	Score	Limb
1		0 1 2		36		0 1 2		71		0 1 2		106		0 1 2	
2		0 1 2		37		0 1 2		72		0 1 2		107		0 1 2	
3		0 1 2		38		0 1 2		73		0 1 2		108		0 1 2	
4		0 1 2		39		0 1 2		74		0 1 2		109		0 1 2	
5		0 1 2		40		0 1 2		75		0 1 2		110		0 1 2	
6		0 1 2		41		0 1 2		76		0 1 2		111		0 1 2	
7		0 1 2		42		0 1 2		77		0 1 2		112		0 1 2	
8		0 1 2		43		0 1 2		78		0 1 2		113		0 1 2	
9		0 1 2		44		0 1 2		79		0 1 2		114		0 1 2	
10		0 1 2		45		0 1 2		80		0 1 2		115		0 1 2	
11		0 1 2		46		0 1 2		81		0 1 2		116		0 1 2	
12		0 1 2		47		0 1 2		82		0 1 2		117		0 1 2	
13		0 1 2		48		0 1 2		83		0 1 2		118		0 1 2	
14		0 1 2		49		0 1 2		84		0 1 2		119		0 1 2	
15		0 1 2		50		0 1 2		85		0 1 2		120		0 1 2	
16		0 1 2		51		0 1 2		86		0 1 2		121		0 1 2	
17		0 1 2		52		0 1 2		87		0 1 2		122		0 1 2	
18		0 1 2		53		0 1 2		88		0 1 2		123		0 1 2	
19		0 1 2		54		0 1 2		89		0 1 2		124		0 1 2	
20		0 1 2		55		0 1 2		90		0 1 2		125		0 1 2	
21		0 1 2		56		0 1 2		91		0 1 2		126		0 1 2	
22		0 1 2		57		0 1 2		92		0 1 2		127		0 1 2	
23		0 1 2		58		0 1 2		93		0 1 2		128		0 1 2	
24		0 1 2		59		0 1 2		94		0 1 2		129		0 1 2	
25		0 1 2		60		0 1 2		95		0 1 2		130		0 1 2	
26		0 1 2		61		0 1 2		96		0 1 2		131		0 1 2	
27		0 1 2		62		0 1 2		97		0 1 2		132		0 1 2	
28		0 1 2		63		0 1 2		98		0 1 2		133		0 1 2	
29		0 1 2		64		0 1 2		99		0 1 2		134		0 1 2	
30		0 1 2		65		0 1 2		100		0 1 2		135		0 1 2	
31		0 1 2		66		0 1 2		101		0 1 2		136		0 1 2	
32		0 1 2		67		0 1 2		102		0 1 2		137		0 1 2	
33		0 1 2		68		0 1 2		103		0 1 2		138		0 1 2	
34		0 1 2		69		0 1 2		104		0 1 2		139		0 1 2	
35		0 1 2		70		0 1 2		105		0 1 2		140		0 1 2	
Totals				Totals				Totals				Totals			
Total 1+ 2				Total 1+ 2				Total 1+ 2				Total 1+ 2			

Key: Score 0 = not lame, 1 = lame (definite limp or uneven rhythm), 2 = severely lame (strong reluctance to bear weight or more than one limb affected)

Total 1+ 2 on page

Place:	Scorer(s):	Time and date:

Total cows scored	
% cows score 1 or 2	

Lameness Assessment Sheet for Tied Cows

Observe the cow individually standing in the stall undisturbed, looking for the indicators listed below. Then move her from side to side and look for any reluctance to bear weight on a particular foot. Note which indicators are present and on which foot/feet. Then, based on these observations, score the cow as lame (1) or not lame (0).

A single indicator, with the exception of rotation of the feet, is sufficient to classify the cow as lame. A cow with any indicator other than rotation should definitely be examined for lameness. A cow with rotation alone may not necessarily be lame but examination would be beneficial as it may reveal a lesion, or the feet may require trimming. The front feet may be difficult to see, and impossible to move, but they should be observed as closely as possible.

Farm			Date		Assessor	
Cow	Resting foot	Standing on edge of step	Stepping (weight shifting)	Reluctance to bear weight	Rotation of foot from parallel to midline of body	LAME Yes/No (1/0) and notes

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Science and society improving animal welfare

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SIXTH FRAMEWORK PROGRAMME

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